DESCRIPTIVE AND STATISTICAL

ACCOUNT

OF

THE BRITISH EMPIRE.

LONDON
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A DESCRIPTIVE AND STATISTICAL

ACCOUNT

OF

THE BRITISH EMPIRE

EXHIBITING

ITS EXTENT, PHYSICAL CAPACITIES, POPULATION, INDUSTRY, AND CIVIL AND RELIGIOUS INSTITUTIONS.

BY

J. R. M'CULLOCH, Esq.

MEMBER OF THE INSTITUTE OF FRANCE.

Fourth Edition, Revised.

WITH AN APPENDIX OF TABLES.

VOL. I.

Est enim cognitio reipublicæ et privato homini et publico utilissima et maxime necessaria; atque scientiam illam, qua duce cognitionem reipublicæ nobis comparamus, imprimis dignam esse, quam studiosius colamus et prosequamur, non est quod jure negare vel adeo dubitare possimus.

Mone, Hist. Statistic.

LONDON:

LONGMAN, BROWN, GREEN, AND LONGMANS.

1854.

TO THE

RIGHT HON. SIR ROBERT PEEL, BART., M.P.

&c. &c.

SIR,

A WORK descriptive of the industry and institutions of the United Kingdom, could be dedicated to no one with so much propriety as to yourself. You have occupied for a lengthened period a prominent position in the councils of the country; and your talents and disinterestedness have rendered your administration one of the most successful and memorable in our annals. Influenced solely by public considerations, you brought forward measures which, though opposed by a great and powerful party, you justly believed were well fitted to promote the real and lasting interests of all classes of Her Majesty's subjects; and in their support, you made, without hesitation, incomparably greater sacrifices than ever were made by any other minister; and overcame difficulties insurmountable by any one else. This devotion to NATIONAL INTERESTS, has ensured you the highest place in the public estimation; and that you may long live to enjoy this proud pre-eminence is the earnest wish of,

Sir,

Your faithful and obliged Servant,

J. R. M^CULLOCH.

London, December, 1846.

NOTICE TO THE FOURTH EDITION.

The greater number of the Statements in this Edition have been revised and made applicable to the present time. It is also enriched with a series of Statistical Tables carefully compiled by Mr. T. G. DARTON, which comprise a great many interesting details.

London, March 1854.

PREFACE TO THE THIRD EDITION.

In the preface to the first edition of this work we made the following statements:—

"It has long been matter of surprise and regret to many, that there should be no modern work exhibiting, within a moderate compass, the physical capacities, population, industry, and institutions of the British empire. The latest work of the kind that has attracted any notice is the State of Great Britain and Ireland, by Chamberlayne, the last edition of which was published so far back as the reign of George II. But, though this once popular publication contains a good deal of useful information, it is not written on any scientific plan, nor with any considerable discrimination; while the change of circumstances, since the peace of Paris, in 1763, would have rendered it, how good soever it might originally have been, quite obsolete for many years past. The want of any separate publication on the state of the empire has been but indifferently supplied by the notices of it in other works. Speaking generally, geographical science in this country has been, until very recently, at the lowest ebb, while during the long interval between Sir William Petty and Dr. Beeke, statistical science could hardly be said to exist. Hence the accounts of Great Britain and Ireland, in our encyclopædias and geographical works, are, for the most part, very meagre and defective. The article on England in the *Edinburgh Encyclopædia*, written by the late William Stevenson, Esq., Librarian to the Treasury, is undoubtedly the best of this class of publications. The space allotted to it was, however, too confined; so that some important subjects, such as those relating to population, education, the poor, revenue and expenditure, army and navy, &c., are disposed of in the briefest and most unsatisfactory manner. The accounts of agriculture and manufactures are the best parts of the article, and are superior to any that had appeared when it was printed in 1815.

"Since this æra a number of detached treatises of various merit have been published on different branches of industry; and our political, commercial, and financial systems have been subjected not only to a more thorough examination than they had previously undergone, but to many important changes. Much valuable information has also been acquired under the Acts for taking the census in 1821 and 1831, and there are few departments that have not been made the subject of investigation by parliamentary committees, or by commissions appointed by the Crown. A vast mass of materials has consequently been collected that may be employed to illustrate the statistics of the empire; and the time seemed to be at length arrived when it might be attempted to compile a work that should give a pretty fair representation of the present condition of the United Kingdom.

"Influenced by this feeling, the author of this work submitted, some years ago, a proposal to the Society for the Diffusion of Useful Knowledge for the publication of a statistical account of the British empire. The Society readily and liberally agreed to it; and the work now before the reader is the fruit of that arrangement.

"The author has endeavoured, with what success the public will judge, to make the work generally interesting and instructive. To have confined it, as some suggested, to mere statements of results, or to the detail of such information as might have been mostly thrown into a tabular form, would have made it unreadable, and destroyed its utility. The plan that has been followed is nearly the same as that adopted by Peuchet in his *Statistique Elémentaire de la France;* but with a greater latitude of criticism than that writer thought it right or perhaps safe to indulge in. We have not been satisfied, for example, in giving an accouut of any branch of industry, with stating the value of its products, the number and wages of the people engaged in it, and so forth; but have, in addition, given some notices of its history, and of the more prominent of the circumstances that have accelerated or retarded its progress. This seemed to be necessary to impart interest to the work, to make it useful, and to give it a chance for getting into circulation. We have, also, seldom scrupled, when a fair opportunity presented itself, briefly to expound the general principles applicable to the subject under review; but as these discussions are always separated from the descriptive and arithmetical details, they may be passed over by those anxious only to acquire information in regard to the latter."

The edition to which these paragraphs were prefixed appeared ten

years ago, or in 1837. A second edition, considerably amended, appeared in 1839, and we would fain hope that the one which is now offered to the public will be found to have still stronger claims on its attention.

It was customary, we believe, to submit the proof sheets of works published under the auspices of the Society for the Diffusion of Useful Knowledge, to the revision of certain of its members. This, at all events, was the course followed with the former editions of this work. But how leniently soever this sort of censorship might be exercised, it was, like all similar devices, disadvantageous rather than otherwise. It occasionally, no doubt, may have prevented blunders and misstatements in matters of fact; but, on the other hand, it tended to prevent the expression of such views and opinions as were not deemed acceptable to the managing committee. The Society in question having, however, ceased to exist, this edition has not been subjected to any species of surveillance; and we have not refrained from freely stating our opinions in regard to the various subjects we have had to discuss, from any apprehension that they might be objected to by any party previously to their being published. Whatever, consequently, may be the merits or defects of this work, we are alone entitled to all the credit of the former, and must bear all the blame of the latter. We can, however, assure the reader that we have not advanced any statements for which we did not suppose we had good grounds; and that the opinions we have expressed, whether right or wrong, have been honestly formed.

Much valuable information has been given to the public, and many important changes have taken place, since the last edition of this work was published in 1839. In that interval the census of 1841 has been taken; a new property and income tax has been imposed; our banking system has been placed on a novel and much improved footing; the corn-laws have been greatly modified, and their speedy abolition provided for; a large share of the public attention has been drawn towards the physical and moral condition and treatment of the poor of Great Britain; and the successive failures that have taken place in the crops of potatoes, have done more than anything else could have done to exhibit the real condition and social relations of the people of Ireland.

In preparing this edition we have endeavoured to profit by this additional information; and have not intentionally neglected any source

by resorting to which we could expect to find means of improving our work. We are, nevertheless, sufficiently aware that it is in many respects defective; but had we deferred its publication till these defects were removed, it would never have appeared. Some of them are inherent in the nature of the subject; and though additional experience and observation might afford the means of obviating others, new deficiencies would be sure to disclose themselves in the interval. Perfection is as unattainable in works of this description as in other things. We have, however, done our best, with the assistance of such means and instruments as we could command, faithfully to represent the state of the country; and by exhibiting the principal circumstances which have contributed to accelerate and to retard its progress in wealth and refinement, to show how its advancement, and the well-being of the population, may be best provided for in time to come. Unless they are made subservient to this end, descriptive and statistical details are of comparatively little value.

In those departments of the work in which the author was but little familiar, he sought the co-operation of others. Thus the articles on the geology of England, Scotland, and Ireland, were contributed to the first edition of the work by the late Mr. Bakewell; and they have been revised and mostly rewritten for this edition by Sir Henry de la Beche and Mr. Maclaren. The article on the climate of England is by Dr. Copeland, the learned author of the Medical Dictionary; and that on botany is by Sir William Jackson Hooker. The article on zoology was written for the first edition by William Swainson, Esq.; but it required and has received much alteration in this edition.

The chapters in the former editions on the English constitution and courts of law, were contributed by F. Forster, Esq., A.M., Barrister-at-Law. Except, however, in mere matters of detail, the chapters on these important subjects in this edition have very little in common with those of Mr. Forster, who is no longer in any degree responsible for them.

William Farr, Esq., of the office of the Registrar-General, is the author of the elaborate and very valuable article on Vital Statistics.

Dr. Irving, Librarian to the Faculty of Advocates, Edinburgh, has contributed the chapter on the Origin and Progress of the English Language.

We have also been greatly indebted to other parties. Our esteemed friend Mr. G. C. Lewis, procured for us many important statements;

and we are truly sorry we have no better return to make for his uniform kindness than to denounce, in no very measured terms, the entire system of which he is the ablest administrator, and which, were it practicable, he would conduct satisfactorily. With but few exceptions, we have not applied to any party possessing information with respect to any of the subjects of which we had to treat, which was not willingly supplied. And had we been better acquainted with the proper parties to whom to apply, our work would have had fewer defects.

Some of those who dip into this book may think we have discussed various topics that had been better omitted, to the exclusion of others of greater importance; and others, without objecting to the subjects, may probably object to the way in which they are treated. But, in a work of this kind, the outline of which does not admit of being accurately defined, and where much must necessarily be left to the discretion of the writer, it is impossible to please all parties; and we shall be satisfied if we shall be thought to have produced a work which, though not free from defects, furnishes, on the whole, a tolerably correct view of the present state and resources of the empire, and of the causes of its advancement.

PUBLICATIONS

BY THE AUTHOR OF THIS WORK.

In addition to this Account of the British Empire, Mr. M^cCULLOCH has published the following Works, viz.:—

1. A DICTIONARY, PRACTICAL, THEORETICAL, AND HISTORICAL, OF COMMERCE AND COMMERCIAL NAVIGATION. A new and improved Edition, in one thick volume 8vo. Illustrated with Maps and Plans. London, 1854.

2. A DICTIONARY, GEOGRAPHICAL, STATISTICAL, AND HISTORICAL, of the various Countries, Places, and principal Natural Objects, in the World. A new and much improved Edition. 2 thick vols. 8vo. Illustrated with Maps. London, 1851.

3. SMITH'S WEALTH OF NATIONS; with a Life of the Author, Notes, and Supplemental Dissertations. New Edition. 1 vol. 8vo., double columns. London, 1850.

4. THE PRINCIPLES OF POLITICAL ECONOMY; with some Inquiries respecting their Application, and a Sketch of the Rise and Progress of the Science. Fourth and amended Edition. 1 vol. 8vo. Edinburgh, 1849.

5. A TREATISE ON THE PRINCIPLES AND PRACTICAL INFLUENCE OF TAXATION AND THE FUNDING SYSTEM. The Second Edition, enlarged and improved. 1 vol. 8vo. London, 1852.

6. THE LITERATURE OF POLITICAL ECONOMY: a Classified Catalogue of Select Publications in the different Departments of that Science, with Historical, Critical, and Biographical Notices. 1 vol. 8vo. London, 1845.

7. A TREATISE ON THE SUCCESSION TO PROPERTY VACANT BY DEATH; including Inquiries into the Influence of Primogeniture, Entail, Compulsory Partition, Foundations, &c., over the Public Interest. I vol. 8vo. London, 1848.

8. TREATISES AND ESSAYS ON SUBJECTS CONNECTED WITH ECONOMICAL POLICY AND THE HISTORY OF COMMERCE, with Biographical Sketches of Quesnay, Adam Smith, and Ricardo. 1 vol. 8vo. Edinburgh, 1853.

9. A TREATISE ON THE CIRCUMSTANCES WHICH DETERMINE THE RATE OF WAGES AND THE CONDITION OF THE LABOURING CLASSES; including an Inquiry into the Influence of Combinations. The Second Edition, corrected and improved. 1 vol. post 8vo. London, 1854.

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INDUSTRY OF THE UNITED KINGDOM.

CHAPTER I.

A DESCRIPTIVE AND STATISTICAL

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OF

THE BRITISH EMPIRE.

THE British Empire, exclusive of its foreign dependencies, consists of the islands of Great Britain and Ireland, and of the smaller islands contiguous and subordinate to them. Great Britain, the largest and by far the most important of the British islands, is divided into the kingdoms of England and Scotland, the former occupying its southern, most fruitful and extensive, and the latter its northern, more barren, and smaller portion. After the Romans withdrew from Great Britain, these two divisions became separate and independent states, between which the most violent animosities frequently subsisted. In consequence of the marriage of Margaret, daughter of Henry VII. of England, to James IV. King of Scotland, in 1502, James VI. king of Scotland, ascended the English throne, upon the demise of Queen Elizabeth, in 1604. But, notwithstanding this union of the crowns, the two kingdoms had distinct and independent legislatures till 1707, when, during the reign of Queen Anne, a legislative union of England and Scotland was completed. In many respects, however, their institutions continue to be peculiar. The common law and the judicial establishments of England differ much from those of Scotland; the prevailing religion and the church establishment of the former are also materially different from those of the latter; and the manners and customs of the two countries, though gradually assimilating, preserve many distinguishing features. Hence, in the following work, we have separated the details respecting the geography, industry, institutions, &c., of England and Wales, from the corresponding details having reference to Scotland, without, however, treating those belonging to the one country as if it were wholly independent of the other.

Similar reasons have induced us to class the details respecting Ireland under distinct heads. Though now legally incorporated with Great Britain, the distinction between the latter and Ireland is far more decided than that between England and Scotland. The insular

situation of Ireland, removed to a considerable distance from Britain, gives her an indelible character of individuality. And though the English and their descendants have long had the ascendancy in Ireland, and English laws have been established there from a remote æra, the Irish continue to be, in many respects, a peculiar people; so much so, that there is certainly less similarity between them and the English than between the latter and the Scotch. The circumstance of the great majority of the Irish being attached to the religion of Rome, while the English in Ireland profess the reformed faith, explains some of the apparently anomalous features in the condition of the Irish people; but, exclusive of this, a vast variety of circumstances, some of the more prominent of which will be mentioned in the course of this work, have contributed to form the distinctive and peculiar habits and character of the Irish.

The British Isles, exclusive of those of Orkney and Shetland, lie between the 50th and 59th degrees of north latitude; and between the 11th degree of west and the 2nd degree of east longitude. They are, consequently, opposite to the northern coasts of France, the Netherlands, Denmark, and the southern part of Norway. The south-east extremity of Great Britain is separated from France by the Straits of Dover, a narrow channel, only 21 miles in width; but, as the British coasts recede from this point in a north-westerly direction, while the opposite Continental shores recede to the north-east, the intervening sea is of pretty ample dimensions. Ireland lies to the west of Great Britain, from which it is separated by St. George's Channel and the Irish Sea; its southern and northern extremities being nearly in the same latitudes as Bristol and Alnwick.

The insular situation of Great Britain and Ireland is an immense advantage. It gives us a well-defined frontier, on which there can be no encroachment, and about which there can be no dispute. It renders us comparatively secure from hostile attacks, at the same time that it affords every facility for commerce; and though it subjects the climate to sudden changes, it makes it really temperate, exempting us from those comparatively lengthened and violent extremes of heat and cold experienced in the Continental countries under the same parallel of latitude.

The distance, in a direct line, from the Lizard point near Falmouth, in lat. 49° 57′ 30″ N., long. 5° 13′ W., the southernmost land in England, to Dunnet Head in Caithness, in lat. 58° 42′ N., long. 3° 29′ W., is 608 miles. But a considerable portion of this line is water, inasmuch as it passes through the Bristol Channel, the Irish Sea, and the Moray Frith. The longest line, not intersected by any considerable arm of the sea, that can be drawn in Great Britain, stretches from Rye in Sussex, in lat. 50° 57′ 1″ N., long. 0° 44′ E., to Cape Wrath in Sutherland, in lat. 58° 37′ N., long. 4° 59′ W., a distance of 580 miles. The longest line that can be drawn crosswise in Great Britain, is from the Land's End, in lat. 50° 4′ 8″ N., long. 5° 41′ 31″ W., to a point near Lowestoffe, on the coast of Norfolk, in lat. 52° 29′ 10″ N., long. 1° 45′ 14″ E., a distance of 367 miles; but, in other places, the breadth from sea to sea is much less considerable, being sometimes under 40 miles.

The east coast of Great Britain, though marked by several prominences, of which the great triangular district terminating in Kinnaird's Head is by far the most conspicuous, is, on the whole, pretty regular; and were a straight line drawn from Dover to Duncansby Head, the land cut off from the main body of the island would not be far from equal to the water included. The western coast, on the contrary, is exceedingly irregular. The principal encroachment of the sea is between the coast of Galloway and the island of Anglesea and the coast of North Wales; but, exclusive of this great basin, the whole west of Scotland is deeply indented with large bays; while Cardigan Bay and the Bristol Channel deeply mark the coast of Wales and the south-west part of England. There are several admirable ports, and some considerable bays, though none of them is on a very large scale, on the south coast of England, between the Land's End and the South Foreland.

PART I.

EXTENT, PHYSICAL CIRCUMSTANCES, AND CIVIL DIVISIONS OF THE UNITED KINGDOM.

CHAPTER I. —ENGLAND AND WALES.

SECT. 1.—*Name and Extent.*

Name.—THE term England is derived from the Angles, or Anglo-Saxons, a German tribe or nation, supposed to have occupied in the sixth century the country between the Elbe and the Eyder. This tribe, following the example that had been set by other tribes of the same race, invaded South Britain in 547, about 140 years after the subversion of the Roman power, and about a century after the invasion of Britain by the Jutes, or Saxons of Jutland. The Angles first landed in Northumberland; but not long after they took possession of Norfolk; and being the most powerful or predominant of the Teutonic tribes established in this part of Britain, it received from them the name of England, that is, the land or country of the English, or Angles.

There is more difficulty in regard to the term Wales. It was the name given by the Saxons to the principality to which it is still applied; and also to Devonshire and Cornwall, which were called West Wales. Etymologists differ as to the origin of the name. Sumner supposes that it is derived from the Saxon *weallen*, to wander; and that the Saxons meant by it to specify the countries to which they and the other German tribes compelled part of the Britons to resort, as fugitives and wanderers, from the richer and more level country to the eastward of the Severn and the Exe.—(*Campbell's Political Survey*, vol. ii. p. 310.)

Figure and Extent.—The figure of this grand division of Great Britain is triangular: the base of the triangle being formed by a line drawn from the South Foreland in Kent, to the Land's End in Cornwall; the eastern side by a line drawn from the South Foreland to

Berwick; and the western, or longest side, by a line drawn from Berwick to the Land's End. It is bounded on all sides by the sea, except on the north, where it unites with Scotland; from which it is separated partly by the river Tweed, and partly by a waving and not very well defined line, drawn from near Coldstream to the bottom of the Solway Frith, in a south-westerly direction.

Geographers and writers on political arithmetic, have differed very widely in their estimates of the area of England and Wales. According to the most ancient and traditional opinion, they contained 29,000,000 statute acres. Dr. Becke remarks, that this nearly coincides with the extent of the Anglo-Saxon kingdom, and he believes that it may be traced back to that period. "Probably," says he, "it was not the result of any geographical inquiry, though the times in which I suppose it to have originated were by no means so incompetent to such an inquiry as may be imagined; but was a computation made from the returns to the royal treasury. The mode of levying the revenue of the Anglo-Saxon kings led to a more minute investigation of the extent and cultivation of their territory than has recently been attempted. The celebrated Domesday Book of the Norman conquerors was evidently formed on a more ancient register of the same kind, to which it continually refers."—(*Observations on the Income Tax*, 2nd ed. p. 10.)

The admeasurement of the maps of the seventeenth century, inaccurate as they were, would have sufficed to prove that England and Wales contained more than 29,000,000 acres. It is singular, therefore, that Sir William Petty should have estimated their area at only 28,000,000 acres. Dr. Beeke thinks it probable that he may have calculated by 60 miles to a degree of latitude; and if so, his estimate would nearly correspond with the area deducible from Morden's map, the best that was then published.

Gregory King estimated the area of England and Wales at 39,000,000 acres; but the first estimate to which much attention is due, is that framed by Dr. Halley. Taking the best maps then extant for the basis of his calculation, he found, measuring the counties separately, the entire area of England and Wales to amount to 39,938,500 acres. Unfortunately, however, the maps to which Dr. Halley was obliged to resort were very inaccurate, particularly as respected the southern counties. The operations connected with the Ordnance survey have shown that the distance between the South Foreland and the Land's End had been exaggerated by about half a degree! But for this extraordinary error, Dr. Halley's estimate would not have been very wide of the mark.

It is needless to specify in detail the various estimates given by Grew, Templeman, Arthur Young, and others; they vary from 31,648,000 to 46,916,000 acres! The last, which is the number given by Mr. Young, in his "Travels in France,"* was adopted by Mr. Pitt, in his estimate of the probable product of the income tax; by Mr. Middleton, in his Survey of Middlesex, and by other authorities.

* Vol. i. p. 286. Mr. Young had previously given a more accurate estimate in the second part of his "Political Arithmetic," p. 26.

The first approach to a more correct computation was made by Dr. Becke, in his elaborate tract on the income tax. Availing himself of later and more correct observations, by which the true distance between several of the principal points had been determined, he computed the area of England and Wales at 38,498,572 acres; but more recent investigations have shown that even this computation is about 1,400,000 acres too great. According to the results deduced from Arrowsmith's map, which, as it was principally founded on the Ordnance survey, could not involve any very material error, the area of England was set down, in the remarks prefixed to the census of 1821, at 50,535 square miles, and that of Wales at 7,425, making together 57,960: but in the census of 1831, Mr. Rickman reduced the area of England to 50,387 square miles.* It is, however, worthy of remark, that the area of the different counties, obtained by adding together the areas of the parishes and hundreds contained in each, as given in the Population Returns, does not correspond in any instance with their aggregate measurement. The area of England and Wales, as deduced from them, amounts to only 49,641 square miles, being 746 square miles less than the other. No attempt is made, in the official papers referred to, to explain this discrepancy. We subjoin—

A Table exhibiting the Area of the Counties of England and Wales in Square Miles and Statute Acres, as deduced from the aggregate Measurement of each; the Acres in each, as deduced from the Particulars in the Population Returns for 1831; *and the Fractional Part of the entire Area of England and Wales, supposing it to be represented by* 1000, *contained in each County, according to its aggregate Measurement.*

ENGLAND.

Counties.	Square Miles, aggregate Measurement.	Statute Acres, aggregate Measurement.	Statute Acres, according to Details in Population Returns.	Part of the Area of England and Wales, supposing it to be 1000, contained in each county, according to aggregate Measurement.
Bedford	463	296,320	297,632	8·008,718
Berks	752	481,280	472,270	13·007,680
Buckingham . . .	738	472,320	463,820	12·765,516
Cambridge . . .	857	548,480	536,853	14·823,912
Cheshire	1,052	673,280	649,050	18·196,914
Cornwall, excl. of Scilly Islands . .	1,330	851,200	849,200	23·005,604
Cumberland . . .	1,523	974,720	969,490	26·344,012
Derby	1,028	657,920	663,180	17·781,775
Devon	2,585	1,654,400	1 636,450	44·713,900
Dorset	1,006	643,840	627.220	17·401,232
Durham	1,097	702,080	679,530	18·975,299
Essex	1,533	981,120	979,000	26·516,986
Gloucester . . .	1,258	805,120	790,470	21·760,188
Hants.	1,625	1,040,000	1,018,550	28·108,351
Hereford	863	552,320	543,800	14·927,697
Hertford . . .	630	403,200	400,370	10·897,392
Huntingdon . . .	372	238,080	241,690	6·434,650
Kent	1,557	996,480	972,240	26·932,125

* We believe it should be 50,380.

ENGLAND—*continued.*

Counties	Square Miles, aggregate Measurement.	Statute Acres, aggregate Measurement.	Statute Acres, according to Details in Population Returns.	Part of the Area of England and Wales, supposing it to be 1000, contained in each county, according to aggregate Measurement.
Lancaster . . .	1,766	1,130,240	1,117,260	30·547,291
Leicester	806	515,840	511,340	13·941,742
Lincoln	2,611	1,671,040	1,663,850	45·163,634
Middlesex . . .	282	180,480	179,590	4·877,880
Monmouth . . .	496	317,440	324,310	8·579,534
Norfolk	2,024	1,295,360	1,292,300	35·010,033
Northampton . .	1,016	650,240	646,810	17·574,206
Northumberland .	1,871	1,197,440	1,165,430	32·363,523
Nottingham . . .	837	535,680	525,800	14·477,963
Oxford	756	483,840	467,380	13·076,870
Rutland	149	95,360	97,500	2·577,320
Salop	1,343	859,520	864,360	23·230,471
Somerset	1,645	1,052,800	1,028,090	28·454,300
Stafford	1,184	757,760	736,290	20·480,177
Suffolk	1,515	969,600	918,760	26·205,632
Surrey	759	485,760	474,480	13·128,762
Sussex	1,466	938,240	907,920	25·358,057
Warwick	897	574,080	567,930	15·515,810
Westmoreland . .	762	487,680	485,990	13·180,655
Wilts	1,367	874,880	869,620	23·645,610
Worcester . . .	723	462,720	459,710	12·506,054
Yorkshire . . .	5,836	3,735,040	3,669,510	100·947,900
Fractional part not explained . . .	7	4,480	..	121,082
Add for Scilly Islands	..	..	5,570	..
Total of England	50,387	32,247,680	31,770,615	871·566,457

WALES.

Anglesey . . .	271	173,440	No details given.	4·687,608
Brecknock . . .	754	482,560		13·042,275
Cardigan	675	432,000		11·675,777
Caermarthen . .	974	623,360		16·847,713
Caernarvon . . .	544	348,160		9·409,811
Denbigh	633	405,120		10·949,284
Flint	244	156,160		4·220,577
Glamorgan . . .	792	506,880		13·699,578
Merioneth . . .	663	424,320		11·468,207
Montgomery . .	839	536,960		14·512,558
Pembroke . . .	610	390,400		10·551,443
Radnor	426	272,640		7·368,712
Total of Wales	7,425	4,752,000	..	128·433,543
Add Total of England as before .	50,387	32,247,680	31,770,615	871·566,157
Total of England and Wales. .	57,812	36,999,680	..	1,000·000,000

SECT. 2.—*Face of the Country.*

Few countries exhibit a greater variety of surface than England, or have been more highly favoured by nature. "Although," says Dr. Aikin, "its features are moulded on a comparatively minute scale, they are marked with all the agreeable interchange which constitutes picturesque beauty. In some parts, plains clothed in the richest verdure, watered by copious streams, and pasturing innumerable cattle, extend as far as the eye can reach: in others, gently rising hills, and bending vales, fertile in corn, waving with woods, and interspersed with flowery meadows, offer the most delightful landscapes of rural opulence and beauty. Some tracts furnish prospects of the more romantic and impressive kind; lofty mountains, craggy rocks, deep dells, narrow ravines, and tumbling torrents: nor is there wanting as a contrast to those, scenes in which every variety of nature is a different charm, the vicissitude of black barren moors, and wide inanimated heaths."—(*England Described*, p. 1.) Such is a vivid description of the general appearance of England. But its varied beauty and richness are not the only things to excite admiration: the mildness of the climate, removed alike from the extremes of heat and cold; the multitude of rivers, their depth, and the facilities they afford to internal navigation; the vast beds of coal and other valuable minerals hid under the surface; the abundance and excellence of the fish in the rivers and surrounding seas; the extent of sea-coast; the number, capaciousness, and safety of the ports and bays; and the favourable situation of the country for commerce; give us advantages that are not enjoyed in an equal degree by any other nation. The splendid panegyric of Pliny on Italy, is, in most respects, still more applicable to England:—"*Ergo in toto orbe et quacunque cœli convexitas vergit, pulcherrima est omnium, rebusque meritò principatum naturæ obtinens, Britannia rectrix parensque mundi altera; viris, fœminis, ducibus, militibus, servitiis, artium præstantia, ingeniorum claritatibus, jam situ ac salubritate cœli atque temperie, accessu cunctarum gentium facili, littoribus portuosis, benigno ventorum afflatu, aquarum copiâ, nemorum salubritate, montium articulis, ferorum animalium innocentiâ, soli fertilitate, pabuli ubertate. Quicquid est quo carere vita non debeat, nusquam est, præstantius: frûges, vellera, lina, vestes, juvenci. Ne equos quidem præferre ullos vernaculis animadverto.*"—(*Hist. Nat.* lib. xxxvii. cap. 13.)

It is farther the good fortune of England, and of the United Kingdom generally, to be placed under the most favourable circumstances for the development of industry and ingenuity. Her inhabitants have many wants that are unknown to those that occupy warmer climates; and having also the capacity and the wish to gratify them, they are fitted to rise higher in the scale of wealth and civilization. They are neither benumbed by extreme cold nor enervated by overpowering heats; the soil is not fertile enough to produce crops with little exertion, nor barren to such a degree as to deny abundant returns to the laborious and skilful cultivator; and while the various vegetable, animal, and mineral products we possess in such unparalleled profusion, furnish ample means, our necessities and acquired desires

prompt to the continued exercise of manufacturing and commercial ingenuity. Hence the United Kingdom may be said to be the chosen seat of industry; nowhere are her gifts more necessary, and nowhere are they more ardently desired, or reaped in greater abundance.

No one will expect to find, in a work of this sort, either a full description of the country, or minute topographical details. It is impossible, however, to form any just notion of its actual *state and resources*, without having a general acquaintance with its physical as well as with its moral and political condition.

The face or appearance of a country may be variously described. Some geographers commence their descriptions by giving an account of the rivers, and of the basins, or tracts of country, drained by each. But though this method has some advantages, we incline to think that the best and most natural order is to begin with the description of the mountains, proceeding successively to describe the vales, the rivers and lakes, and the sea-coasts and harbours; and then laying before the reader accounts of the geology, climate, botany, and zoology. We propose following this plan in regard to the various divisions of the United Kingdom; and it is hoped that the reader may, in this way, acquire sufficiently distinct ideas with respect to its natural powers and capacities.

Sect. 3.—*Mountains and Moorlands.*

The mountains of England, though of very inferior dimensions compared with those of some continental states, form a prominent and distinguishing feature in its physiognomy. We shall include under this head a brief notice of the principal hills and moorlands; meaning by the latter, the principal elevated tracts of heathy or moorish ground.

A chain of mountains or hills extends, with but few interruptions, along the whole western side of the kingdom, from Cumberland to the Land's End. It is of very various breadth and elevation. In some places it approaches quite to the west coast, occasionally sending off large spurs or arms to the east. Assuming the summit of this great chain to form the natural division between the eastern and western sides of the kingdom, the former is by far the largest, richest, and most important. The western side is not, however, without many considerable tracts of fertile, level land; but they are very inferior, in extent and value, as compared with the others.

Most of the rivers of England have their sources in this grand chain. With the exception, indeed, of the Severn, which principally follows a southerly course, and of the Eden, which flows north-west, all of them that are of any considerable magnitude flow eastward; the limited territory traversed by those that run westward not allowing them space to attain a lengthened course, or to carry off a large body of water.

The great longitudinal chain has been divided into three portions, respectively denominated the Northern, Cambrian, and Devonian ranges. The first, taken in its utmost extent, stretches from the Scottish border to the middle of Derbyshire: it enters England at Carter Fell, near the north-eastern extremity of Cumberland, and

stretches southwards, in a pretty direct line, till it is interrupted by the valley of the Ribble, Craven, and the valley of the Aire. This part of the chain lies partly in Cumberland, partly in Westmoreland, partly in Northumberland, and partly in Durham and Yorkshire: its summit ridge separates the waters of the North Tyne, South Tyne, Tees, Swale, Ure, and Wharfe, flowing eastward, from those of the Irthing, Eden, Lowther, Lune, and Ribble, flowing westward. Its elevation varies from 1,200 to near 3,000 feet: the highest summits are Cross Fell, near the sources of the South Tyne and the Tees, in the western part of Cumberland, 2,901 feet high; Shunnor Fell, in which the Eden and the Swale have their sources, on the confines of Yorkshire and Westmoreland, 2,329 feet high; and Whernside, Ingleborough, and Pennigant, respectively 2,384, 2,368, and 2,270 feet high, in the westernmost parts of Yorkshire, contiguous to the sources of the Ribble and the Wharfe.

An important portion of the northern range lies to the westward of that connected central ridge here noticed, being separated from it by the valley of the Eden and the Vale of Kendal. This portion stretches lengthwise from near Ireby, in Cumberland, to Ulverston in Lancashire and from Lowther Water, across to Dent Hill, near St. Bees Head. Some of the summits in this group are the highest of any in England. The most elevated are those of Scaw Fell, Helvellyn, Skiddaw, and Bow Fell, in Cumberland, respectively 3,166, 3,055, 3,022, and 2,901 feet above the level of the sea. Scaw Fell has two principal summits, separated from each other by a deep chasm, the one being 66 feet higher than the other. Helvellyn is in most parts extremely rugged and precipitous: in point of mass it far exceeds almost any other of the Cumbrian mountains: it is, however, closely hemmed round by others; while Skiddaw, though of inferior dimensions, being comparatively detached, appears to much greater advantage, and may be seen nearly on every side in its entire elevation. Exclusive of the above, the Nine Pins, in Westmoreland, rise 2,136 feet above the level of the sea; and Coniston Fell, in Lancashire, 2,577 feet.

The mountains in the central range extend in some places to a great width; insensibly shelving down and uniting, on the eastern side, with the Cheviot hills, and the moors of Northumberland, Durham, and West Yorkshire. They are in general rounded and tame, and are mostly covered with peat earth and heath, having a dreary, bleak, desolate aspect. But those in the western group are generally steep, bold, and rugged; in their disposition there is little of regularity, no lengthened ridge or continuous chain; their appearance is that of a congeries of immense broken and mostly angular masses, having their bases united, or nearly so, except where they are separated by lakes. The western mountains, unlike those of the eastern ridge, are mostly covered with a fine green sward, affording excellent pasture for sheep: Skiddaw, however, is partially clothed with heath.

The varied forms of these mountains, ornamented in parts with wood, and the picturesque beauties of the numerous lakes scattered amongst them, form a *tout ensemble* of very attractive scenery. They are seen to the greatest advantage on the road from Kirby Lonsdale, by Kendal, to Shap.

Besides slate and limestone, of which, indeed, the mountains in this part of the northern range are mostly composed, they furnish considerable supplies of coal, lead, and of the rare mineral plumbago, or black lead; this is obtained from a mine in Borrowdale, in Cumberland, of a finer quality than any hitherto discovered in any other part of the world.

The Cheviot hills unite with the north-eastern confines of the great central range now described. They are situated partly in Scotland, and partly in Northumberland: that part of them which is in the latter, occupies the space between the Scottish border on the north-west, and the upper part of the river Coquet on the south, round by Prendwick, Ilderton, Wooler, and Kirknewton, to Mindrim; including an area of from 90,000 to 100,000 acres. Several of these hills have a conical figure, some being nearly perfect cones; while the shape of others is very irregular: in general, however, they are pointed, their sides smooth, and rapidly sloping, and their bases separated by deep narrow glens. Except at their very summits, where points of rock and loose stones appear, they are mostly covered with a pretty fertile soil, producing a rich, close, green sward; but on the upper parts of the hill, called by way of distinction the Cheviot, and which is 2,658 feet above the level of the sea, there are extensive tracts of heath. The Cheviot hills are depastured by numerous flocks of the valuable and peculiar breed of sheep called the Cheviots, now widely diffused, not only over the north of England, but also over almost all Scotland.

As already stated, the northern part of the great central chain is divided into two portions by the valley of the Ribble, the district of Craven, and the valley of the Aire. The Leeds and Liverpool canal, which passes through Craven, and may be considered as the line of demarcation, has at its summit level, opposite to Pinnow hill, an elevation of 500¼ feet. From this hill, the southern division of the British Apennines, as the northern central range has sometimes been termed, extends nearly south along the eastern border of Lancashire, Cheshire, and Staffordshire, the western parts of the West Riding of Yorkshire, and the northern and western parts of Derbyshire, to near Ashborne in the latter. The length of the chain is above 60 miles; but its breadth is extremely various, being about 20 miles across from near Sheffield to Cheshire, whereas between Rochdale and Huddersfield, it is merely a narrow ridge. It separates the waters of the Calder and the Don, flowing east, from those of the Irwell and the Mersey, flowing west. Its most elevated points are Bolesworth Hill, in the north-east part of Lancashire, 1,689 feet above the level of the sea; Blackstone Edge, on the confines of Lancashire and Yorkshire; Holme Moss, on the confines of Yorkshire and the eastern angle of Cheshire, 1,859 feet; Kinderscout and Lord's Seat, in the hundred of High Peak, Derbyshire, respectively 2,150 and 1,751 feet high; and Axedge, on the confines of Derbyshire, Cheshire, and Staffordshire, 1,715 feet.

The *High Peak*, the name given to the north-western and most mountainous district of Derbyshire, has been repeatedly described. But it derives its celebrity more from its caverns, perforations, and dells, than from its mountains, which are inferior in romantic

beauty and elevation, to those of Wales, Cumberland, and Westmoreland. Poole's Hole, near Buxton, and Castleton Cavern, near the village of Castleton, are the most remarkable of the natural curiosities of the High Peak.

Before noticing the Cambrian mountains, there a few groups of hills that may be alluded to. The Malvern hills, between Herefordshire and Worcestershire, extend north and south about 10 miles. They rise on the eastern side from the Vale of Severn, of which they are one of the finest boundaries, connecting on the western side with a range of lower hills extending for several miles into Herefordshire. Their greatest elevation is 1,444 feet.

The Cotswold hills, in Gloucestershire, run S.W. and N.E. from the confines of Warwickshire to Wotton, a distance of about 44 miles. Their breadth is various, being in some places a narrow ridge, while in others the distance across is from 8 to 9 miles. They form the boundary between the waters that flow into the Severn on the one hand, and those that flow into the Thames on the other. Indeed, the sources of the latter, and those of the Churn, Coln, and Windrush, its principal feeders, are either in, or immediately contiguous to, the Cotswold hills. The general elevation of the ridge may be from 500 to 600 feet. Its highest summits are Broadway Hill, near Chipping Camden, 1,086 feet above the level of the sea; Cleve Hill near Cheltenham, 1,134 feet; and Symond's Hill, near Wotton, 795 feet. It is crossed in one of its hollows by the Thames and Severn Canal, the summit level of which, near the head of the Thames or Isis, is 351 feet above the sea. These hills are covered with a shallow calcareous loam, provincially called stonebrash, and are enclosed and mostly cultivated.

From Symond's Hill, a part of the Cotswold ridge extends to Bath. But the main portion, occupying the space between the Lower Avon, near its source, and the Isis, unites with Salisbury Plain. The Cotswold hills may, indeed, be considered as a continuation of that great central chain of mountains already noticed, stretching from the Scotch border to the middle of Derbyshire.

The Wrekin Hill in Shropshire, is so much higher than any other hill in its vicinity, that it seems to rise alone from the middle of the plain. It is craggy at the top; its plan is that of a long oval, pointing nearly north and south; and its figure has been supposed pretty exactly to resemble that of a whale asleep on the surface of the ocean. —(*Aikin's Tour in Wales*, p. 192.) Its height was not formerly supposed to exceed 1,200 feet; but it is now ascertained to be 1,320 feet above the level of the sea. The Wrekin may be considered as the northern extremity of a ridge, lying in the same line with it, consisting of the hills of Frodsley, Caradoc, &c. They are craggy at the top, and ascend from the plain of Salop at an angle of about 60°.

The Cambrian mountains, forming the Alpine portion of the great longitudinal chain, are a good deal more elevated in North than in South Wales. The principal chain runs in a north-east, and south-west direction, the whole length of Caernarvonshire, from the point of Lleyn, opposite to Bardsey Island, to Penmaenbach Promontory, on Conway Bay. The mountains of which it is composed are the

highest in the principality. They gradually ascend from each extremity of the chain towards the centre, which is occupied by Snowdon, the loftiest of all. The general escarpment fronts the sea; while the particular escarpment of individuals, or detached groups, depends upon the course of the streams. The altitude of the highest peak of Snowdon is 3,571 feet above the mean level of the sea, being the most elevated land in South Britain. The mountain terminates in various cliffs; and the particular cliff, the *Wyddva*, to which the name of Snowdon is particularly applied, scarcely out-tops several of the summits by which it is surrounded. The western side of the mountain is very precipitous, and is composed partly of pentagonal basaltic columns. Carnedd Llywellyn, and Carnedd David, lying N. E. of Snowdon, are the next highest mountains in this chain.—(*Davies's North Wales*, p. 20; *Aikin's Tour in North Wales*, p. 94, &c.)

A chain of mountains, occupying the conterminous parts of Merioneth, Montgomery, and Denbigh shires, runs nearly parallel to the Caernarvon chain, from Powyn and the base of "huge Plynlimmon," to Llangollen. The summit of this chain forms the line of demarcation between the waters that flow into the Severn on the one hand, and the Dee on the other. Its highest points are Cader Ferwyn, Arran Fowdy, and Cader Idris. Of these, the last is by far the most celebrated. It rises on the sea shore, close to the northern side of the æstuary of the small river Disynwy, about a mile above Towyn. It gradually ascends in a northerly direction for about 3 miles; then for about 10 miles further it runs E. N. E., giving out from its summit a branch nearly 3 miles long, in a south-westerly direction parallel to the main ridge. The highest point has an elevation of 2,914 feet above the level of the sea. It is on all sides steep and craggy; especially on the south, bordering Talyllyn Lake, where it is nearly perpendicular. Its breadth, where greatest, bears but a small proportion to its length. In some places it is a mere ridge, with a base not exceeding a mile in width.—(*Aikin*, p. 64, &c.)

Plynlimmon is, in point of mass, the largest mountain in Wales; but in respect of altitude it is inferior to several others, being only 2,463 feet above the level of the sea. The Severn, Wye, and Rhydiol, flowing east, south, and west, have their sources near each other in this mountain.

From Plynlimmon a ridge extends south to Tregarron Down; and then south-westerly, along the southern side of the Teify, to the Prescelly hills in Pembrokeshire. The highest points in this range do not reach an altitude of more than 1,800 feet.

Radnorshire and Brecknock are both much encumbered with mountains. The Talgarth and Black Mountains stretch from the latter into Caermarthenshire. The Black Mountains derive their name from their dreary blackness, or from the dark appearance of the heath by which they are covered, when out of blossom. The Van or Beacon, the highest of the Brecknock hills, and, indeed, of those of South Wales, has an elevation of 2,862 feet. The northern parts of Glamorgan are also mountainous; but none of the summits is of any very considerable height.

The mountains to which the name of the Devonian range has been

given, occupy part of Devonshire, Cornwall, and Somersetshire. The principal chain stretches in a south-westerly direction, from the borders of the Vale of Exeter to the Land's End. The highest points in this range are Yestor and Cawston Beacon, near Okehampton; the former having an elevation of 2,077, and the latter of 1,792 feet; and Rippon Tor, about five miles from Newton Bushel, 1,549 feet high. The space between these mountains, round by Erme Head on the south, and Brentor on the west, is occupied by Dartmoor. This, which is one of the most remarkable tracts in the kingdom, includes a space of from 200,000 to 300,000 acres. It is said, but we suspect the statement is exaggerated, to have a mean elevation of more than 1,700 feet above the level of the sea. Its surface is, in most places, extremely rugged: the soil, where it is not encumbered with broken fragments of rock, is mostly thin and poor; and in the most elevated part of the moor there is an immense morass, covering about 80,000 acres, which in some places is incapable of supporting the lightest animals. The part of Dartmoor called the Forest, embracing an extent of about 54,000 acres, belongs to the Crown, as parcel of the Duchy of Cornwall; and on this and some other of the best parts of the moor, considerable improvements have been made, particularly in the way of planting. Very large buildings for the accommodation of prisoners were erected here during the latter part of last war.—(*Vancouver's Survey of Devon*, p. 279, &c.)

Caraton Hill, 1,208 feet high, and Hensbarrow Beacon, 1,034 feet, are the two most elevated points in that part of the chain now under consideration, which runs through Cornwall. Pertinney, contiguous to the Land's End, has an elevation of 689 feet.

The Mendip, Quantock, and Brendon hills, in Somersetshire, may be considered in connection with the Devonian range. Dunkerry Beacon, in the Brendon hills, is one of the highest hills in the west of England, being 1,668 feet above the level of the sea. From the summit there is an extensive view of the Bristol Channel. The Mendip hills stretch in a north-westerly direction about 25 miles, from near Chesterblade to the south of Shepton Mallet, to near Uphill, on the north side of the river Ax, contiguous to the Bristol Channel: their mean breadth is from 4 to 5 miles. The height of this ridge varies from 800 to about 1,100 feet. It was anciently a royal forest; but it is now partially inclosed and cultivated; the uninclosed portion, which is covered with heath and fern, affording pasture for a peculiar description of sheep. In the parish of Chedder, on the south-west side of the ridge, not far from Axbridge, is an extraordinary chasm, extending fully 2 miles into the hills. In some parts the limestone cliffs rise quite perpendicular, to the height of 300 feet. In general, the salient angles on the one side correspond with the recipient angles on the other; so that it would seem as if the mountain had been torn asunder by some great convulsion.—(*Maton's Western Counties*, vol. ii. p. 124.) The Mendip hills have mines of lead and calamine; but the former are now, either from the exhaustion of the ore or the difficulty of working them, all but abandoned: the calamine mines are still wrought, but not to any considerable extent.

The southern and eastern parts of the island are traversed by

different ranges of chalk hills. Some geologists trace one of these chains from Dorsetshire to Kent, and another from the Isle of Portland to the wolds in the East Riding of Yorkshire: but others contend that the highest, barest, and best defined ridges in the southern parts of the island diverge from the high table land of Salisbury Plain. One of them, after intersecting Hants and Sussex, terminates in the bold chalky cliffs of Beachy Head. The part of this ridge which lies in Sussex, being above 50 miles in length, and from 3 to 6 in breadth, is celebrated, under the name of the South Downs, for the excellence of its sheep and sheep-pasture. Another ridge stretches from Salisbury Plain to the eastern coast of Kent. Part of this ridge, called the Surrey Downs, is not much less celebrated for its sheep-pasture than the South Downs. A little to the east of Farnham, in Surrey, where it is narrow, it is called the Hogsback; but as it penetrates deeper into the county, its breadth becomes more considerable. Its southern side is generally pretty abrupt, its northern gently sloping.

The third and most important range, supposed to diverge from Salisbury Plain, pursues a north-easterly direction, crossing the northern parts of Berks and the southern extremity of Oxfordshire; then running along the southern side of the Vale of Aylesbury, in Bucks, and along the southern confines of Bedfordshire and Cambridgeshire to Suffolk. It separates the waters of the Ivell, the southern Ouse, the Nene, and other rivers that have their embouchure in the Wash, from those of the western Colne, the Lea, Chelmer, Blackwater, Stour, &c., that fall into the Thames or the sea on the Suffolk coast. That part of this chain which is in Oxfordshire and Berks, is called the Chiltern hills. The most elevated points in the ridge are the Whitehorse, and Scatchamfly Beacon, in Berks, respectively 893 and 853 feet above the level of the sea; Wendover Hill, in Bucks, 905 feet; Kinsworth Hill, on the confines of Bedfordshire and Herts, 904 feet; and the Gogmagog hills, in the south of Cambridgeshire. The Grand Junction Canal crosses this ridge near Tring, in the north-western extremity of Herts, being there 389½ feet above the level of the sea.—(See *Priestley's Map of Canals, &c.*) We subjoin—

A Statement of the Elevation of some of the Principal Mountains of England and Wales, as determined from Observations made in the course of the Ordnance Survey.

Agnes Beacon (St.), Cornwall .	621	Billing Beacon, Lancashire . .	633
Allport Heights, Derbyshire .	980	Bindown, Cornwall	658
Alnwick Moor, Northumberland	808	Black Comb, Cumberland . .	1.919
Arbury Hill, Northamptonshire.	804	Black Down, Dorsetshire . .	817
Arran Fowddy, Merionethshire.	2,955	Black Hambleton Down, Yorkshire	1,246
Arrenig, Merionethshire. . .	2 809	Blackheddon, Northumberland .	646
Axedge, Derbyshire	1,753	Bleasdale Forest, Lancashire .	1,709
Bagborough, Somerset . . .	1,270	Bodmin Down, Cornwall . .	645
Banstead, Surrey	576	Bolt Head, Devonshire . . .	630
Bar Beacon, Staffordshire . .	653	Bolesworth Hill, Lancashire .	1,689
Bardon Hill, Leicestershire . .	853	Botley Hill, Surrey	880
Barnaby Moor, Yorkshire . .	784	Botton Head, Yorkshire . . .	1,485
Beacon Hill, Wiltshire . . .	690	Bow Brickhill, Bucks . . .	683
Beacons of Brecknock, Brecknock	2,862	Bow Fell, Cumberland . . .	2,911
Beachy Head, Sussex . . .	564	Bow Hill, Sussex.	702
Beeston Castle, Cheshire . .	556		

Bradfield Point, Yorkshire	1,246
Bradley Knoll, Somersetshire	973
Brandon Mount, Durham	875
Brenin Fawr, Pembrokeshire	1,285
Brightling Down, Sussex	646
Broadway Beacon, Gloucestershire	1,086
Brown Clee Hill, Shropshire	1,805
Brown Willy, Cornwall	1,368
Bull Barrow, Dorsetshire	627
Butterton Hill, Devonshire	1,203
Bwlch Mawr, Caernarvonshire	1,673
Cader Ferwyn, Merionethshire	2,563
Cader Idris, Merionethshire	2,914
Cadon Barrow, Cornwall	1,011
Caermarthen Vau, Caermarthenshire	2,596
Calf Hill, Westmoreland	2,188
Capellante, Brecknockshire	2,394
Capel Kynon, Caernarvonshire	1,046
Carn Bonellis, Cornwall	822
Carn Minnis Cornwall	805
Carnedd David, Caernarvonshire	3,427
Carnedd Llewellyn, Caernarvonshire	3,469
Carraton Hill, Cornwall	1,208
Cawsand Beacon, Devonshire	1,792
Cefn Bryn, Glamorganshire	583
Chanctonbury Hill, Sussex	814
Cheviot, Northumberland	2,658
Cleave Down, Gloucestershire	1,134
Collier Law, Durham	1,678
Coniston Fell, Lancashire	2,577
Cradle Mountain, Brecknockshire	2 545
Cross Fell, Cumberland	2 901
Crowborough Beacon, Sussex	804
Cerny Brain Mountain, Denbighshire	1,857
Danby Beacon, Yorkshire	966
Dent Hill, Cumberland	1,115
Ditchling Beacon, Sussex	858
Dumpton Hill, Dorsetshire	879
Dunkery Beacon, Somersetshire	1,668
Dundry Beacon, Somersetshire	790
Dunnose, Isle of Wight	792
Dwggan, near Builth, Brecknockshire	2,071
Garth (The), Glamorganshire	981
Gerwyn Goch, Caernarvonshire	1,723
Grasmere Fell, Cumberland	2,756
Greenwich Observatory, Kent	214
Haldon (Little), Devonshire	818
Hathersedge, Derbyshire	1,377
Hawkeston Obelisk (Top), Shropshire	812
Hedgehope, Northumberland	2,547
Helveyllin, Cumberland	3,055
Hensbarrow Beacon, Cornwall	1,034
Heswell Hill, Cheshire	475
Highbeech, Essex	750
Highclere Beacon, Hampshire	900
High Pike, Cumberland	2,101
Hind Head, Surrey	923
Holm Moss, Derbyshire	1,859
Hollingborn Hill, Kent	616
Holyhead Mountain, Anglesea	709
Ingleborough Hill, Yorkshire	2,361
Inkpin Beacon, Hampshire	1,011
Kensworth, Hertfordshire	904
Kilhope Law, Durham	2,196
Kit Hill, Cornwall	1,067
Lansdown, Somersetshire	813
Leith Hill, Surrey	993
Llandinam Mountain, Montgomeryshire	1,898
Llanelian Mountain, Denbighshire	1.110
Llangeinor Mountain, Glamorganshire	1,859
Llannon, Caermarthenshire	912
Longmount Forest, Shropshire	1,674
Long Mountain, Montgomeryshire	1,330
Loose Hoe, Yorkshire	1,404
Lord's-Seat, Derbyshire	1,715
Malvern Hills, Worcestershire	1,444
Margam Down, Glamorganshire	1,099
May Hill, Gloucestershire	965
Moel Famman, Denbighshire	1,845
Moel Morwith, Denbighshire	1,767
Moel Issa, Denbighshire	1,037
Motteston Down, Isle of Wight	698
Mole Cop, Cheshire	1,091
Muzzle Hill, Bucks	744
Nettlebed (Windmill), Oxfordshire	820
New Inn Hill, Caermarthenshire	1,168
Nine Standards, Westmoreland	2.136
North Berule, Isle of Man	1.804
Pen Hill, Yorkshire	2,245
Pendle Hill, Lancashire	1.803
Pengarn, Merionethshire	1 510
Penmaen Mawr, Caernarvonshire	1,540
Pennigant Hill, Yorkshire	2,270
Pertiney, Cornwall	689
Pillar, Cumberland	2.893
Pilsdon Hill, Dorsetshire	934
Plynlimmon, Cardiganshire	2,463
Pontop Pike, Durham	1,018
Prescelly Top, Pembrokeshire	1,754
Radnor Forest, Radnorshire	2,163
Rippin Tor, Devon	1,549
Rhiw Mountain, Caernarvonshire	1.013
Rivel Mountain, Caernarvonshire	1,866
Rivington Hill, Lancashire	1,545
Rodney's Pillar, (Base of) Montgomeryshire	1.199
Rook's Hill, Sussex	702
Rosebury Topping, Yorkshire	1,022
Rumbles Moor, Yorkshire	1.308
Saddleback, Cumberland	2787
Scaw Fell (Low Point), Cumberland	3,092
Scaw Fell (High Point), Cumberland	3,166

Scatchamfly Beacon, Berks	853
Shunnor Fell, Yorkshire	2,329
Simonside Hill, Northumberland	1,407
Skiddaw, Cumberland	3,022
Snea Fell, Cumberland	2,004
Snowdon, Caernarvonshire	3.571
Stow Hill, Herefordshire	1,417
Stow-on-the-Wold, Gloucestershire	883
Talsarn, Cardiganshire	1,143
Tregarron Down, Cardiganshire	1.747
Trelleg Beacon, Monmouthshire	1.011
Water Cragg, Yorkshire	2,186
Weaver Hill, Staffordshire	1,154
Wendover Down, Bucks	905
Westbury Down, Wiltshire	775
Whernside (in Ingleton Fells), Yorkshire	2,384
Whernside (in Kettlesdale), Yorkshire	2,263
White Horse Hill, Berkshire	893
Wilton Beacon, Yorkshire	809
Wingreen Hill, Dorsetshire	941
Wittle Hill, Lancashire	1.614
Wordeslow Hill, Durham	632
Wrekin, Shropshire	1,320

Moorlands, &c.—The principal moorlands of England lie in the counties of Northumberland, Cumberland, Durham, York, Lancaster, and Stafford. In many parts they are identified with the great central chain of mountains already described. The Northumberland moorlands are very extensive, occupying nearly a third part of the surface of the county. They lie principally in its western parts, between the river Coquet and the north-western part of Durham, uniting with the great central ridge. Their average elevation may be from 500 to 1,000 feet above the level of the sea. They are not marked by any very striking inequalities of surface, being in general extensive, open, solitary wastes, producing little except heath, and affording a scanty subsistence to the flocks of sheep by which they are depastured.—(*Survey of Northumberland*, p. 5.) In this respect they present a striking contrast to the Cheviot hills in the northern part of Northumberland, and the hills in the pastoral district in the south of Scotland.

The moors of Durham lie in what is called the Lead-mine district of the county, to the west of a line drawn from Allansford to Barnard Castle. They are similar to the Northumberland moors. They were supposed by Mr. Bailey, in 1810, to be worth about 1*s.* an acre, and this is most probably, about their value at present.—(*Survey of Durham*, p. 199.)

The moors of Cumberland and Westmoreland are so intermixed with the mountains of these counties, that they cannot be separately considered. The total extent of moor and mountain land in Cumberland is estimated at from 450,000 to 500,000 acres. In Westmoreland the mountains and moors occupy above two-thirds of the entire surface of the county.

The Yorkshire moors are by far the most extensive and important of any in the kingdom. They consist of two grand portions,—the eastern and the western moorlands. The former lie in the North Riding, extending lengthwise from Osmotherly to Harwood Dale, between Scarborough and Whitby, a distance of above 30 miles; and from Guisborough, on the north, to Kirby Moorside, on the south, about 20 miles. But in this extensive tract there are a number of fertile, well cultivated dales, some of them containing from 5,000 to 10,000 acres and upwards. The middle part of these moorlands, separating the waters that flow into the Esk on the north, from those that flow into the Derwent on the south, is generally elevated about 1,000 feet above the level of the sea; but Botton Head and Loosehoe

hills have, the former an elevation of 1,485 feet, and the latter of 1,404 feet. The surface of some of the hills is entirely covered with large freestones; and in other places, mosses, sometimes very large, and never to be passed without danger, extend to a great distance. The prevailing soil is peat earth, which is generally covered with heath. But in the western parts of the moorlands, called Hambledon hills, the soil is much better, being good loam on a limestone rock. The climate of these moorlands is dry, but cold and backward. Oats and bear, or big, are the only crops cultivated in the higher parts of the dales. Wheat is seldom sown at a greater elevation than 600 feet; and even there it is very precarious, the harvest being about a month later than at the foot of the moors.—(*Tuke's Survey of the North Riding*, p. 4.)

The western moorlands of Yorkshire lie mostly to the west of a line drawn from Barnard Castle, on the confines of Durham, to Ripley, and thence through Otley, Bradford, and Halifax, to the borders of Lancashire and Cheshire, being about equally divided between the North and West Ridings. They are of very great extent; but, exclusive of the moorlands, there are, to the west of the line now mentioned, some extensive valleys, lying along the Swale, Ure, Wharfe, Aire, Ribble, &c., with the high mountains of Ingleborough, Pennigant, Whernside Fells, &c., previously noticed. The western are not generally so sterile as the eastern moorlands. Many of the hills are covered with fine sweet grass; in other places, there are extensive tracts of coarse grass (bent); and where heath prevails, it is mostly mixed with grass, bent, or rushes. The soil in the lower parts of the moors is a fine loam, on a hard blue limestone.

The moorlands of Staffordshire are situated in the part of the county lying to the north of a line drawn from Newcastle-under-Lyne to Uttoxeter. Their elevation varies from about 500 to 1,154 feet; the last being the altitude of the Weaver hills a little to the west of Ashborne. These moorlands are very various in quality and aspect. The best part, being that which lies on a limestone bottom, extends from the Weaver hills to Longnor, and from the river Dove to Morridge. This extensive tract produces fine herbage, and the breed of cattle is superior. Between Cheadle and Oakmoor (so called from the dwarf oaks with which it is covered), the moorlands are rough, barren, and bare; consisting of an immense number of rude heaps of gravel, confusedly thrown together into sudden swells, and deep narrow glens. The country to the north-east of Mole Cop, on the confines of Cheshire, is, however, the worst in the moorlands; consisting principally of high moors and mosses. The summits of some of the hills in the vicinity of Leek terminate in huge cliffs, formed of masses of rock, piled on each other "in a most tremendous manner."—"Here single blocks, the size of church steeples, are heaped together; some overhanging the precipice, and threatening destruction to all who approach; and some of prodigious bulk have evidently rolled from the summit, and broken in pieces."—(*Pitt's Survey of Staffordshire*, 2d edit. p. 274.) Mill Dale, near Alstonfield, is a long uniform valley, or glen, of great depth. The sides consist of overhanging precipices of limestone, estimated to have from 100 to 150 yards of perpendicular elevation,

and very steep. The width of this glen at the top scarcely exceeds the depth of its sides. It seems evidently to have been formed by the bursting or breaking of the rock in which it lies. The waters of the river Manyfold are absorbed by the fissures under the limestone rocks, near Butterton, and are again discharged at Ham, four miles below.—(*Pitt's Survey*, p. 273.)

Besides the above moorlands, and Dartmoor in Devonshire, already mentioned, the forest of Exmoor merits a brief notice. It is situated mostly in the south-west part of Somersetshire, but is partly also in Devonshire. It is an extensive tract, containing about 20,000 acres of moorland. The river Exe rises in the north-western extremity of Exmoor, within about 5 miles of the Bristol Channel; and the elevation of the whole forest is very considerable. It contains a few patches of cultivated land, but it is mostly waste, though it is believed to be susceptible of considerable improvement. On the summits of the hills, especially in the west and north, are swamps of many acres in extent. It produces a small hardy breed of horses; and affords pasture to above 20,000 sheep of a peculiar breed, kept for their wool, and sometimes left to die of mere old age. The rent may be estimated at from 1*s.* to 2*s.* an acre. Portions of it are reserved for game, and the wild stag is still found within its limits.

Heaths.—The most extensive of the level heaths of England are those of Surrey, Dorset, and Hants. Bagshot Heath, in the north-western angle of Surrey, is an extensive tract, containing several thousand acres of exceedingly poor moorland, being for the most part quite level and uninteresting. It is elevated about 460 feet above the level of the sea. The principal heaths in Dorset and Hants extend in a direct line from the river Avon in the latter, to near Dorchester in the former, and from Wimborne Minster to the Purbeck hills. This extensive tract is dreary, and miserably poor. The most elevated parts seem to be wholly incapable of any improvement, unless it be that of planting; and the cost of bringing the barren tracts into tillage would very much exceed any probable return they could make. "A few cattle are kept on various parts of these heaths, and some poor half-starved sheep are occasionally seen wandering about, which are sometimes almost entirely swept off by the rot, and even the rabbits share the same fate."—(*Stevenson's Survey of Dorset*, p. 333.)

Sect. 4.—*Vales, Fens, Marshes, &c.*

In the English language the words vale, valley, and dale, have very appropriate and distinct meanings:—*Vale*, corresponding to the Scotch word *strath*, signifies a considerable extent of low country, lying between ranges of higher grounds: *valley* is the diminutive of *vale*; it is commonly used in the South of England, but in the north of England and the south of Scotland the word *dale* is used in its stead, and in the Highlands of Scotland the word *glen*. In a valley, the lower grounds are narrow, as from half a mile to a mile or two in width, generally with high steep banks on each side. The *dell* of the south of England corresponds to the *groin* or *gill* of the north of England; and the *cleugh* of southern Scotland is the diminutive of

dale or valley, or a short or otherwise inferior valley: *dingle* is the diminutive of dell.

Of these we shall merely notice the vales; the valleys, dells, and dingles being too numerous, and most of them, however beautiful their scenery, too unimportant to deserve any particular description.

The north of England partakes too much of the mountainous character of Scotland to contain many extensive vales. Entering Northumberland from the north, the first we meet with is the Vale of Coquet, traversed by the river of that name. It is particularly noted for its fertility, and the excellence of its agriculture. In the southern part of the same county is the Vale of Tyne; it exhibits a great variety of landscape, and above Newcastle is very rich and beautiful. The Vale of Stockton is formed of the lower vale lands of the county of Durham, and the district of Cleveland in Yorkshire; these together form one homogeneous vale, intersected by the Tees, which forms the boundary between the two counties. This vale accompanies the Tees from the moorlands of Durham, in the neighbourhood of Barnard Castle, to its mouth, a distance of nearly 40 miles. It is bounded on the south by the eastern moorlands of Yorkshire, and on the north by the high lands of Durham; in its widest part it is 15 miles across, but its upper part, above Darlington, is narrow. It includes the towns of Barnard Castle, Darlington, Yarm, Stockton, and Stockesly; while Hartlepool and Guisborough stand on its margin: the surface is remarkably flat; the soil for the most part fertile; and it is distinguished by the excellence of its breeds of cattle, horses, and sheep, and the skill and enterprise of its farmers.

The Vale of York may justly be regarded as the first river vale in the island; it is situated mostly within the North Riding; but its southern extremity extends into the West and East Ridings. Its northern boundary is formed by a number of shallow small lakes, or *meres*, lying between the Tees, the Swale, and the Wisk; its southern boundary consists of the marshes of Yorkshire and Lincolnshire; the limestone of West Yorkshire and the skirts of the western moorlands constitute its western, while the moorlands, limestone heights, and wolds of the East Riding constitute its eastern boundary. From north to south its length is about 60 miles, with an average breadth of about 16; including an area of nearly 1,000 square miles. There are several towns in this vale, of which the principal are York, Northallerton, Thirsk, and Boroughbridge: on its western margin are Richmond, Rippon, Knaresborough, Tadcaster, and Doncaster; its eastern margin is also marked by some small towns, but none of them is of consequence enough to claim our notice. The surface of the vale is sufficiently diversified to give richness and beauty to its appearance; it is in most places fertile, and its agriculture is pretty good. Its northern extremity imperceptibly unites with the south-west margin of the Vale of Stockton; the rise in the ground by which they are separated being so inconsiderable as to escape notice in a general view of the country. Thus there is an uninterrupted continuance of vale lands, from the mouth of the Tees to the Humber, a distance of nearly 100 miles.

The limestone lands of East Yorkshire, which stretch westward

from near Scarborough, along the feet of the moorlands to the Hambledon hills, and then bend southward to the extremity of those hills, where the line returns eastward along the Howardian hills to Malton, form three-fourths of the outline of the Vale of Pickering; the remaining quarter being filled up by the chalk cliffs of the wold: its form is an imperfect oval, the larger diameter being about 35, and its shorter rather more than 10 miles; containing an area of nearly 300 square miles, or about 190,000 acres. This vale has all the appearance of a dried lake; being, in fact, a basin bounded by eminences on every side, except where there is a narrow outlet for its waters. It is intersected by the rivers Derwent and Rye. The district of Holderness, though not strictly a vale, has so many vale characteristics, as regards elevation, surface, and soil, that it would be improper to pass it over without notice. It comprises that part of the East Riding of Yorkshire, which is bounded by the German Ocean and the Humber on the east and south, and by the wolds on the west and north; and contains from 265,000 to 275,000 acres. The surface is not quite flat, but undulating; on the south it is low, Sunk Island, and some other considerable tracts, having been recovered from the sea. It has a strong, rich soil, consisting mostly of clayey loam, producing heavy crops of wheat and beans, and the most luxuriant pasture. In some places it is marshy, and large sums have been expended on its drainage, which, however, is still in progress. Altogether it is one of the most productive agricultural districts in the empire; has very little waste land; and is deservedly celebrated for its breeds of sheep and cattle, both of which have been materially improved. The towns of Hull, Beverley, Driffield, Bridlington, Hornsea, and Patrington, stand on and nearly define its boundaries.

In the north-west of England there is an extensive level tract, including a space of about 300,000 acres, having the city of Carlisle in its centre. This large plain is bounded on the north by the Frith and Moss of Solway; on the east, by the heights of Gillsland, and the eastern moorlands of Cumberland; on the south, it unites with the valley of Appleby; and on the west, it is bounded by the slate-rock mountains and the inlet of Abbey Holm. It is only on its southern margin that in its elevation it rises above the true vale character.

In Lancashire there are several extensive tracts which, though not vales, have a good deal of the vale character. The first we meet with, coming from the north, is "the Fylde." This tract stretches between the road from Garstang to Preston and the sea, being from 8 to 10 miles in width. The western and southern part of the large tract of country lying between the Ribble and Mersey is almost quite flat. There is, in fact, hardly a swell of any importance, in a direct line, between Liverpool and Oldham, at the foot of the central mountain ridge on the confines of Yorkshire. The vale of Warrington, which enjoys a high degree of fertility, is watered by the Mersey, and comprises a considerable extent of ground, both on the Lancashire and Cheshire side of that river.

Cheshire is generally flat: a ridge of high ground crosses it from north to south on its western side; and on its eastern border there are some considerable eminences which form part of the highlands of

Derbyshire and Staffordshire; but the rest of the country is nearly level; forming a very rich and extensive plain.

The Vale of Severn, taken in its most comprehensive sense, may be considered as beginning above Chepstow: it includes within its outline great part of Worcestershire: it then contracts and closes on the north with the hills of Shropshire and Staffordshire. Its banks on the west are formed by the forest of Dean, Mayhill, the Malvern hills, and the hills of Herefordshire and Shropshire. Its eastern banks are formed by the Stroudwater and Cotswold hills, and the rising grounds on the borders of Warwickshire, closing with the Lickey and Clee hills. It is divided by the Bredon hills, and some smaller ones, into the three subordinate vales of Worcester, Gloucester, and Evesham: but if we suppose these hills and some hillocks near Gloucester to be removed, the whole will form one unbroken vale, traversed by the Severn from where its principal branches unite, till it falls into the Bristol Channel. The upper part of this extensive vale is rich; but it is too flat and its banks too tame to be picturesque. Its most striking scenery commences with the Malvern hills; and from these, till it reaches Chepstow, its banks present continuous beauties. Indeed it may almost be said to be a garden of 40 miles' extent, the Severn winding through it with unusual freedom, while the Welsh mountains in the distance present a striking contrast, and constitute a well-marked and noble outline.

> "The Vale of Severn, Nature's garden wide,
> By the blue steeps of distant Malvern wall'd,
> Solemnly vast." DYER'S *Fleece.*

The Vale of Gloucester, or that part of the Vale of Severn now noticed which lies in Gloucestershire, deserves to be more particularly described. It may be divided into the Vale of Gloucester, strictly so called, and the Vale of Berkeley. The former is semicircular, the Severn being the chord, and the environing hills the arc: in it lies the city of Gloucester, with the towns of Tewkesbury and Cheltenham. Its extent from Matson Hill to Bredon Hill, on the north, is 15 miles; its breadth from the Severn to Dowdeshill is 7 or 8 miles, containing between 50,000 and 60,000 acres.

The Vale of Berkeley approaches, in its outline, nearer to the segment of a circle than to any other regular figure: the Severn forms an irregular chord; the hills to the south and east a curve, which is continued to the northern angle by the Matson hills; from the foot of the latter to Auscliff its extent is about 25 miles, and its medium width about 4. Its area may be about 80 square miles, or above 50,000 acres. The waters of the Severn, which are here more like a lengthened æstuary than a river, give infinite grandeur to the view. The surface, which is somewhat irregular, is clad in perpetual verdure: the bottoms of the hills, stretching in many places towards the river, are hung with beech of the most luxuriant growth: the soil is uniformly rich, and the scenery in general extremely fine. By far the larger portion of the land is appropriated to grass.

In the south-west of England the vales of Exeter and Taunton are those most worthy of notice. The former accompanies the Exe from

the sea to the Tiverton hills, which form its northern boundary. This boundary is continued toward the east by Blackdown Hill, till it reaches the Honiton hills: on the west it is bounded by the Halldown hills, and a continuation of some heights that lie to the north of Exeter. It contains about 200 square miles, and is watered by the Exe and the Otter.

The Vale of Taunton, or Taunton Dean, lies in the south-west quarter of Somersetshire. It is bounded on the north by the Quantock hills; on the south by the Blackdown hills, which separate it from the Vale of Exeter; and on the west by the skirts of Exmoor: its boundaries on the east are not very well defined, but, in general, they are formed by the rising grounds of Curry and the marsh of Sedgmoor. It comprises about 100 square miles, or 64,000 acres, having within it the towns of Taunton, Wellington, and Milverton. The river Thone or Tone runs through it. The soil consists principally of a reddish loam, of great fertility, producing the finest crops, fruit, and herbage. The climate is peculiarly mild and serene. Drayton, in his Polyolbion, alludes to this vale as follows:—

> "What ear so empty is that hath not heard the sound
> Of Taunton's fruitful Deane? not match'd by any ground."

The fruitful Vale of Aylesbury lies in the middle part of the county of Buckingham. It is watered by the Thame and a small stream falling into it at the bottom of the vale; and is depastured by large herds of cattle, being principally appropriated to the dairy and grazing systems.

The Trent, in many parts of its course, winds through vales which, though not of great extent, are neither deficient in beauty nor fertility. The Vale of Belvoir, in Nottinghamshire, merits notice: it stretches from the south-east bank of the Trent to the borders of Leicestershire and Lincolnshire. The soil, which is rich and loamy, is partly under the plough and partly in pasture.

Rutlandshire has one vale, that of Catmose, celebrated by Drayton. It extends from the western side to the centre of the county, being watered by the little river Guash, or Wash.

Wales, though mountainous, is not destitute of vales. The Vale of Mold, in Flintshire, is uncommonly rich and beautiful. But the most celebrated of the Welsh vales is situated partly in Denbighshire and partly in Flintshire, extending on both sides the river Clwyd, whence it takes its name, from its mouth above 20 miles inland. Its breadth varies from 8 to 9 miles. It is inferior, in point of picturesque beauty, to some of the deep glens and romantic valleys in other parts of the principality: but is superior to them all in richness of soil and luxuriance of vegetation. Hence it has been called the Eden of North Wales. It is well cultivated, and is thickly studded with gentlemen's seats, villages, and towns. Among the latter are St. Asaph, Denbigh, and Ruthin.

The Vale of Conway, in Caernarvonshire, watered by the river of the same name, a wide, shallow, placid stream, of a dusky hue, is a long, narrow tract, extending from the sea to above Llanrost, admired for its picturesque beauty. It has rich meadows, corn-fields, and

magnificent groves. Its verdure and fertility contrast advantageously with the bleak, barren region of Snowdon, rising abruptly above it on the west.

The Vale, or rather Valley, of Festiniog, is situated in the north-western angle of Merionethshire. It is rich and beautiful, but small, scarcely exceeding 3 miles in length by 1 in breadth; the village of Maentrog occupies its middle; but it derives its name from the village of Festiniog, situated on a hill at the head of the valley. It is watered by numerous streams that fall from the hills on both sides, and discharge themselves into a beautiful small river. The hills are well wooded.

The Vale of Llangollen occupies part of the eastern district of Denbighshire. It is watered by the Dee, and derives its name from the small town of Llangollen, situated within it. This vale has been the theme of much panegyric; but in richness it is inferior to the vale of Clwyd, and in picturesque beauty to that of Festiniog. The prospect from its east end, where it unites with the great plain of Salop, is, however, uncommonly fine.

The only other Welsh vales requiring any notice are those of Towy and Glamorgan. The former lies in Caermarthenshire, and extends about 30 miles up the county: it is about 2 miles broad, on both sides the river Towy. It abounds in picturesque beauties, seen to the greatest advantage from Grongar Hill and the castle of Dynevor. The Vale, or, more properly speaking, great level, of Glamorgan extends along the sea-coast of the county, stretching inland 8 or 10 miles. It is by far the most fertile part of South Wales. The soil is excellent, and it is rich in corn, pasture, and inexhaustible mineral treasures.

Besides the vale districts, there are several other extensive level tracts in England which must not be passed over in any descriptive notice, however brief, of the country. The largest plain in the kingdom extends from the banks of the Thames through Essex, Suffolk, and Norfolk, comprising also a considerable part of the counties which border on these to the west. The road from London to Norwich, by Newmarket, passing along the west of Essex and Suffolk to the middle of Norfolk, a distance of about 108 miles, runs through a more uniformly level country than any other road of the same length in England. Indeed this great plain may almost be said to stretch through Lincolnshire, and, crossing the Humber, to join the vale district of Holderness in Yorkshire.

The Weald of Kent, Surrey, and Sussex, forms a very extensive tract of generally level land, though in some places its surface is varied with gentle eminences. Opinions vary as to its exact limits; but it is generally understood to extend lengthwise from the border of Romney Marsh in Kent, to Petworth in Sussex, a distance of from 60 to 65 miles, varying from 8 to 15 miles in breadth, and containing nearly 1,000 square miles, or 640,000 acres. It is bounded, for the most part, by the South Downs on the south, and the chalk hills of Kent and Surrey on the north. The soil is principally clay, partly very stiff and heavy, and partly of a softer and wetter description; but it is interspersed with considerable tracts of clay mixed with sand, and

sand and gravel. The sandy soil, in common, indeed, with the whole weald, has been very much improved, particularly by marling. It is mostly in a pretty good state of cultivation; and its pastures are rich and luxuriant. The Britons called it *Coit andred*, the mighty wood; and the Saxons, the *Wyeld*, or *Weald*, that is, the wild forest or chase. It continued for a lengthened period to be an immense forest, occupied only by herds of deer and hogs belonging to the king. It was gradually, however, distributed by royal grants among the surrounding religious houses and manors; the portion assigned to each being called a *den*, *denberie*, or *wealdberie*. At first, these grants were used only for the feeding of hogs (*pannage for hogs*), the soil being supposed to be unfit either for tillage or pasture; but in course of time they were by degrees cleared and brought into cultivation; the districts deriving, for the most part, their peculiar and distinctive denominations from the names of those by whom they were occupied and improved, as Tenterden, Halden, Malden, &c. In the Kentish part of the weald the custom of gavelkind, by occasioning the repeated division and subdivision of estates, has rendered these *dens* very small at present compared with their original magnitude. The soil of this extensive district is peculiarly well adapted to the growth of oak timber; and as every inclosure is surrounded with oak trees, and every wood and coppice is full of them, it still retains its ancient woody appearance. "When viewed from the adjoining hills, which command a prospect over the whole of it, the weald exhibits the most delightful scene that can be imagined. It appears to the eye an extensive level country (the few hills in it being so small and inferior to those whence it is viewed), covered with all the richness of both art and nature; the variety of small enclosures of corn and meadow, and the houses, seats, and villages, promiscuously interspersed among the large and towering oaks, which grow over the whole face of it, have the most pleasing effect, and represent to us, even at this time, something, though a great improvement of its original state, in the idea of an inhabited and well-cultivated forest."—(*Hasted's Kent*, 8vo. ed. vol. i. pp. 293–298; *Campbell's Political Survey*, vol. ii. p. 272.)

The other level tracts that seem to deserve any particular notice are the Fens, the Marshes of Yorkshire and Lincolnshire, the level of the Ancholme, Romney Marsh, the Marshes of Somersetshire, and Salisbury Plain. The *Fens*, as they are emphatically termed, lying round the great arm of the sea, called the Wash, are situated principally in the counties of Cambridge and Lincoln, but partly also in those of Northampton, Norfolk, Suffolk, and Huntingdon. They form an immense tract of above 500,000 acres. It seems to be sufficiently established by the circumstances mentioned by Dugdale, in his History of Embanking, and by the remains of ancient roads, trees, &c., found under the surface, that most part of what is now called the Great Level of the Fens was, originally, comparatively firm dry land.* This appears the more singular, as there can be no question that the present

* See Dugdale's "History of Embanking and Draining," cap. 32; see also extracts from Dugdale and other writers, in Elstobb's "History of the Bedford Level," pp. 3—8, &c.

surface of a large portion of the Level is a good deal above what it anciently was.—(*Elstobb's Bedford Level*, pp. 32–37, &c.) But this apparent anomaly admits of a pretty satisfactory explanation. It seems to be sufficiently ascertained that, previously to the invasion of the Romans, the sea at spring tides overflowed very extensive tracts of the low grounds contiguous to the Wash. The greater part of the water that thus overspread the country would be reconveyed to the sea at ebb tide, by the channels of the Ouse, Nene, Welland, and other rivers that run through the fens; and this great addition to the land water would suffice to scour and deepen their channels, and to give them a good outfall.—(*Ibid.* p. 44.) In consequence, the more inland parts of the fens at Thorney, Deeping, Donnington, Downham, &c., were comparatively well drained; and though their surface was lower than at present, it was dry and sound.

The Romans were the first who began to exclude the sea, and to confine the rivers by means of embankments. After this had been effected, the quantity of refluent water being materially diminished, the channels of the rivers not being sufficiently scoured, gradually filled up; and the course of the land water being obstructed, it began to stagnate in the upper part of the fens. The evil was increased by the occasional bursting of the sea through its banks, there being hardly any outlet for the water that had entered by the breach.

An evil of this sort would not speedily manifest itself, but would become more and more perceptible as the rivers got encumbered with sand and mud. Henry of Huntingdon, who lived in the reign of King Stephen, describes the country round Thorney in the most glowing terms; and, allowing for a good deal of colouring, it is still sufficiently certain, that its state must at that time have been widely different from what it afterwards became. So early as the reign of Edward I. the evil had attained to such a magnitude, that attempts at drainage upon a considerable scale were commenced. These attempts have been continued ever since. Previously to the Reformation, a large proportion of the fens belonged to rich religious houses; and the drainage seems to have been conducted under their superintendence, with considerable success. But after the suppression of the monasteries, the estates belonging to them came into private hands; and, in the confusion of the times, the dikes and drains were allowed to fall into decay, and the fens got into an extremely bad state.* Camden, speaking of them, says, that the inhabitants "called *Fenmen*, are a sort of people much like the place, of rugged uncivilized tempers, envying others whom they term *Upland-men*, and usually walking aloft upon a sort of stilts. They all keep to the business of grazing, fishing, and fowling. All this country, in the winter time, and sometimes for the greater part of the year, is laid under water by the rivers that flow through it overflowing their banks; but when these keep to their proper channels, it so strangely abounds with grass, and a sort of rank hay, (by them called *Lid*,) that when they have mowed enough for their use in November, they burn the rest to make it come again the thicker. About which time one sees all this moorish country in a flame, to his great wonder and surprise." (Gibson's ed. i. 490).

* Campbell's "Political Survey," vol. ii. p. 274.

Camden seems to have thought that any attempts that might be made to effect the drainage of the fens would be unsuccessful. But happily the parliament and the country were of a different opinion. From the reign of Elizabeth, their recovery began to be viewed in its true light, as an object of great national importance; and measures were taken in furtherance thereof, which, however, were defeated by the death of the Queen. Many plans, having the same end in view, were proposed and abandoned between the accession of James I. and 1634, when a charter of incorporation was granted by Charles I. to Francis Earl of Bedford (the proprietor of about 20,000 acres of land in the vicinity of Thorney and other places in the fens), and thirteen other adventurers, who jointly undertook to drain the Level, on condition of their being allowed 95,000 acres as a compensation. After the corporation had expended about 100,000*l.* on the undertaking, the contract with the Earl and his associates was set aside, at the instigation of government, on pretence that the works of the adventurers were insufficient to effect the drainage. The real object of this nefarious proceeding was to pave the way for the Crown interfering in what promised to be a profitable business; and no sooner had the corporation been defeated, than an offer by the King to drain the fens, on being allowed 152,000 acres, or 57,000 more than were to have been allowed to the adventurers, was accepted. But this fraudulent scheme was defeated by the disturbances that soon after broke out; and in 1649, William Earl of Bedford was restored, by the Convention Parliament, to all the rights of his father. The works, which had fallen to decay, were forthwith repaired; and, in pursuance of the plan of the famous Sir Cornelius Vermuyden, the New Bedford river was excavated, and the works prosecuted with so much sagacity and vigour, that in 1653 the Level was adjudged to be fully drained, and the 95,000 acres were awarded to the Earl and his associates. Most of the latter were nearly ruined by the enterprise; the expenses of the drainage having amounted to 400,000*l.*—(*Elstobb*, p. 296.)

In 1668, a corporation was established by the 15 Chas. II. cap. 17, for providing for the maintenance and repair of the works, for assessing the proprietors in the sums required to defray the necessary expenses, and other similar purposes. The corporation, under this act, consists of a governor, six bailiffs, twenty conservators, and commonalty. The officers are elected annually; the commonalty consist of all persons possessed of 100 acres within the Level; a conservator must have 200 acres; and the bailiffs and governors 400 acres each. This body was authorized to levy a tax on the whole 95,000 acres; but only 83,000 acres are vested in the corporation in trust for the Earl (now Duke) of Bedford and others, 12,000 acres having been assigned to the Crown, and 2,000 to the Earl of Portland. Several subsequent acts have been passed to explain, alter, and amend the 15 Charles II. cap. 17, but its main outlines have, notwithstanding, been preserved, and it continues to form the basis of the existing government of the fens. In 1697, the Level was divided into three parts, the north, middle, and south Levels; the first comprises the lands between the Welland and the Nene, the second those between the Nene and the old Bedford river, and the third extends from the latter to the southern limits of the fens.

Except within the district subject to the corporation of the Bedford Level, the drainages are mostly everywhere effected by commissioners appointed nearly in the same way as the road commissioners. All proprietors or occupiers of land within the Level are charged with a tax or scot of so much per acre on the land they hold. This tax is collected by a surveyor; and is expended either in clearing or repairing the existing drains, or in making new ones, as the commissioners may order.

In 1795, an act was passed for improving the outfall of the river Ouse, and for making a cut across the marshes from Eau Brink to Lynn. This important work was not, however, undertaken till 1818. It was completed in about two years; and has proved highly serviceable.

But the excavation of the new channel for the outlet of the river Nene, and the works connected therewith, have been productive not only of the latest, but perhaps also of the most efficient and extensive improvements hitherto effected in the drainage and navigation of the fens. Those works were undertaken under acts passed in 1827 and 1829. The new channel of the Nene begins about 6 miles below Wisbeach, and is about 6½ miles in length. Its surface breadth varies from 200 to 300 feet, its depth being about 24 feet throughout. Spring tides rise in it 22 feet at the end adjoining the Wash, and 18 feet at its other extremity. The principal advantage of this new channel consists in the circumstance of the tide ebbing in it nearly 10 feet lower than it did in the old channel. This has given a corresponding outfall to the waters of the adjoining lands; and by the judicious adaptation of new drains and sluices the drainage of the whole of the north Level, or of the tract between the Nene and the Welland, has been nearly perfected.

Exclusive of this vast improvement in their drainage, the formation of this new cut has been of considerable importance to the fens by opening a comparatively easy communication between the sea and Wisbeach, one of their principal emporiums. Previously to its being effected, Wisbeach could only be reached by very small vessels at spring-tides, but now it is accessible to small vessels at all seasons; and large vessels reach it at springs. Under the same acts a considerable tract of land has been gained from the sea; and the communication between the counties of Norfolk and Lincoln has been materially shortened and improved by an embankment and road carried across the sands in the angle between them near Sutton Wash.

Previously to the excavation of the new channel for the Nene the water in the rivers and great artificial cuts in the north Level, as well as in the others, was generally above the level of the surrounding marsh, being confined to its channels by embankments; so that the water in the land drains and ditches had to be elevated into these channels by means of pumps, worked principally by wind-mills, but, more recently, in some instances by steam. But since the opening of the new outfall for the Nene, this system of drainage has ceased in the north Level, the water at ebb-tide in it being several feet below the surface of the marsh.

But where, as in some of the fens of South Lincolnshire, a proper

outfall for the water in the great drains or canals has either not been or cannot be provided, the employment of steam-engines for pumping up the water of the land drains and springs into them, is of the greatest advantage. Heavy falls of rain often take place during calm weather; and when such is the case districts depending on wind-mills for their drainage are frequently quite submerged. There can, however, be little doubt that by making the main drains of a sufficient depth, carrying them out to the low-water mark of spring-tides, and furnishing them with proper sluices, the employment of steam-engines might be almost wholly dispensed with.

The new channel was completed in 1835, at an expense of about 200,000*l.*, a further sum of 150,000*l.* having been at the same time expended upon the drainage of the north Level. The late Duke of Bedford, following the example of his ancestors, was a liberal contributor to these great works.

But though much has been accomplished, the drainage of the extensive tracts comprised within the middle and south Levels, as well as of some of the South Lincolnshire fens, is still, in several respects, defective. It is reasonable, however, to expect that their proprietors will profit by the example of the more perfect drainage of the north Level, so that in the end, the national object of the drainage of the fens may be fully accomplished.*

The Yorkshire and Lincolnshire marshes occupy the extensive and well-defined tract to the west of the Trent, bounded by the latter, the Idle, the Don, and the Ouse. It is mostly below high-water mark; and, but for its embankments, would be overflowed at spring-tides. The portion of this tract in Lincolnshire, principally between the Trent and the New Idle river, is called the Isle of Axholme, from a solitary hill or eminence, formerly an island, on which is the hamlet of Axey or Haxey. This hill was once the site of a castle, which, having been occupied in 1173, in the reign of Henry II., by one of the rebel lords, Roger de Mowbray, was, according to Camden, attacked by the country people in boats! (Camden, Gibson's edit. i. 573). The waters were first drawn off in the reign of Charles I. by a Dutch colony under Vermuyden; but the works have since been much improved and perfected, and the drainage is now pretty complete. That portion of the Level in Yorkshire, called Thorne Waste, is a mere morass, but the Isle of Axholme is extremely fertile, and well cultivated.

The district called the *Level of Ancholme*, in the north parts of Lincolnshire, is very similar to the Fens. It lies along both sides of the river Ancholme, and contains about 20,000 acres. The sand and other alluvial matter brought down by the river having formed a bar at its mouth in the Humber, the discharge of its waters was obstructed, and the adjacent land converted into a marsh. Repeated efforts were made during a long series of years to obviate this evil, and to render the marsh land available for cultivation. But

* An immense number of Reports, &c., have been published on the Drainage of the Great Level. One by Mr. Smeaton was published in 1768. For further particulars the reader is referred to Elstobb's "History of the Bedford Level;" Vancouver's "Survey of Cambridge;" Gough's edition of Camden's "Britannia;" the "Penny Cyclopædia," art. Bedford Level, &c.

though these efforts partially succeeded, the effectual drainage of the level has only been accomplished of late years by means of works planned by the late Mr. Rennie, (who had previously drained the Wildmore Fen, in South Lincolnshire,) and executed by his son the present Sir John Rennie. A new and more capacious sluice, with its sill under the low-water mark of spring tides, has been constructed at Ferriby, where the Ancholme unites with the Humber; and catch-water drains have been excavated to intercept the water from the contiguous high grounds. And in consequence of the better outfall that has thus been obtained for the water in the river, and the prevention of its being overloaded during heavy rains by the water from the surrounding hills, the drainage of the Level has been completed; and it is now a very valuable arable district.

Romney Marsh, in Kent, an extensive tract of level and mostly rich land, occupies its south-east angle. What is strictly included under this appellation comprises about 24,000 acres: but when it is described, as it generally is, in connexion with the Welland Marsh, containing about 16,500 acres, which adjoins it on the south-west; Denge Marsh, containing about 3,000 acres, which unites with the latter on the south-east; and Guildford Marsh, in Sussex, containing about 3,200 acres; its extent may be taken at about 46,700 acres.

The soil of this spacious level is not all of the same quality. In some parts, particularly near the sea, it is poor sandy gravel; but by far the largest portion consists of a soft, unctuous clay, mixed with a greater or less proportion of sea sand, and is uncommonly rich and fertile.

In summer, when the marsh is clothed with luxuriant verdure, and covered with numerous flocks of sheep and herds of cattle, its appearance from the adjacent heights is at once rich and beautiful. It differs from the fens in this, that it was not recovered, like the latter, but wrested from the sea. At what period the process began is not accurately known. It is probable, however, that considerable parts of the marsh were gained during the early part of the Saxon period of our history. Somner, in his discourse concerning Roman ports and forts in Kent, produces a charter of marsh land by Plegmund, archbishop of Canterbury, from the year 889 to 915; and this charter does not seem to have been one of the first. The clergy, indeed, were deeply interested in gaining these lands, being owners of most part of the property in their vicinity; and the practice of *inning*, as it is called, that is, of wresting land from the sea, is commonly supposed to have originated with them. The archbishops of Canterbury, in particular, appear to have sedulously applied themselves to this object, giving their names to such parts of the marsh as they respectively gained. Hence we have Becket's, Baldwin's, Boniface's, Peckham's, &c., innings.—(*Campbell's Survey*, vol. i. p. 404.) The marsh is prevented from being overflowed at high water, by an immense embankment between Hythe and Romney, called Dymechurch Wall, from its contiguity to the village of that name. This wall forms a highway for carriages along its whole extent. Its perpendicular height from the marsh is, in most parts, from 12 to 18 or 20 feet. The slopes are steep, and pretty regular. Next the sea, it forms a shelving irregular

beach, carried out to the distance of more than 100 yards. The width of the top of the wall is from 15 to nearly 30 feet. Its length is rather more than 3 miles. Arched sluices, that pass under the banks, each having two pair of flood-gates, effect the drainage. At ebb tide the waters make their escape through the gates, which are so contrived that they prevent the sea from entering at high water.

There are few trees or hedges in the marsh: the fences consist mostly of ditches and rails; great quantities of wood for the repair of the latter being every year brought from the Weald and other parts of Kent and Sussex. A good deal more land is now ploughed than formerly; but it seems doubtful whether this extension of tillage has been in any respect an advantage. It is very thinly inhabited. It has been said of the air, that "it is bad in winter, worse in summer, and at no time good; being fit only for those vast flocks of sheep which feed all over it." The inhabitants are few in number, and mostly poor; being generally labourers employed to look after the grounds, sheep, and cattle of the owners and occupiers of the land, who live without the marsh.

According to ancient custom, confirmed by charter of the 1st of Edward IV., the inhabitants of the marsh are formed into a corporation, consisting of a bailiff, twenty-four jurats, and the commonalty, who are empowered to purchase lands and tenements, to have a common seal, and to hold a court once every three weeks, for the decision of all suits, real and personal, civil and criminal, arising within the marsh; and they are further empowered annually to choose from among themselves four justices of the peace and a bailiff, to whom all writs are returnable, who have the benefit of all fines, &c., and to whom the regulation of the police of the marsh is exclusively committed. But this body has nothing to do with the drainage of the marsh, or the repair of the walls by which it is defended from the sea. This is intrusted, by ancient custom, to the lords of the 23 manors in and adjoining the marsh, who, with the bailiff and jurats of the corporation now mentioned, who have one vote, are usually called *lords of the marsh*. The bailiff appointed by these lords as chief supervisor of the works is, for the most part, also the bailiff appointed by the corporation of the marsh; the jurats of which are also appointed by the lords to inspect the drains and sewers, the walls, &c., and to attend to the levy of the duties, and all other matters relating to the drainage.

The lords of the marsh and the corporation hold their courts, for the above purposes, in New Hall, Dymechurch. The sums required for the repair of the wall, and the maintenance of the drainage, are raised by a tax or scot per acre, distributed over the whole level; but the Welland and Denge marshes are each taxed separately, to defray their own expenses. The whole of the ancient legislation of England, as to marshes and sewers, is, in all its essential parts, modelled on that established in Romney Marsh.—(*Hasted's History of Kent*, 8vo. ed. vol. iii. pp. 465–467.)

The marshes or fen lands of Somersetshire are of very considerable extent and importance. They lie in the middle of the county, having the Mendip hills on the east, the high lands about Somerton, Petherton, and Ilminster on the south, the Quantock hills on the west, and

the Bristol Channel on the north. They are traversed by the rivers Ax, Brue, and Parret, and are divided into various districts differing in elevation and soil; the latter consisting in some parts of mud and alluvial deposits, in others of strong deep clay, and in others of turf bog, &c. The religious houses that were early established in this county, among which the monastery of Glastonbury was the most eminent, having acquired large possessions in the fens, made the most meritorious efforts for their improvement, by cutting drains to carry off the waters, constructing dikes and sluices to prevent the overflow of the adjacent country, and carrying causeways of stone and gravel through what had previously been almost impassable morasses.—(*Campbell's Survey*, vol. i. p. 333.) After the dissolution of the religious houses, the works they had constructed seem to have gone to decay. Latterly, however, great efforts have been made to improve the drainage of the fens. The great difficulty has been to get a proper outfall; and to prevent the inundation of the low land by the rivers, during floods and high tides. For this purpose, many extensive, though not very deep, cuts have been made, sluices contrived, and embankments erected along the banks of the rivers and the sea shore. In consequence, a great deal of most excellent land, that was comparatively useless at no distant period, has been partly rendered fit for tillage, and partly and principally converted into very valuable meadows. Still, however, it is to be regretted that the drainage of the low grounds is in many places far from complete; and that extensive tracts are not unfrequently laid under water.

In point of fertility, the low grounds of Somersetshire are equal to any in the kingdom. They yield the most luxuriant pasture; and some of them, when ploughed, have been known to produce in succession, and without the intervention of either a fallow or a green crop, from 12 to 20 heavy wheat crops! The only manure given to land so treated is that which is got by cleaning the surrounding ditches.—(*Billingsley's Survey of Somerset*, p. 177.)

The drainages are managed by commissioners, nearly in the same way as those of Romney Marsh.

Salisbury Plain, in South Wiltshire, is one of the most remarkable tracts in the kingdom. It is oval shaped, extending lengthwise, from Warminster on the west, to North Tidworth on the east, about 22 miles; and from East Lavington on the north, to Old Sarum on the south, about 15 miles. This extensive tract consists of a sort of elevated table land of a chalk formation. At a distance it has the appearance of a large plain; but, on a closer inspection, it is found to be traversed by numerous and sometimes pretty extensive valleys, and has almost everywhere a billowy surface. Around the stupendous relics of Stonehenge it is, however, comparatively level; no habitations are near; and nothing is to be seen, except vast flocks of sheep attended by their shepherds. The soil is generally thin, light, and, like all chalky lands, has its usual accompaniment of flints. It is mostly covered with a fine green sward, that affords excellent pasture for sheep, for the feeding of which it is peculiarly well adapted. Mr. Young appears to have formed an exaggerated idea of the fertility of this plain, and the advantages that would result from dividing it into

arable farms, and subjecting the down land to cultivation.—(*Southern Tour*, 2d ed. p. 200.) Since the period when he visited this part of the country, the "greedy plough," influenced by the high prices obtained for corn during the war, has "preyed largely on its carpet." This, however has not generally proved a profitable course. Good crops were at first obtained; but the land, being thin and loose in its staple, unless it be supplied with abundant doses of manure, speedily wears out; and, when laid down to grass in an exhausted state, is worth little or nothing. Hence, tillage on the down lands requires to be skilfully managed; and there should always be a stock of sheep sufficient, by means of folding or otherwise, to keep up their fertility.

Marlborough Downs, an extensive tract adjoining Salisbury Plain on the north-east, is in all respects similar to the latter, except that its surface is more uneven. The Hampshire Avon, flowing to the south; the Kennet, flowing to the east; and some of the feeders of the Lower Avon, flowing to the west; have their sources in Salisbury Plain and Marlborough Downs. This is a sufficient proof of the general elevation of the ground. The Kennet and Avon Canal, at Crofton Tunnel, between Salisbury Plain and Marlborough Downs, is elevated 474 feet above the level of the sea at low water mark. Westbury Down, on the west side of Salisbury Plain, is 775 feet above the sea level. The general elevation of the plain may be from 400 to 500 feet.

Sect. 5.—*Rivers, River Ports, and Lakes.*

The most celebrated and important of the rivers of England are the Thames, Severn, Trent, Mersey, Ouse, Dee, Tyne, Tees, and Medway. We, therefore, purpose giving a brief account of the sources, course, and termination of the above rivers, and of their most important tributaries; subjoining a few short notices of some of the smaller and less celebrated streams. According to Camden, there are, in England and Wales, upwards of 550 rivers and rivulets distinguished by particular names.

Thames.—This noble river, the largest in this part of the kingdom, and, in a commercial point of view, the most important in the world, rises in Gloucestershire, being formed by the junction of the Thames or Isis, Lech, Colne, and Churnet, rivulets which have their sources in the Cotswold hills. The first, which is the most important, rises on the borders of Wiltshire, a little to the south-west of Cirencester; it flows east by Cricklade; and, being augmented by the other streams, the combined river, to which it gives the name of Thames, becomes navigable for barges at Lechlade, on the confines of Gloucestershire and Berkshire. Its course is thence north-east, till, being farther augmented by the Windrush and the Evenlode, from the borders of Gloucestershire, it turns, a little to the north of Wytham-house, to the south. After passing Oxford, it bends suddenly to the west by Nuneham Park to Abingdon. Having again resumed its southerly direction, it is joined, a little below Dorchester, in Oxfordshire, by the Thame.

This latter river has several sources, of which the most remote are in the central parts of Buckinghamshire, near Kreslow and Wendon

Lodge. They unite at Thame, in Oxfordshire, from which point, to where it joins the Thames, it is navigable.

It may here be proper to state, that, according to the common opinion, the Thames obtained its name (said to be Thame-isis, shortened to Thames,) from the junction of the Thame with the Isis, or with the river coming from Gloucestershire. But this opinion, notwithstanding its apparent accuracy, has probably no good foundation. At all events, it appears to be abundantly certain that the river which passes Lechlade, formed by the junction of the rivulets already referred to, has, from a very remote period, been called the Thames; and that the name Isis, given to it by the literati of Oxford, is not mentioned in ancient charters, or by ancient historians, and is wholly unknown to the common people in the country through which it flows.*

From Wallingford, a little below the influx of the Thame, the river flows almost due south, till, passing Basildon Park, it turns east to Reading, where it is joined by the Kennet. It then flows north-east to Great Marlow; thence south to Maidenhead, and south-east by Windsor and Staines, till it receives the Wey. Its course is thence easterly, with many bold sweeps to London; and flowing through the metropolis, and being augmented by the Lea from Hertfordshire, and the Darent, it continues its easterly course till it unites with the sea at the Nore light, 45½ miles below London Bridge.

The distance from London Bridge to Lechlade, where the Thames becomes navigable, following the windings of the river, is 146½ miles; the total rise from low water mark at the former to the latter being about 258 feet. This ascent is overcome by means of several locks, constructed at different periods, of which the first is at Teddington, 18¾ miles above London Bridge; this, consequently, is the limit to which the tide flows. The low water surface of the river from Teddington Lock to London Bridge falls about 16 feet 9 inches, or about 10¾ inches a mile at an average. The high water mark at Teddington is about 1 foot 6 inches above the high water mark at the bridge, and the time of high water is about 2 hours later. The average fall in the *bed of the river*, from Teddington to London Bridge, is about a foot a mile; the breadth of the river at London Bridge is 692 feet.

Though not a rapid, the Thames is by no means a sluggish river; it rolls forward with an equable and steady current, and is remarkable for the purity of its waters. It has been admirably described by Denham in his Cooper's Hill:—

> "Though deep, yet clear; though gentle, yet not dull;
> Strong without rage; without o'erflowing, full."

But it is as a navigable and commercial river, having London on its banks, and bearing on its bosom numberless ships fraught with the produce of every country and every climate, that the Thames is principally distinguished. Its depth of water is so great, that, as a shipping port, London enjoys peculiar advantages; even at ebb tide there is from 12 to 13 feet water in the fair way of the river above Greenwich; and the mean range of the tides at London Bridge is about 17 feet,

* Camden's "Britannia," Gibson's edition, i. 100; Campbell's "Political Survey," i. 139.

while the range at the extreme springs is about 22 feet. The river is, in fact, navigable as far as Deptford for ships of any burthen; to Blackwall for those of 1,400 tons; and to the St. Katherine's Docks, adjoining the Tower, for vessels of 800 tons. As already stated, it is navigable by barges to the confines of Gloucestershire; and the navigation is thence continued by canals through Cirencester and Stroud to the Severn: but the usual water communication between London, Bath, and Bristol, is by the Kennet and Avon canal, and the Kennet, which unites with the Thames at Reading. The conveyance of goods by this channel usually occupies about seven days; and the navigation is besides exposed, particularly between Reading and London, to much interruption from droughts, floods, &c. The whole course of the river, from its source to the Nore, is reckoned at from 205 to 210 miles.

The removal of the old London Bridge has caused a considerable change in the river above, and also, though in a less degree, below the bridge. Owing to the contracted arches through which the water had to make its way at the old bridge, there was a fall of from 4 feet 9 inches to 5 feet at low water; this fall is now reduced to about 2 inches; so that the low water line above the bridge is nearly 5 feet lower at spring tides than formerly. In consequence, a greatly increased body of tidal water now flows up and down the river; and as it meets with no obstruction, it flows with a decidedly greater velocity. The effect of this is to scour and deepen the channel of the river; its influence in this respect being already sensibly felt as far up as Putney Bridge, 7½ miles above London Bridge. The shores above the latter, that were formerly foul and muddy, are now becoming clean shingle and gravel, and near low water the beach is quite hard and firm. The shoals are also decreasing below the bridge; and there can be little doubt that the change will, at no distant period, be felt from the Nore up to Teddington.

Before the removal of the old bridge, a barge, starting from the pool with the first of the flood, could not get farther than Putney Bridge without the assistance of oars. But, under similar circumstances, a barge now reaches Mortlake, 4 miles farther up, before using oars, and with a little help she may reach Richmond; and taking horses there, may get to Teddington in a tide. The descent down the river has been equally facilitated; the mean velocities of the flood and ebb between London Bridge and Westminster Bridge, are flood, 3 miles an hour, extreme, 3½; ebb, 3½, extreme, 3¾.*

Of the tributaries of the Thames, the Kennet, Wey, Lea, and Darent, only are navigable, and are, therefore, the only ones that we need notice.

"The Kennet swift, for silver eels renowned,"

rises on Marlborough Downs, in Wiltshire, and, pursuing an easterly course, falls into the Thames at Reading. It has been made navigable as far as Newbury, whence the canal previously mentioned is carried by Devizes and Bradford to Bath and Bristol. The Wey falls into the Thames near Oatlands; it has its source in the eastern part of Hampshire, and has been rendered navigable from Godalming to the

* We obtained these details from the late John Smeaton, Esq., engineer.

Thames, a distance of about 20 miles. The first navigation locks used in England are said to have been constructed on this river. The Lea rises in the chalk hills near Luton, in Bedfordshire; and, pursuing a southerly course, falls into the Thames near the East India Docks. It has been made navigable, by collateral cuts and otherwise, as far as Hertford. This navigation, which is of considerable importance, began to command the attention of the legislature so early as 1425, in the reign of Henry VI. It has not even yet, however, received all the improvement and extension of which it is capable.—(*Priestley on Inland Navigation, &c.*, p. 411.) The Darent has its source near Westerham, in Kent; it falls into the Thames about four miles below Dartford, to which it is navigable.

The *Medway* can hardly be called a tributary of the Thames; but as it falls into the æstuary of the latter, it may be most properly noticed in this place.

The Medway was called by the ancient Britons *Vaga*, to which the Saxons prefixed the syllable *Mad*, signifying mid or middle, because it ran through the middle of the kingdom of Kent: hence it came to be called Medweg, and latterly Medway.—(*Hasted's Kent*, 8vo. ed. vol. i. p. 273.)

It rises in the south-east corner of Surrey, between the north and south chalk ranges; being joined at Penshurst Place by streams from the north of Sussex. Its course is thence north-east to Maidstone, and then north to Rochester and Chatham; about two miles below which it turns nearly east, expanding at the same time into a wide æstuary interspersed with islands. After prosecuting an easterly course for 8 or 10 miles, it turns once more to the north, falling into the mouth of the Thames at Sheerness. The tide is interrupted by locks, otherwise it would flow up the river to Maidstone. In consequence of works begun in the reign of Charles II., and resumed at different periods, it has been rendered navigable as far as Tonbridge; affording a channel of communication of much importance to the surrounding country. From Sheerness to Chatham there is water to float the largest ships; and the ground being soft, and the reaches short, it forms an admirable harbour for men-of-war, many of which are usually laid up here when out of commission. The arsenal at Chatham is one of the most important in Great Britain. Considering the shortness of its course, the Medway is one of the deepest of European rivers.

In 1667, the Dutch, under De Ruyter, took Sheerness; and, sailing up the river as far as Chatham, destroyed several sail of the line and a great quantity of stores. They accomplished this daring and brilliant achievement without incurring any material loss; but the fortifications were soon after so much improved and strengthened as to render a *coup de main* of this sort no longer possible.

The Stour, Colne, and Chelmer, fall into the mouth of the Thames at different points on the Essex coast. The Stour rises near Haverhill, on the confines of Essex, Suffolk, and Cambridgeshire. Having passed Sudbury, to which it is navigable, and Manningtree, it falls into the mouth of the Thames at Harwich. The harbour of the latter is of great extent, and has sufficient water to float ships of the largest class; but the access to it is a good deal obstructed, so that a pilot should be

always employed. The entrance to the harbour is marked by two lighthouses. The Colne is navigable from Colchester to the mouth of the Thames; and the Chelmer from Chelmsford to the æstuary of the Blackwater, and thence to that of the Thames.

The basin of the Thames, that is, the country drained by it and its tributary streams, including the Medway, is of large extent, and is exceedingly populous: it comprises the greater part of Kent, with the whole of Surrey, Berks, Oxford, Bucks, Herts, Middlesex, Essex, and Suffolk, with part of Gloucester and Wilts,—being an area of about 8,500 square miles, containing, in 1841, about 4,000,000 inhabitants; so that on this space, including between one-sixth and one-seventh part of the surface of England and Wales, is accumulated between a third and a fourth part of their inhabitants, and decidedly more than the third part of their wealth.

This statement seems sufficient to show that the fears of those who anticipate any great falling off in the trade of London must be, in a great degree, imaginary. The foreign trade of Liverpool, Glasgow, and Hull, particularly the first, from their situation in the coal and manufacturing districts, may, it is to be fairly presumed, continue, as it has done for the last half century, to increase more rapidly than that of the metropolis. But we do not think that there is much reason to apprehend any material falling off in the trade of the latter. The great population and vast wealth of the basin of the Thames seem quite sufficient, exclusive of its advantageous situation, to insure the ascendency of London as an immense commercial entrepôt.

Severn, &c.—The Severn, the second river in the kingdom in point of magnitude, and perhaps, also, in importance, has its principal source in a small lake on the eastern side of Plynlimmon mountain, in Montgomeryshire. At its outset it is called the Hafren; the name by which, through its whole course, it was known to the Britons. It flows first towards the south-east, and afterwards turns to the north-east as it approaches Newton, where it takes the name of Severn. Hence, through the vale of Montgomery, its course is almost due north; till, entering the great plain of Salop, beyond Welshpool, it turns abruptly to the south-east; and pursuing the same direction, it almost encircles Shrewsbury. Flowing through Colebrook Dale, and passing Bridgenorth, it follows a southerly course as it leaves Salop, and enters Worcestershire at Bewdley. Being now become a broad and deep river, crowded with barges, it rolls through a pleasant country in a tranquil stream, passing the city of Worcester, and traversing the vales of Evesham and Gloucester. In the latter it divides into two channels, one of which washes the walls of Gloucester; but, being again united, it forms a great tidal river. Its course from Gloucester to Nass Point is tortuous; from the latter it flows south-west, till it assumes the name of the Bristol Channel, expanding and insensibly losing itself in the Atlantic Ocean.

The Severn, particularly below Gloucester, has frequently overflowed its banks, and occasioned much damage to the surrounding country. It is remarkable for its tide, which rushes in with a head 4 or 5 feet high, and a loud noise. This, no doubt, arises from the wide expanse of the waters of the Atlantic in the Bristol Channel being gradually

narrowed, till at length they are forced violently up the river. Outside the Bristol Channel, spring tides rise from 22 to 24 and 26 feet; but in King's Road, at the mouth of the Lower Avon, they rise to the height of 48 feet, and sometimes more; and at Chepstow the rise is 60 feet.* The opposition which the current from the sea meets with from the adverse current of the river occasions that dashing and grinding of the waves known by the name of *hygre* or *eagre*.

The Severn is navigable from the Flatholm Lighthouse, where it loses itself in the Bristol Channel, to Welshpool—a distance of about 178 miles; and its navigation is continued by the Montgomery canal to Newton. It is, consequently, of the highest importance as a channel of internal communication; its capacity in this respect being materially increased by its numerous large tributary streams, and by the canals and railroads that join it. By means of the latter, it commands a large share of the commerce of Birmingham, and of the various trading towns of Staffordshire, Warwickshire, &c.; and is united with the Thames, the Trent, and the Mersey. From Welshpool to the sea it has a gradual fall of 225 feet.—(*Priestley on Inland Navigation, &c.*, p. 596.)

The navigation of the Severn from Nass Point to Gloucester is both tedious and difficult. To obviate this inconvenience, a canal on a large scale has been dug from Berkeley-pill to Gloucester. It is 18½ miles long, from 70 to 90 feet wide, and from 15 to 18 feet deep; and may consequently be navigated by vessels of 350 tons. There is a basin at each end for the accommodation of shipping. This canal, which was opened in 1827, has become the channel of an extensive commerce; and Gloucester is now rising fast in importance as a trading and shipping town.

The barges which navigate the Severn are about 120 feet in length, from 19 to 20 in breadth, and 5 in depth. They carry above 100 tons. The trows are from 60 to 70 feet long, 20 broad, and 5 deep, carrying 75 tons. They carry a square-sail, and have a mainmast and topmast.

Of the tributaries of the Severn, the most important are the Teme, the Upper and Lower Avon, the Wye, and the Usk. The Teme rises in the mountains which divide Radnor and Montgomery shires, and, pursuing a south-easterly course, joins the Severn near Worcester.

The Upper Avon rises on the confines of Leicestershire and Northamptonshire, about 300 feet above the level of the sea. It flows in a south-westerly direction, but with a very winding course, through Warwick, Stratford-on-Avon, and Evesham, falling into the Severn at Tewkesbury. It has a large body of water, and is navigable by barges for about 40 miles, or from the Severn to Stratford, where it is joined by the Stratford canal.

The Lower Avon has its source near Malmesbury, in North Wiltshire. Its course is circular, passing Chippenham, Bradford, Bath, and Bristol. As a shipping and commercial town, Bristol used to be second only to London; but though now far surpassed by Liverpool, and also by Newcastle and Hull, it is still a place of great trading importance. It is situate about 8 miles above where the Avon falls

* Norie's "Sailing Directions for the Bristol Channel," p. 20.

into the Bristol Channel; but, owing to the great rise of the tide, the largest class of merchantmen reach the quays without difficulty. A lateral canal accompanies the river from Bristol to Chippenham.

The Wye, the largest of the tributaries of the Severn, is justly celebrated for its romantic and beautiful scenery. It rises on the south side of Plynlimmon, near the source of the Severn, and pursuing a south-easterly winding course, falls into the latter a little below Chepstow. It is navigable for barges from its mouth as far as Hay, in Brecknock—a distance by water of about 100 miles; but the navigation in the upper parts of the river is liable to much interruption, sometimes from a scarcity of water and sometimes from floods. The latter are occasionally so violent as to make considerable alterations in the bed of the river. Its principal tributaries are the Lugg and the Munnow. Owing to its being the entrepôt of the country traversed by the Wye, Chepstow has a good deal of trade. The tide, as already mentioned, rises here to the extraordinary height of 50 or 60 feet, and sometimes more. Vessels of the largest burthen may, consequently, come up to the town. Owing, however, to the violence of the ebb and flow, the navigation is rather dangerous.

The Usk rises in Brecknockshire, and, taking an east and south course, falls into the Severn about 4 miles below Newport. It is navigable to the latter for the largest ships. The Brecon and Abergavenny canal terminates at Newport, and it also communicates with various railroads. In consequence, partly of this command of internal intercourse and partly of the rapid increase of iron-works in Monmouthshire, Newport has become a place of considerable commercial importance.

Besides the affluents now mentioned, the Bristol Channel or embouchure of the Severn, receives the rivers that drain Glamorganshire, Caermarthenshire, and the greater part of Pembrokeshire. Of these the Taaf, the Neath, and the Towey, are the most important; but with the exception of the latter, which is navigable as far as Caermarthen, none of them seems to require any particular notice.

On its southern side, the Bristol Channel receives the rivers of Somersetshire. Of these, the Parret is by far the most important. It rises a little to the south-east of Crewkerne, on the borders of Dorsetshire, and, flowing northwards, is joined by the Yeo or Ivel, which passes through Ilchester; and by the Thone, which passes through Taunton. The Parret is navigable for vessels of 200 tons burthen to Bridgewater; the Yeo, or Ivel, is navigable as far as Ilchester; and a canal has been cut from Bridgewater to Taunton.

It is clear, from these statements, that the basin of the Severn is of great extent and importance. It includes the counties of Somerset, Worcester, Warwick, Salop, Montgomery, Radnor, Hereford, Monmouth, Glamorgan, Brecknock, Caermarthen, with the greater part of Gloucester, Pembroke, and part of Wilts. Its total area may be taken at about 11,600 square miles, having, in 1831, a population of about 2,150,000.

Trent, &c.—With the exception of the Thames and Severn, the Trent is by far the most important of the rivers of England, on account not only of the length of its course but of the fertile districts through

which it passes, the immense number of canals with which it communicates, and the considerable rivers it receives in its progress.

This fine river has its source near the Cheshire border, in the moorlands of Staffordshire, about four miles north from Burslem. At first its course is nearly south-east, when it makes a sudden turn by the east to the north, near Burton-on-Trent. It afterwards divides Leicestershire from Derbyshire, and pursuing a north-easterly course by Nottingham to Newark, it turns more and more to the north. After dividing Nottinghamshire and Lincolnshire, and passing Gainsborough, it enters Lincolnshire at West Stockwith; and flowing north, with a little inclination to the east, unites with the great æstuary of the Humber, at a place called Trent-falls. It may be navigated by vessels of 200 tons as far as Gainsborough, and by barges as far as Burton-on-Trent—a distance of about 117 miles; having in this lengthened course a fall to low-water mark of only 118 feet, or very nearly a foot per mile. From Burton-on-Trent to its source, the rise of the river is about 376 feet; at least the summit level of the Caldon canal, which passes near the head of the Trent, is 494 feet above the sea.—(*Priestley's Map of Canals, &c.*)

Of the subsidiary streams that fall into the Trent, the most considerable are the Blythe, Tame, Dove, Derwent, and Soar; but of these it is only necessary to notice the last two. The Derwent rises in that part of Derbyshire called the High Peak; after passing Matlock, Cromford, and Derby, it has a circuitous course from the latter to Wilden Ferry, where it unites with the Trent. It is navigable as far as Derby, about 13 miles; but it has been superseded, as a channel of communication, by the Derby canal. The Soar rises east from Hinckley, in Leicestershire: it flows through a rich grazing country, and more than half encompasses the ancient town of Leicester. After receiving the Wrake, its course is north, with a little inclination to the west, till, passing Loughborough, it falls into the Trent, near Cavendish Bridge. It is navigable to near Loughborough, a distance of about 7 miles.

The canals that communicate with the Trent are of the greatest importance; assisted by them, it affords an easy means of export for the manufactures of a large district of Lancashire; the salt of Cheshire; the produce of the Potteries of Staffordshire; the coal of Derbyshire; and the agricultural products of Nottinghamshire, Leicestershire, and Lincolnshire. It also opens a communication with the sea by way of Lincoln and Boston; through which channels, as well as the Humber, the articles above enumerated are conveyed; and, in return, the interior of the country is supplied, either by Hull and Gainsborough, or Boston and Lincoln, with such commodities as are required by an immense population.—(*Priestley's Treatise on Rivers, Canals, &c.*, p. 681.)

Ouse, &c.—The Ouse is of very inferior magnitude compared with the Thames, the Severn, or the Trent. But if we consider it as representing that combination of rivers which join it before it falls into the æstuary of the Humber, all of which communicate with highly important canals, it will be found to rank in the very first class as a commercial channel. The Swale, the remotest branch of the Ouse,

has its source in the mountain of Shunnor Fell, on the borders of Yorkshire and Westmoreland, one of the most elevated in the great central range. Pursuing a south-easterly course, it is joined at Boroughbridge by the Ure, from Askrig, Middleham, and Ripon. A little lower down, at Linton, the Swale loses its original name and takes that of the Ouse. At Benningborough Hall it is joined by the Nidd; and near Cawoode by the Wharfe, which, flowing through Tadcaster, has its source near Arncliffe. At Barnby on the Marsh, the Ouse receives the Derwent, flowing from the eastern Yorkshire moors, 12 miles north-west of Scarborough. A little lower down, near Howden, it is joined by the Aire. This river, so important from its navigation and canals, rises in the central ridge, a little to the east of Settle. It pursues a south-easterly course, till, passing Leeds, it is joined by the Calder at Castleford; its course is thence easterly, with a good many windings. From Leeds to Ferrybridge, the Aire flows through one of the richest plains in the kingdom. At the port of Goole the Ouse is further augmented by the Don. The latter rises in the high moors near the confines of Derbyshire; passing Sheffield, Rotherham, Doncaster, and Thorne.

The Ouse itself is navigable for considerable vessels as far as York, and for barges to Linton. The Derwent, the navigation of which is the private property of Earl Fitzwilliam, has been rendered navigable by locks and otherwise for a distance of about 49 miles. When the improvements in the Aire and Calder navigation are completed, the depth of water will be sufficient to admit vessels of 100 tons burthen to Leeds and Wakefield: and vessels from thence will reach Goole in 8 hours, and from Manchester within 45 hours. The Don is navigable as far as Tinsley, and a canal, 4 miles in length, has, within these few years, been made from the latter point to Sheffield, to which it is of the greatest utility.

The basin of the Humber, or the country drained by the Trent, Ouse, and other rivers that fall into the great æstuary between Yorkshire and Lincolnshire, embraces an extent of about 10,000 square miles, comprising some of the most fertile and populous districts in the kingdom. It includes almost the whole of Yorkshire, with the counties of Leicester, Nottingham, Derby, Stafford, and about a third part of Lincoln. Its principal port is Hull, on the north side of the Humber, at the mouth of the river of the same name. As a commercial emporium, Hull occupies the third place in the kingdom, taking rank immediately after Liverpool. At Spurn Point, at the mouth of the Humber, spring tides rise about 23, and neaps about 14 feet, while at Hull the rise of the former is about 22, and of the latter about 13 feet; and as there is, even at low ebb, a considerable depth of water in the fair-way of the channel, the port may be entered by the largest class of merchantmen. The rapidity of the tides, and the numerous sandbanks, render the navigation of the Humber a little difficult.

Goole, situated on the Ouse at its junction with the Don (there called the Dutch River), about 22 miles more inland than Hull, promises to be a formidable rival to the latter. It has grown up within the last ten or twelve years, and is provided with docks, bonded

warehouses, &c. The difficulty of the navigation is the principal drawback on Goole; but vessels drawing 15 and 17 feet water have, by taking advantage of the tide, reached it in safety.

Great Grimsby is the principal port on the Lincoln side of the Humber. The harbour, which was formerly near choked up, has latterly been materially improved: and there is good anchorage in the roads.

The shores on both sides the Humber have been very much changed within the period embraced by authentic history. "All the northern parts of Lincolnshire have been gained from the sea. Barton and Barrow have not, at present, the least appearance of ports; yet by Hollinshed they were styled good ones. Similar accidents have befallen the upper part of the low tract of Holderness, which faces the congruent shores. Hedon, a few miles below Hull, several hundred years ago a port of great commerce, is now a mile and half from the water, and has given way to the rising fortune of the latter (a creation of Edward I., in 1296), on account of the excellency of its port. But, in return, the sea has made ample reprisals on the lands of this hundred: the site and even the very names of several places, once towns of note upon the Humber, are now only recorded in history. Ravenspur, at one time a rival to Hull, and a port so very considerable in 1332 that Edward Baliol and the confederated English barons sailed from it with a great fleet to invade Scotland, has long since been devoured by the merciless ocean. Extensive sands, dry at low water, occupy the place of these towns. Till about 1666, the district called Sunk Island appeared among these sands like an elevated shoal; when it was regained, by embankments, from the sea, and now forms a considerable estate, probably restored to its pristine condition."—(*Introd. to Pennant's Arctic Zoology*, p. 12.)

Mersey, &c.—Though not a large river, the Mersey has, from its flowing through the principal manufacturing district in the empire, and giving its name to the gulph or arm of the sea between Lancashire and Cheshire, become, in point of commercial importance, second only to the Thames. It has its sources in the great central ridge on the confines of Cheshire and Derbyshire: and, after passing Stockport, is joined by the Irwell. The latter, which has its source in the Lancashire moors, near Haslingden, flows south, through Bury, to Manchester, where, being joined by two smaller streams, it takes a westerly course, till its confluence with the Mersey. After being still further increased by the Bollen, from Macclesfield, the Mersey passes Warrington; a little below which, it expands into a spacious æstuary, having the great commercial ports of Liverpool and Birkenhead, the emporia of the cotton manufacturing district, near its junction with the Irish Sea. The Mersey and Irwell have been rendered navigable from Sankey Bridge to Manchester. Owing to the numerous windings in the rivers, the length of this navigation may be reckoned at about 50 miles; but it has been a good deal shortened by cutting across the bends.

The Weaver falls into the æstuary of the Mersey, about 2 miles below Frodsham. It rises on the borders of Salop and Cheshire, flowing in a northerly direction through the central parts of the latter, by

Nantwich, Winsford, Northwich, and Frodsham, to the sea. It has been rendered navigable, by means of collateral cuts, locks, &c., from the æstuary of the Mersey, at Weston Point, to Winsford Bridge, a distance of above 22½ miles. It falls in this space 50 feet. Vast quantities of rock salt, coal, timber, &c., are conveyed by this navigation, which is both important and lucrative Besides receiving the above and some other considerable rivers, the æstuary of the Mersey is connected, by means of an almost infinite number of canals and railways, with all the great manufacturing towns of Lancashire, Yorkshire, Staffordshire, and Warwickshire, as well as with the ports of Hull, London, and Bristol.

Dee.—This river has its source in Merionethshire, in Bala Lake, the largest in Wales. At first it pursues an easterly course, through the beautiful Vale of Llangollen, till it passes Wynne-Stay. It there takes a northerly direction, separating the counties of Flint and Chester. It enters the latter a little to the south of Eaton Hall; and, having nearly encompassed the ancient city of Chester, is conveyed by an artificial channel to its æstuary.

At the æra of the Conquest, and for many years after, Chester was a place of very considerable importance, as a shipping and commercial port. In this respect, indeed, it was decidedly superior to any port on the west coast of England, with the exception of Bristol. For several centuries it engrossed the principal part of the Irish trade; and it had also an extensive intercourse with the south of France, Spain, and the Mediterranean. But the gradual filling up of the channel of the river proved in the end destructive of its trade. Towards the close of the seventeenth century, the navigation was so much obstructed, that vessels of 20 tons burthen could with difficulty arrive at the quays; so that the shipping and trade of the port were almost entirely transferred to Liverpool, which had then begun to emerge from obscurity. The celebrated Andrew Yarranton, in a work published in 1677, suggested a plan, intended to accomplish the double object of restoring Chester to her ancient commercial importance, and recovering a large tract of land in the æstuary of the Dee, by cutting a new channel for the river.* But, though an Act for this purpose was obtained in the reign of William III., the project was not carried into effect till 1737, when a new channel was formed from the city to near Wepre Hall, on the south-west side of the æstuary of the Dee, being a distance of about 8 miles. The distance thence, by the low-water channel, passing Park Gate, to the opening into the Irish Sea, off Great Hilbree Island, is 15½ miles.

Ships of about 200 tons ascend to the city by means of this cut; and, by confining the waters of the river, 8,000 acres of valuable land have been recovered from the sea, embanked and cultivated. This, indeed, has been the most valuable result of the undertaking; for, owing to the superior facilities enjoyed by Liverpool as a shipping port, the trade and navigation of Chester continue to be of very secondary importance.—(*Pennant's Tour in Wales*, 8vo. ed. vol. i. p. 258; *Priestley's Map of Canals, &c.*)

Tyne.—This important river is formed of two very considerable

* England's Improvement by Sea and Land, part i. p. 191.

streams, the North and the South Tyne. The latter rises on the borders of Durham and Cumberland, near Cross Fell, one of the highest mountains in the great central range; and the former in the moorlands of Northumberland, close to the Scottish border. They unite a short way from Hexham. After their junction, the river takes an easterly direction; and, passing Newcastle, falls into the sea at Tynemouth, having the towns of North and South Shields close to its embouchure.

The Tyne is navigable for large ships as far as Newcastle; and is navigated a few miles further by keels, a peculiar description of vessels, employed to convey coal to the coal ships. Newcastle has extensive intercourse with foreign countries, and is the principal seat of the coal trade. As a shipping port, it is inferior only to London. The towns of North and South Shields are, however, the proper ports of the Tyne.

Tees.—The sources of this river are contiguous to those of the South Tyne. At first it flows in a south-easterly direction; but, below Darlington, it turns abruptly to the north-east, falling into the sea below Stockton, which may be considered its port. Stockton has a good deal of trade; and has recently risen to considerable eminence as a port for the shipping of coal. There are about 8 feet water on the bar at the mouth of the river at low ebb.

Wear.—The Wear rises to the north of the Tees, on the confines of Durham and Cumberland. After passing Wolsingham and Bishop's Auckland, it changes the southerly course it had hitherto pursued, turns to the north-east, and having nearly surrounded the city of Durham, flows northward to Lambton Hall; and then inclining a little to the east, falls into the sea at Sunderland.

The Wear is navigable as far as Durham, a distance of about 18 miles. It is of considerable value as a commercial channel, from its flowing, in the latter part of its course, through a country supplied with vast beds of excellent coal. The exports of this most useful mineral from the Wear are, in fact, but little inferior to those from the Tyne. Sunderland has two grand piers, with a lighthouse 90 feet high. At high spring tides there are from 16 to 17 feet water over the bar, and at neaps, from 10 to 12 feet. This has recently become one of the principal ship-building ports. Sunderland is celebrated for the cast-iron bridge over the Wear, erected in 1796. It consists of a single arch, 236 feet in span, elevated, in the centre, 100 feet above high-water mark

Rivers falling into the Wash.—Of the rivers that have their embouchure in the great æstuary of the Wash, or arm of the sea between Norfolk and Lincolnshire, the most important are the Great Ouse, the Nene, the Welland, and the Witham. The Ouse rises in Northamptonshire, near Brackley, on the borders of Oxfordshire. Its course at first is east, a little inclining to the north, through Bucks; it then passes Olney and Harrold, and, after many windings, reaches Bedford, where it becomes navigable. It subsequently traverses Huntingdonshire, Cambridgeshire, and the north-west corner of Norfolk, falling into the æstuary of the Wash at King's Lynn. From Huntingdon Sluice to Denver Sluice, a distance of about 20 miles, in a direct line,

the Ouse is now called the New Bedford River, from the greater part of its water flowing in the great canal or drain of that name, dug in the reign of Charles II., to facilitate the drainage of the fens. In its course, the Ouse receives the Old River Nene, from Ramsey, in Huntingdonshire; the Cam, from Cambridge; the Little Ouse, from Thetford; the Lake, from Bury St. Edmonds; the Wissey or Stoke, from Stoke Ferry; and the Nar, from Castle Acre; all of them being navigable to the places now mentioned.

The Nene, which rises in the south-west parts of Northamptonshire, flows in a north-east direction from Northampton, where it becomes navigable, past Oundle, till, at the extreme north-west point of Huntingdonshire, it turns to the east, passing Peterborough; and then inclining more and more to the north, and passing Wisbeach, it falls into the Wash by an artificial channel called the Nene Outfall. (See p. 27.)

The Welland rises on the confines of Northamptonshire and Leicestershire, near Market Harborough. After flowing in a north-east and northerly direction, by Stamford, Market Deeping, and Spalding, dividing Northamptonshire from Leicestershire, Rutlandshire, and Lincolnshire, and through the southern part of the latter, it falls into the Wash at Fosdyke Bridge. It is navigable as far as Market Deeping; and a canal has been constructed from the latter to Stamford.

The Witham has a very circuitous course. It rises on the confines of Lincolnshire and Rutlandshire, and pursues a northerly course, by Grantham, to Lincoln: it next flows east for a few miles, and then turning south, it terminates its course about 5 miles below Boston. It is navigable to Lincoln, a distance of about 38 miles; and by means of the Fossdyke Canal, originally constructed by the Romans, is joined with the Trent. Boston has more trade than any place on the Wash; but the access to its port continues, notwithstanding the late improvements, to be rather intricate and difficult.

Almost all the rivers that fall into the Wash run, for a considerable part of their course, through the Great Level of the fens. And in consequence partly of the operation of natural causes, and partly of the cutting of new channels, and the making of embankments, in the view of facilitating drainage and navigation, their courses have been very much altered. This is particularly the case with the Ouse, the Nene, and the Welland.

The basin of the Wash is of considerable extent, consisting mostly of very rich and highly productive marsh land. It has, however, very few manufactures; and its ports have little trade other than that which results from the exportation of the surplus agricultural produce of the surrounding country, and the importation of the various articles required for the use of the population. Exclusive of Boston, already referred to, Wisbeach in Cambridgeshire, and King's Lynn in Norfolk, are the principal ports on the Wash.

Yare, &c.—Leaving the Wash, and proceeding southward round the Norfolk coast, the first river of any importance that is met with is the Yare, which falls into the sea a little below Yarmouth. The Yare originates in several streams rising in the country round Wymondham.

A little below Norwich it is joined by the Wensum, which rises near Rainham Park, in the northern part of Norfolk. Near Yarmouth the Yare is further augmented by the Bure and Waveney, the former being navigable to Aylsham, and the latter to Bungay. The Yare and Wensum are navigable as far as Norwich; but, at present, the principal and best access to that city is by the Lowestoffe navigation. This, which commences at Lowestoffe, consists partly of artificial cuts, partly of the lake Lothing, and partly of the rivers Waveney, Yare, and Wensum. It is about 30 miles in length; and is calculated to admit vessels drawing 8 feet water.

Of the remaining English rivers a few only are of sufficient importance to require any notice in a work of this sort. The Rother falls into the English Channel at Rye. The Sussex Ouse, which falls into the sea at Newhaven Harbour, has been made navigable as far as Paxhill. The Arun, which falls into the sea at Arundel, is an inconsiderable river, but it is joined by means of canals with the Wye near Godalming. The Hampshire Avon falls into the sea at Christchurch. It rises near Devizes, on the north side of Salisbury Plain. At Salisbury it is joined by the Wiley and the Bourne; and is navigable from Trafalgar House to its mouth. The Stour, also, has its embouchure at Christchurch. It flows from the northern extremity of Dorsetshire; and is navigable as far as Sturminster New-town. The Ex has its source in Exmoor, in the western extremity of Somersetshire; and flowing southward by Tiverton, to which it is navigable, and Exeter, it expands into an æstuary at Topsham, about 8 miles from the sea. As the mouth of the river had been much impeded by various obstructions, a canal, which has latterly been enlarged and improved, has been cut from Exeter to a point about 2 miles below Topsham, capable of admitting ships drawing 14 feet water. The bar at the entrance of the æstuary of the Ex, opposite to Exmouth, is dangerous; and should not be crossed without a pilot. The Tamar rises on the confines of Devonshire and Cornwall, near the northern extremity of the latter. It flows in a southerly direction, inclining to the east, by Launceston, to which it is navigable, Saltash, and Devonport, till it falls into Plymouth Sound.

None of the Welsh rivers, with the exception of those already mentioned, seem to require any notice.

The Eden, the most important river in the north-west of England, rises on the borders of Westmoreland and Yorkshire, near Pendragon Castle, close to the sources of the Swale, in one of the highest parts of the great central ridge of mountains. It pursues a north-westerly course, and falls into the Solway Frith below Carlisle, to which it is navigable. But, the navigation being tedious and difficult, a canal has been cut from Carlisle to Bowness Point, a distance of 11¼ miles, admitting vessels of from 60 to 80 tons burthen.

The Ribble and the Lune, or Loyne, have also their sources in the central range of mountains, and, flowing in a south-westerly direction, fall into the Irish Sea, the former a little below Preston, and the latter a little below Lancaster, to which they are navigable by small vessels.

Lakes.—The lakes of England are mostly in the mountainous parts

of Cumberland, Westmoreland, and Lancaster. They are rather numerous; but of no great magnitude or importance, being indebted for their great celebrity entirely to the picturesque beauty, variety, and richness of their scenery. They are usually found in the glens, or hollows between the mountains; and are generally long, narrow, deep, and limpid. The principal are Windermere, partly in Westmoreland and partly in Lancashire; Ulleswater, partly in Westmoreland and partly in Cumberland; Bassenthwaite-water, Derwent-water, Ennerdale-water, &c., in the latter, and Coniston-water in Lancashire. Windermere, the most extensive of the whole, is about 10½ miles long, and where broadest is more than a mile across. Its area, including thirteen or fourteen small islands, or holms, is estimated at about 2,574 acres. In some places it is 35 fathoms deep. The largest island contains about 30 acres. Ulleswater, the next largest lake, is about 9 miles long, its utmost breadth being about a mile. It has a zigzag shape, and contains three small islands.

Besides those in the northern counties, the only considerable lakes in England are the shallow lakes, or meres, as they are provincially termed, in the fenny parts of Huntingdonshire, Norfolk, &c. Of these, Whittlesea Mere, in Huntingdonshire, containing about 1,570 acres, is the most considerable. A project, however, is now (1846) on foot for its drainage. Ramsey Mere, also in Huntingdonshire, about half the size of Whittlesea Mere, has already disappeared from the (correct) maps; and fine crops of wheat are raised on its bottom.

There are several small lakes in Wales. Bala Lake, the largest, has been already noticed. It is about 4 miles in length, and, in some places, nearly 1 in breadth.

Sect. 6.—*Sea-Coasts and Sea-Ports.*

The sea-coast of England and Wales is of great extent. It extends, measured in direct lines, from one headland to another, about 1,200 miles; but including its principal windings, its length may be taken at about 2,000 miles. It has some of the finest harbours and bays in the world; but these are more numerous on the southern and western than on the eastern coast. With the exception, indeed, of London and Harwich, there is no really good harbour between the South Foreland and Berwick-on-Tweed, nor, in fact, till we reach Cromarty Frith in Scotland.

In describing the sea coast of England and Wales, we shall set out from the Thames, and proceed northward. The mouth of the river is bounded on the north by the Naze, a hooked promontory in Essex, to the south of Harwich, and on the south by the North Foreland, in Kent; or perhaps it may be fixed at the Nore, between Shoeburyness in Essex, and Sheerness in Kent. The coast of the former stretches from the point now mentioned north-east to Harwich; the intervening space being deeply indented by the bays or æstuaries formed by the Crouch, Blackwater, Colne, and Stour. It is throughout low, flat, and marshy; and is skirted by numerous sand-banks. Harwich, at the mouth of the æstuary of the Stour, is one of the best ports on the east coast of England. As already stated, the access to it is a good deal

encumbered with rocks; but ships properly navigated need apprehend no danger: there is water sufficient to float the largest men-of-war, and the harbour is at once capacious, safe, and commodious.

The sea has in the course of ages effected very great changes on the Essex coast. It is now rapidly encroaching on the peninsula on which Harwich is built. The battery to protect the town had, when it was constructed 30 years ago, a considerable space of ground between it and the sea; but this and part of the fortifications have been already swept away. Since 1807 a field, belonging to the living of Harwich, has shared the same fate.—(*Lyell's Geology*, 3rd edit., vol. i., p. 40.)

The coast of Suffolk runs northerly, with a small inclination to the east, in a slightly waving line, from Landguard Fort opposite Harwich to Great Yarmouth. The first promontory we come to is Orfordness, a low beach running out into the sea. The town of Orford, formerly a sea-port, is now at some distance inland; but from Orfordness to Lowestoffe the sea has committed great ravages on the Suffolk coast. Dunwich, now an inconsiderable place, with not more than 200 inhabitants, was anciently an important sea-port, having an extensive trade, and a large population; but its port and its ancient site have been totally destroyed. The encroachment of the sea began previously to the Conquest. In the reign of Edward III. an inundation swallowed up more than 400 substantial houses. The last great irruption of the sea was in 1740; but it has continued progressively to make encroachments, and at present there remain only the ruins of one of its many churches. The ravages of the sea at Aldborough have not been much less destructive. Latterly, however, they have been checked by the formation of a sand-bank a litttle off shore.—(*Campbell's Survey*, vol. i., p. 277; *Lyell's Geology*, 3rd edit., vol. i., p. 403.)

The sea opposite to Southwold, between Covehithe on the north, and Thorpeness on the south, is called Sole Bay. It was a frequent station of the English fleet during the Dutch wars in the reign of Charles II.; and here, in 1672, was fought the well contested action between the English and French fleets, under the Duke of York and Count D'Estrées, and the Dutch fleet under De Ruyter.

At Lowestoffe and Yarmouth the land has gained on the sea. The change that has taken place in the vicinity of the latter has been most extraordinary. In the time of the Saxons a spacious æstuary extended as far as Norwich; which city is represented, even in the 13th and 14th centuries, as situated on "an arm of the sea." The sands whereon Yarmouth is built became firm and habitable ground in the early part of the 11th century; from which time a line of dunes has gradually increased in height and breadth, stretching across the whole entrance of the ancient æstuary, and obstructing the ingress of the tides so completely, that they are only admitted by the narrow passage which the river keeps open, and which has gradually shifted several miles to the south. Ordinary tides at the river's mouth only rise at present 3 or 4 feet, and springs 8 or 9 feet.

"By the exclusion of the sea thousands of acres in the interior have become cultivated land; and exclusive of smaller pools, upwards of

sixty freshwater lakes have been formed, varying in depth from 15 to 30 feet, and in extent from 100 to 1,200 acres. The Yare and other rivers frequently communicate with these lakes; and thus they are liable to be filled up gradually with lacustrine and fluviatile deposits, and to be converted into land covered with forests."—(*Lyell's Geology*, 3rd edit., vol. i., p. 398.)

From Yarmouth the Norfolk coast stretches north to Wintertoness, then north-west to Cromer, from the latter nearly west to Gore Point and Hunstanton, and thence nearly south to King's Lynn. It is for the most part fenced by sand-banks, that usually lie parallel to the shore; of these the most celebrated lie off Yarmouth, forming the outward barrier of the Roads.

The coast of Norfolk consists principally of cliffs, partly consisting of chalk, and partly of alternate strata of clay, gravel loam, and sand. These are gradually undermined by the sea, which is everywhere making inroads on the land. The site of the ancient Cromer is now a part of the German Ocean; and the sea still threatens to dislodge the inhabitants from the more inland situation to which they have retreated. In the winter of 1825, some cliffs, nearly 250 feet high, contiguous to Cromer lighthouse, were precipitated into the sea, their fragments covering 12 acres! The ancient villages of Shepden, Wimpwill, and Eccles have been engulphed; and in the harbour of Sheringham there is now water sufficient to float a frigate, where, half a century ago, there stood a cliff 50 feet high, with houses upon it! —(*Lyell's Geology*, vol. i., p. 396.)

At Holkham, Wells, and other places of the Norfolk coast, the shores are low, terminating in little hillocks of sand. The latter, being held together by the *arundo arenaria* or brent, oppose an effectual barrier to the encroachments of the sea. Hunstanton Cliff, at the entrance to the Wash, is naturally a prominent object, and is rendered still more conspicuous from its being crowned with a lighthouse: it is 80 feet high, and consists of chalk and hard red sandstone, resting on a base of iron-coloured puddingstone.—(*Introd. to Pennant's Arctic Zoology*, p. 8.)

Lincolnshire is separated from Norfolk by the Wash, a great arm of the sea, extending south-west from Hunstanton Cliff round by King's Lynn, the Nene Outfall, and Fossdyke, to Gibraltar Point, near Waynfleet. It is encircled on all sides, except where it opens to the ocean, by low marshy land, forming part of the Great Level of the fens. It is mostly filled up with immense sand banks, the summits of which are dry at low water. The channels by which it is navigated are intricate, and require the aid of experienced pilots. An immense extent of land has been gained from the sea round its banks; and the process of "silting up" is continually going forward.

From Gibraltar Point the coast of Lincolnshire sweeps round in a continuous unindented line, without ports, to the Humber. It is so low as to be visible from the sea only at a small distance; so that churches, and not hills, are its distinguishing landmarks. This coast has been the theatre of great changes. Waynfleet, once a noted town, is at present an inconsiderable creek. Skegness, once a large walled town, with a good harbour, is now an inconsiderable place, a mile from

the sea. The port of Grimsby, which in the reign of Edward III. furnished 11 ships for the siege of Calais, was recently almost choked up, and is now entirely artificial. In other parts, however, the sea has gained on the land; and the remains of a forest are said to be still visible under the waves.

Crossing the æstuary of the Humber (see section on rivers), we meet with the Spurn Head, forming the south-eastern limit of the Yorkshire coast. This is a long, low, narrow, hooked promontory: its extremity, on which two lighthouses are erected, being a beach mixed with sand-hills thrown up by the sea.

From this point the coast, which bends north-west to Hornsea, is composed principally of lofty cliffs of brown clay, perpetually preyed on by the sea; which Mr. Pennant states, "devours whole acres at a time." A street in the village of Hornsea has been swallowed up; and of Hyde, a neighbouring village, the tradition only is left.—(*Arctic Zoology, Introd.* p. 13.)

From Hornsea the coast inclines first gently to the west, and then round by the east, till it terminates in Flamborough Head. It is mostly low. Within the elbow, on the south side of the Head, is Bridlington Bay. On the north and west, it is protected by the Head and the adjacent coast, while the anchorage in-shore is defended from the easterly and southerly gales by the sand-bank called the Smithie. The holding-ground between the sand and the shore is good, and there are from 5 to 7 fathoms water. The Smithie is the only sand-bank on the coast, from Spurn Head to Flamborough Head.

This last mentioned promontory is the most striking on the east coast of England. Its high, white, perpendicular limestone cliffs advance a considerable way into the ocean, and render it a most conspicuous object. Many of the rocks of which it is composed are insulated, of a pyramidal form, and soar to a great height. Most of them have solid bases; but others are pierced through and arched. On the north side are vast caverns, leading into the body of the Head, the retreat of immense numbers of sea-fowl and wild pigeons. A lighthouse with the lantern elevated 214 feet above the level of the sea, and distinguishable in fair weather at a great distance, was erected on this promontory in 1806.

This head is further remarkable from its being the commencement of the hard or rocky coasts of the east side of Great Britain, which continue, as Mr. Pennant has remarked, with the intervention of a few sandy bays and low tracts, to its northern extremity.

North-west from Flamborough Head, distant about 16½ miles, a round rocky promontory projects into the sea, by which it is surrounded on all sides except on the west. On the summit of this promontory is built the castle, and on its side stands the town of Scarborough. The latter has a pier harbour, vessels lying aground at low water. The shore is here remarkably bold; the height and appearance of the cliffs resemble those near Dover. Between Scarborough and Whitby, lies Robin Hood's Bay; having deep water, but exposed to the easterly gales. The coast thence to Whitby is rocky and dangerous. Whitby is situated at the mouth of the Esk. It has a fine pier; but its harbour, though justly considered the best in this

part of the country, ebbs almost dry. There is a lighthouse on the pier.

From Whitby to the æstuary of the Tees, the boundary between Yorkshire and Durham, the coast trends west-north-west. It is bold and rude, and destitute of any tolerable harbour; but it is indented with many bays, and varied with little fishing villages, built on the projecting ledges of the cliffs.

Hartlepool, in Durham, marks the northern extremity of the mouth of the Tees. It is seated on a promontory, almost surrounded by the sea; and has risen rapidly in importance as a port for the shipment of coal from the extensive coal-fields in its vicinity, with which it is connected by railways; upwards of 600,000 tons having been recently dispatched from it in the course of a single year. Its means for the accommodation of shipping have been, and are now (1846) in the course of being, very greatly improved by the formation of docks, piers, &c. It has from 5 to 6 feet water in its outer harbour at ebb-tide in ordinary springs; and as the latter rise from 15 to 20 feet, it may be visited by large ships. The depth of water in the docks varies from 18 to 20 and 23 feet.

From Hartlepool for some distance, the coast is flat; but, as it approaches Sunderland, it becomes rocky, and is broken into deep caverns. Sunderland stands on the south side of the river Wear, and so near the ocean as at high water to appear a sort of peninsula. This port began first to rise into eminence, by the exportation of coal, about 1620. Latterly, it has been very much improved; two piers, and a lighthouse 90 feet high, having been constructed. At springs, there is from 15 to 17 feet water over the bar, and at neaps from 10 to 12 feet. The channel is close by the north pier head. Beyond Sunderland, the coast is bleak and dreary, to the point where the opposite towns of North and South Shields mark the embouchure of the Tyne. Within the river, and near the town of North Shields, are two lighthouses, which lead over the bar. The bold ruin of Tynemouth Castle is the first object that presents itself on the Northumberland coast. About 12 miles north from this is Newbiggin Point; between which and Tynemouth are the small harbours of Hartley, Blythe, and Seaton-Delaval, all of them dry at low-water. From this point the coast presents nothing remarkable, except a small island at the mouth of the Coquet, till we reach Bamborough Castle, situated on a promontory, a very striking object, and once a place of great strength. Nearly opposite to it lies the group of rocky islets, called the Farn Isles, on the largest of which are two lighthouses. Holy Island lies about 4 or 5 miles north of Bamborough Castle. The coast of Northumberland, from the mouth of the Tyne to Bamborough Castle, is mostly low cliffs. From Bamborough to the mouth of the Tweed a sandy shore extends.

We have now briefly to notice the western coast of England, beginning with that of Cumberland. The coast of this county, and of the detached part of Lancashire called Furness, forms almost a semicircle, beginning at the mouth of the Eden, and terminating at the Isle of Walney. Toward the Solway Frith, it is marshy, indenting the country afterwards with the Bay of Kilbride. Work-

ington, near the mouth of the Derwent, is the first place of consequence that presents itself. It has about 14 feet water at springs, and 8 at neaps. A little to the south of this is Whitehaven, situated on a small bay, surrounded by naked hills. It is supposed to have received its name from the white cliffs which lie on one side of its port; but its entire consequence is derived from its coal mines, excavated to a great extent under the sea. The harbour is divided into several basins, having from 16 to 18 feet water at springs, and from 9 to 10 at neaps. About 3 miles west-south-west from it is the lofty promontory of St. Bees' Head, surmounted by a lighthouse, and noted for the resort of sea-fowl.

The coast of Lancaster is very much indented by the Irish Sea. Dr. Campbell, in describing it, divides it into three peninsulas. Of these the first is comprised between the river Duddon, which separates Lancashire from Cumberland, and the Kent, which separates it from Westmoreland. The second lies between the Kent and the Ribble, and the third between the Ribble and the Mersey, the boundary between Lancashire and Cheshire. The first of these, called Furness Fells, already adverted to, presents a line of coast of nearly 30 miles. The long and narrow Isle of Walney forms a vast natural breakwater, that protects this part of the Lancashire coast from the waves of the Irish Sea. Within the south end of Walney Island, on which there is a lighthouse, is the harbour or roadstead of *Pile-a-foudre*, protected on the east by the islands of Foula and Ro, to the westward of which vessels may ride in from 5 to 7 fathoms. This is a place of considerable importance, as respects the commerce of Liverpool, being the only safe resort for vessels in this quarter during strong westerly gales.—(*Norie's Sailing Directions for St. George's Channel, &c.*, p. 47.) Ulverston, the port of the Furness district, is situated on the west side of a shallow arm of the sea, into which flow the Crake, Leven, and other streams. This arm, as well as the broad æstuary between Humphry Head and Carnforth, is fordable, though not without danger, at low water. Morecambe Bay forms a spacious gulf, between Furness and Walney Island on the one hand, and the Lancaster coast on the other.

The second part of the sea-coast between Westmoreland and the Ribble is more extensive, as well as flatter, than the former division. To the south of the Lune is the marshy tract along the Wyre, having Rossal Point at its north-west angle. From this point, the coast runs almost due south, till it is indented by the æstuary of the Ribble.

In the last division, between the Ribble and the Mersey, the Lancashire coast takes a sort of circular form, being most advanced at Formby Point, about 11 miles N.N.W. Liverpool. This great emporium lies on the north-east side of the æstuary of the Mersey, between 2 and 3 miles from its mouth. The entrance to it is obstructed by numerous sand-banks, the passages through which are intricate and difficult; and should not be attempted by those not familiar with the port without the aid of a pilot.

The coast of Cheshire is formed entirely of the broad rhomboidal peninsula lying between the Mersey and the Dee, and presents no feature worthy of notice.

The coast of North Wales begins at the bottom of the æstuary of the Dee; but the first object worth notice is the Point of Air. This promontory bounds the embouchure of the Dee, on its western side, and is the most northerly land in Flintshire. It is surmounted by a lighthouse. From this point, the coast takes a concave circular sweep, till it terminates in the Great Ormes Head. This is a vast limestone rock, connected with the mainland by a low marshy neck; and has, no doubt, been at one time an island. Towards the sea the cliffs, which are very abrupt, are hollowed, by the action of the waves, into various inaccessible caverns, affording a secure retreat for multitudes of gulls, cormorants, ravens, rock-pigeons, &c. A telegraph is erected on the summit of the head.—(*Aikin's Tour in North Wales*, p. 165.)

South of the Great Ormes Head is the embouchure of the river Conway. The harbour at the town is fit for small vessels; but ships may lie, in the æstuary, in from 3 to 4 fathoms. From Conway, the coast stretches south-west to Bangor. The road between them skirts the mountain of Penmaenmaur, the last of the Snowdon range, being cut out of the rock, about 200 feet above the level of the sea, which, at high water, dashes against the foot of the mountain, almost directly below. Bangor is situated at the entrance of the Menai Strait, separating the Island of Anglesea from Caernarvonshire. This strait runs north-east and south-west, about 14 miles, varying in width from about 2 miles to about 200 yards. Parliament having liberally contributed a sum of money to assist in improving its navigation, the dangerous rocks by which it was formerly encumbered, have been removed, so that vessels of moderate burthen are able to pass without difficulty through the strait, when it would not be possible for them to double Holyhead. But the Menai Strait is now principally celebrated for the magnificent hanging bridge by which it has been recently crossed. Holyhead being the nearest port to Ireland, and the most convenient place at which to ship and receive the Dublin mails, it became of great public importance that the access to it should be rendered as safe and expeditious as possible. The usual ferry across the strait was in the vicinity of Bangor; and this being frequently attended with both danger and delay, it was resolved to erect, nearly at the same place, a chain bridge, elevated sufficiently above the water to allow ships to pass freely underneath. This great undertaking was begun in 1819, and completed in 1825. There are seven stone arches, each of 52½ feet span; and the length of the catenary or chain part is 579 feet. The bridge cost in all 211,791*l*. Its elegance and solidity reflect credit on the engineer, Mr. Telford; but it is to the parliamentary Commissioners, or, rather, to their chairman, Sir Henry Parnell, that the public is mainly indebted for this improvement.

Holyhead stands on a peninsula on the west coast of Anglesea. Being the station of the post-office packets for the mails between London and Dublin, great efforts have been made to improve its harbour. It used to be always dry at low water, so as to be unsuitable for vessels that could not lie on the mud. To obviate this defect, a pier has been projected about 200 fathoms into the sea, having 12 feet water at its head at low springs. The pier has a lighthouse at its extremity.

The peninsula of Holyhead is terminated by a high rocky promontory, called the South Stack, surmounted by a lighthouse elevated 201 feet above the level of the sea. The Skerries, a small island to the north of Holyhead, is also marked by a lighthouse.—(*Norie's Sailing Directions for St. George's Channel, &c.* p. 32.)

The coast of Caernarvonshire, southward from Menai Straits, is formed by the peninsulated hundred of Lleyn. At its south-western extremity is the small island of Bardsey, furnished with a lighthouse.

The south point of Caernarvonshire forms the north-west horn of the great bay of Cardigan, one of the most considerable indentations made by the sea on the western shore of the island: it is pretty equally distributed between North and South Wales. The coast of Merionethshire, fronting this bay, is wild and mountainous; the only port in it is Barmouth, on the north side of a little arm of the sea, into which several rivulets discharge themselves. It is fit only for small vessels, drawing 9 or 10 feet water. Below Aberystwith, which, also, is only fit for small vessels, the coast of Cardiganshire stretches in a south-westerly direction, till it joins that of Pembrokeshire, a promontory to the north of St. David's, in the latter, forming the southern horn of the Bay of Cardigan. Cardiganshire has a coast of nearly 40 miles; and has suffered a good deal from the encroachment of the waves.

The coast of Pembrokeshire is in general hilly, with steep or perpendicular cliffs. It commences at the mouth of the Teify, on the north side of which is the town of Cardigan, accessible only to vessels not drawing more than 10 feet water. But in Cardigan Roads ships may lie, in moderate weather, almost anywhere without the bar, about 2 cables' length from shore. Its most westerly point is the noted promontory called St. David's Head, off which lies Ramsey island, with a group of rocks, called the Bishop and his Clerks, frequented, in the breeding season, by vast numbers of sea-fowl. To the south of this headland is St. Bride's Bay; and beyond some islands, which lie on its southern side, is the entrance to Milford Haven.

This is one of the most capacious and safest asylums for shipping in the British dominions. It deeply indents the southern part of the county of Pembroke, and branches out into many bays, creeks, and roads. The water is deep; and, being completely landlocked, and the anchorage ground of the very best description, ships ride within the haven as safely as if they were in dock. At springs the rise of the tides is from 28 to 30 feet, affording unusual facilities for the repair of ships, enabling them to get to sea with comparatively little difficulty, and to sail in, even though the wind should be contrary. It may be entered without a pilot as well by night as by day. A dockyard has been constructed on the north side of the haven, at Milford; but, the advantage of having the rendezvous for the fleets in situations better adapted for watching the coasts of France has prevented Milford from attaining that importance, as a naval depôt, which her admirable haven might seem to ensure; while the barrenness of the surrounding country, and the want of all internal communication with any considerable manufacturing districts, will, most probably, prevent any of the places on the haven from becoming of much consequence in a commercial

point of view. St. Anne's Point, forming the north-western extremity of the entrance to the haven, is about 145 feet high; and is surmounted by two lighthouses, one 15, and one 45 feet in height. The entrance is about 1½ mile wide.

The coast of Wales, to the south of Milford Haven, continues rocky; it is also full of caves and remarkable apertures, as far as the entrance to the Bay of Caermarthen. The western horn of this bay is formed by the rock on which Tenby is situated; the opposite horn, by the Worms Head, the western extremity of the peninsula of Gower, in Glamorganshire. On the south side of this peninsula lies the Bay of Oxwich; and, to the east, the Bay of Swansea. The coast then stretches south-easterly to Aberthaw, where it turns to the north-east, bounding the west side of the Bristol Channel.

The shore of Monmouthshire inclines chiefly to the south, verging at last towards the east: at first it is marshy and low, but as we approach the Wye it becomes rocky and lofty. The coast of Somerset, opposite the Bristol Channel, forms an extensive semicircular bay; stretching, if the indented shore line be taken into account, nearly 60 miles: at the outset, it is low, and bordered by marshes, and it continues pretty level till it reaches the Bay of Minehead. Thereafter, the coast of Somerset, together with that of Devon, which soon joins it, may be called mountainous, having many dark cliffs and rocky hollows. The shore of the latter county stretches at first due west, and then turning south, the land is very irregularly indented, so as to form Barnstaple Bay: it turns again westward, and afterwards, advancing north, forms the bay called Porlidge Mouth; at the extremity of which lies Hartland Point.

Soon after passing Hartland Point, the Cornish shore commences. The first place we meet with on it is Beedshaven. A long range of broken coast succeeds, stretching in a south-westerly direction to St. Ives, situate on the west side of a considerable bay. It has a pier, where small vessels lie aground at low water. Large ships may anchor in the bay, in from 6 to 7 fathoms; but, being quite exposed to the northerly gales, which throw in a heavy sea, it is not much frequented. From St. Ives, the coast bends in a circular south-westerly direction to Cape Cornwall, and thence southerly to the Land's End. This celebrated headland, the most westerly land in England, is in lat. 50° 4′ 8″ N., long. 5° 41′ 31″ W. The cliffs forming its extremity are granite, and rise about 60 feet above the level of the sea. They assume, in some places, the appearance of shafts, and are as regular as if they had been cut by the chisel. Cape Cornwall is elevated about 229 feet above the level of the sea. The bay, between the latter and the Land's End, is called Whitsand Bay, from the peculiar whiteness of its sand. About a mile from the Land's End are the rocks called the Longships, on the largest of which is a lighthouse. The Scilly Islands lie in a cluster, about 9 leagues west by south from the Land's End, and are distinctly visible from it. Sir Cloudesley Shovel, with a part of the fleet under his command, was wrecked on these islands on the 22nd October, 1707. A lighthouse has since been erected on St. Agnes, one of the largest of the group. After doubling the Land's End, the Cornish shore advances southward, and then turning to the north,

bounds the west side of Mount's Bay, its east side being formed by the coast, stretching south-easterly to the Lizard Point.

Penzance, the most westerly market town in England, lies on the north-west shore of this bay. It has a pier above 600 feet in length, with a lighthouse at its extremity; within the pier there are 22 feet water at springs, and 17 at neaps.* Penzance is one of the principal seats of the pilchard fishery; the other great seats being St. Ives and Mevagissey. But the most remarkable object in Mount's Bay, and that from which indeed it takes its name, is St. Michael's Mount. This is a rock of a conical form, lying opposite to Marazion, on the north-east side of the bay. Its base is circular, being nearly a mile in extent; it gradually diminishes from the base to the summit, which is crowned with a chapel, its tower being about 250 feet above low-water mark. On its eastern side is a small fishing village, with a pier, having about as much water as at Penzance. The appearance of the Mount is most striking. It was long regarded as a place of peculiar sanctity, and its chapel was annually resorted to by crowds of pilgrims.

Dr. Paris affirms that the sea is encroaching on most parts of the southern coast of Cornwall. He mentions, that the grandfather of the present vicar of Madron received tithes from land under the cliff of Penzance. It appears certain that at some distant period a very considerable extent of land has been submerged in Mount's Bay.—(*Paris's Guide*, &c., p. 15.)

The eastern shore of Mount's Bay terminates, as already stated, in the high bold headland called the Lizard Point. This, which is the most southerly promontory in Great Britain, is famous in navigation; for it is from it that ships take their departure from the English Channel, and it is, also, the best place for a land-fall when homeward-bound. It is surmounted by two lighthouses, at a short distance from each other: the one 223, and the other 224 feet above the level of the sea. The highest lighthouse is in lat. 49° 57′ 41″ N., long. 5° 11′ 5″ W. Some steep rocks, called the Staggs, lie to the southward of the Lizard.

From the Lizard the coast bends in a north-north-east direction to Pendennis Point, on the western side of the entrance to Falmouth harbour; on its eastern side is St. Anthony's Head, the distance between them being exactly a mile. This is an excellent harbour. It runs north about 5½ miles. Falmouth is situated on a creek on its western side; and St. Mawes on its eastern side, immediately within St. Anthony's Head. It has good anchorage ground for the largest ships; and they may also anchor without the harbour, having it in their power to retreat into it in the event of the wind coming to blow from the southward. This gives a great facility to ships getting to sea.

From Falmouth harbour the coast runs N.N.E. in a broken line to Fowey, at the mouth of the river of that name. The entrance to the harbour is only about a cable's length in breadth; but it is free from danger; and within there is at all times 3 fathoms water.

* This is Dr. Paris's statement.—(*Guide to Mount's Bay, &c.* 2nd ed. p. 24.) He notices the different statement given in the Sailing Directions for the Channel, where the depth of water within the pier is said to be only 13 feet at springs.

From Fowey to the Rame-head the coast presents nothing remarkable. This headland forms the western boundary of Plymouth Sound, which opens the moment it is passed.

The harbour of Plymouth is double. The æstuary of the Plym, on which Plymouth is built, forms the Catwater, a convenient harbour for merchantmen. Devonport, where the dockyards are situated, is built on the west side of the tongue of land formed by the confluence of the Plym and Tamar, at the mouth of the latter. The æstuary of the Tamar expands into the road or harbour of Hamoaze, which is almost completely land-locked, with secure anchoring-ground, and depth of water sufficient to float the largest ships close to the Quays. The dockyard is large, commodious, and furnished with every convenience for building and refitting ships. The two harbours open into Plymouth Sound and Cawsand Bay; and it is in the Sound that ships refitted in the dockyards, or in the Hamoaze, as well as those employed during war in the blockade of Brest, usually assemble before going to sea. Owing, however, to the heavy swell that is thrown in from the south, Plymouth Sound was often a very unsafe place for anchoring; and to obviate this inconvenience, a stupendous breakwater, or mole, about 1,700 yards in length, has been formed in the middle of the Sound, stretching in a slightly hooked line between the head of Cawsand Bay on the one side, and Bovisand Bay on the other. The top of the mole is above the level of the highest tides; the under part being formed of vast stones sunk in the sea. This great national undertaking cost a very large sum; but the important object in view in its construction has been completely attained. The part of the Sound within the breakwater has been rendered one of the very best roadsteads in the world; it is accessible on either side, and is sufficiently capacious to admit the largest fleets, which ride, under cover of this immense bulwark, in the stormiest weather, in perfect safety. The entrance to the Sound is defended by the forts on Drake's Island, the citadel opposite, and several adjacent batteries.

Nearly opposite to Plymouth Sound, about 8½ miles from the Rame Head, is the Eddystone lighthouse. It stands on one of a cluster of irregular rocks, part of which is uncovered at low water. Being much exposed to heavy swells from the Bay of Biscay and the Atlantic, the waves frequently break over them with tremendous fury. In consequence of the many fatal accidents occasioned by ships running against these rocks, a lighthouse was erected on one of them in 1696: after standing many violent storms, it was overthrown in the dreadful tempest on the 27th of November, 1703. A second lighthouse, erected in 1708, was burnt down in 1755. The present edifice, built by the celebrated engineer, Smeaton, and finished in 1759, is universally admired for its solidity and the skill displayed in its construction. It bids fair to last for ages.

Leaving Plymouth, the shore stretches in an east-north-east direction till the Bolt Head, elevated 430 feet above the level of the sea, and the Prawle Head are passed. Between these promontories is Salcomb Bay; on the bar at the entrance of which there is not more than 4 to 6 feet water at ebb tide. At a little distance E.N.E. from Prawle Head is the Start Point, a noted promontory. From it the

coast stretches N.N.E. to Exmouth. The first place of consequence met with in this range is Dartmouth, which has an excellent harbour sufficient to accommodate 300 sail in from 7 to 15 fathoms. A little to the north of Dartmouth is Torbay, bounded on the south by Berry Point, and on the north by Torquay. Its form is semicircular, being about 3½ miles wide at the entrance. On both sides its winding shores are skreened with ramparts of rock; between which, in the centre, the ground forms a vale declining gently to the water's edge. The bay fronts the south-east. Ships anchor in it in 6, 7, 8, and 9 fathoms. The ground is strong clay, and holds remarkably well. This spacious basin has frequently afforded shelter to the fleets of England; and our great deliverer, William III., landed here on the ever-memorable 5th of November, 1688.

About four miles north of Torbay is the embouchure of the small river Teign, having a bar harbour frequented only by coasters. Exmouth, still farther to the north, at the embouchure of the Exe, is a place of more consequence. The harbour is, however, rather difficult of access; and at low water, neap tides, has not more than 8 feet water on the bar at its entrance.

From Exmouth, the Devonshire and Dorsetshire coast sweeps in a long circular line inclining to the south, and terminating at the southern extremity of the Isle of Portland. The Chesil bank extends along the Dorsetshire coast from near Abbotsbury to below Chesil in the isle now mentioned, a distance of from 9 to 10 miles. This extraordinary ridge runs nearly parallel to and at a little distance from the mainland, the intermediate space being occupied by a long narrow saltwater creek, communicating with the sea at Portland Road. The ridge is, in some places, about a quarter of a mile broad; its upper part consists of rounded loose pebbles, and its lower of hard blue clay. Mr. Smeaton thinks it has been formed at a comparatively recent epoch: but it is very difficult to account satisfactorily either for its first formation or its continued existence. There is a similar and still more extensive ridge, bounding the Frische Haf, on the coast of Prussia.*

The noted and almost insulated headland, called, for that reason, the Isle of Portland, consists of a vast mass of freestone. On its southern extremity, denominated Portland Bill, two lighthouses are erected. The Race of Portland lies to the south of the Bill. It is a rippling of the water, occasioned by the ruggedness of the ground, which impedes and breaks the course of the tide. At springs it is rather dangerous, at least for small loaded vessels. About four miles north from Portland Bill, on the east side of the island, is Portland Roads, where there is good anchorage ground. Immediately north of Portland Roads is Weymouth harbour, having 8 feet water on the bar at ebb tide.

After leaving Weymouth, the coast stretches east, inclining a little to the south, to St. Alban's Head, in that part of Dorsetshire called the Isle of Purbeck. Farther on is Durliston Head, Peverel Point, and the Foreland Point. Swanage Bay lies between the last two. To

* Maton's "Western Counties," vol. i. p. 63; Stevenson's "Survey of Dorset," p. 49. Dr. Maton says the length of the bank is 17 miles; but this is an error.

the north of the Foreland Point is Studland Bay and Poole Harbour. The last is a large expanse of very irregular shaped water, and includes several islands. It is almost entirely land-locked, the entrance to it from Studland Bay not exceeding a quarter of a mile in width, and hence its name of Pool, or basin. There is a bar at its mouth, which frequently shifts; but it has seldom more than 15 feet over it, even at high water. Poole is situated on an isthmus on the north side of the bay; and vessels drawing 14 feet water come up to the quays. Wareham, situated between the rivers Pidder and Frome, at the western extremity of Poole Harbour, formerly engrossed the greater part of its trade; but it is now much decayed; the passage to it is intricate and difficult, and it is no longer accessible except by very small vessels. "It is a considerable and singular advantage to Poole Harbour that the tide ebbs and flows twice in 12 hours. It first flows regularly 6 hours, and ebbs for 1½ hour: it then flows again for 1½ hour, and ebbs during the remaining 3 hours. The second flood appears to be owing to the peculiar situation of the entrance; for, being in a bay towards the east, the tide of ebb from between the Isle of Wight and the main falls into that bay, and forces its way into that river, so as to raise the water for an hour and a half; at which period the water without the bar, by its falling below the level of that within, produces a second ebb for the space of three hours, or until low water."*

The western coast of the Isle of Wight forms one side of that spacious bay of which the eastern coast of Dorset makes the other. The former terminates in a narrow point, fenced with projecting rocks, the most remarkable and prominent of which are, from their being detached, tapering, and sharp, called the Needles. This promontory is marked by a lighthouse 469 feet above the level of the sea.

The appearance of the rocks from the Needles to West Cowes, and of the opposite coast of Hampshire, affords pretty strong grounds for believing that the island and the mainland were once united. The channel between is, in most places, about 2 miles wide. But a little to the north of the Needles it is narrowed to less than a mile, by a long, low, narrow tongue of land, or causeway, projecting in a south-easterly direction from the Hampshire coast towards Clevesend Point in the Isle of Wight. Hurst Castle stands on the extremity of this tongue, and to facilitate navigation a lighthouse has been erected on each side of it. Owing to the narrowness of the passage, the tide runs through the strait with so much force that it has deepened the channel to 28 fathoms. At high water, the causeway scarcely exceeds 200 yards in breadth: it is a sterile beach, covered with loose gravel and pebbles.

Southampton Water, or Trissanton Bay, is a large inlet of the sea, commencing at Calshot Castle, and stretching north-west into the interior of Hampshire, upwards of 10 miles: it is navigable to the head for vessels of considerable burthen. Its shores are beautiful and picturesque, being lined on one side by the New Forest, and on the other ornamented by the ruins of Netley Abbey.

Southampton, situated at the junction of the Itchen with South-

* Purdy's "Sailing Directions for the English Channel," p. 29; see also Maton's "Western Counties," vol. i. p. 28.

ampton Water, has latterly been rising rapidly in importance from its having become, as it were, one of the outports of the metropolis. The journey between them is performed by means of the South Western Railway, in from two to three hours; and it is now usual for ships leaving the Thames for the Mediterranean, the East Indies, and America, to touch at Cowes, opposite Southampton, to take in water and passengers. The latter avoid, by this means, the difficult and often tedious passage round by the Forelands and Beachy Head, while, owing to the greater facility of getting to sea, they are generally able to proceed on their voyage without further delays. Hence, also, Southampton has of late years become the station for the packets for the Peninsula, the Mediterranean, and the West Indies. To accommodate the increased number of ships frequenting the port, a tidal harbour, 16 acres in extent, has recently been excavated, which may be reached at all times of the tide by vessels drawing 22 feet water. The construction of an extensive wet-dock has also been commenced, and is now (1846) in the course of being carried on.

From the mouth of Southampton Water, the coast of Hampshire stretches, in a south-easterly direction, to Monkton Fort, at the southern extremity of the western boundary of Portsmouth harbour. This noble harbour, unequalled in Great Britain, and surpassed by very few in any part of the world, has a narrow entrance, but within its width increases, and it is sufficiently capacious to contain a great part of the navy of Great Britain. There is a bar outside the entrance; but as it has about 13 feet water over it even at the lowest spring ebbs, it can hardly be said to be any obstruction to the navigation; and within the harbour there is water sufficient to float the largest man-of-war at any time of the tide. The anchoring-ground is excellent; and it is free from sunken rocks, or any similar impediments. The east side of the harbour is formed by the Island of Portsea; on the south-western extremity of which stands the town of Portsmouth, and its large and important suburb Portsea. Here are commodious docks and other establishments, constructed upon a very large scale, for the building, accommodation, and outfit of ships. The town of Gosport stands on the opposite or western side of the harbour. In its vicinity is Haslar Hospital, a very large and convenient building for the reception of sick and wounded seamen. The fortifications that protect this great naval depôt are superior, both as respects strength and extent, to any other in the kingdom. "Thus," to use the words of Dr. Campbell, "it appears that Portsmouth derives from nature all the prerogatives the most fertile wits and most intelligent judges could devise or desire; and that these have been well seconded by art, without consideration of expense, which, in national improvements, is little to be regarded. Add to all these the striking excellence of its situation, which is such as if Providence had expressly determined it for that use to which we see it applied, the bridling the power of France, and, if I may so speak, the peculiar residence of Neptune."—(*Survey of Great Britain*, vol. i. p. 370.)

Portsmouth harbour has the additional and important advantage of opening into the celebrated road of Spithead, lying between the Hampshire coast and the Isle of Wight. It derives its name from a

sand-bank called the Spit, extending about three miles in a south-east direction from the narrow neck or tongue of land on which Gosport is built. A ship of war is always moored at the head of this bank; and the roadstead is marked by buoys, placed at regular intervals. From its safety and capaciousness, it has been called by sailors "*the king's bedchamber.*" It is protected from all gales, blowing from the west round to the south-east, by the Isle of Wight; and from those blowing from the opposite quarters, by the highlands of Hampshire.

There is good anchorage ground in Cowes Roads, on the north coast of the Isle of Wight, opposite Southampton Water. There is also good anchorage in St. Helen's Road, on the east coast of the island; but ships lying there are exposed to the easterly and south-easterly gales.

Between Portsea Island and the coast of Sussex is a large basin, having within it the islands of Hayling and Thorney, with others of inferior dimensions. There are two entrances to this basin; the first of which is called Langstone, and the second Chichester Harbour. They are both encumbered by sand-banks, and can only be approached by small vessels.

The coast here is extremely low, and continues so as it runs south-easterly, till it terminates in the promontory called Selsea Bill. Opposite to this headland are some dangerous sand-banks, called the Owers. As a guide to ships, a light-vessel is moored at their eastern extremity, about six miles south-east from Selsea Bill.

From the latter point, the coast sweeps in a lengthened curve to Beachy Head. After passing the Bill and the little river Avon, we meet with Worthing, a fashionable watering-place, and a little farther east is Shoreham. Its harbour has recently been a good deal improved; but at ebb tide it has not more than 3 feet water. About four miles from Shoreham is Brighton; and about five miles more to the eastward is Newhaven. This is a pier harbour; and is reckoned the best small harbour in the Channel, between the Downs and the Isle of Wight. At low ebb spring tides, the depth of water between the piers is only 2 feet; but at high-water springs there are from 20 to 22 feet, and at high-water neaps from 13 to 14 feet.

Along all this coast, the South Downs form a near background; till, at length, advancing close to the shore, they terminate in the conspicuous bold promontory of Beachy Head, 564 feet in height. It is formed of chalky white cliffs, that project perpendicularly over the beach, whence it derives its name. A lighthouse of the first class was erected, in 1828, on the summit of the second cliff, to the west of the Head, 285 feet above the level of the sea; and caverns have been cut in the cliffs, between the Head and Cuckmore Haven, in the view of affording a place of refuge to such mariners as may be wrecked on this dangerous coast.

Beyond Beachy Head the coast turns to the north-east, and, near Pevensey, is low, sandy, and marshy: it continues of this description till it reaches Hastings, the port of which occupies a hollow space between two cliffs. William the Conqueror is believed to have landed here, in the latter part of September, 1066. At the eastern extremity

of the county of Sussex, there is a capacious bay, or rather æstuary, on which were anciently two good ports, Rye and Winchelsea. The latter is now entirely choked up; and, notwithstanding the improvements effected at the former, it is suitable only for small vessels.

The coast of Kent adjoining Sussex, runs out into the low beachy point of Dengeness, on which a lighthouse is erected. From this point the coast, which is low and marshy, turns north and north-east by Dymechurch and Hythe, till we reach Sandgate, where the chalky cliffs again make their appearance, and continue to the Downs. In one of the hollows of the ridge is the town of Folkestone, having a harbour for fishing vessels. Leaving this, we pass the cliffs of Dover; but, owing to the loftiest having been undermined by the sea, and thrown down, Shakspeare's magnificent description is not very applicable to those that still remain. Dover harbour is not worthy of its ancient celebrity, being deficient in water, and not very accessible. A little to the north-east of Dover is the noted headland, called the South Foreland. The shore stretches thence first north, and then north-westerly, leaving a large sandy area, which appears to have been deserted by the water. This flat tract is terminated to the north by the high grounds of the Isle of Thanet; the most easterly point of which is called the North Foreland. Between these headlands, and opposite to Deal, is the much-frequented roadstead called the Downs. It extends about 6 miles north and south; being protected from the easterly gales by the Goodwin sands, distant 4 miles from Deal, and stretching north-east and south-west about 10 miles. These sands are supposed by some to have once made part of the Kentish land, and to have been submerged about the end of the reign of William Rufus, or the beginning of that of Henry I. They are very dangerous; vessels riding in the Downs being sometimes driven upon them, and, generally wrecked; occasionally through the ignorance and carelessness of pilots, but more frequently from the violence of the south-east and north-east winds. They are divided into two principal parts by a narrow channel: in many places they are dry at low water, and some spots appear even sooner. The northern division is of a triangular form, lying north and south, being about 3½ miles long, and 2½ miles broad: the north end, called the North Sand Head, is about 7 miles from the coast, its position being marked by a light-vessel. The Bunt Head, on the west side, is very dangerous. The largest spot that dries on this sand has got from the seamen the name of Jamaica Island. The south part of the Goodwin Sands is about 7 miles in length; at its north end it is about 2½ miles in breadth, gradually diminishing towards the south-west, till it terminates in the narrow point called South Sand Head, marked by a light vessel, moored about 3 miles from shore. But it is right to observe, that the position of these sands varies more or less every year, through the joint influence of storms and tides.

The South Foreland forms the eastern point of the Kentish shore: two light-houses are erected on it, to warn mariners arriving from the west and south of their approach to the Goodwin Sands. The North Foreland is, by Act of Parliament, declared to be the most southerly part of the port of London. It projects into the sea nearly in the form of a bastion, and is somewhat higher than the adjoining coast; a

light-house was erected on it so early as 1683, for the general convenience of mariners, but more particularly to excite their attention to the Goodwin Sands, and to point out the Gull stream or channel, leading inside the Sands to the Downs. Ramsgate lies a little to the south of the North Foreland: it is a pier harbour, and has been formed at an immense expense. Still, however, owing to the want of water, it can only be entered at certain times of the tide. All vessels passing on the south side of the North Foreland, are said to enter the channel; and all the towns and harbours between London and it, whether on the Kent or Essex shore, are members of the port of London.

Few topics connected with the progressive geography of England, are more interesting than that which relates to the past and present state of the Isle of Thanet. It is now scarcely a river peninsula; but, during the Roman ascendancy, it was a complete island, of a circular form. At that period, the sea on its south-west side, between it and the mainland of Kent, was at least 4 miles broad, gradually decreasing as it flowed through the strait, till, at Sar, where it was narrowest, its breadth did not, probably, exceed a mile and a half. Thus far flowed the south, which there met the north, sea: the latter entered at what was, from this circumstance, called Normutha, *i. e.* Northmouth. We have the explicit testimony of Ammianus Marcellinus to prove that the direct route and accustomed passage to London by sea, so late as the middle of the fourth century, lay through this channel.* In the time of Bede, however, its breadth was considerably diminished; for he tells us, that it was then but three furlongs wide, so shallow, that it was fordable in two places, and that it was thence called Wantsome, or the deficient water. It continued, however, a passable strait for ships of some burthen, till about the time of the Norman Conquest, when the inhabitants, perceiving that the tide no longer flowed with any considerable vigour, began to erect dykes to keep it out; in which object they were at length completely successful. Thus, the Isle of Thanet, which was formerly separated from the rest of Kent by the channel called the *Portus Ritupensis*, and was, in its natural state, all high land, is now a peninsula, or, at most, a river-isle only, having the Stour-wantsome on the south, the Mile-stream on the south-west, and the Nethergong-wantsome on the west. The rest of the Island fronts the east and north seas, as before; but its figure is altered from that of a circle to an irregular ellipse. After the junction of the isle to Kent, the sea, no longer finding a passage through the strait, began to throw up immense quantities of beach on the eastern shore, which produced Stonar, or rather Estanore, that is, the east-stone-shore: this was originally a separate island, but it was speedily united, by a causeway, to the Isle of Thanet.†

Proceeding westward from the Isle of Thanet, the coast of Kent, which still fronts the north, becomes marshy as it descends by Whit-

* Ammiani Marcellini Hist. lib. 20, c. 1.

† Those desirous of further information on this curious subject may consult Dr. Campbell's "Survey," vol. i. pp. 394–397, who has displayed great industry and learning in tracing the successive changes of which the Isle of Thanet and the coast of Kent have been the theatre.

stable to the narrow channel, called the Swale, separating the Isle of Sheppey from the mainland. This channel unites with the æstuary of the Medway, a little below Sheerness, where the latter falls into the Thames.

We subjoin a table of the latitudes and longitudes of the principal places on the coasts of England and Wales. They are mostly derived from the Ordnance Survey.

Principal Headlands and Places on the Coast of England and Wales, with the Latitude and Longitude, as given by the best Authorities.

PLACES.	Latitude.				Longitude.			
	°	′	″		°	′	″	
London (St Paul's)	51	30	49	N.	0	5	47	W.
Greenwich (Observatory)	51	28	39		0	0	0	
The Naze	51	51	51		1	17	7	E.
Harwich	51	56	43		1	17	8	
Lowestoffe (Lighthouse)	52	29	10		1	45	14	
Cromer (Lighthouse)	52	55	20		1	19	30	
Spurn Head (Lighthouse)	53	34	44		0	7	0	
Flamborough Head	54	7	0		0	0	5	W.
Hartlepool	54	41	49		1	10	31	
North Shields	55	0	48		1	26	27	
Berwick	55	40	20		1	59	46	
St. Bees Head (Lighthouse)	54	30	55		3	37	24	
Formby Point (Lighthouse)	53	32	21		3	3	54	
Liverpool (St. Paul's Church)	53	24	40		2	58	55	
Great Ormes Head	53	20	2		3	50	21	
Holy Head	53	18	51		4	39	27	
Bardsey Island (Lighthouse)	52	45	0		4	47	0	
Cardigan	52	4	59		4	38	18	
St. David's Head (Cathedral)	51	52	56		5	14	53	
St. Anne's Head (Lighthouse), Milford Haven	51	40	59		5	10	25	
Swansea	51	37	13		3	55	32	
Flat Holm (Lighthouse)	51	22	33		3	7	3	
Hartland Point	51	1	23		4	30	26	
Trevose Head	50	32	58		5	0	54	
Land's End	54	8	0		5	41	31	
Scilly Islands (Lighthouse)	49	53	38		6	19	23	
Lizard Point (Upper Lighthouse)	49	57	41		5	10	39	
Rame Head	50	18	53		4	12	29	
Plymouth (New Church)	50	22	22		4	7	16	
Eddystone (Lighthouse)	50	10	56		4	15	3	
Start Point (Lighthouse)	50	13	22		3	37	43	
Portland Bill (Lighthouse)	50	31	23		2	26	49	
St. Alban's Head	50	38	10		2	6	15	
The Needles (Lighthouse)	50	39	54		1	33	55	
St. Catherine's Point (Isle of Wight)	50	35	34		1	17	51	
Portsmouth (Academy)	50	48	4		1	5	59	
Selsey Bill (Church)	50	45	19		0	45	41	
Beachy Head (Lighthouse)	50	44	24		0	18	0	E.
Dengeness (Lighthouse)	50	55	1		0	57	48	
Dover Castle	51	7	47		1	19	7	
South Foreland (Lighthouse)	51	8	26		1	22	6	
North Foreland (Lighthouse)	51	22	25		1	27	0	

Sect. 7. *Geology.*

The unrivalled prosperity and extent of the manufactures of Great Britain are owing, in no small degree, to the abundant supply of coal, limestone, lead, copper, tin, iron, and zinc, which the country affords; an account of its geology, comprising the repositories of its mineral and metallic treasures, cannot, therefore, be deemed uninteresting to the general reader. In the present brief survey of the geology of England, we shall commence with a description of the lowest, or most ancient rocks: they compose many of the loftiest mountains and mountain ranges in the island, and form most important features in its physical geography.

The principal rocks in Great Britain and Ireland are divided by geologists into the following classes:—

1. *Igneous rocks*, comprising all varieties of granite, felspar, porphyries, and trappean rocks of different geological dates, including sienites, greenstones, basalts, and others of the like kind, as also the ashes erupted from volcanic vents of different periods.

2. *Aqueous rocks*, formed of mineral matter deposited from water in which it was held in chemical solution, in mechanical suspension, or was merely moved forward on the bottom by the propelling action of water.

It is now well known that granite rocks, instead of being confined to the most ancient accumulations, are intermingled with beds of comparatively modern date. In Devonshire and Cornwall the granite is more modern than the coal measures. In the same counties, so rich in mineral veins, trappean rocks are mixed with the older detrital beds, as also in Wales, showing that they flowed in streams, were showered out as ashes, and burst in among previously-formed beds, in the manner of modern volcanoes. The aqueous rocks are known by different names, of which the following, arranged in the descending order of the strata, will suffice for our present purpose.

a. Alluvial. Of which specimens are daily seen forming on the banks of many of our rivers, at the mouths of our æstuaries, and on our coasts.

b. Post-tertiary, comprising a variety of gravels, sands, and clays, once termed *diluvial.* Further research is necessary in regard to these deposits, since part of them may be merely modifications of accumulations known as part of the next, or tertiary group. Many remains of elephants, rhinoceroses, deer, &c., are found in these beds, which so graduate into common alluvium, that the boundary upwards is difficult to establish.

c. Tertiary series, so called from the old division of rocks into primary, secondary, and tertiary. If certain beds of the last-mentioned class are to be included in this, the area occupied by the tertiary rocks in England and Wales is more extensive than that usually ascribed to these rocks. Otherwise their range is chiefly confined to the so-called London basin, the Isle of Wight, and part of the opposite portions of Hampshire and Dorsetshire. The tertiary rocks have been termed *supra cretaceous series*: they have also been divided into three parts, by the names of

d. Cretaceous series, thus named, from containing the chalk, which constitutes so marked a feature in the geology of England, and forms the upper part of the so-called secondary rocks. The lower part of this group is composed of sands and clay, known as *upper green sand*, *gault*, and *lower green sand*.

e. Wealden series, a name given to a series of clays, sands, and limestones, from being well developed in the weald of Sussex, and which is remarkable for containing the remains of terrestrial, fresh-water, and æstuary animals.

f. Oolitic series, from many beds in it being composed of limestone, formed of rounded grains, resembling the roe of a fish. The series consists of many beds of limestone, clays, sands, and sandstones, to which various names have been given, viz., Portland oolite, Portland sands, Kimmeridge clay, coral rag, or Oxford oolite, Oxford clay, cornbrash, forest marble, great or Bath oolite, fullers' earth, clay and rock, inferior oolite, inferior oolite sands, upper lias, marlstone, and lower lias. This series, which is very fossiliferous, contains many beds extensively employed as building stones, and its course from the south coast of England to Yorkshire, is marked by many well-built towns.

g. New red sandstone series. Chiefly composed of red marls, sands, sandstones, and conglomerates. Towards the lower part a limestone occurs, known as magnesian or dolomitic, from containing a variable amount of carbonate of magnesia. In the south-western part of England and Wales, a conglomerate occurs with the limestone, and both range up higher in the series. Rock salt and brine springs are in some places found in the upper marls, as, for example, in Cheshire, and hence the name *saliferous* has sometimes been given to this group.

h. Coal measures. A most important assemblage of sandstones, conglomerates, and slates, irregularly interstratified with beds and seams of coal. Clay ironstone is also intermingled with this series, more however in some localities, and in parts of it, than in others, and from it the great mass of iron manufactured in Great Britain is chiefly obtained. This group graduates into the next, the intermediate beds being known as the millstone grit, from millstones being often made from its coarser beds in the midland and northern counties of England.

i. Carboniferous or mountain limestone, principally composed of a compact marble limestone, of which that of Derbyshire forms a good example. In the northern part of England, and in Scotland, it contains sandstones and shells, with associated coal beds; the latter worked for profitable purposes. This series has also, in central and northern England, been termed the *lead measures*, from many valuable veins of lead ore being found in it.

k. Old red sandstone, formed of numerous beds of marls, sands, sandstones, and conglomerates, the colour of which is chiefly red. Many fertile parts of the country are composed of these rocks, as, for example, Herefordshire.

l. Devonian series, so named from being well exposed in Devonshire. It appears partly composed of the lower beds of the carboniferous limestone, largely developed, and partly formed of an equivalent of the old red sandstone. It is composed of beds of slate and sand-

stones, with some limestones, affording good marbles, as, for example, at Plymouth, Babbacombe, and Ipplepen. The slate known as Killas, in Cornwall, and which contains so many valuable tin, copper, lead, and iron veins, constitutes part of this series.

m. Silurian series, so named from being well seen in the ancient country of the Silures. It is composed of various beds of marl, limestone, slate, sandstones, and conglomerates. It has been divided into upper and lower Silurian rocks,* the former composed of upper Ludlow rocks, Aymestry limestone, lower Ludlow rocks, Wenlock limestone, Wenlock Shales, and Woolhope limestone; the latter of Caradoc sandstone and Llandilo flags. This is the lowest series in which the remains of animal and vegetable life have been yet discovered. The carboniferous limestone, old red sandstone, Devonian and Silurian series, are now frequently grouped together, with the addition also of the magnesian or dolomitic limestone of the new red sandstone, as the palæozoic series, from containing organic remains, of a kind characterising the most ancient fossiliferous rocks.

Beneath these various rocks, enumerated in the descending order, many are found bearing the names of chlorite slate, mica slate, gneiss and others, all characterised by the absence of organic remains, and presenting a semi-crystalline aspect. At one time all rocks of these mineral characters were supposed to be more ancient than those which are fossiliferous, but more recent researches have shown that many of the latter have been so metamorphosed or altered by the intrusion of igneous rocks, or other causes, as to resemble the former, really formed before the Silurian deposits.

If we take a coast survey of Great Britain, passing westward from Torbay, in Devonshire, to the Land's End, in Cornwall, and thence northward along the western side of Wales to the borders of Scotland, we shall find a large proportion of the rocks that border the sea are either palæozoic rocks or igneous rocks of about the same geological date. If we extend our survey to the northern extremity of Scotland, and thence south to Kincardineshire, the whole of the coast, with some exceptions, is chiefly composed of granite, gneiss, mica slate, Silurian rocks, slate, and other primary rocks, intermixed with trap rocks, and, in some parts, covered with beds of old red sandstone.

Proceeding southward, from Stonehaven to the river Tyne, in Northumberland, a considerable change in the character of the rocks may be observed: coarse conglomerate and sandstone, with trap rocks and strata of the coal formation, border the coast and extend inland.

From the Tyne to the eastern extremity of Kent, and thence along the southern coast to Devonshire, we may observe a most remarkable geological change; for, with two or three exceptions, in the whole of that extent of coast, not a single rock can be found, *in situ*, similar to the rocks on the western coast of England. It is further deserving notice, that only a few traces of the calcareous rocks which cover the eastern and south-eastern side of England, occur any where in Scot-

* From the Silures, a British tribe referred to by Tacitus (Agricola, §§ 11, 17), supposed to have occupied the counties of Hereford, Monmouth, Glamorgan, Brecknock, and Radnor.

land. The rocks on the coast, as we proceed from Tynemouth to Kent, and thence along the British Channel to Devonshire, whence we started, consist chiefly of new red sandstone, magnesian limestone, lias, the various oolites, intermixed with beds of clay, sand, and sandstone, the wealden beds, the green sands and gault, and, lastly, of chalk. Over the chalk, in a few situations, are beds of sand, clay, and limestone, which are classed as tertiary. It will suffice for our present purpose to remark, that chalk, which is well characterised by its colour and structure, forms bold cliffs at Flamborough Head, in Yorkshire, and on the coast of Kent, particularly near Dover; also at Beachy Head, a promontory on the Sussex coast, and in the Isle of Wight. It has been supposed, that from these white chalk cliffs, England originally received the name of Albion. Except, however, in the counties here mentioned, chalk seldom attains any considerable elevation on the coast.

On taking even a cursory view of the rocks and strata that border the sea in the form of cliffs, especially on the southern and eastern shores of England, one cannot help being impressed with the belief that they are more or less rapidly wearing away, through the action of the waves, by which they must, in the course of time, be undermined and thrown down. And we have already seen (*antè* p. 48) that this belief is consistent with, and corroborated by, the evidence of historical facts, which show the deep inroads made by the sea on our rocky barriers. But, on the other hand, where the shores are low, the land generally gains upon the sea; and in some places, large tracts that were formerly submerged, have been converted into firm, dry soil.

An examination of the rocks and strata on the coast of France, proves that they correspond with the English rocks and strata opposite to them in a remarkable manner, so as to leave little doubt that the chalk and other secondary strata on the northern side of France, once formed continuous beds with the similar secondary strata on the south side of England. And hence geologists once too hastily concluded, that Great Britain had been united to the continent of Europe at the present general relative level of the sea and land: but the former continuity of the beds does not prove this; for the chalk strata, for instance, were originally deposited deep under the ocean, as is demonstrated by the abundance of shells and other remains of marine animals, that occur in almost all the beds, which are in some parts a thousand feet thick. These chalk strata, with the strata on which they rest, have, therefore, been raised from the ocean to their present elevation; and the division between England and France may have been formed as the chalk and other rocks emerged from the level of the sea. The cliffs near Boulogne have been carried away to a considerable extent since the country was under the dominion of the Romans. This is proved, by the ruins of a celebrated Pharos or lighthouse, situated on the eastern side of the harbour, at some distance from the cliffs, the ruins of which are nearly obliterated by the gradual wearing away of the coast: even within the last three centuries great changes have been made on that coast, as is proved by ancient maps of the harbour and town. The eastern side of England presents indications of the former extension of

the land towards Belgium. The remains of ancient forests may be observed at low water, on the shores of Yorkshire and Lincolnshire, stretching far into the sea; the roots and broken trunks of the trees are believed to be in the situations in which they grew, though they are at present many feet below high-water mark. Similar remains of trees may be traced inland on the eastern side of Yorkshire and Lincolnshire, covered with alluvial soil to the depth of 17 feet or more. These subterranean and submarine forests indicate a subsidence of the land at an epoch of no very remote date, as the trees are of species indigenous to Great Britain. It is not improbable that the bed of the German Ocean was formed by a subsidence of the land. But whether Great Britain emerged from the sea at one epoch, or by successive elevations, its limits have not always been the same as at present; for, as already seen, it is in parts decreasing, while, in others, it is increasing by the addition of tidal and alluvial deposits, and by the gaining of land from the sea.

The limits of this article will not permit us to dwell longer on the ancient extent of our island. After the general survey we have taken of the coast of Great Britain, we shall find it most convenient to treat of the geology of England and Scotland separately. The geology of Wales is more immediately connected with England, for that principality, in respect to its physical geography, is as much a part of England as Devonshire.

England, including Wales, may be conveniently divided into three geological districts:—1st. The alpine, consisting chiefly of the palæozoic rocks. 2nd. The middle district, containing coal and carboniferous limestone. 3rd. The eastern and south-eastern districts, composed of the oolitic, wealden, and cretaceous groups, above the red marl and sandstone. These strata are in some parts covered by tertiary deposits.

The alpine district, extending from Devonshire to Cumberland, is divided into three distinct groups or ranges, by the intervention of the Bristol Channel, which separates Devonshire from South Wales, and by a deep indentation of the Irish Sea, which separates the mountains of North Wales from those of Westmoreland and Cumberland. These three groups or ranges, we shall denominate, as we have elewhere done (see *ante* p. 8,) 1st, the Devonian range, comprising the counties of Cornwall and Devonshire, except a small part of the south-western side of the latter, and including also a small part of Somersetshire adjoining the Bristol Channel; 2nd, the Cambrian range, which comprises almost the whole of North and South Wales; and 3rd, the northern or Cumbrian range, including the greater part of Cumberland and Westmoreland, the extremity of Lancashire north of Morecambe Bay, and the western parts of Yorkshire, Durham, and Northumberland, adjoining Westmoreland and Cumberland.

Besides these primary districts, isolated patches of the olden palæozoic rocks may be seen at Uske, Monmouthshire, May Hill, Gloucestershire, Woolhope, and the Malvern Hills, Worcestershire, and Charnwood Forest in Leicestershire.

The Devonian range, though presenting a bold and rocky coast, both to the British Channel on the south, and the Bristol Channel on

the north, can scarcely be said to assume a mountainous character, except at Dartmoor Forest and some parts of North Devon.

The granite in this range commences near the Land's End, and extends to Dartmoor; but is covered in several parts by slate rocks, which may be said to divide it into insulated masses: at Dartmoor, where it terminates, the granite is more extensively developed, and rises to the height of about 2,000 feet. The slate, which rests upon granite, provincially called killas, is now known as the Devonian series, and considered as, at least, in part equivalent to the old red sandstone of Herefordshire and other counties in Great Britain. Rocks of serpentine and talcose mica slate occur at the Lizard; some serpentine is also found near Liskeard, in Cornwall. Felspar-porphyry occurs in dykes, in granite, and in slate rocks. With these exceptions, the mass of rocks that covers the northern and the southern sides of Cornwall and Devonshire, on each side of the granite, consists chiefly of different varieties of slate: but in this extensive slate district, roof slate of a good quality is not abundant. The slate rocks are often much contorted, and this is the case also with beds of limestone, that occur in some parts of the district. The granite is commonly white, or rather whitish grey, composed chiefly of white felspar, with a small quantity of quartz and mica. In this granite, large crystals of felspar are often imbedded, giving it a porphyritic structure, as may be seen in many of the flag-stones in the streets of London, which are often of Cornish granite. The granite is sometimes intermixed with schorl or tourmaline. The granite of this district is quarried for building and paving stones. Some of it appears to decompose rapidly. The soft white granite is a valuable substance for the manufacture of porcelain and fine earthenware. Steatite, or soap-stone, was also obtained in Cornwall, and used in the same manufactures but has now become scarce.

The principal mineral treasures of this district are its ores of tin and copper. Tin is a rare metal in Europe; it is never found native like gold, silver, and copper, which not unfrequently occur in a pure metallic form. The most common ore of tin, called tin-stone, is of a dark brown, or reddish brown colour, and is destitute of metallic lustre; the crystals of this ore are sometimes semi-transparent. This ore is extremely hard, striking fire with steel. It is nearly as heavy as metallic tin; it is composed of about 77 parts of metallic tin, and 21 of oxygen. In all probability, metallic tin was first discovered accidentally; for this ore is reduced to the metallic state when heated with charcoal. The tin ore of Cornwall and Devonshire occurs in veins in granite in the Devonian rocks, and in the coal measures which in Devonshire come into contact with the granite of Dartmoor; it is also found in the form of grains and pebbles in the sands of rivers and valleys. These fragments and pebbles of tin ore have evidently been derived from veins in rocks that have been decomposed and washed away; as the tin ore is harder and heavier than the granite, it remained in the form of water-worn pebbles; but portions of the rock are also found with them, which, in many instances, enable the miners to ascertain from what part of the country they have been transported. A considerable quantity of tin is obtained from these layers of tin pebbles, which are

often covered to a great depth by beds of clay, sand, and gravel. The ore so obtained is called stream tin. The veins of tin ore vary in width from a few inches to several feet; they generally intersect granite and slate rocks in an easterly and westerly direction, and decline more or less from the perpendicular direction as they descend. The same vein which contains tin ore, often contains ores of copper at a certain depth; the tin ore commonly occupying the upper part of the vein. When Pryce wrote his Mineralogy of Cornwall, about the middle of the last century, "it was believed, that the richest state of a mine for copper, in that county, was from 80 to 100 yards deep; and for tin, from 40 to 120 yards." Mines have now been sunk to the depth of 600 yards from the surface; and tin ore has been found at the depth of 420 yards. No vein, we believe, has yet been worked out in depth; and since the introduction of powerful steam engines, for clearing the water from mines, it is difficult to assign the limits to which they may be worked. Some of the mines are worked under the sea. For more than 2,000 years, tin has been obtained in large quantities from Cornwall; but during the greater part of that period, the copper ore, which is far more abundant and valuable than that of tin, was neglected and thrown away, its true nature being unknown.—(See *Section on Mines.*) The copper ore is chiefly the double sulphuret of copper and iron, or copper pyrites, intermixed with iron pyrites, and other mineral matter. All copper ore is smelted at, or near, Swansea in Wales.

It is said, that before the nature of the copper ore was known, the miners considered its appearance as so unfavourable, that they abandoned the mines, saying the "*poder* (as they called the copper ore) came in and spoiled the tin." "About the year 1735, Mr. Coster, a Bristol mineralogist, observed this *poder* among the heaps of rubbish, and, seeing the miners unacquainted with its value, he formed the design of converting it to his own advantage: the scheme succeeded, and he continued for a long time to profit by Cornish ignorance."—(*Guide to Mount's Bay.*) Tin ore is disseminated through granite itself in some instances, but this is in the vicinity of veins. The most common vein stone which accompanies the ores of this district, is quartz. Native gold has been found among the stream tin, and small quantities of native silver, with red silver ore, have been found in some of the Cornish mines. Lead and zinc also are found in several veins. Antimony is more scarce. In some of the slate rocks in Cornwall and Devonshire, there are veins of lead ore, which are rich in silver, containing from 20 to 80 ounces of silver in the ton of lead, the Beer Alston Mines once produced argentiferous galena, yielding 120 ounces of silver to the ton of lead. The oxide of manganese is found in considerable quantities at Doddiscomleigh and Upton Pyne, not far from Exeter: it occurs in veins of about 4 feet thick; but in one of the mines, in 1815, it was collected in a mass 20 or 30 feet thick. It is also met with in great abundance near Tavistock and Launceston. The above are the principal metallic and mineral treasures contained in this district. The limestones, in the south of Devonshire, are beautifully spotted and variegated, and are extensively used as marbles.

The Cambrian range.—On crossing the Bristol Channel to the opposite coast of Glamorganshire, we meet with an extensive series of coal strata, covering the older rocks of this part of South Wales, and terminating in Pembrokeshire. This coalfield is nearly 100 miles in length from east to west, and from 5 to 20 miles in breadth. Except in Swansea Bay, and Caermarthen Bay, it is almost every where surrounded by mountain limestone and old red sandstone. This is the most extensive coalfield in Great Britain, and will be afterwards more particularly noticed.

The loftiest mountains of the Cambrian range spread through Caernarvonshire and Merionethshire; mountains of lesser height range from thence, through the western and southern counties of Wales, and into Monmouthshire and part of Herefordshire, and Shropshire.

Several of the mountains in Caernarvonshire exceed 3,000 feet in height; Snowdon, the highest mountain in South Britain, is 3,571 feet above Caernarvon Bay. The general outline of this part of the Cambrian range, from Penmanmaur to the Rivals, on the southern extremity of Caernarvon Bay, is highly picturesque, and presents to the tourist the most magnificent alpine scenery of South Britain; but the lakes of this district by no means correspond with the magnificence of the surrounding mountains. The mineral character of the rocks affords little variety, they are chiefly composed of different kinds of slate, clay slate, and trappean rocks, nearly the whole referrible to the Silurian series. Quarries of excellent roof slate are extensively worked in this part of Wales; and some veins of copper ore are found in Caernarvonshire; but hitherto they have been of little practical importance. The Isle of Anglesea, separated from Caernarvonshire by the straits of the Menai, is far from mountainous; the rocks have a low elevation, and rise through the soil in small ridges, or detached peaks. On the western side of the island are rocks of granite, mica slate, and serpentine. The prevailing rock of many parts of the island is slate. The Paris copper mine, formerly so prolific of copper, is situated on the north side of the island; the body, or internal part of the Paris mountain, consisted of an accumulated mass of ore, which is now supposed to be nearly worked out. On the south-east side of the island, there is a small coalfield, which appears partly to cover mountain limestone. A remarkable trap-dyke, which intersects the rocks in Anglesea, has been described by Professor Henslow in the Transactions of the Philosophical Society of Cambridge. The mountains which range from Snowdon into Merionethshire are many of them composed of porphyritic and other trappean rocks. Cader Idris, one of the most remarkable of these mountains, has a deep depression near its summit; and, on the northern side of the mountain, there are groups of regular columns or prisms of porphyritic trap. The height of Cader Idris is 2,914 feet. There are other adjacent mountains of equal elevation, and composed of similar porphyritic trap.

It is a fact well deserving attention, that beds of gravel and sand, with marine shells, have recently been found on some of the mountains of Caernarvonshire, at the height of 1,400 feet above the sea; the shells are said to resemble the broken shells on the beach. A great part of Denbighshire, with Montgomeryshire, Radnorshire, Car-

diganshire, Caermarthenshire, Pembrokeshire, and the north part of Brecknockshire, are composed of slate, sandstones, and occasional conglomerates, of the Silurian series, presenting little variety of mineral character. Indications of the proximity to granite may be seen in some of the valleys. North of St. Bride's Bay, near the western extremity of Pembrokeshire, there is granite, and many trappean rocks are associated with the Silurian and other palæozoic rocks of the same county. Trappean rocks also occur in Radnorshire. The counties we have enumerated, as chiefly composed of Silurian rocks, are bounded on the south and south-east, from Pembrokeshire to Shropshire, by various beds of old red sandstone,* passing beneath in some parts into them; and, in the upper part, graduating into mountain limestone. These beds of old red sandstone cover the southern parts of Brecknockshire, and nearly the whole of Monmouthshire and Herefordshire. The eastern side of North Wales, in the counties of Denbigh and Flint, is bounded by a considerable extent of mountain limestone, in which are many valuable lead mines. In these counties, the lowest beds of this limestone often rest upon a thick bed of coarse conglomerate, which intervenes between the limestone and Silurian rocks.

Cumbrian or Northern Range.—The mountains in this range may be regarded as a continuation of the mountain ranges of North Wales, which they closely resemble in their mineral characters. The highest mountains of this district surround the lakes of Cumberland.—(See *ante*, p. 9.) The mountains surrounding the lakes are chiefly composed of slates, sandstones, and other rocks referrible to the Silurian series. Granite occurs at Caldbeck Fell, under Skiddaw, and near the lake of Westwater, and also near Shap, in Westmoreland, forming in the latter situation a low insulated mountain, composed of a peculiar kind of small-grained granite, containing large brilliant crystals of red felspar. It may easily be distinguished from any other granitic rock in Great Britain; but it is truly remarkable, that large blocks of the same granite are scattered over distant parts of Westmoreland, Lancashire, and Yorkshire, though the existing mass of granite, near Shap, is every where surrounded by mountains of much higher altitude. Near the lake of Buttermere, the mountain called High Style has a depression on its summit, nearly surrounded by phonolite, a rock closely allied to basalt; it is rudely columnar, and easily fusible. This mountain bears a striking resemblance, in structure, to Cader Idris, in Merionethshire, before mentioned. The depression is filled with water and forms a small lake.

The summit of Scaw Fell is a trap porphyry. Porphyritic dykes are also seen as in Cornwall. In the mountains of Borrowdale, and near Loweswater, a bed of red unctuous ferruginous clay, with ironstone, occurs in contact with beds of grey felspar-porphyry. It is near the contact of these beds, that the irregular vein occurs, which forms the celebrated blacklead mine of Sotaller, in Borrowdale. The mine is situated on the side of a steep mountain, the beds of which are inclined at an angle of about 40 degrees. The black lead, or graphite, is found in irregular nodules of various sizes, intermixed with quartz, green-

* Called old red sandstone, to distinguish it from the red sandstone above the coal strata.

earth, calcareous spar, and ironstone. The vein is in some places narrow, and in others opens out to a considerable width. We were informed in the mine, that the lower side of the vein is the most productive. It is said, that it generally becomes rich in ore where cross veins enter the principal vein. The graphite or blacklead from this mine is of superior quality. The smaller pieces used to sell for 70*l.* per ton, and the larger pieces for 40*s.* per lb., and as much ore as would sell for 1,000*l.* has been obtained in one day; but the produce of the mine is now comparatively inconsiderable. In a similar bed of red unctuous clay, the iron mines near Ulverstone occur, from which the rich hematites are obtained, that yield the ductile iron, used for card wire, in the cotton and woollen manufactures.

The beds in the central mountains of this range present indications of violent disturbing causes, by which they have been broken or displaced. The present depth of the lakes by no means corresponds with the height of the mountains; and they are evidently filling up, and diminishing in extent, by the deposit of the débris from the neighbouring mountains, brought into them by descending torrents. We believe few of the lakes are at present much more than 300 feet in depth, in their deepest parts. It is evident that many of the flat valleys, that form rich meadow, were once lakes, which have been gradually filled up, and are now only intersected by small rivulets. The schistose and porphyritic mountains of this district contain a small quantity of copper ore. Mines are said to have been extensively worked at a former period, but the works have been long discontinued. Antimony, lead, and manganese, occur in small quantities in some of the mountains. The mountains which surround the central group are principally composed of detrital beds, which often seem to pass into a greyish trap rock, but beds of good roof slate occasionally occur. The intermixture of rocks, believed to be of igneous origin, with other rocks of aqueous origin, Mr. Sedgwick refers, with much probability, to submarine volcanic action, and the simultaneous action of igneous and aqueous causes, which have been often repeated. The beds that surround the central group of the lake mountains, are bordered nearly all round by beds of mountain limestone: this limestone, called by some geologists carboniferous limestone, occupies but a narrow strip of country, on the north-west, north, and north-east sides of the lake mountains; but on the eastern and south-eastern sides, it unites with the great expansion of this formation that extends into the north-west of Yorkshire and the district called Craven; and on the east and north-east it branches into the western parts of Durham and Northumberland, in which counties it is particularly rich in lead veins. In Craven, the lofty mountains of Ingleborough, Whernside, and Pennigant, are chiefly composed of beds of mountain limestone; but the two former are capped with beds of sandstone. The limestone of this district rests on older slates, but is sometimes separated from it by beds of conglomerate. On the north-west of the lake mountains, from Whitehaven to the north of Maryport, the mountain limestone is covered by coal strata, which extend under the Irish Sea. On the north-east side of the lake mountains, the vale of Eden, filled with red sandstone and conglomerate, separates Cross Fell and a

lofty range of hills of mountain limestone, in the county of Durham, from the mountains of Cumberland and Westmoreland. The separation of these mountain ranges, and the formation of the valley of Eden, appear, according to Mr. Sedgwick, to have been effected by the violent action of disturbing forces, of which indications may be traced in faults, that range at the foot of Cross Fell, and thence into Craven, in Yorkshire. Cross Fell is the highest limestone mountain in Great Britain, being 2,900 feet above the level of the sea, but the upper part is capped by coal strata. From the summit of Cross Fell, when the weather is extremely favourable, both the Irish Sea and the German Ocean are said to be visible. From its inland situation, snow remains very long upon Cross Fell; some years it has remained over the summer.

Beyond the limits of the great expansion of mountain limestone, in the counties of Northumberland, Durham, and the north-west of Yorkshire, a branch of the same limestone formation extends into Derbyshire and the north part of Staffordshire; but the continuation is apparently interrupted by beds of sandstone, which cover the limestone from Skipton in Craven, to Castleton in the Peak of Derbyshire. The mountain limestone in Durham and Derbyshire is broken by irregular beds of basaltic rocks, which run between the beds of limestone, and sometimes cover them on the surface. Near the banks of the river Tees, beds of basaltic rocks form ranges of columns of considerable extent.

Coal Districts.—Having described the districts of England composed of the more ancient rocks, we proceed to notice the coal formations, which are generally found covering them. If we draw a line from Lyme Regis to Bath, thence to Gloucester, Warwick, Leicester, Nottingham, and Tadcaster, and from Tadcaster to Stockton-on-Tees, all the parts of England on the east side of that line contain no portion of the regular coal formation, though a small quantity of imperfect coal be found in the eastern moorlands of Yorkshire. The line might, in some situations, be drawn several miles beyond the limits assigned; the whole eastern and southern side of England, within these limits, is composed of beds of more recent geological date than the coal measures, and in which good mineral coal is never found in England. The elder rocks on the western side of England are below the coal formations, though in some parts they are covered by coal strata.

The Northumberland and Durham coal is found on the eastern sides of these counties, between the sea coast and the mountain limestone on the west, and extends north and south, from Berwick-on-Tweed to the river Tees, occurring either in the coal measures, properly so called, or in the mountain limestone beneath them. The most valuable beds of coal are supposed to cover an area of 24 miles in length, from north to south, and 8 miles of average breadth; there are nearly forty beds or seams of coal, but only about half of these are of sufficient thickness, or sufficiently good in quality, to be worked. As the strata generally rise towards the north-west, and crop out as they advance in that direction, none of the workable beds extend under the whole district. The two thickest and best beds of coal are the High Main and

the Low Main coal; they are about 6 feet thick, and are separated by strata of sandstone, shale, and smaller seams of coal, of the average thickness of 360 feet.

The Yorkshire and Derbyshire coalfield commences north of Leeds and extends about 70 miles in length, from north to south. Between Aberford and Halifax it is 25 miles in breadth, but it decreases greatly in breadth as it passes through Derbyshire, and terminates at Woollerton, near Nottingham. The thickest bed of the Yorkshire coal is worked near Barnsley. The greater part of the coal of this county is required to supply its numerous population, and its important manufactures of wool and iron. A part of the coal of Derbyshire is carried by canals to the midland counties. Ironstone, of a good quality, is abundant in this coal district. South-west of Derbyshire there are a few small coalfields, in Leicestershire and Warwickshire, near Ashby-de-la-Zouch, Tamworth, Atherstone, and Coventry. The main coal of the Ashby-de-la-Zouch coalfield, at Ashby Wolds, is 13 feet thick. It is worked, in the lowest part, at the depth of 224 yards.

The Coventry coalfield is the most southerly in which coal has been discovered in the midland counties.

On the north-west side of England we find a valuable coalfield, extending from Maryport to Whitehaven, containing seven beds of good coal: in one mine it is worked at the depth of above 300 yards, and in some mines the workings are carried on under the Irish Sea. A considerable quantity of coal is exported from this district to Ireland.

The Lancashire coalfield is separated from that of Yorkshire by a range of lofty hills, extending from near Colne to Blackstone Edge, and thence to Ax Edge, in Derbyshire. The coalfields of Lancashire commence near the western side of this range; the strata dip westward, but are more broken and deranged by faults than the Yorkshire coal strata. The principal beds of coal are one of 6 feet thick, and a lower one called the three-quarter bed.

The Lancashire coalfield runs nearly due north from Macclesfield to Oldham, at the feet of the range of hills abovementioned, but in this part it is scarcely more than 6 miles broad: from Oldham, it extends westward to Prescot, near Liverpool, and northward to Rochdale and Colne. The ample supply of fuel which this coalfield yields for the use of the cotton manufactures of Manchester and its vicinity, may be regarded as contributing, in an eminent degree, to their unrivalled prosperity. In the northern part of Lancashire there is a small coalfield, on the southern side of Ingleborough, but it is of little importance. South of the great Lancashire coalfield there is a small but valuable coalfield, near Newcastle-under-Lyne, in Staffordshire: it is about 10 miles in length from north to south, and from 5 to 7 miles in breadth, and supplies the potteries of this district with potter's clay and fuel. There are numerous beds of coal in the different parts of this coalfield, varying in thickness from 3 to 10 feet. A little to the south-east of the pottery coal district, there is a small coalfield, near Cheadle, but it is of little importance.

The coalfield of Wolverhampton and Dudley, in Staffordshire, is the most valuable in the central parts of England; it contains the

thickest bed of coal in South Britain, the main coal varying from 30 to 45 feet in thickness, beneath which are several beds from 3 to 4 feet in thickness; and several beds occur over the main coal. The value of the 30 feet bed of coal is not, however, so great as might at first appear, though it be of a good quality, and within the reach of the miner. So much labour and expense are required to support the roof, when the coal is worked away, and so much waste coal is unavoidably left in the mine, that it is calculated that a bed of good coal of 10 feet thick, with a firm roof, would yield more profit to the miner, per acre, than the 30 feet bed of main coal. The coal of this district rests upon Wenlock limestone, and shells of the Silurian series. This limestone is singularly raised and bent at Dudley Castle Hill and Wren's-nest Hill.

The Dudley coalfield is about 60 square miles in surface; the 30 feet coal occurs on the southern part of the field; it may be seen cropping out between Wren's-nest Hill and Dudley, preserving a compact form. Minor beds of coal, when they rise to the surface, are generally decomposed, forming what is called coal smut. There are some valuable beds of ironstone, very extensively worked in this district. Besides the immense consumption of coal in the various iron founderies, forges, and other manufactories in Birmingham and the adjacent country, large quantities are sent into the neighbouring counties.

In Shropshire and Herefordshire there are a few small coalfields; the principal one, at Coalbrook Dale, 10 miles east of Shrewsbury, is 6 miles in length, and about 2 miles broad. Coalbrook Dale, including the adjacent tracts of Ketley, &c., is celebrated for its iron furnaces and founderies. The Clee Hills, near Ludlow, contain some small detached coal measures. The summits of these hills are capped with basalt, a dyke or eruptive channel of which cuts through the most southerly of them. The Shrewsbury coalfield is remarkable for containing a bed of freshwater limestone, interstratified with the coal. There is a coalfield on the north-eastern border of Wales, extending from Mostyn, in Flintshire, by the entrance of the valley of Llangollen, in Denbighshire, to Oswestry, in Shropshire: the coal strata are separated from mountain limestone by coarse millstone grit.

The coalfield of the Forest of Dean, on the western side of Gloucestershire, about 10 miles in length, and 6 in breadth, is a very valuable repository of this useful mineral. The several beds of coal, and the strata of sandstone that accompany them, are arranged in a basin-shaped concavity, resting on millstone grit and mountain limestone. It is the most perfect type of what geologists call a *coal basin* of any in Great Britain. This form has been produced by the contortion and subsequent denudation of the palæozoic rocks of the district. It once constituted a portion of the coal measures of the Bristol district on the south, and of the Monmouthshire coalfield on the west.

The most southerly coalfield in England extends from Cromhall, Gloucestershire, to the Mendip hills, embracing the neighbourhood of Bristol; but it is covered in many parts by beds of red marl and sandstone, and lias limestone. One of the deepest coal mines in England is at Radstock, near Bath, being considerably above 400 yards from the

surface. There are several small seams of coal in this coalfield, none exceeding about 3 feet: they would scarcely be deemed worth working, were it not for the scarcity of coal in this part of England.

We have now noticed all the repositories of coal in England and Wales deserving attention, except the great coalfield of South Wales and Monmouthshire, which may be considered the most important in Great Britain. The coal strata extend about 100 miles, from St. Bride's Bay, in Pembrokeshire, to Pontypool, in Monmouthshire; but they are broken into by Caermarthen Bay; and the Pembrokeshire coalfield is separated from the South Wales Basin, properly so called, by old red sandstone. In Pembrokeshire, their breadth is only a few miles, but they cover a great part of Glamorganshire. The extent of surface may be about 1,200 square miles. The beds are contained within a kind of trough of carboniferous limestone, except in Pembrokeshire, where they overlap that rock, and even the old red sandstone beneath it, resting on the Silurian rocks near Haverfordwest, and towards the north part of St. Bride's Bay. The strata are much contorted, and even reversed in Pembrokeshire. They have also been much disturbed in parts of Caermarthenshire, particularly near Llandibie, and are deepest in the same county. Near Llanelly they are estimated to be not less than 11,000 feet thick, containing numerous beds of workable coal. Though basin-shaped, as a whole, a central and longitudinal ridge or anticlinal line runs through the coal district, from the neighbourhood of Neath eastward, towards its eastern boundary near Risca. Before, however, it reaches that boundary, it flattens out and is lost. The lower beds, chiefly composed of shells, contain large quantities of coal and ironstone. From this circumstance, and the proximity of limestone, extensive iron works have been established along the line of outcrop of these lower strata, those of Maesteg being upon the upthrust of the beds which there brings in the lower shells in the range of the anticlinal line above noticed. Among the numerous iron works established upon these beds, those of Merthyr Tydvil are the best known. In one set of works alone (Dowlais) 18 furnaces are now (1846) in blast, each, at an average, producing from 80 to 100 tons of iron per week. The coal is of different qualities, in different parts of the district; that on the western side being chiefly *stone coal* or *culm*, and on the eastern side, bituminous coking coal. Many of the beds of coal and ironstone occur at a great depth from the surface; but the country being intersected by valleys that run northward and southward, and cut through and lay open the various beds, the miner can work them at a small expense, by driving levels into the sides of the hills.

It has been already stated, that a waving line might be drawn from Lyme Regis to Stockton-on-Tees, east of which no good mineral coal is found; very near the same line, a lofty range of calcareous hills may be traced through England, but with some interruption. On the south side of the Vale of Severn, in Gloucestershire, they are well known as the Cotswold Hills, and the range terminates in the Cleveland Hills, on the east side of the North Riding of Yorkshire. Between this line of hill, and the Silurian, old red sandstone, carboniferous limestone, and coal districts before described, the surface of

England is covered by more modern deposits, chiefly consisting of red marl and sandstone, called by geologists the new red sandstone, to distinguish it from the red sandstone which occurs below the coal formation; whereas this new red sandstone, where it occurs with coal strata, is always found above them.

The new red sandstone is regarded as the lowest of the secondary formations that succeed the coal strata in an ascending series. The coal strata are often much bent or inclined, but the strata of red sandstone are nearly horizontal; hence it appears, that the latter were deposited after the coal strata and older rocks had been subjected to the action of the disturbing causes, by which the beds were inclined or bent. The relative position may be conceived, by imagining a series of books to be inclined from the perpendicular, and another series to be laid flat over the inclined edges of the former.

The new red sandstone and red marl are most frequently of the colour which their name implies; their prevailing mineral character is siliceous, but they comprise a great variety of beds, from a coarse conglomerate, composed of large fragments, to a fine-grained sandstone. A series of strata, of magnesian limestone, of considerable thickness, occurs in the lower part of the new red sandstone, forming a narrow range of low hills, extending from Sunderland to Nottingham.

In the upper part of the red sandstone formation, there are thick beds of red and variegated marl, in which are rocks of gypsum and irregular masses of rock salt. The red marl forms some of the most productive soils in England. The new red sandstone and red marl occupy a considerable part of the midland counties, and extend on the western side of England, into Lancashire, and on the eastern side, into Yorkshire. Rock salt has hitherto only been found in Cheshire and Worcestershire, but numerous saline springs, in different parts of the new red sandstone formation, indicate the presence of this mineral. The upper bed of rock salt, in Cheshire, was discovered, about 150 years since, in searching for coal: it is about 40 yards below the surface, and 26 yards thick, and is separated from a lower bed of salt by a stratum of argillaceous stone, 10 yards thick. The lower bed has been sunk into 40 yards. At Northwich, the rock salt extends in a direction from north-east to south-west, 1½ mile; its farther extent in that direction is not ascertained. The breadth is about 1,400 yards. In another part of Cheshire, there are 3 beds of rock salt, the lowest of which has been sunk into 25 yards, without being cut through.

The rock salt of Cheshire is sometimes coloured red, by the admixture of a small portion of oxide of iron; the colourless, transparent specimens are nearly pure salt, with scarcely any water of crystallization. There are also numerous salt springs in Cheshire, containing 25 per cent. of salt.

At Droitwich, in Worcestershire, the existence of rock salt has been proved by boring; but the salt is procured by evaporating the water, which is nearly saturated with it.

Lias limestone and clay may be traced at the feet of the Cotswold Hills, and along the whole range, from Lyme, in Dorsetshire, to Whitby, in Yorkshire. It consists chiefly of dark argillaceous limestone, which contains iron, and forms, when bound, a good water-set-

ting lime. The well-known Aberthaw lime is from the Glamorganshire lias. The most conspicuous section of the lias beds may be seen at Lyme, forming cliffs on the coast, remarkable for the abundance of fossil organic remains, particularly of large saurian animals partaking of the structure of the fish and the crocodile, having paddles in the place of fins or feet; hence called the ichthyosaurus. Some of these animals were of enormous length. Other saurians, named plesiosauri, are remarkable for the extraordinary length of the neck, composed of numerous vertebræ.

In the lias cliffs, near Whitby, the remains of saurian animals are less frequently found; but the lias clay there assumes a slaty form, and is much impregnated with bitumen and sulphuret of iron, forming alum slate, or shale. This slate, or shale, is piled in heaps, with small layers of brushwood: when ignited, a slow combustion is continued for several weeks, by the bitumen and sulphur in the shale, during which process the sulphur forms sulphuric acid, and combines with the alumine in the shale. The saline residue is dissolved in water, and a small portion of potash is added to the solution, to enable the alum to crystallise on evaporation. The alum works at Whitby supply the greater part of the alum of commerce in England.

If we refer to the waving line before mentioned, from Lyme Regis to Stockton-on-Tees, we find the escarpments of the beds of oolite ranging near that line, which forms their termination in that direction, no beds of a similar rock being found on the north of that line, in any part of England.* South and south-east of that line, the whole country is composed of the upper calcareous formations of oolite and chalk, intermixed with beds of sand, sandstone, and clay. This part of England is destitute of any valuable metallic or mineral repositories. Some of the oolite beds furnish useful building-stone; fuller's earth and pipe-clay may also be enumerated among its mineral products. In the eastern moorlands of Yorkshire, a few beds of imperfect coal are worked in the oolitic series, for the purpose of burning lime.

Beds of oolite limestone, with associated beds of clay, cover the southern part of Gloucestershire, and a great part of Oxfordshire, Northamptonshire, Rutlandshire, and the eastern side of Lincolnshire; whence they range along the west side of the Yorkshire Wolds, and terminate in the Cleveland Hills. A bed of clay, called clunch clay and Oxford clay, separates the lower oolites from the middle oolites; it is in some parts 500 feet thick. This clay covers a considerable part of the lowland in Huntingdonshire, Bedfordshire, and Oxfordshire, and may be traced southward into Wiltshire. Between the middle and the upper oolite there is a bed of bituminous clay, which is called Kimmeridge clay, being so bituminous as to have been used for fuel near Kimmeridge, in the Isle of Purbeck. Bitumen is obtained from it in Portland. The upper oolite rests on the Kimmeridge clay, in the Isle of Portland, where it is extensively quarried for building-stone. St. Paul's Cathedral, in London, and most of the churches and public

* The lias on which the oolite beds rest is considered by some geologists as the lowest part of the oolite group; an isolated extent of lias beds has recently been discovered in Shropshire, north-west of this line.

buildings, in London, of nearly the same date, are built of Portland stone: it is easily worked, and is, if properly selected, of fair durability. The total thickness of the different beds of the oolite formation, comprising the beds of clay, has been estimated at from 1,500 to 2,000 feet, to which if we add 500 feet for the lias, we shall have between 2,000 and 3,000 feet of strata, that have evidently been deposited in an ancient sea, as the numerous shells, distributed in every part of this series of strata, are those of marine animals. The shells include various genera and species of bivalves and univalves; there are numerous fossil remains of coralline animals in one of the beds, hence denominated the coral rag. Bones and teeth of enormous animals, allied to the crocodile, are found both in lias and the oolites; and the remains of one species of these animals which had wings, have been discovered near Lyme, and also at Stonesfield, in Oxfordshire.

The animal remains in the oolite and lias, prove that the beds were deposited in an ancient sea; but fragments of wood, and bones of freshwater animals are occasionally found in the same beds, which indicate that there was dry land in the vicinity, and rivers, by which the fragments and bones had been transported into the sea.

At Stonesfield, in Oxfordshire, the bones and teeth of a small species of didelphis (opossum) have been found in calcareous sandstone of the oolite formation, which is the only instance at present known, of the remains of any of the terrestrial mammalia being found so low down in the general series of deposits.

In the eastern moorlands of Yorkshire, there is an imperfect coal formation among the oolite beds, containing remains of terrestrial plants; and in one situation, the fossil stems of a gigantic equisetum are found in an erect position, indicating that they are in the place in which they originally grew. This imperfect coal formation was probably deposited in a freshwater lake, that was occasionally dry.

Over the oolites, occur beds of green and ferruginous sand, covered by thick beds of chalk: all these beds contain exclusively remains of marine animals, but in the wealds of Sussex and Kent, the chalk and green sand do not rest upon the oolites, but on beds of clay and sandstone, about 1,200 feet thick, which contain the remains of terrestrial plants and freshwater animals. The chalk beds have been removed from the valley of the weald by denudation. The whole of the weald is composed of the freshwater beds, which pass under the surrounding chalk hills of the North and South Downs. The freshwater beds have received the name of the wealden beds; they extend from Hastings into Dorsetshire, but are not found north of the Thames. The wealden is a local formation, and appears to have been deposited in the bed, or delta, of a river of vast breadth, for the supply of which a large extent of country would be required. This country must afterwards have been submerged to a great depth under the ocean, and covered with the chalk strata and green sand about 1,500 feet in thickness: at a subsequent period, the chalk and subjacent strata were elevated, to form the present land of the south-eastern counties. However difficult it may be to explain the causes of the repeated oscillations of the earth's surface, by which the land was alternately submerged

under the ocean, and upheaved above its waves, the proofs of such alternations are too manifest to be denied, at least by those who have carefully examined the geology of this district.*

The green and ferruginous sand under the chalk, and a bed of dark clay called gault, which separates them, contain analogous marine fossils, and are regarded as members of the chalk formation; they do not cover a great extent of surface in England, but are to be traced along the feet of the range of chalk hills, cropping out beneath the chalk. The northern termination of the chalk range runs from near Dorsetshire in a north-east direction, through Wiltshire, Berkshire, Buckinghamshire, Hertfordshire, and Cambridgeshire. Chalk is continued into Suffolk and Norfolk, and thence along the wolds of Lincolnshire and Yorkshire, where it terminates near Flamborough Head. The whole of the eastern side of England, south of this range, has a substratum of chalk, except in the wealds of Sussex and Kent, where the chalk appears to have been removed, as before stated. In some parts, the chalk is covered by tertiary beds of clay and sand, which will be afterwards noticed. The average thickness of the chalk beds, where fully developed, may be stated at about 800 feet; the lower beds contain few flints, the upper beds contain numerous nodules and irregular layers of flint. Many of the animal remains are extremely delicate, but are in high preservation, which proves that chalk was deposited in a tranquil sea. Vegetable remains are extremely rare in chalk, and fragments or pebbles of any other rock rarely occur, except in the lowest beds, which are sometimes intermixed with the green sand on which the chalk rests.

Before terminating the account of these strata, it may be proper to observe, that the marine organic remains are not identical with species existing in the present seas, but many of them are allied to genera that inhabit the seas of tropical climates. The new red sandstone and lias rarely attain any considerable elevation. The oolite range, in some parts of the Cotswold Hills, and the Hambleton Hills, in Yorkshire, rises to a height of about 1,100 and 1,000 feet. Crowborough Beacon, the highest part of the wealden beds, is 804 feet. Leith Hill, Surrey, composed of green sand, is 993 feet; and Ink Pen Beacon, Hampshire, the highest part of the chalk range, is 1,011 feet.

The strata we have been describing, generally dip gently towards the south-east, and rise towards the north-west, so that a traveller leaving the northern escarpment of chalk in Berkshire, and proceeding to the Malvern Hills, in Worcestershire, would pass in succession over the edges of all these strata, from the chalk to the red sand-stone, in the vale of Severn. The true character of the different strata is in many parts concealed by vegetable soil and cultivated fields, but may be discovered where the surface is broken, or where recent intersections have been made in forming roads or cutting canals.

* A valuable work on the geology of the south-east of England has been published by Gideon Mantell, Esq., F.R.S., of Lewes, to whom we are indebted for the discovery of the fossil remains of two of the largest and most extraordinary animals, of the saurian genus, hitherto known. The one called the iguanodon, an herbivorous reptile, 70 feet in length; the other, called the hylæosaurus. The remains were found in the gritstone of the wealden beds in Tilgate Forest.

Tertiary Strata.—The name tertiary has been given to all the beds that have been deposited subsequently to the chalk strata; in many situations they cover chalk. The organic remains, both animal and vegetable, in the tertiary strata, differ much from those found in the secondary strata, and resemble or approach nearer to existing species, particularly in the upper or most recent beds. The bones of large mammiferous animals are found also in some of the tertiary strata, but have not hitherto been discovered in those beneath them. In England, the tertiary beds occur only in the south-eastern counties, and present but little variety.

The London clay, and plastic clay, cover the vale of Thames, from Newbury in Berkshire, to the mouth of the Thames, and extend through Essex to Harwich. The London clay, and plastic clay, may be regarded as one formation of sand and clay, varying in different parts; the lower, or what is improperly called the plastic clay, consists chiefly of different beds of sand, in which are a few beds of clay. The London clay consists chiefly of one thick bed of dark clay; the upper part is generally of a reddish brown colour, and is more arenaceous than the lower beds. The total thickness of the beds that cover the chalk near London, varies from 200 to 300 feet. It has been frequently sunk through, in the search for good water, which can rarely be obtained above the chalk, as the clay beds contain sulphuret of iron and sulphate of magnesia.

Several beds of this clay are used as brick-earth. In the lower sands, near Reading, are numerous oyster-shells, and the general character of the bivalve and univalve shells, in this formation, is marine; but the remains of some freshwater animals also occur in it, and the heads of small crocodiles have been found in the London clay. Fossil wood, pierced by an animal resembling the teredo, is very common, but the most remarkable vegetable remains are those of fruit or ligneous seed-vessels, which are abundant in this formation, in the Isle of Sheppey. The vegetable remains, and those of freshwater animals, indicate that part of the London clay and sand were deposited in a bay or æstuary, into which rivers of fresh water transported the productions of a neighbouring country. Beds of plastic and London clay extend along the southern side of Hampshire, and into the Isle of Wight, and on the coast, from Southampton river to Brighton. The London and plastic clay of the Thames has been called the London Basin, and that of Hampshire has been called the basin of the Isle of Wight. It was at first supposed that the strata were deposited in distant bays or seas; but there are patches of similar strata upon several intervening chalk hills. It is therefore probable that the two basins were once united, but have been separated by the upheaving of the chalk hills, of which evident indications are afforded; for instance, in the Isle of Wight, the beds of chalk that range through the middle of the island, are thrown into a vertical position, of which sections are distinctly displayed, at Alum Bay on the west, and White Cliff Bay on the east. The London and plastic clays, which in other situations are nearly horizontal, have here been upheaved with the chalk, and present numerous beds of sand and clay, standing nearly erect, which could never have been their original position. The total

thickness of the upheaved beds is about 3,000 feet. This disruption and elevation of the strata may be traced westward into Dorsetshire, and was evidently posterior to the deposition of the London and plastic clay, for these beds are upheaved with the chalk. In the Isle of Wight, there is a calcareous tertiary formation, not hitherto discovered in any other part of England, consisting of beds of sand and limestone, with freshwater shells: in some parts it is sufficiently hard to make good building-stone. The upper freshwater limestone is principally a calcareous marl, containing numerous well-preserved shells of planorbis and lymneus. The freshwater beds, above the London clay, are on the northern side of the island; they appear to have been deposited in an extensive freshwater lake, when the surface of the land was very different from what it is at present.

In some of the southern counties, occasional beds of siliceous sand occur, over the London clay and chalk, which are supposed to be analogous to the upper marine sand of the Paris Basin. This is sometimes called the Bagshot sand, from its occurrence in a considerable mass at Bagshot, in Surrey.

There only remains one other tertiary formation to be described, which occupies the eastern side of Norfolk and Suffolk, and is provincially called Crag. It consists of ferruginous sand and clay, intermixed with masses of chalk and London clay. The beds are irregular and contain numerous marine shells, with fossil sponges and alcyonites; the organic remains, for the most part, resemble species existing in the present seas. The sand of the Crag is sometimes indurated into sandstone.

In the cliffs of Sussex, near Brighton, there is a stratum composed of sand, intermixed with nodules of flint and masses of chalk, which bears close resemblance to the Norfolk Crag: in this stratum the bones and teeth of the horse and ox, and the tusks and teeth of the elephant, have been found; it has hence been denominated, by Mr. Mantell, the Elephant Bed.

The alluvial and diluvial depositions scattered over various parts of England, consist of beds of clay, sand, and gravel, and loose blocks and fragments of rock, often of considerable size: they are too numerous to admit of a detailed description in the present outline. Alluvial depositions are now forming in the banks and at the mouths of the rivers, and in valleys, but the beds of gravel and scattered blocks of stone have been carried from distant districts, by causes which we no longer see in operation. Fragments of the rocks of Cumberland and Wales are scattered over many of the midland counties, and beds of flint gravel occur at a considerable distance from the chalk districts, not only in the valleys but on the summits of hills, proving the transporting power of water, and indicating also, that in some instances, a considerable change has taken place in the elevation of different parts of the country, since these blocks of sand and beds of gravel were deposited in their present situations. In many beds of clay and gravel, as well as in the floors of caverns, the bones and teeth of the elephant and other large animals are found, of which the species are at present extinct in Europe. The hyena and the great cavern bear have chiefly left their remains in caverns; the bones and teeth of

elephants are generally found in valleys. There can be little doubt that all these animals were once natives of this country.

The mineral and thermal waters of England and Wales present nothing peculiarly deserving of notice. The thermal waters of Bath were known to the Romans, and we have no evidence that they have decreased in temperature for 2,000 years. The hot wells at Bristol, like those of Toplitz, in Bohemia, and Moutiers, in the Tarentaise, were affected by the earthquake of Lisbon, in 1755; they were coloured red, and rendered unfit for use for several months afterwards. The temperature of the Bath waters is 117° and 112° Fahrenheit; those of Bristol are 74°, Buxton 82°, and Matlock 65°. Warm springs rise in many parts of the Peak of Derbyshire, but the temperature is reduced by admixture with cold springs near the surface. No thermal springs are known in England, except in Derbyshire and Somersetshire.

Sect. 8. *Climate.*

The *climate* of a country means all the modifications of the air, by which the organs of man and of the lower animals are affected. These modifications are referrible chiefly to grades and vicissitudes of temperature; to clearness and serenity; to degrees of humidity; to variations of pressure, and of electrical states; to the admixture of various foreign gases; to the more subtile emanations dissolved in the atmospheric moisture; and to tranquillity and motion as respects horizontal and vertical currents. These diversified conditions depend upon the distance from the equator; upon the soil; upon adjoining seas, lakes, and rivers; and upon the physical circumstances of adjoining regions; and they exert a powerful influence over the developement and health of vegetable and animal structures—over the sensations, the intellectual powers, and the moral constitution of man.

England enjoys a climate resulting from several associated circumstances: 1st, from its distance from the equator; 2nd, from its geographical position and relations; 3rd, from the prevailing winds or currents of air passing over it; 4th, from its geology, soil, cultivation, and vegetation; and, 5th, from elevation above, and proximity to, the sea, Each of these exerts a powerful influence over the climate of the country; but there are numerous phenomena connected with them, which are as yet either altogether unknown as respects some situations, or imperfectly ascertained as regards others. England is placed nearly in the centre of the temperate zone, and consequently where the range of temperature is considerable, though very much less than in the same latitude in either of the great continents. It is influenced by the warmth of the Atlantic Ocean on the south and west; by the cold proceeding from immense fields of ice, on the north; by the vapour exhaled from the Atlantic, on the one side, and by the comparatively dry air of the continent of Europe, on the other. These affect the temperature, humidity, and currents of its atmosphere. The *temperature* varies with the declination of the sun, and the direction of the winds, the latter depending much upon the former. As the sun passes to the northward of the equator, and warms the surface of countries near the northern tropic and the Atlantic, the prevailing current of air

is from the north; the air cooled in the icy regions moving southwards, and replacing that elevated into the higher regions from the surfaces heated by the shifted position of the sun. Hence northerly winds prevail in spring and summer, and depress the temperature very considerably in these seasons; these winds exceeding the southerly, upon an average of 10 years, in the proportion of 192 to 173, according to Mr. Daniell. Owing to the great cold of the European continent, during spring, and the comparative warmth of the Atlantic, heightened both by the northern declination of the sun, and by the flow of the intertropical Atlantic waters into the northern and polar seas, an atmospheric current is established from east to west, the air cooled by the continent replacing that which rises warm from the surface of the Atlantic. Thus cold easterly winds prevail in March, April, and May; and a combination of the two foregoing circumstances generally occasions the winds to blow most frequently from points intermediate between north and east, during the months of spring and summer.

The temperature of the inland countries of Europe being raised in summer and autumn, the air, loaded with exhalations from the ocean, rushes to replace the strata which are constantly rising from the heated surfaces of these countries; and westerly winds consequently prevail during these seasons. Towards the end of autumn, the continent of Europe, especially its northern parts, having quickly cooled much below the temperature of the adjoining ocean, northerly and easterly winds again appear, and predominate in the months of November and December.

Thus the altered position of the sun, the frigorific effect of the northern regions, the high and equable temperature of the Atlantic ocean, and the temperature of the European continent varying with the seasons, combine to give certain directions to the atmospheric currents passing over the British Islands. These currents, however, are not always manifested by the state of the winds; for, as more even than two currents may be established in the air at the same time, and as there are numerous causes of divarication, some local, and others contingent or occasional, so it follows that the lowest of these currents, constituting the winds, may often vary remarkably from, or even be quite opposed to, the more important current established in the next super-imposed stratum of the great atmospheric ocean. Hence the wind in valleys, or near the bases of mountains, is often in a different, or even opposite, quarter from that at elevated positions, or on their summits.

The same circumstances which combine to influence the course of the winds also occasion the vicissitudes of atmospheric heat and humidity. The winds from the north convey to it, at all seasons, the frigorific influence of the polar regions, somewhat tempered, however, by the warmer ocean placed between them and our shores. As these winds veer towards the west, and as a more extensive surface of the warmer Atlantic and northern oceans is swept by them, their temperature is proportionally elevated, and their humidity increased; but, as they change towards the east, especially in winter and spring, their temperature is equally lowered, and their

humidity diminished, owing to the immense extent of frozen and dry country over which they pass, and the very limited extent of ocean between the east coast of England and the west coast of continental Europe; and they consequently reach the former but little tempered from the state in which they left the north-eastern regions of the latter; the winds blowing from this quarter being the coldest that pass over the British Isles.

The warmth and softness of the south, south-west, and west winds are caused by the temperature of the extensive ocean from which they proceed; and which, even in the latitude of Great Britain, retains a mean heat much above that of the incumbent atmosphere, and still more above that of the land. During winter and spring the difference between the temperature of the ocean and of the earth's surface, in this latitude, is very great, and is heightened, at these seasons, as well as in others, by the flow of the inter-tropical waters from the south-west to the north-east; the edge of this great current sweeping along the shores of Ireland, and slightly influencing the Irish Channel, so as to constitute what is known to navigators by the name of the inset of this channel; and thereby tempering the climate of that island, as well as that of the southern and western sides of Great Britain.

It is evident that the physical circumstances already alluded to, explain not only the prevalence of certain winds, and the variations of temperature observed to follow every change in the atmospheric current, but also, in a great measure, the comparative dryness and humidity of the air, and the deposition of the exhaled moisture in the states of snow, rain, fog, and dew. The quantity of moisture which the air will retain, without affecting its transparency, varies very remarkably with its temperature. Sir John Leslie ascertained, that air, at the freezing point, is capable of holding a portion of moisture equal to 160th part of its own weight; at the temperature of 59°, the 80th part; at that of 86°, the 40th part; at 113°, the 20th part; and at that of 140°, the 10th part; so that the air has its dryness doubled at each rise of temperature answering to 27° of Fahrenheit. While the temperature, therefore, advances uniformly in arithmetical progression, the dissolving power which this communicates to the air mounts with the accelerating rapidity of a geometrical series. It follows, that when the air, at any given temperature, is saturated with moisture, a depression of temperature will make it yield a portion of such moisture proportioned to the depression; the moisture thus parted with assuming various forms, according to the elevation at which the separation takes place, and the rapidity with which the change of temperature occurs.

Hence it follows, that the amount of evaporation, or, more correctly, the quantity of moisture which the air will retain without affecting its transparency, depends chiefly upon its temperature. Mr. Howard and Mr. Daniell have endeavoured to ascertain this in respect of the vicinity of London, and the results of their inquiries very closely accord. The average annual amount of evaporation, according to Mr. Daniell, is 23·974 inches, and the rate at which it proceeds during the several months of the year is estimated by him as follows:—

	Inches.		Inches.
January	0·413	July	3·293
February	0·733	August	3·327
March	1·488	September	2·620
April	2·290	October	1·488
May	3·286	November	0·770
June	3·760	December	0·516

Thus the average monthly amount of evaporation increases and diminishes with the temperature. The average annual amount of rain that falls in the neighbourhood of London is, according to Mr. Daniell, very nearly the same as the annual amount of evaporation, or $23\frac{1}{16}$ inches; the several months contributing the following proportions:—

	Inches.		Inches.
January	1·483	July	2·516
February	0·746	August	1·453
March	1·440	September	2·193
April	1·786	October	2·073
May	1·853	November	2·400
June	1·830	December	2·426

When we observe the immense oceanic surface to the west and south-west of the British Islands, the humidity of the winds blowing from these quarters will be anticipated; and when we turn to the extensive continent to the east, and reflect on its comparative dryness in spring and summer, and more especially in winter, when the earth's surface, with its rivers and lakes, is congealed into an icy crust, and the moisture of the air is precipitated in hail, snow, and hoar-frost, the dryness of the east winds will be as confidently expected. The moist and warm winds from the former, deposit their moisture in the form of rain, when changes of temperature and electrical conditions diminish the solvent property of the atmosphere, particularly when the temperature of the land sinks below that of the adjoining ocean, and the air is thereby cooled as it passes to the east. Hence the principal part of the rain of England is from the west, about two-thirds of the whole quantity falling on the west side of the kingdom. During spring, when north-east winds prevail, in consequence of the change in the sun's declination, and the much greater warmth of the Atlantic Ocean, the dryness of the air, owing to the circumstances stated above, is often remarkable; and when these winds begin to blow, they generally precipitate, by their great coldness, the moisture as it rises from the warmer surface of the earth, or surrounding waters and lakes, in the form of fogs or mists; producing the catarrhal, bronchial, pulmonary, rheumatic, and aguish affections prevalent at this season, more especially when they pass over low, humid, and marshy grounds, such as are found in various parts of Essex, Cambridgeshire, &c.

During summer and autumn, westerly winds are most prevalent. The air from the Atlantic Ocean rushes to replace the strata constantly rising from the heated surface of the inland countries of Europe, and deposits the moisture with which it is loaded, in the form of rain, as it passes over the nearest land; the mountains, hills, and places in their vicinity, which first attract the clouds formed by the exhaled moisture, experiencing the greatest fall. Still the air does not thus lose all its

moisture, but only that part which the change produced by the terrestrial radiation in its temperature and electricities, renders it incapable of holding in solution; and the atmospheric current, in its course eastward, often parts with other portions, until it has its solvent properties again increased, by the greater heat of the European continent in these seasons; and the rains are replaced by nightly falls of dew, as the nocturnal cooling of the earth's surface lowers the temperature, and also the solvent powers, of the adjoining stratum of air. When, however, the southern declination of the sun at the end of autumn reduces more permanently the temperature of the earth's surface, the air, being consequently cooled, precipitates a large portion of its moisture; and, at the same time, its lower stratum rushes westward, to replace the stratum elevated into its higher regions from the now warmer surface of the Atlantic; whilst this latter stratum, in the higher regions, rushes eastwards, and, as it cools, replaces that which is attracted westward by the cause now assigned; a circulation of the atmosphere from east to west in the lower, and from west to east in the upper stratum, being thus established. It is chiefly owing to this circumstance that falls of rain often take place from the east during the latter part of autumn and commencement of winter; the moisture which, in spring and summer, had passed over this country, either dissolved in the air, or suspended in the form of clouds, and been conveyed to the dry and comparatively warm atmosphere of continental Europe, returning again over Great Britain, and giving rise to prolonged rains or fogs, as the currents and solvent powers of the air change with the varying position of the sun, and with the different degrees of temperature of the earth's surface and of the ocean, at the same latitude. A large portion, also, of the rain which falls when the winds blow from easterly quarters, is owing to the circulation of the warm and moist air from the surface of the ocean into the higher regions, and thence eastwards, where it passes into the lower regions as it cools, and replaces that which flows westwards and afterwards rises from the warmer surface of the ocean; the moisture thus exhaled from the Atlantic not being altogether deposited in the form of rain or snow until it has nearly gone the circuit now pointed out.

It is seldom that a considerable fall of rain takes place with the winds at north-east or east, particularly during winter and spring, unless they veer towards the north or south, or unless the clouds formed by the moisture exhaled from the ocean move in the higher regions of the air in a westerly direction, and, as they become further cooled by the land, either change their course, in the manner now stated, or impart their moisture to the lowest stratum of air circulating in an opposite or different direction. Thus, we generally perceive that rain from the east, or, rather, with the wind at east, is preceded by large clouds or haziness of the air, rising from some quarter connected with the west; and that, although the wind may still continue to blow from the east, these clouds extend, rise out of the western horizon, and move rapidly to the east, until the atmosphere becomes thick in all directions; the clouds supplying the falls of rain from the east actually coming from the west, and depositing their moisture in the course of that circulation explained in the preceding paragraph. Those who

have been led by their occupations to note the changes of the atmosphere never expect the cessation of rain from the east until the western hemisphere becomes clear, or the clouds cease to rise from that quarter; nor trust to any continuance of dry weather, if heavy clouds rise and move in a different direction from that in which the wind is blowing at the time.

The other physical circumstances enumerated above, as influencing the climate of England, are such as exert, upon the whole, a favourable effect. The *elevation* of particular districts is nowhere so great as very remarkably to affect the temperature, or dryness of the air. The range of hills extending southwards from Cumberland and Westmoreland tends, however, to increase the quantity of rain which falls in their vicinity, or in places situated near their bases; and a similar effect is produced by the Welsh mountains. But the geographical and other physical circumstances of the west side of the island would make a greater fall of rain take place on it than on the east side, though no such ranges of hills existed. The extent, however, to which they may operate in producing this result, will appear more fully in the sequel; but more influence seems to have been imputed to them than they really exert.

Proximity to the sea has a marked effect upon our climate, but chiefly in the way already shown. This is felt throughout the kingdom, but principally near the coast, and more especially on the south-west coast; the daily, monthly, and yearly ranges of the thermometer being, through the vast extent of the circumjacent ocean, very much limited; while the humidity of the air is at the same time increased. The tempering effects of the sea on the east side of Great Britain are very much less than on the west. The sea off the former is cooled in winter and spring by the waters of the Germanic rivers, which are poured into it at a temperature little short of the freezing point; whilst that off the latter is, as previously stated, influenced by the constant flow of the Atlantic towards the polar seas. The temperature of the waters of the Irish channel, even in January, seldom falls below 50° Faht.; and that of the Atlantic, in the same latitude, is very considerably above this; whilst the German Ocean, in the same season, is several degrees below 50°: it seldom, indeed, rises above 45°, excepting in July, August, and September.

The *geology* of England has, on the whole, but little influence over the climate, except in as far as it contributes to form the soil and to determine its cultivation; and it is nowhere such as can injuriously affect the atmosphere. The soil and subsoil are, with few exceptions, sufficiently porous, and the surface of the former sufficiently undulating, to facilitate the percolation of superabundant moisture, and to favour its flow into the adjoining rivers: and it is only in certain limited tracts, on the east side of the kingdom, where the soil is deep, absorbent, or marshy, as in parts of Cambridge, Lincoln, Suffolk, Huntingdon, Norfolk, and Essex, and in a few places in Kent and Sussex, that the moisture is retained until it is evaporated, carrying with it a portion of decayed vegetable or animal matters, or the gases formed by their decomposition.

Cultivation has either wholly removed or very materially diminished

most causes of insalubrity, and increased the favourable influence of the circumstances already specified upon our climate. The temperature of some countries is much reduced, the humidity of the air increased, and the sources of disease multiplied, by extensive forests and the neglect of tillage; but such is not the case in England. Our woods are neither large nor thick enough to have any pernicious influence; and our improved system of agriculture has helped to counteract the physical causes that render the atmosphere more moist than in continental countries. In some parts, particularly in the fens, large marshy districts that were formerly overspread with stagnant water, have been drained and cultivated, and rendered incomparably more salubrious, as well as more productive, than formerly. In consequence, the agues and intermittent fevers once so prevalent in them, are comparatively unknown, and are confined to a few limited localities. The improvements now referred to, are not, however, peculiar to the fenny or marshy districts, but have been experienced in a greater or less degree all over the kingdom. The speedy drainage of the land water in all the vast districts having a retentive subsoil, by laying out the land in ridges, and more recently by the adoption of furrow-drainage, has had so powerful an influence, that the dryness of the air has been increased; and the period of harvest, in the districts where it has been carried to the greatest extent, very considerably accelerated.

The *general results* of the circumstances reviewed above, upon the climate of England, are — (*a*) the moderation of extremes of temperature; — (*b*), a humid state of the atmosphere, more remarkable, however, near the sea coast than in the more inland parts, and on the south-west and west sides than on the east; — (*c*), an uncertain and changeable state of the seasons; — (*d*), very frequent vicissitudes of atmospheric temperature and humidity, owing chiefly to changes of the winds; — (*e*), a limited range of these vicissitudes, even when they are most frequent; — and (*f*), a more equable and milder climate, although more humid and more changeable, within certain limits, than that of any other country placed at the same distance from the equator. Certain of these results require illustration.

a. The temperature is so moderated in its extreme ranges, that we are truly, as Tacitus said, without the *asperitas frigorûm*. (Agric. § 12.) The thermometer seldom falls much below the freezing point, even in January, the coldest month; very rarely so low as 18° or 20°, and hardly ever to either of these limits, excepting in the inland counties, and on the east side of the kingdom: and it rarely rises above 78° or 80°, or even so high, unless in south-east and inland places, in the warmest days of July and August. In the northern parts of the kingdom, owing to their nearer proximity to the ocean, the extremes of temperature are still more contracted, the thermometer seldom falling to, and very rarely lower than, the limits now specified; and hardly ever rising above 75°. So that, upon the whole (excepting where difference of elevation above the level of the sea makes a slight variation), the mean annual temperature of the northern parts of the country is only between 2° and 3° lower than that of the south-eastern counties; the more moderate heat of summer and autumn, in the former, being compensated in part by a less

extreme or permanent degree of cold in winter than is occasioned in the latter by proximity to the Continent; and the greater distance of the northern counties from the equator being, in some measure, countervailed by the tempering influence of the ocean. The difference, however, between the annual temperature of the northern and the south-western and inland counties is much greater than that between the northern and south-eastern; owing to the greater distance of the south-western counties from the continent of Europe, and their greater proximity to the equator. In the midland counties (and especially in the more southerly of these), the heating effects of extensive tracts of cultivated land, in summer and autumn, are more manifestly experienced, and the cooling influence of the ocean much less, than in the northern; whilst the warmth of the Atlantic, in winter and spring, is more felt than the cooling influence of the Continent, which, at these seasons, affects chiefly the eastern parts of the kingdom. In spring the difference of temperature, between the northern and southern counties of England, is greatest; the former experiencing the frigorific influence of the icy and northern regions much longer; and the latter feeling the genial influence of the gales from the adjoining and more temperate ocean, and from southern and warmer regions, not only earlier, but also to a greater degree, because of their nearer approach to them.

In estimating the mean temperature of England, it will be convenient to consider the subject with reference to the different parts of the kingdom, which several physical circumstances more or less distinguish. 1st. The *south-east part* consists of the country east of the longitude of London, terminating with Norfolk on the north, and with Kent on the south. 2nd. The *south district* consists of Surrey, Wiltshire, Sussex, Hampshire, including the Isle of Wight. 3rd. The *south-west* comprises Dorsetshire, Somersetshire, Devonshire, and Cornwall. 4th. The *west* embraces Wales, and parts to the northward on that side. 5th. The *north* takes in all to the northward of the fifty-third degree of latitude: and, 6th. The *inland district* consists of the remainder. Although *London* should be placed in the south-eastern district, there are several circumstances which combine to give it a somewhat peculiar climate, and a higher mean temperature, than is observed in its immediate vicinity. These are, its position near the level of the sea; the high cultivation of the adjoining country: the influence of innumerable fires and gas-lights; and the partial shelter, furnished by the high grounds to the northward, from the winds in that quarter. The ground, also, is so completely covered by buildings and pavements, and is so drained by sewers, &c., that little cold is generated during the nights by the evaporation of moisture, which can be given out but to a limited and much less extent than from a soil covered by vegetable productions: the only countervailing circumstances are the low, open, and marshy district to the eastward, and near the mouth and banks of the Thames, which admits of unbroken currents of air from the east, and the practice of watering the macadamized and muddy streets. These affect, in some degree, the climate of London, and increase aguish and similar disorders.

1. In *London*, the mean temperature of the *whole year* is 50·39; of *winter*, 39·12; of *spring*, 48·76; of *summer*, 62·32; and of *autumn*, 51·35; that of *January* being 37·36; and of *July* and *August*, 63·50 each.

2. In the *south-eastern counties*, the mean temperature of the whole year may be estimated at 48·81; of *winter*, 37·20; of *spring*, 48·10; of *summer*, 60·80; and of *autumn*, 49·30; that of *January* being 34·16; and of *July*, 62·40.

3. In the *southern district*, the mean temperature of *the year* is 51·10; of *winter*, 40·35; of *spring*, 49·00; of *summer*. 63·10; and of *autumn*, 51·65; that of *January* being 38·35; and of *July*, 65·00.

4. In the *northern counties*, the mean temperature of *the year* is about 47·65; of *winter*, 37·50; of *spring*, 44·50; of *summer*, 59·50; and of *autumn*, 48·65; that of *January* being 36·10; and of *July*, 60·50.

5. In the *south-west* extremity of the kingdom, or peninsula formed by the English and Bristol channels, the mean temperature of *the year* is about 52·50; of *winter*, 44·50; of *spring*, 49·60; of *summer*, 60·50; and of *autumn*, 53·80; that of *January* being 42·50; and of *July*, 63·50.

6. In the *midland counties*, the mean temperature of *the year* is 51·30; of *winter*, 40·60; of *spring*, 50·20; of *summer*, 64·30; and of *autumn*, 51·00: that of *January* being 38·20; and *July*, 66·30.

The influence of the geographical position of England upon its temperature is well shown by comparing the thermometric ranges observed in it and in continental places in the same latitude. At *Moscow*, which is in the same latitude as the north of England, the mean temperature of the year is only 40°, whilst that of the hottest month is 70·50.

b. Humidity of atmosphere is a necessary result of the circumstances already mentioned; but the air is not equally moist in all parts of the kingdom, or at all seasons.

The *seasons*, as already seen, vary in this respect very remarkably; but the months of February, March, January, and April, may be considered the driest; and summer, autumn, and the early part of winter, the most humid. In respect of *situation*, the south-west and western parts of England are much more moist than the east, south, and inland counties; and the quantity of rain which falls in them much greater. On the south-east coast, and in the vicinity of London, the annual quantity of rain varies from 20 to 25 inches; whilst in the western parts it ranges from 30 to 51 inches, according to the locality; the more westerly places, and those situated near the bases of the most westerly hills, experiencing the greatest falls. In many situations, also, on the west side of the island, foggy and drizzling days are very common, the quantity of rain or moisture then deposited being insufficient to affect the rain-gauge. In Cornwall, the annual quantity of rain is about 45 inches, and the average number of rainy days, according to Mr. Davis Giddy's register, about 180, a number not materially above that observed in the vicinity of London; the difference being in the quantity and continuance of the fall, rather than the frequency of the occasions. But, even when there is no fall of rain, the air is more constantly humid

in the western parts, especially near the coast, than in others. This, which is a necessary consequence of the circumstances already explained, is shown by the hygrometer, and the readiness with which articles of iron and steel rust when exposed even in the driest weather, and by the fact that most sorts of fruits are later in ripening than those raised in the midland and eastern counties, and also inferior in flavour.

The inland, south, and south-east counties possess, upon the whole, the driest air. Of the inland district, those parts which are most elevated, and situated to the eastward of the Welch mountains, and of the range of high hills running southwards from Cumberland and Westmoreland, are amongst the driest. Yet many inland places experience much rain, owing chiefly to there being no high hills or mountains interposed between them and the ocean, and to hills in their immediate vicinity, which attract or otherwise affect the clouds, and assist in condensing the atmospheric moisture. In some of these places there is more rain than in parts situated nearer to the western coast; thus there is a greater fall of rain at Manchester than at Liverpool; and, as moisture is generally precipitated to the lower regions of the atmosphere before it is condensed or aggregated into rain-drops, it follows that a larger quantity falls at the bases of high hills or mountains than on their summits.

c. The variableness and uncertainty of the climate of England have been considered as its greatest disadvantages. They necessarily result from the circumstances already explained, and have been unwarrantably assumed to be injurious to the human frame. They have, also, been inconsiderately magnified; effects have been imputed to them, which they are in no wise concerned in causing; and equal, nay even greater, disadvantages, in foreign climates, have been weighed against them, and been unjustly considered as light in comparison. The frequent vicissitudes of atmospheric temperature are owing chiefly to the variableness of the winds, depending less on the influence of the sun's rays during the day, and of radiation through the night, than in most other countries, even in the same latitude. But, although the vicissitudes of temperature are frequent, the range is generally limited. The *mean daily (or 24 hours') range* of the register thermometer, for London, taking *the average of the year*, is, according to Howard and Daniell, only 11°; in the midland counties it may be taken as high as 14°; and in the peninsula of Cornwall at only 8°, which may be considered as the general average range of most places situated on the sea coast, and possessing an ocean temperature. The observations made at Naples, Rome, Montpelier, and Geneva, give 13·3, 11·0, 12·0, and 12·5 respectively, although not made from a register thermometer, which would have shown the daily thermometric range to be greater. From what was previously stated, it might be inferred that the *extreme daily range* of the thermometer would be greatest in the more inland parts of the country, somewhat less in London, less again near the sea coast, and least of all in the south-west districts; and the observations referred to confirm, as far as they go, these inferences. The *mean daily range* varies with the seasons. In the midland counties, it may be taken at 9° in January, 11° in February, 14° in March, 18° in

April, 19° in May, 20° in June, 19° in July, 18° in August, 17° in September, 15° in October, 11° in November, and 10° in December; the variation thus increasing and diminishing with the calorific influence of the sun, and the cooling effects of radiation and evaporation from the soil and vegetation during the nights, being greatest when the sun's rays are warmest, and terrestrial radiation and evaporation most active. The mean daily range, for *the different months*, is much less near the sea coast, and somewhat less in London, where it is very little more than at Naples.

The *annual range* of the register thermometer is about 64° in London, 67° in the south-east districts, 65° in the southern, 58° in the western, and about 50° in the south-west. The *monthly range* of the thermometer is lowest in January and February, when it is 28° in London, 25° in Cheltenham, 31° in the northern counties, 34° in the south-east districts, and 24° at Penzance; and greatest in April and May, when it is 38°, 36°, 39°, 44°, and 25½°, in these places respectively.

Hence vicissitudes of temperature in England, although frequent, are not really very great. We are unable to compare them with those observed on the Continent in the same latitudes, the observations made in the latter which we have examined being imperfect, and rarely made in the night, or by a register thermometer; but, taking into consideration the calorific power of the sun upon a greater extent of continent; the cooling action of the soil and its vegetable productions by evaporation, radiation, &c.; the influence of high mountains, &c., independently of various other circumstances already noticed; the mean daily and monthly ranges, and, still more, the annual range, must be much greater than in this country.

The difference between the mean temperature of the coldest and warmest months is 26° in London, 30° in Paris, 24½° in England generally, 18½° in Cornwall, 31° in the south-west of France, 35½° in the south-east of France, and 32½° in Italy.

The quantity of rain which falls in Paris is only 2 inches less than that which falls in London, whilst that which falls in Rome and Florence is, according to Sir James Clark, nearly 32 inches, or as much as falls at Bristol and Clifton; the principal difference being, that at Rome there are 117 rainy days, and at Bristol about 140.

The influence of the climate of England over the human constitution is similar to that exercised over the rest of the animal creation, and even over the vegetable kingdom. The warmth of summer is not so great, nor its accession so sudden, as to occasion a too rapid developement, or a too high excitement, of organized bodies; nor the cold of winter so extreme as to depress their vitality to an injurious degree. The localities, soil, and cultivation are such, with few exceptions, as prevent the generation of marsh effluvia, whilst the fresh and strong westerly winds occasioned by the position of the country between the continent and ocean, cause a continued renewal of the atmosphere, even in the closest and most crowded streets of our manufacturing towns, and of the metropolis. As respects these towns, also the quantity of rain is of great benefit, inasmuch as it washes away the

various animal exuviæ and impurities into the sewers and subways, and prevents them from tainting the air.

The limits of this chapter will not admit of an investigation of the influence of our climate over the human frame; the results, however, rather than the modes of its operation may be briefly shown. Its humidity, the *multus humor terrarûm cœlique*, which gives our fields and woods so rich and verdant an appearance, and our improved agriculture are the sources of that abundant supply, not merely of vegetable, but also of animal food, for which England is so remarkable, and which is so necessary in these northern regions. Unless, therefore, some powerful countervailing influences be in operation, it may be fairly presumed that persons possessing the advantages of this appropriate nourishment from their childhood or youth will be the most perfectly developed. But, except in a few situations, no countervailing influences of the kind alluded to exist. The same physical circumstances, which act so beneficially upon those individuals of the animal and vegetable kingdoms best suited to the food and accommodation of man, have also a most favourable influence upon man himself. And it is only in some limited districts that marsh exhalations partially countervail the effects of wholesome nourishment, and that in large and crowded towns and factories certain circumstances connected with arts and manufactories, and with the use of machinery, produce similar effects, though in a different way.

Our climate, therefore, as well by its direct influence over the human constitution, as by favouring an abundant production of the plants and animals most serviceable for food, is certainly not excelled by that of any other country. Its variableness both in the commencement and course of the different seasons, is confined, as shown above, within moderate limits, and seldom affects vegetation and animal health to an injurious extent; and, though hurtful in a few states of disease, and the usually assigned cause of more disorder than it actually occasions, it is really most favourable to the developement of the physical powers, and of the intellectual and moral endowments. Unless when extreme, frequent vicissitudes of weather preclude, as respects the community generally, the regular adoption of means to guard against their operation: the system consequently becomes habituated to them, and is fortified against their influence. That this is the case is shown by the vigorous constitution, mental activity, and longevity of the inhabitants, which are great in proportion to their exposure to the open air; and the more the climate is allowed to exercise its full influence, without the restrictions imposed by injudicious refinement, luxury, and vicious systems of physical and mental education, the more robust, muscular, and symmetrically developed does the human frame become. If we compare the physical and moral history of England with that of France, Italy, and other countries, supposed to possess the finest climate, the pre-eminence of the former in most particulars will be evident.

Among those who have formed a correct estimate of our climate is Sir William Temple. "I must needs," says he, "add one thing more in favour of our climate, which I heard the king say, and I thought new and right, and truly like a king of England, that loved and esteemed his own country; it was in reply to some of the company

that were reviling our climate, and extolling those of Italy and Spain, or at least of France. He said he thought that was the best climate where he could be abroad in the air with pleasure, or at least without trouble and inconvenience, the most days of the year, and the most hours of the day; and this he thought he could be in England more than any other country in Europe."—(*Works*, vol. iii. p. 220.)

With respect to the influence of our climate on the health of invalids, a few observations only need be made. Those who wish to possess further information on the subject will find it in the articles referred to below.* It has been too generally the practice to recommend travel, or residence abroad to persons suffering from various slow diseases, in preference to a change to places in this country equally suited to their ailments. Ignorance of the climate of this kingdom, and of that of foreign parts, to which invalids are usually sent, the influence of fashion, and other circumstances, have led to this practice, which many have had cause to deplore. So varied is the climate of England, that it furnishes a suitable residence to persons suffering from any chronic disease; and with extremely few exceptions, as judicious and beneficial a choice may be made in it as in any foreign country. Even in those diseases where it is beneficial to conjoin change of air with the use of mineral waters, the great variety of the latter, in its different localities, enables the physician to make as advantageous a selection for his patient in this country as he can make for him in any other. And when it is recollected that many, who go abroad for a change of air, mineral waters, and a change of living, are subjected to malaria, and other causes of disease, which scarcely exist in this country, and either fall victims to them, or experience their ill effects for many years afterwards, the advantages resulting from the practice will appear very questionable. There are, also, certain well-ascertained facts, connected with the climate of foreign parts, which should be known to those who wish to visit them for the sake of their health, viz., 1st, That the mean duration of human life, in those parts of the continent which are conceived to be the best for renovating the decayed constitutions of British visiters, is actually below its duration in the most unhealthy localities in this country. 2nd, That consumptions, for the cure of which such parts are principally recommended, are as prevalent, among the natives, as in any part of England, and perhaps more so. 3rd, That no place or town of continental Europe is exempted, at some period of the year, from cold winds, sudden variations of temperature, and other atmospheric vicissitudes; and that, whilst the climate of our own country has been unjustly depreciated, that of foreign parts, especially of Italy and the south of France, has been unjustly overrated, particularly as respects the amelioration and removal of pectoral complaints.

Having made those remarks, in order that a too prevalent delusion may be removed, a few observations, on the advantages and disadvantages of the climate of certain parts of this country, in a medical point of view, may not, perhaps, be unacceptable.

The general use of coal fuel in England, and its employment in

* See the articles *Climate, Arts and Employments, the Causation of Disease*, and *Endemic Influences*, in the Dictionary of Practical Medicine, by James Copland, M.D., F.R.S., &c.

numerous steam-engines, forges, &c., in manufacturing towns, owing to the quantity of sulphur it contains, and to the sulphurous acid fumes and fuliginous matter thereby generated, renders the air in these places irritating to the lungs, and increases the risk of a winter residence in them; especially in the case of those who suffer from, or are liable to, diseases of this organ. In such cases, removal to a more salubrious locality, or to one more suited to the existing ailments or morbid tendencies, becomes necessary. In most cases of residence in large towns or cities, an occasional change of air, and temporary residence in open and healthy localities, are more or less required: but the change should be made with reference to the ailments either threatened or existing; for the locality suited to disorders of the lungs is not appropriate to those of the digestive organs—the two great groups of diseases for which change is most serviceable: and a situation which may benefit one affection of the lungs may be injurious to another.

The south coast of England is much milder and more moist than the east, the south-east, and inland parts, particularly from October to March, inclusive; but, from April to October, the temperature of the inland parts is higher. On the south-coast, Brighton, Hastings, Undercliff in the Isle of Wight, and various other intervening and adjoining places, are suitable winter residences for the weak and delicate, and persons liable to pulmonary complaints. *Brighton*, owing to the air being drier in it than in parts more to the westward, is the best suited of these for persons affected with nervous and dyspeptic diseases, for the simply debilitated and relaxed, and for those labouring under humoral asthma, and chronic affections of the air passages; *Hastings* and *Undercliff*, especially the latter, in consequence of their being more sheltered, and of the air being more humid, are good residences, in winter and spring, for persons affected by diseases of the lungs; but, in fully formed tubercular consumption, they are inferior to several places on the south-west coast, the temperature of which is about 6° higher than that of London, and 3° above that of the south coast.

The south-west coast is especially adapted to persons labouring under pulmonary complaints. The parts chiefly recommended are Penzance, Torquay, Dawlish, Sidmouth, Exmouth, and Salcombe. The air, both of the Land's End and of the coast of Devonshire and Cornwall, is remarkably soft, humid, mild, and equal. Of the parts just named, *Torquay* and *Penzance* are apparently the best in consumptive cases. The equality of their temperature, not only during the day and night, but also throughout the year, in conjunction with the other properties stated above, renders them the most appropriate places in this country for the winter and spring residence of this class of invalids, and ranks them, in this respect, next to Madeira, and above all places in the south of Europe. The temperature of the air at night is at least 7° higher in them during the winter months than in London; and 10° or 11° above the night temperature at the same periods in the midland and eastern districts. This climate, although most beneficial to pulmonary diseases, characterized by inflammatory action or much irritation, or by scanty expectoration, is injurious, especially from May to October, in disorders consisting of simple debility, deficient nervous

energy, and relaxation of the mucous surfaces and soft solids; and even in those diseases for which it is most beneficial, removal will be necessary to a somewhat drier air during the summer, the patient deriving additional benefit from returning the succeeding winter.

The West of England has a temperature a little lower than the southern coast; but in March and April, the thermometer in the former rises above its elevation in the latter; and during the whole winter and spring it is higher on the west than on the east and south-east sides of the kingdom. Bath and Bristol are about 3° warmer than London during the months of November and December; but the difference is reduced nearly a half during January, February, and March. The vale of Bristol is the mildest and most sheltered in this district. Its winter climate is rendered mild by its vicinity to the ocean; whilst the surrounding mountains attract the clouds, and diminish the fall of rain below its amount in places in the vicinity. Bristol Hot-wells, and the lower parts of Clifton, are best suited to consumptive patients, and the more elevated situations of the latter, to other invalids. Bath and Clifton are preferable places of residence to the south-west district, for patients affected by protracted indigestion, or other affections of the digestive organs, by gout, and scrofula. In these affections, the waters of Bristol Hot-well, with regular exercise on horseback or on foot, prove extremely serviceable.

The inland parts of the kingdom are very favourable, during the summer, for the cure of various slow or constitutional diseases, particularly those places towards the west side which possess considerable elevation above the level of the sea. Malvern and the adjoining country, with the Malvern waters, are very serviceable in scrofulous and dyspeptic complaints. A summer's residence in Wales is often beneficial to consumptive patients, and those affected by diseases of debility, more especially when a course of goat's whey is considered necessary. Buxton, Matlock, Leamington, Cheltenham, and the country in their vicinity, are excellent places of residence, especially during summer and autumn, for invalids; these different localities being well suited to different ailments. Independently of the use of their respective mineral waters, and still more especially in conjunction with a judicious and appropriate recourse to these, they are very serviceable for those who are debilitated and relaxed, by whatever cause; whose digestive, secreting, assimilating, and excreting functions are imperfectly performed, or whose abdominal viscera are congested or obstructed. In these latter circumstances, especially, the appropriate use of the waters of those places, assisted by regular exercise on foot or horseback, by suitable medical treatment, and by mental relaxation and amusement, often prove of great service.

The south-east districts enjoy a tolerably dry air, which, however, is often raw, keen, or chilling in spring and early summer; but is, from July to November, particularly during the intervening months, restorative and bracing, especially to those who may be relaxed by residence in the thickly inhabited parts of the metropolis and manufacturing towns. The places chiefly resorted to are the Isle of Thanet, Dover, Southend, and Tunbridge Wells. To those who do not require the Tunbridge waters, the Isle of Thanet is upon the

whole the most beneficial. Its air is dry and bracing, and its soil allows the rain quickly to descend through it, preventing the cold and exhalations resulting from evaporation.

From the rapid survey now taken of the climate of this country, it will be seen that it possesses advantages above any observed in foreign parts. There is scarcely a place, and certainly no considerable town, situated under unfavourable climatorial circumstances: whilst the inhabitants of our vast metropolis, and of our manufacturing towns, have, within a moderate distance, and at an easy access, such changes of air, climate, and water, as are best suited to their wants and ailments, whether occasioned by the dissipations of fashion, the exhaustion of mental or bodily exertion, or the satiety of enjoyment. So variable, so diversified, and yet so salutary, is the climate of England, that threatened disease may be prevented, and protracted complaints removed, by judicious changes made at proper seasons, and to suitable places; and whether estimated according to its own merits, or compared with those of any other climate, we have real cause to exclaim, respecting it, with the Roman poet,

"O fortunatos nimium, sua si bona nôrint!"

Sect. 9. *Botany.*

Since a small part only of this work can be devoted to a scientific notice of the vegetable productions of the British Islands, we shall confine our remarks to such subjects as are of general interest, referring for further information to the "Outlines of the Geographical Distribution of British Plants,"* by H. C. Watson, Esq., and to Mr. Murray's "Encyclopædia of Geography." We have not thought it necessary to divide this article into separate heads for England, Scotland, and Ireland, but have made it applicable to all three.

Situated as the British Islands are, between lat. 50° and 61° N., the 1,500 species of phænogamous plants which they are estimated to contain may naturally be expected to bear a considerable affinity with those of Germany, separated only by the German Ocean on the east, and those of the North of France, divided by the English Channel on the south; while, on the west, the vast Atlantic intervening between us and the similar latitudes on the continent of America, the species of plants will bear no sort of comparison: but what is very remarkable, if a line be drawn from near the limits of perpetual snow, from the Alps of Switzerland and Savoy, in a north-westerly direction, across the summits of our highest mountains along those of moderate elevation in Labrador and Arctic America, to the lowlands of the extreme northern portions of that vast continent and adjacent islands, a very considerable affinity will be found in the vegetation; and twenty or more species, all eminently alpine or boreal, may be found in such situations throughout the whole length. If we trace the more remarkable features of our vegetation from the south to the north, we shall find it influenced no less by climate than by soil,

* Printed for private distribution only; but, through the liberality of the author, now in the hands of most persons to whom it can be useful.

thus testifying the truth of what was long ago sung by the Mantuan bard:—

> "Not every plant on every soil will grow,
> The sallow loves the watery ground and low,
> The marshes alders:—Nature seems to ordain
> The rocky cliff for the wild ash's reign;
> The baleful yew to northern blasts assigns,
> To shores the myrtles, and to mounts the vines."

In the extreme south of England and of Ireland we find many plants incapable of bearing the cold of more northern latitudes. Hence the strawberry tree adorns the woods of Killarney and of Bantry, with its rich evergreen foliage and its copious red berries, and comes to such perfection, that a trunk has been measured of 9½ feet in girth. It is only in our most southern latitudes that we find the large-flowered butterwort (Pinguicula grandiflora); the beautiful ciliated heath (Erica ciliaris); the Cornish heath (E. vagans); the acrid lobelia (Lobelia urens); two species of rampion, the round-headed (Phyteuma orbicularis) and the spiked (P. spicata); the graceful little sibthorpia (S. Europæa); the marsh isnardia (I. palustris); the Cornish bladderseed (Physospermum Cornubiense); the least gentianella (Exacum filiforme); the whorled knotgrass (Illecebrum verticillatum); and the purple spurge (Euphorbia peplis).

The following are among the most striking and ornamental of our native plants, which scarcely reach the middle of the kingdom, and fail below the south of Scotland: The water soldier, with its curious spear-shaped leaves (Stratiotes aloides); the water violet (Hottonia palustris); the small maidenhair grass (Briza minor); the sweet violet, "that loveliest herald of the spring," (Viola odorata); several kinds of mullein (Verbascum); the primrose peerless (Narcissus poeticus and biflorus); the common snake's-head (Fritillaria Meleagris); the Agrostis setacea; the star of Bethlehem (Ornithogalum Pyreniacum); the two species of Squill (Scilla autumnalis and bifolia); the mountain spiderwort (Anthericum serotinum); the Solomon's seal (Convallaria polygonatum) and sweet sedge (Acorus calamus); the yellow wort (Chlora perfoliata); the mezereon (Daphne mezereum); the flowering rush (Butomus umbellatus); the yellow marsh saxifrage (Saxifraga hirculus), though this is on the Continent a very arctic plant; the clove pink (Dianthus caryophyllus and D. prolifer); several catchflys (Silene), Euphorbias, Cistuses, Anemones; the traveller's joy (Clematis vitalba); the ground pine (Ajuga chamæpitys); the wood sage (Teucrium scorodonia); the crested and field cow-wheat (Melampyrum cristatum and arvense); some Orobanches; the vella annua, Draba aizoides, and Iberis amara; some fumitories (Fumaria solida, aurea, and parviflora); the yellow and crimson Vetchlings (Lathyrus, Aphaca, and Nissolia); the Vicia hybrida, lævigata, and Bithynica; Hippocrepis comosa; Orchis morio, pyramidalis, ustulata, fusca, militaris, tephrosanthos, and hircina; Aceras anthropophora; Herminium monorchis; all the species of Ophrys; Epipactis rubra; Malaxis Loeselii; the beautiful and rare Lady's slipper (Cypripedium calceolus); the birth wort (Aristolochia clematitis); the Roman

nettle (Urtica pilulifera); the Xanthium strumarium and Amaranthus blitum; the mistletoe (Viscum album); the sea buckthorn (Hippophæ rhamnoides); and the white poplar (Populus canescans).

The country of which these plants are the produce, including, however, the lowlands of Scotland, is distinguished, by Mr. Watson, as the *woody region*; which, to borrow his expressions, is, from one end to the other, "an undulating plain of meadows, pastures, and cultivated fields, separated from each other by hawthorn hedges or stone walls, and thickly interspersed with parks, woods, gardens, towns, and high roads, altogether betokening a climate where man may attain a high state of civilization, and live for ease and pleasure, as well as for laborious occupations. It is the region where flourish the trees and bloom the flowers rendered classic by our poets, and not the less loved by many of us, that their very commonness has made them familiar by vernacular names, without the aid of botanical systems or a dead language. It is, *par excellence*, the land of the daisy and cowslip, the oak and hawthorn, the hazel copse and the woodbine bower: the region of fruits and flowers, where the trees of the forest unite a graceful beauty with strength and majesty, and where the fresh greensward of the pasture, commingling with the yellow waves of the cornfield, tell us that here at least—

'The cheek of spring
Smiles in the kiss of autumn.'

"Black swampy moors, such as deface so large a portion of the next, or barren, region, are in this of comparatively rare occurrence and small extent. The downs and chases, in early spring are covered with the countless blossoms of the golden gorse, or the more gaudy broom, and empurpled with the different kinds of heath during summer and autumn. Little, indeed, as we may regard these shrubs, in Sweden and North Russia the gorse is prized as we prize the myrtles of the south; and our common heaths (Erica cinera and E. tetralix) are unknown over a wide extent of Europe: nor does the whole of America produce a single specimen either of these or any other species of heath. The oak, ash, yew, hornbeam, alders, elms, poplars, and willows are the principal native trees of this region; the four first gradually yielding to the pine, white birch, and rowan, as we approach the higher portions, forming the upland zone. The beech, sycamore, and Spanish chestnut have been introduced, and the two first now spring up self-sown and readily. A climate in which the heat of summer is rarely excessive, and where rain and clouds are so frequent, is unadapted to the spontaneous growth of fruits; and we accordingly find our native productions poor in the extreme. The wild cherry, crab, bullace, and native pear are the arborescent fruit trees. The raspberry, strawberry, blackberry, sloe, hazel nut, hip and haw, form a very indifferent catalogue for our shrubby and herbaceous fruit plants. The cranberry, bilberry, and crowberry, with the fruit of the rowan and juniper, common to this and the barren region, are greatly surpassed by one fruit, almost peculiar to the latter, viz., the cloud berry, The changes produced by cultivation, on some of the first-mentioned fruits, it is unnecessary to detail. Lastly, the different kinds of gooseberries and currants cultivated in our gardens are probably derived

from species indigenous to Britain, and are very apt to spring up in our woods and hedges from translated seeds."

Ireland is remarkable among the British Isles for producing exclusively certain plants, which are otherwise peculiar to the most southerly parts of Europe, such as the strawberry-tree and large-flowered butterwort, above mentioned; the Irish Menziesia (Menziesia polifolia); London pride (St. Patrick's cabbage of the Irish, Saxifraga umbrosa); the kidney-shaped saxifrage (S. Geum), and its varieties; as well as the fringed sandwort (Arenaria caliata), an inhabitant of mountains upon the Continent; and what is more extraordinary, unless there be some mistake about the plants in question, Professor Giesekè is stated to have found the naked-stalked yellow poppy (Papaver nudicaule) and the marsh ledum (Ledum palustre) upon the rocks of Achil head; whereas, in other parts of the world, these plants are very alpine or very arctic.

The Irish yew and the Irish furze, both well known in our gardens, may be considered rather as varieties of the common yew and common furze, than as distinct species.

The vegetation of the lowlands of Scotland scarcely differs, as may be supposed, from that of the north of England. The valleys in the north are filled with the remains of the ancient fir forests, and many of these are still of great extent. The Pinus sylvestris, of which they are composed (our only native fir), attains to an elevation on the mountains of 1;050 feet, the oak 700, beech 750, alder about 900 feet, birch 1,100, ash and sycamore 900, and hawthorn 800 feet. The extensive moors are empurpled with the autumnal blossoms of three species of heaths (Erica tetralix, cinerea, and vulgaris, the latter Calluna vulgaris of Salisbury). Quitting, then, the belt or zone of our more hardy trees, and ascending the summit of our highest mountains, at an elevation of 4,300 feet (consequently below the limits of perpetual snow), we find the vegetation gradually assuming a more alpine character. Gnaphalium dioicum, Empetrum nigrum, Rubus chamæmorus, with Vaccinium vitis idæa, Leontodon palustre, Aira alpina (often viviparous) and Festuca vivipara, Epilobium alpinum, Cerastium alpinum and latifolium, Rhodiola rosea, Cochlearia officinalis and Statice armeria (the three latter species being equally found on rocky places and upon our sea-coasts), Cherlerea sedoides, Saussurea alpina, Saxifraga stellaris, nivalis, rivularis, and oppositifolia; the beautiful alpine forget-me-not (Myosotis alpestris), Veronica alpina, the brilliant V. saxatilis; Erigeron alpinum, Sibbaldia procubens, the silver-leaved lady's mantle (Alchemilla alpina), which is often washed down by the rains to a much lower elevation; Silene acaulis, of the beauty of which, forming purple cushions some feet in diameter, no one can form a conception without visiting its native place of growth; Salix herbacea, the humblest of our arborescent plants, and scarcely attaining a height, or, rather, length of a few inches, often scarcely visible but from its bright-coloured catkins; Luzula spicata, and, what may perhaps be reckoned the most alpine of all our flowering plants, Luzula arcuata, inhabiting the regions that are the summer residence of the ptarmigan and the white or alpine hare.

Plants peculiar to Scotland, and not inhabiting either England or Ireland, are Veronica fruticulosa, saxatilis, and alpina; several alpine grasses and other glumaceous plants, such as Phleum alpinum and Alopecurus alpinus; Eriophorum alpinum; Juncus arcticus, castaneus and biglumis, and Luzula arcuata; Primula Scotica, Myosotis alpestris, Azalea procumbens, Gentiana nivalis, Sibbaldia procumbens, Convallaria verticellata, Epilobium alpinum, Arbutus alpina, Pyrola uniflora, Saxifraga nivalis and rivularis, Stellaria scapigera (the latter is exclusively British), Arenaria rubella and fastigiata, the Cherleria sedoides, Lychnis Viscaria and alpina, Spergula saginoides, Potentilla opaca, Nuphar Kalmiana, Ranunculus alpestris, Ajuga pyramidalis, Cardamine bellidiflora, Orobus niger, Astragalus Uralensis and campestris, Erigeron alpinum, Corallorhiza innata, Achillea tomentosa, Goodyera repens, the most alpine Carices and Salices, and dwarf birch (Betula nana). Two plants of Scotland deserve particular notice, being found nowhere else in Europe; these are Potentilla tridentata, abundant in arctic America, and upon the rocky and white mountains, and Eriocaulon septangulare. This latter genus is mostly tropical, or a native of the warm temperate zones in America, the East Indies, and Australia. The only exceptions to this rule are the Eriocaulon pellucidum of Michaux, and the plant in question; the former being found in North America, as high as Canada: and, upon examination, the two species prove identical. In these instances, the Eriocaulon and the Potentilla seem to have overcome many obstacles in their migration, and to have reached their eastern boundary. The Eriocaulon is confined to a few lakes in the Hebrides, where we have been surprised, in the month of September, to observe the high temperature of the water, which never freezes; and to some spots in the south and west of Ireland. The Potentilla is only found on one hill in Angus-shire.

Perhaps no country of equal extent in any latitude will be found so rich in cryptogamous plants as the British Islands; and nowhere, probably, have these, the humblest, yet not the least beautiful, of Nature's works, been more successfully investigated, from the briny deep to the highest summits of our mountains, where the almost perpetual moisture favours the growth of numerous tribes of lichens and mosses.

Among the ferns, the elegant Adiantum capillus veneris, so common in the south of Europe, attains its northern limit upon the coast of Galway, in Ireland; and Trichomanes brevisetum is almost unknown, save near Bigley, in Yorkshire, and in one or two stations in Ireland, and in Madeira, whence specimens have been imported. Of mosses, no less than 310 species are found in Great Britain. Of Algæ, 519 kinds, and among these are many that are useful to mankind; Fucus nodosus, Vesiculosus serratus and loreus, yield us kelp in great abundance: the value of this native produce, especially during the late war, when we were prevented from obtaining barilla from abroad, having been very great in the northern parts of Scotland and Ireland. Laminaria esculenta and saccharinar, are eaten in the countries alluded to; as are Halymenia edulis, under the name of pepper dulse, and H. palmata, under that of common dulse.

Even the lichens have yielded an article of utility and of commerce; and that they might do so more extensively, there can be no question. The archil (Roccella tinctoria), indeed, finds its northern limit on the precipitous rocks of the Scilly Isles, and there it grows so scantily as to be scarcely worth the gathering. Cudbear (Lecanora tartarea), and Perelle (Lecanora perella), are very abundant upon subalpine and exposed rocks. The Tripe de Roche of the Canadian hunters (different species of Gyrophora), which saved the lives of the arctic travellers, Sir John Franklin and his party, when deprived of other food, is frequent on the primitive alpine rocks; and Parmelia omphalodes and P. saxatilis, so abundant on stone walls and rocks throughout Scotland, yield a purplish dye in general use among the Highlanders. All our heaths and moors produce such a quantity of the rein-deer lichen, that, were the climate suited to the animal, the rein-deer might be naturalized among us; and the Iceland moss or lichen (Cetraria Islandica), grows in such quantities among some of the mountains in Braemar that we are rather surprised it is not substituted in our shops for the produce of Norway, Lapland, and Iceland. There is a common but little known lichen on the trunks of trees, especially ash, presenting the appearance of roundish spots of a white or powdery substance. This is the Variolaria faginea. Its taste is intensely bitter, so that many hours elapse ere it leaves the mouth; and from it oxalic acid has been prepared, to a very considerable extent, by the French chemists.

The fungi are reckoned amongst the lowest in the scale of the vegetable creation, and the number of species is greater than that of any other order of plants: these have all their use, though in many instances it be unknown. Many hasten the decay of timber, as the Merulius lachrymans, which constitutes one of the kinds of "dry rot," and the different species of Rhizomorpha. Several are esculent in our country, as the mushroom, Agaricus campestris; and a hundred others of the same genus are employed on the Continent. Others are poisonous, especially the Agaricus (Amanita) muscarius; and its juice is used, when mixed with milk, to catch flies in Sweden; while, in the eastern parts of the Russian dominions, an intoxicating beverage is prepared from the same fungus, which has the most extraordinary effect upon the mind. Tubers, or truffles, belong to this family, as do those diseases on our corn known by the names of blight, brand, bladder, or pepper-brand, &c.

Among the indigenous phænogamous, or flowering plants, which claim, from the services they render or injury they do to man or beast, to be counted among the most interesting, and many of which are improved by cultivation, may be reckoned the following:—

Various grasses, particularly such as the sweet-scented vernal grass (Anthoxanthum odoratum), the foxtail grass (Alopecurus), the cats-tail grass (Phleum), bent grass (Agrostis), meadow grass (Poa), cocks-foot grass (Dactylis), dogstail grass (Cynosurus), fescue grass (Festuca), rye grass (Lolium), &c., are food for cattle; while the reed (Arundo phragmites) serves for an excellent covering to our houses; and the lime-grass (Elymus arenarius), along with some kinds of wheat-grass (Triticum), and Carex arenaria (one of the sedges), assist

to bind our sand hills on the shore, and to prevent the encroachment of the sea; thus bidding defiance to that element which no human force can withstand. Bread-corn is not the produce of any British grass.

Among the liliaceous plants, one, the Allium Schænoprasum, constitutes the chive. Asparagus (A. officinalis) is a native plant, and the butcher's broom (Ruscus aculeatus), whose seeds are considered by some to be an excellent substitute for coffee. Several of our orchisses yield salep in their roots.

Of the coniferous family we have the Scotch fir, already noticed (Pinus sylvestris), the juniper, and the yew. Of the amentaceous, 7 species of elm, the birch, and the alder; 68 kinds of willow, and among them some useful for timber, many for basket work, and a few medicinally, as astringents; 4 of poplar; the beech; 2 species of oaks, hornbean, and hazel nut. Of the nettle tribe, the common nettle, once eaten in Scotland,* if not in England, and the hop; and, of the dangerous euphorbiaceous family, several spurges, and the box. Two species of Daphne, mezereon and spurge laurel, the toughness of whose inner bark indicates the presence of a fibre, equally capable of being manufactured into cordage and paper as the East Indian Daphne Gardneri and D. Cannabina. Buckwheat; 2 or 3 kinds of sorrel and kidney-shaped Oxyria (O. reniformis), of which the agreeable acid is, perhaps, superior to that of any true sorrel. Some of our Chenopodia are boiled and used as a substitute for spinach. Of the beet, we have only the maritime kind in a wild state. Our Salsolias and Salicornias are hardly abundant enough to yield barilla. It is procured from plants of the same kind, in the south of Europe and north of Africa.

Among the aromatic family of Libiatæ, or lipped-flowers, we have several mints;—

> "The *thyme*, strong scented 'neath our feet,
> And *marjoram* beds, so doubly sweet;"

the germander, black horehound, betony, white horehound, basil-thyme, wild basil, &c. In the Scrophularia family, the figworts (Scrophularia), foxglove, eyebright, and vervain. Among the narcotic tribe, to which the potato belongs, the nightshade, deadly nightshade, thorn apple, and henbane, are British. All our plants of the gentian family yield a bitter principle, less powerful, however, than the celebrated bitter gentian. The 2 species of periwinkle (Vinca) are the only individuals of the apocyneous order we possess; the common ash and the privet of the olive tribe. Our Vaccinium oxycoccos affords the cranberry, so excellent in tarts. The ramps of the garden are the roots of Campanula rapunculus.

The extensive natural order of the compound flowers (Compositæ), includes many useful plants. Salsafy, the root of the purple goat's-beard (Tragopogon porrifolius), Tansy (Tanacetum vulgare), worm-

* The young tops are boiled and eaten by the common people. "Nae doot, I suld understand my ain trade of horticulture," says Andrew Fairservice, the Scots gardener, "seeing I was bred in the parish of Dreepdaily, near Glasco', where they raise lang kail under glass, and force the *early nettles* for their spring kail."—*Rob Roy.*

wood (Artemisia absinthium), chamomile (Anthemis nobilis), yarrow, &c.

The fuller's teasel (Dipsacus fullonum) is extensively cultivated in the districts where woollen cloths are made, for the fulling of which its heads, all beset with hooked spines, are admirably calculated.

Our rubiaceous plants are wholly confined to such as afford a dye in their roots, as bedstraw (Galium), wild madder, woodruff, and field madder.

Among the umbelliferous tribe we reckon celery (Apium graveolens), parsley, carraway, fennel, samphire, angelica, parsnep, carrot, chervil, cicely, hemlock, coriander, &c. Gooseberries and currants appear to be indigenous.

Rosaceous plants yield us, besides

"The garden's queen, the rose,"

the medlar, hawthorn, plum, and cherry, pear, apple, and service, raspberry, strawberry, and tormentil. The Leguminose (or pea tribe), furze, or gorse, dyer's weed (Genista tinctoria), broom, vetch, sainfoin, melilot, trefoils, medick, and lucerne. Of the Acerinæ, the maple and the sycamore. Of malvaceous plants, the mallow, tree mallow, and marsh-mallow. The common flax is a native.

Among cruciferous plants, we have sea-kale (Crambe maritima), dyer's woad (Isatis tinctoria), scurvy grass, horse radish, water cress, cole seed, turnip, cabbage, mustard, the white and the common (Sinapis arvensis and alba), &c.: and, lastly, among Papaveraceæ, the white poppy, which yields opium.

Such is a brief notice of some of the plants indigenous to the British Isles. If now we direct our attention, for a few moments, to useful *exotics*, we shall find that such is the peculiar temperature of Great Britain, and such the mildness of our winters, particularly in the southern districts, that nowhere, perhaps, has the industry of man brought under cultivation, and in the open air too, so great a number of interesting and useful plants of foreign origin. Some of these are of the highest utility, while others constitute the greatest charms of our parks and pleasure-grounds: we shall notice some of the most important.

Among these is the cedar, which, being a native of Syria, and of mountainous regions, it may not perhaps excite surprise that it should flourish in the warmer parts of England. It has attained, at High Clere, the seat of the Earl of Cærnarvon, a circumference of more than 10 feet, at three feet from the ground.

Some natives even of the tropics have come to perfection in the genial climate of Devonshire. We have seen two or three species of Cactus growing among the rocks of Torquay. Others require more shelter, and are only

"to be found
Within the garden's cultured ground."

Of these the most striking is the American aloe (Agave Americana), an inhabitant of the tropical parts of South America, from the level of the sea to an elevation of 9,000 feet among the mountains. Thence it has been introduced to the warmer parts of the Old World, where

fences are made of it, and a fermented liquor called *pulque;* fibres for thread, and a substance analogous to soap, have also been extracted. It was planted by the late Mr. Yates in his garden at Salcombe Bay, in Devonshire. In 1804, when only three years old, and but 6 inches high, it was placed in the open air, without any protection, save what was afforded by the neighbouring hills. In the year 1820 it had attained a height of 11 feet, and covered a space of ground 16 feet in diameter, when it threw up a flowering stem, which grew for six weeks at the rate of three inches a day, and, in September, measured 27 feet in height, its branches loaded with 16,000 blossoms, thus contradicting the generally received opinion, that the American aloe flowers only once in 100 years. Such a soil, and such a climate, it was thought by the proprietor might be suited, if any in Britain were, to the culture of the New Zealand flax (Phormium tenax), of which most kinds of cordage, sails, matting, clothing, &c., are made in Australia; and a considerable field was planted with the flax, and promised a favourable result; but, owing to the sudden decease of Mr. Yates, we are unacquainted with the ultimate success of the experiment. No doubt, however, it might be reared in the rich and sheltered valleys in the south of England; but it is doubtful whether it be so valuable a variety as was at first supposed, or whether it can be raised so cheaply as it may be imported. The valleys now referred to, bear, unharmed by winter's snows, myrtles, the tea plant, and camellias, Amaryllis sarniensis, and Hydrangea, from China and Japan; Amaryllis vittata, belladonna, undulata, and formosissima, the horse-shoe geranium, Pelargonium zonale, P. inquinans, P. radula, and P. glutinosa; numerous ixias, and heaths, and proteas, from the Cape; various magnolias, from the southern states of North America; Indian shot (Canna Indica), the lemon-scented vervain (Verbena triphylla), whose annual shoots often exceed 14 feet in length; the Celtis micrantha, several cistusses, yuccas, the Azorian jessamine, oleander, Daphne odora, Correæa alba, Melaleuca hypericifolia, and many New Holland plants: these, with several others, adorn the shrubberies of Guernsey, Jersey, and the southern shores of Britain. Even oranges, both the Seville and sweet kinds, and lemons, produce fruit. If the vine and olive, rice and maize, cannot be successfully cultivated, it is rather owing to the prevalence of moisture than of cold. Tobacco has been cultivated in the south of Ireland.

We are indebted to warmer climates than our own for the most valuable and important of our bread-corns. Wheat, of which the native country is unknown, was introduced by the Romans, and is now the principal food of our people, and the grand object of culture. It is every where raised in England, unless the elevation exceed 1,000 feet; but, except in a few rare cases, it is not raised in Scotland, except in the lower grounds.

Barley, also, is of foreign origin. It is raised along with wheat, and is the peculiar crop of the lighter lands. That raised in England is the two-rowed species, Hordeum distichon. In Scotland, 2 other species, or varieties, the bigg, here, or bear, or four-sided barley (Hordeum tetrastichon), and the six-sided here, or bigg (Hordeum

hexastichon), are universally grown. In Aberdeenshire, they succeed at an elevation of 950, and in some instances of 1,050 feet.

Rye (Secale vulgare), a native of Candia, is cultivated in poor soils, in various situations, but is only occasionally mixed with wheaten bread. In Orkney, rye is grown, for the sake of its straw, which is manufactured into ladies' bonnets. By means of a small steel cylinder with 4 blades, each tube of straw is readily split into four pieces, which are braided, or plaited, into the form required; the mass is then covered with a paste of sulphur, exposed to heat, and bleached to a uniform colour.

The cultivation of maize has been attempted, that variety especially which is raised in Canada, under an idea that a variety from so cold a climate could not fail to succeed here: but those who tried it seem, as in the case of the locust tree, or false acacia (Robinia pseudoacacia), to have forgotten the extreme heats of summer, and the depth of the soil, in the countries whence these plants were respectively introduced; and their hopes of success have been universally disappointed.

Among our fruit trees we can reckon but few exotics, which, as standards, will bear the open air of our country, and this not because of the severe cold of our winters (for in no country, probably, under the same latitude, except on the west coast of North America, are they so mild), but for want of a constant summer heat to ripen the fruit, and bring it to perfection before the frosts set in. The fig, the quince, and mulberry, are, indeed, exceptions; but they hardly produce good fruit beyond the south or middle of England: such, however, is not the case with the plum tribe, if indeed these may not be considered as improved varieties of plants indigenous to our own country. The largest of our strawberries is said to be a native of Chili, but the finest come from the United States. Cucumbers and gourds, from Asia, may often be seen loaded with fruit in the open air; but apricots, peaches, nectarines, and grapes, all probably from Asia, require, in most parts of Britain, the shelter of a wall, or, like those tropical productions, pines and guavas, need the protection of glass and artificial heat: and when these are employed, the choicest fruits are nowhere brought to such a degree of flavour and size, as by the British horticulturist.

The produce of our kitchen gardens, contains much that is fitted for the use and for the luxury of our tables; but is too familiar to every one to need particular notice. The individual products, however, are of very old introduction; and it has often been a subject of remark, that, notwithstanding the encouragement given in all parts of the kingdom to the cultivation of vegetables and fruit, scarcely a new vegetable or a new fruit, of any real value, has, for a lengthened period, been introduced. South America has given us, and every other people, the potato: but though the Arracacha of Columbia, and the Oxalis crenata of Peru, have been said to afford a root equal to that of the Solanum tuberosum, they have either proved, on trial, of little real value; or, unsuited to our climate. The skirret (Sium sisarum), once very prevalent in our gardens, and highly prized for its root, is now almost unknown; it abounds so much in saccharine matter, that an ounce

and a half of pure sugar has been obtained from half a pound of this root. The Jerusalem (a corruption of girasole, the Italian name for the sun-flower,) artichoke (Helianthus tuberosus),is a native of Brazil; Scorzonera of Spain, as well as the common artichoke and cardoon; spinach of Asia; while the New Zealand spinach, an excellent substitute for the latter, comes, as its name implies, from New Zealand. Onions are natives chiefly of the South of France and Northern Africa. Endive (Cichorium endivia) is from China and Japan; lettuce from the Levant; the common cress (Lepidium sativum) from Persia and the Levant; radish (Raphanus sativus) from China; and, lastly, we may mention, that the rhubarb so extensively used in tarts (Rheum palmatum and hybridum), is derived from Asia, while the rhubarb root of commerce, only coming to perfection in its native climate, is now generally supposed to be that of the Rheum emodi.

Our fields are indebted to the south of Europe for liquorice (Glycyrrhiza vulgaris), largely cultivated about Pontefract in Yorkshire, and for the beet (Beta vulgaris), equal in quality to the turnip for the feeding of cattle; and to Asia for hemp. Madder has been attempted to be raised, but without success; probably the heat of our summers is not sufficient to elaborate the colouring principle. Beans (Vicia faba) are considered to have come originally from Egypt; the field-pea (Pisum arvense) from the Levant. Commerce has not, therefore, merely supplied us with many important articles unsuited to our climate, and of which we should otherwise be destitute; but it has, also, supplied us with many of our most important vegetable products. We owe to our intercourse with foreigners, those articles which afford the most extensive employment to our agriculturists, and the largest share of food to our people.

Sect. 10. *Zoology.**

Of the three kingdoms of nature, the animal, the vegetable, and the mineral, which divide amongst them all the products of the earth, our attention will now be directed to the first. The botanist investigates the vegetables spread over the surface of the earth: The mineralogist searches beneath, and makes known the earths, the metals, and other substances; which being extracted, are used at home, or sent abroad, either in a raw or manufactured shape: The animal kingdom is the province of the zoologist, who is to investigate the nature of the indigenous animals, and of such foreign species as are capable, by domestication, of improving our existing breeds; he is to point out such as are useful, and such as are detrimental, to the labours of the agriculturist; with the best means for encouraging the one and for counteracting the injuries of the other. This is strictly the economic department of zoology, by which we mean the application of the science to the purposes of life. It would appear, at first sight, that these points could be very easily ascertained, and that nothing is wanting but ordinary experiment and observation to know what animals are hurtful and what beneficial, what would bear domestication, and propagate in these

* This article applies not merely to the zoology of England, but to that of Great Britain and Ireland.

islands, and what would defy all attempts to naturalize. The contrary, however, is the fact; otherwise, we should not have witnessed, in our own days, the failure of the expensive efforts made to introduce the wapati of North America into the parks of England, and the reindeer of Iceland into the Highlands of Scotland. The truth is, that the practicability of such projects mainly depends upon certain considerations of a general nature, regarding the habits and economy of animals, which belong more to the province of the philosopher than to that of the projector. Hence the statistics of zoology, to be well understood, must be contemplated under two points of view; first as regards that original distribution, or assignment, of animals to particular countries, which is the work of nature; and, secondly, the introduction and naturalization of such others as our convenience or pleasure renders it desirable to procure from foreign regions, and which is consequently the work of man. We shall, in the following pages, survey the zoology of Great Britain under both these aspects: both will afford interesting information; and, although the first may appear not to be immediately connected with the practical part of our subject, it will eventually be perceived that they are intimately conjoined.

1. *On the natural distribution of animals in the British Isles.*—There is no fact which more irresistibly proclaims design in the great scheme of creation than the adaptation of the nature of animals to the country in which they were originally destined to live. It is not merely in some one or two isolated circumstances that this principle is conspicuous; but the more minutely we examine into details, the more we become convinced of its universality. Every one knows, for instance, that animals of cold countries are protected from the extreme rigour of winter, either by an unusual thickness of clothing or by the instinct of hybernation. Those, on the contrary, which occupy warmer latitudes, are thinly clad, and only sleep during night. The camel, again, endures thirst longer than any other quadruped, and is consequently found in the most arid and parched regions of the globe. The swiftest quadrupeds, for the same reason, occupy those parts in which we find the most extensive plains, as the deserts of Africa, the pampas of tropical America, and the prairies of the northern states. In these and other thinly inhabited regions the grand features of this harmonious adaptation may still be traced. In them the face of nature, and her races of primæval inhabitants, still, in a great measure, exist with little change; and the philosopher may observe how well the temperature of the climate, the surface of the country, the products of the soil, and the animals, harmonize with each other. By degrees, however, these features become obscured, if not obliterated. Each generation sees a slow but wide-spreading increase of civilization, bringing with it all those attendant changes which transform the face of a country and affect its brute inhabitants. Majestic forests, the ancient fortresses, as it were, of innumerable families of animals, are felled by the axe of the woodman, or destroyed by the more devastating effects of his fires; their ferine inhabitants are hunted or slain, the nests and eggs of hundreds of different birds destroyed, and tens of thousands of the insect races irretrievably perish. For a while those who escape seek refuge in other tracts, still in a state of nature; but in the course of time

these retreats are also invaded, until at length the few remaining stragglers of a once numerous tribe are lost and exterminated even in regions once peculiarly their own.

The changes we have spoken of as taking place in the original zoology of most countries, are nowhere more apparent than in Europe; and, if any part of that great geographic division is more particularly fitted to show the truth of these observations, it is certainly the British Islands, which, within the records of history, were covered with wide-spreading forests, filled with large quadrupeds, though now few traces remain of the former and none of the latter. It thus becomes necessary, in treating of the zoology of Great Britain, to arrange our observations under two heads. Under the first, we shall offer a few remarks upon the animals known to have been formerly natives, but which, from various causes, have been exterminated, or are now slowly disappearing. These changes, and the causes that have produced them, will lead us, secondly, to a review of the present state of our brute population, and of the reasons which account for the peculiarities in our existing zoology.

We may be accused, perhaps, of advancing a startling proposition, when we affirm that Great Britain, as a whole, is much more fertile than any part of southern Europe; premising, that by fertility we mean the *quantity*, and not the *luxuriance*, of vegetable life. Moisture is one of the greatest promoters of vegetation; and hence, with all the disadvantages of our northern situation, our fields, our trees, and our woods possess, from the humidity of our climate, a richness of verdure, during the greater part of the year, which will be sought for in vain on the sunny shores of Spain, Sicily, and Southern Italy. For six months of the year, the traveller who crosses the country surrounding Etna, or traverses Southern Italy, sees the ground parched and cracked, the herbage scorched, and a brown burnt-like tinge spread over the face of nature; and, though he may admire the luxuriance of the vine, and see the sickly-green of the olive never cast its leaf, or change its hue for our rich autumnal tints, he will at once be convinced that the verdure of Britain is one of its chief characteristics. England, also, notwithstanding the havoc cultivation has made in our ancient forests, is extremely well wooded. The hedges which divide the innumerable fields and enclosures, into which the land is portioned, and the vast number of oak, elm, plane, ash, and other trees found in them, give it in many parts, even where it is highly cultivated, the appearance of a continuous forest. It is probable, however, that it was formerly better wooded, at least in certain districts, than at present. The remains of ancient forests buried under the soil are occasionally discovered, while historians attest the existence of others, in the vicinity of the metropolis and elsewhere, of which, in many instances, little more than the name is now left. Now, if we compare this abundance of vegetation with what is seen in Southern Europe, the marked inferiority of the latter is obvious. In former ages the shores of the Mediterranean were, doubtless, better wooded than now; but it is of their present, not of their former, state, that we are speaking. In Sicily, for instance, the enclosures are so few that one of its fields would almost suffice for a small English farm; while the fences, or

rather partitions, by which they are separated, are formed almost entirely of loose stones, gathered from the surrounding soil, or which have fallen from the rocky declivities. In the vicinity of the towns, walls, instead of hedges, protect the gardens and enclosures of the villas; and the orchards of the peasants are surrounded by fences of the cactus or prickly pear, which, although an admirable defence against depredators, gives neither food nor shelter to birds or insects. The only trees that are seen beyond the gardens are tall Lombardy poplars and groves of olives, interspersed with mulberries; the former are planted only on the sides of mountain streams, while the latter, from the dryness and hardness of the olive leaf, seem incapable, like most evergreens, of giving nourishment to insects. The traveller may ride for leagues, during six months of the year, without seeing a verdant meadow, and, as he leaves the vicinity of the chief towns, the plains and mountains are frequently destitute, for many miles, of a single timber tree. The same remarks, with little variation, are applicable to the whole of Naples and Greece, with the exception of the Lower Calabria. If, however, we consider the *luxuriance* and *fecundity* of the vegetable world in Britain and Italy, the superiority of the latter is unquestionable. Heat, and a moderate degree of moisture, are the great promoters of vegetable life; and when once the soil of Italy is moistened, the heat of the climate makes vegetation spring up with astonishing luxuriance.

The preceding observations may be supposed, perhaps, to be rather irrelevant to our present object; but such is not really the case. The abundance of vegetation in the British Islands is one of the circumstances that have mainly influenced the peculiarities of their zoological history. Animal life, throughout the world, is always proportioned, in its variety and numerical amount, to that of the vegetable; the latter supplying food to the former in the proportion, probably, of 10 herbivorous animals to one that is carnivorous. Nay, the deficiency of vegetation operates quite as much, although indirectly, to the injury of rapacious animals, as to those of an opposite description; for, as they feed upon others, which are herbivorous, it follows that, where the vegetable food of such animals is deficient, they will be scarce, from a want of food, and this scarcity of plant-eating animals will create a corresponding scarcity of those which are carnivorous, and depend upon the former for support. We are now to consider in what manner these circumstances influence the subject before us.

It is highly probable that large portions of these islands were, in remote ages, nearly covered with forests, and that these gave shelter to numerous indigenous quadrupeds of a large size cannot be doubted, whether we draw the inference from analogies presented by the former condition of other countries, or from that reciprocity, already alluded to, in the distribution of animals and vegetables. On this point, however, we have other evidence. Besides the few wild animals, mostly of small dimensions, which still find shelter in the patches of woodland scattered over the country, our old historians make incidental or direct mention of several others which have long ceased to exist. We leave to geologists to determine whether we should include among these ancient races the elephant, tiger, alligator, rhinoceros, and hippopotamus, the fossil

remains of which have been found at great depths below the surface, in formations that belong to a different order of things. There can be no doubt, however, that the hyænas of the Kirkdale and Plymouth caves really inhabited the dens in which their bones are now found; and though none of these quadrupeds are mentioned in history, our chronicles record the existence of the bear, wolf, wild boar, and beaver, as inhabitants of our ancient forests, whence, with the others, they have long disappeared.

A few notices of some of the animals which, though now exterminated, form an important part of the aboriginal zoology of these islands, may not be uninteresting to the reader.

That a species of bear was once a common inhabitant of this island, is apparent from different authorities. Martial states that the Caledonian bears were used to heighten the torments of the unhappy sufferers on the cross (*Martial, Lib. Spect.* ep. 7), and Plutarch relates that bears were transported from Britain to Rome, where they were much admired. Ray also mentions, that in some old Welsh MSS. relating to hunting, this animal is reckoned among our beasts of chase, and that its flesh was held in the same esteem as that of the hare or boar. Many places in Wales still retain the name of Pennarth, or the Bear's Head, another evidence of their existence in that principality. It does not appear how long they continued in Wales, but they infested Scotland in 1057, when a Gordon, for his valour in killing a bear, was authorized to carry three bears' heads upon his banner. Long after their extirpation from our island, bears were imported for "baiting," which was classed by our ancestors among the "merry disports" of the Elizabethan age, and considered meet entertainment for her Majesty!

The wolf, it is well known, was the most destructive beast of prey in these islands during the heptarchy. In the reign of Athelstan, wolves abounded so much in Yorkshire, that a retreat was built at Flixton, in that county, to which passengers might resort for protection from their attacks; and such ravages did they commit during winter, particularly in January, when the cold was severest, that our Saxon ancestors distinguished that month by the title of *wolf-moneth*. They also called an outlaw *wolf-shed*, as being out of the protection of the law, and as liable to be killed as that destructive beast. King Edgar attempted to extirpate these pests in England, by commuting the punishments of certain crimes for a specified number of wolves' tongues; and in Wales he pursued the same object, by converting the tax of gold and silver into an annual tribute of 300 wolves' heads. But notwithstanding these enactments, and the destruction they must have occasioned, the scheme proved abortive; for we find that some centuries after his reign wolves again became the object of royal attention, Edward I. having issued his mandate to Peter Corbet to superintend and assist in their destruction in the counties of Gloucester, Worcester, Hereford, Salop, and Stafford. Camden states that certain persons at Wormhill, in Derbyshire, held their lands by the duty of hunting and taking the wolves which infested the country, whence they were styled *wolve-hunt.*—(*Pennant's British Zoology*, i. 78, 4th ed.)

Wolves maintained their ground in Ireland to a much later period

than in England.—"They were not exterminated (in Kerry) till about the year 1710, as I find by presentments for raising money for destroying them in some old grand-jury books."—(*Smith's History of Kerry*, p. 173.) Scotland was cleared of these pests some years sooner, the last being killed in 1680 by Sir Ewen Cameron, of Lochiel.

The wild boar was a favourite animal of chase with our ancestors, and was carefully preserved. Fitz-Stephen incidentally mentions that in his time a *vast forest*, on the north side of London, abounded with all the large animals of the chase, among which were wild boars. In the reign of Charles I., however, wild boars had become so scarce, even in the New Forest, that many were turned into it to breed; but the civil wars, which soon after ensued, occasioned their speedy destruction.

The wild ox, or, more properly, Urus, which formerly inhabited the forests of Britain, was of a gigantic size, and of a totally different species from the domestic ox; although Pennant supposed they were the same. The horns of the wild urus have been found in the same strata with the bones of the lost elephant, proving that it belonged to the zoology of a former period; and it has, also, been found in more recent formations, as peat mosses, marshes, and beds of sand. This huge animal, no doubt, existed in Britain in the time of Cæsar: and the horns of the "Dun Cow," exhibited in Warwick Castle, are unquestionably those of a wild urus. This, and other skulls of the same sort, existing in different museums, are nearly one-third part larger than those of domestic oxen, square from the orbits to the occipital crest, and somewhat hollow at the forehead: the horns show a peculiar rise from their root, at the side of the above crest, upwards; they then bend outwards, and finally forwards and inwards. "No domestic race," as Mr. Hamilton Smith remarks, "possess this peculiarity of turn, but numerous specimens of inferior size, found fossil in some of the Cornish mines, have this shape, and the wild bull of Scotland in part retains it." It does not exactly appear at what precise time this formidable race of oxen was exterminated. Fitz-Stephen, referred to above (a learned monk, who lived in the reign of Henry II., and wrote a History of London), mentions these animals, under the name of *Uri Silvestres*, among those which, in his time, were found wild in the great forests close to the city. Leland also enumerates, among the provisions at the feast of Nevil, Archbishop of York, six wild bulls. (*Pennant's British Zoology*, 4th edit., p. 23.) The Scotch urus seems to have been a smaller and inferior breed of this species, peculiar to the woods of Southern Scotland and Northern England. It is probable that this breed was exterminated from the open forests long after that larger species which had more especially inhabited Southern England; for Sibbald assures us, that in his days a wild and white species was still found in the mountains of Scotland: and Bishop Lesley, who wrote in 1598, affirms that wild cattle were then found in Stirling, Cumbernauld, and Kingcairn. But, some time before the Reformation, the few that remained were confined in parks belonging to ecclesiastical establishments, whence they were transferred at their dissolution to Drumlanrig. It was at the latter, and in the park belonging to Chillingham Castle, Northumberland, that Pennant

(*Tour in Scotland*, ii. 124) saw these modern descendants of the ancient urus. He describes them as having lost their manes, but retaining their original white colour and great fierceness; they were of a middle size and long-legged, with black muzzles and ears, their horns fine, with a bold and elegant bend. The keeper of those at Chillingham said that the weight of the ox was 38 stone, and of the cow 28 stone; that their hides were more esteemed by the tanners than those of the tame race, and that they would give sixpence per stone more for them. "These cattle are wild as any deer, for, on being approached, they instantly take to flight, and gallop away at full speed; never mixing with the tame species, or coming near the house, unless constrained by hunger or very severe weather. When it is necessary to kill any, they are always shot; if the keeper only wounds the beast, he must take care to keep behind some tree, or his life would be in danger from the furious attacks of the animal, which will never desist till a period is put to its life."—(*Brit. Zool.* i. 26.) On a subject so interesting, we may add the following particulars, furnished by Mr. Hamilton Smith, who states that the individuals of the Scotch urus, in the park of Burton Constable, were all destroyed in the middle of last century by a distemper. The race, he says, is entirely of a white colour; the muzzle, invariably black; the inside of the ear, and about one-third part of the outside, from the tips downwards, red; the horns are white, with black tips, of a fine texture, and, as in fossil skulls, bent downwards. Bulls weigh from 35 to 45 stone, and cows from 25 to 35 stone, 14 pounds to the stone. Before they were kept in parks, they were probably larger and more rugged; old bulls still acquire a kind of mane, about two inches long, and their throat and breast are covered with coarser hair. Those at Burton Constable differed from the others, in having the ears and tips of the tail black. In their manners, also, they were unlike domestic oxen, and assimilated more to the ancient urus. Upon perceiving a stranger, these animals gallop wildly in a circle round him, and stop to gaze, tossing their heads, and showing signs of defiance: they then set off, and gallop round a second time, but in a contracted circle, repeating this circular mode of approaching till they are so near that it becomes prudent to retire from their intended charge. The cows conceal their young calves for eight or ten days, going to suckle them two or three times a day; if a person comes near the calf, it conceals itself by crouching. When one of this breed happens to be wounded, or is enfeebled by age or sickness, the others set upon it and gore it to death. These animals were killed, till within a few years, by an assemblage of horsemen and country people armed with muskets; the former singled one from the herd, and the latter took their stations on walls or in trees. There was grandeur in such a chase, but from the number of accidents which occurred, it was laid aside. We believe, concludes Mr. Hamilton Smith, that at present none remain, excepting at Chillingham Castle, the property of the Earl of Tankerville, near Berwick-upon-Tweed; at Gisborne, in Craven; at Lime Hall, in Cheshire; and at Chartley, in Staffordshire. There is also a large breed, not perfectly white, in the Duke of Hamilton's park, Lanarkshire, Scotland. It is not necessary to do more than notice the opinion that the remains of oxen, which occur in

marl pits in this country, belong to the "*Bos taurus*," or common ox; Cuvier and Hamilton Smith having shown that they are those of the *Bos urus*.

The beaver, which exists in small societies on the unfrequented banks of one or two of the great European rivers, was formerly found in Great Britain, but has for many ages ceased to exist here and in the greater part of the Continent. Giraldus Cambrensis, who travelled through Wales in 1188, gives a brief history of its manners; and adds, that in his time it was found only in the river Fervi. Two or three waters in that principality still bear the name of Llyn yr afange, or the beaver lake; attesting the existence of these animals in more than one locality. Pennant mentions having seen two of their supposed haunts; one in the stream that runs through *Nant Francon;* the other in the river Conway, a few miles above Llanrwst; both places having, in all probability, been formerly crossed by beaver dams. Beavers, however, must have been very scarce even in the earliest times; for the laws of Howel Dha, or the Good, fixed the price of their skins at 120 pence each, a great sum in those days. The Welsh call them *Croen Llostlydan*, that is, the broad-tailed animal. Beavers, however, were not confined to Wales: in remote times they must have inhabited Berkshire (*Phil. Tr.* 1759) and different parts of Scotland, their bones having been found in them, in beds of marl and in peat moss.

Such were some of the quadrupeds that once ranged the forests of Britain. Their extirpation, though gradual, has been complete. A great numerical diminution has also taken place in the case of several birds, mostly of the aquatic order, which, though not absolutely banished from our islands, have gradually disappeared even in our own times, and are become either exceedingly rare as natives, or are merely seen as stragglers. Two of the largest birds of game, not only of Britain, but of Europe, are now all but extinct in these kingdoms, although they were pretty abundant in the last century, viz., the *Urogallus Europæus* (Cappercailzie), or great cock of the wood; and the *Otis tarda*, or great bustard. The first is a noble bird, still found in the north of Europe, measuring commonly about 2¾ feet in length, and weighing from 13 to 14 pounds. It seems to have been confined, in these islands, to the fir woods of Ireland and Scotland. In the latter, a specimen was seen so late as 1760, in the woods of Strathglass; and it was found in Strathspey in 1745. Recently, however, it has been again introduced into the forests of Argyll, Perth, and Aberdeen, by the Marquis of Breadalbane and the Earl of Fife: and where it is protected, it succeeds admirably well; but it is too tempting a mark for the poacher to be able to maintain its ground if left to defend itself. The great bustard is a still larger bird, measuring at least 4 feet in length, and weighing about 26 pounds. Pennant says, that in his days (1777) these birds inhabited "most of the open countries of the south and east parts of this island, from Dorsetshire as far as the Wolds in Yorkshire," and were generally found in flocks of fifty or more: but, in 1812, his editor observes, "the breed is now nearly extirpated, except on the downs of Wiltshire, where it is also very scarce." At present we believe it is only to be met with on a particular estate in Norfolk, the proprietor of which, being desirous of preserving a remnant of this

noble indigenous race, prohibits their being shot, upon any pretence, within his domain. In Scotland, owing to the mountainous nature of the country, and the want of open downs, it was always rare, though it has been met with.

To pursue this inquiry into the remaining orders of the animal kingdom would be superfluous, were it possible. Notwithstanding the great number of fish indigenous to our seas and fresh waters, some may possibly have been exterminated, and the larger fish-quadrupeds (such as whales and porpoises) are no longer met with in those latitudes where formerly they were common. Very many species of insects, also, even within the records of entomological science, have been exterminated. A striking instance of this regards the Mellitæa tessellata, *Steph.*, figured by old Pettevir, and described by him as "pretty common in Caen Wood." The Cynthia Hampstediensis, *Steph.*, is likewise similarly mentioned by the same accurate author, who calls it "*Albins Hampstead eye*," where it was caught by this curious person, and is the only one I have yet seen. These instances, among conspicuous and showy insects, make it probable, that when the "great forests round London," and in other parts of the empire, were progressively destroyed, a considerable number of insects of rare and local species shared the same fate. Few persons, not even professed entomologists, are aware of the very narrow limits to which some insects are confined. A species may be in the greatest profusion within, perhaps, two or three acres of ground, beyond which it may never have been seen. In a small brush-wood, in the forest of Urupee, in the province of Bahia, Mr. Swainson met with a new and striking Hesperia, in such profusion that thousands might have been captured. Beyond this spot, however, it was not to be found; nor did he ever meet with a single specimen, before or after, during nearly three years of entomological research in Brazil. There can indeed be no doubt, that the influence of cultivation has lessened the numerical amount and the number of species of native animals, in every department, independent of such as have been exterminated by the chase.

Animals now found in the British Islands, &c.—Let us now consider the actual zoology of Britain, turning to such animals as still inhabit our islands, and either roam at large, as indigenous natives, or thrive and multiply in a state of domestication. The latter, which claim our first attention, are comprised in the following list:—

Quadrupeds.	*Birds.*
Horse.	Peacock.
Ass.	Turkey.
Domestic Ox.	Fowl.
Sheep.	Guineahen.
Goat.	Muscovy Duck.
Pig.	Goose.
Dog.	Tame Swan, and perhaps the
Cat.	Pheasant.

Commencing with the quadrupeds, we perceive that those best fitted for the service of man, whether to lighten his labour, clothe his body, or supply him with food, are abundantly supplied. The plains of

Central Asia are generally supposed to have been the cradle of the human race, whence, as from a centre, the different branches of the primitive family diverged in all directions, slowly, but surely, fulfilling the command, that they should be "fruitful, and multiply, and replenish the earth." With them went "their flocks and herds," and such other creatures as had been provided for their more immediate service. It is natural, however, to suppose that the animals thus following the primitive nomadic tribes would soon acquire a much wider geographical range than man himself. Individuals would be frequently straying from the camp, or lost during a march: thus every tract or region, through which the wandering patriarchs successively passed, received, in all probability, the original stocks of their domestic animals; which for a season might continue wild, yet, by their natural instinct, would return to the haunts of men as soon as colonies were settled near their vicinity. There is, perhaps, no other cause more natural, or probable, to account for the almost universal distribution of these animals over the Old World. We have, also, seen, within the compass of modern history, a similar dispersion take place in the New World, from a similar cause, in regard to the horse, ox, and other animals. Individuals of the first two classes escaped from the settlements of the Spaniards, by whom they were first imported, or were dispersed during their wars; and it was thus, no doubt, that the pampas of Paraguay were filled with the horses and oxen, that are now killed merely for the sake of their hides. These remarks may serve to show the futility of dissertations upon the native country of such species as are now, in fact, naturalized in almost every climate, yet cannot, with certainty, be traced to any one. It is probable, however, that Western Asia was the original seat of the greater part of the quadrupeds and birds in the foregoing list. But the wild ass, mentioned by Persian and Indian travellers as found in this region, is the Dziggetai of the Tartars (Equus Hemionos), the ονος αγριος, or Hemionos of the Greeks, a distinct species; and wild horses have never been seen by any trustworthy traveller. The sheep, however, still inhabits the solitary recesses of the Caucasus; wild dogs exist both in India and Western Asia; and the original stock of our domestic cat has been supposed to have been discovered in Northern Africa by Rüppell. Why the horse should be regarded as "indigenous," merely because "it lives and propagates, nearly in a state of nature, in the Highlands of Scotland," it is not easy to imagine. The pheasant lives and propagates in the Regent's Park, or at least in almost every park throughout England, and should, according to such reasoning, be also regarded as indigenous.

The wild cat of Great Britain is now become of very rare occurrence. Mr. Swainson, indeed, by whom the outline of this article was originally compiled, supposed that he had ascertained that it existed in considerable numbers in the country round Moffat, in Dumfriesshire. But from information subsequently obtained, we incline to think that he was mistaken in this respect, and that the animals he referred to do not belong to the species of the real wild cat, but are merely the domestic race run wild, which is a common enough occurrence in

woody countries. Pennant mentions that, in his time, the wild cat inhabited some of the mountainous and woody parts of England, living mostly in trees, and feeding only by night, when it attacked poultry, kids, and lambs.

Regarding the few remaining quadrupeds of Britain, as the hedgehog, martin, polecat, otter, &c., little can be said applicable to the nature of this work. It is much to be wished, however, that the vulgar prejudices regarding the fancied injuries done by the hedgehog were overcome, for a more useful animal to the farmer can scarcely be named.

The chief of our domestic birds have been originally brought from Asia; the principal exceptions being the turkey, guinea fowl, and musk duck. The peacock, still found wild in different parts of India, and sometimes in great abundance, is, without exception, the most imposing and magnificent of birds. Alexander the Great, who first saw it in vast numbers on the banks of the Hydraotis, was so struck with its surpassing beauty, that he severely punished those by whom it was destroyed. Ælian states that, on its introduction into Greece, it was so highly esteemed, that a male and female were valued by the Athenians at 1,000 drachmæ, or 32*l.* 5*s.* 10*d.* sterling. Peacocks were then domesticated at Samos, where they were preserved about the temple of Juno in that island, as a fit emblem of the queen of the gods. They were great favourites with our ancestors, both as serving for food and ornament. Ernald de Aclent paid a fine to King John of 140 palfreys, with sackbuts, lovains, gilt spurs, and peacocks' crests, "such as would be for his credit." The Romans, also, highly esteemed them for their tables; but at present only the young are eaten, the flesh of the old bird being thought hard and dry. In fact, they are now kept wholly for ornament.

The wild turkey, from which our domestic races have unquestionably sprung, is still found in the more unfrequented tracts of Louisiana, where they live in societies, as do most gallinaceous birds. Audubon has given a long and interesting account of its native manners, to which we must refer the reader. Pennant supposes that turkeys were first seen in France in the reign of Francis I., who died in 1547, and in England in the reign of Henry VIII. The first part of this statement is corroborated by Le Grand d'Aussy, a better authority than Pennant in respect to such matters, who states, that the earliest authentic notice of turkeys in France is in a work of Champier, published in 1560, where it is said they were introduced *ab hinc paucos annos.*—(*Vie Privée des Français*, i. p. 290.) Other writers specify the year 1524 as the date of their introduction into Britain; and about 1585 they began to form one of the dainties at Christmas feasts. Vast quantities are reared in Norfolk and Suffolk, which used to be driven to the London markets in flocks of several hundreds, the drivers managing them with great facility, by means of a bit of red rag tied to the end of a long stick; this, from the antipathy the birds bear to any scarlet colour, effectually answering the purpose of a scourge. They are now, however, mostly killed in the country; and about Christmas, the Norfolk and Suffolk railway coaches for London

are heavily laden with these birds. In a wild state they grow to a much larger size than when domesticated; but the plumage, although somewhat darker, is not materially different.

The domestic fowl is dispersed over almost every nation in temperate and tropical climates. The whole genus, in fact, seems to possess the same character; so that, in the different breeds and crosses which have sprung from them, it is difficult, if not impossible, to say whether they have originated from one or from several stocks. It would appear, however, that the original seat of this family is in Central and Southern Asia; where, even to this day, not one only, but several species are found in a wild state. Colonel Sykes, in an interesting notice of the birds of that part of India called the Deckhan, enumerates three species; but one of these, the gigantic cock (Gallus giganteus, *Tem.*), he regards as having been introduced from Sumatra or Java. Temminck is disposed to trace our domestic fowl to the Bankiva cock (Gallus Bankiva), which inhabits the woods of Java. Others suppose that the jungle cock (Gallus Sonneratii) is the parent of our common breed of poultry. The most general opinion, however, is, that the domestic cock (the Phasianus gallus cristatus of Linnæus) is a distinct species; and Colonel Sykes, who investigated the question upon the spot, states, that "the domestic fowl is so abundant in the Deckhan, that in parts of the country not much frequented by Europeans he has bought from 8 to 12 full-grown fowls for 2*s*. Many of the hens, particularly of the villages in the Ghauts, *are not to be* distinguished from the wild birds, excepting only in the want of the cartilaginous spot on the wing-covers."

The Guinea hen (Numida meleagris) is the only one of our domestic birds introduced from Africa; being almost confined to the western or tropical regions of that continent. Guinea fowl are the Meleagrides, or Gallinæ numidicæ, of Athenæus and other ancient writers. According to Barbot, who calls them Pintadas, they are found in flocks of 200 or 300: when at rest, they perch upon trees, their food consisting chiefly of worms and grasshoppers, which they search for in marshes and morasses: they feed, however, also upon seeds. They were in great request among the Romans, who served them at their banquets; and though, from their quarrelsome disposition, they are not very generally brought into our farmyards, they are but little inferior in flavour to the pheasant. But the difficulty of rearing them operates against their becoming so common as the domestic fowl.

The pheasant (Phasianus colchicus, *Lin.*) derives its name from Phasis, one of the chief rivers of Colchis, whence the species is supposed to have been introduced into Europe, about the æra of the Argonauts. But, be this as it may, those birds were much sought for, and are now generally distributed over central and southern Europe. It seems, however, even in Italy, to be confined to parks and preserves; for its size and value, as a bird of game, would soon operate to its extermination, were it not protected. The ringed pheasant is supposed by some to be a variety, and by others a distinct species. The common partridge (Perdix cinerea) is a well-known native; but that

usually termed the red-legged, or Guernsey species (Perdix rufa), has been introduced from that island and from the coast of France. It has become common in several preserves, especially in those near Orford, in Suffolk, belonging to the Marquis of Hertford. Bewick, indeed, affirms that in some of the eastern counties of England the individuals of this species are more numerous than those of the native breed; but this is doubtful. It is bad game, inasmuch as it runs along the ground, and does not rise before the dogs. Like the silver pheasant, too, it beats away the common species from its haunts: so that most gentlemen by whom it had been patronized are now taking measures for its extirpation.

Of our aquatic birds, the two principal species, the duck and the goose, are indigenous; of the former family, the musk duck, we believe, is the only one which breeds with any facility in a state of domestication, although many efforts have been made to render the teal, the Carolina summer duck, and others, equally familiar and prolific. The musk duck is valuable from its superior size; and, although frequently called the *Muscovy*, was, in fact, originally brought from South America. Muscovy is doubtless a corruption of musk, originating in an erroneous opinion of its native country. These birds are not so common among us as formerly, though their flesh is good, and they are very prolific of eggs.

The swan of our preserves and rivers is a different species from that which is occasionally seen wild in the north of Britain. It is said that it originally came from eastern Europe, but this is very uncertain. Nearly all the varieties of the swan genus are white, and resemble each other so closely, that not even the eye of a naturalist can immediately detect their specific differences; and hence the impossibility of ascertaining which were known to the ancients, or assigning a correct name to such as are incidentally mentioned by old writers. The tame swan is chiefly known from the wild by the difference in its bill, and by having thereon a hard black knob at the upper base. In former times the swan was a conspicuous dish at great regal feasts: and according to Pennant, when he wrote (in 1777), cygnets, or young swans, were fattened at Norwich about Christmas, and sold for a guinea a-piece. These birds were formerly held in so much estimation that, by an act of Edw. IV., no one, unless he possessed a freehold of the clear annual value of 5 marks, was permitted to keep them; and by the 11th of Henry VII., cap. 17, the punishment for taking their eggs was imprisonment for a year and a day, and a fine, at the king's will. Though at present they are not so much valued as an article of food, they are still preserved, for their great beauty, on several of our rivers, particularly on the Thames and Trent; but nowhere, as Pennant observes, in greater quantity than on the saltwater inlet of the sea near Abbotsbury, in Dorsetshire.

There appear to be good grounds for doubting whether there be a single foreign quadruped whose introduction would, in an economical point of view, be advantageous. But with respect to foreign birds, there are a few, the introduction of which might be ornamental; and the naturalization of some of the larger breeds would probably be a desirable addition to our present stock of poultry. The gigantic cock

(Gallus giganteus), for instance, is nearly twice the size of our ordinary species, and is, we believe, equally easy of domestication. Temminck states, that it is not uncommon in the farmyards of southern Europe, particularly near Padua, where it grows to an immense size, often exceeding ten pounds in weight. In a wild state, this gigantic race, like most of its family, is found in the forests of India, and it has the singular peculiarity of resting on the first joint of the leg: how far its fecundity may place it on a level with the common fowl, is not exactly known. The family of Curassow birds (Craxidæ V.) comprises, with the exception of the turkey, nearly all the indigenous domestic poultry of South America. They are not only large-sized (that is, between the fowl and the turkey), but very prolific and sociable. Nothing, however, has yet been accomplished in the way of introducing those strangers into our poultry-yards or preserves; though they are by no means uncommon, in such situations, upon the Continent. Temminck assures us that, in many menageries in Holland, the curassow birds are as familiar as the common poultry. Ameshoff, by bestowing proper care upon them, bred several of the species with great success: the Crax rubra and the Crax pauxi, among others, produced as numerously, under this gentleman's management, as our common domestic fowls. The flesh of the young is white, and of exquisite flavour, being superior to that of the pintado or the pheasant. Happily, however, we are in no absolute need of these birds. A very large species of fowls, of the size of small turkeys, is found in the neighbourhood of Dublin; and Dublin crammed fowls are celebrated all over Ireland.

On the actual State of Great Britain, as regards its indigenous Animals.

It has been the practice of some writers to give a much more limited definition of the term *indigenous* than we think it fairly entitled to. An indigenous animal, with them, is one which lives and dies in the same country, never quitting it, either for food or a warmer temperature; hence, in their divisions of summer residents, occasional visiters, and stragglers, we occasionally find birds as truly British as the common sparrow. To prevent therefore, any misconception of our statements, it may be premised, that, by *indigenous*, we mean not only such birds as live and breed in these islands, but such also as are found with us during only a portion of the year. Such residence is obviously a part of their natural economy; for they cannot dispense with that law of nature which compels them, as it were, to leave their former residence, and come to us. They are, therefore, to all intents and purposes, as strictly native as the swallow, which passes his winter, like so many members of our aristocracy, in a warmer climate, but who are not on that account considered foreigners. This being premised, we shall lay before the reader a list sufficiently accurate for our present purpose, of the quadrupeds and birds of Britain, stating the nature of their food, and the means of supply they possess. To do the same with the insects, and the lower animals would, from their vast numbers, be impossible; but some general remarks upon them will conclude the survey of British animals.

Our indigenous quadrupeds amount to about 37, which we shall enumerate in the following list, in the natural orders wherein they have been scientifically arranged:—

Order I.—QUADRUMANA. *Cuv.* *Four-handed Quadrupeds.* Food.

Bats.
Ronolphus ferrum equinum. Horse-shoe Bat.
——— minutus. Lesser Horse-shoe Bat.
Plecotus auritus. Long-eared Bat.
——— barbastellus. Barbastel Bat.
Vespertilio serotinus. Serotine Bat.
——— Nattererii. Natterer's Bat.

Order II. FERÆ. *Rapacious Quadrupeds.*

Erinaceus Europæus. Common Hedge-hog.
Sorex araneus. Common Shrew.
——— fodiens. Water Shrew.
Talpa Europæa. European Mole.
Meles vulgaris. Common Badger.
Mustela vulgaris. Common Weasel.
——— putorius. Polecat.
Mustela erminea. Stoat or Ermine.
Martes fagorum, *Ray*. Beech Marten.
——— abietum. Pine Marten.
Lutra vulgaris. Common Otter.
Canis vulpes. Fox.
Felis sylvestris. Wild Cat.
Phoca vitulina. Common Seal.
——— barbata. Bearded or great Seal.

Order III. CETACEA. *Whales.*

Balænoptera musculus. Round-lipped Whale. *Fish.*
——— boops. Sharp-lipped Whale. *Fish.*
——— rostrata. Snout Whale. *Fish.*
Physalis vulgaris. Razor-back Whale.
Balæna mysticetus. Common Whale.
Delphinus phocæna. Porpoise. *Fish.*
——— Orca. Grampus. *Fish.*
——— melas. Ground Grampus. *Fish.*
——— Delphis. Common Dolphin. *Fish.*
Delphinus tursio. Blunt-toothed Dolphin. *Fish.*
Delphinoptera albicans. Whitish Grampus.
Hyperoodon bidens. Double-toothed Grampus.
Monodon monoceros. Narwal. *Fish.*
Physeter tursio. Flat-toothed Finner. *Fish.*
——— microps. Spermaceti Whale. *Fish.*
Catodon macrocephalus. Cachalot Whale.

Order IV. GLIRES. *Gnawers.*

Mus musculus. Common Mouse.
—— sylvaticus. Field Mouse.
—— messorius. Harvest Mouse.
—— rattus. Black Rat.
—— decumanus. Norway Rat.
Myoxus avellanarius. Dormouse.
Arvicola aquatica. Water Rat.
——— agrestis. Field Mouse.
Sciurus vulgaris. Common Squirrel.
Lepus timidus. Hare.
——— variabilis. Alpine Hare.
——— cuniculus. Rabbit.

Order V. UNGULATA. *Hoofed Quadrupeds.*

The Horse, Ox, Boar, Sheep, and Goat, strictly belong to this order; but, as these animals are only found in a state of domestication, they are omitted in the present list, being fully treated of in another part of this work.
Cervus elaphus. Stag.
Dama Europæus. Fallow Deer.
Capreolus Europæus. European Roe.

By this list, it appears that our indigenous land quadrupeds amount to 37, while those fish-like species, inhabiting the sea, are 16: of the latter we shall take no account in the subsequent remarks, because we cannot extend the same investigation to the fishes, upon which nearly all the aquatic quadrupeds almost entirely subsist. On looking over this table, we perceive a remarkable disproportion in the number of carnivorous or bird-catching species, compared to such as are herbivorous; so that, however extraordinary it may appear, we may safely

affirm that nearly half our native quadrupeds are ferocious; for it is the habit, and not the size, of an animal which confers this character; and it is well known that the weasel is more blood-thirsty and cruel than even the tiger. In what manner, then, are we to account for this unusually large proportion of such quadrupeds? Simply by the fact of the great abundance of their prey, that is, of the birds and insects inhabiting these islands. The same relation may be traced between the larger carnivorous and herbivorous species: the former originally comprised, as we have seen, vast numbers of wolves, which preyed upon the deer, roebuck, and goat; but while the latter have almost disappeared from the open country, their enemies have been totally extirpated. Cultivation, in fact, has nearly annihilated both; for man has not only destroyed the wolves, but has broken up the pastures which supplied food to the animals which they persecuted; the latter being now found only in preserves or in mountain districts. During summer, when insects abound, bats are abroad, constantly thinning their numbers in their twilight excursions; but when their services, in this respect, are no longer wanted, these insect-eaters retire to their winter-nooks, and pass the rest of the year in sleep. Foxes not only suck eggs and destroy birds, like stoats, weasels, and martens, but they are the natural enemies of the hare and rabbit; so that here again we see balanced the demand and the supply of food. Of the granivorous quadrupeds, or such as more especially live upon nuts, fruits, and grain, we have eight or nine species, whose food is supplied by the various products of our fields and woods. Allied in analogy to these animals, but essentially distinct from them, is the mole, a carnivorous quadruped, more numerously and widely spread than perhaps any other; and the reason is that the earth-worms, on which the mole principally feeds, are more universally distributed, and in far greater numbers than any other animal. There can be no doubt that squirrels, at one time, abounded in all our woods, for we have no more common tree than the hazel nut, and the only two vertebrated animals which are known to make this fruit their chief repast are the squirrel and the nuthatch. No reasonable cause can be discovered for the diminution of the latter; but the squirrel is persecuted and destroyed by game-keepers, who erroneously imagine that squirrels, like stoats, suck the eggs and feed upon the young of partridges and pheasants. The vast number of oak trees found in Britain supplied abundance of food to the wild boars, with which our island was formerly stocked. But here man has been at work, and, having destroyed the wild boar, has created an anomaly which did not originally exist. Every autumn, thousands upon thousands of oaks scatter a plentiful supply of acorns; but the denizens of the forest, for whose support this repast was intended, having long since been exterminated, the acorns are now only gathered by the cottager for his tame pig, or are eaten by the hogs permitted, in autumn, to leave their sties, and grub among the fallen leaves of the neighbouring oaks.

Our native *birds* are arranged in the following list, according to their natural affinities:—

Order I. Raptores. *Birds of Prey.*

1. Aquila chrysaëtos. Golden Eagle.
2. ——— albicilla. Cinereous Eagle.
3. ——— halietus, Osprey or Fishing Eagle.
4. Falco Islandicus. Gyr Falcon.
5. —— peregrinus. Peregrine Falcon.
6. —— Subbuteo. Hobby.
7. —— Æsalon. Merlin.
8. —— Tinnunculus. Kestril.
9. Accipiter pulumbarius. Goshawk.
10. ——— Nisus. Sparrow Hawk.
11. Circus æruginosus. Moor Buzzard.
12. ——— cyaneus Hen Harrier.
13. Circus cinerarius. Ash-coloured Harrier.
14. Strix Bubo. Great Horned Owl.
15. —— otus. Long-eared Owl.
16. —— brachiotus. Short-eared Owl.
17. —— Scops. Little Owl.
18. —— nyctea. Snowy Owl.
19. —— flammea. Barn Owl.
20. —— stridula. Wood Owl.
21. —— passerina. Little Owl.
22. —— Tengmalmi. Tengmalm's Owl.

Order II. Insessores. *Perching Birds.*

Tribe Dentirostres. *Tooth-billed Tribe.*

23. Muscicapa atricapilla. Pied Fly-catcher.
24. ——— grisola. Spotted Fly-catcher.
25. Lanius excubitor. Great Ash Shrike.
26. ——— Collurio. Rufous-backed Shrike.
27. ——— rutilus. Woodchat.
28. Oriolus Galbula. Golden Oriole.
29. Merula atrata. Blackbird.
30. ——— torquata. Ring Ouzel.
31. ——— iliaca. Redwing.
32. ——— pilaris. Fieldfare.
33. ——— musica. Song Thrush.
34. ——— viscivora. Missel Thrush.
35. Cinclus aquaticus. Water Ouzel.
36. Bombycilla garrula. Chatterer.
37. Saxicola Œnanthe. Wheatear.
38. ——— rubetra. Whinchat.
39. ——— rubicola. Stonechat.
40. Erythica rubecula, *Sw.* Robin.
41. Phœnicura. Redstart.
42. ——— (Gould's species.)
43. ——— Succica. Blue-breasted Warbler.
44. Philomela Luscinia, *Sw.* Nightingale.
45. ——— atricapilla. Blackcap.
46. ——— hortensis. Greater Pettichaps.
47. ——— Hippolais. Lesser Pettichaps.
48. ——— cinerea. Whitethroat.
49. ——— sylviella. Lesser Whitethroat
50. Curruca salicaria. Sedge Warbler.
51. ——— Locustella. Grasshopper Warbler.
52. ——— arundinacea. Reed Warbler.
53. Sylvia provincialis. Dartford Warbler.
54. Sylvia Regulus. Gold-crested Warbler.
55. —— Trochilus. Willow Wren.
56. —— sylvicola. Wood Wren.
57. Parus Major. Great Tit.
58. —— cæruleus. Blue Tit.
59. —— palustris. Marsh Tit.
60. —— ater Coal Tit.
61. —— cristatus. Crested Tit.
62. —— caudatus. Long-tailed Tit.
63. —— biarmicus. Bearded Tit.
64. Accentor alpinus. Alpine Accentor.
65. ——— modularis. Hedge Accentor.
66. Motacilla alba. Pied Wagtail.
67. ——— boarula. Grey Wagtail.
68. ——— flava. Yellow Wagtail.
69. Anthus pratensis. Titlark.
70. — —— petrosus. Shore Lark.
71. ——— minor. Field Lark.
72. ——— Richardii. Richard's Lark.

Tribe Conirostres. *Conic-billed Birds.*

73. Alauda arborea. Woodlark.
74. ——— arvensis. Skylark.
75. Plectrophanes Lapponica. Lapland Longspur.
76. Emberiza nivalis. Snow Bunting.
77. ——— miliaria. Common Bunting.
78. ——— citrinella. Yellow Hammer.
79. ——— Schœniclus. Reed Bunting.
80. ——— Cirlus. Cirl Bunting.
81. ——— hortulana. Ortolan Bunting.
82. Pyrgita domestica. Common Sparrow.
83. ——— montana. Tree Sparrow.
84. Fringilla cœlebs. Chaffinch.
85. ——— montifringilla. Brambling.
86. Coccothraustes Europæus. Hawfinch.
87. Linaria chloris, *Sw* Green Linnet.

88. Linaria Linota. Linnet.
89. ——— cannabina. Great Redpole.
90. ——— minor. Lesser Redpole.
91. ——— montium. Twite Linnet.
92. Carduelis Europæus. Goldfinch.
93. ——— spinus. Siskin.
94. Pyrrhula enucleator. Pine Grosbeak.
95. ——— Europæa. European Bullfinch.
96. Loxia curvirostra. Crossbill.
97. Sturnus vulgaris. Common Starling.
98. Pastor roseus. Rose Pastor.
99. Corvus Corax. Raven.
100. ——— Corone. Crow.
101. ——— frugilegus. Rook.
102. ——— Cornix. Hooded Crow.
103. ——— Monedula. Jackdaw.
104. ——— Pica. Magpie.
105. Nucifraga Europæa. Nutcracker.
106. Garrulus glandarius. Magpie.

Tribe Scansores. *Climbers.*

107. Cuculus canorus. Cuckoo.
108. Dryotomus martius, *Sw.* Black Woodpecker.
109. Dendrocopus major, *Sw.* Greater Spotted Woodpecker.
110. ——— minor, *Sw.* Lesser Spotted Woodpecker.
111. Chrysoptilus viridis, *Sw.* Green Woodpecker.
112. Yunx Torquilla. Wryneck.
113. Sitta Europæa. Nuthatch.
114. Certhia familiaris. Common Creeper.
115. Troglodytes Europæus. Wren.

Tribe Tenuirostres. *Suctorial Birds.*

116. Upupa Epops. Hoopoe.

Tribe Fissirostres. *Wide-mouthed Birds.*

117. Merops apiaster. European Bee-eater.
118. Alcedo ispida. Kingfisher.
119. Hirundo rustica. Swallow.
120. ——— urbica. Martin.
121. ——— riparia. Sand Martin.
122. Cypselus murarius. Swift.
123. Caprimulgus Europæus. Nightjar. Fern Owl.

Order III. Rasores. *Gallinaceous Birds.*

124. Columba Œnas. Stockdove.
125. ——— Livia. Rock Pigeon.
126. ——— Palumbus. Wood Pigeon.
127. ——— Turtur. Turtle Dove.
128. Lagopus Scoticus. Red Grouse.
129. ——— Ptarmigan.
130. Lyrurus Tetrix, *Sw.* Black Grouse.
131. Perdix cinerea. Common Partridge.
132. Perdix rufa. Red-legged Partridge.
133. Coturnix Europæus. Quail.
134. Otis tarda. Great Bustard.
135. —— Tetrax. Little Bustard.
136. Œdicnemus crepitans. Thick-kneed Bustard.
137. Cursorius Isabellinus. Cream-coloured Plover.

Order IV. Grallatores. *Wading Birds.*

138. Platalea leucorodia. White Spoonbill.
139. Ciconia Europæa. Common Crane.
40. ——— alba. White Stork.
141. ——— nigra. Black Stork.
142. Ardea major. Common Heron.
143. ——— alba. Great White Heron.
144. ——— Gazetta. Egret.
145. ——— æquinoctialis. Little White Heron.
146. Nycticorax. Night Heron.
147. ——— Caspica. African or Purple Heron.
148. Butor Stellaris. Common Bittern.
149. ——— comata. Squacco Heron.
150. ——— minuta. Little Bittern.
151. Tantalus igneus. Glossy Ibis.
152. Numenius arquata. Curlew.
153. ——— Phæopus. Whimbrel.
154. Rusticola Europæa. Woodcock.
155 Scolopax major. Great Snipe.
156. ——— Sabini. Sabine's Snipe.
157. Scolopax Gallinago. Common Snipe.
158. ——— Gallinula. Jack Snipe.
159. ——— grisea. Brown Snipe.
160. Limosa ægocephala. Bartailed Godwit.
161. ——— melanura. Blacktailed Godwit.
162. Tringa canutus. Knot.
163. ——— maritima. Purple Sandpiper.
164. ——— pygmæa. Pygmy Sandpiper.
165. ——— rufescens. Buff-breasted Sandpiper.
166. ——— alpina. Purre.
167. ——— pusilla. Little Sandpiper.
168. ——— Temminckii. Temminck's Sandpiper.
169. ——— pugnax. Ruffe.
170. Totanis glottus. Greenshank.
171. ——— fuscus. Spotted Redshank.

172. Totanis calidris. Redshank.
173. ——— ochropus. Green Sandpiper.
174. ——— glareola. Wood Sandpiper.
175. ——— macularius. Spotted Sandpiper.
176. ——— hypoleucas. Common Sandpiper.
177. Strepsilas collaris. Turnstone.
178. Vanellas cristatus. Lapwing.
179. ——— malanogaster. Grey Lapwing.
180. ——— Calidris arenaria. Sanderling.
181. Charadrius pluvialis. Golden Plover.
182. ——— morinellus. Dottrel.
183. ——— hiaticula. Ring Plover.
184. ——— Cantiana. Kentish Plover.
185. Himantopus melanopterous. Long-legged Plover.
186. Recurvirostra Avocetta. Avoset.
187. Hæmatopus Ostralegus. Oyster-catcher.
188. Rallus aquaticus. Water Rail.
189. Gallinula crex. Landrail.
190. ——— chloropus. Waterhen.
191. ——— Porzana. Spotted Waterhen.
192. ——— Baillonii. Little Gallinule.
193. ——— pusilla. Olivaceous Gallinule.
194. Phalaropus hyperboreus. Red Phalarope.
195. ——— lobatus. Grey Phalarope.
196. Fulica atra. Common Coot.

Order V. NATATORES. *Swimming Birds.*

197. Boschas domestica, *Sw.* Wild Duck.
198. ——— crecca, *Sw.* Teal.
199. ——— querquedula, *Sw.* Garganey.
200. ——— bimaculata, *Sw.* Bimaculated Teal.
201. Anai clypeata, *L.* Shoveller.
202. Chauliodes Strepera, *Sw.* Gadwall.
203. Dafila caudacuta, *Leach.* Pintail.
204. Tadorna Europæa. Sheldrake.
205. ——— rutila, *Steph.* Ruddy Sheldrake.
206. Macera Penelope, *Selby.* Common Widgeon.
207. Somateria mollissima, *Leach.* Eider.
208. ——— spectabilis. King Eider.
209. Oidemia fusca. Velvet Scoter.
210. ——— perspicillata. Surf Scoter.
211. Fuligula ferina. Red-headed Pochard.
212. ——— rufina. Red-crested Pochard.
213. ——— nyroca. White-eyed Pochard.
214. ——— marila. Scoup Pochard.
215. ——— cristata. Tufted Pochard.
216. ——— dispar. Western Pochard.
217. Harelda glacialis. Long-tailed Duck.
218. Clangula vulgaris. Golden-eye.
219. ——— histrionica. Harlequin Golden-eye.
220. Mergus merganser. Goosander.
221. ——— serrator. Red-breasted Merganser.
222. ——— cucullatus. Hooded Merganser.
223. ——— albellus. Smew.
224. Anser palustris. Greylag Goose.
225. ——— ferus. Bean Goose
226. ——— erythropus. White-fronted Goose.
227. ——— leucopsis. Barnacle Goose.
228. ——— bernicla. Brent Goose.
229. ——— ruficollis. Red-breasted Goose.
230. Cygnus ferus. Whistling Swan.
231. ——— Bewickii. Bewick's Swan.
232. Podiceps cristatus. Crested Grebe.
233. ——— rubicollis. Red-necked Grebe.
234. ——— cornutus. Sclavonian Grebe.
235. Podiceps auritus. Eared Grebe.
236. ——— minor. Little Grebe.
237. Colymbus glacialis. Great Diver.
238. ——— arcticus. Black-throated Diver.
239. ——— septentrionalis. Red Diver.
240. Uria Troile. Foolish Guillemot.
241. ——— Grylle. Black Guillemot.
242. Mergulus melanoleucos. Common Rotche, *Selby.*
243. Alca impennis. Great Auk.
244. ——— Torda. Razorbill Auk.
245. Mormon arctica, *Illiger.* Common Puffin.
246. Carbo cormoranus Common Cormorant.
247. ——— cristatus. Crested Shag.
248 Sula Bassana Solan Gannet.
249. Sterna Caspica. Caspian Tern.
250. ——— Boysii. Sandwich Tern.
251. ——— Hirundo. Common Tern.
252. ——— Dougallii. Roseate Tern.
253. ——— arctica. Arctic Tern.
254. ——— minuta. Lesser Tern.

255. Sterna nigra. Black Tern.
256. ——— anglica. Gull-billed Tern.
257. Larus minutus. Little Gull.
258 ——— ridibundus. Laughing Gull.
259. ——— canus. Grey or common Gull.
260. ——— rissa. Kittiwake Gull.
261. ——— eburneus. Ivory Gull.
262. ——— glaucus. Glaucous Gull.
263. ——— Islandicus. Iceland Gull.
264. ——— argentatus. Herring Gull.
265. ——— marinus. Great Black-backed Gull.
266. ——— fuscus. Lesser Black-backed Gull.
267. Lestris Cataractes. Common Black-bearded Jager.
268. ——— pomarinus. Pomarine Jager.
269. ——— parasiticus. Arctic Jager.
270. Procellaria glacialis. Fulmar Petrel.
271. ——————— Puffinus. Cinereous Puffin.
272. ——————— Anglorum. Manx Puffin.
273. Thalassidroma pelagica, *Vig.* Common Storm Petrel.
274. ——————— Leachii. Leach's Storm Petrel.

No less than 274 species of birds are thus seen to be natives, or visiters, of Britain, putting aside several others that have been occasionally seen as stragglers, but which properly belong to the fauna of America. If we separate these into groups, according to the nature of their food, we shall have some curious results. First, there are 22 large and 3 small-sized rapacious species, or such as feed not only upon small quadrupeds, but also upon other birds. We should add to these, also, the cŭckoo; because, though it does not actually kill and eat, as do hawks, owls, and shrikes, yet it destroys, and materially checks, the increase of the smaller birds, by its extraordinary habit of dispossessing them of their legitimate offspring and substituting its own. We shall thus have one rapacious species for ten that are not, and whose food consists of insects, seeds, or fishes. The land and water birds (considering the waders as coming under the latter denomination) are nearly equal in point of species, there being 137 of the former and 136 of the latter. This equality is never found but in the ornithology of moderate-sized islands, where there is a great extent of coast, and the land not so near to the adjacent continent as to permit the free passage of the ordinary perching birds. In all this there is a beautiful harmony, the shores of every region being peopled with their proportionate number of feathered inhabitants, and producing for their use, by the rise and ebb of the tides, a constant and varied supply of food in the shape of marine animals. On looking, again, to those which inhabit the land, we find that out of 137, only 14 feed exclusively upon berries and seeds. This certainly appears, at first sight, an unequal and an unnatural proportion; seeing that our woods, hedges, and fields, supply such quantities of berries, seeds, and grain. But this plentiful supply of vegetable food is not produced in vain, nor is it left to useless decay. Those birds, stationary in our island, which, during summer, thin the ranks of the insect world, would perish in winter from sheer hunger, had they not, at that season, an appetite for vegetable rather than for animal food. We accordingly find that, as soon as autumn approaches and insects become scarce, blackbirds, thrushes, and various other perchers, sustain themselves during winter on the hips and haws of our hedges, and the innumerable seeds left on the fallow lands and on hedge-banks; the crow genus alone, by their powerful bills, being able to break the half-frozen ground, and search for insects concealed beneath its surface. It must be remembered, also, that although the

finch tribe are insectivorous, yet that, during winter, their chief, if not only, food consists of seeds; and that other stationary birds, especially adapted, by their structure, for insect destroyers, subsist, during winter, upon the produce of the vegetable world. The robin and the hedge-sparrow are striking examples of this; both are insectivorous, but not being migratory, they subsist, during the colder months, on seeds and berries. We have said that England is both naturally and artificially a peculiarly woody country; but such being the case, how comes it that we have so few of that family of birds, especially adapted, both from their structure and economy, to live among trees, namely, the woodpeckers? Eight only are found in the whole of Europe, and of these four, or rather, perhaps, only three, belong to us. We must, however, look not to the *habitation*, but to the peculiar food, of these birds. The majority of woodpeckers feed on the larvæ or adults of such insects as live on the wood of trees and perforate its substance. These chiefly belong to the tribe of the Capricornes, or long-horned beetles, which, though abundant in tropical regions, are very scantily distributed in temperate latitudes, and are very rare in Europe. Hence it is not enough for woodpeckers that they should have plenty of forest range, but that the trees composing such forests should produce a sufficient supply of their peculiar food. The scarcity of the latter in Europe, and more especially in Britain, fully accounts for the paucity of our woodpeckers, one species of which (the great black woodpecker) is almost extinct, while another feeds both upon fruits and ants; thus reducing our actual efficient number to two, and these very small. But in no department of our fauna is the dependence of one set of animals on another more conspicuous than in the economy of the purely insectivorous birds, composing the genera Saxicola, Phœnicura, Philomele, Lanius, Curruca, Sylvia, Musicapa, Hirundo, and Caprimulgus. The major part of these are summer visiters, coming to these islands for the purpose of breeding, and quitting them in the autumn. They comprise between 27 and 30 species, and, as more than half are common, they must amount, collectively, to many hundreds of thousands. The number of insects which such a countless host daily require for their subsistence is almost beyond belief: some idea, however, may be formed by supposing that each bird, upon an average, captures 150 insects a day, or about 14 an hour; a number, we are persuaded, much below the reality. 100,000 birds would thus require a daily supply of 15,000,000 insects! But these hosts of birds do not come at once, or in immense divisions; for that would be inconsistent with the progressive appearance of the different insects. Each species, therefore, chooses its own time and its own route: as the advancing summer warms into life new tribes of insects, produced in our hedges, woods, and meadows, so do other parties of summer birds arrive; and these detachments continue to come, until the whole country has poured forth its insect inhabitants, and there is an abundant supply both for our residents and our visiters. We were particularly struck with the opposite circumstances while travelling from Calais to Paris. During the whole journey, we did not see, at the very most, more than 20 birds, including 2 or 3 crows, and about as many hawks; while, had there been more, there was scarcely a tree, thicket,

or hedge to shelter them, or to furnish them with the means of subsistence. But let any one traverse the same extent of country in Britain, along our hedged and often shady roads, and he will most likely count 20 species of birds in a single hour! It is immaterial how this remarkable inequality in the distribution of birds, in the two countries, has originated. Man, indeed, may change the face of nature, but he has no control over the effects which attend such changes. He cannot clear a country of wood, and yet retain all its brute inhabitants: and, if he destroy trees, he at the same time annihilates the insects which fed upon their leaves, and scares away the birds which found shelter in their branches. There are some instances worth adverting to of these changes in the distribution of our native birds. More water-fowl were formerly found in the fens than anywhere else in Europe; and the capture of the birds, especially of wild ducks, gave a large annual revenue to the proprietors. The fens, however, have of late years been mostly drained and cultivated: the birds have consequently deserted them, and probably they do not now furnish a fiftieth part of the number formerly captured. At no remote period, the Manx puffin (Procellaria Puffinus, *Lath.*) resorted in great numbers to the Calf of Man, a small islet to the south of the main island, and only divided from it by a narrow channel. It has since, however, deserted the islet, from which it was supposed to have been driven by the too great destruction of its young. These were held in considerable estimation; and Pennant mentions that, in his day, great numbers of them were taken during the breeding season by the person who farmed the islet. But, it appears, that rats, which had escaped from a vessel wrecked on the coast, were the real exterminators of the birds.—(*Quayle's Survey of the Isle of Man*, p. 8.)

We are unable, from want of space, to enter into any details regarding the fishes and fisheries of Britain; and we regret this the less, as the practical details in relation to the fisheries will be given in a subsequent part of this work. Whales were once much more abundant upon our northern coasts than now, when the appearance of a solitary straggler is considered a remarkable occurrence. Perhaps, also, our pilchard fishery is less productive than formerly. We may, however, still say of it, as was said by Dr. Borlase, in 1768, that "it employs a great number of men on the sea, training them thereby to naval affairs; and that it employs many men, women, and children, on land, in salting, pressing, washing, and cleansing, the fish, and in making boats, nets, ropes, casks, and all trades depending on their construction and sale. The poor are fed with the offals of the captures, the land with the refuse of the fish and salt; the merchant finds the gains of commission and honest commerce, the fisherman the gains of the fish. Ships are often freighted hither with salt, and into foreign countries with the fish, carrying off, at the same time, part of our tin." (For an account of the present state of the pilchard fishery, see article on Fisheries.)

The herring is one of the most valuable and abundant of our native fishes. Its fishery is of great antiquity: the Dutch appear to have been the first who engaged in it, about the year 1164; and it continued in their possession for several centuries. At length, however, its value became so apparent, and, we may add, exaggerated, that it gave rise to

much contention between them and the English. The salmon fisheries are chiefly confined to the rivers of Scotland and Ireland. It is only necessary farther to state, that few islands in this hemisphere have so varied and plentiful a supply of fish as Great Britain. The total number of species, both sea and freshwater, amounts to upwards of 170.

In the order of Reptiles, our islands are fortunately very deficient. The hawksbill turtle has occasionally been found wandering near our northern coasts; and Borlase mentions two instances of the coriaceous turtle having been caught on the western shores. Of the family of lizards, one species only, the Lacerta agilis, is admitted by some authors; others, like Ray, consider that under this name are included four or five distinct species (see *Linn. Tr.* vol. v. p. 49), a supposition much more probable than the first. These little creatures are, however, extremely rare. The efts, on the contrary, are common: two species inhabit our clear ponds, where they may be seen swimming about in summer, while the other is strictly terrestrial, and is met with at the roots of thick rank weeds, growing on the side of walls, or among rubbish.

The only Serpents are,—1. the common snake; 2. the viper; 3. the blindworm; and, 4. the Dumfries snake of Sowerby. The first is harmless, and never exceeds 4 feet in length. Although habitually inhabiting the land, it sometimes enters the water, and swims with facility. We remember to have read of two or three instances where snakes have been found crossing an arm of the sea on the coast of Wales. Considering its fecundity (for it lays from 10 to 20 eggs), it is surprising that the snake is not more frequent; but it has a deadly enemy in the hedgehog, which, as Dr. Buckland has proved, feeds upon this reptile: thus establishing by fact, what we should have inferred from theory, that as the hedgehog, in its own tribe, represents the real hog in the order of Ungulata, so there should be some striking point of agreement between them. The Dumfries snake is small, and is probably the same species as the Coluber Austriacus of the Continent. The viper is the only animal whose bite is poisonous: there are three or four prominent varieties, which some have considered different species; though Dr. Leach (*Nat. Mis.*) seems to regard them as one only. Lastly, the Anguis fragilis, or blindworm, is also of rare occurrence, and probably derives its name from the smallness of its eyes: the body is greyish, with two dark brown stripes upon the back; the belly also is brown; and the usual length of the animal is a foot. Of the batracian reptiles, or true Amphibia, our list is equally scanty, comprising only the frog, toad, and natterjack: all perfectly harmless, useful in the economy of nature, and serviceable even to man: they feed upon slugs, worms, and insects, and, instead of being despised and persecuted, should be protected and encouraged both by the agriculturist and the gardener.

Considering the northerly situation of these islands, the number of marine shell-fish found on our coasts is considerable, though much inferior, in size and variety, to those of the warm shores of the Mediterranean. There are few of any size or beauty, except indeed the Pectens, whose vivid and varied colours equal those of any country in the world. The orange-mouthed Whelk is the largest univalve or

spiral species, and the great Pecten is the largest bivalve, being much superior to the common oyster. The latter, however, is by far the most important of our shell-fish. In antiquity Britain was so celebrated for oysters, that they were sent to Rome, a fact attested by more than one of the Roman poets: the epicures of the imperial city had their layers or stews for oysters, as we have at present, in the open sea. According to Pliny (*Hist. Nat.* lib. ix. c. 54), the oyster reservoirs were first made by Sergius Orata, not for the gratification of his palate, but as a speculation, by which he realized large profits. The ancients ate oysters, as we do, either raw or roasted; but they had also a way of stewing them with mallows and docks, and sometimes with fish. There is a curious account of the treatment of oysters in Sprat's History of the Royal Society, an abstract of which may be found in Pennant's Zoology. We shall give some notices of the present state of the oyster trade in the article on fisheries.

It may be worth while, perhaps, to mention that pearls have occasionally been found in a large mussel (Unio margaritifera), that inhabits some of our northern and more rapid rivers. Suetonius states that among the motives that induced Julius Cæsar to undertake the invasion of Great Britain, was his wish to become master of the pearls with which it was supposed to abound (*Sueton. Vit. Jul. Cæsar*, c. 47); and as the Romans set an exceedingly high value on pearls, it is probable the statement may have had some foundation. But the British pearls were soon found to be of little or no value, being usually small and ill-coloured, *subfusca ac liventia.*—(*Tacit. Agricola*, c. 12.)—They have been repeatedly found in modern times, and sometimes of a considerable size, more especially in the river Conway.—(See *Gough's Camden*, iii. 189, ed. 1806, and *Pennant's Zoology*, iv. 80.)—Pearls have also been found in several of the rivers of Ireland, but small and of the same pale and dusky colour as those of Britain.—(See *Smith's Kerry*, p. 128, and his *Cork*, ii. 264.)—The total number of marine, fresh-water, and land Testacea may be estimated at from 430 to 450 species, omitting such families of true mollusca as are destitute of shells.

In the radiated class of animals, (so named from having their mouth in the centre of their body,) are the star-fish, the sea-egg, and the medusa. There is nothing in their history to interest the general reader; they are all marine, or rather pelagic, animals, wandering about in the ocean, or lying buried in its recesses. It is only when the sea has been violently agitated, so as to cast upon the beach some of its slimy inhabitants, that ordinary observers behold, perhaps for the first time, some of those singular, and, indeed, incomprehensible animals. Allied to these Radiata are the naked Cephalopoda, or Cuttlefish, of which seven species are enumerated as indigenous to our seas. The most common of these is the Sepia officinalis, whose internal plate, or bone, we once found, in the greatest profusion, on the shores of Hampshire, near Christchurch and Hurst Castle. It is this substance which supplies the scribe with pounce, and is known in the chemists' shops under the name of cuttle-bone. There are a great variety of small corallines, but those of a more imposing size and beauty must be sought for in warmer seas.

The Entomology of Great Britain is highly interesting in itself and

important to our present purpose, as illustrating those general remarks already made on our climate and vegetation. No branch of our natural history has been more successfully investigated as to the species, and the valuable *Systematic Catalogue* of Mr. Stephens affords the means of drawing some general results of an interesting nature. Looking to the entomology of these islands as a whole, it exhibits all those prominent characteristics which mark the entomological features of Europe as opposed to those of temperate America and of Northern Asia. The Apterous insects (under which term we include, with Linnæus, the spiders, crabs, and acari) bear nearly the same proportion to the Ptilota, or winged orders, as in other parts of the world. Yet there is, perhaps, a greater preponderance in the number of spiders than even in the South of Europe, and certainly much greater than in the fauna of tropical America. Now this is accounted for by a singular fact, not hitherto mentioned. The whole of Europe may be considered the chief metropolis of the Diptera, or flies. Britain participates in this abundance, for no less than 1,670 species have been detected; while, during three years' researches in tropical America, we may safely affirm that not a sixteenth part of this number was discovered. Flies are the natural food of spiders, more than any other order; and while nature has given us an abundance of the one, she has likewise proportioned her supply of food in the other. A further reason for this abundance of Diptera will be found in the great number of our summer insectivorous birds, but more especially of swallows, whose food is almost exclusively supplied by dipterous insects. It seems singular that the Mellivorous Hymenoptera, or the bees, are more abundantly distributed, in point of numbers, in temperate than in tropical countries, seeing that in the latter there is greater scope for them in the sweets of the vegetable kingdom. Yet this is undoubtedly the fact. On the other hand, it should be remembered, that no flowers in tropical America are spread over so wide a surface as that occupied by the many thousands of acres of *clover*, cultivated in our island; setting aside the great variety of other plants found in a wild state. But, although bees are so numerous in Europe, South America has a much greater preponderance of rapacious Hymenoptera, particularly those of the Vespidæ and Sphegidæ families, which abound in warm latitudes, although comparatively scarce in Britain. The total number of Hymenopterous insects may be reckoned, in even numbers, at 2,100 species. The most splendid family of these is Crysis, called rubytails by the collectors, of which no less than 35 supposed species are enumerated in the above-mentioned list, while only three have yet been discovered throughout the whole of Brazil. The group, in fact, is chiefly European. In the Hemipterous order (divided, in the modern systems, into two artificial orders), the majority of species are small, and neither remarkable for elegance nor singularity. Several genera are peculiar to Europe: they chiefly consist of insects which live among those tall meadow grasses, found only in Britain and other pasture countries. The plant-sucking Aphides are in great variety and abundance: they constitute one of the most prominent features of our entomology, for not a single species is to be met with in tropical America. The musical Cicades, on the other hand, which love the warmth and bask

in the rays of an Italian sky, are almost unknown in Britain, one solitary species only having been found, though very rarely, in the New Forest. The lesser tribes, however, are very numerous, and fly in profusion, during summer, from every hedge. Next come the Lepidoptera, comprising the butterflies, hawk-moths, and moths. In the first of these tribes we have many most beautiful species, but not more than one or two which are peculiar to Britain. Authors have swelled the list of our native butterflies to nearly 100, but several of these rest on very dubious authority. The most typical of this tribe have their metropolis in hot latitudes, and are merely represented in Britain by a single species, the European swallowtail (Podalirius Machon, *Sw.*); but among the brush-footed division there are few exotic species which surpass the splendid Vanessa Io (the peacock butterfly), the Vanessa Antiopa (Camberwell beauty), or the V. Atalanta (the Admiral), the first and last being among the most common of our insects. The meadow brown butterflies (Satyridæ, *Sw.*) are seen in profusion in the fields and along the hedges, while our pastures are enlivened by numerous little azure butterflies, forming the genus Polyommatus, and of which few or none are found in other parts beyond Europe. In the Hesperian tribe (Hesperidæ), on the contrary, we can count only six or seven native species, while in Brazil alone we discovered nearly 250. The hawkmoths of Britain are few, and the larger species are scarce. The type of this remarkable tribe is the death's-head (Sphinx Atropos, *L. Sw.*), the largest, in point of bulk, of the British Lepidoptera; but it is rare, and seldom met with, except in particular localities: the Smerinthus ocellatus, or eyed hawkmoth, is perhaps the most beautiful, and is by no means uncommon. To this tribe also belong those elegant dark green and crimson spotted insects, so frequently met with in our pastures during summer, forming the genus Anthrocera, or burnet moths: the geographic distribution of this group, with some slight alterations of structure, extends to America, but that of the clear-winged Ægeria, of which we possess eleven species, is entirely excluded from the warmer latitudes of the New World. One of the most remarkable features in British, no less than in European entomology, is the vast disproportion between the *diurnal* and the *nocturnal* Lepidoptera. Of the former, as already premised, we have scarcely 100 species, while of the latter the catalogue before us enumerates the names of no less than 1,778. True it is that the smaller families of this tribe are generally overlooked by collectors who visit tropical countries; but it is a very mistaken idea, we believe, that, if such regions were properly investigated, the proportion between their butterflies and moths would be nearly the same as what we find in those of Europe. We cannot, in this slight sketch, enter into very exact numerical calculations; but, after much attention bestowed upon the Lepidoptera of Brazil, we do not believe that our collection of moths exceeds much more than twice the number of the diurnal Papiliones. In the Coleopterous order, the most numerous, perhaps, of the whole of the Ptilota, or winged insects, the number of species detected in Great Britain is truly great. Mr. Stephens's catalogue comprises upwards of 3,300 species. It would be highly interesting to trace the means by which nature has provided a sufficient supply of all the various sorts of vegetable food suited to this immense

insect (or rather beetle) population: our prescribed limits, however, will oblige us to be very brief. It appears that out of this large number of species, about 550 are of the Cicindelidæ, Harpalidæ, Carabidæ, Dytiscidæ, and other families of rapacious beetles, while nearly all the others live upon vegetables that are either in a living or decayed state. Of the Capricorn, or tree-boring family (Cerambycidæ), there are not more than about 30 species, and very many of these, on better examination, will probably be removed to the floral Capricorns, forming the natural family of Lepturidæ. The weevils (Curculionidæ), on the other hand, are exceedingly numerous, but their size is small, and their colours, with two or three splendid exceptions, dull and sombre. Finally, we should notice the small-sized but beautiful Chrysomelidæ, as being the most resplendent of the British Coleoptera, while the Aphoidæ, the Staphilinidæ, and the Cocinellidæ, are among those geographic groups which more especially belong to Britain. The Linnæan Neuroptera is the only remaining order of the Ptilota we have to notice; and, although not extensive in point of numbers, our country still possesses types of most of the leading families. Great Britain, destitute of any considerable tracts of sand, is without any example of the Myrmelionidæ; yet numbers of the Libellulidæ, or dragon flies, are seen on the sides of our streams, ponds, and rivulets, flitting among the aquatic plants, or soaring in rapid course over the water in quest of their prey. Of the locust tribe, we only possess four or five species, and these are of a small size when compared with those whose ravages astonish and distress mankind. Such are the leading peculiarities of the Zoology of Great Britain. Our notices indeed have been, from necessity, brief; yet we hope they are not devoid either of popular or scientific interest, while to enter into greater detail would not be suited to a work of this nature. It might, perhaps, be interesting and useful to point out the direct influence which various animals, and more especially insects, exercise over the labours of the agriculturist; but this would be an inquiry of too great extent to find a place here. In the mean time, the curious reader may peruse with advantage the chapters devoted to injurious insects, in Kirby and Spence's Elements of Entomology; while the gardener and the agriculturist will find information on the same subject in Loudon's Encyclopædias of Gardening and Agriculture.

Sect. 11. *Civil Divisions.*

When the Romans invaded England, it was parcelled in unequal portions among a number of petty tribes. A great deal of erudition has been expended in attempting to define the exact situation and extent of country occupied by each: but a good many of the conclusions that have been come to on this point continue involved in much obscurity; and, though it were otherwise, their statement would be quite foreign to the object of this work.

Roman Provinces.— The divisions of England, by the Romans, varied at different periods of their ascendancy; but under the reign of Constantine, when their empire had been matured and consolidated, they distributed it into four provinces, viz.:—1. *Britannia Prima*, the most important and valuable, comprised the whole country south

of the Thames and of the Bristol Channel; 2. *Flavia Cæsariensis*, the limits of which are not exactly known, but which included the middle parts of the kingdom, or those lying between the Humber on the north, the Thames on the south, the Severn on the south-west, and the eastern coast: 3. *Britannia Secunda*, bounded, on the south, west, and north by the Bristol Channel, St. George's Channel, and the Irish Sea, and on the east by the Severn and *Flavia Cæsariensis*; including modern Wales, the counties of Hereford and Monmouth, with the greater part of Warwick, Worcester, Stafford, Salop, and Cheshire. The fourth province, entitled *Maxima Cæsariensis*, comprised the country between the Humber and the Tyne, or rather between the former and the wall of Severus. The province of *Valentia*, formed at a subsequent period, included the county of Northumberland, and the whole of Scotland, as far as the Friths of Forth and Clyde; that is, it included the whole country between the walls of Severus and Antoninus Pius. Besides other considerable towns, several are enumerated where colonies of Roman citizens were established. Of these, *Camulodunum*, now Maldon, in Essex, was one of the principal; and among the others were, *Eboracum*, or York; *Lindûm*, or Lincoln; *Wintonia*, now Winchester; *Cestria*, or Chester; *Sorbiodunum*, afterwards Sarum, in Wilts, now totally decayed, &c. *Londinium*, or London, the modern metropolis of the British empire, and *Verulamium*, near St. Albans, in Hertfordshire, were *municipia*, or free cities, their inhabitants enjoying most of the privileges of Roman citizens.—(*Ancient Universal History*, 8vo. ed., vol. xix., pp. 79—116.)

Heptarchy.—During the greater part of the Saxon period, England was divided into a *heptarchy*, or seven petty kingdoms, among which the country was successively distributed nearly as follows:—

1. Kent comprised Kent.
2. Sussex, or the South Saxons.—Sussex and Surrey.
3. Wessex, or the West Saxons,—Devonshire, Dorset, Somerset, Wilts, Hants, Berks, and part of Cornwall.
4. East Angles,—Norfolk, Suffolk, and Cambridge, including the Isle of Ely.
5. Essex, or the East Saxons,—Essex, Middlesex, and Hertfordshire in part.
6. Northumberland, — Lancashire, Yorkshire, Durham, Cumberland, Westmoreland, Northumberland, and Scotland to the Frith of Forth.*
7. Mercia, —Gloucester, Hereford, Warwick, Worcester, Leicester, Rutland, Northampton, Lincoln, Huntingdon, Bedford, Buckingham, Oxford, Stafford, Chester, Derby, Salop, Nottingham, and part of Hertford.

The heptarchy may be said to have ceased in 827 or 828, when the whole of England, from the Tyne southwards, was formed into one kingdom, under Egbert, originally king of Wessex. Wales preserved its independence till a considerably later period.

* Northumberland is divided by some into two kingdoms, Deira and Bernicia. Mr. Turner, who adopts this division, consistently substitutes the term "octarchy" for heptarchy.—(*History of the Anglo-Saxons*, 5th ed., vol. i. pp. 317, 323, &c.)

Formation of modern Counties or Shires, &c.—The present division of England into counties, or shires, is supposed to owe its origin to Alfred. Shire is a Saxon word, signifying a division. Under the Saxons, the shires were governed by an ealderman, or alderman, an appellation that seems to indicate the mature age of those selected to fill this office. After the Danish conquest, the term earl, from the Danish jarl, was substituted for alderman. County (*comitatus*) is plainly derived from the count (*comes*) of the Franks, who was charged with the same functions as the alderman of the Saxons, and the jarl of the Danes. At first, the government of shires or counties was directly exercised by the earl or count; but this duty he afterwards devolved upon his deputy, a subordinate officer, called in Latin the *vice comes*, and in English the sheriff, shrieve, or shire-reeve. The civil administration has been long wholly in the hands of this officer.

Reeve seems to be synonymous with the Scotch word *grieve*, which is still applied to the manager of a farm or colliery, or to the person who superintends the reapers during harvest.

According to the division of England by Alfred, it contained but 32 counties, Durham and Lancashire being included in York; Cornwall in Devon; Rutland in Northampton; Monmouth was deemed part of Wales; and Northumberland, Westmoreland, and Cumberland were subject to the Scotch.

During the Norman period of our history, there were few alterations of consequence in the geography of England: Cumberland and Westmoreland, indeed, were wrested from the Scotch, but their possession was precarious and uncertain. The provinces north of the Humber, which, after the extinction of the Danish kingdom of Northumbria, preserved for a while a sort of dubious independence, were gradually incorporated with the monarchy; but Northumberland, liable to the inroads and devastations of the Scotch, especially in its northern parts, was still, frequently, a merely nominal part of the kingdom.

The counties of Lancaster, Durham, and Chester, are called counties palatine, *a palatio;* because formerly the owners of these counties, that is, the Duke of Lancaster, the Bishop of Durham, and the Earl of Chester, exercised sovereign power in them, as fully as the king in his palace. They granted pardons for all sorts of offences; appointed judges and justices; all writs ran in their names; and offences were said to be committed against their peace, and not, as elsewhere, against that of the king. Lancaster and Chester have, however, been long held by the crown: but the courts and law officers of the former are still quite distinct; and this also was the case with those of Chester till the passing of the Welsh Jurisdiction Act of George IV. The county palatine of Durham continued in the possession of the bishop till 1836, when it was vested in the Sovereign by the 6 and 7 Will. IV., c. 19. The jurisdiction of the courts was, however, excepted from the operation of this Act.

The division of Wales into its present counties took place at a comparatively late period. Long, indeed, before the conquest of that country by Edward I., its princes did homage to the crown of

England; but that monarch, who may justly be styled the conqueror of Wales, subverted the line of its ancient sovereigns, and conferred the title of Prince of Wales on the eldest son of the king of England. In the 10th of Edward I., it was declared by the statute of Rhudhlan,* that the territory of Wales, with its inhabitants, which had formerly been subject to the king by feudal right, was entirely reannexed to the crown of England, as part of that monarchy. But, notwithstanding this statute, the Welsh retained many of their peculiar laws and customs, particularly their rule of inheritance; viz., that their lands were divided equally among all the issue male, and did not descend to the eldest son. Subsequent statutes still further abridged these provincial immunities. At length the famous statute, 27 Henry VIII., cap. 26, completed the incorporation of Wales with England, by abolishing all the peculiarities of Welsh jurisprudence, at the same time that it admitted the inhabitants to a full participation in all the rights and privileges of Englishmen. It enacts, 1st, That the dominion of Wales shall be for ever united to the kingdom of England; 2ndly, That all Welshmen born shall have the same privileges and liberties as other the king's subjects; 3rdly, That lands in Wales shall be inheritable according to the English tenures and rules of descent; 4thly, that the laws of England, and no other, shall be used in Wales; besides several other regulations and enactments of inferior importance.

The statute 34 and 35 Henry VIII., cap. 26, confirms the above statute, adds further regulations, and confers some privileges on the Welsh, particularly that there should be courts within the principality itself, independent of the process of Westminster Hall.† But this statute claims our attention, at present, more especially from its having given to the counties of Wales, and the adjoining counties of England, the names and boundaries they still retain. This Act divided the marches, or intermediate lands between England and Wales, partly into new counties, and partly annexed them to old counties. The new counties thus formed were, Monmouth, which was declared an English county; with Brecknock, Denbigh, Montgomery, and Radnor, assigned to Wales. Of the English counties, Gloucester, Hereford, and Shropshire were augmented by annexations; of the Welsh, Cardigan, Caermarthen, Glamorgan, Merioneth, and Pembroke.

Trethings, Trithings, or Tridings, &c.—The next inferior division of the territory of England is into *trethings*, *trithings*, or *tridings*; *lathes* and *rapes*. The former appellation is evidently derived from the circumstance of the county to which it is applied being divided into three parts. These trithings still subsist in the great county of York; where, by an easy corruption, they are denominated ridings. The terms lathes and rapes are of less certain etymology or meaning;

* So called from Rhudhlan, or Rhydland, in Flintshire, where it was issued. This, though reckoned among the statutes, was really an act of the king in council. —(See *Barrington on the Statutes*, p. 106.)

† In 1831 the Welsh system of judicature was abolished; the Welsh counties being attached to the Oxford and Western Circuits, according to the convenience of their situations.

but, though not synonymous with trithings, they signify a large division of a county, comprising from 3 to 4 hundreds. Kent is the only county divided into lathes; and Sussex the only one divided into rapes. These had formerly their lathe-reeves and rape-reeves, acting under the sheriff or shire-reeve. The rapes of Sussex were military divisions at the time when Domesday Book was compiled; and the lathes of Kent may have had a similar origin, connected, perhaps, with the Cinque Ports, and for the defence of the coast against invasion. The county of Lincoln is divided into three *districts*, each of which, like the large divisions of Yorkshire, Kent, and Sussex, contains several hundreds. Perhaps, also, the shires, which are found in some of the northern counties, though now merely nominal, were originally larger divisions of a similar nature; as Hallamshire, comprising the district round Sheffield; Richmondshire in the North Riding, and Howdenshire in the East Riding of Yorkshire; Hexhamshire and Bamboroughshire in Northumberland; and Norhamshire and Islandshire, comprising those parts of the county of Durham that lie to the north of Northumberland. Parts of several other counties, as well as Durham, lie detached: this is very remarkably the case with Worcester.

Hundreds.—The next inferior division is that of hundreds. This division seems rather to have been introduced into England than invented in it; and there is reason to believe that the Saxons, in the southern part of the island, were the first to establish it. This institution, like all those of the Saxon period which relate to the due administration of justice, has generally been ascribed to Alfred. But a similar division had been established in France 200 years before his æra; "and, indeed," says Mr. Justice Blackstone, "something like this institution of hundreds may be traced back as far as the ancient Germans, from whom were derived both the Franks, who became masters of Gaul, and the Saxons, who settled in England; for both the thing and the name, as a territorial assemblage of persons, from which afterwards the territory itself might probably receive its denomination, were well known to that warlike people. *Centeni ex singulis pagis sunt, idque ipsum inter suos vocantur; et quod primus numerus fuit, jam nomen et honor est.*—Tacit. De Moribus German. 6."—(*Commentaries, Introd.* § 4.)

It is uncertain whether the appellation of hundreds was given to these divisions because they contained 100 (which in Saxon numeration means 120) persons, 100 heads of families, or, as some suppose, 100 farms. It is, however, most probable that each hundred contained 100 (120) heads of families of freemen. That the hundreds were regulated by population, is evident from the great number of hundreds in the counties that were first peopled by the Saxons; or which, from their local situation, were least exposed to the devastation of war; or, from their natural fertility, were most likely to attract, and most capable of supporting, a great number of inhabitants; while, on the contrary, the counties gained by the Saxons at a later period, which were held by them on a precarious tenure, and continually liable to invasion, or which were naturally uninviting, contain comparatively very few hundreds. Thus, according to Domesday Book, there were in

Kent and Sussex, at the period when that survey took place, respectively, 62 and 64 hundreds, the numbers they contain at present. Norfolk, though only about the fifth county in the kingdom in point of extent, contains 660 parishes (a greater number than any other county), and 33 hundreds. Suffolk contains 575 parishes, and 21 hundreds; Essex, 415 parishes, and 20 hundreds: whereas, in Lancashire, there are only 6 hundreds; in Cheshire, 7; in Cornwall, 9; in Northumberland, 7 divisions, which correspond to hundreds; and in Cumberland, 5. In some counties there are hundreds that do not exceed a square mile in area, nor contain more than 1000 persons. The hundreds of Lancashire, on the contrary, average 300 square miles, and the population of one of them, Salford hundred (including Manchester), amounted, in 1841, to 764,654! The population of the hundred of West Derby (including Liverpool) was, at the same time, 474,212.

This striking irregularity seems to have been felt as an inconvenience as early as the reign of Henry VIII., when the smaller hundreds were, in some instances, united, and the larger hundreds partitioned into districts, called *divisions*, *limits*, or *circuits*. These divisions still exist, more or less manifestly, in most of the English counties, and have been recognised in subsequent acts relating to the poor. Formerly a court was regularly held in each hundred, for the trial of causes; but this has now fallen into disuse.

Wards and Wapentakes.—In the northern parts of England, the counties were not divided into hundreds, but into wards and wapentakes: Cumberland, Westmoreland, Northumberland, and Durham, continue to be divided into the former, and Yorkshire into the latter. Wards are so called from the inhabitants being obliged to keep watch or ward against the irruptions of the Scotch or Picts. The term wapentake is evidently synonymous with weapontake, and was given to the divisions of Yorkshire from the same circumstance.

Tithings.—The subdivision of hundreds into tithings is undoubtedly owing to Alfred. "In ancient times it was ordained, for the sure keeping of the peace, that all freeborn men should cast themselves into several companies, by 10 in each company; and that every one of these 10 men should be surety and pledge for the forthcoming of his fellows: for which cause these companies, in some places, were called tithings; and as 10 times 10 make 100, so, because it was also appointed that 10 of these tithings should meet together for matters of greater weight, therefore that general assembly was called a hundred." One of the principal inhabitants of the tithing, who was called the tithingman, or headborough, and in some counties the borsholder, or boroughs-ealder, was annually appointed to preside over the rest, and to take care of their interests. Tithings are seldom mentioned now, except in legal proceedings, or in topographical descriptions.

Sokes.—In Lincolnshire, another species of division exists, called *sokes*. *Soke*, *sok*, *soc*, or *soka*, according to Bracton, signifies "the power of administering justice; and the territory or precinct in which the chief lord did exercise his soke, that is, his liberty of keeping court, or holding trials within his own soke or jurisdiction."

Parishes.—Although parishes were originally ecclesiastical divisions, they may now be more properly considered as coming under the

class of civil divisions; and, consequently, claim our attention under this head. It is not easy to determine the æra of the division of England into parishes: they are mentioned in the laws of King Edgar so early as 970, when the whole kingdom seems to have been divided into parishes; but it is probable that the division was not made at once, but by degrees. It is, according to Blackstone, pretty clear and certain that the boundaries of parishes were originally ascertained by those of manors; for it very seldom happens that a manor extends itself over more parishes than one, though there are often many manors in one parish. The parochial division of England was nearly the same in the reign of Edward I. (1272—1307) as at present.

Parishes are frequently intermixed with one another. This seems to have arisen from the lord of the manor having had a parcel of land detached from the main part of his estate, but not sufficient to form a parish of itself. It was natural for him to endow the church which he had erected upon his principal estate with the tithes of these disjointed lands: especially if it happened that there was no church in any lordship adjoining to them.

The boundaries of parishes depend on immemorial custom; but it is probable that they were not settled with very minute precision till the introduction of the poor laws, when, in consequence of the claim for relief upon their particular parishes given to the poor, it became a matter of consequence to define exactly the limits of each parish. They cannot now be altered but by legislative enactment.

In the northern counties, where the parishes sometimes embrace 30 or 40 square miles, the poor laws, the due administration of which must always depend on an intimate knowledge of the situation and character of every one applying for relief, could not be properly carried into effect. To remedy this inconvenience, an act was passed in the 13th of Charles II., permitting townships and villages, though not entire parishes, severally and distinctly to maintain their own poor. Hence townships in the north of England may be regarded as divisions subordinate to parishes; and are, in practice, as distinctly limited as if they were separate parishes.

Towns originally contained but one parish; but, from the increase of inhabitants, many of them are now divided into several parishes.

Besides parishes, or townships, there are places which are deemed extra-parochial, or not within the limits of any parish. These were formerly the site of religious houses, or of castles, the owners of which would not permit any interference with their rights. At present they enjoy some most valuable privileges; among others, a virtual exemption from the poor's rate, because there is no overseer on whom the order of a magistrate may be served—from the militia laws, because there is no constable to make the return—and from repairing the highways, because there is no surveyor. Their tithes are, by immemorial custom, payable to the king instead of the bishop. The number of such places is not inconsiderable, amounting to more than 200. It seems highly inexpedient that any part of the country should enjoy such an exemption from burdens imposed for the benefit of the community. Extra-parochial wastes and marsh lands, when improved and drained, are assessed to all parochial rates in the parish next adjoining.

In some counties, *liberties* interrupt the general course of law as affecting hundreds, in the same manner as extra-parochial places do with regard to parishes. This inconvenience is particularly felt in Dorsetshire. The number of parishes and parochial chapelries in England and Wales is not exactly ascertained; but there are not many doubtful cases, and, for any general purpose, they may safely be taken at 10,700. About 550 parishes extend into two counties, or into more than one hundred or other divisions.—(*Blackstone's Commentaries, Introd.* § 4.; and *Preliminary Remarks to Census of* 1831, p. 14—18.)

Towns.—Under the general term *town* is now comprehended cities, boroughs, and common towns. A city is a town incorporated, which is, or has been, the see of a bishop; and though the bishopric be dissolved, as at Westminster, it still remains a city. A borough is now understood to be a town, whether corporate or not, that sends burgesses to parliament. There are an immense number of other towns, which are neither cities nor boroughs; some of them having the privilege of markets, and others not. Several of these have small appendages, called *hamlets*, which are supposed by Spelman to have originally consisted of less than *five* freemen; but many of them have now grown to be considerable places. They are sometimes under the same administration as the town itself, and are sometimes governed by separate officers; in which case they are, in several respects, looked upon as separate townships.

SECT. 12. *Statistical Notices of the different English Counties.*

England is, at present, divided into 40, and Wales into 12 counties. Of the former, 6 form the northern division; 4 border on Wales; the midland district consists of 12; the eastern of 8; the south-eastern of 3; the southern of 4; and the south-western district of 3. Wales is divided into North and South Wales, each containing 6 counties. But these divisions are arbitrary, and of little or no practical importance.

It is foreign to the objects, and inconsistent with the limits, of this work to enter into minute topographical details; but the subjoined statements seem, notwithstanding, to be necessary to the proper understanding of our subject.

Northern Division.—The northern division of England consists of the following counties:—

1. *Northumberland*, a maritime county, and the most northerly in England, is bounded by Durham and Cumberland on the south and south-west; by the German Ocean on the east; and by Scotland, and a detached portion of Durham, on the north and north-west. It contains 1,197,440 acres, of which it is estimated that about 800,000 are arable, meadow, and pasture. It exhibits every variety of soil and surface; but, except in the vales and along the coast, its most prevalent features are nakedness and sterility. The extensive district bounded by Scotland and Cumberland, on the north-west and west, and by a line drawn from Mindrim to Wooler, Rothbury, and thence, through Hexham, to the confines of Durham, on the north and east, consists mostly of hills, mountains, bleak dreary moors, and swampy

morasses. The Cheviot hills are, however, distinguished by their fine green verdure (see *ante*, p. 10); but the other hills and moors are mostly covered with peat earth, and produce little except heath. Along the coast, and in the vales, the soil, for the most part, consists of clayey loam. Between the coast district and the moors there is a good deal of moist loam, on a cold clay subsoil. The climate varies with the nature and elevation of the soil, being cold and backward in the mountainous districts, and comparatively mild and early in the vales and low grounds. There are few counties in which improvements of all sorts have made so rapid a progress as in this. Arable and stock husbandry are both prosecuted with great spirit and success. The farming along the banks of the Till, in the vale of the Coquet, and some other districts, is equal, perhaps, to any in the empire. The culture of turnips in drills, which commenced between 1760 and 1770, is extensively practised upon all the soils suitable for their growth; and has added greatly to the produce and value of the land. The usual rotation on such soils, is, 1st year, after grass, oats; 2nd, turnips and a small quantity of potatoes; 3rd, spring wheat and barley; 4th, clover and other grasses; 5th, pasture; the land being in some cases kept in pasture for 3 years, before it is again ploughed up. On the heavy clay, or strong wheat lands, a four or six course system is pretty extensively followed; the rotation in the first being, 1st, fallow, well dunged; 2nd, wheat; 3rd, clover on half the land, and beans, or beans and peas; and 4th, oats: in the other the rotation is, 1st, oats; 2nd, beans drilled or hoed; 3rd, wheat; 4th, fallow; 5th, wheat; 6th, clover. But both these systems require good land and abundant manure, to ensure good crops; and a less exhaustive course, with more of grazing and stock, is, in most cases, found to be more advantageous.—(*Journal of Royal Agricultural Society*, II., 182.) Principal corn crops, wheat and oats, the latter being of excellent quality. Rye was, at one time, grown extensively on dry sandy soils; but these have been so much improved by the use of lime, and the introduction of the turnip husbandry, that they now produce excellent crops of wheat, so that, at present, very little rye is raised. A good deal of barley is grown; but neither it nor oats is so largely used by the inhabitants as when Messrs. Bailey and Culley drew up their *Report*. Cattle, principally of the short-horned breed. Some wild cattle, believed to be a remnant of the ancient native breed of the country, are found in Chillingham Park. Sheep, in the hill pastures, consist almost wholly of the peculiar hornless breed, known by the name of Cheviots, from the district in which they were originally found; the heath or moor breed, with large spiral horns, and black faces and legs, having nearly disappeared. The improved Leicesters are the universal stock of the low grounds. The total stock of all kinds of sheep may be estimated at about 500,000, and the annual produce of wool at about 14,000 packs.* The best draught horses are brought from Clydesdale. Estates of all sizes, but mostly large: farms also large, bringing, in many instances, from 1,000*l.* to 3,000*l.* a-year rent; they are generally let on lease for 21 or 15 years; but on some extensive estates, the occupiers hold at will,

* A pack is equal to 240 lbs.

and in these the farming is uniformly inferior. "The capitals necessary for large farms entitle their occupiers to a good education, and give them a spirit of independence and enterprise that is rarely found among the occupiers of small farms under short leases. Their minds being open to conviction, they are ready to try new experiments, and adopt every beneficial improvement that can be learned in other districts: for this purpose many of them have traversed the most distant parts of the kingdom to obtain agricultural knowledge, and have transplanted every practice they thought superior to those they were acquainted with, or that could be advantageously pursued in their own situation: and scarcely a year passes without some of them making extensive agricultural tours, for the sole purpose of examining the modes of culture, of purchasing or hiring the most improved breeds of stock, and seeing the operation of newly-invented and most useful implements."—(*Messrs. Bailey and Culley's Report*, p. 29.) Farmhouses and offices generally good, and mostly kept in repair by the landlord. Thrashing-machines are to be found on all large farms; and where the supply of water is scanty, they are now generally worked by steam. This is the only county in England, the rental of which has materially declined since 1814–15; it having amounted in that year to 16*s.* 8½*d.* an acre, whereas, in 1842-43, it only amounted to 13*s.* 11½*d.* This decline has been occasioned by the large proportion which the clay or heavy lands, having retentive subsoils, bear to those suitable to the turnip culture; the fall, which in some instances has been very heavy, having been wholly confined to the former. Generally, indeed, the rent of the lighter lands is higher now than at any former period; and this, also, is the case with the rent of such clay lands as have been adapted, by means of furrow-draining and subsoil ploughing, to the turnip culture. There are a good many plantations and some natural woods; but, speaking generally, the county is rather bare of trees. Pit-coal forms the staple product of Northumberland. It possesses an almost inexhaustable supply of this invaluable mineral. There are also rich mines of lead in the south-western parts of the county, producing, probably, about 4,500 tons a year, with iron, limestone, &c. Newcastle, the principal town in the north of England, ranks, as a shipping port, immediately after London; but its vessels are principally engaged in the coasting trade, or in the conveyance of coals to London and other places in the south. The principal branches of manufacturing industry carried on in the county are ship-building, and the arts subordinate to and dependent on it. But there are also extensive glass-works at Byker, Newcastle, &c., with white-lead works, copper-works, &c. Principal rivers, Tyne, Coquet, Aline, Blythe, Wansbeak, and Till. A railway has been constructed from Newcastle to Carlisle, and thence to Maryport, forming a communication across the island; and another railway runs along the coast from Newcastle to Berwick, forming part of one of the great lines of communication between the north and south parts of the island. The salmon fishing on the Tyne was at one time important, but is now much fallen off. Cod and other fish, lobsters, cockles, &c., are very abundant upon the coast. Northumberland is divided into 6 wards, and 88 parishes. It returns 10 members to parliament; viz.,

4 for the county; 2 each for the boroughs of Berwick and Newcastle; and 1 each for Morpeth and Tynemouth. Principal towns:—Newcastle, Tynemouth, North Shields, Berwick, Morpeth, and Alnwick. Population of county in 1841, 250,278. Sum expended for the relief of the poor in 1844-5, 76,377*l.* Annual value of real property, in 1815, 1,291,413*l.*; ditto in 1842-3, 1,542,434*l.*

2. *Cumberland*, a maritime county, is bounded on the north by Scotland and the Solway Frith; on the east, by Northumberland and Durham; on the south, by Westmoreland and Lancashire: and, on the west, by the Irish Sea. It contains 974,720 acres, of which about 660,000 are supposed to be arable, meadow, and pasture; the rest principally consisting of mountains, irreclaimable heaths, and lakes. The mountainous and moorish tracts, which are separated into the Eastern and Western Divisions by the valley of the Eden, have been already described (see *ante*, p. 9). The prevailing soil in the lower districts, and in some parts of the western mountains, is a dry loam, admirably suited to the turnip husbandry; but there is also a good deal of wet loam, on a clay bottom. The soil of the eastern moors and mountains is mostly peat earth; and they are bleak, heathy, wet, and barren in the extreme. The climate is more humid than that of Northumberland, and not so favourable for the ripening of corn; neither is the husbandry so good as in the last-mentioned county, but, in general, the land is kept clean and in fair condition, and, considering its quality and the rather unfavourable climate, there are not many counties superior to this in agriculture. Wheat and oats are the principal crops. The rotation on the dry loams, after the land has remained three years in grass, which is generally cut for hay one year and fed two, is, 1st, oats; 2nd, turnips; 3rd, barley or wheat; 4th, seeds: in the clay soil the wheat is generally fallowed, and the rotation is, 1st, oats; 2nd, fallow; 3rd, wheat; 4th, seeds.—(*Kennedy and Grainger on the Tenancy of Land*, i. 167.)—Turnips were first grown in this county for the use of cattle, by Mr. Howard, of Corby, in 1755; they are extensively cultivated, according to the most approved principles of the drill husbandry. The old Cumberland cattle consisted principally of a comparatively small variety of the long horns; but they have been extensively intermixed with Galloways and Kyloes, and, more recently, the short horns have begun to make their way into the county. Sheep mostly Cheviots, but the black-faced moor breed is still found in considerable numbers. The total stock is estimated at about 400,000, and the total produce of wool at about 10,000 packs. Exclusive of the sheep bred in the county, the Cumberland farmers buy great numbers at the Highland markets, which, being fattened upon turnips, are sent to Liverpool and other places. They also graze large flocks of geese, brought from Northumberland. Property in Cumberland is very much divided. There are a few large estates; but by far the largest portion of the county is divided into small properties, varying in value from 10*l.* to 150*l.* a-year, generally occupied by their owners, provincially called "statesmen," or "lairds." Messrs. Bailey and Culley inform us that agriculture is not under any very peculiar obligations to these little proprietors. "The statesmen," say they, "seem to inherit with the estates of their ancestors their notions of cultivating them, and are

almost as much attached to the one as to the other. They are rarely aspiring, and seem content with their situation; nor is luxury, in any shape, an object of their desires. Their little estates, which they cultivate with their own hands, produce almost every necessary article of food; and clothing they, in part, manufacture themselves. They have a high character for sincerity and honesty, and, probably, few people enjoy more ease and humble happiness."—(*Report on Northumberland, Cumberland, &c.*, p. 181.)—A good many particulars, in this description, have, however, been materially changed during the last 30 years. No domestic manufactures are now carried on, and, in other respects, the "statesmen" have approached much more nearly to the common level. Farms mostly small: they are usually let on 7 years' leases. Tenants strictly prohibited from having 2 white crops in succession, and they are bound to manage their farms so that a certain part of them may remain in grass for 3 years; they are also bound to manure for turnips or wheat, when sown upon a fallow. Farm-houses, offices, and cottages, moderately good and commodious. The Cumberland "lairds" are liable to many vexatious payments that have grown out of the military services to which their ancestors were subject in the days of border warfare; a fine is exigible on the transmission of all real property, whether it passes by descent or by inheritance. Average rent of land in 1842-3, 12*s.* 4½*d.* an acre. The spinning of cotton yarn and the manufacture of various descriptions of cotton goods, is carried on extensively at Carlisle and its vicinity. Ships are built and sail-cloth manufactured at Whitehaven and other places. Coarse woollens are made at Keswick, and there are iron founderies and paper-mills in different places. There are some very valuable coal-mines; Dublin and a large portion of Ireland, with part of Scotland, being principally supplied with coal from Whitehaven. The lead mines are also valuable, having produced, in 1839, about 4,300 tons. The rare and useful substance known by the name of *plumbago*, or black lead, is believed to be found of a better quality than in any other part of the world, at Borrowdale, in this county; but the produce of the mine has been declining for some years, and is now very limited. Limestone is very abundant. The Eden is the largest river in the county (see *ante*, p. 45). The lakes, some of which are of considerable size, are celebrated for the picturesque views they afford (see *ante*, p. 46). The county is traversed from north to south by the great line of railway leading from Lancaster, by Carlisle, to Edinburgh and Glasgow. Maryport and Carlisle are also connected by a railway. Cumberland contains 5 wards and 104 parishes. It returns 9 members to parliament, viz., 4 for the county, 2 each for the city of Carlisle and the borough of Cockermouth, and 1 for Whitehaven. Principal towns: Carlisle, Whitehaven, Workington, and Cockermouth. Population of county, in 1841, 178,038. Sum expended for the relief of the poor in 1844-5, 36,921*l.* Annual value of real property in 1815, 737,438*l.*; ditto in 1842-3, 910,334*l.*

3. *Durham*, a maritime county, is bounded on the east by the German Ocean, on the north by Northumberland, on the west by Cumberland and Westmoreland, and on the south by Yorkshire. It contains 702,080 acres, of which nearly 500,000 are supposed to be fit for the

purposes of aration or meadow. Aspect very various, but for the most part hilly and bare. The country lying to the west of a line drawn from Allansford through Wolsingham to Barnard Castle, consists principally of mountains and extensive heathy moors. Soil very different in different districts; in some it consists of a fertile, clayey loam; but there is a great extent of stubborn infertile clay, with a less extent of calcareous soil of various degrees of fertility. The soil of the moors is mostly peat. Climate various, and depending, in a great degree, on the elevation. When the weather is fine and mild in the lower districts, snow is frequently seen upon the mountains in November, and may be found upon them till the middle or latter end of June. The most general season for harvest is from the beginning of September to the middle of October; but in the western parts of the county it is often prolonged to the middle of November. Agriculture, on the whole, good. Principal crops, wheat, oats, barley, beans, and peas. A mixture of rye and wheat, provincially termed *maslin*, is cultivated in this county, and furnishes part of the bread used by the inhabitants. Turnips extensively cultivated on all the dry lands, but particularly in the vales and newly taken-in lands in the western parts of the county, where improvements are carried on with most spirit. Potato culture best understood in the parish of Whetton-le-Wear. Mustard, of excellent quality, was formerly much grown; but it is now rarely met with. Principal manure, lime, which is obtained in the greatest perfection; it is laid on at the rate of from 70 to 80 bushels an acre, producing, when the land is dry, luxuriant crops of wheat and clover. The Teeswater variety of short-horned cattle has been long admitted to be one of the very best in the empire, both for feeding and milking, and is now very extensively diffused. The native sheep of the same district are large, and produce fine long combing fleeces; but they have been a good deal crossed and intermixed, in the view of improving their carcass, with the new Leicesters and other varieties. In the other districts, Cheviots and heath sheep are the prevailing breeds. The total stock of sheep in Durham may be estimated at about 230,000, and the annual produce of wool at about 7,000 packs. Waggons are very rarely seen in Durham, Northumberland, or Cumberland; all the work being done by single-horse carts, as in Scotland. The Scotch, or swing-plough, drawn by 2 horses driven by the ploughman, is also in universal use. Some large estates; but there are a considerable number of a medium and many of small size. A great deal of property belongs to the church, the tenures under which are unfavourable to cultivation. Farms of various sizes, from 50 to 1,000 acres; greater number between 50 and 200: except in the western districts, they are mostly held at will. "A few are let for 12 or 14 years: where this happens to be the case, considerable improvements are going forward; but the farms let for short periods remain stationary, as no prudent man will lay out his money on improvements for which, when completed, he will be rewarded by an advance of rent proportioned to the improvement he has made."—(*Survey of Durham*, p. 71.)—Mr. Bailey speaks very unfavourably of the condition of the small farmers; he says they work harder and live worse than their servants. Farm-houses, offices, and cottages, of a medium description. Average rent

of land in 1842-3, 15*s.* 4*d.* an acre, being nearly identical with its average rent in 1814-15. Durham is very rich in mineral treasures. Her extensive and valuable coal mines furnish, along with those in Northumberland, immense supplies for the consumption of London and the southern parts of the island, as well as for exportation. Lead mines numerous in the western part of the county, and extensively wrought, having produced, in 1839, 7,628 tons. Iron ore is abundant in the western parts of the coal district, and at a former period it was extensively smelted; but the iron works recently established are of trifling importance. Gateshead-fell is celebrated for its freestone quarries, which yield the "Newcastle grindstones;" so called from the port of shipment. Manufactures various, but not very important. Huckaback, diapers, and sheeting, made at Darlington. Principal rivers, Tees, Wear, and Derwent. Darlington and Stockton are united by a railroad. Durham is divided into 4 wards and 75 parishes. It returns 10 members to parliament, viz., 4 for the county, 2 each for the city of Durham and the borough of Sunderland, and 1 each for the boroughs of South Shields and Gateshead. Principal towns: Durham, Sunderland with Bishop Wearmouth, Gateshead, South Shields, and Darlington. Population of county in 1841, 324,284. Sum expended for the relief of the poor in 1844-5, 72,210*l.* Annual value of real property in 1815, 885,580*l.*; ditto in 1842-3, 1,668,986*l.*

4. *Yorkshire*, a maritime county, being by far the largest and most important in England, is bounded on the north by the counties of Durham and Westmoreland; on the west by the latter and Lancashire; on the south by the counties of Chester, Derby, Nottingham, and Lincoln, and the Humber; and on the east, by the German Ocean. It contains 3,735,040 acres, of which 2,500,000 are supposed to be arable, meadow, and pasture. It is divided into the districts called the North, West, and East Ridings, being respectively as large as most counties, and each of them having its own lord-lieutenant; and there is besides a separate smaller district, called the city of York and Ainstey. Owing to its immense extent, and various capacities, Yorkshire presents an epitome of the whole kingdom, with respect to surface, soil, products, and industry. Some of the mountains on its western border are among the highest in the great central ridge extending from Scotland south to the middle of Derbyshire; and both there and in its northern division there are very extensive tracts of high, sterile, moor ground (see *ante*, p. 17). In the East Riding there is a large tract of wolds, extending from Flamborough Head and Filey Head, on the coast, to Pocklington and Market Weighton. But, notwithstanding these deductions, Yorkshire contains a great extent of the most excellent land. The vale of York, the district of Cleveland in the north, and that of Holderness in the south-east (see *ante*, p. 19), besides various other extensive tracts in different parts of the county, are exceedingly fertile, possessing soils suitable to every purpose, either of arable or stock husbandry. The climate is as various as the soil and elevation; but, except on the high grounds, it is mild and early, and is everywhere salubrious, except on the low, marshy grounds along the Humber. Agriculture in a medium state of improvement: not so far advanced as in Northumberland or Lin-

colnshire, but not so backward as in several other counties. There is in this respect, however, a great difference in the different Ridings. Messrs. Kennedy and Grainger say that agriculture is in a much more forward state in the West Riding than in either of the others. The general rotation there is, 1st, turnips or fallow; 2nd, barley; 3rd, seeds; 4th, wheat. Bone manure is largely used, but not to so great an extent as rape dust: the latter, however, is principally used for wheat, the bone manure being decidedly superior for turnips. Drainage is too much neglected in the North and East Ridings. In the latter no system is acted upon except in the wolds, where the rotation is, 1st, turnips; 2nd, barley; 3rd, seeds; 4th, wheat. In other parts of this Riding, and in the North Riding, two corn crops not unfrequently follow in succession; and but few operations are performed as they ought to be.—(*Kennedy and Grainger on the Tenancy of Land*, i., 367.) Yorkshire is more of a grazing than of an agricultural county. Vast numbers of horses are bred in most parts. Those in the highest estimation are called Cleveland bays, partly from the district in which they were originally found in the greatest perfection, and partly from their colour; but they are now very widely diffused. They are in extensive demand as carriage horses. Cattle very various: they consist mostly of the long-horned breed; but there are considerable numbers of short horns, with endless varieties produced by crosses between these and other breeds. At present the Teeswater and Holderness breeds are the greatest favourites with the graziers; but the long horns, or a cross between them and the short horns, are preferred by the dairy farmers. Yorkshire supplies most of the cows used in the London dairies. Their average yield of milk may be estimated at from 22 to 24 quarts a-day; but it does not yield a proportional quantity of butter.—(*Youatt on Cattle*, p. 245.) Sheep as various as cattle. The stock, which has been much improved, is very large, being supposed to amount to about 1,200,000, producing annually 28,000 packs of wool. Many hogs are kept; and the hams of Yorkshire are famous in every part of the country. Property in the West and North Ridings very much subdivided; but in the East Riding it is less so than in most parts of England. Many families in this Riding have held their estates for centuries. Farms of all sizes; but the great majority seem to be unusually small. Most part of these farms are held from year to year, or by tenants at will; and, notwithstanding the contrary opinion of Mr. Tuke (*Survey of the North Riding*, pp. 55, 76,) we have the best reasons for thinking that this has operated in no ordinary degree to retard the progress of agriculture. It has made such of the tenants as have attempted improvements turn their principal attention to stock rather than to tillage husbandry. A tenant without a lease, and, consequently, depending on the goodwill and caprice of his landlord, may not deteriorate his farm; but it would be unreasonable to suppose that he should lay out any considerable amount of capital on its improvement. Farm-houses and buildings for the most part rather indifferent. Average rent of land, in 1842-3, 21*s.* 4¼*d.* an acre, having increased 4*s.* 8¼*d.* an acre since 1814-15. The West Riding of Yorkshire, if it be not the very first, certainly stands in the first rank as a manufacturing district.

Leeds, Bradford, Huddersfield, Halifax, and Wakefield, are the great seats of the woollen manufacture; and flax-spinning is carried on to a greater extent in Leeds than any where else in England. The manufacture of hardware at Sheffield, and the immediately contiguous districts, rivals, and in some departments, such as cutlery, surpasses, that of Birmingham. There are extensive iron works at Rotherham, which have long enjoyed a considerable celebrity. But the iron works of Yorkshire, though latterly they have made considerable progress, are of inferior importance compared to those in other parts of the country. Their total produce in 1840 was estimated at about 56,000 tons. Cotton factories have been established at Easingwold, and in some other parts of the West Riding. The manufactures in the other Ridings are but of trivial importance. The valuable beds of coal found in the vicinity of Leeds, Sheffield, Bradford, Wakefield, &c., have, no doubt, been the principal source of their prosperity. Besides coal and iron, Yorkshire has mines of lead, and veins of copper; alum works were established at Whitby in the reign of Queen Elizabeth, and are still carried on; and there are in various places excellent limestone and freestone quarries. Principal rivers, Ouse, Swale, Ure, Wharfe, Aire, Calder, Don, Derwent, Hull, and Esk; the waters of all of them, except the last, being poured into the great æstuary of the Humber (see *ante*, p. 40.) Railways and canals, particularly in the West Riding, are numerous, some of them being also of the greatest importance. Hull, the principal port of Yorkshire, has, notwithstanding the competition of Goole (*ante*, p. 40,) perhaps the largest inland trade of any port in the empire; and it has also a very extensive foreign trade. Its imports of bones, linseed, rapeseed, oil-cake, and other articles to be employed in agriculture are quite immense, their value being, if not above, little short of 1,000,000*l.* a-year! A good deal of trade is also carried on by Whitby and Scarborough. The county is divided into wapentakes and liberties; and contains 613 parishes. It returns 39 members to Parliament; viz., 6 for the county, being 2 for each riding; 2 each for the city of York, and the boroughs of Leeds, Sheffield, Hull, Bradford, Halifax, Doncaster, Pontefract, Ripon, Knaresborough, Beverly, Malton, Richmond, and Scarborough; and 1 each for the boroughs of Huddersfield, Whitby, Wakefield, Northallerton, and Thirsk. Principal towns, York, Leeds, Sheffield, Hull, Halifax, Huddersfield, Wakefield, Bradford, and Saddleworth. Population of East Riding, 194,936; North ditto, 204,122; West ditto (manufacturing district), 1,154,101; City and Ainsty, 38,321; making a total of 1,591,480. Sum expended for the relief of the poor in 1844-5, 318,427*l.* Annual value of real property in 1815, 4,760,425*l.*, ditto in 1842-3, 7,495,029*l.*

5. *Westmoreland*, an inland county, is bounded on the north and north-west by Cumberland, on the east by Yorkshire, and on the south and south-west by Lancashire. It also touches Durham for a small space on the north-east. It contains 487,680 acres, of which only 180,000 are set down as arable, meadow, and pasture. It is what its name (*Westmoorland*) imports, a region of lofty mountains, naked hills, and black barren moors; but the valleys, particularly those of the Eden in the north, and of Kendal in the south, are fertile and well

cultivated. The agriculture, state of property, and the character and condition of the occupiers of Westmoreland, are so very similar to those of Cumberland, that the statements as to the latter may be applied, with very little variation, to the former. Average rent of land in 1842-3, 11*s.* ½*d.* an acre, being the lowest of any in England. Westmoreland abounds in slate of the finest quality; in lead; and in some few places, on its southern and western borders, there are coal mines. Principal rivers, Eden, Lune, and Kent. The lakes are even more celebrated than those of Cumberland. Windermere, on its western border, is the most extensive lake in England.—(See *ante*, p. 46.) It is divided into 4 wards and 32 parishes; and returns 4 members to parliament; viz., 2 for the county, and 2 for the borough of Kendal and some adjoining districts. The county town is Appleby; but the principal town is Kendal, celebrated for the manufacture of a peculiar description of coarse woollen goods called cottons, being, most probably, a corruption of coatings. Population of county in 1841, 56,454. Sum expended for the relief of the poor in 1844-5, 18,176*l.* Annual value of real property in 1815, 299,582*l.*, ditto in 1842-3, 334,501*l.*

6. *Lancashire*, a maritime county, being the last in the northern division, is bounded on the north and north-west by Westmoreland and Cumberland; on the north-east and east, by Yorkshire; on the south by Cheshire and the æstuary of the Mersey; and on the west, by the Irish Sea. Its most northern part, consisting of the peninsulated hundred of Furness, is detached from the main body of the county by the intervention of part of Westmoreland and the river Kent. The coast is of great extent, and is deeply indented by bays and arms of the sea. It contains, in all, 1,130,240 acres, of which about 850,000 are supposed to be arable, meadow, and pasture. Surface very various. The hundred of Furness is ragged and similar to Westmoreland: along the Yorkshire border there is a considerable extent of hilly and moorish ground; and this is, also, the character of the whole tract of country from the ridge called Blackstone Edge west to Chorley. The southern part of the county from Formby Point and Liverpool east to Oldham, is an immense plain, interspersed with several extensive morasses. The hundred of Fylde, between Lancaster bay and the æstuary of the Ribble, is also flat, and is comparatively rich and fertile. Sandy loam and sand are the most prevalent soils in the lower districts, and peat in the moors. The climate though probably the most humid of any in England, is mild and salubrious. Lancashire owes its celebrity, wealth, and population to its manufactures and commerce, and not to agriculture, in which it has little to boast. Principal corn crops, oats and wheat, particularly the former. Few turnips are raised; but potatoes are more extensively cultivated than in any other English county; and this is probably also true of carrots. A good deal of hemp is raised. It is said, in the *Agricultural Survey of Lancashire*, published in 1795, that "nothing can be so barbarous as the rotation of crops in this district; if that can be denominated a system of rotation which depends merely on the caprice of the cultivator, or upon what he thinks the land is capable of producing for the moment." (p. 52.) And it

would seem, from the statements of Messrs. Kennedy and Grainger, that the progress made towards a better system in the lengthened period that has elapsed since the *Survey* was published, is not nearly so great as might have been supposed. They tell us that tenants are either prohibited from having more than a certain portion of their lands under the plough at any time, being allowed to manage it as they please, or they are prohibited from having more than two white crops in succession, before the land is laid down in seeds in regular rotation for one or more years. The latter is the preferable practice, but they are both bad; and a great deal of the land under tillage is foul, out of condition, and worn out. Draining is much neglected. It is singular that, in a county so distinguished for machinery, corn should be almost entirely threshed by the flail, and that every description of agricultural implements should be of the most defective construction.—(*Tenancy of Land*, vol. i. p. 259.) Most parts of Lancashire are well supplied with marl, the liberal use of which has been of much service. It is, however, more of a grazing and dairying, than of a tillage, county; the portion of the surface in grass being by much the largest. Immense quantities of hay are required for the supply of the numerous large towns; and the bleaching grounds cover a considerable extent of land. Lancashire is believed to be the native country of the long-horned breed of cattle; but they are now so much crossed and intermixed with others as to be seldom found pure. The short horns have been pretty extensively introduced. The Yorkshire, or Holderness cows, being superior to all others as milkers, are generally kept in the vicinity of large towns; but in the cheese and butter dairies, in the northern and middle parts of the county, long-horned cows are mostly kept. In the cheese dairies the average produce is from 2½ to 3 cwt. of cheese from each cow, the family being also provided with milk and a little butter. Few sheep are kept in the southern parts of the county; but they abound in the north and north-western districts. They are mostly of the heath breed; though South Downs, Cheviots, and other varieties have been extensively introduced. The total stock in all parts of the county has been estimated at 310,000; and the annual produce of wool at about 5,800 packs. Horses of various kinds are bred in most parts; and the stock of this useful animal has been much improved. There are some large estates; but property is generally very much divided. Tillage farms, for the most part, small; but the majority of those occupied by dairy farmers are rather large. They are most commonly let on lease for 7 years. Farm buildings generally good. The fences in many parts consist of dry stone walls. There are some pretty extensive coppice woods in the northern parts of the county; but, generally speaking, it is deficient in timber. Average rent of land in 1842–3, 28*s.* 11½*d.* an acre. Lancashire is the grand seat of the cotton manufacture; which has increased, since 1770, with a rapidity altogether unparalleled in the history of industry, and has been productive of an extraordinary increase of population and wealth. Manchester, now the second town in the empire, is the principal centre of the manufacture; but it is also carried on to a great extent, and with astonishing success, at Preston, Bolton, Oldham, Ashton, Blackburn, Bury, Chorley, Wigan,

&c. Woollen goods are also largely produced at Rochdale, Manchester, &c., as are silks, hats, paper, and an immense variety of other articles. Lancashire is indebted, in no inconsiderable degree, for its wonderful progress in arts and commerce, to its inexhaustible coal-mines, which supply at the cheapest rate that power which sets its machinery in motion. Copper lead, iron, and slates are all found in the hundred of Furness. Large quantities of the latter are shipped at Ulverstone. Principal rivers, Mersey, Irwell, Ribble, Lune, Wyre, &c. The first of the modern English canals was constructed by the Duke of Bridgewater, in this county, which was the grand theatre of Brindley's operations; and it now commands a vast extent of artificial navigation. The railway from Manchester to Liverpool is a work not only of great local, but of great national importance. By showing the all but miraculous influence of railways in facilitating intercourse, and their advantages as a means for the profitable investment of capital, its completion gave the first great stimulus to the immense works of that description, with which this county, and indeed the whole country, is now being overspread. The foreign trade of Lancashire is mostly centred at Liverpool, which from an obscure, inconsiderable place, at the commencement of last century, has become a very large and populous city; being, London only excepted, the principal emporium of Europe. The nett customs' duties collected at this port in 1844, amounted to the immense sum of 4,365,526*l.* It is to be regretted that, notwithstanding the great extent of the Lancashire coast, it does not possess, with, perhaps, the exception of Liverpool, a single good harbour; and the entrance to the latter is a good deal encumbered with sand-banks. Lancashire, which is a county palatine, is divided into 7 hundreds and 4 boroughs, and contains 70 parishes. It returns 26 members to Parliament; viz., 4 for the county; 2 each for the boroughs of Manchester, Liverpool, Oldham, Bolton, Preston, Lancaster, Wigan, and Blackburn; and 1 each for Rochdale, Bury, Clitheroe, Ashton-under-Line, Salford, and Warrington.

The following tabular view of the population of the county and its principal towns since 1801, exhibits an increase hardly exceeded by anything in the United States:—

	1801	Increase per Cent.	1811	Increase per Cent.	1821	Increase per Cent.	1831	Increase per Cent.	1841
Lancashire .	672,731	23	828,309	27	1,052,859	27	1,336,854	24·7	1,667,054
Manchester .	90,399	22	110,244	40	154,807	47	227,808	30·0	296,183
Liverpool .	79,722	26	100,240	32	131,801	44	189,242	39·6	264,298
Preston . .	11,887	44	17,065	44	24,575	35	33,112	51·4	50,131
Ashton . .	15,632	22	19,052	37	25,967	29	33,597	37·8	46,304
Oldham . .	12,024	39	16,690	30	21,662	49	32,381	31·5	42,595
Blackburn .	11,980	26	15,083	45	21,940	23	27,091	35·2	36,629
Bolton . .	12,549	36	17,070	29	22,037	28	28,299	18·8	33,610
Wigan . .	10,989	27	14,060	26	17,716	17	20,774	22·8	25,517

Sum expended for the relief of the poor in 1844-5, 289,535*l.* Annual value of real property in 1815, 3,139,043*l.*; ditto in 1842-3, 7,756,228*l.*

Counties bordering on Wales.

1. *Cheshire*, a maritime county, is bounded on the north by the æstuary of the Mersey, Lancashire, and a small part of Yorkshire; on the east by Derbyshire and Staffordshire; on the south by Shropshire and a detached part of Flintshire; and, on the west, by Denbighshire, Flintshire, and the æstuary of the Dee. It contains 673,280 acres, which Dr. Holland states were distributed, in 1808, nearly as follows: viz., arable, meadow, and pasture land, including parks and pleasure-grounds, 620,000 acres; waste lands, heaths, commons, and woods, 28,600 acres; peat bogs and morasses, 18,000; the residue consisting of sea sands within the æstuaries of the Dee and the Mersey. But a good deal of the waste land, and of the bogs and morasses, has since been brought under tillage. A ridge of hills runs along the eastern border of Cheshire, from Lawton, on the confines of Staffordshire, to its north-eastern extremity; and a ridge extends from Malpas, on its western side, to Frodsham. The latter is, however, much broken. The most singular feature in it is the insulated rock of Buston, about two miles south from Tarporley, rising on one side, almost perpendicularly from the plain, about 366 feet. But, with these exceptions, the rest of the county, comprising four-fifths of its entire extent, is remarkable for the flatness of its surface, being, probably, not more, on a medium, than from 100 to 200 feet above the level of the sea. Its appearance is that of an extended plain, thickly covered with wood. The soil consists, for the most part, of a red, rich, clayey, or sandy loam; and, with the exception of a few limited tracts of moss and heath, it is eminently fertile. More rain is believed to fall in Cheshire than in any other part of England; Westmoreland and Lancashire, perhaps, excepted. It is impossible to imagine a finer grazing district. The grass, owing to the mildness and moisture of the climate, the favourable nature of the soil, and the shelter afforded by the luxuriant hedges and hedge-row trees with which the fields are surrounded, retains its verdure and its growth throughout almost the whole year. The dairy husbandry is, in consequence, principally attended to. Dr. Holland, following Mr. Fenna, estimated the number of cows kept in the county, for dairy purposes, at 92,000. Cheese is the principal product; and it is not only well known and highly esteemed everywhere in England, where the consumption is immense, but also in most parts of Europe. Supposing each cow to yield, at an average, 2½ cwt. of cheese, the whole annual produce will be 11,500 tons. Arable husbandry, though improved, being deemed of inferior importance, is but indifferently understood, and is considerably behind. Potatoes very extensively cultivated: in addition to the great home consumption of the root, immense quantities are sent to Liverpool, Manchester, and other markets in Lancashire. They are usually planted on a ley, being commonly followed by oats, and these not unfrequently by wheat or barley. Latterly, however, the culture of turnips has been gaining on that of potatoes. Drainage, though much required in most parts of the county, and successfully practised on a few farms, is, in general, lamentably deficient. Previously to the inclosure of the waste tract called Delamere forest, in 1813, it was depastured by a peculiar breed of sheep, which have since mostly disappeared. The present stock of

sheep has been estimated at about 65,000, and the produce of wool at about 1,250 packs. Estates, for the most part, large. Farms small, a great many being under 10 acres, and only one or two of 350 or 400 acres. If those under 10 acres be excluded, the average size of the rest may be about 70 acres. Leases becoming less common than formerly: tenants strictly prohibited, under heavy penalties, from having more than a given proportion of their farms (generally about a third) under tillage, and from breaking up meadows. Though there are no large woods in Cheshire, it contains a great deal of valuable timber, chiefly in hedge-rows. From some points of view, indeed, it resembles a continuous forest. Average rent of land in 1842-3, 28*s.* 7*d.* an acre. Cheshire possesses large supplies of excellent marl, the plentiful use of which has materially contributed to its fertility. It is also famous for its inexhaustible beds of fossil or rock salt, near Northwich, Middlewich, &c.; and for its brine springs, contiguous to the same places. Vast quantities of the former are annually dug up both for home use and for exportation. It has also extensive beds of coal. Manufactures of cotton, silk, &c., have been extensively introduced into this county, and are carried on with much spirit and success at Macclesfield, Stockport, Congleton, and other places. Hats are made at Stockport, &c., and shoes for exportation at Sandbach. Small quantities of lead and shot are made at Chester. Principal rivers, Dee and Weaver. It is also intersected by several canals. Notwithstanding its apparently favourable situation, Cheshire, owing to the badness of Chester as a port (see p. 42), has hitherto had but little foreign or even coasting trade. This, however, will no longer be the case, it being abundantly certain that the newly-formed port of Birkenhead, opposite to Liverpool, will participate largely in the commerce of the Mersey. Cheshire is divided into 7 hundreds and 90 parishes, exclusive of the city of Chester. It returns 10 members to parliament; viz., 4 for the county, and 2 each for the city of Chester and the boroughs of Macclesfield and Stockport. Population of the county in 1841, 395,660. Sum expended for the relief of the poor in 1844-5, 73,948*l.* Annual value of real property in 1815, 1,114,927*l.*; ditto in 1842-3, 1,889,937*l.*

2. *Shropshire*, or *Salop*, an inland county, is bounded on the north by Cheshire, the detached part of Flintshire, and a corner of Denbighshire; on the west, by the latter county, and the counties of Montgomery and Radnor; on the south by Hereford and Worcester; and on the east by Stafford. It contains 859,520 acres, of which nearly 790,000 are supposed to be arable, meadow, and pasture. Aspect much diversified. No part of the surface is quite flat; but the great plain of Salop, or Shrewsbury, is comparatively level. It extends lengthwise from Whitchurch, on the confines of Cheshire, south to Church Stretton, a distance of about 30 miles; and from Oswestry, on the confines of Denbighshire, to Colebrook Dale on the east, about 28 miles. The Wrekin-hill (*ante*, p. 11.) rises out of this extensive plain on its eastern side. The south, or rather the south-west, parts of the county contain several ranges of flattish, square-shaped hills, divided by beautiful valleys. The Bettus-ridge, on the confines of Radnorshire, the Stipper-stones, the Long-mount, and the Wenlock-ridge, are the

most important. Soil various, but generally fertile. On the east it consists of a red sandy loam, like that of Cheshire; on the south, a mixture of clay and loam is most prevalent; on the west, there is a good deal of gravelly light soil. The harvest is said to be a fortnight earlier on the east than on the west side of the county; a difference depending partly, no doubt, on the greater elevation of the ground on the western side, but partly, also, on differences of soil. Salop is principally under tillage; but, in the south and west. breeding and dairying are carried on to a considerable extent. A good deal of cheese, sold under the name of Cheshire, but inferior to the genuine article, is made in this county. The wool of the hilly tracts used to be of a peculiarly fine quality, but it has deteriorated within the last 20 or 30 years, in consequence of the efforts of the farmers to increase the size of the sheep and the weight of the fleece. The total stock of sheep in the county is supposed to exceed 420,000; producing annually above 7,000 packs of wool. Hops are produced on the borders of Hereford. Property variously divided; some estates being very large, while there are many of every inferior degree of size. On the borders of Wales, farms very small; many not exceeding 20 acres; but on the east side of the county, in the vicinity of Shiffnal, Wellington, Newport, &c., they vary from 100 to 500 acres or more. The district of Clun Forest, in the south-west part of the county, is divided into small, freehold properties, varying in value from 5*l.* to 150*l.* a year, the majority being of the smaller class. Their occupiers, who in most cases are also the owners, employ few labourers, the principal part of the work on their farms being executed by themselves and their families. Farmers very industrious, working along with their servants, while their wives bake, brew, spin, &c. Leases less common now than formerly, and farms generally held from year to year. Agricultural management improving; but, owing to the want of leases of a reasonable length, and with proper conditions as to management, it continues to be very defective. The number of corn crops taken in succession has been materially diminished within the last 15 or 20 years; but two wheat crops still not unfrequently follow each other. These remarks do not, however, apply to the district on the east side of the county mentioned above, where the farms are large; for there the tenants are active and enterprising, and agriculture highly improved. Turnips extensively cultivated, and, for the most part, in drills; few oats grown. Cattle of mixed breed, and rather inferior. Pork and bacon much used by the people. Large flocks of turkeys raised by some farmers. Drainage in some places much wanted. Average rent of land, in 1842-3, 24*s.* 5*d.* an acre. Principal mineral products, iron, coal, lead, limestone, and freestone. With the exception of South Wales and Staffordshire, more iron is made in Salop than in any other county of England; the quantity produced in 1840, having amounted to 82,750 tons; and the probability is that it has increased considerably in the interval. The furnaces are principally situated in Colebrook Dale, between Wellington and Willey. Excellent China ware, and a very superior species of pottery, are made at Coalport on the Severn, and its vicinity: pipes, nails, &c., are made at Broseley; carpets at Bridgenorth; gloves at Ludlow, &c. Some branches of the flannel manufacture are carried on

in Shrewsbury and its neighbourhood; but by far the largest portion of the flannel sold in its markets is brought from Merionethshire and Denbighshire: latterly, however, there has been a material falling off in this trade. The Severn, which becomes navigable at Pool, in Montgomeryshire, traverses the county in a south-easterly direction, dividing it into two not very unequal portions; and it is besides intersected by several very important canals. The first iron bridge constructed in Great Britain was erected in this county, in 1777, by Mr. Abraham Darby, of Colebrook Dale. It crosses the Severn about 2 miles above Coalport. It consists of a single arch 100 feet 6 inches wide, rising 45 feet; and is as perfect now as when first put up. Another iron bridge, on a larger scale, was thrown over the Severn at Buildwas, by Mr. Telford, in 1797. Roads formerly very bad, but now a good deal improved, though still susceptible of much amelioration. Salop is divided into 15 hundreds, or districts, answerable to that denomination, and 216 parishes. It returns 11 members to parliament; viz., 4 for the county, and 2 each for the boroughs of Shrewsbury, Bridgenorth, and Wenlock, and 1 for Ludlow. Population of county in 1841, 239,048. Sum expended for the relief of the poor in 1844-5, 54,594*l.* Annual value of real property in 1815, 1,083,702*l.*; ditto in 1842-3, 1,475,339*l.*

3. *Herefordshire*, an inland county, is bounded on the north by Salop; on the west, by the counties of Radnor and Brecknock; on the south, by those of Monmouth and Gloucester; and, on the east, by the latter and Worcester. It contains 552,320 acres, of which nearly 500,000 are arable, meadow, and pasture. Surface beautifully diversified, and set off to the greatest advantage by magnificent woods. On the east it is separated from Gloucestershire by the Malvern hills; and, on the south-west, it is separated from Brecknockshire by the Black Mountains. The soil is usually represented as being everywhere rich and fertile. But the luxuriant woods, and rich alluvial lands upon the banks of the rivers, are said to have deceived the superficial observer; and that the fertility of the soil is not, speaking generally, so great as is commonly stated. The pasture grounds are even said to be poor, and the herbage not nutritious.—(*Youatt on Cattle*, p. 33.) But it, notwithstanding, produces excellent crops of wheat and barley; and is particularly celebrated for its cyder and wool. Hops extensively cultivated, principally in the parts bordering on Worcestershire; there being, in 1845, 6,597 acres under this crop. Property variously divided: some large estates; many of a medium, and some of a small, size. The tenures of gavelkind and borough-English exist in some districts, but are usually nullified by will. Farms generally large; number of those that are small decreasing; let, for the most part, by the year. Considering the sort of tenure under which it is held, the land is in general tolerably well managed; but in many places its drainage is neglected, and there is a great want of good husbandry. Turnips extensively cultivated. In some parts very important improvements have been accomplished by means of irrigation. Herefordshire cattle deservedly held in great estimation; they feed easily, though less active than those of North Devon; they are excellent workers, produce the finest beef, and are remarkably quiet and tractable. Nearly half the ploughing is performed by them; and they are extensively em-

ployed in the labours of harvest. As milkers, however, they are good for nothing. The wool of the Ryland sheep, so celebrated for its fineness, has been injured by crossing with Leicesters, but the carcass has been materially improved. At an average, the weight of the Herefordshire fleeces, and the produce of wool, is supposed to have been about doubled since 1800. The stock of sheep in the county is very large, being estimated at about 500,000 head; and the quantity of wool now annually brought to market is rated at about 10,000 packs. Average rent of land in 1842-3, 22*s.* 9½*d.* an acre. Oak timber is very abundant in this county; and forms, with oak bark, an important article of export. Iron ore has been discovered, but it is not wrought; and the other minerals are of little importance. If we except that of cyder, large quantities of which are sent to all parts of the country, Herefordshire has no manufactures of any importance. Gloves are, however, made at Hereford and Leominster; ropes and sacking at Tedbury; and some coarse woollens in a few places. Principal rivers, Wye, celebrated for its beautiful scenery, Lug, and Munnow. The Wye is navigable, at particular periods, to Hereford, for barges carrying from 18 to 30 tons; but the navigation is very uncertain, being liable to frequent interruptions from a deficiency of water, floods, &c. Hereford is divided into 11 hundreds and 219 parishes. It returns 7 members to parliament; viz., 3 for the county, and 2 each for the city of Hereford and the borough of Leominster. Population of county in 1841, 113,878*l.* Sum expended for the relief of the poor in 1844-5, 45,198*l.* Annual value of real property in 1815, 629,156*l.*; ditto in 1842-3, 805,319*l.*

4. *Monmouthshire*, a maritime county, is bounded on the north by the counties of Hereford and Brecknock, on the west by the latter and Glamorgan, on the south and south-east by the Bristol Channel, and on the east by Gloucestershire. It contains 317,440 acres, of which 270,000 are arable, meadow, and pasture. Aspect much diversified, comprehending every variety of scenery, from the wildness and sublimity of Alpine regions, to the richness and variety of a cultivated country. The western division, or that between the river Usk and Glamorganshire, is, for the most part, rugged and mountainous; but the eastern division, or that lying between the rivers Usk and Wye, is comparatively level, and is well wooded. Soil various, but generally of a good quality. Substratum, in many parts, limestone. There is a considerable extent of low level land along the coast, of a deep, rich, loamy soil, in some places, and of a black peat earth in others. Parts of this tract are liable to be overflowed by the sea, and it is defended from inundation by immense dykes. Agriculture a good deal improved, but still susceptible of much amendment. Tillage chiefly performed by oxen. Upon clay the rotation is fallow, wheat, oats, seeds; and, upon the sandy soil, turnips, barley, seeds, and oats: a fallow is then made for wheat, if the land be not very clean; but most frequently a second crop of wheat is sown after oats. Lime is the principal manure. Cattle of the Hereford breed: they are finer beasts than those kept in most of the adjoining counties, except in that whence they derive their name and origin. Mules are a good deal used, principally about the mines. Stock of sheep estimated at about 175,000, producing 2,000

packs of wool a-year. There are numerous orchards, but generally on a small scale: hops are cultivated in a few places. Some large estates, but the property a good deal subdivided. Size of farms from 60 to 300 acres; 140 acres supposed to be the medium. Farms usually let from year to year, and the want of leases much complained of. Average rent of land in 1842-3, 18*s.* 3½*d.* an acre. About 30 years ago, roads were in the most wretched state imaginable; now, however, they are a good deal improved. The county is intersected by two canals, and by various railways, intended to facilitate the access to the mines. Principal minerals: coal, iron, and limestone. The abundance of iron-ore and coal has led to the establishment of a great many very extensive iron works, that furnish employment to a numerous population, and are of great public importance. These are principally situated in the western division of the county. Those of Tredegar are upon a very large scale. Manufactures of little importance. Pontypool was at one time famous for its japanned ware; but this article is now principally produced at Birmingham, Bilston, and Wolverhampton. Principal rivers: Wye, Usk, Munnow, and Ebwy. It is divided into 6 hundreds and 127 parishes. It returns 4 members to parliament, viz., 2 for the county and 2 for the borough of Monmouth. Population of county in 1841, 134,355. Sum expended for the relief of the poor in 1844-5, 27,479*l.* Value of real property in 1815, 298,981*l.*; ditto in 1842-3, 591,162*l.*

Midland Counties.

1. *Nottinghamshire*, an inland county, is bounded on the north by the counties of York and Lincoln, on the east by the latter, on the south by Leicester, and on the west by Derby and York. It contains 535,680 acres, of which about 500,000 are arable, meadow, and pasture. Excepting the level through which the Trent runs, and the vale of Belvoir, the surface is, for the most part, hilly and uneven; but the hills do not rise to any considerable height. On the western side of the county, from Nottingham to Bawtry, the soil is principally sandy and gravelly; east of this, from Burton Joyce to Breckingham, is a tract of clay land. The soil of the low level tract along the Trent, called the Trent-bank land, consists principally of a sandy loam, and that of the fruitful vale of Belvoir of a clayey loam. The climate is reckoned peculiarly dry and good. Harvest generally begins about the 1st of August, and is concluded by the middle or end of September. The ancient forest of Sherwood, the principal scene of the adventures of Robin Hood and his companions, covered the greater part of the sandy and gravelly soil on the west side of the county, which is still, for that reason, called the forest district. The forest extended, lengthwise, from Nottingham to near Worksop, a distance of about 25 miles, with a breadth varying from 6 to 9 miles; but it has been long since disforested, and now contains some of the finest parks and residences in England. Agriculture, though not equally advanced in all parts of the county, is, on the whole, good; and has been much improved of late years. The forest lands, which are divided into farms varying from 300 to 500 acres, are well suited to the turnip husbandry, and produce excellent crops of wheat and barley, especially the latter. The

usual rotation in this district is the Norfolk or four shift course, viz., 1st year, turnips; 2nd, barley; 3rd, grass-seeds or red clover; 4th, wheat. In the clay lands in the north part of the county, and in the vale of Belvoir, wheat is the principal crop; beans, peas, and cabbages, being also raised. The husbandry of the clays is, however, inferior to that of the lighter soils, partly from their being unsuitable to turnips, for which fallows have to be substituted, and partly from the size of the farms, varying from 70 to 150 acres, being too small to admit of the adoption of the best methods of farming. The Trent-bank land is famous for its crops of oats, as many as 10 quarters having been reaped from a single acre! and their quality is not inferior to their quantity. A species of oats, provincially called *skegs*, are raised in this county: they are sown on the worst land, where they produce about 4 quarters an acre; but on good land they produce 14 or 15 quarters an acre. They are reckoned excellent food for horses, fetch about two-thirds the price of oats, and grow where nothing else will.—(*Lowe*, p. 148.) —Hops have been cultivated in the northern district, but to a small extent only. There is a considerable breadth of excellent grass land and meadows on the banks of the Trent and the Soar, employed partly for feeding and partly for the dairy. About half a century ago the cattle were mostly long-horned, but these are now nearly superseded by the short horns. The sheep in the forest district used to be a small-polled breed, with grey faces and legs; but it has now almost entirely disappeared, being supplanted by the new Leicester and other improved varieties. The total stock of sheep in the county is estimated at about 300,000, and the annual produce of wool at about 10,000 packs. Some large black draught horses are bred. There is a good deal of timber in the forest district, the Dukes of Newcastle and Portland having distinguished themselves by the magnitude of their plantations. The latter is, also, distinguished by the extent to which he has carried irrigation, having converted, by its means, a large district of light, unproductive forest land, into very valuable meadow. Pigeons very abundant. There are some large and many small estates. Farms mostly held at will. Farm buildings said to be spacious and convenient. Average rent of land in 1842-3, 26*s*. 5*d*. an acre. Nottinghamshire, especially the town of Nottingham, is one of the principal seats of the stocking manufacture. Of 48,482 stocking frames, the number supposed to be employed in the United Kingdom in 1844, Nottinghamshire had 16,382: these were mostly all engaged in the manufacture of cotton and silk stockings, especially the former. This county is also famous for the beautiful fabric known by the name of bobbinet, or Nottingham lace. This, which is a novel branch of manufacture, has increased with extraordinary rapidity, and is now become of very great value and importance. The malting business is, also, extensively carried on. Coal is abundant in the western parts of the county, and there are valuable limestone and freestone quarries. The Trent enters the county on its south-western border at Attenborough, and, pursuing a north-westerly course by Nottingham and Newark to Laneham, it forms from this point, as far as West Stockwith, the boundary between Nottinghamshire and Lincolnshire. The Idle rises in Sherwood Forest, and, flowing through Ollerton and East Retford, falls into the

Trent at West Stockwith. The Soar, previously to its falling into the Trent, separates the extreme south-western angle of the county from Leicestershire. The county is also intersected by the Nottingham, Chesterfield, and other canals, and by various railways. Nottinghamshire is divided into 6 wapentakes or hundreds, and the liberty of Southwell and Scrooby, and contains 285 parishes. It returns 10 members to parliament, viz., 4 for the county, and 2 each for the boroughs of Nottingham, Newark, and East Retford. Population of county in 1841, 249,910. Sum expended for the relief of the poor in 1844–5, 60,655*l.* Annual value of real property in 1815, 751,626*l.*; ditto in 1842-3, 1,142,367*l.*

2. *Derbyshire*, an inland county, is bounded on the north by the county of York and a small part of Cheshire; on the west by the latter and Stafford; on the south by the latter, Leicester, and a single point of Warwick; and on the east by Nottingham. It contains 657,920 acres, of which about 500,000 are arable, meadow, and pasture. All that part of the county which lies to the south of Belper is comparatively level, but from it northwards the hills begin to ascend, forming the commencement of that great central ridge that runs thence to the Scottish border. The north-western angle of the county, called the High Peak, is full of mountains and moors, and is famous for its caverns, of which the most celebrated is near Castleton, and other natural curiosities. But its most romantic scenery is found in its valleys and dells, some of which are narrow, and bounded by high, precipitous, fantastic cliffs. The soil in the southern part of the county consists principally of a reddish loam. In the middle and eastern parts there is almost every variety of soil. Considerable tracts of moss are met with in the High Peak. The climate varies with the elevation and exposure of the land, being cold and backward on the high grounds and mild in the lower parts of the county and in the vales. Derby is both a corn and a pasture county; but the latter predominates, particularly in the northern parts. Agriculture rather behind. In the southern parts, tenants are seldom under any restriction either as to the mode or frequency of cropping, so that the land is too often in a foul, exhausted state. There is in most parts, also, a great want of drainage, though this greatest of all improvements is making considerable progress. Principal crops: wheat, beans, and oats. In the northern parts of the county the dairy is the great dependence of the farmer, and there the occupiers are strictly prohibited from breaking up any pasture land, their tillage being confined to a small spot hardly sufficient to supply their consumption, and sometimes even that is not allowed. Oats is the leading crop in this district, and oat bread has long been a principal part of the food of the labouring classes in the High Peak. In ploughing, the horses are always driven in line, three or four being most commonly yoked to a plough, which has generally two wheels. A few acres are under hops. There is no decided preference shown to any particular breed of cattle; some prefer the long-horned or Stafford breed, and others the short-horned or Durham breed; but the former are much more general than the latter. A cross between these breeds is much sought after, being considered to possess most of the good qualities of each.—(*Kennedy and Grainger on the Tenancy of Land*,

p. 184.) Cheese is the principal product of the Derbyshire dairies, and is in considerable estimation. It is here a common practice, when cheese is made from new milk, to extract butter afterwards from the whey. The principal dairy district is in the vicinity of Ashbourne; and large quantities of cheese are annually sent to other parts of the country. The moor breed of sheep was formerly most prevalent in all the northern parts of the county, but it has been nearly superseded by other and larger varieties. At present the total stock of sheep is estimated at about 360,000, and the total annual produce of wool at about 9,000 packs. The black horses of Derbyshire rank next to those of Leicester. Great numbers of hogs, of no peculiar breed, are kept at the dairies; and more asses are employed in this than in any other English county. Estates of various sizes; some very large, but the majority small. Farms generally small, and mostly held at will. Farm buildings, particularly in the northern parts, on a very limited scale. Average rent of land in 1842-3, 25*s.* 8¼*d.* an acre. Derby ranks high as a mineral and manufacturing county. The coalfield is of great extent, stretching from Dale Abbey north to the frontier of the county. It is certain that the collieries near Derby were wrought as early as 1306. Ironstone is found in most parts of the coal district, and iron has been produced and smelted in this county from a remote epoch. In 1840, the total produce of the Derbyshire furnaces amounted to about 31,000 tons. The lead mines have long been famous; and it appears to be satisfactorily ascertained that they were wrought by the Romans. They are principally situated in the hundreds of Wirksworth and High Peak; but they are also found in other parts of the county. Latterly, however, their productiveness would appear to have declined; for, in 1789, they are said to have yielded from 5,000 to 6,000 tons of lead, (*Encyc. Metrop.*, Part xxxix. p. 195); whereas, in 1839, they did not yield more than 4,500 tons. A good deal of zinc is obtained from some of the lead mines. Copper has been found, but in inconsiderable quantities. The mines and miners of this county are subjected to peculiar laws and regulations, established so far back as 1287, which are fully detailed in *Farey's Survey* (vol. i. pp. 356—365). Derbyshire is famous also for its spar, and its quarries of marble, gypsum, &c. The manufactures consist principally of cotton and silk, and are of great value and importance. Cotton spinning is principally carried on in the parish of Glossop, on the confines of Cheshire in the High Peak, and at Belper, Derby, Cromford, and other places. In 1844, 6,006 stocking-frames were at work in different parts of the county, mostly on cotton and silk. Sir Thomas Lombe's famous silk mill was erected at Derby in 1719: at present there are about 10 silk mills in that town in full operation. Porcelain of a superior quality, and beautiful spar ornaments, are both produced at Derby. There are cast iron and nail manufactories at Chesterfield, Belper, &c.; and hats, with a great variety of other articles, are made in different parts. Principal rivers: Trent, Derwent, Dove, and Rother. The Trent crosses the southern angle of the county. The Derwent rises in the High Peak, and, passing through Belper and Derby, falls into the Trent at Wilne, on the confines of Leicestershire. The Dove forms the western boundary of the county from Ax-Edge, where it rises to

Newton Solney, where it falls into the Trent. The county has also a great extent of railways and of canal navigation. Derbyshire is divided into 6 hundreds, exclusive of the borough of Derby, and 139 parishes. It returns 6 members to parliament, viz., 4 for the county, and 2 for the borough of Derby. Population of county in 1841, 272,217. Sum expended for the relief of the poor in 1844-5, 51,281*l.* Annual value of real property in 1815, 883,370*l*; ditto in 1842-3, 1,379,025*l.*

3. *Staffordshire*, an inland county, is bounded on the north by Cheshire; on the east by the counties of Derby and Warwick; on the south by Worcester; and on the west and north-west by Cheshire, Salop, and Derby. It contains 757,760 acres. Aspect very various. The northern part, or the portion of the county lying to the north of a line drawn from Uttoxeter, on the confines of Derbyshire, to Newcastle-under-Lyne, consists principally of moorlands. The hills in some parts of this district rise to an elevation of about 1,000 feet above the level of the sea; sometimes consisting of vast heaps of gravel, and sometimes of huge cliffs having immense masses of rock scattered round their bases. With the exception of some beautiful valleys, the whole of this district is sterile, cold, and dreary. The soil in many places is peat; but in some parts, particularly between the rivers Dove and Churnet, it is of a superior quality, and produces good herbage. The middle and southern parts of the county are agreeably diversified with hills, level lands in pasture and corn, plantations, and gentlemen's seats; but, in its extreme southern angle, the iron works are its most prominent feature. The valley of the Trent is particularly fertile and beautiful. Mr. Pitt estimated the cultivated land, including parks, at 600,000 acres, of which he supposed 100,000 may be meadow and pasture, and 500,000 arable. The latter he distributed as follows, viz.: 200,000 acres of clay loam, or more friable mixed loam; 200,000 acres of gravelly or sandy loam, or other mixed, including calcareous soils; and the remainder, or 100,000 acres, of light sandy, gravelly, or other soils.—(*Survey*, p. 13.) The air is sharp and cold; and, in the northern parts, particularly, there is a great deal of rain. Stafford is more of a mining and manufacturing than of an agricultural county; but husbandry, though not so far advanced as it might be, is, of late, very considerably improved. Wheat, oats, beans, and barley are the principal crops. The usual rotation on the clay land is, 1st, fallow; 2nd, wheat; 3rd, beans; 4th, oats; 5th, seeds. On the lighter soils, 1st, turnips; 2nd, barley; 3rd, wheat; 4th, seeds; 5th, oats. According to returns obtained from the Quarter Sessions, of the 600,000 acres of arable land, 54,000 were in wheat; 36,000 in barley; 45,000 in oats; 15,000 in beans, peas, and vetches; 33,000 in wheat fallow; 17,000 in turnips; and 400,000 in grass.—(*Survey*, p. 225.) The above returns were published in 1813; but since that period the extent of land in fallow has been considerably diminished, and that under beans and turnips increased. Barley, and perhaps oats, has also decreased, while wheat has been augmented. Various important improvements have been effected within the last 20 years, particularly on the estates of the Duke of Sutherland, who has expended large sums on drainage, on the building of new, commodious, and excellent farm houses, and on other substantial improvements. Cannock Heath, immediately to the west

of Rudgeley, containing about 20,000 acres, is by far the largest tract of waste land in the county. But though, at present, this extensive heath merely furnishes a scanty subsistence to a few half-starved sheep, its soil is said to be preferable to that of the moors of Lincolnshire, which have been brought into the highest state of cultivation; and there is every reason to think, that it might, with a moderate outlay of capital and judicious management, be converted into valuable arable land. The cattle of Staffordshire are principally of the long-horned breed; but within no very distant period they have been extensively crossed with the short horns; and the stock of some of the principal breeders consists, at present, entirely of the latter. Dairy husbandry is extensively practised; cheese is the principal product, and it is but little inferior to that of Cheshire and Derbyshire. The sheep stock of Staffordshire is estimated at about 187,000, and the produce of wool at about 3,500 packs. Property in estates varying from 10,000*l.* a-year down to 40*s.*; farms of all sizes, from 25 to 500 acres, but the smaller class is decreasing; leases frequently granted, but the greater number of farms held at will. Average rent of land in 1814-15, 22*s.* 9¼*d.* an acre; in 1842-3, 29*s.* 1½*d.* Coal, iron, and lime, are found in the greatest abundance in most parts of the county. It is particularly famous for its potteries and iron foundries. The chief seat of the former is in a district denominated *The Potteries*, between Newcastle-under-Lyne and Norton-on-the-Moors, in which there are several very considerable towns and villages mostly supported by the business. The neighbourhood affords abundance of fire clay and coal: but the finer clays are principally brought from Purbeck in Dorsetshire, soapstone from Cornwall, and flints from the chalk-pits near Gravesend, and from Wales and Ireland. The iron-works are situated in the southern angle of the county, in the vicinity of Walsall, Wednesbury, Bilston, &c. Their increase has been quite extraordinary. In 1840 there were in this county 151 furnaces; producing 427,650 tons of iron, being about double its produce 10 years before, and very decidedly exceeding all that was produced in all England besides: at present, (1846,) the make of iron is understood to exceed 550,000 tons! The manufacture of locks, nails, edge-tools, bridles, spurs, and an infinity of other hardware articles, is prosecuted upon a very large scale at Wolverhampton, Bilston, and Walsall, and their vicinity. Soho, the famous establishment of Messrs. Boulton and Watt, where there is the greatest manufactory of steam engines in the world, is situated within this county, on its extreme southern border. Glass is also made on the confines of Worcestershire. Hats, shoes, and boots are prepared at Stafford, for exportation as well as home consumption; and cotton mills have been erected at Rochester and other places. Principal rivers, Trent, Dove, and Stour. The Grand Junction Railway intersects the county, and it is also intersected by the Trent and Mersey Canal; and by an immense number of other railways and canals. Staffordshire is divided into 5 hundreds exclusive of the city of Lichfield and the boroughs of Stafford and Newcastle-under-Lyne, and 145 parishes. It returns 17 members to parliament; viz., 4 for the county; 2 each for the city of Lichfield and the boroughs of Newcastle-under-Lyne, Stafford, Tamworth, Wolverhampton, and Stoke-

upon-Trent; and 1 for Walsall. Population of county in 1841, 510,504. Sum expended for the relief of the poor in 1844–5, 108,756*l.* Annual value of real property in 1815, 1,200,325*l.*, ditto in 1842-3, 2,441,553*l.*

4. *Leicestershire*, an inland county, is bounded on the north by the counties of Nottingham and Derby; on the west by the latter and Warwick; on the south by Northampton; and on the east by Rutland and Lincoln. It contains 515,840 acres, of which 480,000 are arable, meadow, and pasture. Surface varied and uneven; but, except in the district called Charnwood Forest to the south of Loughborough, the hills do not attain to any considerable elevation, and are flat and tame. Here, however, some of the summits consist of barren rocks. The view from Bardon Hill, on the west side of the forest, is particularly fine. The soil consists principally of strong clayey loam, sandy loam, and very rich meadow. The pastures are excellent, and the proportion of land in grass very much exceeds that under the plough. Leicestershire is famous for its horses, cattle, and sheep; all of which, but especially the last two, were believed to be greatly improved by the skill and persevering exertions of the celebrated Mr. Robert Bakewell, of Dishly, near Loughborough. But it is a singular fact, that the Dishly breed of long-horned cattle, so famous a few years ago, is now everywhere losing ground; and that comparatively few of them are to be found even in this their native county! The old breed has resumed its place, or, where that is not the case, the improved short horns are now generally the favourites.—(*Youatt on Cattle*, p. 208.) Tillage husbandry not so much improved as breeding and grazing; but the ground is in general clean, and kept in good condition. A greater breadth of land is sown with barley than with any other species of grain; but wheat, oats, and beans, are all extensively cultivated, and produce excellent crops. On the clay land the rotation is, 1st, fallow; 2nd, wheat; 3rd, beans: on the loamy soil, 1st, turnips; 2nd, barley or oats; 3rd, seeds; 4th, wheat. The peculiarly rich, mild cheese, called Stilton, is principally made in this county, in the farms round Melton Mowbray; but, exclusive of this, a great deal of very superior cheese is made in other parts of the county. Its total produce is stated at about 1,800 tons. The Leicestershire sheep consist principally of the old Leicesters, the new Leicesters or Dishly breed, and the Charnwood or forest breed. They all produce long combing wool. The stock is reckoned at about 400,000, and the produce of wool at above 10,000 packs. Horses, well adapted for the saddle or draught, but especially the latter, are reared in considerable numbers. Estates generally large. Farms of all sizes: that of Mr. Bakewell contained between 400 and 500 acres, but there are many from 80 to 100 acres; they are mostly held at will. Tenants strictly prohibited from breaking up old pasture land; and mostly restricted in cultivation to the system of 2 crops and a fallow. Average rent of land in 1842-3, 34*s.* 10½*d.* an acre, being the highest rent paid by any county in England, Middlesex excepted. Coal is wrought at Ashby-de-la-Zouch and other places. Iron and lead are also found. Lime of excellent quality is made at Barrow-on-Soar. Thick and heavy slates, quarried at Swithland, are used for building as well as for roofing. Leicestershire is one of the great seats of the stocking manufacture. In 1844 it was esti-

mated to possess in all 20,851 frames, of which 2,303 were idle; of the others, 9,875 were employed in the worsted and 6,933 in the cotton departments. The business is carried on in the towns of Leicester, Loughborough, Hinckley, &c., but more especially in the first: it is not, however, confined to them, but is diffused among most towns and villages of the county. Hats are made at Loughborough, Hinckley, and other places. Lace-making is also introduced; and malt is made in considerable quantities. Principal river, Soar. Owing to the openness of the country and other recommendations, Leicestershire has been long famous as a hunting county. Melton Mowbray, in the centre of the sporting district, has accommodation for a vast number of horses; and during the season is crowded with visitors, foreign as well as native. The county is divided into 6 hundreds, and 216 parishes. It returns 6 members to parliament; viz., 4 for the county, and 2 for the borough of Leicester. Principal towns and population in 1841,—Leicester, 48,167; Loughborough, 10,025; Hinckley, 6,356. Population of the county in 1841, 215,867. Sum expended for the relief of the poor in 1844–5, 76,308*l.* Annual value of real property in 1815, 951,908*l.*, ditto in 1842-3, 1,376,384.

5. *Rutland*, the smallest of the English counties, is surrounded by Lincoln, Leicester, and Northampton. It contains 95,360 acres; of which 90,000 are arable, meadow, and pasture. Surface gently varied; air pure; and the soil almost everywhere loamy and rich. The western part of the county, in which is the celebrated vale of Catmose, is under grass, and the eastern chiefly in tillage. It is particularly celebrated for its wheat, cheese, and sheep. Estates and farms of various sizes. Labourers said to be very well off. Average rent of land in 1842-3, 27*s.* 5½*d.* an acre. The river Welland runs along its south-eastern border, from Rockingham to near Stamford, and there is a canal from the river Soar to Okeham. It is divided into 5 hundreds and 25 parishes; and returns 2 members to parliament, both for the county. Population of county in 1841, 21,302. Sum expended for relief of the poor in 1844–5, 7,834*l.* Annual value of real property in 1815, 138,216*l.*, ditto in 1842-3, 156,988*l.*

6. *Northamptonshire*, an inland county, is bounded on the north and north-west by the counties of Lincoln, Rutland, and Leicester; on the west by Warwick and Oxford; and on the south, south-east, and east by Oxford, Bucks, Bedford, Huntingdon, and Cambridge. It contains 650,240 acres, of which about 580,000 are supposed to be arable, meadow, and pasture. The aspect of the county has great variety and beauty. In most parts it is varied by waving hills and gradual declivities, with intervening well-watered vales. There is very little land but what either is or may be rendered useful. The highest hills are in the south-western part of the county, near Daventry, contiguous to which the Nene, the Ouse, and some other rivers have their sources; but their most elevated summit is only about 800 feet above the level of the sea. Soil various, but mostly rich and fertile, consisting principally of various descriptions of loam. Much the largest proportion is of a strong heavy staple, well adapted to the culture of wheat and beans; but there is a good deal of a lighter quality, though, except in a few instances, we do not meet the extremes

either of stiff clay or sand. The general excellence of the soil seems to be owing mainly to its depth, and to the dry porous nature of the subsoil, a good deal of which is lime. In the north-east corner of the county there is a considerable tract of rich fen land; and along the Welland and the Nene there are some very fine natural meadows. The climate is reckoned particularly good and salubrious; and there are more mansion houses in this than in any other county. Northampton is pretty equally divided between tillage and grazing. The former is said to be conducted at present as it has been for many years past. The rotation on loams is, 1st, turnips; 2nd, barley; 3rd, seeds; 4th, wheat. Ground in general clean and in good condition—(*Kennedy and Grainger*, vol. i. p. 284.) Principal corn crops, wheat, barley, and oats; but the first is much the largest proportion. When sown upon a fallow, it is invariably ploughed in. Beans and turnips extensively cultivated. Mr. Pitt, in his *Survey* of the county, published in 1813, taking the extent of the arable and pasture land, exclusive of forests, woods, &c., at 600,000 acres, supposes it to be distributed as follows, viz.: wheat, 60,000 acres; rye, 3,000; barley, 33,000; beans, 30,000; oats, 24,000; peas and vetches, 15,000; green crops, 30,000; fallow, 30,000; and grass land, including clover and seeds, 375,000; making, in all, 600,000 acres. But, though this distribution should have been pretty accurate at the time, which may, perhaps, be questioned, it must now, no doubt, be in several respects wide of the mark. Northampton is not distinguished as a breeding county; but large numbers of cattle are purchased from other districts and fattened for the London market, to which it is supposed to send, annually, from 15,000 to 16,000 head. The long horns were formerly the only breed to the raising of which any attention was paid; but the short horns are now beginning to be introduced. There is a considerable number of dairy farms in the south-western parts of the county. The rearing of sheep is a principal object with the Northamptonshire farmers. Breed, long-woolled and much crossed. Stock supposed to be about 640,000, and the annual produce of wool about 16,000 packs. A good many horses, principally of the large black breed, are raised. Mr. Pitt estimated the number kept for business and pleasure at 20,000.—(*Survey*, p. 219.) But, this being one of the counties in which it is not unusual to see 5 horses in a team, their number might be very advantageously reduced. Estates generally large; but there are few large farms. The average size of uninclosed farms used to be about 130 acres, and that of those that were inclosed varied from 180 to 200 acres; but we believe their dimensions have latterly increased. They are usually let from year to year; a species of tenure which, no doubt, contributes materially to perpetuate the routine practices observable in this and other counties. Farm-houses and offices, with the exception of some constructed during the present century, mostly inferior, and inconveniently situated, being not unfrequently in villages; and sometimes, indeed, altogether detached from the farm! They are usually thatched. Cottages bad, and mostly huddled together. Average rent of land in 1842-3, 29*s.* 1*d.* an acre. The woodlands in this county are very extensive. They consist principally of the remains of the ancient Royal forests of

Rockingham, Salcey, and Whittlebury, with the chaces of Geddington and Yardley. Their extent, including private woodlands, is estimated by Mr. Pitt at 40,000 acres. The proprietors and others adjoining the forests have right to cut the underwood, and to depasture them at certain periods of the year; and it is the opinion of those conversant with the subject, that a *tenth part* of the forest lands, supposing it were well fenced and protected from trespass, would yield more timber than will ever be obtained from the whole under its present management. If we except limestone, which is very abundant, the mineral productions are of little importance. Slates are dug from quarries at Collyweston near Stamford; they are of a good size, but, being thick and heavy, and disposed to imbibe water, are not much used. Coal is principally imported from Staffordshire, by the Grand Junction Canal; wood is also extensively used as fuel. Large quantities of boots and shoes for the use of the army, and the supply of the London market, are manufactured at Northampton, Wellingborough, and some other places. Lace-making used to afford employment to great numbers of persons in the south-western parts of the county; but this business is now much reduced. Whips are manufactured at Daventry; silk stockings at Towcester; and the latter and some descriptions of woollen stuffs at Kettering. The want of coal is, however, a very serious obstacle in the way of this county ever becoming of considerable importance in manufacturing industry. The Nene, Ouse, and Welland have their sources in Northamptonshire. The Nene rises a little to the west of Daventry, on the confines of Warwickshire, flowing east by Northampton, where it becomes navigable. It then takes a north-easterly course by Thrapstone and Oundle to Peterborough, where it quits the county. The Ouse rises near Brackly, in the southernmost part of the county, which it soon after leaves, but touches it again at Stony Stratford. The Welland rises near Hothorpe, on the confines of Leicestershire; and forms the northern boundary of the county, from Market Harborough to Crowland. Besides these, and other rivers of less importance, the county is intersected by the Grand Junction Canal a branch from which is carried to Northampton—and by the Derby and Leicester Canal, &c. Northamptonshire has 20 hundreds and 306 parishes. It returns 8 members to parliament; viz., 4 for the county, 2 for the city of Peterborough, and 2 for Northampton. Population of county in 1841, 199,228. Sum expended for the relief of the poor in 1844–5, 91,006*l.* Annual value of real property in 1815, 947,578*l.*, ditto in 1842-3, 1,252,100*l.*

7. *Warwickshire* lies almost in the centre of England: it is bounded on the south by the counties of Oxford and Gloucester, on the west by Worcester, on the north-west by Stafford, on the north-east by Leicester, and on the east by Northampton. It contains 574,080 acres, of which above 500,000 are arable, meadow, and pasture. The northern and largest part of Warwickshire was formerly an extensive forest, and still retains something of its ancient character, being interspersed with heaths and moors, and sprinkled with woods; but the former have greatly diminished within the last 30 years. The southern portion is, in general, very fertile. Mr. Murray estimated the total extent of land in meadow and pasture grass at 235,000 acres, and the extent in arti-

ficial grasses at 60,000, making together 295,000 acres, being more than half the county. Of this quantity he supposes that from 80,000 to 85,000 acres are meadows, mown annually for hay; that from 10,000 to 15,000 acres of the artificial grasses are cut green for horses and other cattle, and made into hay; and that the residue, consisting of from 195,000 to 205,000 acres, is depastured by sheep and cattle.—(*Survey*, p. 128.) Both the dairy and grazing systems are successfully practised; but the former has been gaining on the latter. The long-horned breed of cattle is preferred for the dairies, the average produce of a cow being about 2¾ cwt. of cheese. Short-woolled sheep have been almost entirely banished from the county. The standing sheep stock has been estimated at 342,000, and the produce of wool at about 8,600 packs. Arable husbandry not so well understood as grazing, and in some districts it is far behind. Wheat, barley, oats, and beans, are extensively cultivated. The first is generally drilled, and, when such is the case, it is not a little singular that turnips should be very generally sown broadcast. Beans generally dibbled. The system of top-dressing is more commonly followed in this than in any other county. Estates of various sizes; some very large, and others small. Farms vary from 80 to 500 acres; but the smaller class predominate so much that the average is not supposed to exceed 150 acres. Old inclosures average about 10 acres, new about 15. Leases getting more uncommon, and farms mostly held from year to year. Tenants bound not to exceed three crops to a fallow; but there is no restriction as to the quantity of wheat sown. Average rent of land in 1842-3, 31*s.* 6½*d.* an acre. Little can be said in favour of the farm buildings. The old houses and offices were sometimes built of timber; sometimes the walls were of stone and sometimes of mud or clay, and thatched; they are in general injudiciously placed, ill planned, and inconvenient. The new farm-houses and offices are of brick, covered with tile, and are very substantial; but conveniency is said not to be much studied; and it is also said that there is a deficiency of open sheds for wintering cattle, and of feeding sheds for soiling with turnips and other green food. Coal is wrought to a considerable extent at various places; but Birmingham is supplied with coal brought by canal from Staffordshire. Warwick ranks high as a manufacturing county. Birmingham is the principal seat of the hardware manufacture; and nowhere, perhaps, has the combined influence of ingenuity, skill, and capital, been more astonishingly displayed than in the immense quantity, variety, beauty, utility, and cheapness of the articles produced in this great workshop. Coventry has been long distinguished for its proficiency in the silk trade, particularly in the manufacture of ribands. Needles and fish-hooks are made at Alcester, hats at Atherstone, and flax-mills have been erected near Tamworth and in other places. Principal rivers: Avon, Tame, Alne, and Leam. The Birmingham and Fazely Canal runs along the north-west side of the county, and it is intersected by the Warwick and Birmingham Canal, the Warwick and Napton Canal, the Oxford Canal, &c. The grand line of railway from London to Birmingham, and thence to Manchester, passes through the county, which is also intersected by numerous subordinate lines. Warwick-shire is divided into 4 hundreds and 4 subsidiary districts, and contains

205 parishes. It returns 10 members to parliament, viz., 4 for the county, and 2 each for the city of Coventry and the boroughs of Birmingham and Warwick. Population of county in 1841, 401,715. Sum expended for the relief of the poor in 1844-5, 67,947*l.* Annual value of real property in 1815, 1,269,757*l.*; ditto in 1842-3, 2,364,490*l.*

8. *Worcestershire*, an inland county, having a very irregular outline, and several detached portions, is bounded on the north by the counties of Salop and Stafford, on the west by Hereford, on the south by Gloucester, and on the east by Warwick. It contains 462,720 acres, of which above 420,000 are arable, meadow, and pasture. Surface beautifully diversified: the Malvern Hills divide the south-west part of the county from Herefordshire; the Bredon Hills, to the south of Pershore, have an elevation of near 900 feet; and there are also some considerable hills on its northern frontier, between Hales Owen and Bromsgrove. The vales of Worcester and Evesham, or rather the vales of the Severn and Avon, particularly the latter, are very fertile and beautiful; but the soil in many parts, especially on the eastern side of the county, is cold and poor. Besides cattle and daily produce, Worcestershire produces large quantities of fine wool, apples, hops, and excellent cyder. Agriculture in a backward state. "The system followed is, in itself, a bad one, and is carelessly and negligently conducted. There is no rotation as to cropping, nor are any pains taken to relieve the ground from water, though it is in most places very wet. Ploughing is badly performed, and the whole management of a slovenly description."—(*Kennedy and Grainger*, vol. i. p. 358.) In 1845, there were 1,542 acres of hops. Estates variously divided; farms, for the most part, small. Average rent of land in 1842-3, 31*s.* 6½*d.* an acre. Coal is found in the northern part of the county, and the brine springs at Droitwich supply vast quantities of salt. The city of Worcester is the principal seat of the leather glove manufacture; the iron, hardware, and glass manufactures are carried on with spirit and success at Dudley; and Kidderminster is famous for its carpets. Principal rivers: Severn, Tame, and Avon. Worcestershire is divided into 5 hundreds and 171 parishes. It returns 12 members to parliament, viz., 4 for the county, 2 each for the city of Worcester and the borough of Evesham, and 1 each for Kidderminster, Bewdley, Droitwich, and Dudley. Population of county in 1841, 233,336. Sum expended for the relief of the poor in 1844-5, 69,867*l.* Annual value of real property in 1815, 820,021*l.*; ditto in 1842-3, 1,332,538*l.*

9. *Gloucestershire*, a maritime county, is bounded on the south by the counties of Wilts and Somerset; on the east by Berks, Oxford, and Warwick; on the north by Worcester; on the west by the latter, Herefordshire, Monmouth, and the channel of the Severn. It contains 805,120 acres, of which 750,000 are arable, meadow, and pasture. It is naturally divided into the Cotswold, Vale, and Forest districts. The first, or Cotswold district, comprises the hilly country, stretching from Chipping Camden, on the confines of Warwickshire, to near Bath. It is often divided into the Upper and Lower Cotswolds. The vale takes in the lowlands from Stratford-on-Avon to Bristol: it is usually divided into the vales of Evesham, Gloucester, and Berkeley; but, perhaps, a better division would be into the vales of Severn and Avon.

The former comprising all the low country between Tewkesbury and Bristol, and the latter the lowlands between the Upper Cotswold and the Avon, from Tewkesbury to Stratford, wherever that river is a boundary of the county. The Forest district includes the parishes on the west side of the Severn up to Gloucester, and, afterwards, on the west side of the river Leden till it enters the county of Hereford. This district derives its name from the Royal Forest of Dean, once of large extent, but now much reduced by grants to individuals, and by the progress of cultivation. It still, however, contains a good deal of valuable timber. The soil in the vales is extremely fertile; but in the other districts it is, for the most part, sandy and poor. Climate of the vale remarkable for its mildness: according to William of Malmesbury, who flourished in the 12th century, it produced wine but little inferior to that of France! The air on the Cotswolds is keen and sharp. From 300,000 to 400,000 acres are under tillage. Agriculture not very advanced. Wheat, barley, oats, and beans, are the crops principally cultivated. Beans mostly produced on the clay soils of the vales, and much depended on by the farmer. Mr. Rudge says, that "the slovenly way in which a great deal of the vale land is cultivated, occasions *the loss of* 1 *in* 3 *or* 4 *crops* (from excess of fallowing); and even with this management the lands are not clean."—(*Survey*, p. 105.) But it must be borne in mind that this statement was published in 1807, and though still rather behind, there has been a great improvement in the interval. The number of horses kept for agricultural purposes is much too great, as many as 6 and 7 being not unfrequently seen in a team! A large extent of the best land is occupied as meadows, pastures, and orchards. The most valuable meadows lie along the banks of the Severn below Gloucester, being defended from inundation by banks or sea walls constructed for that purpose. At certain periods, however, the lands are allowed to be overflowed; and, when the water speedily retires, its influence in increasing the supply of herbage is said to be very great. It is not unusual to cut from these meadows from 2 to 2½ tons of hay an acre in a season. Gloucestershire has been long famous for its dairies, particularly those in the vale of Berkeley, which produce the greatest and best part of the excellent cheese known by the name of double and single Gloucester. All sorts of cattle are met with in the dairies, the beauty of the animal being reckoned of inferior importance to its quality as a milker. A good cow will yield from 3½ cwt. to 4½ cwt. of cheese in a season. The average yield of a dairy of 20 cows may be estimated at 4 cwt. a cow; in all 4 tons. The native sheep of the Cotswold Hills are large, and produce coarse long-combing wool; but the pure breed is become scarce, in consequence of its intermixture with new Leicesters, South Downs, &c. The total stock of sheep in the county has been estimated at about 550,000, and the annual produce of wool at about 15,550 packs. Cyder is the principal product of this county. Almost every farm has an orchard; but those where cyder is made for sale are found only on the sides of the hills, and in the vale and forest lands. The highly esteemed species of cyder, called Styre, is almost peculiar to the western banks of the Severn. It is strong, and, when new, is extremely harsh, so that it requires to be kept for several years before it is sufficiently

mellowed for use. Property much divided, estates being of all sizes, from 15,000*l.* a-year down to 5*l.* or less. Some large, but many small farms; their average rental may be from 200*l.* to 500*l.* Average rent of land in 1842-3, 27*s.* 10*d.* an acre. Iron ore is abundant in the Forest of Dean, and, owing to the convenient supply of timber, it used to be worked to a considerable extent. But notwithstanding there is also abundance of coal in the Forest, the production of iron had declined in 1840 to 15,500 tons; South Wales and Staffordshire having decidedly greater facilities for carrying on the business. Veins of lead ore are found in the limestone rocks in the lower part of the vale. Gloucester is a very considerable manufacturing county, and is particularly celebrated for its fine broad cloths; latterly, however, Yorkshire has been gaining upon it in this department. Tin plates, brass, glass, pins, soap, refined sugar, &c., are extensively manufactured, especially at Bristol and its vicinity. Principal rivers: Severn, Wye, Upper and Lower Avon, Thames or Isis, &c. The Severn flows through the county from Tewkesbury, past Gloucester, Berkeley, &c. The Wye and the Lower Avon divide it; the former from Monmouthshire and the latter from Somerset. The Cotswold Hills divide the waters that flow into the Severn from those that flow into the Thames. The principal source of the latter, or Isis, is from 3 to 4 miles south-west of Cirencester; after receiving the Churn, the Coln, &c., it becomes navigable at Lechlade, on the confines of Berkshire.—(See *ante*, p. 32.) The county is intersected by the Thames and Severn Canal, the Gloucester and Hereford Canal, &c. The ship canal, already referred to (*ante*, p. 37), from Berkeley Pill to Gloucester, has rendered the latter a shipping port of considerable and increasing consequence. A good deal of the import and export trade of Warwickshire is now carried on by this channel. Gloucester and Cheltenham, Gloucester and Birmingham, and Gloucester and the Great Western Railway, near Swindon, have been united by railways. Bristol used to rank next to London as a commercial city; but though now far surpassed by Liverpool, and perhaps also by Hull, she still continues to enjoy an extensive foreign trade. Gloucestershire is divided into 28 hundreds and 339 parishes. It returns 15 members to parliament, viz., 4 for the county; 2 each for the cities of Bristol and Gloucester, and the boroughs of Cirencester, Stroud, with the adjoining parishes, and Tewkesbury; and 1 for Cheltenham. Population of county in 1841, 431,383. Sum expended for the relief of the poor in 1844–5, 118,145*l.* Annual value of real property in 1815, 1,315,726*l.*; ditto in 1842-3, 2,074,515*l.*

10. *Oxfordshire*, an inland county, of a very irregular shape, is bounded on the north by the counties of Northampton and Warwick; on the west by Gloucester; on the south by Berks; and on the east by Buckingham. It contains 483,840 acres; of which above 400,000 are said to be arable, meadow and pasture. Surface irregular and elevated. The soil of the part of the county from North Ashton to its extreme northern angle consists principally of a red, rich, deep, friable loam. The soil in the middle part of the county, or the tract lying between the one now mentioned and the Thames on the south, is comparatively unproductive; being, for the most part, shallow, sandy,

or gravelly, and poor, particularly the portion called Whichwood Forest; but along the Thames and other rivers there are extensive tracts of rich meadow land. The southern portion of the county, or that lying south-east from the city of Oxford, includes the Chiltern Hills. The soil in this portion is very various; but that which is thin and chalky predominates. Extensive tracts of this county, and of some of those that are contiguous, are frequently laid under water from the overflow of the rivers. But it is believed that these inundations, which occasion great injury, might be obviated without incurring any very heavy expense, compared with the importance of the object, by constructing embankments, and employing machinery to drain off the water, for which there is no sufficient outfall. Most part of Oxfordshire is in tillage; but this is not by any means in an advanced state. Some material improvements have been introduced within the last 20 years; but the management is still, in various respects, essentially defective. The principal dependence of the tillage farmer is on his barley, the crops of which, particularly in the northern part of the county, are very abundant; frequently yielding from 7 to 8 quarters an acre: it is reckoned equal, if not superior, to any other barley for malting; and large quantities of malt are made; mostly, of course, for the London market. Turnips are raised in most parts of the county. The usual rotation is, 1st, turnips; 2nd barley; 3rd seeds, which remain for 2 years; 4th wheat. Dairy husbandry extensively practised, and better understood than tillage. Butter the principal product. Sheep of various breeds; but at present they are almost all long-woolled. Stock estimated at about 300,000, and the total produce of wool at about 6,300 packs. There are but few large estates; and farms are generally smaller than in most other counties. Leases granted for 7 or 14 years. Tenants not bound to adopt any particular mode of cultivation, nor are they restricted in the sowing of wheat. Hence, in many instances, farms, towards the end of a lease, are in a very worn out, exhausted state; and the land is in general far from being in the condition required by good husbandry. Average rent of land, in 1842-3, 24*s.* 1¾*d.* an acre, being nearly identical with its amount in 1814-15. The manufactures of Oxfordshire are but of little importance. Witney is, however, celebrated for its superior blankets, and Woodstock for its gloves. The city of Oxford is the seat of the most ancient and most celebrated of the English universities. Camden, who was one of its *alumni*, calls it, "Our most noble Athens; the most famous source of learning and wisdom, whence religion, politeness, and learning, are copiously diffused all over the kingdom." —(*Gough's Ed.*, ii. 5.) The city is finely situated; the buildings belonging to the different colleges are magnificent in the extreme; and next to the British Museum, the Bodleian Library has the best collection of books in the United Kingdom. Oxford is united by a branch line with the Great Western Railway, and, consequently, with the metropolis, &c. Principal rivers, Thames or Isis, Thame, Evenlode, Cherwell, Windrush, &c. The Thames bounds the entire south-western frontier of the county, from near Lechlade to the immediate vicinity of Reading. The Oxford Canal joins the Thames and the Grand Junction Canal. Oxfordshire is divided

into 14 hundreds and 217 parishes. It returns 9 members to Parliament; viz., 3 for the county, 2 for the city, and two for the University of Oxford, and 1 each for the boroughs of Banbury and Woodstock. Population of county in 1841, 161,643. Sum expended for the relief of the poor in 1844–5, 76,454*l.* Annual value of real property in 1815, 790,866*l.*, ditto in 1842-3, 1,025,421.

11. *Buckinghamshire*, an inland county, is bounded on the north by the county of Northampton; on the east by the counties of Bedford, Herts, and Middlesex; on the south by Berks; and on the west by Oxfordshire. Its shape is very irregular. It contains 472,320 acres; of which 440,000 are supposed to be arable, meadow, and pasture. Surface finely diversified. The rich vale of Aylesbury occupies the middle of the county, having the Chiltern Hills running north-east and south-west along its southern side, and a nearly parallel range of sand hills along its northern side. The prevalent soils are rich loam, strong clay, chalk, and gravel. It is about equally divided between tillage and pasture. Agriculture in a backward state. Tenants seldom under any restrictions as to cropping, and allowed to carry away hay and straw. In consequence, the land is very often overcropped and exhausted; and an entering tenant is frequently obliged to purchase the preceding year's crop, for the sake of the manure. Turnip husbandry chiefly confined to the hills. Wheat and beans are the principal crops raised on the low grounds; and they frequently follow each other, without the intervention of a fallow, for a lengthened period. There are few counties in which there is so great a waste of horse power. The grass lands and rich meadows in the vale of Aylesbury and other parts, are used partly and principally for the dairy, and partly for fattening; but a great deal of hay is also sent to the metropolis. The stock of dairy cows has been estimated at about 27,000, of which it is supposed that 21,000 are always productive. Butter the chief product; and it is supposed that from 4,000,000 to 4,500,000 lbs., are annually produced for sale in this county. It is almost entirely sent to the London market. The fattening of cattle is principally confined to the vale of Aylesbury; the excellence of the pasture being such as speedily to make a visible alteration in the size and appearance of every animal sent to it. Both the dairy and grazing cattle consist almost entirely of short horns. Great changes have been made, during the last 30 years, in the breed of sheep in this county; so much so, that the average weight of the fleece is supposed to have been increased, in that period, from 3 to 5 lbs.! The present sheep stock is estimated at above 220,000, and the produce of wool at above 4,600 packs. Hogs are an important article in the rural economy of Buckinghamshire, on account of the refuse milk from the dairies. Ducks are raised in large quantities at Aylesbury. Cottages generally good, and most of them have gardens attached. There are some large estates: size of farms various; average about 180 acres. Leases not general. Average rent of land, in 1842-3, 25*s.* 3½*d.* an acre. Cross roads said to be in a very bad state. Minerals of none, and manufactures of but little importance. The manufacture of pillow-lace, once very generally diffused, has declined materially, in consequence of the wonderful increase of bob-

binet, or machine lace, at Nottingham. A good deal of straw plat is made in the parts of the county nearest to Bedfordshire; and there are some paper mills in the neighbourhood of Wycombe. The Thames runs along the southern border of the county, dividing it from Berkshire. The Ouse partly intersects and partly bounds the northern division of the county; and the Thame has its sources among the high grounds to the north of the vale of Aylesbury. The Grand Junction Canal intersects the county on the east, having branches to Buckingham, Aylesbury, and Wendover. Bucks is divided into 8 hundreds and 202 parishes. It returns 11 members to Parliament; viz., 3 for the county, and 2 each for the boroughs of Buckingham, Aylesbury, Marlow, and Wycombe. Population of county in 1841, 155,983. Sum expended for the relief of the poor in 1844–5, 79,983*l.* Annual value of real property in 1815, 662,872*l.*; ditto in 1842-3, 827,890*l.*

12. *Bedfordshire*, an inland county, and the last of the midland district, is bounded on the north-west by the county of Northampton; on the west by Bucks; on the south by the latter county and Herts; on the east by the latter and Cambridge; and on the north-east by Huntingdon. It contains 296,320 acres; of which about 250,000 are arable, meadow, and pasture. The face of the county presents an alternation of gently rising hills, and beautiful, well-watered, extensive vales. The southern angle is occupied by the Chiltern Hills. There is every variety of soil, from the stiffest clay to the lightest sand. To the north of the chalk district, a belt of sand extends from Leighton Buzzard, on the borders of Bucks, north-west, across the county to Potten. The breadth of this belt varies from 1 to 5 miles; it is of varying degrees of fertility, and is particularly well suited for horticultural purposes, and for the turnip husbandry. The soil in the vale of Bedford consists mostly of clay. In the northern part of the county, the soil is mostly of a blackish colour, gravelly, light, and poor. On the whole, however, the soil seems, speaking generally, to be of about an average degree of fertility. So late as 1770 it was estimated that nearly three-fourths of the surface consisted of "open or common fields, common meadows, and common or waste lands." But the greater part of these lands have since been enclosed, subdivided, cultivated, and improved, to the great profit and advantage of those concerned, as well as of the public. This change was effected principally through the exertions and example of Francis Duke of Bedford. Land chiefly under tillage. Agriculture in a medium state of advancement. On the sandy and chalky soils, turnips, particularly the Swedish variety, succeed very well, and are extensively cultivated. No regular rotation is observed. On the clays, beans and wheat are the principal produce; on the light soils, turnips, barley, seeds, and wheat usually follow each other; on the loams, beans or oats are generally sown after wheat. The drill is in extensive use, and a good deal of wheat is dibbled. Clay used as a manure for the sandy soil with good effect. At an average each plough in the county is believed to be wrought by rather more than 3 horses. In the parishes of Sandy (so called from its soil), Gritford, and other places, there are extensive market-gardens, in which large quantities of vegetables are raised for the supply of London, Cambridge, &c. Cattle of a

mixed breed, and "without any pretensions to very peculiar excellence." Sheep in the same predicament as cattle. Stock of the former has been estimated at about 200,000, and the produce of wool at about 4,250 packs. There are some large estates; but property is, notwithstanding, considerably divided. Average size of farms about 150 acres. They are mostly held from year to year; but some are held under leases, generally of 7, but in a few instances, of 10 and 14 years. It is stated by Mr. Bachelor, in his able *Report* on the county (p. 41.), that some of these leases may be cancelled on half a year's warning being given by either landlord or tenant! Of course, it is not to be expected that any improvements should be effected by tenants holding under such a tenure. Farmers in the northern district said to be very poor. Farm buildings indifferent, and, for the most part, inconveniently situated: they are generally kept in repair by the landlords. Average rent of land in 1842–3, 25*s.* 5*d.* an acre. Fuller's earth procured in the neighbourhood of Woburn. Formerly a good deal of pillow-lace was made; but this business has here, as well as in Bucks, been materially injured by improvements in the manufacture of Nottingham lace. Straw plat for hats, of a quality inferior only to that brought from Tuscany, is made in large quantities of Dunstable, and generally in all the southern parts of the county. Principal rivers, Ouse and Ivell; the former enters the county at Turvey, on the borders of Bucks, and leaves it at St. Neot's, on the confines of Huntingshire. The distance between these two places, in a direct line, is from 18 to 19 miles, but the windings of the river are such, that the distance by water is above 45 miles. Bedfordshire is divided into 9 hundreds and 123 parishes. It returns 4 members to Parliament; viz., 2 for the county, and 2 for the borough of Bedford. Population of county in 1841, 107,936. Sum expended for the relief of the poor in 1844–5, 42,934*l.* Annual value of real property in 1815, 364,277*l.*, ditto in 1842–3, 517,474*l.*

Eastern District.

1. *Lincolnshire*, a maritime county, being the second in England in point of extent, and the first in point of husbandry: it is bounded on the north by the æstuary of the Humber; on the east by the German Ocean and the arm of the sea called the Wash; on the south by the counties of Cambridge, Northampton, and Rutland; and on the west by Leicester, Nottingham, and York. It contains 1,671,040 acres, and is divided into the three districts of *Lindsey*, *Kesteven* and *Holland*. The first comprises most part of the country from the Foss dyke and the Witham north to the Humber, being fully half the county. The soil of this district is very various. Along the coast, and in its north-west angle, consisting of the district called the Isle of Axholme, formed by the rivers Trent, Idle, and Ouse, there is a considerable extent of rich marsh and fen land. The extensive tract called the Wolds stretches from Spilsbury north to Barton on the Humber: its soil is principally sandy loam on a chalk bottom, of very various degrees of fertility, but now generally producing excellent crops. From Lincoln north to Manton there is a tract of heathy ground, but it also has been greatly improved, and is very productive. The district

of Kesteven occupies the south-western part of the county. There are some heathy and some marshy lands in this district; but, in general, it is dry and fertile. The district of Holland occupies the remainder, or south-eastern part, of the county round the Wash. Like the continental state of the same name, it consists almost entirely of low marsh and fen land; the marsh being the portion nearest to the sea, and the fen that which lies more inland. It is principally included within what is called the Great Level of the Fens (see *ante*, p. 24); being defended from the sea, and from the overflowing of the rivers, by immense embankments. In a few places, the fens and marshes continue nearly in their natural state; but in general, they have become, through the long continued and well-directed efforts that have been made for their drainage and improvement, sound and dry; and constitute one of the most productive tracts in the kingdom. Round the Wash, a great deal of very fine land has been gained, within the last 50 years, from the sea; and the embankments are gradually extending. But, though remarkably fertile, the marshes and fens are devoid of beauty; the water is also, in general, brackish, and the climate far from salubrious. At an average, Lincolnshire produces more beef and mutton than any other county of the empire. In some parts of the marsh, the pasture is so excellent that it will feed 6 sheep an acre, and 4 bullocks to 10 acres. Exclusive of the vast outlay on embankments and drains, improvements of all sorts have been prosecuted in Lincolnshire for many years past, on a very large scale, and with a degree of enterprise and success that has not been exceeded, if equalled, in any other county. In the best parts of the fens and marsh under tillage, the crops chiefly cultivated are oats and wheat: the usual rotation is, 1st, cole; 2nd, oats; 3rd, wheat: the latter, if not sown in that course, produces too much straw to be a profitable crop. Undoubtedly, however, the marsh land is decidedly better fitted for grazing than for cropping; and it is to be regretted, that the very high prices obtained for corn during the latter years of the war should have tempted the owners and occupiers of some pretty considerable tracts of marsh land to subject them to the plough. This was soon found to have been a very unwise proceeding, but it is no easy matter to get the inferior sorts of fen and marsh land, after they have been cropped for a while, restored, in good order, to grass. Beans are not much grown in any part of the county; but, when resorted to, they are sown after wheat, for the same reason that makes wheat be sown after oats; but a second oat crop is, more frequently than any other, taken after wheat. The farms in the wolds and moorish district are very extensive. Large tracts which, at no very distant period, were entirely covered with heath and gorse, or were all but worthless, are now in the highest state of cultivation, and yield the finest crops. The change, indeed, has been alike striking and unprecedented. In proof of this, we may mention that the extensive tract of country stretching from Canwick, near Lincoln, to Swayfield, was formerly a dreary moor, without house or habitation of any kind: to such a degree, indeed, was this the case, that so late as the middle of last century, a light was exhibited on a tower at Dunston, 70 feet in height, on this moor, to serve as a guide to travellers passing at night along the pathless waste! But, *quantum mutatus!* the deserted tract

on which this extraordinary, and, we believe, unique beacon, was erected, is now one of the best cultivated in England, the farms into which it is divided having so rich and so finished an appearance, that they seem rather to be farmed by landlords as examples to others, than, as is really the case, by tenants farming for a profit, and paying high rents.* In other parts, especially in the wolds, the improvement has been equally great; and many thousands of acres which, at the date of Arthur Young's last report, about 40 years since, were occupied as rabbit-warrens, are now in the highest state of cultivation. Turnips, wheat, barley, and oats, are all produced, particularly the first, in the greatest abundance. This extraordinary improvement has been principally brought about by the liberal use of bone manure, which has been employed for a longer period, to a greater extent, and with better effect, on the wolds and moors of Lincolnshire, than in any other part of the kingdom. Latterly, also, it has been the practice to use great quantities of oil-cake in the feeding of cattle, which improves the quality at the same time that it increases the supply of manure. The usual rotation is, 1st, turnips; 2nd, barley or oats; 3rd, seeds; 4th, wheat. The turnip husbandry is here prosecuted on a greater scale than in any other part of England. A single farmer (Mr. Dawson, of Withcall, near Louth) has usually about 600 acres in turnip. He dresses entirely with bone manure; and, since its introduction, the crops of turnips on the wolds have become from 5 to 10 times heavier than formerly; and the productiveness of other crops, and of the pasture, has been increased in a corresponding ratio.† Large quantities of chalk and rape dust are also laid upon the light lands; and it is the practice in the fens to dress with clay. In consequence of the richness of its pastures, Lincolnshire has been long celebrated for its breed of horses, cattle, and sheep. Some of the finest dray horses seen in London are bred in the fens. The cattle are a coarse, large sort of short horns; but they have latterly been a good deal improved by crossing with the Teeswater breed. The native sheep of the fens are remarkable for their great size, and for the extraordinary length of their wool. They have, however, been so much crossed with the new Leicesters, that it is now difficult to meet with a Lincoln sheep of the genuine county breed. The carcass of the present breed of sheep is not so large, nor is their wool so long, or their fleece so heavy, as that of the old native breed; but they are less coarse and bony, fatten earlier, and suit the purposes of the butcher much better. The stock of sheep in Lincolnshire is very large, being estimated at upwards of 1,800,000, of which above 1,300,000 are marsh sheep, producing fleeces weighing 9 lbs. each at an average: the average weight of the fleeces of the others is estimated at 6 lbs. The total produce of wool exceeds 62,000 packs. Previously to the drainage of the fens, they were frequented by immense numbers of aquatic wild fowl; and vast quantities of geese were bred and reared in them. The business is now much fallen off; but in some places it is still carried on to a consider-

* Mr. Pusey's account of the agriculture of Lincolnshire, in the 4th volume of the Journal of the Agricultural Society.

† *Kennedy and Grainger on the Tenancy of Land*, vol. i., p. 269; *British Husbandry*, p. 400.

able extent. The quills and feathers are very valuable. The geese are plucked 4 or 5 times a year; but, barbarous as this practice may appear, the operation, when performed at the proper season, is said to be less painful and injurious to the bird than might be supposed. Decoys for the taking of wild ducks, teal, widgeons, &c. were also, at one time, very common in the fens; but a few only exist at present.* In 1844, there were 405 acres under hops. Property in Lincolnshire very variously divided. Estates of all sizes, from 30,000*l.* a year down to 5*l.*; but the great majority small. In the island of Axholme, the inhabitants live together in hamlets or villages, as in France, and almost every house, except very poor cottages on the borders of commons, is inhabited by the proprietor and occupier of a farm of from 1 to 50 acres; which is cultivated with the greatest care and attention. Mr. Young says that these little proprietors are very happy; but he adds, that he was informed that "they work like negroes, and do not live so well as the inhabitants of a poor-house."—(*Survey of Lincolnshire*, 2nd ed. p. 20.) Size of farms as various as that of estates. In the wolds and moorish district they are, as already stated, very large; but, taking the county at an average, the number of large ones bears no sort of proportion to the number of those that are small. They are generally held under leases of 7 and 14 years; but sometimes also at will. The occupiers of large farms are distinguished by their intelligence and enterprise. "I have not seen a set more liberal in any part of the kingdom. Industrious, active, enlightened, free from all foolish and expensive show, or pretence to imitate the gentry, they live comfortably and hospitably, as good farmers ought to live; and, in my opinion, are remarkably void of those rooted prejudices which sometimes are reasonably objected to this race of men. I met with many who had mounted their nags, and quitted their homes, purposely to examine other parts of the kingdom; had done it with enlarged views, and to the benefit of their own system of cultivation."—(*Young's Survey*, p. 48.) Farms in the fenny districts are but indifferently supplied with offices; the walls of many of them are formed of a mixture of stubble and clay. Cottagers, on many estates, have cows, with small pieces of ground, and are said to be comparatively comfortable. Average rent of land in 1842-3, 28*s.* an acre, having increased about 6*s.* an acre, since 1814-15. Manufactures and minerals of no importance. Stamford, in this county, is one of the few places which have the custom of *Borough English;* that is, a custom according to which the youngest son, if his father die intestate, succeeds to the paternal property, to the exclusion of the elder branches. Principal rivers: Trent, Witham, Welland, and Ancholme. The Witham has been made navigable from Boston to Lincoln; and the Foss dyke canal extends from the latter city to the Trent, near Torksey, completing the important internal navigation between the Wash and the Humber. The Foss dyke canal was first excavated by the Romans; several of whose works for embanking and draining in this county still exist, and attest the power and sagacity of their undertakers. The Foss dyke navigation was re-opened in the reign of Henry I.; and has recently been

* For an account of the breeding of geese in the fens, and of the construction of decoys, &c., see *Pennant's British Zoology*, arts. "Grey Lag Goose," and "Mallard."

deepened and otherwise improved. There are, also, canals from the Witham to Horncastle and Sleaford; and from Titney Haven, on the east coast, to Louth. Lincolnshire contains, exclusive of the three great divisions already noticed, 33 hundreds, wapentakes, and sokes, with the city of Lincoln, and the boroughs of Stamford, Boston, and Grantham. It is divided into 629 parishes. It returns 13 members to parliament; viz. 4 for the county; 2 for the city of Lincoln; 2 each for the boroughs of Boston, Grantham, and Stamford; and 1 for Great Grimsby. Population of county in 1841, 362,602. Sum expended for the relief of the poor in 1844-5, 115,375*l.* Annual value of real property in 1815, 2,096,611*l.*; ditto in 1842-3, 2,868,339*l.*

2. *Huntingdonshire*, a small inland county, surrounded by the counties of Northampton, Cambridge, and Bedford. It contains 238,080 acres; of which 220,000 are arable, meadow, and pasture. Surface in the western and southern parts gently varied; but the north-eastern portion, adjoining Cambridgeshire, is mostly included within the Great Level of the Fens. Soil various, but for the most part very good. Such of the fens as have been properly drained are peculiarly fertile; and, though the drainage be still in parts imperfect, it has been most materially improved. The whole upper part of the county was at one time a forest; but timber is now scarce. The fens are principally devoted to grazing; the remainder of the county being about equally divided between tillage and pasturage. Agriculture, though improving, is not very advanced. The land in this county and Cambridgeshire is usually ploughed in immense ridges, by which a good deal of it is wasted; and it is, besides, very often foul and out of order. Chief crops: wheat, oats, and beans. Rape and mustard are both rather extensively raised. Turnips are confined to a few elevated spots. The stock of cattle is estimated at from 9,000 to 10,000. They were formerly of mixed and generally inferior breeds: but recently they have been materially improved by the introduction of short horns. In various places a good deal of very fine cheese, and in others of butter, is made.* The stock of sheep is estimated at about 200,000; which are supposed to produce above 4,500 packs of long-combing wool. Pigeon-houses are more abundant in this than in any other county, except Cambridge. Fuel scarce: the poorer inhabitants mostly burn turf and what wood they can get; but the latter is far from plentiful. Estates generally extensive. Many large farms, but small ones predominate; they are mostly let from year to year. Average rent of land, in 1842-3, 26*s.* 2½*d.* an acre. Minerals and manufactures of no importance. The Ouse enters the county at St. Neots, flows north to Huntingdon, and then east to St. Ives, and along the border of Cambridgeshire to Louth. It is everywhere navigable. The Nene divides the county from Northamptonshire. The shallow lake, called Whittlesea Mere, in the fens, contains about 1,570 acres; but, as previously stated, a project is

* It is usually held, that Stilton cheese was first made in this county, in the parish of Stilton, whence it took its name: but, in point of fact, it was originally made in Leicestershire, where it continues to be produced in the greatest quantity; and derived its name from its being first brought into notice at an inn on the great north road, in the parish of Stilton —(*Youatt on Cattle*, p. 208)

on foot for its drainage. Ramsey Mere, about half the size of the latter, has been drained, and converted into dry arable land.—(*Ante*, p. 46.) Springs are deficient; and water for household purposes is mostly obtained from ponds. Huntingdonshire is divided into 4 hundreds, exclusive of the town of Huntingdon, and 103 parishes. It returns 4 members to Parliament, viz., 2 for the county and 2 for the borough of Huntingdon. Population of county, in 1841, 58,549. Sum expended for the relief of the poor in 1844-5, 1,016*l.* Annual value of real property in 1815, 325,964*l.*; ditto in 1842-3, 401,684*l.*

3. *Cambridgeshire*, an inland county, is bounded north by Lincolnshire; east by the counties of Norfolk and Suffolk; south by those of Essex and Hertford; and west by those of Bedford, Huntingdon, and Northampton. It contains 548,480 acres, of which above 500,000 are arable, meadow, and pasture. The southern and northern parts of this county have a very different aspect. Almost the whole county north of a line drawn from Newmarket, on the border of Suffolk, to Connington, on the border of Huntingdonshire, is quite flat, and is, indeed, included in the Great Level of the Fens. That part of the fens which lies to the north of the river Ouse consists principally of the district called the Isle of Ely, having a separate jurisdiction within itself. The part of the county to the south of the line, already mentioned, has a finely diversified surface. Soil of the fens mostly rich, black, and deep, but in some places it is clayey and sandy. In the uplands the soil is very various; in some parts clayey and loamy, and in others chalky, gravelly, &c. We have already noticed (*ante* pp. 27, 28) the vast improvements that have been of late years effected in the fens, of which those belonging to this county constitute a very important portion, by the opening of new channels for the outfalls of the Ouse and the Nene, and by the employment of steam-engines instead of windmills to pump up the land-water into the main drains. In consequence, most part of the Cambridgeshire fens has become firm and dry land, and in extensive tracts, where, a few years ago, there was little save stagnant pools, sedge, and rushes, there are now superb pastures and heavy crops of oats and wheat. The healthiness of the district has increased with its productiveness, the inhabitants having become comparatively free from marsh-fever and ague. The population has, also, been considerably augmented, partly, no doubt, from the increased salubrity, but more perhaps from the greater demand for labour, occasioned by the drainage and culture of the fens. About a third part of the county is under tillage, which is very similar to that of Huntingdonshire. Besides oats and wheat, potatoes and cole are extensively grown in the fens; the latter not for the sake of its seed, but to serve as green food for sheep. Considerable quantities of hemp and flax are also raised in the fens. All sorts of corn crops, but more especially barley, with turnips, are produced in the more elevated districts. Great numbers of cattle, and of long-wooled sheep, are grazed in the fens; and the southern part of the county, particularly the valley of the Cam, along the banks of which are some very fine meadows, has been long famous for its dairies. The butter of Cambridgeshire is reckoned equal to almost any made anywhere in

England; it goes mostly to London, where it is sold as Epping butter. The large thin cream cheese, made in Cottenham and the immediately contiguous parishes, is highly esteemed. Its superiority is not said to be owing to any particular management in the dairies, but to the nature of the herbage. Heavy dray and cart-horses are extensively bred. The stock of sheep was estimated some years ago at about 110,000, of which about 42,000 were long-wooled, producing fleeces of the average weight of 8 lbs. each; but the number has been since, most probably, greatly increased. The rest of the sheep are short-wooled, and are kept principally in the south-eastern part of the county, where there are some extensive sheep-walks. There is a pigeon-house on almost every farm; the produce of a single "pigeonry" frequently exceeds 100,000 dozens a-year! Some large estates; the greatest part of the county in estates from 200*l.* to 500*l.* and 1,000*l.* a-year: many worth from 20*l.* to 50*l.*, and even 400*l.* a-year, occupied by their owners. Size of farms very various; mostly from 20 to 100 acres; but there are many from 100 to 1,000 acres, but few above the latter number. The tenants chiefly hold at will: when a lease is granted, it is generally only for four or five years, which is even a worse tenure than the other. Much of what is backward in the state of agriculture in this county and Huntingdon may be traced to the want of properly framed leases of a reasonable length. Farm-houses and offices generally inferior; cottages said to be, for the most part, "wretchedly bad." Average rent of land, in 1810, 16*s.* 6½*d.*, and, in 1842–3, 28*s.* 2¾*d.* an acre, being a rise of no less than 11*s.* 8*d.* an acre in the interval; a consequence, principally, of the better drainage of the fens, but partly, also, of improvements in agriculture. Minerals and manufactures unimportant. Principal rivers: Ouse, Cam or Granta, and Nene or Nen. The old and new Bedford rivers are immense artificial cuts for the drainage of the fens, but the old one is now nearly choked up; the waters of the Ouse run, for a part of its course, principally in the latter. The town of Cambridge is the seat of one of the great English universities, and is united to London by the North Eastern Counties Railway. The county is divided into 14 hundreds, exclusive of the Isle of Ely, the city of Ely, and the borough and university of Cambridge, and contains 167 parishes. Cambridgeshire returns 7 members to Parliament, viz., 3 for the county, 2 for the university, and 2 for the borough of Cambridge. Population of county in 1841, 164,459. Sum expended for the relief of the poor in 1844-5, 74,537*l.* Annual value of real property assessed in 1815, 705,372*l.*; ditto in 1842–3, 1,102,415*l.*

4. *Norfolk*, a maritime county, is bounded on the north and north-east by the German Ocean; on the south and south-east by Suffolk; and on the west and north-west by the counties of Cambridge and Lincoln, and the great arm of the sea called the Wash. It contains 1,295,360 acres, of which nearly 1,200,000 are supposed to be arable, meadow, and pasture. Surface generally flat. There is not, in fact, a single hill, of a medium size, to be seen in the whole county; but in some places there are gentle swells and depressions. The soil varies from the richest marsh land, clay and loam, to the lightest sand; but sandy loam is the most prevalent. The marsh land lies principally

in the western part of the county, contiguous to Lincolnshire and Cambridgeshire, forming part of the Great Level of the Fens (*ante* p. 24.); but there is also a considerable extent of very rich marsh or fen land, extending from Yarmouth as far west as Brundall, and north to Mundsley, on the coast; within this district there are several shallow lakes. In the north-western angle of the county, the soil consists of a sandy loam; and it is here that the peculiar system of agriculture, known by the name of the "Norfolk husbandry," is chiefly practised. The country from Thetford north to Castle Acre, has a poor, very light, sandy soil, bare of vegetation, and occupied mostly by heaths, sheep-walks, and warrens. The soil of the rest, or middle part, of the county consists of various descriptions of loam, some clayey and wet, but the greater portion sandy, dry, and suitable to the turnip husbandry. There is in most parts of the county inexhaustible supplies of excellent marl. The climate is dry and early; but the easterly winds are prevalent and severe in the spring. Norfolk, which is naturally a poor county, has been more improved than any other district in England, Lincolnshire excepted. Previously to the reign of George II., the largest portion of the north-west part of the county, which is at present the most improved, consisted of wastes, sheep-walks, and warrens of very little value. These were converted into highly productive arable land by inclosing, marling, and the aid of the turnip husbandry. Lord Viscount Townshend did more to promote these improvements, and in particular to introduce the turnip culture, the corner stone of the Norfolk system, than any other individual. The leading improvements, in more modern times, have principally consisted in the adoption of the drill husbandry, the better rotation of crops, the better selection and management of sheep and cattle, the better drainage of the fens by the substitution of steam engines for windmills, and the claying of fenny and mossy lands. It is admitted, on all hands, that this county was formerly the best cultivated in England; and, if we except Lincoln and some of the best parts of Northumberland, "it undoubtedly excels every other county, both in the neatness and the condition of the soil."—(*Tenancy of Land*, vol. i., p. 288.) Barley is the principal corn crop. The usual rotation is, 1st, turnips; 2nd, barley; 3rd, clover, or clover and rye-grass; and 4th, wheat: the seeds, in general, do not remain longer down than a year. Some farmers, particularly in the marsh land on the east coast, take a crop of pease or barley after the wheat; but it is a bad system, and is not followed by any good farmer in other parts of the county. Turnips form the basis of the Norfolk husbandry; and, in conjunction with marl, may be said "to have made the county." Tenants are in general so restricted that they cannot injure the land by over cropping. In other counties the principle of not taking two white crops in succession is approved, but here it is rigorously and systematically followed, except in the marshes. On some estates, no oats are allowed to be sown, but only barley, the latter being supposed to be less injurious to the land. Norfolk is, indeed, by far the greatest barley county in the empire. Ploughing wholly executed by ploughs drawn by 2 horses or 2 oxen. Threshing-machines in pretty general use. The grazing husbandry of Norfolk is very inferior to the arable. Mr.

Young says, that meadows and pastures are nowhere worse managed (*Survey of Norfolk*, p. 370); but the management has been materially improved since he wrote. The Galloway breed of cattle has been naturalised in Norfolk, and is now the prevailing breed there and in Suffolk. The Galloways have gained in size since they were naturalised; but they are not so well-proportioned, do not fatten so easily, nor is their meat so good as in their native province. Besides those raised at home, vast quantities of Scotch cattle are annually purchased at the great fairs in Norfolk, to be stall-fed, and otherwise fattened, for the markets of the metropolis, which derive a large part of their supplies of butchers' meat from this county and Suffolk. The native sheep of Norfolk are hardy, active, small horned, with a black nose and feet, their fleeces weighing about 2 lbs., and their mutton much esteemed. Mr. Kent and Mr. Marshall supposed them to be better suited than any other breed to the county; but they have not stood their ground, and are now nearly superseded, partly by the South Downs, and partly by Lincolns and Leicesters. At present the stock of sheep is supposed to amount to 750,000, and the total annual produce of wool to about 15,000 packs. Vast quantities of excellent turkeys are reared in Norfolk and Suffolk: and, besides those sent by other conveyances, at Christmas the railway coaches from these counties to London, are laden with turkeys. Pheasants and partridges are also very abundant; as are rabbits on the sandy grounds north of Thetford. Geese are still raised on some of the fens. Estates of all sizes from 30,000*l.* a-year downwards. Farms mostly large. "Great farms have been the soul of Norfolk culture: split them into tenures of 100*l.* a-year, you will find nothing but beggars and weeds in the whole county. No small farmers could effect such great things as have been done in Norfolk. Inclosing, marling, and keeping a stock of sheep large enough for folding, belong absolutely and exclusively to great farmers."—(*Young's Eastern Tour*, vol. ii., p. 161.) Leases for 21 years were formerly general; and Mr. Young justly considers the security inspired by such a tenure as having contributed powerfully to the progress of improvement. At present, however, the usual leases are 7 or 14 years; but the late Earl of Leicester, one of the principal proprietors, and the greatest improver in the county, always granted leases of 21 years; and this conduct, which was alike judicious and liberal, promoted, in no ordinary degree, the superior order of his estate. Farm buildings generally good. Barns larger than anywhere else in the kingdom. Average rent of land in 1810, 14*s.* 4½*d.*, and in 1842-3, 25*s.* 4¾*d.* an acre, being a rise of 11*s.* an acre in the interval! The woollen manufacture, particularly the worsted branch, has been long extensively carried on in this county, especially at Norwich. Various descriptions of silk goods, such as silk and woollen shawls, poplins, satins, crapes, &c., are also manufactured here. But these branches are rather on the wane, in consequence of the competition of Bradford, Paisley, &c., which enjoy the important advantage of comparatively cheap coal. Principal rivers: Great Ouse, Nen, Little Ouse, Waveney, Yare, Wensum, and Bure. A water communication, intended to admit vessels drawing 10 feet, has been opened between Norwich and Lowestoff, on the coast of Suffolk. It consists

partly of artificial cuts, and partly of the channel of the river Yare, which has been deepened and improved, but it has not answered so well as was anticipated. Norfolk contains 33 hundreds, and no fewer than 731 parishes. It returns 12 members to parliament, viz.: 4 for the county, 2 for the city of Norwich, and 2 each for the boroughs of King's Lynn, Thetford, and Yarmouth. Population of county in 1841, 412,664. Sum expended for the relief of the poor in 1844–5, 174,430*l.* Annual value of real property in 1815, 1,516,651*l.*, ditto in 1842-3, 2,327,371*l.*

5. *Suffolk*, a maritime county, is bounded on the north by Norfolk; on the east, by the German Ocean; on the south, by Essex; and, on the west, by Cambridgeshire. It contains 969,600 acres, of which 820,000 are supposed to be arable, meadow, and pasture. Surface generally flat. Soil various: that of the middle and most extensive districts consists principally of a strong loam on a clay-marl bottom. The district bounded by the rivers Stour, Orwell, and Brett, south from Burstall, is a very rich loam of extraordinary fertility. The maritime district, lying along the east coast, consists of sandy loam and sand, which, in some places, is covered with heath. The soil in the north-western parts is comparatively poor, consisting partly of sand and partly of peat. On the whole, Suffolk is not inferior, in respect of natural fertility, to any county in the kingdom. The climate is dry; but frosts are severe, and in spring the north-east winds are sharp and prevalent. Tillage husbandry is prosecuted in Suffolk with great skill, spirit, and success. Ploughing, in every part of the county, is performed as in Scotland, by a pair of horses driven by the ploughman, and is extremely well executed. Fallowing is uniformly practised on the heavy lands. These, also, are particularly adapted for the growth of beans, which, as well as peas, are extensively cultivated. Turnips not so extensively grown as in Norfolk, being principally raised on the borders of Cambridgeshire. On clover leys, wheat is very generally planted by the dibble; but, where the land will admit, all sorts of grain, as well as turnips, are drilled. Arthur Young ascribes a great part of the improvement of Suffolk to the avoiding of spring ploughing. Most part of the land in beans, peas, tares, &c., is now drilled without any ploughing, being merely scarified and scuffled so as to be rendered fine enough for the drill to work. The usual rotation in the turnip land is, 1st, turnips; 2nd, barley; 3rd, seeds; 4th, wheat: on the heavy lands, 1st, fallow; 2nd, wheat; 3rd, seeds or beans; 4th, wheat: when the 3rd is seeds, beans or oats come in 5th. Hemp has been cultivated for a very long period, and is reckoned of the finest quality. Carrots are a good deal grown; and hops are raised in the vicinity of Stowmarket. Suffolk is famous for its breeds of horses, cattle, and hogs. The horses are called *punches;* and are, as the term implies, short and compact, being well fitted for regular farm work. The cattle have sprung from the Galloways, many of which are fattened in the county. Like their progenitors they are polled, and rather small sized. At present the favourite colours are red, red and white, brindled, and a yellowish cream colour. Dun colour is now generally regarded as a mark of inferiority. They are better suited than the Galloways for the dairy, being excellent milkers.

The produce of butter, is not, however, supposed to be in proportion to the milk, though it is also very considerable. Arthur Young supposed that about 40,000 firkins of butter were annually sent from Suffolk to London (*Survey*, 2nd ed., p. 204); and, as the management of cows is now better understood, and more attended to, the quantity may, at present, be increased to 50,000 or 55,000 firkins. Arthur Young estimated the stock of sheep in the county at 240,000; but, according to Messrs. Luccock and Hubbard, it amounts to about 500,000, producing annually from 9,000 to 10,000 packs of wool. Ipswich sheep fair is one of the most extensive in the kingdom. Warrens were formerly numerous in the sandy district, but they are now much diminished. Property much divided; a good deal in the hands of respectable yeomen, who cultivate their own estates. Farms generally large, but many small. They are usually let on lease for 7 or 14 years. Tenants mostly restrained from exceeding 3 corn crops to a fallow; but, in other respects, they are left pretty much at liberty. Farm buildings indifferent. Cottages generally bad. Average rent of land in 1842-3, 23*s.* 8*d.* an acre, being 6*s.* 8*d.* an acre above its rent in 1814-15. Minerals of no importance. This county was formerly celebrated for its manufactures, particularly those of wool; but they are now much decayed. Mixed silk and worsted stuffs are still, however, manufactured at Sudbury, Gainsford, and other places. Gun flints are made in large quantities at Brandon. There is a considerable manufacture of stays at Ipswich. Suffolk is well watered, being intersected by the rivers Orwell, Deben, Ald, Blythe, and Lark. It is separated from Essex by the Stour. Suffolk is divided into 21 hundreds and 510 parishes. It returns 9 members to parliament, viz.: 4 for the county; 2 each for the boroughs of Bury St. Edmunds and Ipswich,; and 1 for the borough of Eye and the contiguous parishes. Population of county in 1841, 315,073. Many houses of industry have been erected for the support of the poor; but they seem to have wholly failed in their object, there being few counties in England in which the poor are so numerous or the rates so heavy. Sum expended for the relief of the poor in 1844–5, 145,809*l.* Annual value of real property in 1815, 1,151,305*l.*; ditto in 1842-3, 1,717,325*l.*

6. *Essex*, a maritime county, is bounded on the north by the counties of Suffolk and Cambridge; on the east by the German Ocean; on the south by the Thames, which separates it from Kent; and on the west by Middlesex and Herts. It contains 981,120 acres, of which 900,000 are arable, meadow, and pasture. The face of the country is generally flat, and, though not destitute of hills or eminences, they nowhere rise to any considerable elevation. Soil in most parts loamy, and more generally heavy than light. In the north-west corner of the county, near Saffron Walden, there is a small tract of chalk land, and along the Thames and the sea there is a considerable extent of very rich marsh land. The remains of the ancient forests of Epping and Hainault are situated in the south-western corner of the county. The remaining unenclosed woods and wastes in them both may amount to from 10,000 to 12,000 acres. East winds in spring are severe. In the low grounds, along the sea, and in the heavy clays, fogs, particularly in autumn, are very prevalent; and formerly they used to be seldom free from ague.

But such has been the effect of cultivation, of an improved system of drainage, and of the sinking of Artesian wells, by which an abundant supply of good water has been obtained for domestic purposes, that the low grounds are now about as healthy as the more elevated parts of the county. Tillage husbandry is in a much more forward state than in many other counties. Wheat and barley the principal corn crops. In many parts the soil is not suited to turnips; but they are very generally raised on the soils adapted to their culture. On light loams the usual rotation is, 1st, turnips; 2nd, barley or oats; 3rd, seeds; 4th, wheat; and 5th, tares for feed: after which they make a clean fallow for wheat or barley again, and, if a crop of peas or beans be taken, instead of sowing tares for feed, a slight dressing of dung is generally laid on the clover ley for wheat. On the stiff heavy loams, where turnips cannot be grown, the usual rotation is, 1st, fallow; 2nd, oats or wheat; 3rd, clover; 4th, wheat or oats; 5th, beans; 6th, wheat. But there are thousands of acres in Essex that are fallowed alternately, year after year, half the arable land being under a dead summer fallow! It is believed, however, that this system would be materially improved by the occasional substitution of beans for fallows, and by other modifications.* Chalk, either by itself or mixed with other substances, is applied to all the heavy clays, and has done more than any thing else to make them porous and to increase their fertility. The quality of Essex wheat is very superior. Mr. Vancouver estimated the produce per acre, of the lands under wheat in the county, at 24½ bushels. Mr. Young's estimate was 25 bushels, and we believe it may now be safely estimated at 35 bushels. According to Mr. Howlett, Essex sent annually to the metropolis 250,000 quarters of wheat and 150,000 quarters of malt; but this estimate was formed many years ago, and the exports of wheat have been largely increased in the interval.—(*Young's Survey*, vol. i., p. 389.) Potatoes, owing in some degree, perhaps, to the vicinity of London, are more generally cultivated in this than in any other southern county. Hops in a few places; coriander and carraway, mustard, saffron (in the neighbourhood of Saffron Walden), and some other articles of inferior importance, are raised in this county. Essex has no particular breed of cattle. The suckling of calves, the dairy and grazing businesses, are all carried on to a considerable extent. The suckling farmers procure calves chiefly from the London and Suffolk dairies, and some from the Essex dairies. They are bought in at from 10 to 14 days' old, and, being fattened for about three months, are slaughtered for the supply of the London markets. The principal dairy farms are at or in the neighbourhood of Epping, so famous for its butter. The grazing business is chiefly confined to the marsh lands, the principal stock fed on them being Welsh and Scotch runts. Lincolns, Leicesters, Southdowns, and most other breeds of sheep, are met with; but the Southdown is the most prevalent. The total stock has been estimated at about 520,000, and the annual produce of wool at 8,650 packs. A good many hogs are kept. The Berkshire is the favourite breed in the southern parts, but in the northern there is every variety of mixture. Mr. Young says that the late Lord Western's breed of hogs

* *Kennedy and Grainger on the Tenancy of Land*, vol. i. p. 208; *Young's Survey*, vol. i. pp. 201—213.

was by far the finest he saw in Essex; they are not, however, peculiar to his lordship's farm, but are pretty general in the county, though little known elsewhere.—(*Young's Survey*, vol. ii., p. 341.) Suffolk horses are favourites in Essex. Except upon the very heavy land, which requires 3, more than 2 horses are rarely seen in a plough. Property is very differently divided, there being estates of all sizes, from 1*l.* and 5*l.* up to 25,000*l.* a-year; but there are few counties in which there are so many small and moderate sized farms in the occupation of their owners. Some of the hired farms in this county are amongst the largest in the empire. Even so early as 1767, Mr. Young found some of above 1,000*l.*, 1,500*l.*, and even 2,000*l.* a-year of rent. Perhaps, however, the number of the very large farms has diminished, and they are now met with only in the maritime districts. But, taking the county at an average, the size of farms is by no means great, varying perhaps from 150 to 200 acres. Here, as in every other part of England, the best management, best stock, and the most improved and efficient implements, are uniformly met with on the larger farms. Leases less frequent now than formerly; those granted are for 7 and 14 years: some hold under running leases, renewable every 7 years. Farm-buildings mostly good and commodious. Mr. Young (*Survey*, i. 72,) estimated the average rent of the county, in 1807, at 20*s.* an acre; but this was fully 3*s.* an acre beyond the mark, it being only 18*s.* 5½*d.* an acre in 1810. In 1814-15 it amounted to 22*s.* 7½*d.* an acre; and such has been the progress of improvement in the interval, that the rent in 1842-3 had increased to 26*s.* 3½*d.* an acre. Minerals of little importance. At Purfleet, on the Thames, there are very extensive lime and chalk quarries; but the greater part of the chalk used by the Essex farmers is brought from Kent. Manufactures, particularly of baize, were formerly carried on upon a large scale at Colchester, Coggeshall, and other places; but they are now much decayed, and have not been replaced by new ones of any importance. Besides the Thames, the Lea, and the Stour, which bound Essex on the south, the west, and the north, it is intersected by the rivers Roding, Crouch, Chelmer, Blackwater, Colne, &c. These rivers, as well as the Stour, have all, with the exception of the Roding, spacious havens, and are navigable to a considerable distance. Some of the rivers of Essex, particularly the Crouch and the Blackwater, are famous both for the breeding and feeding of oysters. A great number of boats are employed in carrying lean or half-fed oysters from Jersey, Portsmouth, and other places, to the beds or feeding-grounds, and in conveying the oysters, when fattened, to London and other places. Essex is divided into 14 hundreds, 5 half hundreds, and a royal liberty, and into 406 parishes. It returns 10 members to parliament, viz., 4 for the county, and 2 each for the boroughs of Colchester, Harwich, and Maldon. Population of county in 1841, 344,979. Sum expended for the relief of the poor in 1844–5,168,251*l.* Annual value of real property in 1815, 1,584,108*l.*; ditto in 1842-3, 1,935,610*l.**

* Mr. Howlett, vicar of Dunmow, in Essex, well known by his excellent pamphlets on Population, the Poor, Tithes, &c., was employed by the Board of Agriculture to draw up a Survey of Essex. He made considerable progress in the undertaking, but unfortunately died before he had brought it to a close. Mr. Young

7. *Hertfordshire*, an inland county, is bounded on the north by Cambridgeshire, on the east by Essex, on the south by Middlesex, and on the west by Bucks and Bedford. Its northern and western frontier is very irregular, and a detached portion at Coleshill is surrounded entirely by Bucks. It contains 403,200 acres, of which about 350,000 are said to be arable, meadow, and pasture. This is a very pleasing county. One of the great chalk-hill ranges runs along its northern frontier; the rest of its surface is diversified with hills and valleys, and, as it possesses a great number of gentlemen's seats and thriving plantations, it has a rich and highly ornamented appearance. It contains, according to Arthur Young, about 148,000 acres of sandy and flinty loam, 90,000 acres of clay, 47,000 acres of chalk, and about 17,000 acres gravel.* The best of the loamy soils is the sandy vale from Cheshunt to Hoddesdon. The clay soils lie principally on the eastern, but partly, also, on the western side of the county. The gravelly tract lies around Hatfield, North Mims, &c.; it is very poor and unproductive. Substratum generally chalk. By far the largest portion of the county is in tillage. Principal crops wheat and barley, the quality of both being reckoned particularly good. Indeed, many thousand quarters of wheat are annually sold in the London markets as the produce of Herts, though brought from other counties. Turnips have been long pretty extensively cultivated in this county; but not so skilfully or successfully as in some others. In point of agricultural management, Herts does not stand high. "The land is, in general, ploughed very shallow, and is, in many parts, extremely foul; it is now much more the practice to take three crops to a fallow than two. The rotation generally is, 1st, fallow; 2nd, wheat; 3rd, seeds; 4th, wheat; 5th, oats; or, 4th, beans; 5th, wheat. The sowing of the corn, in many parts, reflects but little credit on the seedsman." (*Kennedy and Grainger*, vol. i., p. 239.) Large quantities of hay are produced; and its quality is reckoned superior. In the south-western parts there are a good many apple and cherry orchards; and, in a few places, hops are raised. Few cattle are raised or fed in Herts; it being found more profitable to employ the grass land in the production of hay. A good many sheep are, however, prepared for the butcher; the stock in the county having been estimated at 277,000, and the produce of wool at 6,000 packs. Property much divided. Few large estates. Farms of various sizes, but not generally large. Leases, when granted, are usually for 7 or 14 years. Average rent of land in 1842-3, 21*s.* 8¾*d.* an acre. The manufactures of Herts are not of much consequence. A good deal of straw-plat is made in the vicinity of Berkhampstead, Stevenage, St. Albans, &c. Silk and cotton are spun and ribands made at Tring, Watford, St. Albans, &c. Paper is manufactured on a large scale, and in the most approved manner, near Rickmansworth and Watford. The malting business is extensively prosecuted at Ware, Hitchen, and other towns. Except chalk, the minerals are of no importance. The river Lea runs through the middle of the county, and it is also watered by the Rib, Beane, Colne,

embodied the fragments left by Mr. Howlett in his work on Essex, which, in consequence, is one of the best of the class to which it belongs

* This can only be considered as a very rude approximation; Mr. Young having materially underrated the extent of the county.

Gad, &c. The Stort bounds it for a considerable distance on the east. The London and Birmingham Railway and the Grand Junction Canal pass along its western borders. Herts contains 8 hundreds and 135 parishes. It returns 7 members to parliament, viz., 3 for the county, and 2 each for the boroughs of Hertford and St. Albans. Population of county in 1841, 157,207. Sum expended for the relief of the poor in 1844–5, 63,338*l.* Annual value of real property in 1815, 583,657*l.*; ditto in 1842-3, 849,794*l.*

8. *Middlesex*, the metropolitan county, is bounded on the east by the Lea, which separates it from Essex; on the north by the county of Hertford; on the west by Bucks; and on the south by the Thames, which separates it from Surrey and Kent. It is one of the smallest counties, containing only 180,480 acres; of which 150,000 are arable, meadow, and pasture. Surface greatly diversified. The highest eminences are those of Hampstead, Highgate, and Harrow-on-the Hill. Soil various; and for the most part, at least in the vicinity of London, gravelly, and of little natural fertility, but enriched by the vast quantities of manure that have been laid on it. A tract of fine rich sandy loam stretches along the Thames from London to Isleworth; and there is a good deal of strong loam in the hundred of Thorn, between Pinner on the north and Northcote on the south. Some of the meadows along the Lea are exceedingly productive. Enfield Chase, in the north-east corner of the county, has been mostly enclosed and cultivated; but the greater part of Hounslow Heath, in its opposite or south-west angle, still continues in a state of nature. There are, also, some considerable commons in various parts of the county. Though variable, the climate is good. In London, in November and December, there are frequently very dense fogs. The temperature of the air in the city and its vicinity is a good deal affected by the immense number of fires; and, when dry, the atmosphere is always loaded with smoke and other impurities. But, notwithstanding these defects, and the deleterious influence of cold, biting, north-east winds in March, April, and May, there are few, if any, large cities so healthy as London. It owes this distinction partly to its being mostly built on a dry soil, shelving to the river; partly to the excellence of its drainage, the liberal supply of water, and the general attention to cleanliness; and partly to the ebb and flow of the tide in the Thames, which scours its channel, and sweeps away every sort of filth and impurity, bringing with it constant supplies of fresh air as well as fresh water. Only a very small part of Middlesex is in tillage and garden ground; and, contrary to what might have been anticipated, there are few counties less advanced in agriculture. The old rotation used to be, fallow, wheat, and barley, or fallow, wheat, and beans sown broad-cast. But turnips and potatoes on the light, and drilled beans on the heavy soils, are now frequently substituted for fallows. The farming implements are generally bad; and it is said to be impossible to get any made on new or improved principles by the country artificers: the plough in common use is heavy, clumsy, and, in fact, barbarous; nor is it uncommon to see ploughs at work drawn by four, five, and six horses, with a ploughman and two drivers! The rich ground along the Thames, from Kensington to Isleworth, is principally occupied by market-gardeners and nurserymen, and con-

tributes largely to the supply of the London markets with fruit and vegetables. By far the largest portion of the county is in grass; the management of which, particularly as respects the making of hay, is extremely well understood. Exclusive of the rich meadows along the Lea, and in other parts, about 70,000 acres are said to consist of upland meadows and pastures.—(*Middleton's Middlesex*, 2nd edit. p. 284.) Breeding and fattening are, however, but little practised; the farmers having it in their power to turn their grass and hay to much better account, by selling them to the cow-feeders and stable-keepers of the metropolis. The consumption of hay and corn by horses is quite immense; and there are supposed to be at least 12,000 cows in the dairies of the metropolis and its vicinity: they are all short-horned. Few dairymen breed from their cows, which are fattened and sold as soon as their milk dries. The number of sheep bred and kept in the county is but inconsiderable. The feeding of house-lambs, as a luxury, in the winter months, used to be extensively practised by the Middlesex farmers. The lambs thus fed are the produce of Dorset-shire ewes, which are made to drop their young about Michaelmas. But the suckling system has been successfully tried in the counties at a greater distance from town, and has, in consequence, fallen off in its vicinity. Property, as is usual in the vicinity of all large towns, is very much subdivided. A few farms extend to from 500 to 600 acres, and a good many are about 200; but, at an average of the county, their size is not supposed to exceed 100 acres. Leases pretty general, mostly for 14 and 21 years. Old farm-houses and buildings principally of wood, and thatched; but those more recently erected are generally constructed of brick, and covered with tiles. Owing to the preponderance of meadow land, but few buildings are required on the farms. Average rent of land, in 1814–15, 57*s.* 4½*d.* an acre: whereas, in 1842–3, it is reported to be only 42*s.* 11*d.* an acre; but we apprehend there must be some mistake in the returns, and that this extraordinary decline is more apparent than real, being most likely occasioned by the Commissioners of Income Tax having omitted to assess some of the smaller properties, which were invariably assessed under the old Act. Minerals of no importance. In some places near London vast quantities of earth and clay have been dug up and converted into bricks; in most instances to the great advantage of the owners. Middlesex is extremely well watered. Its southern frontier, which is very irregular, is bounded throughout its whole extent, from the East India Docks to Staines, by the Thames. On the east it has the Lea, which is also navigable. On the west it is partly bounded and partly intersected by the Colne. The Brent rises near Barnet, and, flowing through the county, falls into the Thames at Brentford. The Grand Junction Canal enters Middlesex near Hare-field, in its north-western angle, and, passing Uxbridge, unites with the Thames at Brentford. A branch from this canal has been carried to Paddington, on the western side of the metropolis; and has thence been continued, by the Regent's Canal, round the northern and eastern skirts of the city, to the Thames at Limehouse. Middlesex is divided into 6 hundreds, exclusive of the metropolitan divisions, and contains 197 parishes. It returns 14 members to Parliament, viz.,

2 for the county, 4 for the city of London, 2 for the city of Westminster, 2 for Marylebone district, 2 for Finsbury ditto, and 2 for the Tower Hamlets. Principal towns and population, in 1841,—London city, within and without the walls, 125,008; Westminster city, 222,053; Marylebone district, 138,164; Finsbury district, 185,174; Tower Hamlets, 428,078; Chelsea, 40,179. Population of county in 1841, 1,576,636. Sum expended for the relief of the poor in 1844–5, 291,669*l.* Annual value of real property in 1815, 5,765,374*l.*; ditto in 1842–3, 11,345,851*l.*

London, for many ages the metropolis of England, and now of the British empire, stands principally on the north bank of the Thames in this county. It is said by Tacitus to have been, in the days of Nero, *copiâ negotiatorum et commeatuum maximé celebre.* (*Annal.* lib. xiv. § 33.) From this remote epoch it has continued to be a place of great trade, magnitude, and importance. Its increase, in modern times, has been quite astonishing. We believe it is now the most populous, as it certainly is the richest and most commercial city that ever existed. No situation could be more happily chosen. Though 45 miles from the sea, London enjoys, owing to its position on the Thames, all the advantages of an excellent sea-port; vessels of 800 tons burden coming up the river almost to London Bridge. (See *antè*, p. 33.) Had it been built lower down, it would have been less healthy, and more exposed to hostile attacks; and, had it been higher up, it would have been deprived of the inestimable advantage of a deep-water harbour. An infinite number of trades and professions are carried on in London; and, owing to the ample field afforded for the display of superior skill and ingenuity, and the intense competition that exists in every department, its tradesmen and artificers are amongst the best and most expert of any in the world. With the exception, however, of that of silk, which is prosecuted to a considerable extent in Spitalfields, and hat-making, but few branches of industry, coming under the usual denomination of manufactures, are carried on in the city. Of the artizans, the coach-makers, harness-makers, watch-makers, cabinet-makers, cutlers, printers, engravers, jewellers, mathematical and optical instrument makers, &c., are believed peculiarly to excel in their respective departments. We subjoin a classified account, taken from the Population Returns of 1841, of the persons that were then engaged in some of the principal trades and professions carried on in the metropolis (*See* page 193.)

The breweries and distilleries, in the metropolis and its vicinity, are of great extent and importance. Notwithstanding its vast size, the markets of London are copiously furnished, at reasonable prices, with every article of necessity, convenience, and luxury; the supply of the most perishable articles being adjusted to the demand with a regularity and precision that must, *à priori*, have appeared incredible. With the exception of butcher's meat, most part of the bulky articles made use of in London is conveyed to her markets either by internal navigation, or by the sea. Coal is brought almost wholly by the latter, from the north, a small portion only being derived from Staffordshire by inland carriage. It is impossible, indeed, that London should ever have attained to anything like her present size but for her command of

	Males.		Females.		Total.
	20 Years of Age and upwards.	Under 20 Years of Age.	20 Years of Age and upwards.	Under 20 Years of Age.	
Baker	7,866	925	308	11	9,110
Blacksmith	5,923	756	32	5	6,716
Bookseller, Bookbinder, and Publisher	3,534	515	1,109	341	5,499
Boot and Shoemaker	22,400	2,457	3,157	560	28,574
Bricklayer	6,270	449	24	..	6,743
Brush and Broom-maker	1,461	222	372	100	2,155
Butcher	5,502	814	134	..	6,450
Cabinet-maker and Upholsterer	6,497	764	655	57	7,973
Carpenter and Joiner	16,965	1,273	83	..	18,321
Clerk (Commercial)	17,299	3,056	55	7	20,417
Clock and Watchmaker	3,700	523	63	4	4,290
Coachmaker (all branches)	3,821	372	58	5	4,256
Cooper	3,058	369	22	..	3,489
Currier and Leather-seller	2,095	195	37	1	2,328
Dressmaker and Milliner	107	10	17,183	3,480	20,780
Dyer, Silk	206	20	4	1	231
Engineer and Engine Worker	3,642	503	5	1	4,151
Fishmonger and Dealer	1,604	139	119	4	1,866
Grocer and Tea Dealer	3,944	475	560	7	4,986
Hatter and Hat Manufacturer (all branches)	2,600	219	556	131	3,506
Jeweller, Goldsmith, and Silversmith	3,421	478	67	5	3,971
Laundry-keeper, Washer, and Mangler	195	11	15,549	465	16,220
Mason, Paviour, and Stone-cutter	3,182	282	7	..	3,471
Merchant (General)	3,831	39	20	..	3,890
Milkseller and Cowkeeper	2,003	73	670	18	2,764
Painter, Plumber, and Glazier	10,513	914	75	5	11,507
Plasterer	2,321	265	12	1	2,599
Porter, Messenger, and Errand-boy	10,282	2,726	79	16	13,103
Printer	5,533	1,020	59	6	6,618
Saddler, and Harness and Collar-maker	1,923	189	50	9	2,171
Seaman	6,566	436	..	..	7,002
Servant, Domestic	29,595	9,705	95,916	33,485	168,701
Silk Manufacturer (all branches) See also Silk Dyer	3,595	440	2,566	550	7,151
Surgeon, Apothecary, and Medical Student	3,909	312	..	..	4,221
Tailor and Breeches-maker	18,513	1,752	2,795	457	23,517
Tavern-keeper, Publican, and Victualler	4,290	60	502	9	4,861
Tobacconist, and Tobacco and Snuff Manufacturer	1,396	309	333	22	2,060
Warehouseman and Woman	3,400	376	54	4	3,834
Wheelwright	2,189	162	14	..	2,365

internal and external navigation; while, however, the first gives her an easy communication with most parts of England, the latter opens to her a ready access to all the great markets in every other part of the world; so that, should our manufactures continue to prosper, London may increase her colossal magnitude for centuries to come. On the 31st of December, 1845, there belonged to London 2,843 registered sailing vessels, of the burden of 592,283 tons, manned by above 32,000 seamen; and she had then also 86 steamers of less than 50 tons burden, and 177 of more than 50 tons ditto. The *nett* customs-duty collected at the port, in 1844, amounted to the amazing sum of 11,197,981*l.*! So vast an amount of shipping and commerce was never previously centred in any single city. London may be truly said to be *universi orbis terrarum emporium!* In one of Sir William Petty's Essays on Political Arithmetic, published in 1687, the population of London, including Westminster and Southwark, is estimated at 696,000. But, according to Gregory King, their population, in 1696, did not exceed 530,000;* and we have little doubt that this estimate is nearer the mark than the former. During the first half of last century, the population of the metropolis was not sensibly increased; and the mortality was such that it required large bodies of immigrants from the country to keep its numbers at their old level. But after the peace of Paris, in 1763, it began to increase; and since 1780 it has advanced with extraordinary rapidity. This has, no doubt, been, in part, a consequence of the increasing wealth and prosperity of the country, but more, perhaps, of improvements peculiar to London, by which the condition of its inhabitants, and, in particular, their health, have been astonishingly improved. In 1796, the births, for the first time, exceeded the funerals: they have since continued to preserve a decided superiority; so that the population of the city might have been materially augmented, during the last half century, though she had not drawn a single recruit from the provinces. When the census was taken, in 1801, the metropolis was found to contain 864,845 souls, and its progress in population has since been as follows:—

Years.	Population.	Years.	Population.
1811 . . .	1,009,546	1831 . . .	1,471,941
1821 . . .	1,225,694	1841 . . .	1,710,426

The population of the towns of Deptford, Greenwich, and Woolwich, and of the parishes of Camberwell, Chelsea, Fulham, &c., is not, however, included in the above returns. But the places referred to are, to all intents and purposes, part and parcel of the metropolis; and, taking them into account, it contained, in 1841, on an area of 44,850 acres, a population of 1,873,676, of whom 876,956 were males, and 996,672 females. At present (1846) the population may be estimated at about *two* millions; and we venture to say, that so great a number of human beings has never, in any age or country, been accumulated on so small a space of ground. The population of the department of the Seine in France, which comprises an area of 117,491 acres (47,548

* See the Treatise by Gregory King, appended to the edition of *Chalmer's Comparative Estimate*, published in 1802, p. 411.

hectares), and has Paris in its centre, amounted, in 1842, to 1,194,603, that is, to less than three-fifths the population of London.

South-eastern District.

1. *Surrey*, though inland, enjoys, in consequence of its being skirted by the Thames, most of the advantages of a maritime county. It has to the north Middlesex and a small part of Bucks, from both of which it is separated by the Thames; on the east it is bounded by Kent; on the south by Sussex; and on the west by Hampshire and Berks. It contains 485,120 acres, of which 400,000 are arable, meadow, and pasture. With the exception of the weald, the surface of Surrey consists of alternate hill and dale. Some of the hills rise to a pretty considerable height, affording highly diversified and beautiful prospects. This is particularly the case with St. Ann's Hill, St. George s Hill, Box Hill, Leith Hill, &c. The last commands a view of the entire weald of Kent, Sussex, and Surrey. The soil of this county comprises every variety, from the richest loam to the poorest moor. There are three portions, the soils of which are particularly well defined; viz., 1st, the weald, occupying all the southern part of the county from Crowhurst to Haslemere; 2nd, the sandy loam district, lying between the weald and the downs; and 3rd, the downs, or chalk land, occupying the whole eastern side of the county from Croydon to Tilsey, but gradually decreasing as we advance westward, till, at Farnham, on the border of Hants, it is reduced to a narrow strip. To the north-east of the downs, between them and the Thames, there is a great variety of soil, partly consisting of strong, dark clay, partly of sandy loam, &c. In the north-western and south-western parts of the county, but especially the former, there are very extensive tracts of heath and moorish ground; and smaller tracts of the same kind are met with in various other places. In general, the Surrey heaths are of the very worst description. Bagshot Heath, including those that adjoin it, is by far the most extensive, and perhaps, also, the least valuable of the whole: it lies along the border of Berks. On the whole, the county may be said to be of an average degree of fertility. The climate is good; and, owing to the variety of surface, the abundance of wood, and its contiguity to the metropolis, it is one of the most desirable counties in England for a residence. A large proportion of Surrey is in tillage; but agriculture, speaking generally, is in a decidedly backward state. The usual rotation in the weald (for an account of the weald, see *ante*, p. 24) is, 1st, fallow; 2nd, wheat; 3rd, seeds; 4th, oats; 5th, tares, which are fed-off, and the land brought in again for wheat; but frequently it is, 3rd, oats; 4th, seeds; 5th beans. In the northern part of the county, the rotation is, 1st, turnips; 2nd, barley; 3rd, seeds; 4th, wheat; 5th tares, rye, or other green crop. But two, or even more, white crops still not unfrequently follow in succession. On the rich, friable, calcareous loams, between Croydon and Epsom, 6 quarters of wheat an acre are not unfrequently reaped; and on the rich sandy loams, near Godalming, 5 quarters is no uncommon crop; but on the poorer soils, and in the weald, the produce seldom exceeds from 3 to 3½ quarters. The turnip culture was introduced into Surrey sooner than into any other English county;

but even at present turnips are but seldom drilled: their management is but imperfectly understood, and tares are generally preferred by the Surrey farmers to any other species of green crop. Turnwrest ploughs are used in many quarters, but the swing plough is most common. It is drawn by 3, 4, or 5 heavy horses, yoked in line! Lime is extensively used as manure; and the application of salt for that purpose is daily becoming more general. Hops are raised in considerable quantities; and those grown in the neighbourhood of Farnham are preferred to most others. Peppermint, lavender, wormwood, chamomile, &c., are raised in the physic gardens about Mitcham; and a considerable extent of land at Battersea, and other places along the Thames, is appropriated to the production of asparagus and other vegetables, for the supply of the London market. There is no peculiar breed of cattle in Surrey; but the short horns and the Sussex breed are the most prevalent. A considerable number of sheep are kept, principally on the down land. The total stock has been estimated at 300,000, producing annually 4,500 packs of wool. Large numbers of hogs are fed: they consist principally of the Berkshire and Chinese varieties. The Dorking breed of fowls is in high estimation; they are large, handsome, perfectly white, and are distinguished by having 5 claws to each foot. There are no very large estates in Surrey. Farms of all sizes. The largest are on the down lands, and the smallest in the weald; but, at an average of the county, the size of farms is not supposed to exceed 170 acres. They are commonly held under leases for 7, 14, or 21 years; but the vicious customs that prevail as to entry defeat the advantages that might otherwise have resulted from this tenure. Here, as in Kent and Sussex, an entering tenant has so many claims upon him for articles and work of comparatively little value, that, unless he be unusually rich, the greater part of his capital is swallowed up before he begins the business of his farm. This custom has contributed more, perhaps, than anything else to retard improvement, to attach the farmers to ancient practices, and to keep agriculture in a depressed state, notwithstanding the advantages the Surrey farmers enjoy, through their proximity to the London market.—(*Kennedy and Grainger on the Letting of Land*, vol. i., p. 321.) In the weald the farm houses are mean and ruinous, but they are better in other places. Cottages good; and frequently ornamented with vines and flowers. Average rent of land in 1842–3, 17*s.* 10*d.* an acre, having varied but little since 1814–15. There is a great deal of valuable timber and coppice-wood in Surrey, particularly in the weald. Large quantities of fullers' earth are dug up in various places in this county; and there are also excellent quarries of freestone and limestone. Except in so far as it is connected with the metropolis, Surrey has very few manufactures. Calico bleaching and printing are carried on at Wallington, Mitcham, and Merton; there are copper-works in the parish of Wimbledon; and Godalming retains some portion of the stocking manufacture for which it was once so celebrated. Besides the Thames, it is watered by the Wey, the Mole, and the Wandle; and it is traversed by the Surrey and Croydon Canals. Turnpike roads good; but cross-roads, particularly in the weald, very indifferent. Surrey contains 13 hundreds, exclusive of the boroughs of Southwark and Lambeth, and the town of

Guildford; and is divided into 142 parishes. It returns 11 members to Parliament; viz., 4 for the county, 2 for the Lambeth district, 2 for the borough of Southwark, 2 for the borough of Guildford, and 1 for the borough of Reigate. Population of county in 1841, 582,678. Sum expended for the relief of the poor in 1844–5, 179,538*l.* Annual value of real property in 1815, 1,589,702*l.*; ditto in 1842–3, 2,939,068*l.*

2. *Kent*, a maritime county, being the most south-easterly and nearest to the continent of any in England, is bounded on the north by the Thames and the German Ocean; on the east and south-east by the latter and the Straits of Dover; on the south by Sussex; and on the west by Surrey. It contains 996,680 acres, of which above 940,000 are arable, meadow, and pasture. Aspect varied and beautiful. Along the banks of the Thames there is a considerable extent of marshy land. Indeed, the greater part of the land to the north of a line drawn from Gravesend, through Chatham, to the channel called the East Swale, near Milton, including the Isles of Sheppey and Grain, is of this description; and there is, also, a good deal of marsh land on the banks of the Stour river, separating the Isle of Thanet from the rest of the county. Contiguous to the marshes, on the East Swale and the Stour, lies a tract of very fine, deep, rich, loamy land, stretching from Deal, by Canterbury and Faversham, to Hartlib. Immediately to the south of the western marshes, and of the tract now mentioned, a ridge of chalk-hills extends the whole length of the county from Dover, where the cliffs overhang the sea in a north direction to Faversham, on the confines of Surrey. Nearly parallel to the ridge now mentioned, and at the distance, in most places, of about 8 miles, there is another ridge called the lower or ragstone ridge. To the south of the latter is the district called the weald; and in the extreme south-eastern angle of the county is Romney marsh. The soil in these districts is exceedingly various. In the marshes it is mostly alluvial, deep, rich and very fertile. On the chalky grounds, particularly on the sides of the hills, it consists principally of a loose, chalky mould, having, in some places, a small admixture of flints; and in others, of a poor, black, light mould and sand. The low grounds between the two ridges of hills, consists mostly of dry, loamy soil, which is both fertile and easily wrought. The soil of the lower, or ragstone ridge, varies much; in some parts it is a rich loam, while in others it is clayey, sandy, and stony. The weald and Romney marsh have been elsewhere fully described.—(See *ante*, p. 24 and p. 29.) Generally speaking, the soil of the eastern division of the county is believed to be superior to that of the western division.

The Isle of Sheppey, alluded to above, lies eastward from the mouth of the Medway, being separated from the rest of the county by the navigable channel called the Swale. It is about 11 miles in length, and 8 across, at the broadest part, having the naval station of Sheerness at its north-western extremity. The soil consists principally of a deep, strong, stiff clay; but in the marshes the clay is covered with a thin stratum of very rich vegetable mould. The southern, and larger portion of the island, is low and marshy; but, on its northern side, the cliffs are pretty high; and, being gradually undermined, portions of them are every now and then falling into the sea. Most part of this island, as well as the marsh land in general, is far from being healthy.

The Isle of Grain consists of a low, marshy tract, lying to the west of the embouchure of the Medway; but the shallow, narrow arm of the sea, by which it was formerly separated from the main land, is now partly filled up, so that it is no longer an island.

We have elsewhere noticed some of the more prominent circumstances connected with the progressive geography of the Isle of Thanet (*ante*, p. 62), occupying the north-eastern angle of the county. It contains about 3,500 acres of excellent marsh, and about 23,000 acres of dry arable land. The last rests entirely on a hard, dry, chalk subsoil, and is, for the most part, particularly in the district between Ramsgate and Monkton, loamy and very fertile. Thanet formerly belonged principally to religious houses, which were by far the best farmers of their age: it is mostly under the plough, and has always been famous for its superior culture. There are few districts, of the same extent, in which so much sea-weed is used for manure.

Kent, principally no doubt from its proximity to the Continent, was the most early civilised portion of Great Britain. Cæsar, speaking of the British tribes, says, *Ex his omnibus longe sunt humanissimi qui Cantium incolunt.*—(*De Bello Gallico*, lib. 5. § 14.) The same circumstances to which it owed its early superiority rendered it, for a lengthened period, the most important county in the kingdom; and, though it be now far surpassed by others in wealth and population, its situation, the variety of its soil and surface, the amenity of its climate, and its peculiar customs, preserve to it no small portion of its ancient celebrity. Nothing can exceed the variety and excellence of its raw products. It yields capital crops of all sorts of grain, but in particular of wheat, barley, peas, and beans. More hops are raised in it than in any other county; and it supplies a very large part of the cherries, filberts, plums, apples, &c. required for the supply of the London markets. The weald has been long celebrated for its oak timber; and Romney marsh for its cattle, sheep, and wool. There are, also, very large gardens for the culture of asparagus, cauliflower, &c. From Maidstone to Tonbridge, the orchards and gardens have a very beautiful appearance; and the training of the filbert trees, the crops of which are an object of much importance, is well worth attention. Poultry of every sort is large and fine; and the fish caught on its own shores, and the rivers and ponds within it, not only supply the tables of the rich in great plenty, but afford a cheap and constant support to the poor. The native Milton oysters are said to be superior to those taken in any other part of England. The several warrens supply the markets with rabbits. From the number of parks, there is great plenty of venison; which, in those of Eastwell, Knoll, and Cobham, is esteemed superior in flavour and goodness to all others. Game, including hares, pheasants, and partridges, is in great abundance; the pheasants being esteemed larger, and finer flavoured, than in any other part of the kingdom. Deservedly, therefore, did Drayton, in his *Polyolbion*, celebrate its praises—

> "Oh! famous Kent, *quoth he*,
> What county has this isle that can compare with thee?
> Which hast within thyself as much as thou canst wish,
> Thy conies, ven'son, fruit, thy sorts of fowl and fish:
> And, what comports with strength, thy hay, and corn, and wood:
> Not any thing thou wants that any where is good."

Agriculture, particularly in East Kent, is in a very advanced state. Wheat and barley are raised in large quantities: the best samples of the former, brought to the London market, being the produce of the Isle of Sheppey. The culture of beans and peas is said to be better understood here than anywhere else in England: they are mostly put in by the drill plough; and corn on the light land is, also, mostly drilled. Except in the Isle of Thanet, turnips are grown on all the lighter soils, to a considerable extent. The usual rotation is, 1st, turnips; 2nd, barley; 3rd, seeds; 4th, wheat; 5th, peas: in West Kent it generally is, 1st, fallow; 2nd, wheat; 3rd, oats; 4th, seeds or beans.* Various sorts of manure are made use of; among which may be specified fish and woollen rags. The effect of the former lasts but for a short time; but that of the rags is said to continue for several years. Chalk is burnt and used as manure within the county; and chalk is carried across the Thames in large quantities to Essex, where it is applied with the best effect to cold, stiff, clay lands. The hop plantations principally lie between Maidstone and Canterbury. In 1845, the entire plantations in the county occupied 24,888¼ acres; and the duty (2*d.* per lb.) produced 160,058*l.*; showing that the crop amounted to 19,206,966 lbs.; but hops are a very precarious article, and this was a favourable year. The woollen rags are commonly applied to the hop plantations. Exclusive of the leading articles of produce, a number of inferior articles, as canary seed, radish seed, spinach seed, &c., are very extensively cultivated, principally in the Isle of Thanet, but partly, also, in other parts of East Kent. Enclosures generally small, except in the north-east part of the county beyond Canterbury, which is comparatively open. Kent can hardly be said to be either a grazing or a breeding county; but large numbers of cattle are, notwithstanding, fattened and kept for the dairy. In the weald the Sussex oxen are a good deal used for the plough and the road; but the dairy cattle are generally drawn from other counties, being principally Welsh mixed with Sussex, &c. The stock of sheep in Kent is very large. The Romney marsh sheep is peculiar to the county: it stands high on its legs, and is handsome; but is not so large as it looks: it fattens early, and produces long combing wool. The stock of marsh sheep is estimated at about 300,000; the stock in the rest of the county at about 520,000. The total produce of wool is supposed to exceed 18,500 packs. Property much divided. The yeomanry are here a superior class; and, besides their own estates, some of them occupy extensive hired farms. All lands in Kent, unless specially exempted by an act of the legislature, are held by the tenure of *gavelkind;* descending, in the event of the father dying intestate, not to the eldest son, but *to all the sons alike in equal portions;* and, if there be no sons, then they divide equally among the daughters. This is supposed to have been the common tenure in England before the Conquest; but, besides Kent, it now obtains only in a few places. Some estates have been *disgavelled*, or excepted by act of parliament from this tenure; and partition is now, in most instances, prevented by testament. But such lands as are not disgavelled, or are not disposed of by testament, are invariably divided as stated above.—(See *Hasted's*

* *Kennedy and Grainger on the Tenancy of Land*, vol. i., p. 252.

Kent, vol. i., pp. 311—321.) Size of farms various; many from 10 to 14 acres; few exceed 200 acres; though there are some from 600 to 1500 acres. In many parts the farmers hold at will; but the greater number have leases for 7 or 14 years. The practice as to the entry to farms, that prevails in this county, is the same that prevails in Surrey (which see); and, considering its vicious nature and powerful influence, it is surprising agriculture should be so advanced. Hundreds of tenants have, however, been ruined, in consequence of the oppressive charges made upon them at entering having deprived them of capital sufficient to manage their farms, and to meet any unfavourable contingency.* Owing partly to the gambling spirit occasioned by the uncertainty of the hop harvest, partly to the prevalence of smuggling on the coast, caused by the exorbitant duties on foreign brandy and geneva, and partly to the mal-administration of the poor-laws, the peasantry, in parts of Kent, were of late years a good deal demoralised. Luckily, however, these causes of demoralization have either been, or are in the course of being obviated; so that an important improvement may, in this respect, be fairly anticipated. Farm-houses and buildings generally indifferent: most part of the old ones have been constructed of timber; but those that have been erected during the present century are mostly of brick, and are more commodious. Average rent of land in 1842-3, 26*s.* 7½*d.* an acre, being no less than 9*s.* an acre greater than in 1810! Besides the oak timber in the weald, there is a great deal of valuable timber, and of coppice wood, in other parts of the county. Underwood is in great demand for hop-poles. Birch, of which there are large quantities, chiefly goes to the broom-makers of the metropolis. Labour mostly done by the job. Manufactures not very important; the principal being that of ship-building, carried on at Deptford, Woolwich, Chatham, and other places. Toys and turnery ware are made at Tonbridge; gunpowder at Dartford and Feversham; and paper at Maidstone and Dover. Iron ore is found all over the weald; and extensive iron works were formerly carried on in the parts of that district contiguous to Sussex. Principal rivers, Thames, Medway, Stour, Rothe, Darent, and Ravensbourn. A canal for barges unites Gravesend on the Thames with Chatham on the Medway, obviating a considerable length of navigation. The Grand Military Canal, constructed as a defensive work during the last war, runs along the northern boundary of Romney marsh. Kent is intersected by various railways. It is divided into the 2 nearly equal divisions of East Kent and West Kent, each district having its own court of sessions. It is also divided into 5 lathes, which are subdivided into 63 hundreds and 15 liberties: it contains 411 parishes. Kent returns 18 members to parliament; viz., 4 for the county, 2 each for the cities of Canterbury and Rochester; 2 each for the boroughs of Dover, Greenwich, Maidstone, and Sandwich; and 1 each for Chatham and Hythe. Population of county in 1841, 548,337. Sum expended for the relief of the poor in 1844–5, 190,746*l.* Annual value of real property in 1815, 1,687,443*l.*; ditto in 1842-3, 2,907,606*l.*

3 *Sussex*, a maritime county, is bounded on the north and north-east by Surrey and Kent, on the south and south-east by the English

* See remarks on the letting of land in this work.

Channel, and on the west by Hampshire. It contains 938,240 acres. Surface and soil very various. A ridge of chalk-hills, to which (though in strictness applicable only to a part) the term South Downs is usually applied, runs through the county from South Harting and Miland Chapel, on the confines of Hants, to Beachy Head, where it terminates in high precipitous cliffs. Their northern declivity is rather steep, but that on the southern side is gently sloping. The soil of the South Downs is generally a light hazelly mould, on a substratum of loose chalk. On the south side of this range, along the coast from Emsworth, gradually decreasing to near Brighton, there is a considerable extent of fine, rich, loamy land. To the north of the South Downs lies the extensive tract called the weald of Sussex, uniting on the east with the weald of Kent, and stretching as far west as Petworth. Some writers include the poor sandy districts between Horsham and Maresfield, and those in the north-east corner of the county, in the weald; while others, and we think with more propriety, exclude them. The soil of the weald is similar to that of the weald of Kent, being for the most part a stiff tenacious clay, with occasional sandy and gravelly patches intermixed. It is thickly covered with oak wood, and, when viewed from the South Downs, appears like an immense forest.—(For an account of the weald, see *ante*, p. 23.) In the eastern parts of the county, in what is called Pevensey Level, and near Winchelsea, there are considerable tracts of very fine, deep, marsh land. The Rev. Mr. Young, in his *Survey of Sussex*, distributed the surface as follows:—Down land, 68,000 acres; rich arable, 100,000; waste (chiefly sand), 110,000; arable and pasture in the weald, 425,000; woods in weald and elsewhere, 170,000; making in all 903,000 acres: the rest consisting of water, sands, buildings, &c. Climate mild, dry, and early. A large extent of Sussex is under the plough, but husbandry is in a backward condition; and Messrs. Kennedy and Grainger truly state, that no very material improvement need be expected till those pernicious habits with respect to the letting and entry to farms, that prevail in this county, as well as in Kent and Surrey, be totally changed. —(*Tenancy of Land*, vol. i., p. 337.) The crops principally cultivated are wheat, oats, and barley; and on all the light lands turnips are extensively grown. The usual rotation on these is, 1st, turnips; 2nd, barley; 3rd, seeds; 4th, wheat; 5th, rape or other green crop. In the weald the usual rotation is, 1st, fallow; 2nd, wheat; 3rd, seeds; 4th, oats; or 3rd, oats; 4th, seeds. Beans not much cultivated. Great quantities of hops are raised, particularly in the eastern parts of the county, there being, in 1845, 11,016 acres under this crop. Sussex is deservedly celebrated for its breeds of cattle and sheep, each being about the very best of its kind. The oxen are of a deep red colour, and have tapering turned-up horns; they fatten easily, produce excellent beef, and are not inferior to any other breed in field labour. The greater part of the tillage in the weald is performed by ox-teams. The native cattle do not, however, answer for the dairy. The peculiar breed of sheep belonging to the county is called the South Down, from its being found in the greatest perfection on the South Down chalk-hills. The breed is now widely diffused, but, owing to the extension of tillage on the downs, and the increase in the size of the animal and the weight

of the fleece, neither the mutton nor the wool is supposed to be so good as formerly. The high prices obtained for corn during the latter years of the war, and the low prices of wool from 1825 to 1830, occasioned a considerable extension of tillage on the down lands. But the comparatively low price of corn, and great rise in the price of wool since 1830, have caused a reaction, and have made a good deal of the land be again restored to its most suitable purpose, that of pasturage. Generally, also, the sheep stock has been increasing, as compared with that of cattle, in every part of the county. The total stock of sheep was estimated by Messrs.Luccock and Hubbard at about 863,000, of which 316,000 are supposed to be depastured on the downs. The entire annual produce of wool is estimated at 10,800 packs. This estimate differs materially from that given by Mr. Young in his survey (p. 373); but we incline to think that it is the more accurate of the two. The fact is, that the extension of cultivation, though it has deteriorated the quality of the wool, has, by increasing the turnip culture, materially increased the number as well as the size of the sheep and the weight of the fleeces. Sussex has been celebrated from the remotest period for the abundance and excellence of its timber, and in these respects it continues to be decidedly superior to every other county. Oak is the principal timber of the weald; but in other parts beech is most prevalent. To the abundance of wood is principally to be ascribed the circumstance of Sussex being formerly distinguished for the number of its *iron-works;* but since pit-coal began to be generally employed in the smelting and refining of iron, these have been wholly abandoned, as well as those that were established in Kent. Property much divided. Average size of farms in the weald 100 acres; in the downs, from 1,200 to 2,000 acres. A great proportion of the farms held by tenants at will, and, owing to injurious customs as to entry, a large part of the capital of the tenant is swallowed up in the useless payments he is compelled to make, so that much of the land is very insufficiently stocked. Offices invariably thatched and weather-boarded. Average rent of land in 1842-3, 18*s.* 2¾*d.* an acre. Manufactures of little importance. Ironstone, fuller's earth, limestone, and sandstone, are all met with. The rivers are of no great magnitude. The principal is the Arun. It communicates by a canal with Langport harbour on the west, and with the Wye and the Thames on the north. The London and Brighton railway intersects the county. In the weald there are several ponds in which freshwater fish are fed for the London markets. Sussex is divided into 6 rapes, and these again into 65 hundreds, and contains 310 parishes. It returns 18 members to parliament, viz., 4 for the county; 2 for the city of Chichester; 2 each for the boroughs of Brighton, Lewes, Hastings, and Shoreham; and 1 each for Arundel, Horsham, Midhurst, and Rye and Winchelsea. Population of county in 1841, 299,753. Sum expended for the relief of the poor in 1844-5, 114,995*l.* Annual value of real property in 1815, 919,350*l.*; ditto in 1842-3, 1,676,999*l.*

Southern District.

1. *Berkshire*, an inland county, is bounded on the north by the counties of Oxford and Buckingham, from which, through its whole

extent, it is separated by the Thames; on the east by Surrey; on the south by Hants; and on the west by Wilts and a part of Gloucestershire. It contains 481,280 acres. This, which is one of the most beautiful counties in the empire, is naturally divided into four districts, viz.:—*First*, the Forest district, comprising almost all the eastern part of the county, as far west as the river Loddon. It contains Windsor Forest, part of Bagshot Heath, and some other considerable tracts of waste land. Its surface and soil are various; but the latter is, for the most part, sandy, gravelly, and poor. *Second*, the Vale of the Kennet, stretching from near Wargrave on the east to Hungerford on the west. Gravelly soils predominate in this vale, but they differ widely in quality and fertility: a good deal of peat is found at different places along the banks of the river. *Third*, the chalk-hills, or downs, stretching across the county, from near Streatley on the east to Ashbury on the west. And, *Fourth*, the Vale of the White Horse, lying to the north of the chalk-hills, and so called from the gigantic figure of a horse rudely sketched on one of these hills. The prevailing soil of the level parts of the vale is a strong, grey, calcareous loam, producing luxuriant crops of grass and corn; but in some places the soil is of inferior fertility. Dr. Beeke, one of the best statistical writers that this country has produced, supposes Berks to contain 464,500 acres, distributed as follows:—

	Acres.
Arable land, about	255,000
Meadows, and dairy land in the vale	72,000
Sheep-walks, chiefly unenclosed, on the chalk-hills	25,000
Other dry pastures, parks, &c.	25,000
Wastes, chiefly barren heaths	30,000
Wood, copses, &c.	30,000
Space occupied by buildings, courts, fences, roads, rivers, &c.	27,500
	*464,500

Agriculture a good deal improved, but still at rather a low ebb. Principal crops, oats and wheat. The land is usually held on leases for 7 and 14 years; but, as there is rarely any restriction on the tenants as to its cultivation, or the mode of cropping, the soil, unless where it happens to be occupied by its owners, is, generally speaking, very much out of condition. "*A tenant, down to the last year or two of his lease, drives the land as hard as he possibly can, and, in fact, leaves it entirely run out.*"—*Kennedy and Grainger*, vol. i., p. 145.) The ordinary rotation on the turnip land is, 1st, turnips; 2nd, barley or oats; 3rd, seeds; 4th, wheat; and 5th, oats: upon the heavy land the course is, 1st, fallow; 2nd, wheat; 3rd, beans; 4th, wheat or oats; and, if the 4th be wheat, then 5th, oats. The land, as the authorities now quoted observe, is, in most cases, "*tried to the utmost.*" Four or five horses are generally used in ploughing; and it is believed that, of the total number of 12,000 or 13,000 horses, supposed to be employed in the county for agricultural purposes, a third might be advantageously dispensed with. On the heavy soils beans are chiefly dibbled. Berks enjoys considerable celebrity as a dairying and grazing county. The cattle are now principally of the Holderness and Teeswater

* *Mavor's Survey of Berks*, p. 3.

breeds; but Scotch and Welch cattle are extensively grazed in the Forest district. The western part of the Vale of the White Horse, and particularly the parish of Buscot, contiguous to Gloucestershire, is celebrated for its dairies. It is there that the "pine-apple" cheese is principally made; but the greater part of the cheese made in the Berkshire dairies is of the description called double Gloucester. Dr. Mavor estimated the total number of cows kept in the dairying district at 5,000; and he states, that from 2,000 to 3,000 tons of cheese were annually sent to London from the wharf at Buscot; of which the quantity furnished by the Berkshire dairies was not less than 1,000 tons.—(*Survey*, p. 375.) At present, however, very little of the cheese of Berks, Gloucester, Wilts, and other western counties, is conveyed to London by water. The frequent interruptions in the navigation of the Thames, and the liability of the cheese to heat, having occasioned so much loss that it is now mostly all forwarded by waggon or railway. The South Down breed of sheep, but much crossed, is at present the most generally diffused. The total stock of sheep has been estimated at about 308,000, and the total annual produce of wool at 4,500 packs. The Berkshire breed of hogs is one of the best in the empire. They are raised in great numbers, and are mostly made into bacon. About 4,000 are killed at Faringdon only, between Michaelmas and April. Large quantities of onions, asparagus, &c., raised at Reading and its vicinity for the London and Bath markets. Few large estates: property much divided; and a good deal in the occupation of yeomen. Farms middle-sized, rather small. Farm buildings and cottages of a medium quality. Average rent of land in 1842-3, 24*s.* 8½*d.* an acre. Windsor Castle, the ancient and only magnificent residence of the kings of England, stands on the eastern margin of this county. Manufactures and minerals of no importance. Exclusive of the Thames, by which it is bounded along its whole northern frontier for about 100 miles, Berks is watered by the Kennet, the Loddon, the Ock, and other rivers; it is also traversed by the Kennet and Avon, and the Berks and Wilts canals, and by the Great Western Railway from London to Bath and Bristol. It contains 20 hundreds and 151 parishes. It returns 9 members to parliament, viz.: 3 for the county, 2 each for the boroughs of Reading and Windsor, and 1 each for Abingdon and Wallingford. Population of county in 1841, 161,147. Sum expended for the relief of the poor in 1844-5, 78,178*l.* Annual value of real property in 1815, 719,890*l.*; ditto in 1842-3, 967,475*l.*

2. *Wiltshire*, an inland county, is bounded on the north and north-west by the county of Gloucester; on the west by Somerset; on the south by Dorset and Hants; and on the south-east and north-east by the latter and Berks. It contains 874,880 acres, of which about 800,000 are arable, meadow, and pasture. It is divided by the rivers Kennet and Avon, and the canal by which they are united, into two grand divisions, popularly termed, from their situation, North and South Wiltshire. But it would be more naturally divided into a north-west and south-east division, by a line drawn from Bishopston, on the Berkshire border, to Devizes, and thence to Maiden Bradley, on the confines of Somersetshire. This would throw almost all the down

lands into the south-east division. But, taking the divisions as we find them, the southern one consists, in great part, of Salisbury Plain, extending from Westbury and Warminster, on the west, across the county to Hampshire, and from Lavington, on the north, to near the city of Salisbury on the south. It consists principally of chalk downs, intermixed, however, with some fertile, well-watered, and beautiful valleys. Though called a plain, the surface, as in all chalk land, is undulating: the most level part lies round Stonehenge. There is a good deal of rich land in the southern division, between Trowbridge and Pewsey, and between the Willy and the Dorsetshire border, east, to Wilton and Salisbury. Marlborough Downs, which bear, in most respects, a close resemblance to Salisbury Plain, lie in the northern division of the county, between Marlborough and Swindon; but, with this exception, this division consists principally of rich vale land, considerably exceeding in extent and importance the cultivated grounds of the southern division. There are some large estates; but property is, notwithstanding, a good deal subdivided. Farms of all sizes, and generally let on lease for 7, 14, and 21 years, with unobjectionable conditions as to entry. Farm-houses, in the southern division, were formerly built together, for the convenience of water; but the more modern ones are generally detached. Agriculture in Wiltshire is in an advanced state, and reflects credit on the skill and enterprise of the farmers. The land under the plough is remarkably clean and in good order. It is believed, however, that tillage on the down lands has been too much extended. When once broken up, it is extremely difficult to get them again into good condition as pasture; while, unless corn fetches a pretty high price, they are most productive in the latter. Principal corn crops, wheat and barley; the latter being, however, confined in a great measure to the light chalky soils. Turnips, rape or cole seed, and potatoes, largely cultivated. Much of the rich land in the northern division is appropriated to the dairy husbandry, and the fattening of cattle. The cheese, which, excepting inferior butter made from the whey, is the only product of the dairies, was formerly sold as Gloucestershire cheese; but it is now well known, and much valued in London and elsewhere, by its proper name of North Wiltshire cheese. Breed of cattle various: they are partly slaughtered in Bath, Salisbury, &c., but the greater number are sold to the London butchers. In despite, however, of the encroachments made by the plough on the downs, sheep continue to be regarded, in the greater part of the county, as the principal support of the farmer. They afford the chief article of manure used on the land; while the sale of the lambs and wool furnishes the principal means of paying the rent. In consequence, as it would seem, of this dependance, and of the high price of wool during the last 4 or 5 years, there have been fewer complaints among the Wiltshire farmers than amongst those of most southern counties. The sheep stock, consisting partly of the native horned breed, but in a far greater degree of South Downs, and crosses between the two, is estimated at about 700,000; of which about 584,000 are depastured on the downs, and the rest on the cultivated land: the fleeces of the former are supposed to weigh, at an average, 2¾ lbs., and those of the latter 4 lbs.; producing, together, about 8,650 packs of

wool. The irrigation of water meadows is to be seen, in the greatest perfection, in South Wiltshire, and is practised on a large scale. Many hogs are kept; and Wiltshire bacon is highly esteemed. In the vicinity of some of the towns of South Wiltshire a good deal of garden husbandry is carried on. Average rent of land in 1842-3, 23*s.* 4½*d.* an acre. Stonehenge, of which the date and the object are alike unknown, stands, in solitary magnificence, in the middle of Salisbury Plain. It is a collection of vast stones, disposed endwise, in circles, some of them being joined by immense blocks, stretching from the top of one to that of another. (See *Geog. Dict*, Art. Stonehenge.) The manufactures of Wiltshire are considerable: they consist principally of various descriptions of superfine woollen goods, made at Bradford, Trowbridge, Westbury, &c.: thicksets and other sorts of cotton goods are also prepared, though in small quantities. Wilton was long celebrated for a carpet manufactory, established by one of the earls of Pembroke; but this, though it has latterly increased, is not so considerable as formerly; and, speaking generally, manufactures of all sorts are here, as in the other southern counties, on the decline. Principal rivers, Thames, Upper and Lower Avon, and Kennet. The Great Western Railway runs through the north division of the county. Exclusive of some local jurisdictions, Wilts contains 28 hundreds and 300 parishes. It returns 18 members to parliament, viz.: 4 for the county; 2 for the city of Salisbury; 2 each for the boroughs of Chippenham, Cricklade, Devizes, and Marlborough; and 1 each for Calne, Malmesbury, Westbury, and Wilton. Population of county in 1841, 258,733. Sum expended for the relief of the poor in 1844-5, 134,545*l.*, Annual value of real property in 1815, 1,215,619*l.*; ditto in 1842-3, 1,424,558*l.*

3. *Hampshire*, *Southampton*, or *Hants*, a maritime county, including the Isle of Wight, is bounded on the north by Berks; on the east by Surrey and Sussex; on the West by Wilts and Dorset; and on the south by the English Channel. It contains 1,040,000 acres, of which the Isle of Wight contains about a twelfth part; and, including the island, 900,000 acres are supposed to be arable, meadow, and pasture. This county is reckoned one of the most agreeable in England. Its surface is varied with gently rising hills and fruitful vales, while its climate is peculiarly mild and genial. Soil various, but the greater portion chalky. The northern districts, towards Berkshire, are, in parts, hilly; but between Basingstoke and Silcester there is some of the finest wheat and bean land in the county. A broad zone of chalky hills, or downs, intersected by numerous valleys, extends across the county from the borders of Salisbury Plain, on the west, to Dockingfield, Petersfield, and Blendworth, on the borders of Surrey and Sussex. The south-western district, or the country lying between Southampton Water and Dorsetshire, is principally occupied by the New Forest, and by extensive heaths. To the north of Portsmouth harbour there is a considerable tract of forest and down land. But in the southern and middle parts of the county, and particularly in the vales watered by the Anton, the Itchen, and other rivers, there are large tracts of very good land, and some of the finest water meadows in England. Marsh land is found at different places on the

coast, particularly on the west side of Southampton Water, near Fawley, but not to any great extent. Principal crops, wheat, barley, oats, beans, and a few peas. Turnips extensively cultivated, particularly on the light calcareous soils. Saintfoin, also, is grown to a greater extent on the chalky soils of Hampshire than, perhaps, in any other part of England. In 1845, 1,637 acres were under hops in the mainland, and 1,128 ditto in the Isle of Wight. Arable husbandry, though much improved during the last 20 or 30 years, has not attained the perfection that might have been expected. It is usual to prohibit a tenant from taking two *wheat* crops in succession; but two white crops not being commonly objected to, oats frequently follow wheat; so that the land in many places, is impoverished and worn out. But this pernicious practice is on the wane.—(*Kennedy and Grainger*, vol. i., p. 242.) The old Hampshire plough, usually drawn by four large heavy horses, is a bulky, clumsy, inplement; but ploughs of an improved construction, and made wholly of iron, are now in general use. The patent Hampshire waggon is formed by uniting two carts, and bolting them firmly together. The cattle consist of various breeds; but along the coast, and in the Isle of Wight, the Alderney or smaller breed of Norman cattle predominates: in other parts of the county Devons, or a cross between them and the Alderney, are most common. The dairy is not much attended to; and but little more butter is made than is required for the consumption of the county. Sheep of various breeds. In the forest lands, the heath sheep, and the old Wilts breed, were formerly the most prevalent; but they have since been much crossed with other breeds, and, in some degree, superseded by the South Downs. The stock of sheep is very large; having been estimated at above 516,000 in the mainland, and above 60,000 in the Isle of Wight. The annual produce of wool is estimated at about 7,600 packs. The sheep fair, held at Weyhill, near Andover, in this county, is the best attended, and most important, of any in England. A great many small hardy horses are bred in the forest lands and on the heaths. Hants is famous for its bacon: its superiority does not, however, depend on the excellence of the native breed of hogs, these being coarse, raw-boned, and long-sided. The pure native breed is now, however, seldom met with; the prevailing breed being that of Berkshire, or a cross between it and the native breed, or the Chinese, or other variety. Estates mostly large: only a small part of the county belongs to, or is cultivated by, yeomen. Farms of all sizes: in the central parts of the county they are large, many comprising 400 and 500 acres, but in the other parts they are a good deal smaller. Until lately they were mostly let on lease: the practice of tenancy at will is, however, gaining ground. Farm-houses generally good. Many of the farm-buildings are of timber. Average rent of land in 1842-3, 14*s.* 11½*d.* an acre. The New Forest contains, at present, about 92,000 acres, but it was formerly much larger. It occupies the whole country between Southampton Water on the east, the British Channel on the south, and the Avon on the west. William the Conqueror is generally believed to have afforested this immense tract, destroying, for that purpose, several towns, and many villages and churches. But it appears to be suffi-

ciently established that there is but little foundation for these statements; that the greater part of the tract referred to had been a forest previously to the Conquest; and that the injury done to the inhabitants by the proceedings of the Conqueror was comparatively trifling.* Only about 64,000 acres of forest land are now the property of the crown; the rest of the land, within the modern limits of the Forest, having been assigned to individuals. Oak and beech are the prevailing species of timber; but there are, in the forest, large tracts of heath. Besides the New Forest, there are, in this county, the remains of Bere Alice, Holt, Woburn, and other forests; and there are extensive bush woods on all the chalk lands. A great deal of honey is collected in different parts of Hampshire; but that made in the forest is most esteemed. If we except the building of ships at Portsmouth, and the various works connected with their construction and outfit, the manufactures of Hants are of no great consequence. Shalloons and serges were formerly made at Andover, Romsey, and other places, but the business is now much declined. There are silk mills at Overton, and straw bonnets are made in various parts of the county. The malting business is carried on upon a large scale. Minerals of little importance. Principal rivers, the Avon, which runs through the extreme south-western part of the county, the Anton, and the Itchen. The Anton rises in the northern parts of the county, near Overton, and passing through Whitchurch, Stockbridge, and Romsey, falls into the north-western extremity of Southampton Water. A lateral canal accompanies it from its embouchure to Stockbridge and Andover. The Itchen rises in the middle parts of the county; and passing through Winchester, falls into Southampton Water at Southampton. It has been rendered navigable as far as Winchester. The South-Western Railway intersects this county, and brings Winchester and Southampton within a 3 hours run of the metropolis. The noble harbour of Portsmouth, and the road of Spithead, lie in the sound, which divides the mainland from the Isle of Wight.—(See *ante*, p. 59.) Hants, including the Isle of Wight, is divided into 39 hundreds, and contains 298 parishes. Population of county in 1841, 355,004. Amount of sums expended on the relief of the poor in 1844-5, 134,545*l.* Annual value of real property in 1815, 1,240,547*l.*, ditto in 1842-3, 1,661,447*l.*

The *Isle of Wight* (the *Vectis* of the Romans) lies opposite to the Hampshire coast, being separated from it by the road of Spithead on the east, and by the Solent, or West Channel, on the west. From the southern part of the mainland, below Gosport, across the channel to Bursted, the distance is about 3 miles; but from Hurst Castle, across to the Isle, it is little more than a mile. The figure of the island is rhomboidal, having its sides parallel to the opposite shores of the mainland. From its eastern to its western angle, the distance is about 22 miles, and from the northern to the southern, about 13. It contains 86,810 acres. The face of the country is beautifully diversified with hills, dales, towns, villages, and gentlemen's seats. A range of chalk hills extends lengthwise across the island, affording excellent pasture for sheep, and some very commanding views. The cliffs on the south coast are bold and precipitous; and being undermined by the

* *Beauties of England and Wales*; Hampshire, p. 158.

sea, portions of them occasionally fall into it. The cliffs called the Needles, on the western angle, are lofty, detached, almost perpendicular, and strikingly picturesque.—(See *ante*, p. 58.) One of the tallest of these cliffs, being undermined by the action of the waves, was overthrown and totally disappeared in 1782. Climate extremely mild, and, perhaps, the most salubrious in England. Soil loamy, and mostly very fertile, being well adapted for all sorts of agricultural purposes. The husbandry is similar to that on the good soils of the mainland; and the island has a large quantity of agricultural produce to dispose of after supplying its own inhabitants. It is divided into two nearly equal parts by the river Medina. Large quantities of fine sand are shipped from Freshwater Bay, for the glass and china manufactures in different parts of the country; but it has no other minerals of any importance. Population of the island in 1841, 42,550.

4. *Dorsetshire*, a maritime county, is bounded on the north by the counties of Wilts and Somerset; on the west by Devonshire; on the east by Hants; and on the south by the British Channel. It contains 643,840 acres, of which nearly 600,000 are arable, meadow, and pasture. Face of the country pleasantly diversified. Climate dry and salubrious, but the harvest not so early as in other districts not so far south. Mr. Stevenson, in his survey of this county, estimated its surface at about 504,000 acres, of which he supposed 161,000 to consist of chalk soil; 85,000 sand; 38,000 loam; 60,000 gravel; 30,000 stone-brash; 117,000 clay; and 13,000 miscellaneous. Dorsetshire has been sometimes termed the garden of England; but, though the vale of Blackmoor, traversed by the Stour, containing about 170,000 acres, and some other districts in the west part of the county and along the coast, be eminently fertile, it does not seem to have any very peculiar title to this epithet. It contains a large extent of chalky downs: between Blandford and Hampshire there is a considerable extent of forest land; and round Poole Harbour there are many thousand acres of heathy, unimproved moors. Property in large estates. Farms of various sizes, but the greater number large. Leases less common now than formerly. Average rent of land in 1842-3, 19*s.* ½*d.* an acre. Arable husbandry materially improved of late years by the adoption of a better rotation of crops; the substitution of turnips for fallows on the light soils, &c. Hemp and flax a good deal grown, but less than formerly. Water meadows extensive, and their management well understood. The greater part of the county in grass; being devoted either to the feeding of sheep, or to the dairy system. Sheep short woolled, and reckoned superior to most others, both for fattening their lambs and bringing them early forward. Mr. Parkinson characterized "the Dorset ewe as the best horned ewe in the kingdom, those of Somerset excepted; and they are so nearly alike that few people know the difference." (*Stevenson's Survey*, p. 393.) The stock of sheep in the county has been estimated at about 632,000, the average weight of the fleece at 3¾lbs., and the total produce of wool at about 10,000 packs. Sheep-folding extensively practised. Cattle of no peculiar breed. The dairies are many of them very large. Butter the principal product; the cheese, being made only from skimmed milk, is generally consumed within the county. Dairies, for the most part, let

by the farmers at so much a cow; and several of the lessees are known to have made considerable fortunes. Free-stone of a very superior quality is furnished by the quarries in the Isle of Portland, large quantities being shipped from it for the metropolis and other places. Purbeck furnishes the potteries of Staffordshire with supplies of the clay used in the manufacture of the finer sorts of earthenware. There are considerable manufactures of flax and hemp at Bridport and Beaminster. Shirt buttons are made in large quantities at Shaftesbury and Blandford; white baize at Sturminster; silk is spun at Sherborne; and there is a considerable manufacture of baskets and other small articles. Principal rivers, Stour and Frome. Dorset contains 34 hundreds, distributed into 5 divisions and 271 parishes. It returns 13 members to parliament; viz., 3 for the county; 2 for each of the boroughs of Bridport, Dorchester, Poole, and Weymouth; and 1 each for Shaftesbury and Wareham. Population of county in 1841, 175,043. Sum expended for the relief of the poor in 1844–5, 82,721*l.* Annual value of real property in 1815, 726,264*l.*; ditto in 1842-3, 917,077*l.*

South-western District.

1. *Somersetshire*, a maritime county, is bounded on the north and north-west by the Bristol Channel; on the north-east by the county of Gloucester; on the east by Wilts; on the south by Dorset and Devon; and by the latter on the west. It contains 1,052,800 acres, of which about 900,000 are supposed to be arable, meadow, and pasture. With, perhaps, the single exception of Yorkshire, there is no county in England that has a greater variety of surface and soil than Somerset. In some places, particularly in its western and north-easterly divisions, it is hilly, and even mountainous: in the middle part of the county, between the rivers Ax and Parry, there are very extensive tracts of marsh land, which, in some places, is of extraordinary fertility (see *ante*, p. 31): in other places, again, there are extensive moors, of which Exmoor, at the western extremity of the county, is the principal (*ante*, p. 18). But, exclusive of these, the county contains a large extent of land equally adapted for tillage and pasturage. The vale of Taunton, already described (p. 22), is one of the richest and most beautiful tracts in the kingdom. Tillage husbandry is neither extensively carried on, nor in the most approved manner. The land is not injured by overcropping, but it is not properly wrought, and is frequently foul and out of order. Principal crops, wheat, oats, barley, and beans. In the southern and interior parts the rotation is, 1st, fallow; 2nd, wheat; 3rd, beans or seeds; 4th, oats: in the eastern part of the county it is generally, 1st, fallow; 2nd, wheat; 3rd, oats or barley; 4th, seeds. Potatoes are pretty extensively grown, but turnips are not cultivated to any very considerable extent in any part of the county. Lime is frequently used on the arable land; and, with the exception of dung, is the only manure that is employed. Drilling but little practised; beans mostly planted by the dibble. Labourers said to be indolent; and that they seem, when employed, as if they would rather stand still than exert themselves.—(*Kennedy and Grainger*, vol. i., p. 308.) A large proportion of the

county is in grass; the dairy and fattening systems being both extensively carried on. The drainage of the marshes, though of the highest importance, is, from the want of a proper outfall, and the non-employment of steam-engines, so very defective that thousands of acres of crop-land are sometimes laid under water. Cattle principally of the Devonshire breed, but a great variety of other breeds are met with. The celebrated Chedder cheese is so called from a village of that name on the west side of the Mendip Hills; but it is now principally made in the marshes round Glastonbury. Bridgewater cheese is made in the marshes between that town and Cross. The stock of sheep in Somersetshire is supposed to amount to about 500,000 head, partly long and partly short-wooled; and is estimated to produce, in all, about 10,500 packs a-year. Large quantities of excellent cyder are made in various parts, but particularly in the vale of Taunton. The woods and woodlands in different parts of the county are supposed, in all, to cover a space of from 20,000 to 25,000 acres; and it is distinguished by the stately growth of its hedgerow timber. Property very variously divided: some large estates, but a good deal of land occupied by yeomen who farm their own estates. Farms of various sizes, but the majority small. Leases, when granted, are usually for 8 or 12 years: in many instances, however, farmers hold at will. The situation of the peasantry in this and the contiguous counties of Wilts, Hants, and Dorset, is not what might be anticipated from the fertility of the soil and the general progress of improvement. Their wages are low; they use but little butchers' meat, potatoes constituting a large proportion of their food; they also suffer much from the scarcity of fuel; their cottages are badly furnished; and, on the whole, their condition is exceedingly depressed, which may, perhaps, account for the indolence noticed above. Average rent of land, in 1842–3, 32*s.* 7*d.* an acre, being, with the exception of Leicester and Middlesex (the latter of which, having the metropolis within it, should not be compared with any other district), the highest rent of any county in England. This is, perhaps, ascribable to the great extent and excellence of the pastures. Mineral products numerous and valuable, consisting principally of coal, lead, calamine, fuller's earth, limestone, freestone, &c. Owing, however, to the lead mines having been nearly exhausted, or becoming more difficult to work, the produce of lead is now quite inconsiderable. The woollen manufacture used to be extensively carried on at Taunton; but it has given place to the silk trade, introduced in 1778, and at present prosecuted on a pretty large scale. The manufacture is still, however, carried on at Frome, Shepton Mallet, Wellington, and some other places in the county, but it has long been in a declining state. Gloves largely manufactured at Yeovil. Principal rivers, Lower Avon (*ante*, p. 37), Ax, Brue, Parret, and Exe. The Parret is navigable from Langport to its mouth. Taunton and Bridgewater are united by a canal; and there are canals in other parts of the county. Somersetshire is divided into 40 hundreds and 7 liberties, and contains 475 parishes. It returns 13 members to Parliament, viz., 4 for the county; 2 each for the cities of Bath and Wells; 2 each for the boroughs of Bridgewater and Taunton; and 1 for Frome. Population of county

in 1841, 435,982. Sum expended for the relief of the poor in 1844-5, 164,732*l.* Annual value of real property in 1815, 2,308,723*l.*; ditto in 1842-3, 2,991,746*l.*

2. *Devonshire*, an extensive maritime county, having on the north and north-west the Bristol, and on the south and south-east the English, Channel; on the west it is bounded by Cornwall; and on the north-east and east by Somerset and Dorset. It contains 1,654,400 acres, of which about 1,200,000 are arable, meadow, and pasture. Surface and soil very various. Dartmoor, and the immediately contiguous country, extending from Okehampton on the north to Ugborough on the south, and from Ilsington on the east to near Tavistock on the west, exhibits an assemblage of mountains, rugged moors, and swampy morasses, being one of the least valuable tracts in the kingdom.—(See *antè*, p. 13.) But, with the exception of this, and some other hilly and moorish districts of inferior extent, the county consists generally of good land. It has several extensive and well-sheltered vales, denominated "the gardens of the west," of which that of Exeter is the most celebrated. The soil consists principally of a reddish loam, which, in some places, particularly in the south, is largely intermixed with sand. Climate mild; but, owing to the advanced position of the county in the ocean, it is unusually moist. It is to this circumstance, more than anything else, that the harvests in most parts of this county, as well as in Cornwall, are generally later by a fortnight at least than in the midland counties, 2½° or 3° more to the north. Agriculture not so advanced as in many other counties. It is mentioned by Vancouver (*Survey of Devonshire*, p. 44) that it was common in North Devon, in 1813, when his work was published, to authorise the tenants to take three or four white crops in succession; and that no native of the district would take a farm unless he were allowed this baleful licence! But the custom as to tillage has since been so far improved that tenants are now generally restrained from taking more than two white crops in succession, under any circumstances, and two wheat crops unless after fallow.—(*Kennedy and Grainger*, vol. i., p. 198.) The most usual rotation is, 1st, wheat from a ley; 2nd, barley or oats; 3rd, seeds; or, 1st, wheat; 2nd, turnips; 3rd, wheat. The latter, were it properly managed, would, no doubt, answer extremely well; but, though, of late years its importance has been admitted, no proper system of cultivation has hitherto been generally introduced, and the turnip culture is still very imperfectly understood. The wheat harvest in Devonshire, towards the beginning of the present century, must have been a species of saturnalia: in some parts the people engaged in it received no wages other than their victuals and drink; but these seem to have been a more than adequate compensation for their services. We understand, however, that these practices have now fallen into comparative disuse. —(*Vancouver's Survey of Devon*, p. 146.) Barley formerly constituted a large proportion of the bread-corn used in farm-houses and by the peasantry; but within the last 30 years the use of wheaten bread and potatoes, particularly the latter, has been so much extended as to have, in a great measure, superseded the use of barley. Exclusive of those used in the county, large quantities of potatoes are shipped at Dartmouth and other towns. Sea-weed and sea-sand are frequently

used as manure, and often with very good effect. Orchards, especially those on the western side of the county, very extensive, and much depended on. Their produce is estimated to amount, at an average, to about 3¾ hhds. of cyder per acre. Though of various sorts, Devonshire cyder may, speaking generally, be said to be harsh and acid; and to these qualities, and the freedom with which it is drunk, is ascribed a species of colic prevalent among the lower orders. Devonshire breed of cattle reckoned one of the best in the empire. They fatten easily, yield excellent beef, and are superior to all other breeds in field labour; being, though rather light, active, docile, and willing to exert themselves to the utmost. They are extensively employed in the labours of the field and on the road. As respects the dairy, they are, perhaps, inferior to some other breeds; but their milk, though deficient in quantity, yields more than the ordinary proportion of cream and butter. In the vale of Exeter, which is a dairy district, there are all sorts of cattle. Dairies, indeed, in most parts of the county, are an important source of profit. The farmers frequently let their cows to a dairyman by the year at so much a head; but the most industrious uniformly undertake the management of the dairy. This county is famous for its "clouted cream." The Exmoor and Dartmoor breeds of sheep are the most celebrated of the indigenous varieties belonging to the county; but most other British varieties are met with in it. The total stock of sheep has been estimated at about 630,000, of which nearly 200,000 produce heavy fleeces of long combing wool. The total annual produce of wool is estimated at about 15,500 packs. Horses a small compact breed, but they are said to be less attended to and worse treated in this than in any other English county; a consequence, perhaps, of the superiority of the Devonshire oxen, and their more general employment. Property much subdivided. Farms of all sizes, from 5*l.* to 500*l.* a-year; but the majority small. The small occupiers, like their brethren elsewhere, are said to work hard, and to fare very indifferently. Farm-houses and offices rather inferior, and in North Devon they are said to be situated so as "to defy the utmost efforts of ingenuity to dispose and place them where the purposes of their establishment could be worse, or more ineffectually answered."—(*Survey*, p. 86.) Average rent of land in 1842-3, 18*s.* 9¾*d.* an acre. Tin, copper, lead, iron ore, and manganese are met with; and the first two are wrought to a considerable extent. Granite, freestone, limestone, and slate, are particularly abundant. From 25,000 to 30,000 tons of clay, raised near Kingsteignton, Bovey, and other places in that part of the county, are annually shipped for the potteries in Bristol, Swansea, and Staffordshire, particularly the latter. The woollen manufacture, which was formerly prosecuted on an extensive scale at Exeter, Crediton, and other parts of the county, is now much decayed. The lace manufacture of Honiton is, unfortunately, also in this predicament. The principal rivers are the Exe, the Dart, and the Tamar, falling into the English Channel. The Tamar divides Devon from Cornwall. The Taw and the Torridge unite in a large æstuary communicating with Barnstaple Bay, on the north-west coast of the county. Several canals have been completed and others have been projected. Devon contains 33 hundreds and 465 parishes. It returns 22 members to parliament, viz., 4 for the county;

2 for the city of Exeter; 2 each for the boroughs of Plymouth, Devonport, Barnstaple, Hohiton, Tavistock, Tiverton, and Totnes; and 1 each for the boroughs of Ashburton and Dartmouth. Population of county in 1841, 533,460. Sum expended for the relief of the poor in 1844-5, 159,936*l.* Annual value of real property in 1815, 1,924,912*l.*; ditto in 1842-3, 2,589,377*l.*

3. *Cornwall*, a maritime county, and the most westerly in England, is everywhere bounded by the sea, except on its eastern side, which borders upon Devonshire, from which it is principally separated by the Tamar. It contains 851,200 acres, of which about 700,000 are arable, meadow, and pasture. The appearance of Cornwall is not inviting. Surface rugged, and in many places incumbered with immense masses of granite. Brown Willy, the highest hill, has an elevation of 1,368 feet above the level of the sea. There is a moorish sterile tract of great extent, stretching from Davidstow, on the north, to near St. Neot's, on the south; and from North-hill, on the east, to Blisland on the west. But there is, notwithstanding, a considerable extent of fertile land, particularly on the banks of the Alan, the Fowey, and the Fal. Generally speaking, the soil is light, and is largely intermixed with gravel. The country is bare of wood; but a good many plantations have been formed of late years, especially in the eastern parts adjoining Devonshire. The climate of Cornwall, particularly of the western parts, has been highly commended on account of the superior equality of its temperature; the land being so much embosomed in the Atlantic, that it is neither sultry in summer, nor particularly cold in winter. At Penzance and Mount's Bay, frost, if it occur, is but of a few hours' duration; and snow seldom falls, and still seldomer lies for any considerable period. The progress of vegetation is but little checked during the winter months, and the meadows retain their verdure throughout the year. On the other hand, however, owing to the moisture of the air, and coolness of the summers, the fruit is inferior in flavour to that raised in the more easterly and midland counties. The grape rarely ripens in the open air; and even the walnut and common hazel-nut seldom bear fruit. Cornwall is very subject to frequent rains, but they are not very heavy; and the quantity that falls is said to be rather under the mean of all England. According to Dr. Paris (to whose *Guide to Mount's Bay and the Land's End*, pp. 6—13, we are indebted for these particulars), the western parts of Cornwall are a peculiarly eligible residence for invalids. Considering the nature of the soil, its remote situation, and the great number of small farms, agriculture is more advanced in Cornwall than might have been anticipated. The extent of land under crop is probably about the same now as at the epoch of Morgan's survey in 1810; but the produce is vastly greater. It was then usual to take crop after crop of corn, till the land was completely exhausted, or capable only of bearing the *nuda avena*, or naked oat, (provincially pillar from the Cornish word *pilez*, bald,) used in the feeding of poultry and pigs. But since that period, and more especially since 1835, when bone-dust began to be extensively introduced, a very great change has taken place for the better. An incomparably greater breadth of land is now under green crop, the importance of which is fully recognized, and a proportional

addition has been made to the supply of manure, and to the productiveness of the corn crops. Agriculture, however, is still merely in a state of transition, and at present (1846) it is not unusual to prohibit tenants from taking more than two or three white crops in succession! The diminutive size of many of the farms is also an all but insuperable obstacle to their improvement. Farms of 150 or 300 acres may be, and, indeed, frequently are, badly cultivated; but it is a very rare case to witness anything approaching to good husbandry on very small farms.* Potatoes extensively cultivated. In the vicinity of Penzance the land produces 2 crops in a season; and an acre has been known to yield 300 bushels (Winchester measure) of early potatoes for the first crop, and 600 bushels, of a later species, for the second! Latterly, however, the potato crop has become rather precarious, and, in some instances, it has entirely failed. Lime is largely employed as a manure, no fewer than 1,480,000 bushels having been employed for that purpose in 1843, of which 1,280,000 were brought from Devonshire. Sea-sand and sea-weed, refuse pilchards, &c., are also used as manure. Cattle of various breeds. The indigenous variety is small, black, hardy, and coarse; but the prevailing breed is a cross between the native variety and the North Devons. But little cheese is made in Cornwall, and that little is said to be very inferior. The excellence of the Cornish butter, of which considerable quantities are made, is, however, universally admitted. The stock of sheep in Cornwall has been estimated at about 200,000, producing 5,900 packs of wool a year. Property much divided, and "vexatiously intermixed." Farms mostly small, and held under lease for 7, 14, or 21 years. The custom of the county as to the entry to farms is bad, and has an injurious influence over agriculture. Average rent of land in 1842-3, 18*s.* 2¼*d.* an acre, having increased about 8*s.* an acre since 1810! Cornwall is famous for its tin and copper mines, which rank among the most productive of their kind in the world. The tin mines are believed to have been wrought from the æra of the Phœnicians; but the copper mines, though discovered at a comparatively recent epoch, are now become of far greater value and importance.—(See section on *Minerals.*) There are also mines of lead, slate, soapstone; and small quantities of gold and silver have been met with. About 5,000 tons of soapstone, and 7,000 tons of China clay, are annually shipped from Charlestown and Pentewan, principally for the potteries. The pilchard fishery is carried on along the coast, particularly at St. Ives, Mount's Bay, and Mevagissey; and is a source of considerable wealth to the county.—(See *Fisheries.*) Principal rivers, Tamar, Lynher, Fowey, Camel, and Fal. Cornwall contains 9 hundreds and 203 parishes. It used to return 42 members to parliament, but now it returns only 14; viz., 4 for the county; 2 each for the boroughs of Bodmin, Falmouth, and Truro; and 1 each for the boroughs of Helston, St. Ives, Launceston, and Liskeard. Population of the county in 1841, 341,279. Sum expended for the relief of the poor in 1844-5, 77,945*l.* Annual value of real property in 1815, 922,259*l.*; ditto in 1842-3, 1,353,261*l.*

* See the valuable accounts of Cornish farming in the *Agricultural Journal*, vi., 402, &c.

Wales.

This ancient principality has a large extent of sea-coast, being bounded on the north by the Irish Sea; on the west, by St. George's Channel; on the south by the Bristol Channel; and on the east by the counties of Monmouth, Hereford, Salop, and Cheshire. It is usually divided into North and South Wales; the former containing the counties of Anglesea,* Caernarvon, Denbigh, Flint, Merioneth, and Montgomery; and the latter those of Brecon, Caermarthen, Cardigan, Glamorgan, Pembroke, and Radnor. In all, Wales is supposed to contain 4,752,000 acres, of which 3,117,000 are said to be arable, meadow, and pasture. Surface mountainous and hilly. Snowdon, in Caernarvonshire, the highest mountain in Wales, is elevated 3,571 feet above the level of the sea. Cader Idris and Cader Ferwyn, both in Merionethshire, have an elevation, the former of 2,914, the latter of 2,563 feet; the Beacons, in Brecknockshire, rise to the height of 2,862; Plynlimmon, in Cardiganshire, to 2,463 feet; and there are many other mountains dispersed through the principality of an altitude varying from 1,500 to 2,300 feet. The climate is moister than that of England, in the proportion of 34, the average number of inches of rain which falls in Wales, to 22, the average fall in England. The temperature is materially affected by the elevation of the land: in the vales it is unusually mild; on the more elevated grounds and mountainous ridges it is cold and piercing; but even in the northern counties the frosts are seldom of long continuance. The vale of Glamorgan, and the southern parts of Pembrokeshire, are particularly celebrated for the mildness of their climate. Snow never lies long on the ground; and myrtles, arbutus, and other tender shrubs, bear the open air as well as on the opposite coasts of Devon and Cornwall. Owing, however, to its humidity, the climate of Wales is more suitable to pasturage than to the raising of corn. The soil is, for the most part, of an inferior description; but there are some vales of extraordinary fertility. Of these the principal are the vale of Clwyd, in the north; and the vale, or rather *level*, of Glamorgan in the south. The latter is very extensive: it consists principally of clay soil; and, when well cultivated, produces the finest crops of wheat. The agriculture of Wales is altogether bad. Improvements have made less progress in it than in almost any other part of the empire. Speaking of Caermarthenshire, Messrs. Kennedy and Grainger observe,—"The soil is very fertile: it in general consists of a sandy loam; nor is there finer land anywhere in Great Britain than is to be found in some parts of this county, either for the growth of turnips or for the feeding of sheep. These advantages, however, are not here of much avail; as whatever requires a little trouble, or is over and above the natural productions of the land, is thought quite unnecessary, and is totally neglected. There never existed, indeed, a country more erroneously conducted, as to its agriculture, than Caermarthenshire; *nor does Wales in general*

* This island is celebrated as the Mona of Tacitus. It was the principal seat of the religion of the Druids, its groves being *sævis superstitionibus sacri.*—*Annal.* lib. xiv. § 30.) Anglesea is now joined to the mainland by the Menai Bridge.—(See *ante*, p. 52.) It contains 173,440 acres.

produce half what it is capable of doing under proper management."—(P. 169.) The statements of the same gentlemen in reference to Denbigh, Glamorgan, and other counties, are precisely similar. A rotation of crops, on sound principles, is but seldom introduced. In Caermarthenshire "the first crop is wheat, after which there are regularly two crops of barley taken, and then oats are sown as long as they will grow. When the land is entirely exhausted, some farmers will be at the expense of a few grass-seeds to lay it down; but others let it return again naturally to pasture, and it then has rest for 6 or 7 years longer before it goes through the same round, only having a few beasts running upon it."—*Kennedy and Grainger*, p. 172.) In Anglesea it was customary, about 25 years ago, to take five white crops in succession, most of which were so poor as hardly to pay their expenses; but an improved system is in course of being gradually introduced. Oats are far more extensively cultivated than any other species of grain: in the mountainous districts black oats are most frequently raised. Turnips and potatoes have been introduced; and the culture of both is extending, but particularly that of the latter. The Welsh plough, which is still in common use, is a wretched implement: it does not cut, but tears the ground by main force. The land is frequently, indeed, not more than half ploughed. In some places the team consists of a pony and a half-starved riding horse, or a pony and a pair of small oxen, with a girl to drive them. There is everywhere a great want of drainage. The horses, cattle, and sheep differ according to the nature of the pastures. In the vales they are of a larger size than on the hills and mountains, and are more intermixed with other breeds. The small native Welsh ponies (*Merlins*) are now seldom met with, except in Merioneth and Montgomery, in the former of which they are still raised in considerable numbers. They are sure footed, and exceedingly hardy. The vales of Montgomery have been long noted for a superior breed of horses. The rearing of black cattle is a principal part of Welsh husbandry, the farmers depending mainly on them for the means of paying their rent and other outgoings. Cattle differ in different parts of the country, according to the abundance of food, the care with which they are attended to, &c. They mostly belong to the *middle-horned* variety, and are rather stunted in their size. Pembroke and Glamorganshire have probably the best cattle. A cross between an Ayrshire bull and a Glamorgan cow has recently begun to be held in high estimation; being accounted better milkers, hardier, and more easily kept than the native cattle. Numbers of small black cattle are raised in Anglesea; 5,861 having been annually sent across the Menai bridge, at an average of the 3 years ending with 1833; but of these about 500 were Irish cattle landed at Holyhead.* The total stock of sheep is estimated at about 1,250,000, and the annual produce of wool at above 10,000 packs. The mutton of the mountain sheep is highly esteemed. Estates of all sizes, from 20*l.* a-year up to 30,000*l.* The custom of gavelkind formerly prevailed in Wales, the consequence of which was a too

* Mr. Youatt says (*Cattle, their breeds, &c.*, p. 59), that at least 10,000 Anglesea cattle are now annually sent across the Menai bridge; but the official statement, given above, shows that this is about double the actual number. The imports of sheep from Anglesea are increasing. They amounted, in 1833, to 8,358.

minute division of property. "Equality and poverty went hand in hand. But when the custom was abolished, and alienation permitted, an accumulation of lands was the necessary consequence, which became very prevalent in the last two centuries; and, having arrived at its maximum early in the 18th century, it has, since that period, shown some instances of retrogradation."—(*Davies's North Wales*, p. 76.)—Farms of various sizes: some large; but the great majority small. The average size of those in South Wales is estimated at from 50 to 60 acres. Leases not uncommon, but ill-contrived: for the most part they contain no regulations as to management, so that the farm is completely exhausted previously to the close of the lease. The great majority of the old farm-houses and offices wretched in the extreme, and very ill-placed. But farm-buildings, of a new and improved construction and appearance, are now to be met with in most parts of the country, and are gradually becoming more numerous. Cottages in North Wales used to be almost as bad as those of Ireland; but they also, are improving. Those of South Wales are preferable. In Glamorganshire the more newly built cottages are constructed of stone and mortar, and whitewashed inside and outside. In Pembroke, the walls of the cottages, and even farm-buildings, frequently consist of mud or clay. Average rent of land in 1842-3, 9*s.* 11¼*d.* an acre. Wales is particularly rich in minerals. The famous copper mine of Parys, in Anglesea, discovered in 1768, was, for many years, singularly productive; but it is now much fallen off. The lead mines of Cardigan, once so famous, have been wholly abandoned; and those of Flintshire have declined. The latter, however, are still very productive. In 1828, the lead mines of Wales are estimated to have produced, in all, 12,000 tons of pig lead; "of which Flint and Denbigh, but particularly the former, furnished by far the largest portion."—(*Ency. Metrop.* Part xxxix., p. 195.) In 1839, the produce of lead in Wales amounted to 13,396 tons. Both divisions of the principality have coal; but the coal-field of South Wales is the largest in the empire, and may, for all practical purposes, be looked upon as inexhaustible. Being, also, well supplied with ironstone, as soon as experience had disclosed the superiority of Lord Dudley's plan for preparing iron by means of pit-coal, the attention of capitalists and speculators began to be particularly directed to the capabilities of South Wales for the production of iron. Works were, in consequence, commenced at Merthyr Tydvil, and other places, not long after the middle of last century; and such has been their extraordinary success, that the quantity of iron made in South Wales in 1840 was estimated at 505,000 tons, while that made in Staffordshire and the rest of England did not exceed 650,000 tons.* There were, during the same year, 26,500 tons of iron produced in North Wales. The Welsh slate quarries, particularly those in the vicinity of Bangor, are very extensive, and furnish slates of all sizes, and of the most excellent quality. Limestone is particularly abundant. Almost all the copper raised in Cornwall is carried to Swansea, and other places in South Wales, to be smelted; and, in all that respects

* The ironstone of Wales is poorer than the ores of Stafford, and other parts of England; but the contiguity of the stone to coal, and the comparative facility with which both are raised, more than compensates for the poverty of the metal.

the smelting and refining of ores, the Welsh are equal, if not superior, to the inhabitants of any other district. Woollens, particularly flannel, for which Wales has long been celebrated, are made in various parts, but more largely in Montgomeryshire than anywhere else. Gloves are extensively manufactured at Denbigh; and stockings in different parts of the country. The cotton manufacture has been successfully introduced into Flint and Denbigh. The towns of Mold and Holywell are particularly distinguished by their activity in manufacturing industry. The Welsh language is still in common use in most parts of the principality; and a very considerable proportion of the population have either no knowledge of English, or one that is but very imperfect. Education in the principality is less advanced, perhaps, than in any other portion of the United Kingdom, and civilization is proportionally backward. The contrast between the appearance of the country and of the inhabitants in the English counties adjoining Wales, and in the latter, though less now than formerly, is still very striking. Gough, in his edition of Camden, published in 1806, says, "There is nowhere, perhaps, south of the Tweed, a greater air of misery and savageness than among the inhabitants of the Glamorganshire mountains, always employed in coal, iron, and copper-works, almost naked, excessively nasty, their long straight hair hanging about their tawny faces. The women outdo the men in hard labour, their feet and legs bare, almost above their knees. Their huts, like their hedges of stones, confusedly piled up and wedged together without cement or earth. Mr. Wyndham observes, that though Caerphylly is but two miles from Monmouthshire, and separated only from it by a simple brook, the buildings, manners, and dress of the inhabitants, are as strictly Welsh as those of Merionethshire, and the English language is as little understood here as among the mountains of Caernarvonshire," (iii., 125.) A very considerable change for the better, has, no doubt, been effected since this paragraph was written; but there is yet much room for amendment. Chartist doctrines, a few years ago, made such progress in South Wales, as to give rise to dangerous commotions, which were not suppressed without bloodshed; and at a later period there was a general demolition of the turnpike-gates in many parts of the principality. The latter, however, had been vexatiously multiplied; and they have since been placed on a better footing. The great rivers Severn, Dee, and Wye, have their sources in the principality; and besides these there are the Clwyd, Conway, Wnion, Dyfi, Teify, Towy, Tawe, Neath, Taffe, &c. Some of these rivers are navigable to a considerable distance; and internal communication in South Wales is now much facilitated by means of canals and railroads. The common roads of the principality, which at no distant period were excessively bad, have, within these few years, been very much improved. Many new and comparatively level lines have been cut, and most of the old lines have been materially meliorated. The great road from Shrewsbury to Holyhead, by the Menai Straits, is, perhaps, the best in the empire. Notwithstanding its great extent of sea coast, and the advantage it enjoys in the possession of Milford Haven, Wales has but little commerce and shipping. Wales contains 869 parishes. The principality returns 29 members to par-

liament: viz., 2 each for the counties of Caermarthen, Denbigh, and Glamorgan; 1 each for the counties of Anglesea, Brecon, Cardigan, Caernarvon, Flint, Merioneth, Montgomery, Pembroke, and Radnor; 1 each for the boroughs of Brecon and Merthyr Tydvil; and 1 each for the several districts of boroughs, of which Beaumaris, Caermarthen, Cardigan, Caernarvon, Denbigh, Flint, Cardiff, Swansea, Montgomery, Pembroke, Haverfordwest, and Radnor, are the principal or returning boroughs. Population of principality in 1841, 911,603. Sum expended for the relief of the poor in 1844-5, 277,966*l.* Annual value of real property in 1815, 2,323,970*l.*; ditto in 1842-3, 3,465,719*l.*

Islands.

Exclusive of the Isle of Wight and Anglesea, already noticed (*ante*, pp. 208, 216), there are a few islands dependent on England, of which the following are the principal:—

Channel Islands.—These, which form the only remains of the Norman provinces once subject to the British crown, lie in the English Channel, a little to the west of the peninsulated department of *La Manche* in France. They consist of Jersey, Guernsey, Alderney, and Sark, with some dependant islets. Alderney, the most northerly, and the nearest to England, is about 55 miles south from the Isle of Portland. Jersey, the largest and most valuable, is supposed to contain about 40,000 acres, and Guernsey about 32,000. The population in 1841, was—Jersey, 47,544; Guernsey, 26,649; Alderney, 1,030; Sark, 785; other islands, 57: in all, 76,065.

Jersey is fertile, well wooded, and has a rich and beautiful appearance. Guernsey is less fruitful, and has much less wood; but it also possesses a considerable extent of productive soil. Climate peculiarly mild and agreeable. Agriculture, even in Jersey, the most improved and flourishing of the islands, is still far behind. This seems to be principally ascribable to the minute division of the land; property having been so much frittered down by the law of equal division, that the average size of estates does not exceed 15 acres, while one small field has sometimes half-a-dozen owners. Wheat and barley, especially the former, are the principal corn crops raised in the island. According to the official returns, the produce per acre of wheat is very large, being nearly 5 quarters. We have little doubt, however, that this is very decidedly beyond the mark; and we are confirmed in this belief by observing that the returns make the produce per acre of wheat and barley exactly the same.—(*Parl. Paper*, No. 74, Sess. 1835.) Lucerne, potatoes, and parsnips are extensively cultivated, particularly the latter. Cyder is one of the principal products of Jersey; and it is said that, at an average, about 150,000 gallons a year are exported. Sea-weed is the chief article of manure used in all these islands; the cutting and gathering of it being subjected to peculiar regulations.

The agriculture of Guernsey is, in most respects, similar to that of Jersey. Cyder is, however, less an object of attention. The produce of wheat in Jersey is at present estimated at about 14,000 quarters a year, and that of barley at about 3,600 quarters; being, together, about adequate to supply *half* the demand of the population. In

Guernsey, the annual average growth of wheat is estimated at 4,000 quarters, and of barley at 4,000 quarters; making only about a *fourth part* of the quantity required for its supply. The deficiency is made up by importations from France, the north of Europe, &c.; and it has been suspected that some portion of the foreign corn imported into the islands finds its way into the English market free of duties.—(*Parl. Papers*, Nos. 74 and 289, Sess. 1835.) Land in Jersey and Guernsey brings a very high rent.

The Channel Islands are celebrated for a peculiar breed of cattle, known in this country by the name of Alderney or Norman cattle. They are small, and far from handsome; but seem to be well suited to their native soil. They do not give much milk; but what they do give is rich and excellent, producing an extra quantity of very superior butter: hence their general introduction into gentlemen's parks and pleasure grounds. Otherwise the breed is but little esteemed in this country. In the islands, however, it is held in the highest estimation; so much so that, in both Jersey and Guernsey, the importation of any other description of cattle is prohibited under the severest penalties!—(*Inglis's Channel Islands*, 2nd edit. p. 129.) Cattle and their products form a principal article of export from Jersey. But few sheep are kept. The oyster fisheries of Jersey are of considerable importance and value; 208,023 bushels a year having been shipped for England, at an average of the 4 years ending with 1832. The peculiar red-legged Guernsey partridge is now extensively introduced into England.—(See *antè*, p. 121.) The islands possess some valuable quarries. Worsted stockings, of a very fine quality, have been accounted the staple manufacture of Jersey; and she annually exports large quantities of boots and shoes made of leather brought from France.

Owing to the various privileges which they enjoy, particularly their almost total exemption from taxation, their being allowed to export all articles of the growth, produce, or manufacture of the islands to England and the English colonies, on the same footing as other British subjects, and their favourable situation for carrying on a contraband trade, the commerce of Jersey and Guernsey is extensive and important. Their mercantile marine has rapidly increased. In 1845 Jersey had 311 registered vessels, of the burden of 27,651 tons, exclusive of a considerable number of large boats, mostly engaged in the oyster fishery. Guernsey had, at the same time, 120 vessels, of the burden of 12,898 tons. All sorts of timber and cordage being admitted duty free into the islands, we need not wonder that great numbers of vessels are now annually built in them; but we may well wonder that they should be permitted to enjoy a valuable privilege of this sort, denied to the ship-owners and ship-builders of the rest of the empire.

The government of the islands is in the hands of states, some members of which are named by the king, while others are chosen by the people, and others sit *ex officio*. Party spirit runs very high in Jersey. The natives speak corrupt French; and are industrious and penurious. Causes are determined by their own officers; but an appeal may be made to the king in council. These islands are a very costly appanage of the British crown. They have been fortified at an immense expense; and their defence in time of war is supposed to cost fully 500,000*l.* a

year, which has to be wholly defrayed by England; the total revenue collected in the islands not amounting to 20,000*l.* a year. Even in peace they occasion a heavy charge. The advantages derived from their possession seem neither very obvious nor very material. Principal towns, St. Helier's in Jersey, and St. Peter-le-Port in Guernsey. The former had, including the parish, in 1841, a population of 21,040; and the latter, of 15,220.—(See *Quayle's Survey of Jersey and Guernsey;* and *Inglis's* excellent work *on the Channel Islands.*)

The *Scilly Islands* lie about 30 miles west by south from the Land's End. The total number of islands and rocks is very great; but there are only about half-a-dozen of any importance. St. Mary's, the largest, is said to contain 1,640 acres: their entire area, as given in the population returns, is only 5,570 acres. In 1841 they had a population of 2,582. Small quantities of wheat, barley, and oats are raised; but the inhabitants, who are often involved in great distress, principally support themselves by fishing. They also act as pilots to such ships as may require their services. These islands are supposed by some to be the *Cassiterides*, or tin islands, of the ancients. But it is most probable that the ancients gave this name to the western parts of Cornwall, where tin mines have been wrought from the remotest antiquity. A lighthouse was erected on St. Agnes island in 1680, the lantern of which is elevated 138 feet above high water mark. It is, according to the ordnance survey, in lat. 49° 53′ 38″ N., long. 6° 19′ 23″ W.

The Isle of Man is not, strictly speaking, an English island, but it may be as well described here as anywhere else. It is situated in the Irish Sea, about 20 miles from the Burrow Head in Scotland; its distance from the nearest points of England and Ireland not being much more considerable. It is about 30 miles in length, and from 10 to 12 in breadth; containing about 180,000 acres.* It had, in 1841, a population of 47,975.

Man is divided into two nearly equal parts by a chain of mountains that runs through it in a longitudinal direction. Sneafell, the highest summit in the island, is elevated 2,004 feet above the level of the sea. Soil various; for the most part sandy and loamy; but stiff clays are met with. It is nowhere very productive. Climate milder than in the adjacent parts of Great Britain and Ireland, particularly in winter. Frost and snow rare; and, when they occur, of but short continuance. In consequence, however, of the greater humidity of the climate, the summers are deficient in heat, and harvest is, in general, rather late. The mountains, commons, and other waste lands are supposed to include about 54,000 acres; leaving above 100,000 acres for the purposes of cultivation. Agriculture a good deal improved, but still very backward. The extent of land under white crops, and the average produce of each, is estimated to be —

Wheat, 8,000 acres at	2½	quarters per acre,	20,000	quarters.
Barley, 5,000 —	4	ditto,	20,000	do.
Oats, 13,000 —	3½	ditto,	45,500	do.

* This is the statement of Mr. Quayle, in his *Survey* of the island. In the *Parl. Paper*, No. 74, Sess. 1835, the island is said to contain only 134,000 acres. Perhaps, the former is an exaggerated statement; but we have little doubt that the latter is below the mark.

This is supposed to leave a surplus of about 5,000 quarters of wheat and 3,000 of barley over the consumption.—(*Parl. Paper*, No. 74, Sess. 1835.)

Potatoes extensively cultivated: turnips, also, are raised, and flax for home use. Marl, lime, and sea-weed are used as manures. Man had a native breed of small hardy cattle, but they are now rarely met with; the existing stock being a mixture of various breeds, Irish and British. Ayrshire cows have recently been introduced, it is said, with much advantage. The native sheep of the island are small and hardy, but slow feeders, and long in coming to maturity. They are mostly white, but many are grey, some black, and a few of a peculiar dark buff colour. This breed is still found in the hills; but the lowlands are now mostly stocked with improved breeds. Since the introduction of two-horse ploughs, the native breed of small hardy horses has been, to a considerable extent, supplanted by others of larger size and strength. Property seems formerly to have been divided into very minute and nearly equal portions; and such are its characteristics at present. By far the largest portion of the island is possessed by yeomen farming their own little estates, consisting of from 10 to 200 acres; and possessing mostly a portion of lowland with hill pasture. There are but few properties in the island worth above 1,500*l.* a year.

Man used to be one of the principal seats of the herring fishery; but latterly it was for several years comparatively deserted by the herring shoals, and the fishery had, in consequence, become quite inconsiderable. This, however, was hardly to be regretted. The fishery was carried on from July to October; being the period of the year when the services of the yeomen and others, engaged in it, were most necessary at home. Being, also, a species of lottery, in which large sums were occasionally made by a few weeks' exertion, it attracted crowds of adventurers without either capital or skill; while the irregular life they led at the fishery tended to foster habits of intemperance, and was believed to be the main cause of that idleness for which the people have been long proverbial.—(*Quayle's Survey*, p. 147.) There was, in fact, a material improvement in the habits of the people, and in their industry, during the decline of the fishery; and its recent revival is believed to have been injurious to the island rather than otherwise.

The feudal sovereignty of Man was formerly vested in the Earls of Derby, and more recently in the Dukes of Atholl. There has always been a considerable difference between the duties on commodities in it and in Britain. This discrepancy led, towards the middle of last century, to a great deal of smuggling from the Isle of Man to the contiguous coasts of England, Scotland, and Ireland. To put an end to this, parliament purchased, in 1765, the feudal rights of the Duke of Atholl; and, since then, the contraband trade has been confined within comparatively narrow limits. But the duties on almost all foreign articles consumed in the island, being still decidedly lower than those on the same articles when entered for consumption in Britain, it becomes necessary, for the prevention of smuggling, to limit

the quantity of such articles that may be imported into the island, and to keep up a considerable extra number of custom-house officers and revenue cruisers; and, after all, the evil still exists, though not to a great extent. It were better for all parties that this discrepancy in the duties, and the vexatious regulations that grow out of it, should be put an end to. Man lies in the line of the steam packets plying between Liverpool and Glasgow, and Liverpool and Dublin, most of which, indeed, touch at Douglas; and it is not easy to imagine that anything can exceed the anomalous absurdity of having a considerable territory, situated in the very centre of the empire, and much resorted to, with peculiar duties and revenue laws.

The government, political institutions, and laws of Man are in many respects peculiar. The legislative and judicial authority is principally vested in the House of Keys, formerly a delegated, but, for many years past, a self-elected body, consisting of 24 individuals. Two deemsters, officers of great antiquity, are judges in common and criminal cases. The governor is named by the king; and has a council, consisting of 4 or 6 individuals, who hold their seats *ex officio*. The keys, deemsters, governor, and council, constitute the parliament, or, as it is called, the *Tynwald Court* of the island. Its privileges, though much impaired, are still considerable. A grand court is annually held at Midsummer at the Tynwald Mount, near Peel; and no law is binding till it has been publicly read and proclaimed at this assembly.

The Manx language is still in common use. It is derived from the ancient Celtic, but has a greater affinity to the Erse and Irish than to the Welsh or Armoric. All the inhabitants can, however, speak English; and it is probable that, in no very long time, the Manx language will be entirely laid aside.

Lead mines are wrought to a considerable extent near Peel, on the west side of the island, having produced, in 1839, 1,829 tons. Slates are quarried in the same vicinity. Limestone is abundant, and lime is prepared in considerable quantities. Manufactures inconsiderable. In 1845 there belonged to the island 332 registered vessels, of the burden of 8,452 tons, but of these by far the greater number were boats of less than 50 tons, engaged in the herring fishery. At present timber may be imported into Man for ship-building, or any other purpose, on paying an *ad valorem* duty of 10 per cent. Should it be permitted to enjoy this valuable privilege, and the timber duties be continued on their present footing in Great Britain, the fair presumption seems to be that it will engross a large share of the ship-building business. Douglas, by far the largest town in the island, had in 1841 a population of 8,647. It is pretty well built, and is much resorted to in summer by visitors from Liverpool and other places. None of the other towns had, in 1841, a population of 3,000.

Exclusive of the official paper and *Quayle's Survey*, already referred to, we have consulted the excellent article on Man in *Rees's Cyclopædia*, &c. *Feltham's Tour in Man in* 1797 *and* 1798 (8vo. Bath, 1799) contains, however, by far the best account of the island that we have met with.

Exclusive of the above, a few small islands lie off other parts of the English coast, such as the Fearn Islands off Northumberland; the Flat and Steep Holms in the Bristol Channel; Ramsey, Bardsey, &c., off Wales; but they are too inconsiderable to merit notice.

CHAPTER II.—SCOTLAND.

SECT. 1.—*Name.—Extent.—Face of the Country.*

Name.—The origin of the term Scotland is involved in much obscurity. That part of Great Britain between the Friths of Forth and Clyde was made known to the Romans by the victories of Agricola, and was discriminated by them from the rest of the island by the special appellation of Caledonia. The inhabitants of this district, the Caledonians of Tacitus, were afterwards known by the name of Picts;* and from them the country was for some centuries called Pictland. The term Scotland began to come into use, for the first time, in the eleventh century. This new name had been previously applied to Ireland, and is said to have been given to the country of the Picts by the Irish clergy, by whom the rude and ignorant natives were instructed in the Christian religion. A colony of Scots (the Dalriads of the venerable Bede, and the Attacotti of Ammianus Marcellinus,) had previously left Ireland, and planted themselves in Argyleshire and the West Highlands; and they are supposed by some to have conquered the Picts, and thence to have given their name to the country. But this does not appear to have been the case, as the Saxon and Irish authors continued to use the terms Picts and Pictland long after the conquest by the Scotch or Attacotti is supposed to have taken place.—(See *Pinkerton's Geography*, vol. i., p. 145, and his *Inquiry into the Early History of Scotland*, passim.)

Extent.—The longest line that can be drawn in Scotland is from its most southerly point, the Mull of Galloway, in lat. 54° 38′ N., long. 4° 52′ W., to Dunnet Head, its most northerly point, in lat. 58° 40′ 30″ N., long. 3° 22′ W., being about 280 miles; but the longest line that can be drawn in about the same parallel of longitude is from the Mull of Galloway to Cape Wrath, in lat. 58° 37′ N., long. 5° W., being about 274 miles. The breadth is extremely various. The country is so much penetrated by friths or arms of the sea as to be in no place more than 40 miles from shore. Between Buchanness Point, on the Aberdeenshire coast, and Rowanmoan Point, on the west coast of Rossshire, the distance is about 146 miles; from Montrose Point to the point of Ardnamurchan in Argyleshire, in lat. 56° 45′ N., long. 6° 8′ 30″ W., being the most westerly land in Great Britain, the distance is about 139 miles; and it is nearly as much between St. Abb's Head and the point of Knap in Argyleshire. But between Alloa, on the Frith of Forth, and Dunbarton, on the Clyde, the breadth is only

* The identity of the Caledonians and Picts has been denied by some writers; but appears to be sufficiently established by Pinkerton, in his *Inquiry into the Early History of Scotland*, vol. i., pp. 103—120.

32 miles; and between the bottom of Loch Broom and that of the Frith of Dornoch it is not more than 24 miles.*

Owing to the extreme irregularity of its figure and the want of complete surveys, great differences of opinion have been entertained as to the area of Scotland. Mr. Templeman, of Bury, computed it, inclusive of the islands, at 27,794 square miles, or 17,788,160 acres. But, though this estimate has been adopted by Pinkerton and others, there can be no doubt that it is considerably under the mark. The elements of the following table, (see p. 227,) deduced from Arrowsmith's map, are given in the *General Report of Scotland.* In so far as respects the mainland it cannot differ materially from the truth; but the estimates of the area of the islands are not generally entitled to much weight, and can be regarded only as a rough approximation.

Face of the Country.—As compared with England, the surface of Scotland is, speaking generally, sterile, rugged, and mountainous. To such a degree is this the case, that, estimating the whole extent of the country, exclusive of lakes, at 19,000,000 acres, it is doubtful whether so many as 6,500,000 be arable; whereas, taking the extent of England and Wales at 37,000,000 acres, the arable land certainly exceeds 29,000,000; so that while in Scotland the proportion of the cultivable to the entire land is about a third, in England it exceeds three-fourths. With the exception, indeed, of a few tracts of rich alluvial land (carses), Scotland has no extensive vales; the surface of the rest of the country being, even where most level, considerably varied with hill and dale. It should, however, be observed, that the general inequality of the surface makes the lower parts of the country appear to a stranger less fruitful than they really are, the hollows between the small eminences being often very fertile, and the eminences themselves, even where not susceptible of being ploughed, frequently furnish excellent pasture. This is particularly the case in the south-western counties, much of the best land in which, if surveyed from a distance, would appear, to one not acquainted with its capabilities, worth little or nothing.

Even the finest parts of the low country of Scotland usually want the rich luxuriance of an English landscape. Within the last 60 or 70 years a great deal has, no doubt, been done in the way of raising plantations; and the strictures of Dr. Johnson, as to the deficiency of wood, would at present be quite inapplicable, however just they may have been when dictated. But in Scotland plantations are not spread generally over the country, but are mostly congregated in the neighbourhood of gentlemen's seats, while in many large tracts they are wholly wanting. In most parts, too, we look in vain for those hedgerow trees that give so much of a woody appearance to the southern part of the island. Generally, also, the inclosures are a good deal larger than in England, and the fences being either stone walls (dykes) or hedges, that occupy only a small space of ground, having but little of the breadth and roughness of those of England, the country, however well farmed, seems to an Englishman deficient in vegetation and verdure, and cold and comfortless. On the other hand, however, the succession of new objects presented by the unevenness of the surface,

* In the *General Report of Scotland*, this distance is erroneously said to be 36 miles.

Table showing the Total Extent of the several Counties of Scotland in Square Miles and English Statute Acres; specifying the Extent of the Land and of the Fresh Water Lakes in each County; and showing the Fractional Part of the entire Area of Scotland, supposing it to be 1,000, *contained in each County.*

Counties.	Extent in Square Miles.			Extent in English Statute Acres.			Corresponding Proportions of each County to 1000, assumed the Total Area of Scotland.
	Land.	Lakes.	Total.	Land.	Lakes.	Total.	
Aberdeen . .	1,960	10	1,970	1,254,400	6,400	1,260,800	65·149
Argyle, besides Islands .	2,200	60	2,260	1,408,000	38,400	1,446,400	74·740
Ayr . . .	1,039	6	1,045	664,960	3,840	668,800	34·559
Banff . . .	645	2	647	412,800	1,280	414,080	21,396
Berwick . .	442	..	442	282,880	..	282,880	14,617
Caithness . .	687	10	697	439,680	6,400	446,080	23·050
Clackmannan .	48	..	48	30,720	..	30,720	1·587
Cromarty . .	256	10	266	163,840	6,400	170,240	8·796
Dunbarton .	228	31	259	145,920	19,840	165,760	8·565
Dumfries . .	1,253	10	1,263	801,920	6,400	808,320	41·768
Edinburgh .	354	..	354	226,560	..	226,560	11·707
Elgin . . .	473	7	380	302,720	4,480	307,200	15·874
Fife . . .	467	3	470	298,880	1,920	300,800	15·543
Forfar (Angus)	888	4	892	568,320	2,560	570,880	29·499
Haddington .	272	..	272	174,080	..	174,080	8·995
Inverness, besides Islands	2,904	132	3,036	1,858,560	84,480	1,943,050	100·403
Kincardine .	380	2	382	243,200	1,280	244,480	12·633
Kinross . .	72	7	79	46,080	4,480	50,560	2·612
Kirkcudbright	821½	12½	834	525,760	8,000	533,760	27·581
Lanark . .	942	3	945	604,880	1,920	604,800	31,252
Linlithgow .	120	..	120	76,800	..	76,800	3·968
Nairn . . .	195	3	198	124,800	1,920	126,720	6·548
Peebles . .	319	..	319	204,160	..	204,160	10·549
Perth . . .	2,588	50	2,638	1,656,320	32,000	1,688,320	87·241
Renfrew . .	225	2	227	144,000	1,280	145,280	7·507
Ross, besides Islands . .	2,069	60	2,129	1,324,160	38,400	1,362,560	70·408
Roxburgh . .	715	½	715½	457,600	320	457,920	23·662
Selkirk . .	263	1½	264½	168,320	960	169,280	8·747
Stirling . .	489	13	502	312,960	8,320	321,280	16·601
Sutherland .	1,754	47	1,801	1,122,560	30,080	1,152,640	59·560
Wigtown . .	451½	7½	459	288,960	4,800	293,760	15·179
Sums of these	25,520	494	26,014	16,332,800	316,160	16,648,960	860·308
Islands.							
Hebrides, viz.:							
Bute, &c. .	161	4	165	103,040	2,560	105,600	5·456
Isles of Argyle . .	929	21	950	59,4560	13,440	608,000	31,417
Isles of Inverness .	1,150	59	1,209	736,000	37,760	773,760	39·982
Isles of Ross & Cromarty	560	20	580	358,400	12,800	371,200	19·181
Orkney Isles .	425	15	440	272,000	9,600	281,600	14·551
Shetland Isles.	855	25	880	547,200	16,000	563,200	29·102
Totals .	29,600	638	30,238	18,944,000	408,320	19,352,320	1000·000

the rude grandeur of the mountains that everywhere bound the prospect, and the striking contrast frequently afforded between rich, well cultivated, low grounds, and the contiguous high barren ridges, take from the Scottish landscape the tameness and monotony that prevail in many parts of England, and render it singularly picturesque and impressive.

Popularly, Scotland is divided into the Highlands and the Lowlands; the former comprising the most extensive, rugged, mountainous tracts, and the latter the greater part of what may be considered as a comparatively flat country. The Highlands commence with the Mull of Cantire, and comprise the whole country to the north of the Frith of Clyde, as far as Dunbarton. From the latter their boundary may be traced by a waving line passing through Crieff, Dunkeld, and Brechin, to Stonehaven or Aberdeen; so that they include the counties of Argyle, Inverness, Aberdeen, Banff, Elgin, Nairn, Ross, Cromarty, Sutherland, and Caithness, with parts of Dunbarton, Stirling, Perth, Forfar, and Kincardine. The level ground skirting the Moray Frith is sometimes excepted from the Highlands; but it is of comparatively limited extent; and, in popular language, the whole country north of the line already mentioned is usually understood by the term Highlands.

The Highlands are divided into two unequal portions by the long, low, narrow glen, called Glenmore, *i. e.* the *Great Glen*, stretching north-east and south-west across the island, from Inverness to Fort William. In its highest part, this remarkable glen is only 94 feet above the level of the sea. It consists principally of a chain of deep narrow lochs, or lakes, and these, being joined together and made navigable from sea to sea, form the Caledonian Canal.

The northern division of the Highlands, though it does not contain the highest mountains, is decidedly the more barren and unproductive of the two. The good land is mostly restricted to the eastern parts of Ross and Cromarty. The western and northern coasts, and the interior, are, for the most part, in the last degree sterile, bleak, and unproductive; but the latter contains some pretty considerable straths, and innumerable glens, separated by high mountain ranges, and almost invariably possessing lakes and mountain tarns. There is a good deal of pretty level land in Caithness, but it is in great part moss and moor.

The Lowland division of the kingdom comprises, also, a great deal of mountainous country; but the mountains are not so high, nor, generally, so rugged as those of the Highlands, while the low country bears a far larger proportion to the hills.

Sect. 2.—*Mountains, Vales, &c.*

The mountains of the Highlands of Scotland consist either of detached groups, closely wedged together, or of ridges or chains, running for the most part in a north-east and south-west direction. They are, in many instances, extremely rocky and precipitous; but the greater number are covered with heath growing out of peat earth, rock, or gravel, few comparatively being clothed with green herbage. They

are frequently separated from each other by deep narrow ravines, or glens. The *passes* into the country lie in these: hence they admit of being easily defended; and, until recently, that roads have been carried through some of the principal ravines, they were impracticable almost to all but natives. To this, more than to anything else, must be ascribed the successful resistance opposed by their inhabitants to the attacks of the Romans and the Saxons; and to it, also, is it owing that the Highlanders are to this day a distinct people, differing essentially in language, dress, and manners from the Lowlanders.

Of the Highland mountains, the Grampian chain, mentioned by Tacitus (*Agricolæ Vit.*, cap. 29), is at once the best known and the most celebrated. Its limits are not very well defined; but it may be regarded as commencing on the east side of Loch Etive, in Argyleshire, and as stretching across the island; till it terminates between Stonehaven and the mouth of the Dee on the eastern coast. It forms, as it were, a natural rampart, bounding the entire frontier of the Highlands. Its southern acclivity rises from the great valley of Strathmore. The summit of the ridge marks the line that separates the waters that flow into the Forth, the Tay, and its numerous tributaries, and the South Esk, from those that flow into the Spean, the Spey, and the Dee. The highest mountains of Scotland, excepting Ben Nevis, are all comprised in the Grampian range. The principal summits, beginning at the west and proceeding eastwards, are Cruachan Ben, at the head of Loch Awe, 3,390 feet above the level of the sea; Ben Lomond, on the east side of Loch Lomond, 3,195 ditto; Ben More, at the head of Glendochart, 3,870 (B) ditto; Ben Lawers, on the north side of Loch Tay, 3,945 ditto; Schiehallion, near the east end of Loch Rannoch, 3,550 ditto. The most elevated part of the Grampian chain lies at the head of the Dee, between Ben Gloe, in Perthshire, and Cairngorm, on the confines of Aberdeenshire and Inverness-shire. Here, the huge mass of Ben Macdhu, ascertained, by the Ordnance survey, to be the highest mountain in the United Kingdom, rises to an elevation of 4,390 feet above the level of the sea, being 20 feet higher than Ben Nevis, hitherto reckoned the loftiest of the British mountains, and no fewer than 719 feet higher than Snowdon. The adjoining mountains of Cairngorm, Cairntoul, and Ben Avon are respectively 4,095, 4,220, and 3,967 feet in height. From this central point, the principal branch of the Grampians runs along the southern side of the Dee, gradually declining in height till it reaches Gaerloch Hill, near Stonehaven, 1,890 feet high. The coast from Stonehaven to the Dee is high and precipitous, and may be considered as the extreme limit of the Grampians on the east. The branch of the Grampians to the north of the Dee is of comparatively small extent, terminating at the Buck, above Glenbuckett, on the north, and near Tarland, on the south.

The Grampians are, in general, remarkable for their sterility, and their desolate aspect. Their sides are in some places extremely precipitous, exhibiting, in the instance of Ben Macdhu, vast perpendicular ledges of rock, 1,000 feet in height. Their summits are frequently rounded, sometimes nearly flat, entirely covered by disintegrating blocks and stone, together with grit and sand, except where the granite

rocks present the singular appearance of large tabular protruding pinnacles, having their blocks seemingly arranged in regular strata.

Of the Grampian passes, the principal are those of Aberfoyle, Leni, Glenshie, and Killiecrankie. The latter, which is the most celebrated, is about 15 miles from Dunkeld. It is about half a mile in length. The road is cut out of the side of one of the contiguous mountains; and below it, at the foot of a high precipice, in the bottom of the ravine, the river Garry dashes along over rugged rocks, but so shaded with trees as hardly to be seen. At the northern extremity of this pass, the revolutionary army, under Mackay, was defeated in 1689, by the troops of James II., under the famous Graham of Claverhouse, Viscount Dundee, who fell in the moment of victory.

Ben Nevis lies immediately to the east of Fort William, being separated from the Grampians by the desolate tract called the Moor of Rannoch. It rises to the height of 4,370 feet, being, as previously seen, only 20 feet lower than Ben Macdhu, though, from its not being surrounded by other mountains, it appears to be the higher and greater of the two. Its circumference at the base is supposed to exceed 24 miles. Its outline all round is well defined. Its northern front consists of two distinct ascents or terraces; the level top of the lowest of which, at an elevation of about 1,700 feet, contains a wild *tarn*, or mountain lake. "The outer acclivities of this, the lower part of the mountain, are very steep, though covered with a short grassy sward intermixed with heath; but at the lake this general vegetable clothing ceases. The surface of the upper and higher part of the mountain, where not absolutely precipitous, is strewed with angular fragments of stone of various sizes, wedged together, and forming a singularly rugged covering, among which we look in vain for any symptom of vegetable life. On the north-east side, a broad, terrific, and tremendous precipice, commencing at the summit, reaches down to a depth of not less than 1,500 feet. The furrows and chasms in the black beetling rocks of this precipice are constantly filled with snow, and the brow of the mountain is also encircled with an icy diadem. From the summit the view is remarkably grand and sublime." It commands most of the western islands, from the Paps of Jura to Cuchullin in Skye; and on the east the view extends to Schiehallion, Cairngorm, and Ben Macdhu. —(*Anderson's Highlands, &c.*, p. 266, &c.)

The Monagh Lea mountains run nearly parallel to and along the western side of the Spey, from its source to Dollas on the Lossie, a distance of about 56 miles. The summit of this ridge divides the waters that flow into the Spey, on the one hand, from those that flow into the Findhorn on the other. The mountains comprised in this chain, though wild, are tame, and do not attain to any very considerable elevation. "They rise in long ridges from an elevated base of dark heathy moor, and they possess but little of the abrupt serrated aspect of the west coast hills; their outlines being less decided, and their acclivities less broken. Extensive straths or pastoral valleys, abounding in streams and herbage, lie embosomed among the mountains, and support great herds of black cattle, for which the district has long been celebrated; while the adjoining solitudes, which are wide, and rarely visited by the foot of man, continue still to be the

retreats of great numbers of roe and red deer, and of grouse and ptarmigan. A scattered, but hardy, and very ancient race of people occupy the straths of this district, whose almost exclusive occupation is that of shepherds or drovers."—(*Anderson's Highlands, &c.*; p. 125.)

The western and central parts of the Highlands, from Ben Nevis north to Cape Wrath and Strathy Head, are almost everywhere sterile, dreary, and mountainous. This is particularly the case with the country from Loch Lochy and Loch Askeg north to Loch Broom. The mountains in this district are lofty; Ben Attow attaining to an elevation of nearly 4,000 feet, and some of the others being but little inferior.* The glens along the waters run generally east and west, and are very narrow and contracted; and the country is so impracticable that it cannot be traversed except by following the course of the streams. It is mostly appropriated to sheep-farming and the rearing of cattle, and is very thinly inhabited, not a house being sometimes visible in the course of many miles. The sides of the mountains are generally abrupt and precipitous: their peaks are occasionally sharp and rugged; but those along the coast have, on the whole, more verdure, and a less heathy and barren aspect, than those that are more inland. The mountains round Loch Maree are, however, as barren, lonely, and terrific, as can well be imagined.

From Loch Broom north to Cape Wrath, along the coast, there are no very high hills; but the country to a considerable distance inland is elevated about 1,000 feet above the level of the sea, and is peculiarly rocky, barren, and savage. Ben More, in Assynt, on the eastern verge of this worthless tract, is 3,231 feet in height.

Of the central Highland mountains, to the north of the Caledonian canal, the most conspicuous are Mealfourvony, contiguous to Loch Ness, 2,730 feet above the level of the sea: Ben Wyvis, north-west from Dingwall, is 3,426 feet high; and, though not the highest, is, from its enormous lateral bulk, and extensive ramifications, the principal mountain in this part of the island: Ben Derag, at the head of Loch Broom, is 3,551 feet above the level of the sea; Ben Hee, in Sutherland, east of Loch More, 2,835 ditto; and Ben Clibrick, to the south of Loch Naver, in the same county, 3,165 ditto. Morven, in Caithness, has an altitude of 2,334 feet. The glens and valleys among the mountains are partly cultivated, and partly depastured by black cattle; the higher levels, and the mountains themselves, when not entirely barren, being mostly depastured by sheep.

The mountains of the southern Lowlands, or of that part of Scotland lying to the south of the Friths of Forth and Clyde, cover all the central part of the country, sending, in some places, ridges to the coast. They may be regarded as commencing with the Cheviot Hills, on the borders of Northumberland, stretching thence across the island to Loch Ryan. They occupy the southern parts of Roxburghshire, the northern parts of Dumfriesshire, the principal part of Selkirkshire and Peeblesshire, the extreme southern part of Mid Lothian, the southern part of Lanarkshire, the south and east parts of Ayrshire, and the north and west parts of Kirkcudbrightshire. A branch,

* *Brewster's Encyclopædia*, article *Scotland*, p. 614.

denominated the Soutra and Lammermoor Hills, diverges from the central mass on the confines of Mid Lothian and Selkirkshire, terminating at St. Abb's Head and Fast Castle on the eastern coast.

The highest of the southern mountains lie contiguous, in the central part of the country, on the confines of the counties of Dumfries, Peebles, Lanark, and Selkirk. Broadlaw, in the parish of Tweedsmuir, 12 or 14 miles from Moffat, the most elevated mountain in the south of Scotland, is 2,741 feet above the level of the sea: Hartfell, contiguous to Broadlaw, formerly supposed to be the highest summit in this quarter; has an altitude of 2,635 feet; and several of the surrounding summits rise to the height of about 2,000 feet. The great rivers Tweed, Clyde, and Annan, flowing east, north-west, and south, rise near each other, on the skirts of Hartfell or of the immediately adjoining hills. The next highest points in the southern mountains are Whitecomb, in Dumfriesshire, 2,685 feet high; Cairnsmuir of Carsphairn, and Cairnsmoor of Fleet, in Kirkcudbrightshire, respectively, 2,597 and 2,329 ditto; Lowther Hill, Dumfriesshire, 2,396 ditto; Queensberry Hill, ditto, 2,259 ditto; Dunrich Hill, Roxburghshire, 2,421 ditto; &c.

The mountains in the counties of Roxburgh, Peebles, Selkirk, and Dumfries have, for the most part, smooth sides, with flat rounded summits. They are seldom heathy; but are mostly well covered with grass and other herbage, affording excellent pasture for sheep. The mountains of Kirkcudbright and Ayrshire are more rugged and heathy; but they generally want the bold precipitous character of the Highland mountains.

Exclusive of the great mass of southern mountains now alluded to, there is in the Lowlands a remarkable chain of hills running parallel to, and at no great distance from, the Grampians, across the island. But this chain has not, like the Grampians, one general appellation; and it is divided by the valleys of the Tay and the Forth into three distinct portions. Its direction and bearing cannot, however, be mistaken. From Montrose to Perth, where it is intersected by the Tay, this chain is called the Sidlaw Hills; thence to the valley of the Forth it is called the Ochill Hills; and, reappearing again in Stirlingshire, it is prolonged to Dunbarton, by the names of the Dundaff, Fintry, and Campsie Hills. The low country, or valley, between this range of hills and the Grampians is called, by way of distinction, Strathmore, *i. e.* the Great Valley; and, except where it is crossed by a low ridge joining the Grampians and Ochills, between Muthill and Dunblane, and by another separating Loch Lomond from the valley of the Forth, it is said not to be in any part much more than 200 feet above the level of the sea. The summit of Ben Clach, the highest of the Ochill hills, is 2,359 feet above this level.

Of the detached mountains of the Lowlands, those most worthy of attention seem to be the Lomond hills in Fife, and the Pentland hills in Mid Lothian. Criffel, a detached rugged mountain on the Solway Frith, rises 1,831 feet above the level of the sea.

Some of the Western Islands are mountainous; but, except in a few instances, their summits do not attain to any very great elevation. Ben More, in Mull, rises 3,168 feet above the level of the sea. The

altitude of the Cuchullin hills, in Skye, is but little inferior. Goatfell, Arran, is 2,865, and the Paps of Jura are respectively 2,470 and 2,359 feet above the level of the sea.

Undoubtedly, however, the Rock of Ailsa is at once the most unique and remarkable of the insular eminences. It is situated in the Frith of Clyde, about 10 miles west from Girvan. It has an elliptical base 3,300 feet by 2,200 feet, and rises abruptly from the sea to the height of 1,098 feet. It consists of columnar trap. The north-west side is almost perpendicular, being formed of successive tiers of columns of vast magnitude, both as to length and diameter. Ailsa affords shelter to innumerable flocks of sea-fowl; and is a very striking object from almost every part of the Ayrshire coast.

Altitudes of some of the principal Hills and Mountains of Scotland, mostly derived from the Ordnance Survey.

Ailsa, Frith of Clyde	1,098	Cairngorm, Inverness-shire	4,095
Arthur's Seat, Edinburghshire	822	Cairntoul, Aberdeenshire	4,220
Bannoch, Forfarshire	3,377	Cairnsmoor of Fleet, Kirkcudbrightshire	2,329
Battock Hill, Kincardineshire	2,611	Cairnsmoor of Carsphairn	2,597
Ben Achonzie, Perthshire	3,028	Calton Hill, Edinburgh city	356
Ben Attow, Inverness-shire	4,000	Carnethy, highest point of Pentland Ridge, Edinburghshire	1,880
Ben Avon, Aberdeenshire	3,967	Criffel, Kirkcudbright	1,830
Ben Clach, highest summit of the Ochills	2,359	Cruachan Ben, Argyleshire	3,670
Ben Clibbrick, Sutherland	3,165	Cuchullin, Isle of Skye	2,995
Ben Derag	3,551	Dunrich Hill, Roxburghshire	2,421
Ben Gloe, Perthshire	3,690	Ettrick Pen, Dumfriesshire	2,258
Ben Hee, Sutherland	2,853	Gaerloch, Kincardineshire	1,890
Ben Lawers, Perthshire	3,945	Goatfell, Isle of Arran	2,865
Ben Ledi	2,863	Hartfell, Dumfriesshire	2,635
Ben Lomond, Stirlingshire	3,195	Lochnagar, Aberdeenshire	3,815
Ben Macdhu, Aberdeenshire	4,390	Lomond Hill, Fifeshire	1,709
Ben More, Perthshire	3,819	Lowther Hills, Dumfriesshire	2,396
Ben More, Assynt, Sutherland	3,231	Mealfourvony, Inverness-shire	2,730
Ben More, Island of Mull	3,168	Morven, Caithness	2,334
Ben Uarn, Aberdeenshire	3,589	Paps of Jura, Island of Jura	2,470 & 2,359
Ben Nevis, Inverness-shire	4,370	Queensberry Hill, Dumfriesshire	2,259
Ben Ormen, Sutherland	2,307	Scarscoch, Aberdeenshire	3,390
Ben Voerlich, Perthshire	3,180	Schiehallion, Perthshire	3,513
Ben Wyvis, Ross-shire	3,720	Soutra Hill, Haddingtonshire	1,776
Black Larg, Kirkcudbright	1,950	Tintoc, Lanarkshire	2,306
Black Hoe Hills, Selkirkshire	2,370	Whitecomb, Dumfriesshire	2,685
Broadlaw, Peebles-shire	2,741	Wisp Hill, Roxburghshire	1,830
Cairneelar, Inverness-shire	3,350		

Vales.—As already observed, the level tracts of Scotland are but few, and limited in extent, as compared with those of England. The most important are the low alluvial lands (*carses*) on the banks of the Forth and Tay, with the Merse of Berwickshire, and that part of Strathmore that lies in Angus and East Perthshire. The first, usually called the Carse of Stirling and Falkirk, occupies the country on both sides the Forth, from Borrowstonness on the south, and Kincardine on the north, westward to Gartmore, having attached to it the level lands on the Teith and the Allan. The towns of Stirling, Alloa, and Doune are in this level. The first is a very striking object: the rock on which the castle and town are built rising on the west and north sides almost perpendicularly from the plain, and declining

rapidly to the east and south. The soil of the carse is eminently fertile; producing the most luxuriant crops of wheat, beans, &c. The view from the ramparts of Stirling Castle is particularly grand.

The level lands on the Tay, and its tributary the Earn, are of very considerable extent; and that portion denominated the Carse of Gowrie, being the tract between Dundee and Perth, bounded by the Sidlaw hills on the north and the Tay on the south, is decidedly the richest and finest country in Scotland; and is not, in fact, inferior to any in the empire. Strathearn, or the low ground on each side the Earn, from Crieff to Rhind Point, where it unites with the Tay, consists in most places of rich alluvial land of great fertility, though in this respect it is surpassed by the Carse of Gowrie.

The view from the hill of Kinnoul, immediately to the east of Perth, is most striking. The valleys of the Tay and Earn are also seen to great advantage from several points of the Ochill hills. The view not only embraces a large expanse of this rich and highly-cultivated valley, with the course and confluence of its noble rivers, but commands, in the distance, the Grampian range. Hence it may readily be conceived to be, if not superior, certainly not inferior, in point of variety, extent, and magnificence, to any other in the empire.

The Merse of Berwickshire extends from the Leader Water along the Tweed to Berwick, occupying most of the low and generally level part of the county, or nearly half its surface, having within it the towns of Greenlaw, Dunse, and Coldstream. The soil of the Merse is loamy, and generally excellent; and its farming is not surpassed by any to be met with anywhere else.

By Strathmore, in its more confined sense, is meant the low country in Angus and Perthshire, stretching from Laurencekirk in the former to Methven in the latter. This, however, includes part of the valley of the Tay, already noticed. That part of Strathmore that lies in Angus is not generally flat, but has its surface diversified by gentle eminences: it is of various degrees of fertility; portions of it remaining waste and uncultivated. It wants, indeed, some of those characteristics that are, in England, understood to be inseparable from vale land.

Besides the above, there are several smaller straths. Of these the most important and valuable seem to be Teviotdale, or the low country along the Teviot, in Roxburghshire; Tynedale, or the low rich country along the Tyne, in East Lothian; and the *How of Fife*, or the low rich land along the Eden, in Fifeshire. The surface of these straths is gently varied: they consist, for the most part, of a loamy soil, and are in a high state of cultivation.

Moors.—It would be useless to attempt particularising the Scottish moors: they are too frequent and extensive, in most parts of the country, to require, or, indeed, to admit of specification. The moor of Rannoch, lying between Schiehallion, Cruachan Ben, and Ben Nevis, seems, however, to be entitled to some notice. It includes a vast extent of rocks, lakes, and morasses, elevated about 1,000 feet above the level of the sea; and is one of the most dreary, wild, and worthless districts imaginable. It is not inhabited, and is seldom even visited. There is a somewhat similar tract on the west coast of

Cromarty and Sutherland, stretching from the southernmost point of the former to Loch Inchard in the latter, about 10 miles inland. Though without any great hills, and not very elevated, it is extremely rugged, bleak, and miserable. The soil of most of the Scottish moors, as well as many of the mountains, is peat, which, being impregnated with water, must exert an unfavourable influence over the climate.

Sect. 3. *Rivers and River Ports.—Lakes, &c.*

Rivers and River Ports.—The rivers of Scotland, having their sources and channels in a more mountainous, rugged country, differ materially in character from the English rivers; being in general purer, more rapid, more interrupted by rocks and cataracts, and more liable to sudden overflowings. Owing, also, to the greater altitude whence they descend, and the comparatively limited extent of level ground through which they flow, they are not nearly so available for the purposes of navigation as the rivers of England. With the exception of the Clyde, they almost all run east, north, or south, but principally east. There is not, indeed, on the whole western coast of Scotland, from Cantire northwards to Cape Wrath, the embouchure of a single considerable river.

Tweed, &c.—The Tweed, during the latter part of its course, forms the boundary between Scotland and England; but, as its sources and principal tributaries are all in the former, it is properly considered a Scotch river. It rises on the east side of Errickstane Hill, about 6 miles from Moffat. Its course is first north-east, to Peebles; then east, with a little inclination to the south, to Melrose; it next passes Coldstream and Kelso; and, pursuing a north-easterly direction, falls into the sea at Berwick. The descent from the source of the Tweed to Peebles is 1,000 feet, and thence to Berwick about 500 feet more.—(*New Statistical Account of Scotland*, p. 2.) The waters of the Tweed are particularly pure and limpid. The first part of its course is through a fine pastoral country; and the latter through one that is rich and well cultivated. Including windings, its length is reckoned at rather more than 100 miles. Notwithstanding it conveys a large body of water to the sea, it is not navigable for any considerable distance. The salmon fisheries on the Tweed are of great importance; in this respect, indeed, it is second only to the Tay.

Among its principal tributaries is the Etterick, which, flowing from the southern parts of Selkirkshire, joins it at the Eildon Hills. A little lower down it receives the Gala, from Mid Lothian, and the Leader from the borders of East Lothian. The Teviot rises in Roxburghshire, on the confines of Dumfriesshire; and flowing north-east, and receiving several tributaries, it falls into the Tweed at Kelso. The Till rises in Northumberland, near Ingram, and, pursuing a north-westerly course, falls into the Tweed at Tilmouth. Near Berwick the Tweed receives the Adder, a considerable river, composed of the united streams of the Blackadder and Whiteadder, having their sources in the Lammermoor hills. The basin of the Tweed is estimated at about 1,870 square miles.

Berwick, so celebrated in border history, lies on the north side of

the Tweed, close to its mouth. It has a pier, with a lighthouse at its head. At low spring ebbs there are not more than 5 or 6 feet water on the bar: but at high water it has from 3 to 3½ and 4 fathoms. The channel does not exceed a cable's length across; and is difficult to take in stormy weather, or when there is much fresh water in the river.

Forth, &c.—Proceeding northwards along the coast, we meet with the great arm of the sea, extending westwards from the Isle of May to Kincardine. This, which is the *Bodotria* of Tacitus, is now called the Frith or æstuary of the Forth, from its receiving, at its remotest extremity, the river of that name. The Forth has sometimes been reckoned the chief of the Scotch rivers; but, in point of magnitude, it is decidedly inferior to the Tay. It originates in several mountain streams that rise on the east side of Ben Lomond. Its course is easterly, with many sinuosities, by Aberfoyle, Stirling, and Alloa, till it unites with the Frith of Forth at Kincardine. Its most important tributary, the Teith, has its sources a little more to the north, and is the channel by which Lochs Katherine, Venacher, Voil, Lubnich, &c., are drained of their surplus water. It pursues a south-easterly course past Callendar and Doune, bringing to the Forth, a short way above Stirling, a volume of water greater than its own. The Forth is joined, somewhat lower down, by the Allan, flowing south from Perthshire, and the Devon, flowing west from Kinross-shire. Except near its source the Forth is by no means a rapid river. For the greater part of its course, it flows, with many windings, through a low, rich country. The distance, in a direct line, from the source of the Forth to Kincardine, is only about 35 miles; but by water it is about three times that distance. It is navigable for vessels of 70 tons as far as Stirling; but its course below the latter is so very tortuous, that, though the distance from Stirling to Alloa, by the road, be only about 7 miles, it is more than 23 by water. Hence it is little navigated in this part of its course, except by steam-vessels. Ships of 300 tons burden ascend the Forth to Alloa, which may be regarded as its principal port. There is good and secure anchoring ground in the channel of the river, or rather bay, between Grangemouth and Queensferry. The Forth and its tributaries are supposed to drain about 800 square miles. There are valuable salmon fisheries near Stirling, and in several other parts of the river. The great canal, joining the Forth and Clyde, commences at Grangemouth, on the Frith of Forth, near the mouth of Carron Water.

Tay, &c.—The Tay is the greatest of the Scotch, and, in respect of the quantity of water it conveys to the sea, it is the greatest even of the British, rivers. It rises in the high mountainous country a little to the north of Loch Lomond; and, flowing north-east by Killin, expands into the beautiful long narrow lake called Loch Tay. Issuing thence, its course is north and east to Logierait; south to Dunkeld; east to Kinclaven; south, inclining a little to the west, to Perth; north-east to the point of Rhind; then, north-easterly, past Dundee, till it falls into the sea between Tentsmoor Point and Buttonness. From Rhind Point to Dundee the channel of the river expands into an æstuary called the Frith of Tay. From its source to Dunkeld the Tay flows

with a rapid current, partly through a very wild, and partly through a highly picturesque, romantic country. Its subsequent course, as far as Perth, is through a comparatively fruitful country; and, from the latter to the sea, it flows through the richest and finest valley in Scotland.

From Buttonness to Dundee the river is navigable for ships of 500 tons burden; and, at high water, vessels of above 100 tons burden reach Perth, 20 miles above Dundee. Two light-houses have been erected on Buttonness to mark the entrance to the river. The bar at its mouth has 2¼ fathoms water over it. Dundee, the port of the Tay, is a large, rapidly improving, and highly important manufacturing and commercial town. It has wet docks and a pier harbour. The latter dries at low ebb; but at high water springs it has a depth of 14 or 15 feet, and at neaps of 9 or 10 feet. Large ships anchor in the channel of the river. The mouth and channel of the Tay are a good deal incumbered with sand-banks; and its navigation is rather difficult, partly on that account, and partly from the strength of the tides.—(*Norie's Sailing Directions for the North Sea*, p. 106.)

Among the more remarkable of the tributaries of the Tay may be mentioned the Lyon, which joins it near Fortingal. The Tummel has its sources in the moor of Rannoch, and, flowing through the loch of that name, is joined near the pass of Killiecrankie by the Gary, from the confines of Loch Ericht. The united river falls into the Tay at Logierait. Near Kinclaven, the Tay receives the united waters of the Airdle, the Isla, and other rivers flowing south from the mountains on the confines of Aberdeenshire. At Rhind point it receives its important tributary the Earn, flowing eastward from Loch Earn. The basin of the Tay comprises a space of about 2,400 square miles; and Mr. Smeaton ascertained that it carries to the sea more water than even the Thames. Its course from its source to Buttonness is estimated at about 110 miles. It is the finest salmon river in Great Britain: its fisheries let for a large sum; the fish being mostly conveyed, packed in ice, to London.

South and North Esks.—These rivers rise in the Grampian mountains, on the confines of Aberdeenshire, and, flowing south-east, fall, the first into the sea, a little below Montrose, and the latter about 4 miles more to the north.

Montrose is situated on the north side of the river, about 1½ miles from its mouth. Two light-houses have been erected on its extreme north-east boundary. The channel is narrow; but there are 15 or 18 feet water on the bar at low ebbs, so that middling-sized ships may run in at any time of the tide. The basin of Montrose, above the town, has a fine appearance on a map; but it is too shallow to be of any use. Notwithstanding the recent improvements, the narrowness of the channel, and the rapidity of the tides, make it advisable for ships entering Montrose to employ a pilot.

Dee.—This river has its sources in the highest part of the Grampian mountains, at the point where the south-western extremity of Aberdeenshire unites with Inverness-shire. It flows east, by the castle-town of Braemar, Glengairn, and Durris, till it falls into the sea, on the south side of New Aberdeen. It receives many tributaries, but none of very material importance. The total length of the Dee,

from its source to its mouth, following its various windings, is between 80 and 81 miles; but a straight line, drawn between the two extremes, would not exceed 65 miles. For the first 10 miles of its course there is no human habitation near the banks of the Dee. It is distinguished by its rapidity, its broad and capacious channel, and the limpid clearness of its waters. It is not navigable, in ordinary tides, for more than a mile from its mouth. It is well stocked with salmon, trout, and eels, and the fisheries of the first are valuable. There is but little alluvial land along its banks; but they are extremely well fitted, particularly in the upper districts, for the growth of timber. The Dee and its tributaries drain about 900 square miles of country.

Great efforts have been made, by the construction of massive and lengthened piers, and otherwise, to improve the harbour of Aberdeen: it is still, however, but indifferent. At low ebb the bar at the mouth of the river has about 12 feet water.

Don.—This, the second of the Aberdeenshire rivers, rises on the skirts of Ben Avon, on the confines of Aberdeenshire and Banffshire, flowing in a circular curve by Towie, Monymusk, and Kintore, till it falls into the sea, on the north side of Old Aberdeen. Its total course, following its windings, is about 61 miles; and a straight line, drawn from its source to its mouth, would be about 42 miles. It is a much less rapid river than the Dee, and flows, for a considerable part of its course, through rich valleys. A canal, about 19 miles in length, and 3 feet 9 inches deep, runs along the southern side of the Don, from Aberdeen to Inverury. It is used principally to bring down granite for shipment at Aberdeen. There are salmon fisheries on the Don, but not so valuable as those on the Dee.

Spey.—Proceeding northwards, we meet with no river of sufficient magnitude to require any notice here, till, passing Kinnaird Head, and turning to the west, we fall in with the Spey. This important river has its source in Loch Spey, within about half-a-dozen miles of the head of Loch Lochy. It pursues a north-easterly course through Badenoch and Strathspey to Fochabers, below which it falls into the great arm of the sea called the Moray Frith. It receives innumerable mountain streams, but no very important tributary. Following its windings, the course of the Spey is about 96 miles; but it is only about 75 miles, in a direct line, from its source to its mouth. It drains above 1,300 square miles of country; and, besides being one of the largest, is admitted to be the most rapid of the Scotch rivers. Being fed wholly by mountain torrents, it is very liable to sudden and destructive inundations. It flows through what is the best wooded portion of the Highlands. The Duke of Richmond is proprietor of several valuable salmon fisheries on this river

Findhorn.—This river has its sources in the Monaghlea mountains, 8 or 10 miles west from Kingusie on the Spey. It pursues a north-easterly course, falling into the Moray Frith at the village of Findhorn. Including its windings, its course is altogether about 50 miles; and it drains about 400 square miles of surface. The scenery along its banks is celebrated for its beauty and variety. It is more liable than the Spey or any other river in Scotland to sudden and dangerous floods. One of the greatest of those, of which we have any authentic account, occurred in August, 1829. In some parts of its course the

water rose no less than 50 feet in perpendicular height above its ordinary level; sweeping before it trees, mill-dams, bridges, and even vast masses of rock! It is singular that notwithstanding the rise was as sudden as it was extraordinary, and that a great extent of country was laid under water, only eight lives are supposed to have been lost.—(*Anderson's Account of the Highlands*, p. 143, &c.) The *Nairn* has its embouchure about 10 miles more to the west than the Findhorn: the *Ness* issues from Loch Ness, and, after a short course, falls into the sea at Inverness: the *Beauley* falls into the Beauley Frith; and the *Conon* into the Frith of Cromarty. These are the most considerable rivers falling into the sea in the Moray Frith; but none of them is navigable to any distance, or seems to require any special notice. The rivers of Sutherland and Caithness are all in the same predicament: and we have already stated that there is nothing deserving the name of a river on the whole western coast, from Cape Wrath to the Clyde.

Clyde, &c.—This fine river, the *Glotta* of Tacitus, decidedly the most important, in a commercial point of view, of any in Scotland, rises, as already remarked, in the highest part of the southern mountain land, at no great distance from the sources of the Tweed and the Annan. At first its course is northward, inclining a little to the east, through Crawford Moor, till, near Carstairs House, it turns suddenly to the south-west; but, being joined by the Douglas, near Harperfield, it takes a north-west course, by Lanark, Hamilton, and Glasgow, falling into the Frith of Clyde below Dunbarton. From its source to Dumbarton, the distance in a direct line, is about 52 miles; but, following its windings, the length of the river is about 73 miles. Its basin comprises about 1,200 square miles, comprising the principal manufacturing district of Scotland, with the city of Glasgow, and the towns of Paisley, Greenock, Hamilton, Lanark, Pollockshaws, &c. Its principal tributaries are the Douglas, Nethan, Avon, Mouse, Kelvin, Cart, and Leven.

Immediately after the junction of the Douglas with the Clyde, a little above Lanark, the river begins to be precipitated over a succession of falls or cataracts. The first considerable fall is that of Bonnington; its height, including that of a little one immediately above it, being about 30 feet. The second fall is that of Corehouse, where the water dashes from one ledge of shelving rock to another; its perpendicular height being about 70 feet. Dundaff Fall is 10 feet high; and there are three distinct falls at Stonebyres, below Lanark, making together about 76 feet. The distance from the highest to the lowest fall is about 6 miles; and, throughout the whole of this part of its course, the river dashes along with the impetuosity of a mountain torrent, and is deeply ingulfed between rocky banks.* At the lowermost fall it resumes its former quiet character: the valley on both sides gradually widens; and it pursues its course through a comparatively well cultivated, rich, and populous country, intersecting the great and flourishing city of Glasgow; about 7 or 8 miles below which it begins to expand into an æstuary.

* *Naismith's Survey of Clydesdale*, pp. 19, 20, &c.

The Clyde is navigable at high water as far as Glasgow. Formerly the navigation was much obstructed; and a great deal of money and labour have been expended in efforts to improve and deepen the channel. These have been so very successful, that, at present (1846), vessels of 500 tons or upwards get up to the city. Still, however, the navigation is not in a very desirable state. It was once proposed to cut a ship canal from Port Glasgow to the city; and it were better, perhaps, had this been done twelve years ago; but the expediency of the measure becomes very doubtful now that so great an outlay has been made on the river, and that it has been so much improved. It is seldom, however, that attempts to deepen the bed of rivers have the wished-for success. In general, their navigation is liable to frequent interruptions from tides, floods, droughts, &c. The success that has attended the cutting of the Gloucester Canal, from Berkeley to Gloucester, is pretty decisive as to the superiority of such a channel, as compared with that of even a moderately good river.

The great canal, joining the Forth and Clyde, falls into the latter at Dunglass, a little above Dunbarton. A branch of the canal is carried to Port Dundass, on the north side of the city of Glasgow.

Dee, Nith, and Annan.—Of the southern rivers these are the only ones that seem to require notice. They flow south, with a little inclination to the east, and fall into the Solway Frith. The Dee has its sources in the most northerly part of Kirkcudbrightshire, amongst the mountains, on the confines of Ayrshire. Below New Galloway it expands into the long and beautiful sheet of water called Loch Ken. Issuing thence, it flows south past Kirkcudbright, uniting with the Solway Frith at the Ross, about 6 miles below that town. The Dee is a fine river, and may be navigated by large vessels to Tongland Bridge, about 2 miles above Kirkcudbright. The Nith is the largest of the southern rivers. Its sources are in the northern parts of Dumfriesshire, some of them being contiguous to those of the Clyde. Pursuing a south-easterly course through Nithsdale, and passing Dumfries, it falls into the Solway Frith, about 7 miles below the latter. It is navigable to within a couple of miles of Dumfries for vessels of considerable burden; but the navigation is a good deal impeded by sand-banks. The course of the Annan is nearly parallel to that of the Nith. It rises on the south side of Hartfell, near Moffat, and falls into the Solway Frith, a little below Annan.

Lakes.—Exclusive of the many narrow inlets or arms of the sea, that indent its west coast, Scotland has to boast a vast number of fresh-water lakes, or lochs, particularly in the islands. Of the Lowland lakes, Loch Leven, in Kinross-shire, seems to be the only one requiring a distinct notice. Not long since it was about 4 miles in length by about 2¼ in breadth; but it has recently been diminished by drainage. It is a beautiful sheet of water, having the Lomond hills on its east, and Benarty Hill on its south side, with the towns of Kinross and Milnathort on its western margin. But it derives its principal celebrity from having within it a little island, on which are the ruins of the castle wherein Queen Mary was confined previously to the battle of Langside. This lake has a peculiar species of red trout, which is highly esteemed. The fishery lets for a considerable sum; and it is a

Table exhibiting the Dimensions, Situation, and leading Characteristics of the principal Scottish Lakes.

	Names.	Length in Miles.	Greatest Breadth in Miles.	Square Miles of Surface.	Counties in which they are situated.	Characteristics.
1.	Loch Lomond	24	7	45	Dunbarton and Stirling	Full of wood-clothed islands, partly surrounded with mountains, and abounding in fish.
2.	Awe	25	2½	30	Argyle	Ditto, ditto, amid beautiful mountain scenery.
3.	Ness	22	2½	30	Inverness	Surrounded with mountains, full of fish, and in the tract of the Caledonian Canal.
4.	Shin	20	1½	25	Sutherland	Surrounded with wild mountain scenery, and abounds in fish.
5.	Maree	12	3	24	Ross, west coast	Abounds in fish, full of islands, many of them wooded.
6.	Tay	15	2	20	Perth	Full of fish, and in the heart of a beautiful Highland country.
7.	Arkeg.	12	2	18	Inverness	Abounds in fish, and in the heart of a fine rural Highland country.
8.	Shiel	16	1	16	Inverness, west coast	Abounds in fish, and in the heart of a mountainous country.
9.	Lochy	16	1	15	Inverness	In the tract of the Caledonian Canal, fine salmon, and clear hard water.
10.	Laggan	8	1½	12	Inverness	Abounds in fish, and in the heart of a wild Highland country.
11.	Morrer	9	2	12	Inverness	Abounds in fish, in the heart of a rural Highland country.
12.	Eannich	7	1½	10	Ross, in the middle	In a remote part of the country, surrounded by lofty mountains.
13.	Ericht.	14	2	10	Perth and Inverness	In a wild mountainous country, fringed with wood, remote from habitation.
14.	Earn	8	1¼	9	Perth	In a pleasant Highland country, with much natural wood.
15.	Naver	6	2	9	Sutherland	In a remote and mountainous country.
16.	Stennis	8	2	8	Orkney, mainland	Full of fish, much haunted by sea-fowl, and in the midst of a low and barren country.
17.	Rannoch	9	1	8	Perth	Full of fish, and in the heart of a woodland Highland country.
18.	Leven	4	2	7	Kinross	Full of fish, has an island with a castle, and in the heart of a cultivated country.
19.	Fuir	4	2	6	Ross	In a wild mountainous country.
20.	Lydoch	6	1	6	Perth and Argyle	In a wild country, remote from habitation.
21.	Dee and Ken	10	0¾	6	Kirkcudbright	Abounds in fish, and in the heart of a cultivated country.
22.	Loyal	6	1	6	Sutherland	In a mountainous country, near the north coast.
23.	Glass	5	1	5	Ross, east	Abounds in trout, in the midst of a hilly country.
24.	Katherine.	8	0¾	5	Perth, Menteith	Abounds in uncommonly picturesque scenery, wild and gloomy.
25.	Doon	9	1	4½	Ayrshire	Encircled with a rocky shore, and abounds in trout.
26.	Luichart	3	1	3	Ross	In a mountainous country, the precipitous shores covered with wood.

singular, and not very easily explained, circumstance, that it is almost the only Scotch lake that yields any revenue to its proprietors.

Loch Lomond, lying between Dunbartonshire and Stirlingshire, is at once the best known of all the Highland, and the largest of all the British lakes. This noble sheet of water is about 24 miles long; and, where broadest, is from 7 to 7½ miles across; but in its upper part, contiguous to the county of Perth, it is not more than a mile in breadth. On the whole, it is supposed to cover a space of about 28,000 acres. Its most usual depth is about 20 fathoms; but in some places it has a depth of 80 and even of 120 fathoms. It is studded with many finely wooded islands, some of them of considerable size. The scenery of this lake is most magnificent. On both its east and west sides there are high rugged mountains, among which Ben Lomond stands conspicuous, rising from the water's edge to the height of above 3,000 feet. The recesses between the hills are mostly filled with gentlemen's seats, surrounded with fine natural woods and plantations. But towards its southern extremity the country is rich, fertile, and well cultivated. The surface level of Loch Lomond is from 3 to 5 feet higher in winter than in summer: generally it is about 22 feet above the mean level of the sea at Dunbarton. Its surplus waters are conveyed to the Clyde by the river Leven.

Among the other Highland lakes are Loch Ness, forming part of the Caledonian Canal; Loch Maree, in Ross-shire; Loch Awe, in Argyleshire; Lochs Tay, Rannoch, and Ericht, in Perthshire; Lochs Shin and Naver, in Sutherland, &c. They are mostly all long, narrow, and deep; occupying the bottoms of the hollows between the mountains. Their water is generally pure and limpid; and they are well supplied with trout, perch, pike, &c. We give on the previous page, from the *General Report of Scotland*, a synoptical table of the size, situation, and leading features of the principal Scotch lakes.

Sect. 4. *Sea-coast and Sea-ports.*

The coasts of Scotland partake of the character of the country, being generally bold, precipitous and rocky. They are very much indented, especially on the western side, with inlets or arms of the sea, denominated friths and sea-lochs. These frequently penetrate many miles inland; while, in other places, the shores extend into lengthened headlands or mulls, as in the case of the Mull of Cantire and the Mull of Galloway. Were the coasts of the mainland of Scotland, excluding the arms of the sea, measured by straight lines, they would not exceed from 600 to 650 miles; but, in consequence of the numerous indentations referred to, the actual extent of sea line is believed to be little, if at all, under 2,500 miles! These friths and inlets give very considerable facilities to commerce; and are, in this respect, the more important, as few of the rivers are navigable to any considerable distance from the sea. They also afford convenient fishing stations, and abundant supplies of sea-weed for manure; while they farther tend, by familiarising a great number of the inhabitants to the water, to increase the supply of sailors, and to give additional energy to the spirit of adventure and enterprize.

Setting out from Berwick, the first considerable promontory we meet with is St. Abb's Head, constituting, with the promontories of Ernescleugh and Fastcastle, the eastern extremity of the Lammermoor hills. It is high and bold, and, being separated from the ridge by a narrow dell, it has, at a distance, the appearance of an island. Passing St. Abb's Head, the coast bends west-north-west past Dunbar, which has an indifferent harbour, to North Berwick. A little to the east of the latter, and about a mile from shore, is the Bass, a large, high, precipitous rock, with deep water all round.

The coast of East Lothian has undergone considerable changes, the sea having in some places receded, while in others it has gained materially on the land. The shore consists, in some parts, of high earthy banks, and these, being undermined by the action of the waves, are every now and then falling down. On the other hand, those parts of the shore that are low and flat are constantly extending themselves, by the deposits of sand, shells, and earth, heaved upon them by the tide. A process of this sort is, of course, going on wherever the coast consists of earthy banks or low beaches, and is as obvious on many parts of the English shore as in the district now mentioned.—(See, farther, on this subject, *Somerville's Survey of East Lothian*, pp. 297—319.)

The Bass is within the mouth of the Frith of Forth, the southern shore of which stretches south-west from North Berwick to Musselburgh, and thence west, inclining to the north, to Airth. Its north is in most places nearly parallel to its southern shore. The distance from the Bass to Elie Ness, on the opposite coast of Fife, is between 9 and 10 miles; but the Frith gets wider immediately after. Its depth, from the Isle of May to Kincardine, may be reckoned at about 48 miles. At Queensferry, above Edinburgh, the channel contracts to about 2 miles in breadth, but it again expands to a breadth of 4 or 5 miles. The shores of this spacious inlet are low, in part rocky, in part a pleasant beach, but everywhere of the greatest beauty. The view of Edinburgh from the Frith is particularly fine. There is good anchorage ground in many parts of this magnificent æstuary; but there is not, in its whole extent, a single good harbour. The principal ports on its south side are Leith, Queensferry, Borrowstonness, and Grangemouth; with Burntisland, Kinghorn, Kirkcaldy, and Largo, on the north side. Leith, being the port of Edinburgh, has a considerable trade; and very large sums have been expended on the construction of docks, and in efforts to improve the harbour. Owing, however, to the want of water, Leith is not, and we apprehend never can be, anything better than a high-water harbour; and even at springs it has not more than 16 or 17 feet. Happily, however, the serious inconveniences which Edinburgh has experienced from the want of a good harbour have latterly been in a great measure obviated through the public spirit and enterprise of the Duke of Buccleugh. At Granton, which belongs to his Grace, about 1½ miles west from Leith, there is comparatively deep water, and here he has constructed a magnificent pier, with harbours on each side, accessible to large vessels at all times of the tide. This new port has already become the resort of the steamers trading between London and Edinburgh, and will be of the greatest service, not merely to the Scottish capital, but to all the surrounding country. Grange-

mouth, situated at the eastern extremity of the Forth and Clyde Canal, has a good deal of trade. It is rarely, however, visited by ships drawing more than 10 or 12 feet water. Burntisland is a good high-water harbour, as is also Kirkcaldy. There is pretty good anchorage ground in Leith Roads, Burntisland Roads, and Largo Bay. Light-houses have been erected on Inchkeith Island, opposite to Leith, and on the Isle of May, at the mouth of the Frith.

The shores of Fife, or of the extensive peninsula lying between the Friths of Forth and Tay, are mostly rocky, without, however, being lofty. At St. Andrew's, and some other places, the sea has encroached considerably on the land. Fifeness, the eastern extremity of the county, lies nearly north from the Isle of May, distant about 6 miles. From this point the shore turns north-west to the mouth of the Eden, and then north to Tentsmoor Point, at the mouth of the Frith of Tay. St. Andrew's Bay, in the elbow, affords good anchorage in from 9 to 12 fathoms; but the harbour of St. Andrews dries at low water.

Nearly due east from Buttonness, distant about 12 miles, is the Bell Rock, a dangerous insulated ledge, about 850 yards in length by 110 in breadth. At low water some of its summits appear from 4 to 8 feet above the level of the sea; but at high water they are always covered. Many vessels have been lost upon this rock, and, to lessen the chance of such disasters in future, a magnificent light-house, constructed on the model of the Eddystone, has been erected, within these few years, on one of its points. The lantern is 115 feet above low-water mark.

Leaving the Tay, which has been already described, the land stretches north by east, in a pretty even line, as far as Buchanness Point, in Aberdeenshire, the most easterly land in Scotland, in lat. 57° 29′ 15″ N., long. 1° 47′ W. The coast, though in some places low and sandy, is mostly bold and rocky. Between Arbroath and Montrose there are cliffs penetrated by tremendous caverns, of which the Geylit Pot, forming a communication between the sea and a circular chasm at some distance in the country, is the most celebrated. The sandy part of this coast lies principally contiguous to, and immediately north from, Aberdeen. In some places the sand is so moveable that it has more than once occasioned great mischief. Near Buchanness are the famous arched rocks, called the Bullers of Buchan, enclosing a natural harbour.

Unfortunately there is not, on the whole coast, from the Tay to Buchanness, one really good harbour. Montrose and Aberdeen, which, especially the first, are by far the best, have been already noticed. Stonehaven harbour dries at low water; and at high water, when the wind is easterly, there is a very heavy swell. Peterhead, a little to the north of Buchanness, has a double harbour; but it also labours under a deficiency of water, though recently it has been much improved. A good deal of trade is carried on from the town, the inhabitants of which have distinguished themselves by the spirit and success with which they have embarked in the whale and herring fisheries. A light-house has lately been erected on the Point of Buchanness.

From Peterhead a bold and rugged shore extends north, inclining a little to the west to Kinnaird Head, the *Taizalum Promontorium* of the ancients. It is crowned by a castle and a conspicuous light-house.

At Kinnaird Head, the northerly direction of the coast suddenly changes, and, stretching nearly due west by Troup Head and Knock Head to Burgh Head, it declines south-west to the bottom of the Moray Frith and Loch Beauley. This line of coast forms the base of the vast triangular bay, extending from Kinnaird Head to the mouth of the Moray Frith, and thence to Duncansby Head. The ports from Kinnaird Head to Fort George are merely tide havens. In the first part the shore is bold, precipitous, and picturesque; but from the Burgh Head, along the Moray Frith to Loch Beauley, it is mostly low and sandy. Large vessels may anchor opposite Inverness, or go farther up to Loch Beauley.

The east end of the Caledonian Canal unites with the Moray Frith at Clachnacarry Basin, a little to the west of Inverness. The canal admits vessels drawing 15 feet water.

Crossing the ferry from Inverness to the opposite shore, the coast, which is low and sandy, stretches north-east to the mouth of the Frith of Cromarty, and thence to the promontory of Tarbet Ness, separating the Moray Frith from the Frith of Tain or Dornoch. The Frith of Cromarty is about a mile wide at its entrance, extending south-west to Dingwall, about 17 miles. It is, beyond all doubt, the finest harbour on the east coast of Great Britain, and is, indeed, surpassed by very few in any part of the world. At its mouth it has from 30 to 22 fathoms water, the depth within varying from 15 to 7 fathoms. The town of Cromarty stands on the south side of the Frith, a little within its mouth. Owing to the limited extent of the good land round the Frith, and the want of manufacturing towns, population, and internal communication, it has very little trade; so that this excellent harbour is comparatively useless.

Between the point of Tarbet Ness, on which is a light-house, and Dornoch, the coast of Sutherland takes a north-east direction. Except at Brora and a few other places, it is mostly low and sandy. But on the confines of Caithness the mountains come down to the water's edge, terminating in the lofty stupendous precipices that form the Ord of Caithness.

From this point the coast pursues its north-easterly direction to the Noss Head. It is in general bold and rugged. In one of the openings of the cliffs is the thriving town and harbour of Wick. Being conveniently situated for the herring fishery, of which it is now the principal station, great efforts have been made to improve its port; and they have been so far successful, that it affords safe accommodation for large numbers of the smaller class of vessels.

Noss Head lies a little to the north of Wick. It is remarkable for its high bold cliffs, which, in clear weather, are visible at a great distance at sea. Within the head is Sinclair's Bay, in which ships may anchor with off-shore winds. From the bottom of the bay the coast runs north-north-east, till it terminates in Duncansby Head. This celebrated promontory, the *Berubium* of the ancients, and the extreme north-east point of Great Britain, is in lat. 58° 38′ N., long. 3° 2′ W. It consists of lofty perpendicular cliffs, some of which stand detached in the sea, and are sometimes mistaken by mariners for Noss Head, to which it bears a considerable resemblance. To obviate such mistakes,

which have been occasionally attended with fatal consequences, it has been proposed to erect a light-house on Duncansby Head. John o'Groat's House is about 1½ mile west from the extreme point of Duncansby Head. Of this structure nothing now remains but the foundations.

About 3½ miles east by north from the Head are the rocky islets called the Pentland Skerries. For the security of mariners in the Pentland Frith two light-houses have been erected on the Great Skerry. In the Pentland Frith the tides are very violent. When strongest they run about 9 miles an hour.

From Duncansby Head the coast runs north-north-west, in a waving line, to Dunnet Head, the most northerly headland of Great Britain, in lat. 58° 40′ 30″ N., long. 3° 22′ W. It is high and rocky. A light-house has recently been erected on the Head, the lantern being 346 feet above the mean level of the sea.

Between Dunnet Head and Holburn Head is Dunnet Bay, having the town of Thurso, with a moderately good harbour, on its south-western side. But it is too remote, the country around too barren, and the navigation of the Pentland Frith too dangerous, to allow of its ever becoming a place of any importance.

From Holburn Head the coast, which in some places is deeply indented, and in others runs out into bold precipitous headlands, (of which Strathy Head and Far Out Head are the most remarkable,) pursues, on the whole, a nearly westerly direction, till it ends in Cape Wrath, or Parph Head. The cliffs that compose the sides of this famous headland consist of old red sandstone, and are singularly magnificent; some of them overhang the sea to the height of from 300 to 500 feet, exhibiting vast fissures, caverns, and subterranean openings, into which the water rushes with tremendous fury. The headland of the Cape itself is, however, a mass of granite, washed smooth and bright by the ceaseless action of the waves. It is fenced round with dangerous rocks, some of them nearly a mile from shore. Cape Wrath forms the north-western extremity of the mainland of Great Britain, and is in lat. 58° 37′ N., long. 5° W. A light-house was erected on it in 1828, having the lantern elevated 400 feet above high water mark.

It would be useless to enter at so much length into the description of the western coast of Scotland from Cape Wrath to the Clyde: it is sufficient to observe that, throughout its whole extent, it is rugged, wild, and dreary, the mountains generally coming close to the water's edge. It is indented in many places by narrow arms of the sea, penetrating far inland, carrying, in most instances, a great depth of water even to their inmost recesses, and affording safe but unfrequented asylums for the largest fleets. Linnhe Loch, taken in connection with Loch Eil, is one of the most important of these inlets: it stretches north-west from Dowart, in Mull, to the western extremity of the Caledonian Canal, of which it may be said to form a part, a distance of about 34 miles, and has deep water throughout.

The islands of Skye, Mull, and Jura, are separated from the main land by narrow channels, through which the tide rushes with much force. In some places it forms dangerous whirlpools, as at Corry-vrechan, between Jura and the small island of Scarba.

The great arm of the sea, lying between the Mull of Cantire and the Ayrshire coast, has the Island of Arran in its centre. At its northern extremity it branches off into the two great divisions of Loch Fyne and the Frith of Clyde, separated by the Island of Bute and the district of Cowall, in Argyleshire. The Frith of Clyde is again subdivided into three arms; viz., Loch Long, separating Argyleshire from Dunbartonshire; Loch Gare, of very inferior dimensions to Loch Long, but parallel to, and separated from it by a narrow isthmus; and the æstuary of the Clyde, winding east, with a little inclination to the south, having Dunbartonshire in the angle between it and Loch Long.

Loch Fyne extends, with a slightly circular sweep, from Skipness Point, round by Silvercrags and Inverary, to Achadounan, a space of about 40 miles. Its breadth from Skipness Point to the opposite point of Cowall is about 7 miles, contracting gradually as it penetrates into the interior. It has very deep water throughout; so much so, that at Inverary, within about 7 miles of the bottom of the Loch, there are upwards of 60 fathoms. Loch Fyne used to be one of the principal seats of the herring fishery. The Crinan Canal, between Loch Gilphead on Loch Fyne and the head of the sound of Jura, insulates the long narrow peninsula of Knapdale and Cantire; and, consequently, saves those vessels that would otherwise be obliged to go round the Mull of Cantire a lengthened navigation.

The water in Loch Long and Loch Gare is also very deep; and in the Frith of Clyde, within a short distance of Greenock, there are 23 fathoms at ebb. This and Port Glasgow are the principal harbours of the Clyde, and, as such, possess a good deal of shipping, and enjoy an extensive commerce. Lamlash Bay, on the east coast of the Isle of Arran, is, however, the finest harbour near the mouth of the Clyde. It is completely land-locked, being protected from the easterly gales by the little island of Lamlash.

The Ayrshire coast, as far as Girvan, is mostly low and sandy. A great deal of labour has been expended on the formation of a harbour at Ardrossan, to which it was intended to bring a canal from Glasgow; but the canal has only been excavated as far as the thriving village of Johnston, a little to the west of Paisley; and Ardrossan is now connected with Paisley by a railway. The harbour of Troon, about 10 miles from Kilmarnock, to which it is united by a railway, has been very much improved by the exertions and at the expense of the Duke of Portland, and is now decidedly the best on the coast. Ayr harbour has also been materially improved; but it dries at low water, and the westerly gales throw in a heavy sea. From Girvan to Wigtownshire the mountains come close to the water's edge, so that the shore is bold and precipitous. Opposite to Girvan, and about 10 miles distant, is the rock of Ailsa, already noticed.

The north-west part of the county of Wigtown is indented by Loch Ryan, a fine sheet of water, extending from Kirkcolm Point to Stranraer. Within this loch, and opposite to a place called Cairn, there is good anchorage, and water sufficient to float the largest ships. A little to the westward of Kirkcolm Point is the point of Corsewall, on which is a lighthouse. Hence the shore stretches south, inclining a

little to the east by Port Patrick to the Mull of Galloway. This bold prominent headland, the most southerly point in Scotland, is in lat. 54° 38′ N., long. 4° 54′ W. It has recently been surmounted by a lighthouse, the lantern of which is elevated 325 feet above the level of the sea at high water. Port Patrick is about 22 miles from the port of Donaghadee, in Ireland.

The Mull of Galloway forms the north-western extremity of that vast bay, bounded on the north by Galloway and Dumfriesshire, on the east by Cumberland, Lancashire, and Cheshire, and on the south by North Wales, having the island of Anglesea at its south-western extremity. The Isle of Man lies between its horns, and marks its western limits.

Passing the Mull of Galloway, the Bay of Luce opens; a broad expanse of water, extending northwards to within 6 or 7 miles of Loch Ryan, and nearly insulating the western district of Wigtownshire, called the Rhynns. The eastern shore of this bay terminates in the bluff rocky promontory of Burrow Head. Between this latter point and the Mull of Galloway, and about equidistant from each, are two remarkable rocks, called the Scaurs, much resorted to in the breeding season by sea-fowl.

Leaving the Burrow Head, the coast is again indented by the Bay of Wigtown. From the eastern boundary of this bay, at the Ross, the shore of the counties of Kirkcudbright and Dumfries stretches in a broken uneven line, east by north, till it unites with that of England, at the bottom of the Solway Frith.

The coast of Galloway, except in the upper parts of Luce and Wigtown bays, is mostly bold and precipitous. Its best ports are at the Isle of Whithorn, near Burrow Head, and Kirkcudbright Bay. The coast of Dumfriesshire is mostly low and sandy. The tide in the Solway runs with great force, the flood sometimes advancing with a head 3 or 4 feet high. We subjoin an account of the

Principal Headlands and Places on the Coast of Scotland, with the Latitude and Longitude of each, as given by the best Authorities.

PLACES.	Latitude.				Longitude.			
	°	′	″		°	′	″	
St. Abb's Head	55	56	0	N.	2	7	30	W.
North Berwick	56	4	0		2	42	0	
Edinburgh Observatory	55	57	19		3	10	56	
Fifeness	56	17	0		2	35	0	
Buttonness Lighthouse	56	28	0		2	44	15	
Montrose	56	42	10		2	27	15	
Aberdeen	57	9	0		2	9	0	
Buchanness Lighthouse	57	29	15		1	47	0	
Kinnaird's Head Lighthouse	57	41	40		2	1	0	
Inverness	57	31	0		4	12	10	
Tarbet-Ness Lighthouse	57	54	0		3	47	0	
Noss Head	58	30	0		3	9	0	
Duncansby Head	58	38	0		3	2	0	
Dunnet Head	58	40	30		3	22	0	
Far Out Head	58	36	0		4	44	0	
Cape Wrath	58	37	0		5	0	0	
Ru Rea Point	57	54	30		5	32	0	

PLACES.	Latitude.			Longitude.		
	°	′	″	°	′	″
Ardnamurchan Point	56	45	0 N.	6	8	30 W.
Mull of Cantire Lighthouse	55	19	0	5	49	0
Greenock	55	58	0	4	44	0
Glasgow	55	51	32	4	16	0
Corsewall Point Lighthouse	55	1	0	5	10	0
Portpatrick	54	50	0	5	8	0
Mull of Galloway Lighthouse	54	38	0	4	52	0
Burrow Head	54	42	0	4	22	15
Southerness Lighthouse	54	52	15	3	37	0

SECT. 5.—*Geology.*

Scotland not being separated from England by any great natural boundary or intervening sea, the geology of the adjacent districts in each is nearly the same; but, if we take a general survey of the whole country, we shall find the great features of the geology of Scotland very different from those of the geology of England. If a line be drawn in a north-east direction, from the mouth of the Clyde to Stonehaven, on the eastern coast, nearly the whole of Scotland south of that line is composed of transition rocks, covered in many parts by coal-measures, traps, or red sandstone. On the north of this line nearly the whole country is composed of primary rocks of granite, gneiss, and mica slate, covered at the feet of the mountain chains with beds of conglomerate and red sandstone. The upper secondary strata, which are spread over nearly the half of England, scarcely appear in Scotland, and can only be traced in a few detached patches, which bear no assignable proportion to the surface of the country. The general bearing of the different mountain ranges in Scotland is from south-west to north-east. The force by which the mountain ranges were upheaved appears to have acted in distant and nearly parallel lines, not only through the mainland of Scotland, but also in the western Islands. Thus, the islands from Barra to Lewis are so nearly connected that they may be regarded as one chain or range of mountains, composed of gneiss, running from south-west to north-east for about 100 miles, in a parallel direction with the mountain chains in the north of Scotland, but separated from them by a deep valley, which forms the bed of the intervening sea. The mainland of Scotland itself is nearly divided into two islands, by a deep valley, running in the same direction, and forming the bed of several long and narrow lakes, or lochs, between the sound of Mull and the Moray Frith. The general direction of the numerous lochs which open to the sea, and run for many miles inland, is also from south-west to north-east, owing to the same cause,—the parallelism of the mountain ranges to the same direction.

We shall commence our survey of the geology of Scotland with the more alpine or primary districts north of the Clyde and the Forth; but the Western Islands, or Hebrides, may be viewed as an interrupted extension of the alpine ranges of Scotland, the direction and composition of the mountain beds being nearly the same: we shall therefore notice them before proceeding to the mainland. The range of islands,

of which Lewis is the northernmost, and by far the largest, extends, as before mentioned, for about 100 miles in a south-west and north-east direction. These islands are so nearly united as to have received the popular name of the "Long Island." According to Dr. Macculloch, to whom we are indebted for almost everything that is known of their geology, gneiss is the predominant and fundamental rock of the whole range; which he appropriately denominates the Gneiss Islands. The gneiss presents nothing very different from the general character of this rock in other situations: the beds are often broken, and much contorted, and are intersected by numerous veins of granite. Beds of mica slate, talc slate, hornblende slate, clay slate, and grey-wacke occur in some parts; and the gneiss itself passes by gradation into these rocks. There are also some beds of conglomerate, composed of rolled pebbles of various sizes, imbedded in sandstone and compact gravel: this conglomerate, Dr. Macculloch says, bears a perfect resemblance to most part of that great mass of conglomerate beds found in the mainland of Scotland, separating the primary from the secondary strata: but, in general, it is of a much harder texture. It reposes immediately on the gneiss. The islands of Coll, Tiree, and Iona, situated at a considerable distance from the Long Island, are also classed by Dr. Macculloch with the Gneiss Islands. In Tiree the gneiss often contains masses of limestone. The rose-coloured or pink limestone, with hornblende and green augite, called Tiree marble, and well known by mineral collectors, is an irregular mass, about 100 feet in diameter, surrounded on all sides by gneiss: nearly half the mass has been already worked out.

The next group of islands is called by Dr. Macculloch the Trap Islands, from being chiefly composed of basaltic or trap rocks. The two principal of these islands, Skye and Mull, are so close to the mainland as scarcely to leave a doubt that they have been united to it at no very remote geological epoch; and it is probable that many of the existing peninsulated promontories will, in process of time, become entirely insulated, by the impetuous action of the ocean on the narrow tongues of land by which they are now connected with the mainland. Skye, the largest and northernmost of the Trap Islands, with the exception of a small tract on its western side, is chiefly formed of trap rocks; comprising in that term the different varieties of basaltic rocks, composed of felspar and hornblende, or felspar and augite, in various proportions, and passing from a compact to a granular structure. In some parts the felspar forms nearly the whole mass: in other parts it is porphyritic, and sometimes intermixed with granular hornblende, forming syenite. In Skye and the other Trap Islands the trap rock frequently assumes the columnar structure. The Cuchullin mountains, in this island, are principally composed of a rock containing hypersthene, or hornblende, with a semi-metallic lustre. The limits of the present article will not admit of mineralogical details; but there is an important fact in the geology of the Isle of Skye which must not pass unnoticed. The secondary strata of the lias and oolite formation, which rarely appear anywhere in the mainland of Scotland, occur near the eastern side of the island, containing the characteristic fossils of these beds; but where the lias approaches the syenite it is converted into a crystalline limestone,

nearly white. A few patches of similar limestone occur on the western side of the island, and in the adjacent small islands of Raasay, Scalpa, and Pabay. The lias is bounded by red sandstone. The fundamental rock of the Isle of Skye appears to be gneiss, which is seen along part of the eastern coast.

Mull is, after Skye, the largest of the Trap Islands. The geology, in a general view, is nearly the same in both, except that in Mull, on the westernmost headland, opposite Iona, there are rocks of granite and gneiss. A few patches of the lias and oolite formation, and sandstone, occur near the coast; with these exceptions the whole island is covered with various trap rocks, frequently assuming the columnar form. Some small seams of coal have been found both in Skye and Mull, but they are of too little value to be worked. Mull is the most mountainous of all the Hebrides. Ben More is 3,168 feet above the sea: the other mountains seldom attain a higher elevation than 2,000 feet.

The Trap Islands, between Mull and Skye, are Rum, Canna, Muck, and Egg. Of these, Rum, the largest, is skirted on the eastern and northern sides by red sandstone. Egg is remarkable for a lofty rock, called the Scuir of Egg, placed on a high range of trap rocks. It towers over the whole island, resembling an immense castle. The face of the rock is nearly vertical, and is 470 feet in height: it is composed of columnar pitchstone, which contains imbedded crystals of glassy felspar. The Scuir of Egg is an object of considerable interest both to the tourist and the geologist, and may be visited with greater facility than Staffa. Part of the Isle of Egg appears to have lias for the fundamental rock: it is seen on the northern shore.

Staffa, the smallest of five basaltic islands off the north-west side of Mull, has long been celebrated for its basaltic columns and cavern, called Fingal's Cave. The island, or rock, is about a mile and a half in circuit, surrounded by basaltic cliffs of variable height: the highest on the south-west, as measured by Dr. Macculloch, is 144 feet. The cliffs generally present a columnar arrangement; but the columns are inclined in various directions, oblique, horizontal, or erect. There are three distinct beds of trap, of different characters, the lowest consisting of that conglomerate called trap tuff; the next of the great columnar basaltic range; and the uppermost of an irregular mixture of columnar and amorphous basalt. These beds dip towards the east, at an angle of elevation of about 9°. The lowest bed on the western side of the island, is about 50 feet thick: the middle, or columnar bed, varies in thickness from 36 to about 54 feet, which is the extreme height of the columns: the upper or amorphous bed of basalt measures 58 feet in thickness above the highest columns, but in other parts it is much thinner. Mackinnon's Cave is an opening in the lowest bed: it is about 58 feet high, measured from the sea at quarter-ebb tide. Its breadth is 48 feet, and its length 224 feet. The sides of this cavern are smooth, being formed of conglomerate, and are deficient in that regularity which constitutes the beauty of Fingal's Cave.

The latter is one of the most remarkable natural excavations of which we have any account. It is formed in the columnar bed of basalt, where it declines to the level of the sea, which washes the feet of the columns

that range on either side the cavern like the pillars of an immense cathedral, placed close to each other, the sea forming the floor. The top of the arch at the entrance is 66 feet above the level of the sea at mean tide: the bed of amorphous basalt that rests upon the columns is 36 feet thick: the breadth of the cave at its entrance is 42 feet, and its length 227 feet. The pillars on the western side are 36 feet in height; but on the eastern side they appear lower, being partly concealed by broken columns in front of them. The height of the cave diminishes within from 50 to 40 feet, which is also the altitude at the extremity. —(See *Dr. Macculloch's Western Islands of Scotland*, vol. ii. pp. 16, 17.) There are other caverns of less note in the island.

The surface of Staffa is covered with a good soil, producing luxuriant grass. Various blocks of granite, quartz rock, and schist, similar to the rocks on the mainland of Scotland, are spread over some parts of the island, though no rocks of this kind appear *in situ*. The basalt, of which the columns in Staffa is composed, is very similar to that of the Giant's Causeway in Ireland. *Were the two basaltic formations ever united?* This is not very improbable: the basalt of Ireland is evidently of submarine origin; and it appears to be highly probable that the basalt of Staffa was erupted under the sea, although no calcareous marine beds are found upon it. St. Kilda, the most remote of the Western Islands, is composed of several varieties of trap rocks. There are several small isles, composed principally of trap rocks, in the vicinity of Mull; but they do not present any peculiarity of structure or composition. South of Mull, there is a group of islands, which Dr. Macculloch calls the Schistose Isles: the principal of these are Jura and Islay. They are chiefly composed of clay slate, chlorite slate, quartz rock, with some mica slate, and of various admixtures of felspar and hornblende, and also greywacke and limestone: the latter is but in small quantity, and interposed between laminæ of slate rocks. The different rocks succeed each other: the dip is to the south-east; but, as several of these rocks are repeated in succession, the exact order of super-position cannot be traced. Were it not for the absence of granite and gneiss, these islands might be considered as a type of all the primary districts in Scotland north of the Clyde. The most remarkable feature in their geology is the great proportion of granular quartz, called quartz rock. Mountains of quartz rock most frequently assume the conical form. The three remarkable mountains in Jura, called the Paps, are composed of this rock: their average height about 2,500 feet.

The most southerly of the Scottish Isles deserving attention is Arran. Its situation near the mouth of the Clyde rendering it easy of access, it is more frequently visited by geologists than any of the Hebrides. If a line be drawn in a north-east and south-west direction from the south of Brodick Bay, on the east, to Machrie Water, on the west, it will divide the island into two nearly equal parts, distinguished by their external features and internal structure and composition. In the northern portion, the central parts are occupied by lofty mountains of granite, surrounded by different varieties of slate rocks, except on the eastern side, where masses of conglomerate skirt the granite mountains. As seen from near the coast, the granite mountains rise

with much grandeur, and their serrated peaks remind the traveller of the granitic Aiguilles in the vicinity of Mont Blanc, in Savoy. The highest granite mountain in Arran, Goatfell, is 2,865 feet above the sea. The southern portion of Arran is chiefly occupied with secondary strata, covered for the greater part with masses of porphyry and trap, which form the principal hills in this division of the island. The secondary strata of Arran consist, according to Messrs. Sedgwick and Murchison, in an ascending series, of old red sandstone and conglomerate, some few beds of mountain limestone, over which are various sandstones, and shale of the coal formation, containing some coal, which was formerly worked. The igneous rocks consist of a great variety of porphyry, clinkstone, claystone, greenstone, and pitchstone: the latter mineral forms veins of considerable width, intersecting the secondary strata: it passes in some instances from a semivitreous state into a rock which differs little from basalt. These pitchstone veins have excited the attention of geologists, as they present striking indications of their igneous origin.

The Western Islands of Scotland, like the primary districts in the mainland, contain few mineral or metallic treasures that have hitherto been made available for useful purposes: this may be owing to the dangerous and tempestuous seas which surround them, and render their access difficult, except in the summer months; and, probably, they have never yet been examined with the minuteness of research that may be necessary for the discovery of metallic repositories.

The mainland of Scotland, north of the line we have supposed to be drawn from the mouth of the Clyde, in a north-east direction, to the German Ocean, contains almost every variety of primary rocks, with their diversified admixtures and gradations, and a great number of minerals, regarded as rare by collectors. Gneiss occupies the largest portion of the surface. Mica slate is next to it in extent, after which come clay slate, quartz rock, and old red sandstone. Extensive masses of granite are irregularly interspersed among these stratified rocks, but nearly all amidst the gneiss. No coal has been discovered in this part of Scotland, except a small deposit at Brora in Sutherland: it has few metallic veins; and its mineral exports are chiefly roofing slate, and stone for building or paving.

This extensive primary country is everywhere bounded on its southern side by beds of red sandstone and conglomerate, which will afterwards be noticed. The prevailing rock that extends from Argyleshire to Kincardineshire is mica slate, which is skirted by clay slate and chlorite slate: these pass by gradation into the former. The chlorite slate at Inverary is sectile, and may be easily shaped into building stone. The castle of the Duke of Argyle, in the vicinity of this town, is built of it. Ben Lomond and many of the mountains in the Grampian range are composed of mica slate, intermixed with hornblende slate and quartz rock, and, in some parts, with a small portion of crystalline limestone. Such are also the prevailing rocks that surround Loch Tay, and the mountains Ben Lawers and Schiehallion, with various alpine ranges in this part of Scotland. On the west, near Inverary, rocks of ancient porphyry appear, and extend southward nearly to Loch Gilp. Ben Nevis, near Fort William, Inverness-shire,

4,370 feet in height, is composed of granite and ancient porphyry, which, like that of Inverary, seems to be a variety of granite, wherein the felspar greatly predominates, and is nearly compact. Near the western coast gneiss is the prevailing rock; and on the eastern coast, in Aberdeenshire and Banffshire, granite and gneiss are the prevailing rocks. They are continued thence to the northern extremity of Scotland; but in Caithness, and part of the adjacent counties, the primary formations are covered by red sandstone and conglomerate. The granite of Aberdeen is generally small-grained: both the granite and gneiss are intersected with numerous veins of larger grained granite, in which the felspar and quartz are crystallised in distinct concretions of considerable size, and the mica occurs in hexagonal plates of two or more inches in diameter. The promontory of Cape Wrath, on the north-west extremity of Scotland, is composed of gneiss and hornblende slate; but is so much intersected, in every direction, by granite veins that they appear to form the greater portion of the rock itself. At Portsoy, in Banffshire, there are beds of beautiful dark green serpentine, and good specimens of graphic granite.

Many of the mountains, which appear externally composed of mica slate and other schistose rocks, have a central axis of granite. This is the case with Cairngorm, in Inverness-shire: from this mountain the crystals of smoke-coloured quartz, called Cairngorm stones, are obtained. The most alpine parts of the Highlands of Scotland are Inverness-shire and the western side of Perthshire. North-west of Loch Linnhe and Loch Ness the mountains generally decrease in altitude; but some of the mountains in Ross-shire and Sutherland are among the highest. Benwivis, in the former county, is 3,720 feet, and Benmore Assynt, in the latter, is 3,231 feet, above the level of the sea. But Ben Macdhu in Aberdeenshire is the most elevated mountain in Scotland, or Britain, being 4,390 feet in height. (See p. 229.) Snow often remains on the northern sides of the higher mountains during the whole year. It has been seen on Ben Ledi, in Perthshire, in the month of August, though it is 1,000 feet lower than Ben Lawers, in the same county. The bottoms of the alpine plains and valleys in the Highlands are often filled with vast accumulations of alluvium, composed of sand and immense blocks of primary rocks. Other alpine valleys and plains are covered with mosses, which sometimes are found, particularly on the north-eastern sides of the mountains, at an elevation of 1,500 or 2,000 feet. It would exceed our limits to enumerate and describe the lochs or freshwater lakes of Scotland: they generally take the same direction as the principal mountain ranges, viz., from south-west to north-east. Loch Lomond, the most considerable of the freshwater lakes, varies from this direction, and extends north and south about 24 miles. It is about 7½ miles broad near its southern extremity, but very narrow at its northern end. The general character of the Scottish lakes is that of solemn and lonely grandeur:—

> "Where melancholy sits, and round her throws
> A death-like silence and a dread repose."

In the vast extent of primary mountains, which constitute the Highlands of Scotland, very few metallic ores have been found. Lead

mines were formerly worked at Tyndrum, near the western end of Loch Tay. Lead mines of considerable depth are worked at Strontian, in Argyleshire, at which place the carbonate of Strontian was first discovered. There is one mineral production, the occurrence of which in mica slate, we believe, is peculiar to Scotland. At Glen Strathfairar, in Inverness-shire, veins of plumbago run between the laminæ of the mica slate, and have taken the contorted form so common to that rock.

The peninsular headlands on the western coast of Scotland, north of the Isle of Skye, are covered in many parts with beds of red sandstone and conglomerate, often of great aggregate thickness, and resting upon gneiss, which they sometimes cover to the depth of from 1,000 to 2,000 feet. The beds occur nearly horizontal, and also highly inclined. Detached hills of this conglomerate attain the elevation of 3,000 feet, but the base to a certain height is gneiss. The conglomerate hills extend through Ross-shire, along the coast to near Cape Wrath. These isolated hills of conglomerate are regarded as the remains of extensive beds, which have been torn up, and cut away by the great disturbing and denuding forces that have acted on the surface of our planet at an early geological epoch. The beds are of extreme hardness, and, in a certain degree, crystalline; but they contain everywhere, in a greater or lesser quantity, imbedded fragments, and rolled masses of the lower rocks on which they rest. Some of the finer grained beds resemble granular quartz rock; others consist of fragments and rounded pieces, apparently cemented by a siliceous solution into one crystalline mass. In Caithness, a conglomerate with sandstone and irregular beds of limestone, like the cornstone of Herefordshire, would seem to identify this formation with the old red sandstone of the latter county. There is an extensive formation of bituminous schist in Caithness, between the upper and lower sandstone and conglomerate: the schist contains fossil remains of fish. A great proportion of Caithness is covered with these beds. Beds of sandstone and conglomerate occur on the shores of the Dornoch and Moray Friths. Near Brora Loch a part of the oolite series and lias covers red sandstone: some seams of imperfect coal occur in these strata. Beds of sandstone and conglomerate also extend along part of the great valley of Scotland, in the line of the Caledonian canal. Along the southern flanks of the Grampian mountains, beds of conglomerate and sandstone extend from the German Ocean to the Western Sea, covering the whole country between the Grampian mountains and the basaltic and coal districts on the Forth and the Clyde. Isolated masses of trap rocks range from the south-west of the Clyde to near Stonehaven. The trap, in some instances, forms caps on the summits of hills of sandstone: in other parts, it forms entire hills of considerable magnitude: it is sometimes irregularly interstratified with sandstone. The rock on which Dunbarton Castle stands is basalt. Basaltic rocks may be traced thence to Stirling, Perth, and Montrose.

The Ochill hills, situated in this line, extend from the confluence of the river Allan with the Forth to the north-east extremity of Fife. They consist chiefly of porphyry and amygdaloid. The hill of Kinnoul, near Perth, is an amygdaloid, and contains numerous nodules of agate

and cornelian. The summits of Arthur's Seat and the Castle Hill at Edinburgh are composed of basalt; the Calton Hill of porphyritic claystone. Claystone, clinkstone, and felspar rocks, occur at Braid hills and the Pentland hills. Almost every variety of trap rocks occurs in the vicinity of Edinburgh. The interesting phenomena they present gave rise to much geological discussion a few years since, when the origin of these rocks was considered doubtful. Geologists are now generally agreed that they have been formed by subterranean heat: indeed, the basalt of Arthur's Seat is identical with a basalt seen in situations near the ancient volcanos in Auvergne, which passes from a compact form to that of scoriaceous lava.

We come now to that important mineral district, the great coalfield of Scotland: it extends, with little interruption, from the eastern to the western coast; but the most valuable portion of this field is situated on the north and south sides of the Forth (not exceeding the average breadth of 10 or 12 miles on each side), and on the north and south sides of the Clyde, ranging through Renfrewshire, part of Lanarkshire, and the north of Ayrshire. This great coal-field has been described as situated between a line drawn from the mouth of the Tay, on the east coast, by Stirling, to the north end of the Isle of Arran on the west; and another line drawn from Dunbar, on the east, to Girvan in Ayrshire, on the west coast. The greater part of the coal of Scotland will certainly be included between these lines, which are nearly parallel; but, strictly speaking, these limits include several large detached coal-fields, often separated by intervening tracts of land, in which no coal is found. The Fife coal-field, north of the Forth, extends from Stirling to St. Andrews. The strata are arranged in trough-shaped concavities. The richest part of the coal-field, north of the Forth, is stated to be between Dysart and Alloa. On the south side of the Forth an extensive coal-field, which lies to the south and east of Edinburgh, covers an area of about 80 square miles. The strata in the vicinity of Edinburgh, in the north-west division of this coal-field, dip to the south-east, at an angle of about forty-five degrees, and, in some places, are nearly perpendicular; but, in the south-east division of the field, the strata are comparatively level. To the west of Edinburgh, for some miles, are considerable beds of sandstone and limestone, and some small seams of coal; but at Bathgate workable coal strata commence, and extend westward, with some interruption, to the neighbourhood of Glasgow. The Clyde and the Forth form the southern and northern boundaries of this field: beyond Blantyre, the coal extends, on the south side of the Clyde, to the Cathkin hills. After passing Glasgow, this coal-field stretches westward, on the south side of the Clyde, and occupies the valley in the line of the Ardrossan Canal; extending through Renfrewshire to Dalry, in Ayrshire. Other detached coal-fields occur in various parts of Ayrshire. The most southerly is near Girvan. The above coal-fields constitute the principal mineral treasures of Scotland, on which it depends for its manufacturing and commercial prosperity. Ironstone, of an excellent quality, abounds in many of the coal-fields, and has, to use the words of Dr. Millar, "given birth to numerous manufactures, and, in particular, to the operations of the smelting furnace, in the reduction of the ores of iron, as well as of converting that

invaluable metal into the multifarious utensils and articles of machinery, for which the peculiar properties which it possesses, in its various states of combination, render it eminently useful. To verify this remark, the iron-works at Shotts, Cleland, Airdrie, and Clyde, and particularly the grand establishment at Carron, need only be mentioned." The iron trade of Scotland has increased with unprecedented rapidity since the above account was written. The total amount of iron produced in 1840, by 490 furnaces in England, Scotland, and Wales, was estimated at 1,396,400 tons, of which 241,000 tons were produced by 70 furnaces in Scotland. But at present (1846) the production of iron in Scotland probably exceeds 550,000 tons. The abundance and cheapness of coal has enabled Glasgow to rival Manchester in the manufacture of cotton goods of almost every quality.

The coal strata, in many of the coal districts, are much broken and deranged by basaltic dykes that traverse them. In the Dysart coal mines, at the depth of 270 feet, the main coal was 21 feet in thickness. At the Quarrelton coal-field, in Renfrewshire, there is a mass of coal from 50 to 60 feet thick in some parts: it is composed of five distinct seams, separated by thin strata of stone and ironstone. This great thickness appears to have been produced by a disturbance of the strata, which has caused the series to break and overlap, or double over each other, in one part of the field. The disturbing cause was, in all probability, an irruption or protrusion of the basalt, which covers and underlies the coal.

In Hurlet coal mine, 3 miles south-east of Paisley, which has been worked for two or three centuries, the bed of shale over the coal, in the old workings, has become converted into alum slate by the combination of sulphuric acid, from the decomposition of pyrites with the alumina or clay. The quantity of alum is so great that a large alum-work has been many years established there.

A small coalfield exists in the upper part of Dumfries-shire; and rocks belonging to the lower part of the coal formation are found in Berwick and Roxburghshire, but they contain no beds of coal worth the trouble of working.

The southern part of Scotland, extending from the English border to the Forth and Clyde, comprises the most fertile and best cultivated lands in Scotland; but it partakes, in a considerable degree, of the character of an alpine country; and the leading features of its geology resemble those of Cumberland, and the portion of Northumberland adjoining Scotland. Several of the mountains rise from 2,000 to near 3,000 feet above the level of the sea: the rocks of which they are composed are, for the most part, of the transition class. Greywacke and coarse slate are the most prevailing beds. Three large masses of granite occur in Kirkcudbrightshire; one at Loch Doon on the borders of Ayrshire, one near New Galloway, and the third and largest on the Solway Frith, south from Dumfries. On the eastern side, the range of Cheviot Hills, composed of porphyry, forms a conspicuous feature in the country. The beds in the vicinity of these porphyritic rocks appear to have suffered considerable derangement of position by the protrusion of the porphyry. The most valuable mining district that has been worked in Scotland is that of the Lead Hills, in Lanarkshire. The prevailing

rock is stated to be greywacke. The veins that intersect this rock are rich in lead ores: they vary much in width: one vein, called the Susannah vein, contained a mass of ore 14 feet thick. The mines at Lead Hills formerly produced 1,400 tons of lead per annum, and those of Wanlock Head 1,000 tons. In the soil which covers the Lead Hills and Wanlock Head, a considerable quantity of gold was formerly found. In the time of Queen Elizabeth, 300 men were employed in searching for and washing the gold; and a quantity worth 100,000*l.* sterling is said to have been found in the course of a few years. During last century the works were resumed; but the quantity of gold discovered was not sufficient to repay the expense of the operations. The gold was found immediately under the vegetable soil; and was obtained by repeatedly washing the earthy matter with which it was intermixed, the gold subsiding to the bottom. Whether the sand and alluvial soil in the beds of rivers, in any other part of Scotland, have been examined in this manner, we are not informed. Gold may be obtained from the sands of rivers in most of the alpine parts of Europe, but seldom in sufficient quantity to repay the expense.

The Shetland and Orkney Islands may be regarded as an interrupted extension of the primary range, that passes through Caithness. In the Shetland Islands the rocks are much broken by the violence of the waves, and in some parts are cut into various fantastic shapes, presenting the ruins of isles now nearly obliterated. In the Orkney Islands, the primary rocks are covered in many parts by thick beds of sandstone and conglomerate.

The Isle of Man.—It may be doubtful whether this island should be classed geologically with England, Ireland, or Scotland, as it is nearly equidistant from each country: its general character resembles that of the alpine parts of the south of Scotland. From the sea, the Isle of Man presents a mountainous appearance: a group of mountains, of moderate elevation, range in a south-west and north-east direction: the highest of these is Sneafel, 2,004 feet above the level of the sea. From its summit, the Mourne mountains in Ireland, the Cumberland mountains, and the mountains of the south-west of Scotland, are distinctly visible. The hilly and mountainous district in the Isle of Man, which forms the greatest part of the island, is chiefly composed of clay slate, containing some beds of roofing slate. Low rocks of granite make their appearance in some parts of the slate district. On the southern end of the island, mountain limestone rests upon the slate, separated from it by a bed of conglomerate. The limestone extends from Poolvash to Derby Haven, a distance of about 5 miles. The northern end of the Isle of Man is nearly flat, and is chiefly composed of alluvial soil. Veins, containing ores of lead, zinc, copper, and iron, intersect the mountains in a north and south direction: the first, which are worked, produced, in 1839, nearly 2,000 tons of lead. As might be expected from the geology of the island, no coal has been discovered in the Isle of Man: the inhabitants procure their fuel from Whitehaven.

Sect. 6.—*Climate.*

The climate of Scotland depends upon the same physical circum-

stances that have been specified when treating of that of England, the chief differences between them being occasioned by the different geographical relations of the two countries. Scotland is remarkably indented by bays, creeks, friths, or arms of the sea: she has a much more limited extent of inland superficies than England, a wider expanse of ocean on the east, and is placed at a greater distance from the equator. In consequence of this last circumstance, she is more subject to cold winds from the north, to falls of snow, and to ungenial and late springs and summers, than her more southerly neighbour. But the proximity of even the more inland places to the sea, and its tempering influence, prevent snow from continuing long undissolved, and the temperature from remaining, for any very lengthened term, at the freezing point, except in the more mountainous parts. There, however, snow often lies for a very long time, and the labours of the Highland farmers are not unfrequently interrupted for two, and even three, months. Before reaching Scotland, the east and north-east winds have to traverse a wider superficies of ocean than before reaching England, so that they do not reduce the temperature so low in the former as in the latter; and heavy falls of rain more frequently come from these quarters in Scotland than in England.

Owing to these causes, the mean annual temperature of Scotland is very high for the latitude, being about 46½° in places near the level of the sea. In the more southerly parts of the kingdom the climate differs but little from that of the northern parts of England. Dr. Brewster states the mean annual temperature to be 48·36 at Leith. At Edinburgh, which is elevated from 300 to 400 feet above the level of the sea, and situated about two miles from it, the *annual* temperature is 47·8, and this may be taken as a near approximation to that of the more inland parts of the south of Scotland: the mean temperature of *winter* being 38·6; of *spring*, 46·4; of *summer*, 58·2; of *autumn*, 48·4: the *coldest* month being 38·3, and the *warmest* 59·4.

From a long series of observations made at Gordon Castle and at Kinfauns Castle, between the latitudes 57° and 58° N., the mean annual temperature was found to be 46$\frac{8}{10}$°. At Huntly Lodge, which is 440 feet above the level of the sea, it was 45$\frac{8}{10}$°. The observations published in the *Transactions of the Royal Society of Edinburgh* very closely approximate to the above, and furnish the following additional results:—

St. Andrew's, on the east coast, in latitude 56° 20′, has a mean annual temperature of 46$\frac{8}{10}$°; that of the winter months being 39·12; spring, 45·2; summer, 56·4; and autumn, 47·7.

At Wick, in Caithness, in latitude 58° 28′, the mean annual temperature is 46$\frac{7}{10}$°; that of the winter months being 40·35; spring, 44·41; summer, 53·77; and autumn, 48·82.

At Samburgh Head, the most southerly promontory of the Shetland Isles, in latitude 59° 52′, the mean annual temperature is 45½°; that of the winter quarter being 40; spring, 43·29; summer, 50·63; and autumn, 47·48.

The *barometric ranges* are often very great and sudden, and, as respects the British Isles especially, are evidently increased with the distance from the equator. On the southern coasts of Great Britain

the range of the barometer seldom exceeds two inches, and in the more inland parts of the southern counties it is rarely so much. In the south of Scotland it is about two inches and six or seven tenths; but in the Orkney and Shetland Isles it is fully *three* inches.

The quantity of *rain* which falls on the east side of Scotland varies from 22 to 26 inches, whilst, on the west side, and in the Hebrides, it is nearly twice as much, ranging from 35 to 46 inches, according to situation. Mr. Adie states the mean annual fall of rain at Edinburgh, for the years 1824 and 1825, to have been 23½ inches, which was distributed as follows:—

	Inches.		Inches.
January	1·090	July	0·860
February	1·360	August	1·690
March	0·880	September	2·230
April	0·990	October	3·460
May	1·940	November	4·140
June	2·030	December	2·080

Mr. Dalton assigns 37 inches as the annual fall at Dumfries, the last six months of the year being the most rainy, and each furnishing nearly an equal proportion. There is a very remarkable difference in the amount of rain that falls in one year from that which falls in another, in all situations where observations have been made. At Dalkeith, a few miles from Edinburgh, at an average of eight years, the annual fall was 22$\frac{6}{10}$ inches; at Glasgow, at an average of thirty years, it was 30 inches; at Dundee, at an average of nine years, 22 inches; at Peebles, at an average of fourteen years, 28·7 inches; at Longforgan, on the Tay, at an average of twelve years, 24·5 inches; at Belmont, in Strathmore, at an average of ten years, 30½ inches; at Carbeth, in Stirlingshire, at an average of eight years, 42 inches; at Mount Stewart, in Bute, at an average of seven years, 46·6 inches. Sir John Sinclair estimated the mean annual fall of rain in Scotland at 31 inches. Argyle, with its islands, has, perhaps, the most rainy climate. Ireland is interposed between Galloway and Ayrshire, and the Atlantic Ocean; but Argyle is exposed, without any such protecting screen, to its entire influence. "Its lofty mountains attract the vapours that arise from the ocean, and the clouds burst in torrents upon the valleys. In the district of Cowall, and probably over the whole county, the face of the heavens is generally lowering and cloudy; a serene sky is seldom to be seen. The winds, prevented from a free circulation, rush through the glens with irresistible violence; and at the bottom of high hills, and in narrow valleys, the transitions from heat to cold are sudden and excessive. The winters are, for the most part, mild and temperate; but the summers are frequently rainy and cold. Frosts are not intense, nor do snows lie long."—(*General Report of Scotland*, Appendix, i. 123.) We are not aware that observations with the rain-gauge have been made in Orkney or Shetland; but we believe that the quantity of rain falling in them is not much under that which falls on the western coast. The truth is, however, that the *quantity* of rain that falls annually in any country is a very inferior consideration compared with the *distribution* of that quantity over the year. It is by this that the operations of the agriculturist are principally influenced, and it is this that determines

the character of a climate. A great deal of rain may fall in a country; but if, like tropical rains, it mostly falls within a short space of time, as two or even three months, its climate is said to be dry; whereas a country, with a much smaller total fall of rain, but distributed over a half or two-thirds of the year, is said to have a wet climate.

From an analysis of the statistical accounts of Scotland, it would appear that the average number of days in which either rain or snow falls, in parts situated on the west coast, is about 200; on the east coast about 145. And it is owing to this excess in the number of rainy days, more than to the excess in the total quantity of rain, that the climate of the western side of the kingdom is said to be wet as compared with that of the eastern side, and that it is less fit for the maturing and ripening of corn.

Winds in Scotland are influenced by the physical circumstances already explained (see sect. on the *Climate of England*); but they are even more variable than in England, and more boisterous, especially about the equinoxes. Westerly winds are the most prevalent, particularly during autumn and the early part of winter; but north-east winds are prevalent and severe, especially on the east coast, during March, April, and May, and sometimes part of June. High gales are generally from the west. The weather is exceedingly variable in winter and spring, particularly in the northern and western districts. The occurrence of snow, frost, sleet, and rain, with calms and high winds, in the same day, is by no means unusual. In the most northerly parts, snow generally begins to fall about the middle of November, and continues or recurs until March or April. Thick fogs, with drizzling rains, are frequent in spring and autumn, and generally throughout the year; especially in the Western and Northern Isles, and when the wind blows from the east. In the Shetland and Orkney Isles the heaviest and most prolonged falls of rain are from the east and south-east.

The influence of the climate upon the vegetable productions of the country is very considerable; but much is also owing to the nature of the soil, its height above the level of the sea, exposure, &c. The numerous and extensive peaty moors and morasses in hilly districts, particularly in the northern and insular parts, seem to be the result chiefly of low temperature, humidity of the air, and imperfect drainage. Some of these morasses have been formed within a comparatively recent period; and if they have not actually deteriorated the climate, they must, at all events, have materially countervailed the influence of the ameliorations growing out of improvements in cultivation, drainage, &c.

During summer and autumn vegetation is luxuriant, and, even in the eastern and southern districts, is very seldom interrupted or stunted from deficiency of moisture. The lateness of spring and summer, the occasional prevalence of north-easterly winds and fogs during these seasons, the frequent short duration and rarity of sunshine with heavy rains in autumn, and the occurrence of high gales in September, are the principal defects, in an agricultural point of view, of the climate of Scotland, and require a degree of exertion, activity, and skill, on the part of the husbandman, to secure his crop from damage, to which the farmer in the south of England is unaccustomed. These circum-

stances, too, either altogether prevent the cultivation of wheat to the north of the Grampians, except in a few peculiarly favourable situations along the Moray Frith, or render it uncommonly precarious. It is very rare, indeed, that crops in Scotland suffer from drought or too much heat. Almost all the bad harvests and scarcities that have occurred have been occasioned by the opposite circumstances,—by cold wet summers and autumns.

In the western and northern isles, and in many parts along the western coast, the crops of corn not unfrequently suffer from the spray of the sea blighting them before they reach maturity, while high winds shake or beat the grain from the ear when ripe. Very heavy losses have sometimes occurred from these causes; and hence oats, which suffer most from high winds, are seldom allowed to stand till they be perfectly ripe, and are frequently, indeed, particularly on the west coast, cut down when they are a little greenish. To the circumstances now mentioned is also to be ascribed the deficiency of trees and plantations on both the west and east coasts, but especially on the former and in the Hebrides, and the Orkney and Shetland Isles. There the frequent high gales roll mountainous waves from the Atlantic, the Northern, and German Oceans, that break with tremendous violence upon precipitous cliffs, dashing the spray and foam to a very great height, and carrying them far over the land. The air is, in consequence, saturated with saline particles, which blight the buds, young leaves, and shoots of trees, and entirely prevent their growth.

The favourable influence of the climate of Scotland over the physical and mental powers of the people is sufficiently manifest. No other country, since the revival of learning, has produced, compared with the amount of population, so many individuals distinguished in literature, science, and the arts. And, if we except the inhabitants of a few large manufacturing towns, the strength, activity, and longevity of the natives are, perhaps, nowhere exceeded. Though without any accurate data to go upon, we believe it may be truly affirmed, that the mean duration of life is as great in Scotland as in almost any other country. The number also of those who, having reached a very advanced age, still preserve their mental and bodily powers, is remarkably great. It is not, however, by isolated instances that the longevity and general vigour of the inhabitants of a country should be estimated; but, 1st, by the proportion of those who arrive at an advanced age; and 2nd, by the bodily and mental power possessed by those who attain that age. Now, if we take these for criteria, the salubrity of the climate of Scotland is obvious. We are pretty confident, from extensive observation in different countries, that the proportion of the population that reaches 70 or 80 years of age, and the vigour then remaining, are greater in Scotland than almost anywhere else. The countries which rank next to it in these respects are England, Ireland, Norway, Denmark, the north of France, and the countries bordering on the Baltic.

We do not mean to say that other causes, and those, too, of a very powerful description, have not conspired to produce these effects; but it is admitted, on all hands, that they have not been counteracted, and it would be very easy to show, were this a proper place for such discussions, that they have been materially promoted, by the climate.

The causes of the salubrity of Scotland, and of the longevity of its inhabitants, will be shown more fully hereafter; but we may remark, that the objections urged by ill-informed and careless observers to the climate, viz., the prevalence of stormy and changeable weather, and the low range of temperature, are the chief causes of salubrity. From whatever quarter, except one, the wind may blow, a wide expanse of sea is passed over; and the air, though moist, is purified from injurious emanations, which are readily absorbed by the ocean. The country contains comparatively few physical sources of disease. Injurious exhalations from the land are scarcely anywhere observed to prevail: the low grounds in the southern counties are too highly cultivated to produce them; and the moors and mosses, in the northern and more elevated districts, consist chiefly of antiseptic substances; so that the emanations from them, though they reduce the temperature, are in no other way deleterious. Owing chiefly to the circumstance of the winds blowing over a great extent of ocean, the principal foreign matters which the air contains are watery vapour, saline particles dissolved in that vapour, and minute portions of iodinous fumes. But the temperature in the latitude of Scotland will not admit of the air holding much water in solution; and a moderate quantity of moisture is evidently conducive rather than injurious to health. The other substances specified are present in such minute proportions that no injury can result from them.

Scotland being one of the most salubrious countries in the world, it need not be matter of surprise, if many of its sons, who select other countries for constant or occasional residence, are disappointed in their anticipations of improved health; and that they frequently bring back to their native land prolonged and dangerous diseases, the causes of which either do not exist in it, or occur slightly, and at short intervals.

For accounts of the Botany and Zoology of Scotland see the sections under those heads, p. 99 and p. 109.

Sect. 7. *Civil Divisions.*

We find ourselves, in regard to the ancient history of the territorial divisions of Scotland, both civil and ecclesiastical, in a situation similar to that in which we stand regarding most subjects of Scotch antiquities. We have a large mass, probably a sufficiency, of materials; and these have been successfully employed in the elucidation of some local questions. But no satisfactory general or systematic view of the whole subject has hitherto been given. Scotland has had some profound antiquaries, many clever ones, and a few more noted for ingenuity than honesty; but she has had neither a Camden nor a Selden.

Shires.—The Latin name of the sheriff (*vicecomes*), and the supposed facts in the history of his office in England, have furnished some Scotch lawyers with plausible grounds for saying, that the sheriff was originally the deputy of the *comes* or earl. But, whatever may be thought of the etymology, and whatever may have been the origin of English sheriffdoms, no evidence is believed to exist in Scotch history to show that Scotch sheriffs, even on the first institution of their office,

were deputed by or connected with the earls. And it is, at all events, certain that from the time when sheriffdoms began to be instituted, the country was progressively divided into shires, and subjected to the jurisdiction of sheriffs, without the smallest regard to the powers of the earls, or to the territorial extent or boundaries of earldoms. The old earldom of Lennox included several districts, which, at a very early period, were divided into separate shires or sheriffdoms: the shire of Perth, again, included several earldoms; and some districts, of which Berwickshire is one, were erected into shires, without seeming to have been ever under an earl.

No trace of sheriffdoms in Scotland has been found further back than the twelfth century. The office and the territorial division are mentioned in the reigns of Alexander I. and David I.; but a considerable period elapsed before the office, or the division of territory, became general. Some districts, indeed, as Galloway, Ross, and the Western Isles, were not placed permanently under sheriffs for some centuries after that time: with these exceptions, however, Scotland appears to have been universally divided into shires, each subject to its local judge, the sheriff, as early as the accession of Robert Bruce. The sheriff was the king's judge, and his powers, and the boundaries of his shire, or sheriffdom, were determined by royal grants. But so early as the period last mentioned, the office of sheriff had, most unfortunately for the country, become hereditary in certain families. And either at this early period, or not long after, numerous hereditary functionaries, with powers like sheriffs, were established under the names of Stewarts of Stewartries, Baillies of Bailliewicks, &c., whose authority extended over portions of most shires in Scotland. The legitimate influence of government, and the speedy and impartial administration of justice were alike obstructed by the functions of sheriffs and other local officers having thus become hereditary, and in a great degree independent of the Crown, and by the subdivision of the shires. But though the mischiefs and inconveniences of such a state of things be obvious, and had been long complained of, they continued to spread their baneful influence on all sides down to the middle of last century. The occurrences of 1745, however, having set the incompatibility of hereditary jurisdictions with the maintenance of the public tranquillity, and the introduction of an improved plan of government, in the clearest light, they were abolished in 1747, compensation being at the same time made to the proprietors. Responsible and properly qualified parties were then nominated by the Crown, nearly in the same way as at present, to discharge the duties of sheriffs in the different counties. The division of the kingdom into the latter, was continued nearly on its old footing, except in a few cases in which two small counties were united under one sheriff. It may be worth while to notice, that there is in Scotland no trace of the subdivisions of the English counties, called hundreds, wapentakes, &c.

Parishes.—Some writers have pretended to find the institution of parishes in Scotland as far back as the ninth century: but the evidence is weak, and the arguments rendered unsatisfactory, by the looseness of the phraseology used in the documents founded on; for the word parochia certainly meant, anciently, not parish, but diocese; and in

some of the oldest deeds, which have clear reference to parishes, the name used is the Saxon word shire. Charters and other writs make it certain, however, that the parochial division had been introduced and was familiar in Scotland by the middle of the twelfth century; and canons of the Scottish clergy, passed at two of their general councils, held about the middle of the thirteenth century (1242 and 1269), distinctly recognise the universal existence of the parochial clergy, and the allotment of a fixed district or parish to each individual.

Till the Reformation, the bishops retained the power of uniting and disjoining parishes, and were, probably, the parties who originally introduced the division. Between the Reformation and the Union, several successive commissions of the Scotch parliament held, besides powers regarding teinds or tithes, authority also to unite and disjoin parishes. In 1707, Parliament transferred the powers of these commissions to the Court of Session, continuing to this new commission the powers of the older ones over tithes, and full power to unite and annex parishes; but, for the protection of the tithe-payers, limiting their power of disjoining parishes, transplanting old churches, or erecting new ones, to cases where consent is given by persons possessing 3-4ths of the valued rent of the parish. Under that commission the court continues to act.

Sect. 8. *Statistical Notices of the different Scotch Counties.*

Scotland is divided into 33 counties. We shall notice them in succession, beginning with the most southerly.

1. *Wigtownshire*, a maritime county, occupying the south-west extremity of Scotland, is bounded on the west and south by the Irish Sea; on the north by Ayrshire; and on the east by the Stewartry of Kirkcudbright. It contains 293,760 acres, of which about a third may be arable. Surface hilly, but the hills do not rise to any considerable height. It is divided into 3 districts, viz., the *Machars*, extending from Wigtown and Port William to the Burrow Head; the *Rhynns*, comprising the peninsula formed by Loch Ryan and the bay of Luce, terminating in the mull of Galloway on the south, and Corsewall Point on the north; and the *Moors*, or upper district. The soil of the first two districts is, for the most part, a hazelly loam, dry and well adapted for the turnip husbandry; but near the town of Wigtown there is a considerable extent of rich alluvial land. The moors, which are bleak and barren, comprise more than a third part of the county. Climate mild, but rather moist. Property in a few hands, and mostly under entail; farms middle sized, and uniformly almost let on leases for 19 years. Agriculture in this, as in most other Scotch counties, was formerly in the most barbarous and wretched state imaginable. There was no rotation of crops; the processes and implements were alike execrable; the pasture land was overstocked; and the occupiers steeped in poverty. Marl, of which Galloway contained immense quantities, began to be discovered and applied to the land about 1730; and for a while it caused an astonishing improvement in the corn crops. But their unceasing repetition

reduced the soil to its former sterility; and convinced the landlords that marling, which promised so much, and from which so much had been realised, could be of no permanent utility to their estates, unless the tenants were restrained from overcropping. In consequence principally of this feeling, but partly, also, of the diffusion of intelligence as to such subjects, it was the usual practice, previously to the American war, to prohibit tenants from taking more than *three* white crops in succession; and it was also usual to prohibit them from breaking up pasture land until it had been at least 6 or 9 years in grass. This practice, barbarous as it is, was a vast improvement on that by which it had been preceded; and it prevailed generally throughout Galloway and Dumfriesshire till the beginning of the present century, and in some backward parts lingers even to this day. But in all the best parts of the district two white crops are now rarely seen in succession; and every department of husbandry has been astonishingly improved. Generally, however, the county is better fitted for pasture than for tillage; and it, as well as Kirkcudbright, suffered a good deal from overcropping between 1809 and 1815. Oats and barley principal crops; wheat, however, is now raised in considerable quantities. Potatoes largely cultivated. Turnips have been long introduced, but it is only within the last dozen years that their culture has become an object of general attention; it is now rapidly extending, and large quantities of bone-dust and guano are imported as manure for the turnip lands. Farm-houses and offices mostly new, substantial, and commodious. Roads new, and for the most part excellent. Breed of cattle polled, and one of the best in the empire. Breed of sheep in the low grounds various; in the moors principally the black faced, or Linton, variety. Owing to its vicinity to Ireland, and the easy communication by steamers between Port Patrick and Donaghadee, this county (and in a lesser degree Kirkcudbright and Dumfries) is literally overrun with crowds of Irish labourers in the most abject state of poverty. The latter, indeed, constitute at present the majority of the labouring population, the Scotch labourers having mostly emigrated, some to America and the Colonies, some to England and elsewhere. Wages are consequently low, and though the condition of the immigrants is better than it was in Ireland, it is far from good, and their habits are not materially improved. (See Account of Whithorn, *New Statistical Account of Scotland.*) Average rent of land in 1842-3, 8*s.* 7½*d.* an acre, being the same as in 1810. Minerals and manufactures quite unimportant. Principal rivers: Cree, Bladenoch, and Luce. It is divided into 17 parishes. Wigtownshire returns 1 member to parliament; and the burghs of Wigtown, Whithorn, and Stranraer, in this county, unite with the inconsiderable burgh of New Galloway, in Kirkcudbright, in returning a member. Population of county in 1841, 36,258. Valued rent, 67,642*l.* Scotch. Annual value of real property in 1815, 143,425*l.*; ditto in 1842-3, 135,407*l.*

2. *Kirkcudbright* (*Stewartry of*), a maritime county, forming, with Wigtownshire, the district known by the name of Galloway. It is bounded on the west by Wigtownshire; on the south by the Solway Frith; on the east and north-east by Dumfriesshire; and on the north

and north-west by Ayrshire. It contains 533,760 acres, of which about one-fourth part is supposed to be arable. Surface almost everywhere hilly; and in extensive districts mountainous. The highest point of the Kells range, in the northern part of the county, has an elevation of 2,659 feet; Cairnsmoor of Fleet, one of 2,329 ditto; and Criffel, a detached mountain on the Solway Frith, 1,831 ditto. The arable lands lie principally to the south of a line drawn from Dumfries to Gatehouse; the most fertile being situated on the sea coast, and along the rivers Dee and Nith; but Criffel, and some other mountains of inferior dimensions, are situated within this line. Climate in the lower districts peculiarly mild, but in the upper or mountainous districts it is not unfrequently rather severe. Some large estates; but property, in general, more subdivided than in most Scotch counties. Farms of a medium size; and let on 19 years' leases. Arable husbandry very greatly improved, but the principal attention is paid to the rearing of cattle. Furrow draining has been practised on some farms to a great extent, and with the most perfect success. Galloway formerly possessed a breed of horses peculiar to itself, and well adapted for the saddle, distinguished by smallness of head and neck, cleanness of bone, and hardiness of constitution. But this ancient breed is now almost lost; its place being supplied by horses of a larger size, and more suitable for draught. Breed of cattle excellent. Sheep on the moors and high grounds mostly black-faced; but Cheviots, South Downs, and New Leicesters are introduced into the lower districts, and the first have begun to make their way into the moors. Breed of hogs much improved, and considerable numbers raised. The greater number of the cattle raised in this, and the contiguous county of Wigtown, have hitherto been sent up half fed to the Norfolk fairs, where they are sold to graziers, by whom they are fattened for the London market; but the practice of fattening cattle and sheep at home, particularly the latter, and sending them by steam to Liverpool, is now pretty extensively introduced. Farm buildings vastly improved; and on some estates, indeed, a few were constructed previously to 1815 on an absurdly extravagant scale. All considerable farms have thrashing mills. Towards the middle of last century, the roads in this county were little better than mere footpaths; and, with the exception of the military road from Dumfries to Newtonstewart, the others were in most places quite impracticable for carriages. But now, notwithstanding the unevenness of the country, it is everywhere intersected by uncommonly level, well-made roads; nor is it easy for any one, at present passing through the south of Scotland, to form any notion of the difficulties the traveller had to contend with even half a century ago. Potatoes extensively cultivated. Turnip culture rapidly extending. Kirkcudbright and Wigtown were early enclosed with those dry stone walls, now well known all over the kingdom by the name of Galloway dykes. When properly constructed, they make an excellent and a very durable fence. They are shortly described in another part of this work. Lead mines were at one time wrought near Newtonstewart, but are now abandoned. Lime, coal, and freestone are all imported, principally from Whitehaven, on the opposite coast of Cumberland. Average rent of land in 1842-3, 6*s.* 11½*d.* an acre, having declined about 4*d.* an acre since 1810. Manufactures unimpor-

tant. Extensive cotton works were erected at Gatehouse a good many years ago; but they have proved very unprofitable, and recently have been for the most part abandoned. Principal rivers: Dee (see *ante*, p. 240), Fleet, and Urr: the salmon fisheries on the first important and valuable. The Nith separates Kirkcudbright from Dumfriesshire. Kirkcudbright contains 28 parishes. The county returns 1 member to parliament; and the burgh of Kirkcudbright joins with Dumfries, Annan, &c., in returning a representative. Population of county in 1841, 41,119. Valued rent, 114,597*l.* Scotch. Annual value of real property in 1815, 213,308*l.*; ditto in 1842-3, 193,801*l.*

3. *Dumfriesshire*, a maritime county, is bounded on the south and south-east by the Solway Frith, and part of Cumberland, on the north-east and north by the counties of Roxburgh, Selkirk, Peebles, and Lanark; and on the west and south-west by Ayr and Kirkcudbright. It contains 808,320 acres, of which between a fourth and a fifth part are supposed to be arable. Surface much diversified, but for the most part mountainous. The Hartfell group of mountains lie partly in the parish of Moffat, in this county, and partly in the adjoining county of Peebles. They are amongst the highest in the southern part of Scotland. The summit of Hartfell, in this county, is elevated 2,635 feet above the level of the sea. Many of the other hills have an elevation of from 1,500 to 2,000 feet: and a few, among which are the Queensberry and Lowther hills, rise still higher. They are mostly of an easy curved outline, and, like the Cheviot Hills, are generally covered with a fine green sward. Soils in the lower districts generally light, resting on sand, gravel, or rock. There are some considerable morasses in the lower parts of the county. Climate similar to that of Kirkcudbright. Estates in general very large, and mostly entailed. Farms in the lower districts vary from 100 to 400 acres; in the higher from 500 to 5,000. Leases universal. Arable husbandry much improved during the last 40 years, by the introduction of improved implements, the adoption of a better rotation, keeping the ground cleaner, and by the recent practice of feeding off sheep with turnips. This latter practice has been productive of the greatest advantage both here and in Galloway. So rapidly has it extended, that it is believed there are at present (1846) about *ten times* as many turnips raised as there were in 1830. This extraordinary increase is owing partly and principally to the facilities afforded by steam navigation for the advantageous disposal of the sheep in the markets of Liverpool, and partly to the introduction of bone manure. It has had a wonderful influence in keeping up the rent of land, and improving the condition of the farmers in Galloway, as well as in this county. Fences and farm buildings generally good and commodious. "Let any one look into the cottages, and he will find them nearly or fully as comfortable as the farm houses were 40 years ago; and let him compare the dress of the cottagers, and their mode of living, with that of the farmers at the above distance of time, he will find that at present they are not greatly inferior."—(Art. Parish of Moffat, in *New Statistical Account of Scotland*, No. 2, p. 121.) Cattle principally of the Galloway breed. Sheep one-third black-faced, two-thirds Cheviots, but the proportion of the latter continues to increase. Total stock estimated at 240,000. Pigs extensively

raised, and the curing of pork, bacon, and ham, well understood. Average rent of land in 1842-3, 6*s.* 7¼*d.* an acre. The remarks as to the roads of Kirkcudbrightshire, may, with little modification, be equally applied to those of this county. There are valuable coal and lead mines in the parish of Sanquhar; and limestone and freestone quarries are met with in various parts of the county, the latter being particularly abundant in the vicinity of the town of Dumfries. Principal rivers: Nith, Annan (see *ante*, p. 240), and Esk. Dumfriesshire contains 43 parishes. It returns 1 member for the county; and the burghs of Dumfries, Annan, Sanquhar, and Lochmaben, in this county, unite with Kirkcudbright in returning a representative. Population of county in 1841, 72,830. Valued rent, 158,503*l.* Scotch. Annual value of real property in 1815, 295,621*l.*; ditto in 1842-3, 319,751*l.*

4. *Ayrshire*, a maritime county, lies in the form of a crescent along the eastern side of the Frith of Clyde, having about 75 miles of sea coast. It is bounded on the south and south-east by the counties of Wigtown, Kirkcudbright, and Dumfries; and on the north and north-west by Renfrew and Lanark. It contains 668,800 acres, of which about a half is supposed to be arable. Surface irregular, and in part mountainous. There is a large extent of hill pasture, moor, and bog, particularly in the southern and eastern parts of the county. The arable land lies principally along the shore from Girvan to West Kilbride. The soil in the lower districts, along the coast, is in most parts light and sandy; but in the more inland parts it is principally adhesive clay, and is in some places very fertile. The lower part of the county presents, from the hills on its east and north sides, an uncommonly rich and beautiful prospect. Climate mild, but moister than on the eastern side of the island. Ayr is popularly divided into the three districts of Carrick, Kyle, and Cunningham. The first, which is the largest, lies between the river Doon and Wigtownshire. It contains a large expanse of wild, dreary wastes; but it is not destitute of some very fertile land, particularly the strath along Girvan Water. Kyle, the middle district of the county, lies between the Doon on the south, and the Irvine on the north: more than half this district is in cultivation; and the lowlands, particularly in the vicinity of the town of Ayr, have a rich, luxuriant appearance. Cunningham lies north of the Irvine, between it and Renfrewshire; and, though the smallest, is the most populous, and richest of the three districts. There are several very large estates; but there are also many of the middling and smaller class of proprietors. Arable farms mostly small. Agriculture in Ayrshire, about the middle of last century, was in the most depressed state. It has since been wonderfully improved, and is at this moment in a state of rapid advancement, the farming in parts of Kyle, adjacent to Ayr, being but little, if at all, inferior to any to be met with elsewhere in Scotland. Bone dust and guano are extensively used, and the crops of turnip are excellent. Wheat and barley are both raised; but in Cunningham in 1819 (and we believe the proportion has not very materially varied in the interval) there were 18,582 acres under oats, and only 2,838 under wheat and barley—(*Robertson's Rural Recollections*, p. 163); and in the other districts the proportion under oats was still larger. Beans, pease, and potatoes are also raised; the latter in con-

siderable quantities. Dairy husbandry extensively practised, particularly in Cunningham. The Ayrshire cows are celebrated all over the country as milkers. The well-known and much esteemed Dunlop cheese, so called from a parish of that name in the district of Cunningham, is produced in considerable quantities; but most part of the cheese made in the adjoining parishes, and even in the adjoining counties, is sold as Dunlop cheese. The total stock of cattle in Ayrshire has been estimated at 61,000; and, perhaps, this is not far from the mark, Mr. Robertson having ascertained that the stock of cattle in Cunningham, in 1819, amounted to 21,154, of which 12,563 were dairy cows. The practice of furrow draining, by means of tiles, has been introduced into most parts of Scotland; but it has nowhere, perhaps, been carried to such an extent as in this county. Several millions of drain tiles are now annually manufactured, and the supply is, notwithstanding, in general, inadequate to meet the demand. The Duke of Portland is a very large tile manufacturer, and drains for such of his tenants as require it, on their paying an additional rent of 5*s.* an acre; which is very decidedly under the value given by the drainage to the wet clay soils on which it is practised. And while the produce of the land has been vastly increased by the practice of draining, the climate has been equally ameliorated, and the harvests rendered a fortnight or three weeks earlier than formerly. Farmhouses and offices much improved; but still inferior to what they are in some less advanced parts of Scotland. Fences in the low grounds generally hedge and ditch; and the enclosures smaller than in many other counties. Average rent of land in 1842-3, 11*s.* 3¾*d.* an acre. Roads formerly execrable, now generally good. Minerals important and valuable. Coal is found in many parts of Kyle and Cunningham, and is largely exported from Ayr, Troon, &c. The manufacture of iron has long been carried on at Muirkirk; but of late years it has extended to other districts, and is now in a state of rapid advancement. The make of iron in the county in 1845, was estimated at about 40,000 tons; and this year (1846) it is believed it will exceed twice that quantity. Limestone and freestone are met with in many places. Various branches of the woollen manufacture, especially those of carpets, bonnets, and worsted shawls, have been long introduced, and are now successfully prosecuted on a very large scale at Kilmarnock, and to a less extent at Stewarton, and other towns. Extensive cotton works have been erected at Catrine, on the river Ayr, at Beith, &c.; and large quantities of yarn are woven for the Glasgow and Paisley manufacturers, at Girvan, and other towns. There are some considerable tanneries; and many thousand pairs of boots and shoes are produced for exportation as well as home consumption. Old Cumnock and Mauchline, in this county, are, with the exception of Laurencekirk and Montrose, the only places in Scotland where wooden snuff-boxes are manufactured. They are beautifully jointed and varnished; and are everywhere in the highest estimation. Principal rivers: Ayr, Doon, Stinchar, Girvan, &c. The town of Ayr is connected with Paisley and Glasgow by a railway; and a railway has been constructed between Kilmarnock and the thriving and much-improved port of Troon. Ayrshire contains 46 parishes. It returns 1 member to parliament; and the burghs of Ayr, Irvine, and Kilmarnock,

which are its principal towns, are associated with others in sending representatives to parliament. Population of county in 1841, 164,136. Valued rent, 191,605*l.* Scotch. Annual value of real property in 1815, 409,983*l.*; ditto in 1842-3, 531,319*l.*

5. *Renfrewshire*, a small maritime county, bounded on the south and south-west by the county of Ayr; on the east by Lanark; and on the north and west, by the Frith of Clyde. It contains 145,280 acres, of which about one-half is arable. Surface agreeably diversified. There is a large extent of hilly, moorish ground, particularly in the western part of the county, and along the confines of Ayrshire. From Port Glasgow eastwards, along the river Clyde, the country is comparatively flat. The soil in this as well as in the other parts, is very various: in some places it is thin and sandy, but in others it consists of a deep, loamy clay, abundantly fertile; and being well enclosed with hedges, and ornamented with gentlemen's seats and plantations, it has a rich appearance. There are several large estates, but property is notwithstanding a good deal subdivided. Farms middle-sized. Farm-houses and buildings of a medium quality. Though still rather backward, arable husbandry has been exceedingly improved; but the county is on the whole better calculated for grazing and dairying—the latter being extensively practised—than for tillage. Tile draining and the use of bone manure, guano, &c., are rapidly extending; and the roads, which at the close of the American war were scarcely passable, except during summer and the frosts of winter, are now everywhere excellent. Average rent of land in 1842-3, 21*s.* 2¾*d.* an acre. Renfrewshire derives its principal importance from its manufactures and shipping. Paisley is, next to Glasgow, the principal seat of the Scotch cotton trade; and it has, also, considerable manufactures of silk, wool, &c. Manufacturing industry is extensively prosecuted at Pollockshaws, Neilston, and other places. Greenock and Port Glasgow, particularly the former, are important shipping towns; and besides that commerce and navigation which may be regarded as native to themselves, are the places whence a part of the foreign trade of Glasgow is carried on, though, in consequence of the improvement in the navigation of the Clyde, this branch of their business has diminished, and is diminishing. There are valuable coal mines near Paisley, and in the eastern parts of the county; and limestone and freestone are pretty generally diffused. Principal rivers: White Cart, Black Cart, and Gryfe. Number of parishes, 16. Renfrewshire returns 3 members to Parliament, viz., 1 for the county, and 1 each for the burghs of Paisley and Greenock. Renfrew and Port Glasgow are associated with other burghs in the return of a member. Population of county in 1841, 155,072. Valued rent, 69,172*l.* Scotch. Annual value of real property in 1815, 265,534*l.*; ditto in 1842-3, 474,568*l.*

6. *Lanarkshire* or *Clydesdale*, an inland county, is bounded on the west and south by the counties of Renfrew, Ayr, and Dumfries; and on the east and north by Peebles, Mid Lothian, West Lothian, Stirling, and Dunbarton. It contains 604,800 acres, of which from a third to a half is supposed to be cultivated. Surface very various; in some places mountainous, in others hilly, and in others comparatively flat. The low grounds on both sides the Clyde, from Tintoc to Glasgow,

slope gradually to the north west, and increasing in breadth as the river descends, occupy at its lower end nearly the whole width of the county. They embrace a large extent of fertile and moderately level, but finely diversified, country, interspersed with cultivated fields, thriving plantations, country seats, towns, and villages. Climate, in the upper districts, sometimes very severe; in the lower, mild but humid. Lanarkshire is divided into three wards, upper, middle, and lower; each having a sheriff substitute to superintend its judicial concerns. The *Upper Ward*, of which Lanark is the principal town, comprises nearly two-thirds of the surface of the county; embracing all that extensive portion that lies between Peeblesshire on the east, Dumfriesshire on the south, and Ayrshire on the west. This tract consists, for the most part, of mountains, hills, and wide dreary moors, unsusceptible of improvement. The highest land is either in or contiguous to the parish of Crawford, where the Clyde has its source, adjoining Dumfriesshire and Peeblesshire. Coulter Fell, on the borders of the latter, is 2,440 feet above the level of the sea. The village of Leadhills, near Wanlock Head in Dumfriesshire, has an elevation of about 1,280 feet; and the range of the Lowthers, near Leadhills on the Dumfriesshire border, has, where highest, an elevation of 2,396 feet. Tintoc, on the confines of the hilly district between Biggar and Lanark, is 2,306 feet high. The arable land lies along the Clyde and the Douglas, but principally the latter; the strath becoming more and more extensive as the river advances in its course, and as its elevation becomes less. The *Middle Ward*, having Hamilton in its centre, is rather more than half the size of the Upper Ward. Its surface is comparatively level. There is a considerable breadth of low ground along the Clyde, whence it shelves irregularly to the highest ridge, on each side near the confines of the county; but these ridges, a few summits excepted, do not generally rise more than 700 feet above the level of the sea. The *Lower Ward*, occupying the north-west angle of the county, is of very inferior dimensions as compared even with the Middle Ward; but it is the most fertile, best cultivated, and, having the city of Glasgow within its limits, by far the most populous, rich, and important of the three. The soil of that part of the Upper Ward that is not absolute mountain, moor, or bog, is principally dry, light, and friable. In the Middle and Lower Wards, the soil is principally a retentive clay; but in parts it is loamy, sandy, gravelly, &c. About three-fourths of the county belong to very large proprietors: remainder parcelled into comparatively small properties. Stock-farms large; tillage-farms of various sizes, but the greater number rather small. Farm houses and buildings greatly meliorated, and now equal to those in most improved districts. Agriculture in a pretty advanced state. Drainage, though essential, was long too much neglected; and though it has been for some time prosecuted with great spirit, it is still in many parts very deficient. A good deal of wheat is raised in the Lower and Middle Wards; but oats is the principal corn crop, and next to it barley, or rather bear. Turnips extensively cultivated. The use of bone dust and guano as manures for raising turnips has been recently introduced into some of the least improved parishes in the county, and has been of the greatest advantage. The statements of the reverend author

of the account of the parish of Avondale, or Strathavon, in the New Statistical Account of Scotland, (Lanarkshire, p. 307,) in regard to the progress of agricultural improvement, may be applied with little modification to the entire county. "Within the last 30 years the rental of the parish has been doubled. Vast quantities of marsh and moss have been reclaimed, and are now yielding most abundant crops. The Strathavon moss, consisting of above 200 acres, and which, little more than half a century ago, was perfectly worthless, is now drained and improved, and is, perhaps, more productive than any land in the parish. Some of it is let as high as 4*l.* per acre. Throughout the parish the farmers are actively engaged in furrow draining their lands; and the process may still be carried on to a great extent, and to very great advantage." Apples, pears, plums, &c., a species of crop but little known in other parts of Scotland, except in gardens, are raised pretty extensively in what is called the *Trough of the Clyde*, that is on the low flat lands on the banks of the river, principally between the lowest waterfall and the mouth of the South Calder. It is supposed that about 550 acres are occupied with orchards. The produce varies extremely in different seasons. In one year, the fruit produced from half an acre of land may sell for 150*l.*; but in other years it may produce little or nothing. (*Naismith's Clydesdale*, p. 132, ed. 1806.) There must of course be a good deal of market gardening carried on in the neighbourhood of Glasgow. The dairy system has been pursued for a lengthened period, and with much success, in Lanarkshire. Ayrshire cows are the most common stock; and some farmers have from 15 to 40. Cheese mostly made to imitate Dunlop. The draught horses of this county are well known, and are held in high estimation all over the south of Scotland and the north of England. Mr. Naismith estimated the horses employed in agriculture in Lanarkshire, inclusive of the young ones not fit for labour, at about 8,000.—(*Survey*, p. 101.) And if this estimate was nearly accurate at the time (1806) when it was published, their number may now be safely estimated at from 12,000 to 14,000. Sheep, partly Cheviots, but mostly black-faced. Standing stock estimated by Mr. Naismith at 120,000; but we are informed that this estimate is at present far below the mark. Plantations have been much extended in all parts of the county during the last 20 years. Average rent of land in 1842-3, 11*s.* 3½*d.* an acre. This county is principally indebted for its great manufacturing and commercial prosperity to its all but exhaustless coal mines; some pits have been opened almost within the suburbs of Glasgow, and coal is, perhaps, cheaper in that city than in any great town in the empire. Lanarkshire has also large supplies of ironstone, and has latterly become one of the principal seats of the iron trade. The rapidity of its progress in this great department of industry has been quite extraordinary, so much so, that while the make of iron in it in 1806 did not exceed 9,000 tons, it advanced in 1834 to 48,000 tons, and last year (1845) it exceeded 375,000 tons! The lead mines at Leadhills are the most productive in Scotland. Limestone and freestone abundant, and largely consumed. Glasgow is the first town of Scotland, and the third of Great Britain, in point of population. It is famous for its cotton and other manufactures, its extensive foreign trade, its university, and

the magnificence of its streets and buildings. The Clyde is the chief of the rivers of this county, and of the west of Scotland; it has several tributary streams, some of them of considerable importance. —(See *antè*, p. 239.) The Forth and Clyde canal is partly, and the Monkland canal entirely, in this county. Glasgow is already connected by railways with Edinburgh, Paisley, and Ayr, and others are in the course of being constructed, that will connect it with Manchester and London on the one hand, and with the north of Scotland on the other. Lanarkshire contains 47 parishes. It returns 3 members to parliament, viz., 1 for the county, and 2 for the city of Glasgow. The boroughs of Lanark, Airdrie, and Hamilton join with Linlithgow and Falkirk in returning a member. Population of county in 1841, 426,972. Valued rent, 162,132*l.* Scotch. Annual value of real property in 1815, 686,531*l.*; ditto in 1842-3, 1,834,999*l.*

7. *Peeblesshire*, an inland county, is bounded on the south by the county of Dumfries; on the south-west by Selkirk; on the north and north-west by Mid Lothian, and on the east by Lanark. It contains 204,160 acres, of which a comparatively small portion only is arable.* The greater part of the surface consists of mountain, moor, and bog; but there is some fertile soil on the banks of the Tweed. The highest mountains are in the southern part of the county, in the parish of Tweedsmuir, where the Tweed has its source. They belong to the Hartfell group. The summit of Broadlaw rises 2,741 feet above the level of the sea at low water; this, which is about 100 feet above the altitude of Hartfell, is the highest elevation in the south of Scotland. The hills are generally smooth, and afford good sound sheep pasture. In the low parts of the county, agriculture has been very much improved; but it is now pretty generally believed that tillage has been too much extended. The buildings on farms of any importance have been entirely renovated, principally within the last thirty years. The black-faced breed of sheep used, at no very distant epoch, to be diffused over the whole county, to the exclusion of every other; but about 1795 Cheviots began to be introduced, and their numbers have so rapidly increased, that, even in the parish of Tweedsmuir, which is the wildest and most exposed, there are now three Cheviots for one black-faced sheep. The total stock of sheep at present in the county is estimated at 102,000. Property in a few hands; farms very large. Average rent of land in 1842-3, 6*s.* 7½*d.* an acre. Neither minerals nor manufactures of any importance. Principal river, the Tweed. Peeblesshire contains 16 parishes, and returns a member to parliament. Peebles, the only town of any importance, had, in 1841, 1,898 inhabitants. At the same period, the population of the county was 10,499. Valued rent, 51,938*l.* Scotch. Annual value of real property in 1815, 64,182*l.*; ditto in 1842-3, 74,810*l.*

8. *Selkirkshire*, an inland county, is bounded on the south by the county of Dumfries; on the east by Roxburgh; on the north by Mid Lothian; and on the west by Peebles. It contains 169,280 acres,

* According to the *General Report of Scotland*, the land in cultivation in Peebles amounts to 24,500 acres; but in the *New Statistical Account of Scotland* (No. III. p. 181), the cultivated, or occasionally cultivated, land, is said to amount to 34,762 acres.

of which hardly a tenth part is supposed to be arable. This county is in most respects similar to Peebles. The greater part of the surface is mountainous; but the hills are green and smooth to the very summits. St. Mary's Loch, and the adjoining Loch of the Lowes, in this county, the former about 7½, and the latter about 1½ miles in circumference, are among the largest lakes in the south of Scotland. There is some fertile ground in the valleys of the Tweed, the Yarrow, Ettrick, and other streams; but the extent is inconsiderable. Selkirkshire has fully participated in the wonderful improvements that have been made during the last half century in most parts of Scotland. Its agriculture, breeds of cattle and sheep, roads, buildings, food, and clothes of the inhabitants, &c., have been all signally improved. The change is set in a very striking point of view, in the following remarks on the parish of Yarrow (*New Statistical Account of Scotland*, Selkirkshire, p. 57), which may be equally applied to the whole county:—"Since the date of the last statistical account, the Cheviot have superseded the black-f ced sheep; and, with the breed, the management has been materially altered. There is no ewe-milking as formerly, and no *hog* hirsel kept; but the different parts of the stock roam promiscuously, and at large. In very severe snow storms the flocks on the higher grounds used to be removed to the low country of Annandale in quest of food; but now a store of hay is cut from the bogs, and forms ample winter provision for the sheep during any storm; while *stells*, or inclosures for sheep, at the same time are more numerous and accessible. Within the last forty years, too, the country has been thoroughly drained. Equally great have been the improvements in the agriculture of the parish. The system of having out-field and in-field was long practised; the milk ewes and cattle being folded at night, and the ground thus manured for cultivation. Cropping, too, went on till the particular spot was exhausted. But now a better system prevails; the arable and meadow land being enclosed and subdivided, the two-horse plough used, turnip husbandry introduced, a regular rotation of cropping followed, and wheat, so long deemed unsuited to our soil and climate, frequently raised with success. The new houses of the tenants have, for the most part, been built in better style and situations than the old, which were small thatched cottages, placed generally on some sloping bank, or up some secluded burn, where security was sought in marauding times. The roads, also, have been greatly improved, and are far more frequented. Besides, all classes are better fed and clad. The dress is no longer of home produce or manufacture. What used to be the luxuries have become the necessaries of life; so that, instead of a single carrier on foot, as formerly, a number of carts supply the Yarrow Vale with wheaten bread. A solitary newspaper formerly made its passage up the water by slow stages, and through many hands, contrasting forcibly with the regular and rapid circulation of periodicals at present. Withal, there has been a striking change in the habits of the peasantry. Local attachments have given way to general knowledge. The legends of superstition are in a great measure forgotten, and its rites forsaken. There is no longer 'heard a lilting at the ewes' milking,' or 'tales at the farmer's ingle.' The minstrel's strains, however, had lingered long after the deeds which they commemorated were over. In this pastoral

district it was that Sir Walter Scott found many of the old ballads which had been handed down for ages as a patrimony from sire to son; but, on the publication of his 'Minstrelsy,' the spell that bound them was broken; and these relics of Border song, thus laid bare to the light of day, have, like the friendly and familiar spirits of Border superstition, on being noticed with peculiar kindness, entirely disappeared, and that, too, in consequence of the very effort made to preserve them. In this district, too, there existed almost a feudal relation between master and servant; there being instances in which the domestic has grown up and grown grey beneath the same roof: but now the half yearly term is too often one of change, and the stipulated service performed with mechanical unconcern." Average rent of land in 1842-3, 4*s.* 7*d.* an acre, being almost identical with its amount in 1810. The woollen manufacture has been introduced at Galashiels, and is carried on with spirit and success. Minerals of no importance. Principal rivers: Tweed and its tributaries, Yarrow, and Ettrick. Selkirk contains 7 parishes and returns 1 member to parliament. The county, in 1841, contained only 7,990 inhabitants, and has no town of any consequence. Valued rent, 80,308*l.* Scotch. Annual value of real property assessed in 1815, 43,584*l.*; ditto in 1842-3, 49,766*l.*

9. *Roxburghshire*, or *Teviotdale*, an inland county, is bounded on the south-west by the county of Dumfries; on the south-east and east by Cumberland and Northumberland; on the north by Berwick; and on the west by Mid Lothian and Selkirk. It contains 457,920 acres, of which about two-fifths are occasionally under the plough. There is a great variety of surface. The low or arable lands in the valleys of the Tweed and the Teviot consist principally of a light turnip soil. The mountainous or pastoral district lies principally in the southern and south-eastern parts of the county, along the Dumfries, Cumberland, and Northumberland border. The highest land is found on the summits of Carterfell, and other points in the ridge of the Cheviots, on the east; and the Maiden Paps, Winniburgh Hill, &c., between the sources of the Teviot and the Liddle, on the south. The hills, like those in the contiguous counties, are mostly smooth, dry, and well covered with good sheep pasture. The Eildon hills, near Melrose, in the low country, are 1,634 feet above the level of the sea. Property mostly in large estates; but there are several of the smaller class of proprietors. Farms generally large, and some farmers frequently hold three or more farms. Arable husbandry is as well understood and practised in the lower parts of Roxburghshire as in any part of Berwickshire, Northumberland, or East Lothian. This county is also celebrated for its having been the theatre where some of the principal improvements in modern farming were first introduced, and where others were first successfully practised in Scotland. Mr. Dawson, the great improver of Scotch husbandry, occupied the farm of Frogden, near Kelso, in this county; and in it, *soon after* 1760, *he set to work the first plough drawn by 2 horses, driven by the ploughman, that was ever seen in Scotland!* And if Mr. D. was not the first to set the example of raising turnips, he was the first practical farmer by whom they were profitably cultivated on a large scale.—(*Survey of Roxburgh*, pp. 69, 90.) Fanners for dressing corn were

also made and used in this county before they were seen in any other part of Scotland.—(*Survey*, p. 59.) Large quantities of wheat are now produced. Cattle a mixed breed. Sheep principally Cheviots. Within the last 20 years many important improvements have been effected in this district. A large extent of land, that was entirely pastoral, now bears luxuriant crops; bone manure has been introduced; agricultural management has been materially amended; a good deal of waste land has been planted; farm-houses and buildings have, in numerous instances, been rebuilt on approved plans; thrashing machines have been erected on most considerable farms; and the habits and accommodations of the people have been materially improved.—(*New Statistical Account of Scotland*, article Roxburgh, pp. 23, 33, 40, 125, &c.) There are some very productive orchards in the neighbourhood of Jedburgh, Melrose, and Kelso. During the American war tobacco was extensively cultivated. Average rent of land in 1842-3, 11*s.* 3½*d.* an acre. If we except marl, of which there are vast quantities in several parts of the county, minerals are of no importance. Various branches of the woollen manufacture have been introduced into Roxburghshire, and are prosecuted with considerable vigour at Hawick and Wilton, and in a lesser degree at Jedburgh, Melrose, and Kelso. The parish of Kirk Yetholm, in this county, is celebrated as being the residence of the largest colony of gipsies in Scotland. Principal rivers: Tweed, Teviot, Gala, Leader, &c. Roxburgh contains 31 parishes, and returns 1 member to parliament for the county. Jedburgh joins with other burghs in choosing a representative. Principal towns: Jedburgh, Hawick, and Kelso. Population of county in 1841, 46,025. Valued rent, 314,663*l.* Scotch. Annual value of real property in 1815, 254,180*l.*; ditto in 1842-3, 284,204*l.*

10. *Berwickshire*, a maritime county, is bounded on the north and north-east by East Lothian and the North Sea; on the south-east, south, and west, by part of England, Roxburghshire, and Mid Lothian. It contains 282,880 acres, of which from a third to a half is supposed to be arable. That part of the county which lies between the Leader on the west, the Tweed on the south, and the foot of the Lammermoor range of hills on the north, is called the Merse. It is comparatively level, sloping gently to the south-east; and, having in most parts a deep, fertile, clayey soil, and a dry, warm, early climate, it is particularly well calculated for tillage husbandry. The Lammermoor district consists principally of high, cold, bleak, moorish ground; but valleys are occasionally interspersed, the soil of which is comparatively fertile. Mr. Kerr (*Survey of Berwickshire*, p. 17), having taken the extent of the county, inclusive of Berwick township, at 290,120 acres, distributes it as follows:—

	Acres.
Lowlands of the Merse	100,226
Ditto in Lauderdale	7,280
Ditto of Cockburnspath	2,200
Berwick township	4,680
Total arable, improved, or improvable	114,386
Hill lands of Lammermoor and Lauderdale	175,734
Total	290,120

The Merse is one of the best farmed districts in the empire. No very large estates, but property, notwithstanding, in a few hands. In 1808 (and there has been no material change in the interim), the total number of proprietors was estimated at 292; but of these 160 possessed property under 100*l.* a-year (Scotch) of valued rent, being provincially called pendiclers, feuars, &c. Farms large; farm-buildings generally very good. Steam power is employed in several thrashing mills in this county. Farmers intelligent, active, and enterprising. All the principles and processes of the most improved systems of arable and stock husbandry are well understood, and systematically practised. Wheat and turnips are the great objects of culture, but barley and oats are raised in large quantities; beans also are cultivated to a considerable extent. Many improvements have been effected during the last 20 years by the more complete drainage of the land, the adoption of rotations better suited to its varying capacities, the introduction of bone manure, the culture of waste land, &c. Horses principally of the Clydesdale breed, and in general strong and active. It was supposed that there were in 1809 about 4,500 *draught* horses kept in the county, and that about 6,000*l.* went annually from it to the west of Scotland for horses to keep up the stock.—(*Kerr's Survey*, p. 405.) At present we are assured the stock of draught horses may be estimated at 5,500. A pair is considered sufficient for from 40 to 50 acres of tillage land; and, as about a half of all tillage farms is in grass, the draught horses are usually in the proportion of a pair to each 100 acres of land in the farm. Cattle a mixed breed, and a good deal of attention has latterly been paid to its improvement by the introduction of short-horned bulls and otherwise. In the Merse the sheep are principally long-woolled: in the Lammermoor hills the Cheviots have been extensively introduced; but in the bleakest and worst parts the black-faced breed, or a cross between them and the Cheviots, keep their ground. The total stock of sheep may be estimated at about 115,000. Average rent of land in 1842-3, 16*s.* 9¾*d.* an acre, being almost identical with its amount in 1810. Roads pretty good, but difficult to keep in repair, and, when not in order, they are very heavy. Minerals and manufactures quite unimportant. Principal rivers: Tweed, Whittader, Blackadder, and Leader. The salmon fisheries on the Tweed are among the most valuable in the empire; though here, as in most other places, there has, within the last few years, been many complaints of a scarcity of fish. Produce principally sent to London. Berwickshire contains 33 parishes. The county returns 1 member to parliament. The town of Berwick returns 2 members; but it is an English more than a Scotch town. The borough of Lauder unites with Haddington, Dunbar, North Berwick, and Jedburgh, in sending a member to parliament. Towns quite inconsiderable. Dunse, inclusive of the parish, only contains 1,939 inhabitants. Population of county in 1841, 34,438. Valued rent, 178,366*l.* Scotch. Annual value of real property in 1815, 245,379*l.*; ditto in 1842-3, 254,169*l.*

11. *East Lothian*, or *Haddingtonshire*, a maritime county, is bounded on the north, north-east, and north-west by the North Sea and the Frith of Forth; and on the south, south-east, and south-west, by Berwickshire and Mid Lothian. It is of small size, containing only

174,080 acres, of which about four-fifths are arable, or fit for cultivation. The part of Lammermoor which belongs to this county, though not nearly so extensive as that which belongs to Berwickshire, has the same character. But, with this exception, most of the county is comparatively level; and, when viewed from the summit of the Lammermoor hills, has the appearance of an extremely rich and beautiful plain, gradually declining to the sea. The surface of the low ground is, however, considerably diversified. North Berwick-law, so called from the village of that name to which it is contiguous, is an insulated hill of considerable height; and there are some other detached hills, though of no great importance. Along the coast the soil is a rich light reddish loam; it gradually varies to clay towards the upper districts, and its general character is that of a clay bottom. The lower grounds are not surpassed, in point of productiveness, by many spots in the kingdom. The moorish districts occupy between a third and a fourth part of the surface of the county. Easterly winds are prevalent, and severe in April and May; but the climate is, notwithstanding, reckoned healthy, at the same time that it is dry and early. The whole property of this county was divided, in 1811, in very unequal portions, among 183 proprietors; of whom about a half possessed estates under 100*l.* a-year of valued rent. We understand that the number at present is not materially different. Nearly half the county is entailed. Farms rather above the middle size. At an average, they are supposed to amount to from 300 to 500 acres over the whole of the arable land; but they are smaller, perhaps, on the best soils, and larger on the inferior. They are almost universally let on lease for 19 or 21 years; and rents, though payable in money, are generally determined by the price of corn. Tillage husbandry has been carried to a very high pitch of perfection. "Turnip husbandry, in this county, far surpasses that which is to be found in any part of England, not only as to the management, but with reference also to the quality of the turnips. The latter effect must chiefly arise from the richness of the soil; the turnips are remarkably large, and are found to be much sounder than in any other part of the United Kingdom, they being never at a loss for proper nourishment, and being continually kept in a growing state." —(*Kennedy and Grainger on the Tenancy of Land*, vol. i. p. 220.) Barley is but little grown. Wheat is the grand object of attention; but considerable quantities of oats and beans are also raised. The rotation on the coast is, 1st, turnips; 2nd, wheat; 3rd, clover; 4th, wheat; 5th, beans; 6th, oats: on the clay land the wheat is generally fallowed for, and the rotation is, 1st, fallow; 2nd, wheat; 3rd, seeds; 4th, oats; and sometimes, 5th, beans; but, if a crop of beans be taken, a little dung is always laid upon the land. Tenants are compelled to keep during their lease, and to leave at its expiration, a certain extent of land in fallow or green crop, and a certain extent in seeds and in corn. They are strictly prohibited from taking two white crops in succession. Sea-weed is extensively used as a manure along the coast. Lime is liberally applied to the clay land; but the manure most generally used, and on which most dependence is placed, is that of the farm-yard. Latterly, however, bone manure and guano have been much employed in the raising of turnips. The greater number of the

principal Scotch farmers and improvers have either belonged to, or been in some way connected with, this county. The practice of fallowing was introduced here about 1720; and was extensively practised many years before it obtained any footing in any other part of Scotland.—(*Survey of East Lothian*, p. 92.) But, excepting on the heavy clay lands, the turnip husbandry has gone far to supersede fallows. There can be no doubt, however, that the culture of corn was carried to an excess in this county previously to 1815, and that the land was *unduly forced*. Its fertility had, in fact, been a good deal impaired; there were several failures in the wheat crops; and its farmers suffered more by the fall of prices after the peace than those of any other Scotch county. These defects in the management are now, however, obviated by keeping a greater extent of land in grass, and for a longer time. Farm buildings generally extensive and commodious. The implements are all of the most improved description, and there is not a farm without a thrashing mill, most of which are now wrought by steam power. It may, however, be worth remarking, as evincing the rapidity with which improvements of all sorts have been diffused, that two-horse ploughs were not introduced till about 1772, nor were they in general use till about 1780. Stock husbandry, though still a secondary object, has been a good deal extended within these few years, in consequence of the increase of pasture land. Comparatively few cattle and sheep raised; but large numbers are purchased to be fattened on turnips, straw, and hay, for the Edinburgh market. The value of the low land in this county has advanced since 1770 in a most extraordinary ratio. At present it fetches as high a rent as is brought by the very finest lands in most other districts of the kingdom. The following statement, taken from the article on the parish of Dirleton, in the New Statistical Account of Scotland, may be applied to the whole county. "It cannot be doubted that, since the date of the former statistical account of this parish, its condition has improved. The soil is more effectually drained; green crops are more extensively raised; live stock is more carefully attended to; many of the fields are better sheltered; the general system of management is less slovenly, and, compared with the amount of produce, less expensive. Steam power, in farm operations, was then unknown: it is now employed every year more and more extensively, and, as is universally allowed, with much advantage. The spirit of enterprise is more active among the farmers: the labourers are more alert and skilful in their several departments; and all the implements of husbandry are in a state of greater efficiency. Within the last few years, even the science and practice of agriculture have made considerable advances; and there is at present (1837) an evident tendency towards still further improvement." Average rent of land in 1810, 20*s.* 10*d.* an acre; in 1842–3, 25*s.* 5½*d.* per ditto. The western part of the county is well supplied with excellent coal; and limestone is very generally diffused. With the exception of some considerable distilleries, there are few manufactures of any importance. A good deal of salt used to be made at Prestonpans, but since the abolition of the duties, the works have been abandoned. The county sends a member to parliament; and the burghs of Haddington, Dunbar, and North Berwick join with Lauder and Jedburgh in returning a repre-

sentative. The Tyne is the only river of consequence. There are 24 parishes. Population of county in 1841, 35,886. Valued rent, 168,874*l.* Annual value of real property in 1815, 250,126*l.*; ditto in 1842–3, 258,743*l.*

12. *Mid Lothian* or *Edinburghshire*, a maritime county, is bounded on the north by the Frith of Forth; on the east by the counties of East Lothian, Berwick, and Roxburgh; on the south by Selkirk, Peebles, and Lanark; and on the west by West Lothian. It contains 226,560 acres, of which nearly two-thirds are susceptible of cultivation. In some parts the surface is hilly, and in others almost mountainous. The highest point in the Pentland ridge is 1,880 feet above the level of the sea. This ridge divides the lower grounds of the county into two comparatively level tracts, that unite towards the sea. Clay soil predominates; and there are few parts of the county remarkable for natural fertility. There are a considerable number of rather large estates; but property is, on the whole, well divided. Farms of various sizes. Agriculture similar, but inferior, to that of East Lothian; and it is a good deal modified by the demand of the capital for potatoes, milk, &c. Wheat the principal object of the farmer's attention: and there may be, at present, from 15,000 to 18,000 acres under this crop. There has, in this respect, been a wonderful change within the last century. In 1727, a small field of 8 acres, within a mile of Edinburgh, sown with wheat, was so extraordinary a phenomenon as to attract the attention of all the neighbourhood!—(*Robertson's Rural Recollections*, p. 267.) The breadth of land now under wheat is believed to be more than double what it was in 1790; and, during the interval, the crops have been materially improved. A good many Ayrshire cows are kept for the supply of the metropolis with milk, butter, &c. Average rent of land in 1842–3, 21*s.* 7½*d.* an acre, having declined about 3*s.* an acre since 1810.

Edinburgh, the ancient metropolis of Scotland, is situated in the northern part of Mid Lothian, near the sea. Its situation is peculiar, and at the same time interesting and romantic. The old town, with its high houses, narrow *wynds*, its antique castle and palace, strikingly contrasts with the broad rectangular streets and modern mansions of the new town. Edinburgh is famous for its university, and for its superior literary and philosophical society. With the exception of printing, shawl-making, and coach-building, which are successfully carried on, the manufactures of Edinburgh are of no great importance. Leith, which may be called the port of Edinburgh, is now almost connected with the latter. It labours under the disadvantage (which attempts have been unsuccessfully made to obviate) of having a bad harbour; and from its not being the port of any great manufacturing district, its trade is comparatively trifling. Edinburgh is well supplied with fuel. There are large beds of coal at Dalkeith, within 6 miles of the city, to which a railway has been constructed; and it also derives a supply from a greater distance by the Union Canal, stretching from the city to Falkirk, and by the railway which unites it with Glasgow. Principal rivers: North and South Esk, Almond, and Water of Leith. Exclusive of Edinburgh, Mid Lothian contains 27 parishes. It returns 4 members to parliament, viz., 1 for the county; 2 for the city of

Edinburgh; and 1 for the burghs of Leith and Musselburgh. Population of Edinburgh in 1841, 138,182; Leith, 26,433; Musselburgh, 6,331; Dalkeith, 4,831. Population of county in 1841, 225,454. Valued rent, 191,054*l.* Scotch. Annual value of real property in 1815, 770,875*l.*; ditto in 1842-3, 1,074,992*l.*

13. *West Lothian*, or *Linlithgowshire*, a small maritime county, bounded on the north by the Frith of Forth; on the east and south-east by Mid Lothian; and on the west and south-west by Stirling and Lanark. It contains 76,800 acres, of which about three-fourths are arable. Surface varied with knolls, but there are but few hills, and no mountains; soil clayey, sandy, and gravelly. There is a considerable extent of thin moorish ground, and some morasses, in the south-western parts of the county, contiguous to Lanarkshire. Climate rather cold. Agriculture similar to that of Mid Lothian; with this difference, that more turnips are raised, and fewer potatoes. Some horses are bred, and also a good many cattle. Property in a few hands: farms of a medium size. Average rent of land in 1842-3, 22*s.* 1*d.* an acre. Coal is found in most parts of the county, particularly in the vicinity of Borrowstonness, where large iron-works have lately been established, limestone and freestone are also abundant. Manufactures, if we except a little ship-building, unimportant. Principal rivers, Almond and Avon. It contains 13 parishes. A member is returned to parliament for the county; and the boroughs of Linlithgow and Queensferry join with others in returning representatives. Population of county in 1841, 26,872. Valued rent, 75,019*l.* Scotch. Annual value of real property in 1815, 97,597*l.*; ditto in 1842-3, 109,322.

14, 15. *Stirlingshire*, including the small county of *Clackmannan*, a maritime district, is bounded on the east by Linlithgowshire, the Frith of Forth, Fife, and Perthshire; on the north by the latter; on the west, by Loch Lomond and Dunbartonshire; and on the south, by the latter and Lanarkshire. Stirling contains 321,280 acres, or, deducting water, 312,960 acres, and Clackmannan, 30,720, about two-thirds of the whole being arable. Surface exceedingly diversified, consisting partly of high mountains; partly of extensive moors, bogs, woods, &c.; and partly of very rich alluvial carse lands. Ben Lomond, the most celebrated and best known of the Highland mountains, is situated in the north-west part of Stirlingshire, immediately above Loch Lomond. It has an altitude of 3,191 feet. The Fintry, Campsie, and Lennox hills lie in the middle and southern parts of the county: the surface, from Denny north-west, to Loch Lomond, is in most places very bleak and sterile. The Ochill hills encroach on the northern parts of Clackmannan. The low alluvial lands, which are extremely productive, lie on both sides the Forth. On the south they extend from Falkirk to above Stirling; and on the north they extend all along the southern boundary of Clackmannan. They are supposed to comprise in all from 45,000 to 50,000 acres. The soil of the carse principally consists of a bluish clay, intermixed with sand. In the western parishes clay soil predominates, and, as it rests on a bottom of hard ferruginous clay (*till*), it is cold and wet. In some places along the rivers the soil is light and gravelly. In the high moors it is mossy;

and in the lower grounds there are considerable peat bogs. Several large estates; but property a good deal divided. Farms in the lower districts vary from 20 to 300 acres; but, in the hilly and mountainous districts, they are much larger. Agriculture very various, but generally well suited to the situation and climate. Drainage has recently been practised on a very extensive scale. In the carse, wheat, beans, barley, and clover, but particularly the first two, are the principal crops. On the lighter lands, turnips are largely cultivated; oats being the prevailing crop on all the poorer high lands. Potatoes generally cultivated. Sheep mostly of the black-faced Linton breed; but Cheviots have been largely introduced. Besides the cattle bred in the county, which are not remarkable for their goodness, great numbers of Highland cattle are annually purchased for feeding at the Falkirk *trysts*. These are the greatest fairs or markets for cattle of any in Scotland. They are held on the 2nd Tuesday of August, September, and October; the last being the largest. Cattle in all sorts of condition are brought to them from all parts of Scotland, but principally from the north; as are also sheep and horses. At an average, it is supposed that about 80,000 cattle, 50,000 sheep, and 5,000 horses, are annually disposed of at these trysts Estimating the cattle to be worth 7*l.* each, the sheep 11*s.*, and the horses 10*l.*, their entire value will be nearly 650,000*l.*—(*Youatt on Cattle, &c.*, p. 121.) Stirlingshire is said to have about 13,000 acres of natural wood, and above 10,000 acres of plantations. The eastern parts of Stirlingshire, and the whole of Clackmannan, have a rich and a finely diversified appearance. Coal abundant; and there are large supplies of ironstone, freestone, &c. Average rent of land in 1842-3, Stirling 11*s.* 6¾*d.* and Clackmannan 22*s.* 11¼*d.* an acre. Extensive works have long been established at Carron, and continue to be carried on with spirit and success, for the smelting of iron, and the manufacture of all sorts of cast-iron goods, whether for civil or warlike purposes. The species of cannon, called *carronades*, derived their name from having been first manufactured at Carron. Exclusive of distilleries, some branches of manufacture, on a pretty considerable scale, are carried on at St. Ninian's, Stirling, Falkirk, and other towns. Principal river, Forth; to which are tributary the Carron, Bannockburn, and other small streams. Stirling and Clackmannan contain 30 parishes. Stirlingshire returns 1 member to parliament, Clackmannanshire unites with Kinross-shire and part of Perthshire, in returning a member. The borough of Stirling unites with the boroughs of Inverkeithing, Dunfermline, Queensferry, and Culross; and the borough of Falkirk with those of Linlithgow, Lanark, Airdrie, and Hamilton, in returning representatives. Population of Stirling county in 1841, 82,057; of Clackmannan, 19,155. Valued rent of Stirling, 108,509*l.*; of Clackmannan, 26,483*l.* Scotch. Annual value of real property in Stirling in 1815, 218,761*l.*; ditto in 1842-3, 279,705*l.*: Clackmannan, in 1815, 37,978*l.*; ditto in 1842-3, 52,924*l.*

Stirling, the capital of this county, was formerly a royal residence, and was one of the most important places in Scotland. It owes this distinction partly to its castle, on the summit of a steep basaltic rock, which, previously to the invention of gunpowder, was of great strength, and partly to its situation at the point where the Forth becomes navi-

gable, making it, in some measure, the key of the Highlands on the one hand, and of the Lowlands on the other. The view from the castle, if not unrivalled, is, at all events, unsurpassed by any other in the empire. It contains all that can give variety, interest, and grandeur to a prospect. To the east it extends over the richest valley in Scotland, as far as Edinburgh, commanding all the windings of the Forth; to the west is the fertile strath of Menteith, the view in this direction being bounded by Ben Lomond; on the north it is bounded by the range of the Ochill hills; and immediately to the south is the field of Bannockburn, the Marathon of Bruce and of Scotland.

16. *Fife*, a maritime county, comprising the peninsula surrounded by the Frith of Forth on the south, the German Ocean on the east, and the Frith of Tay on the north; on the west it has the counties of Perth, Kinross, and Clackmannan. It contains 300,800 acres, of which more than two-thirds are cultivated. Surface finely diversified. The highest summit of the Lomond hills, on the eastern border of Kinross-shire, is 1,721 feet above the level of the sea. The eastern and south-eastern parts of the county are comparatively level and fertile. The extensive strath watered by the Eden, having Cupar in its centre, popularly called the *Howe of Fife*, is also, in most places, level and rich. The moory and least valuable land lies mostly in the western parts of the county along the eastern and southern confines of Kinross-shire, particularly between the latter and Dunfermline and Burntisland. There is some hilly ground in the north along the Frith of Tay, but it is broken by many fruitful valleys. Soil very various. In the more fertile districts it consists principally of a rich loam; in the poorer districts it is mostly clay, resting on a cold *till* bottom; but, besides these, there is every variety of soil. Climate dry and good, having been materially improved by drainage and cultivation. On the whole, Fife may be justly regarded as one of the best of the Scotch counties. It is well cultivated, has a more than usual proportion of country seats and plantations, and its coast is thickly studded with villages and towns. Pennant is quite enthusiastic in his admiration of this county. "Permit me," says he, "to take a review of the peninsula of Fife, a county so populous that, excepting the environs of London, scarcely one in South Britain can vie with it: fertile in soil, abundant in cattle, happy in collieries, in ironstone, lime, and freestone; blest in manufactures; the property remarkably well divided; none insultingly powerful to distress and often depopulate a county; most of the fortunes of a useful mediocrity. The number of towns is, perhaps, unparalleled in an equal tract of coast; for the whole shore from Crail to Culross, about 40 English miles, is one continued chain of towns and villages."—(*Tour in Scotland*, 1772, Part II. p. 212.) Farms of various sizes, from 50 to 500 acres. Farm-buildings vastly improved within the last 40 years. Previously to 1790, the farmers generally lived in low, smoky houses, badly lighted, and without any apartments, or divisions, except those made by the furniture; the offices being at the same time mean and deficient in the extreme. But since then the farm-buildings have been almost entirely renovated, and the farm-houses and offices will now bear to be compared with those of any other county. Drainage has been conducted in Fife on a very large scale, and has done much to improve

the appearance of the country, and to increase its productiveness. Several pretty extensive lakes, or lochs, that occupy prominent places in the maps of the county published 30 or 40 years ago, are now completely drained, and bear the finest crops. This also has been the case with large tracts of low, swampy ground. More recently, furrow-draining has been prosecuted with great vigour and success. Agriculture has made corresponding advances; but it may still be a good deal improved, at least in the western parts of the county. Wheat and barley are largely cultivated, but oats is the principal crop. Turnip culture much extended; barley, beans, and potatoes, extensively grown. "By the new system of agriculture, and especially by the liberal employment of draining, the land has been brought into the highest state of cultivation, and grounds, which 40 years ago would have been thought good for nothing, are now seen waving with the richest harvests. The houses of the peasantry are now equal to what those of the farmers were then, and the mansions of the latter surpass, both in appearance and comfort, such as the smaller proprietors formerly possessed. The condition of the people is much improved. Tea has become a new article of consumption Their superior clothing forms another striking proof of the improvement of the peasantry."—(*New Statistical Account of Scotland*, Fifeshire, p. 294, and p. 314.) Fife has long been celebrated for the excellence of its breed of cattle. In 1800 there were supposed to be about 10,000 milch cows in the county. Sheep not very numerous; but recently a good many have been slaughtered at Kirkcaldy, and sent by steam to London. The old breed of horses was small, unsightly, and ill fitted for the saddle or draught; but it has been much improved. Pigeon-houses numerous. Coal very abundant, as are limestone and freestone. Average rent of land in 1842-3, 25*s.* 6¼*d.* an acre. Several branches of the linen manufacture are carried on with much spirit, particularly that of table linen at Dunfermline and Kirkcaldy. Fife contains 61 parishes, 13 royal burghs, and a university, St. Andrew's, the oldest in Scotland. It may be said to return 4 members to parliament, viz., 1 for the county; 1 for the boroughs of Cupar, St. Andrew's, East and West Anstruther, Crail, Kilrenny, and Pittenweem; 1 for those of Dysart, Kirkcaldy, Kinghorn, and Burntisland; and 1 for those of Inverkeithing, Dunfermline, Queensferry, Culross, and Stirling: the last 2 boroughs being the only ones not belonging to the county. Principal rivers, Eden and Leven. Principal towns: Dunfermline, Kirkcaldy, Cupar, and Dysart. Population of county in 1841, 140,140. Valued rent, 363,192*l.* Scotch. Annual value of real property in 1815, 405,770*l.*; ditto in 1842-3, 508,923*l.*

17 *Kinross-shire*, a small inland county, to the west of Fife, being entirely surrounded by that county and Perthshire. It contains 50,560 acres, of which 4,480 are water, consisting principally of Loch Leven. Surface varied. In the lower district, to the north and west of the lake, the soil is clayey, sandy, and tolerably fertile; but in the more elevated parts it is unproductive, being mostly moorish and mossy. Agriculture greatly improved; but, owing to the backwardness of the climate, it labours under great disadvantages. Property very much subdivided, and mostly occupied by resident owners (feuars of the estate

of Kinross). Oats principal crop. There is one large distillery, and cotton is woven at Kinross and Milnathort, on account of the Glasgow manufacturers. It has limestone and freestone quarries, but is destitute of coal. Average rent of land in 1810, 9*s.* 10*d.* per acre; in 1842-3, 16*s.* 10½*d.*, showing (unless there be some mistake in the returns), an increase of no less than 7*s.* an acre in the interval. Principal rivers, Leven, and North and South Queich. The level of Loch Leven has been recently reduced by a cut made for that purpose; but the undertaking promises, it is said, to be rather unprofitable. Kinross and Milnathort are the only towns. Parishes, 7. Kinross-shire unites with Clackmannanshire and certain parishes in the south-western part of Perthshire in returning a member to parliament. Population of county in 1841, 8,763. Valued rent, 20,193*l.* Scotch. Annual value of real property in 1815, 25,805*l.*; ditto in 1842-3, 44,010*l.*

18. *Dunbartonshire*, a maritime county, having its main body bounded on the north by Perth, on the east by Loch Lomond and Stirling, on the south by Lanark and the river Clyde, and on the west by Loch Long and Argyleshire. But, in addition to this, there belongs to it a small tract of country lying on both sides the Forth and Clyde canal from Kirkintilloch to Cumbernauld. It contains 165,760 acres, of which 19,840 are water. The greater part of the county consists of lofty mountains, incapable of cultivation. The arable lands, which are of comparatively limited extent, lie principally along the Clyde, east of Dunbarton, on both sides the Forth, and on the south side of Loch Lomond. Soil of the arable land principally clay. Climate moist and changeable. There are many highly picturesque situations in this county, principally on the banks of Loch Lomond and the Clyde. The contrast between its high sterile mountains, and the beauty and fertility of the low ground, is very striking. There is a great deal of natural wood and a good many plantations. Property in a few hands. Farms of all sizes. Excellent wheat is raised in the low grounds along the Clyde, and in the parishes of Old and New Kilpatrick; but oats is by far the most common crop. Cattle generally of the small Highland breed, and not remarkable for their quality; but Ayrshire cows are now met with, to the nearly total exclusion of every other variety, in all the dairy farms in the lower parts of the county. Sheep originally of the small mountain breed; but the black-faced Tweedale breed, and, still more recently, Cheviots, have been widely diffused. Average rent of land in 1842-3, 9*s.* 10½*d.* an acre. Dunbartonshire produces coal, iron, freestone, and limestone. There are extensive printfields on the Leven; some cotton-mills have been erected; and glass-making, paper-making, &c., are carried on to a considerable extent. The Leven is the only river of importance. Parishes, 12. The county returns a member to parliament, and the burgh unites with Renfrew, Rutherglen, Kilmarnock, and Port Glasgow in returning a representative. Dunbarton burgh had in 1841 a population of 3,782, and the county of 44,296. Valued rent, 33,328*l.* Scotch. Annual value of real property in 1815, 71,587*l.*; ditto in 1842-3, 140,753*l.*

19. *Argyleshire*, a very extensive maritime county, consisting partly of mainland and partly of islands. It is bounded on the south and west by the Frith of Clyde, the Irish Sea, and the Atlantic Ocean; on

the east by Dunbarton and Perth; and on the north by Inverness. It is supposed to contain 2,054,400 acres, of which 1,446,400 are mainland and 608,000 islands. The fresh water lakes in the mainland and islands are supposed to cover 51,840 acres. The shores of the mainland, to which our attention is at present confined, are deeply indented with bays and arms of the sea, and it consists, in great part, of long narrow promontories, of which Cantire is the most remarkable. Surface almost everywhere rugged; and in many places, but particularly in the northern districts, contiguous to Inverness-shire and Perthshire, it is mountainous, wild, and dreary in the extreme. Cruachan Ben, at the head of Loch Awe, has an elevation of 3,670 feet. But some fertile valleys are interspersed between the mountains, and lie along the rivers and arms of the sea. The entire extent of the arable land of the mainland part of the county is not, however, supposed to exceed 170,000 acres. Soil very various: in the low grounds along the sea and rivers it is most usually a light loam, mixed with sand and gravel; on the sides of the hills, the prevailing soil is gravel on a till bottom. The mountains are generally rugged; their summits consist of bare barren rocks, and their sides are in part covered with strong heath. There are also large tracts of marshy and mossy ground. Natural woods and plantations supposed to cover from 35,000 to 45,000 acres. Some of the Dukes of Argyle have been very extensive planters; and the size and magnificence of the trees at Inverary are well known. Climate wet, boisterous, and very ill fitted for the ripening and harvesting of corn. Property in 1805 divided among 156 individuals; and, owing to the sale in the interval of large portions of the principal estate in the county, the number at present is probably greater. There is an extreme diversity in the size of farms; some comprising only a few acres, while others extend over several square miles. In various districts, the practice that formerly prevailed in most parts of the Highlands of holding land in a sort of partnership, or in what is there called *run-rig*, (the *run-dale* of Ireland,) is still kept up. Under this system a number of persons take a farm in common, each being bound for the rent. They then divide the arable land into small contiguous portions, or ridges, as equally—quantity and quality taken together—as is possible: the share of each tenant being determined by lot, sometimes for the whole lease, but sometimes only for a single season! Ploughing and most other sorts of labour are performed in common; and, if there be any hill pasture attached to the low ground, it also is occupied in common. In some of the low Highland districts, held in this way, the extent of land falling to the share of each tenant does not exceed from 3 to 7 acres. It is needless to enlarge on the pernicious influence of this mode of holding land. Where it prevails, it is obvious there can be nothing like industry, nor anything deserving the name of agriculture. We are glad, therefore, to have to state that it is everywhere declining, partly in consequence of the extension of the sheep-farming system, and partly by several of the landlords hostile to that system having, notwithstanding, divided the lands held in common, or in *run-rig*, into separate possessions. Still, however, it is but too prevalent, not only in Argyle but in most other Highland counties. Farm-houses and buildings differ as widely as the size of farms. The

principal farmers and storemasters occupy substantial comfortable houses; and the offices on their farms are good and suitable for the purposes in view. But, speaking generally, the houses of the smaller class of occupiers and cottagers are miserable hovels. The walls, which are low, sometimes consist of dry stone and sometimes of turf. They are thatched either with straw or heath; but, in general, so insufficiently that they afford a very inadequate protection from the rain: in some instances they are without chimneys. On some estates, however, the landlords have laudably exerted themselves to improve the cottages; and it is to be hoped that the examples they have set may be generally followed. Principal crops, oats and potatoes. The culture of the latter has been rapidly extended. "Here," says Dr. Smith, "potatoes may be well said to be the *staff of life;* for most of the inhabitants live mostly upon them for more than three-fourths of the year."—(*Survey of Argyle*, p. 92.) Implements greatly improved, but still in many places very imperfect. Ploughing indifferently executed; and a good deal of work done with the spade. Formerly the county was almost inaccessible, from the want of roads; but in this respect a vast improvement has taken place within the last 40 years. More recently, steam navigation has powerfully contributed to promote an intercourse with Argyle, and to open a ready market for its products. The Crinan canal, by obviating the necessity of the lengthened navigation round Cantire, has done much to facilitate the communication between Glasgow and the North-west Highlands. This county is celebrated for its excellent breed of black cattle. They are hardy, feed easily, and afford, when fattened in the low grounds of Scotland or England, excellent beef. The stock is estimated at about 65,000, furnishing a large annual supply for the south. Formerly the breed of sheep was much neglected; but for some years past its improvement has been an object of primary importance, and Cheviots have been extensively introduced. Average rent of land, including islands, in 1842-3; 2*s.* 3¼*d.* an acre. The herring fishery used formerly to be prosecuted with great success in Loch Fyne, and some other parts of the Argyleshire sea; but of late years it has greatly declined. Lead, copper, and iron are met with. Coal is wrought near Campbeltown; and the best slates in Scotland are obtained from the quarries in the small islands of Easdale, and at Balachulish; near Loch Eil. There are no large rivers; that of Awe is the most considerable. Argyle is popularly divided into various districts, of which Cantire, Knapdale, Argyle, Lorn, Appin, and Cowall are the principal. It contains 50 parishes. It sends 1 member to parliament for the county; and Campbeltown, Inverary, and Oban join with Ayr and Irvine in returning a member. Population of county in 1841, 97,371. Valued rent, 149,596*l.* Scotch. Annual value of real property in 1815, 227,493*l.*; ditto in 1842-3, 262,273*l.*

20. *Perthshire*, one of the largest and most important of the mainland Scotch counties, is bounded on the south by Dunbarton, Stirling, Clackmannan, the Frith of Forth, Kinross, and Fife; on the east, by the Frith of Tay and Angus; on the north, by Aberdeen and Inverness; and on the west, by Argyle. It contains 1,688,320 acres, of which 32,000 are water. This great county comprises within itself

almost all that is peculiar to, or characteristic of, Scotland. It has every variety of surface and soil, from lofty, rugged, sterile mountains to low, level, fertile vales. Its scenery is beautifully diversified. Its lakes and rivers are on a grand scale; and while, in parts of their course, the latter rush forward with the impetuosity of a mountain torrent, in others they creep sluggishly along, expanding into large æstuaries before they reach the sea. The climate is equally various, being mild and early in the vales, and severe and backward in the more elevated regions. Agriculture, in some parts, is highly improved and flourishing; but in the remoter districts, the bad practices of a former age, are not yet wholly eradicated. The Celt is found on the mountains, and the Saxon on the plains, presenting, in language, dress, and manners, the most striking contrast. Perthshire was formerly divided into the districts of Gowrie, Perth, Stormont, Strathearn, Menteith, Breadalbane, Balquhidder, and Rannoch, each of which was subjected to a particular sheriff or stewart; but the act of 1748, abolishing hereditary jurisdictions, put an end to these divisions in a legal sense, though they are still frequently referred to. It is naturally divided into highlands and lowlands: all the country, including the Ochill and Sidlaw hills, from its southern frontier to the foot of the Grampians, being included in the lowlands, and the remainder in the highlands. The part of the Grampian chain in this county comprises some of the highest mountains in Scotland. Ben Lawers, 3,945; Ben More, 3,944; Ben Gloe, 3,690; Schiehallion, 3,550; Ben Achonzie, 3,028; and Ben Ledi, 2,863 feet above the level of the sea, are the most elevated summits. Besides the mountain and hilly districts, there are very extensive, though progressively diminishing, tracts of moor, moss, and bog. There is, also, a large extent of natural wood and plantations. The latter were much extended by the operations of the late Duke of Atholl, who planted above 15,000 statute acres! But, notwithstanding these deductions, the cultivated land is estimated at from 530,000 to 560,000 acres, or at about a third part of the entire surface. The most valuable tract of low land is denominated the Carse of Gowrie, being the district bounded by the Tay on the south and west, the Sidlaw Hills on the north, and Forfarshire on the east. Its soil is mostly a deep rich clay; and in point of fertility, it is not, perhaps, surpassed by any land in the kingdom.—(See *ante*, p. 234.) The lower part of Strathearn, from Forteviot to the confluence of the Earn and Tay, consists of a similar soil, and is hardly less fertile. Exclusive of these, and the lowlands along the Tay, above Perth, there are in the valleys of the Teith, Forth and other rivers, extensive tracts of carse land, and of sandy, gravelly loam. Light gravelly soil is, indeed, predominant in Perthshire. There are some very large estates; but there is, also, a fair proportion of the smaller class of properties. Arable farms vary in size, from 50 to 500 acres. The same plan that formerly prevailed in Argyle (see that article) of holding lands in common prevailed throughout the highlands of Perthshire; but examples of it are, at present, rarer in the latter than in the former. Farms in the lower districts universally let on lease; generally for 19 years; large stock farms are also let on lease; but some of the small highland occupiers hold from year to year. Buildings, and other

accommodations, of the farmers, in the lower districts, for the most part substantial and excellent; but in some of the highland districts they are still, in many instances, very bad and deficient. Wheat and beans, of excellent quality, are the prime articles of cultivation in the carse of Gowrie, Strathearn, parts of Strathmore, the valleys of the Forth and Teith, &c. In the midland districts, barley, and in the higher, oats, are the principal crops. Potatoes everywhere cultivated, largely consumed, and recently exported in large quantities to the London market. Turnip culture extensively prosecuted. Improvements of all kinds have been carried on of late years with equal vigour and success. "Draining, planting, enclosing, improved tillage, and judicious cropping, have completely changed the face of the country."—(*New Statistical Account of Scotland*, art. Perthshire, p. 450.) Considerable quantities of fruit, as apples, pears, &c., are produced in the vales, particularly in Gowrie. Breeds of cattle various, but none peculiar to the county; the stock differs with the varying quality of the land on which it is pastured. Number of sheep vastly increased within the last 40 years. Formerly the white or yellow-faced small mountain breed was the only one known. About 60 years ago the black-faced Tweeddale breed was introduced; and more recently they have been partially displaced by the Cheviots. Dr. Robertson estimated the entire stock in all parts of the county, in 1813, at 220,000; but we are assured that this is now much under the mark. Roads signally improved; as much so, certainly, as in any other Scotch county. Coal is found in the southern part of the county contiguous to the Frith of Forth; and limestone and freestone are pretty generally diffused. Average rent of land in 1842-3, 6*s.* 7½*d.* an acre. The linen and cotton manufacture has been introduced, particularly in the city of Perth; but neither has had any very extraordinary success; so that, on the whole, Perthshire may be regarded as an essentially agricultural district. Principal rivers, Tay, Forth, Earn, Teith, Lyon, Garry, Tummel, &c. Fisheries on the Tay about the most valuable in the kingdom. Parishes, 80. Perth returns 2 members to Parliament; 1 for the county, and 1 for the city of Perth. Some parishes in the south-western part of the county are joined, for election purposes, with the counties of Kinross and Clackmannan. The borough of Culross unites with Inverkeithing, Dunfermline, &c., in returning a member. Principal towns: Perth, Crieff, and Dunblane. Population of county in 1841, 187,390. Valued rent, 339,892*l.* Scotch. Annual value of real property in 1815, 555,532*l.*; ditto in 1842-3, 613,168*l.*

21. *Angus*, or *Forfarshire*, a maritime county, is bounded on the south by Perthshire and the Frith of Tay; on the east, by the North Sea; on the north-east, by Kincardine; on the north, by Aberdeen; and on the west by Perth. It contains 570,880 acres, of which 2,560 are water. This opulent and flourishing county is naturally divided into 4 districts. The first, or Grampian district, comprises somewhat less than half the surface, including the whole country north of a line drawn from Lintrathan on the west, by Cortachy, to Edzell. The mountains in this tract are sometimes called the Braes of Angus, and ascend pretty gradually to the northern boundary of the county, formed by the ridge separating it from Aber-

deenshire. These mountains are mostly rounded and tame; are covered with a thin coat of moorish earth, and carry stunted heath. In some places, however, particularly in Glen Clova, the mountains exhibit bold, terrific precipices; and where there is any soil upon them, it is clothed with green and succulent herbage. The next division of the county forms part of the great valley of Strathmore, being provincially designated the *How of Angus*. It occupies the space between the foot of the Grampians and the Sidlaw Hills, extending about 33 miles east-north-east, with a breadth varying from about 4 to 6 miles. It is beautifully diversified by gentle eminences, well cultivated fields, plantations, and country seats; though in a few places it is still waste. Soil in the valleys mostly alluvial; but not so fertile as might thence be supposed. The Sidlaw Hills form the third district. They run parallel to the Grampians, rising to about 1,400 feet in height: some of them are detached, with conical summits; of these Dunsinnan Hill, "married to immortal verse," is by far the most celebrated. Some of them are covered with stunted heath, while others are cultivated to their very tops. The fourth and last district consists of the low ground lying between the Sidlaw Hills, the Frith of Tay, and the sea. With few exceptions, it is a fertile, highly-cultivated tract, extending over about 142,000 acres. On the whole, Forfarshire contains a greater proportion of land fit for the plough than most Scotch counties. The climate varies with differences of altitude, exposure, soil, &c. Some large estates; but property, on the whole, a good deal subdivided. Size of farms very various. It is supposed that in 1808 there were in all 3,222 farms in the county. In the lower districts land is usually let on 19 years' leases, but in parts of the Grampian district there are no leases; and "where this is the case, there is no improvement, and cultivation is in the same backward state in which it was some hundred years ago."—(*Survey*, p. 248.) In parts of this district, the ancient system of holding lands in common and *run-rig* still prevails. Farm buildings and cottages formerly wretched; but in the lower districts they have been mostly rebuilt within the last 40 years in a substantial and convenient manner. In the Grampian district, however, the houses of many of the small farmers and cottagers continue to be as bad as possible. "They are damp, smoky, and dirty in the extreme; and it is hard to say whether their occupants, or their cattle, be worse accommodated. Such houses are commonly arranged together in clusters, with intermediate houses for the cattle, forming a sort of village without symmetry or plan. The dung is commonly thrown into a sort of hollow in front of each dwelling house, which it is difficult to enter without going to the knees in filth."—(*Survey*, p. 128.) Drainage, and all sorts of agricultural improvements, are making rapid progress. Fallowing is general in the low grounds, which produce heavy crops of wheat. Potato and turnip culture much extended. Bone manure and guano, have been extensively introduced, and large quantities of the former are now prepared in Dundee and other towns. Breed of cattle various. Sheep originally small white-faced mountain-breed; but now, as in the other Highland districts, the black-faced and Cheviot breeds have been largely introduced, particularly since the extension of the sheep-farming system.

In 1813, the natural woods and plantations were supposed to cover 20,764 acres; but from the extension of plantations in the interim, they may now be safely estimated at from 30,000 to 35,000 acres. The following extract from the notice of the parish of Oathlaw, in the *How of Angus*, in the *New Statistical Account of Scotland* (No. 5, p. 310), may be applied to the whole county:—"At the time of the last Statistical Account, much of the land in the parish was in a state of waste, the appearance of the country was bare and bleak, the climate cold and damp, owing to the quantity of water on the land. Most of the houses were at that time of the rudest and meanest kind, built of unhewn stone, and covered with thatch; scarcely one of mason work, or covered with slates. *Now* the farms are all laid out and enclosed, draining is carried to great perfection, and farm-houses and offices are neatly and substantially built and covered. Thriving woods and belts of plantations are rising up, and giving a rich and clothed appearance to the country. Along with all this, it is gratifying to observe that the habits of the people are improving. There is now a greater neatness and cleanliness in their dwellings, and a greater share of the comforts of life amongst them; and though last, not least, there is evidently an increasing desire of information, and, generally speaking, a higher and better tone of moral feeling." Average rent of land in 1842-3, 10*s.* 11¼*d.* an acre. Minerals, with the exception of limestone, of little value. Dundee is a place of great and rapidly-increasing importance, both as respects trade and manufactures. It is the principal seat of the linen manufacture, which has made an astonishing progress during the last few years, especially since the abolition of the bounties and restrictive regulations connected therewith. In fact the exports of linen from Dundee only are now about equal to those from the whole of Ireland! But, though the grand centre be at Dundee, the manufacture is generally diffused amongst the other towns of the county. There are some valuable salmon fisheries along the coast and in the rivers. Principal rivers: North and South Esks, and Isla. Angus contains 56 parishes, and 5 royal burghs. It returns 3 members to parliament; viz., 1 for the county; 1 for Dundee; and 1 for the burghs of Montrose, Arbroath, Brechin, Forfar, and Inverbervie. Population of county in 1841, 170,520. Valued rent, 171,240*l.* Scotch. Annual value of real property in 1831, 361,241*l.*;* ditto in 1842-3, 502,841*l.*

22. *Kincardineshire*, or the *Mearns*, a maritime county, is bounded on the south and south-west by Angus; on the east by the North Sea; and on the north and north-west by Aberdeenshire. It contains 244,480 acres, of which 1,280 are water; half the county is supposed to consist of cultivated land, wood-land, improveable moor, &c.; and half of mountains, hills, &c. The Grampian Mountains occupy the western, central, and most of the northern parts of the county; extending eastwards from the Angus border, near Fettercairn, and the Aberdeenshire border, a little to the south of the Dee, to Stonehaven and Nigg. They are not very lofty. Mount Battock, on the confines of Angus, the highest amongst them, rises 2,611 feet above the level of the sea. The arable land consists principally of the *How of the*

* The *Survey* of this county, by the Rev. Mr. Headrick, is one of the best of that class of publications.

Mearns, that is, of a continuation of Strathmore, or the *How of Angus*, extending from Strathcathro and Marykirk to within 4 miles of Stonehaven. It contains about 50,000 acres of comparatively low, fertile, and generally well-cultivated land, having about 7,000 acres of thriving plantations. On the east, the *How* is sheltered by a range of low hills which separate it from the *coast district*. The latter contains about 68,000 acres, of which about 32,000 are in a high state of culture; the remainder being hill pasture, moor, and woodland. The other arable district consists of the narrow glen or valley lying along the Dee. Climate in the lowlands mild, but rather late. Property in a few hands. Arable farms of all sizes; many small, but some from 400 to 500 acres. The remarks as to leases, buildings, management, &c., made under the head of Angus, apply with little variation to this county. In 1807, there were estimated to be 1,247 acres under wheat; 9,806 ditto under barley; 22,784 ditto under oats; 1,742 ditto under beans and peas; 6,142 ditto under turnips; 1,160* ditto under potatoes; 236 ditto under flax; 2,619 ditto in fallow; 472 in gardens; and 28,641 under artificial grasses: making a grand total of 74,849 acres under cultivation, or about 30 per cent. of the entire surface. The natural woods and plantations were then supposed to cover 17,609 acres. The stock of cattle was then also estimated at 24,825 head; of which 6,236 were milch cows, and 5,280 calves; and the sheep stock at 24,957, exclusive of lambs. Of the sheep, 21,500 were depastured on the Grampians; and the remainder on the lower parts of the county by the coast side, and in the *How*.—(*Robertson's Rural Recollections*, p. 464.) Improvements have been and are prosecuted with extraordinary spirit in this county, and the produce of the land has been augmented in a degree that could hardly have been conceived possible. Rent of land in 1810, 13*s*. 2*d*. per acre; in 1842-3, 10*s*. 6¾*d*. per ditto, showing a fall of 2*s*. 7¼*d*. an acre in the interim; but this fall can be apparent only, and has, no doubt, been occasioned by some error in the returns. Lime, the only mineral of any importance, is very abundant. The manufacture of those beautifully jointed and varnished wooden snuff-boxes, long in universal demand, originated in the village of Laurencekirk, in this county, about the year 1790, where it is still carried on; but they are now principally made at Cumnock and Mauchline, in Ayrshire. Some linen is woven at different parts in the county. Principal rivers: Dee, North Esk, Bervie, Dye, &c. There are some valuable salmon fisheries. The Mearns contains 19 parishes, and 1 royal burgh, Inverbervie, an inconsiderable place; and sends 1 member to parliament. Stonehaven is the principal town. Population of county in 1841, 33,075. Valued rent, 74,921*l*. Scotch. Annual value of real property assessed in 1815, 94,861*l*.; ditto in 1842-3, 134,341*l*.

23. *Aberdeenshire*, an extensive maritime county, having about 60 miles of sea-coast, is bounded on the south and south-west by the counties of Kincardine, Angus, and Perth; on the west and north-west by Inverness and Banff; and on the north and east by the North Sea. It is estimated to contain 1,260,800 acres. About a fifth part of the surface consists of high mountainous tracts; and these, with hills, ex-

* There is now a much greater breadth of land under potatoes.

tensive moors, mosses, and other waste lands, occupy nearly two-thirds of the entire county. It was anciently divided into the districts of Mar, on the south and west; Fromarton, Garioch, and Strathbogie, in the middle; and Buchan, on the north. The mountains in the south-western parts, in the district of Mar, near the source of the Dee, are the highest in Scotland. Ben Macdhu, on the confines of Inverness-shire, is 4,390 feet above the level of the sea, being 20 feet higher than Ben Nevis, formerly supposed to be the highest of the British mountains. Cairntoul has an elevation of 4,220 feet; Cairngorm of 4,095; and several others vary in height from 3,000 to 3,700 feet. These mountains, present, in some places, vast perpendicular ledges; their summits are generally bare, consisting sometimes of smooth and solid, and sometimes of rugged detached, masses of granite. The extent of absolutely barren land on the upper parts of these mountains, reaching from Lochnagar on the south, and Cairnneelar on the west, to Benavon on the north, is at least 100 square miles; and the moory or mossy soil on their ridges and the narrow glens between them, amounts to about 200 square miles more. The arable land lies principally between the Don and the Yethan, in the districts of Fromartin and Garioch; in Strathbogie, and between the Ugie and the sea on the north, in the district of Buchan. In the lower parts round the coast, clay is the prevalent soil: in the upper arable districts there is a considerable extent of light, sharp, sandy loam. Sand, moor, and moss prevail on the hills and higher grounds. Owing to its projecting into the sea, and the great extent of coast, the winters are mild, but the summers are short, and usually cold. In 1811, Aberdeenshire was divided among 228 proprietors, as follows:—

3 had estates valued above 10,000*l.* (Scotch) each; 6, from 4,000*l.* to 10,000*l.*; 6, 3,000*l.* to 4,000*l.*; 16, 2,000*l.* to 3,000*l.*; 9, 1,600*l.* to 2,000*l.*; 16, 1,200*l.* to 1,600*l.*; 11, 1,000*l.* to 1,200*l.*; 19, 800*l.* to 1,000*l.*; 51, 400*l.* to 800*l.*; 19, 300*l.* to 400*l.*; 13, 200*l.* to 300*l.*; 30, 100*l.* to 200*l.*; 29, below 100*l.*

Great diversity in the size of farms; but though the number of small occupancies has been materially diminished, there are more of them at present in the low grounds of Aberdeenshire than in most other arable districts of Scotland. Usual for mechanics to occupy a patch of an acre or two. Houses and offices similar to those in Angus and Kincardineshire. Tillage husbandry of a mixed sort, and very much improved. About 160,000 acres of land are supposed to be annually sown with oats, being more than is ploughed for all other purposes whatever. A good deal of bear or big is raised; and some, but not much, wheat. In fact, neither the soil nor climate of this county are suitable for wheat. It is often thrown out of the ground by storms or hard frosts, succeeded by thaws, in the winter or early in the spring; and in late seasons it is exposed to heavy rains in September. Turnip culture has rapidly extended. In 1811, there were 20,000 acres under turnip, being about five times the extent of land under potato; but, though the turnip culture has increased in the interval, we are informed that the proportion under the potato is now greater. On the small holdings of tradesmen and others, a good deal

is done by the spade. Above 3,500 acres have been trenched in the vicinity of Aberdeen; and the practice of trenching is general throughout the county. This is necessary to get quit of the blocks of granite with which the soil is incumbered. The larger pieces are cut into stone for building or pavement, being partly consumed in the country, and partly exported: the smaller pieces are put into *consumption dykes*, or are employed in the construction of roads, drains, &c. In no country, perhaps, has, nature done less to promote improvement, and in none has the patient industry of man done more. Large additions are annually made to the arable land. Farmers from Berwickshire, and other improved southern districts, have taken farms in this county; and, by setting an example of improved cultivation, have done much to introduce a knowledge of the best systems and modes of management. The greatest obstruction to the progress of improvement consists, it is said, in the landlords not being sufficiently careful to prevent the intrusion of sub-tenants upon their estates; but they are more alive to this evil now than formerly. "Within the last 40 years," says the reverend author of the account of the parish of Old Deer, in Buchan, "great improvements have been made upon the value, comfort, and aspect of the country. In the course of that period several great lines of communication by turnpike-roads have been opened; much barren land has been brought into cultivation; a greatly improved system of husbandry introduced; thirlage to mills abolished; more attention paid to the selection and breeding of live-stock; leases of moderate duration substituted for life-rent tenures; a greater facility of market provided for farm produce, principally by the establishment of a regular and frequent steam communication with London; a more liberal allowance granted by proprietors to their tenants for houses, fences, and drainage, while they have, at the same time, had their rent-rolls greatly increased. A marked improvement has, also, taken place in the dress, diet, furniture, and manners of almost every class of the people."—(*New Statistical Account of Scotland*, art. Aberdeenshire, p. 165.) Woods very extensive and valuable. Those of Mar alone occupy nearly 100 square miles. A greater number of cattle are bred in this than in any other Scotch county. The native breed is preferred by the best judges. They have increased much in size during the last 30 years; and are said, indeed, to have *doubled in weight* since the introduction of the turnip husbandry!—(*Survey of Aberdeenshire*, p. 468.) The stock of cattle in 1811 was estimated at 110,000; of which 28,000 were milch cows, 22,000 calves, 20,000 year olds, 19,000 two-year olds, and 21,000 three years old and upwards. The dairy husbandry has made great progress during the last dozen years. The value of the butter shipped from Aberdeen and Peterhead is now believed to exceed 100,000*l.* a-year. The stock of sheep in this county was formerly greater than at present. In 1811, it was not supposed to exceed 100,000; but it has increased since, notwithstanding sheep-farming has made less progress in this than in any other Highland country. Breed various: small white-faced, black-faced, and Cheviots. Limestone is abundant; and there are quarries of excellent slate. Aberdeen granite is much esteemed; the value of the exports of it to London, and other places, having in some years exceeded 40,000*l.* Average

rent of land in 1810, 3*s.* 8½*d.* per acre; in 1842–3, 6*s.* 9*d.* per ditto, showing a rise in the interval of 81 per cent., being very decidedly greater than in any other county of Great Britain! The city of Aberdeen is the seat of a university, and has considerable manufactures. Principal rivers: Dee, Don (both of which have considerable salmon fisheries), Yethan, Ugie, Bogie, Doveran, &c. Parishes, 85. Aberdeenshire returns 1 member to parliament for the county; 1 for the city of Aberdeen; and the boroughs of Peterhead, Kintore, and Inverury, unite with Elgin, Cullen, and Banff, in returning a representative. Population of county in 1841, 192,387. Valued rent, 235,665*l.* Scotch. Annual value of real property in 1815, 325,218*l.*; ditto in 1842–3, 605,802*l.*

24. *Banffshire*, a maritime county, is bounded on the north by the Moray Frith, on the east and south by Aberdeenshire, and on the west by Inverness-shire and Morayshire. It contains 414,080 acres, of which 1,280 are water. Along the coast, which extends from near Troup to Spey Mouth, a distance of about 21 miles, the surface is pretty level; and the soil, consisting chiefly of sand and loam, is, in general, well cultivated, and highly productive. But, with this exception, the surface is mountainous and hilly, with only a few valleys interspersed. Property in immense estates, above two-thirds of the county being divided among 4 entailed proprietors. Some large, with many small, farms. Buildings similar to those in other Highland counties. Agriculture has been much improved in Banff, principally through the meritorious exertions of the late Lord Findlater and other landlords. Wheat, barley, turnips, and all the crops now usually cultivated in Scotland, are raised in this district; but oats occupy by far the largest portion of the ground under the plough. Tillage is in most places, however, a secondary object. The principal dependence of the husbandman is on his cattle, there being comparatively few sheep in this county. The old native cattle were a hardy and valuable breed; but they are now seldom met with, except in the upper districts, where, owing to the deficiency of food, they are stunted in their growth. In several of the lower districts, the Galloway breed of cattle has been extensively introduced, and has been found to answer exceedingly well. The polled breed of Aberdeen, and some Ayrshire cows, have also been introduced. Stock of cattle in the county estimated at about 25,000. Marble, limestone, and marl abound; but, owing to the want of coal, most of the lime is brought from Sunderland and the Frith of Forth. Rock crystals and topazes are found on the mountains on the southern and western boundaries of the county. The lichen used in the preparation of the dye-stuff known by the name of cudbear, is also gathered on the mountains. Many thriving plantations; but the natural woods inconsiderable. Average rent of land in 1842-3, 5*s.* 4½*d.* an acre. The Spey, one of the largest of the Scotch rivers, forms part of the western, and the Doveran part of the eastern, boundary of the county. Parishes, 24. Banffshire returns a member to parliament, and the boroughs of Banff and Cullen unite with Elgin and others in returning a member. Banff and Keith are the only towns of any importance. Population of county in 1841, 49,679. Valued rent, 79,200*l.* Scotch. Annual value of real property in 1815, 88,942*l.*; ditto in 1842-3, 124,347*l.*

25, 26. *Moray*, or *Elginshire*, and *Nairnshire*, two contiguous maritime counties, lying to the east of Banff, are united under the same sheriff, and may be most advantageously treated together. They are bounded on the north by the Moray Frith, on the east by Banff and a portion of Inverness, and on the south and west by Inverness. They contain 433,920 acres, of which 6,400 are water. Surface for the most part hilly and mountainous; but on the sea-coast there is a considerable extent of light, fertile, arable land; though in some places, particularly in Nairn, it is much encumbered with dry moveable sand. The climate along the Moray Frith is noted for its mildness, being, in fact, one of the best in Scotland. Wheat has for a long period been successfully cultivated along the shore, and about the best samples in the London market not unfrequently come from Moray. Property in a few hands. Farms of all sizes. Farm-houses and buildings formerly wretched; but those on the larger farms have been mostly rebuilt, and are now substantial and commodious. The turnip husbandry has been extensively introduced; improvements of all sorts have been attempted, and such of them as were found to answer have been carried to a considerable extent. Latterly, however, the progress of improvement in this county has been less rapid than in most other districts of Scotland. Much might be done for the *Braes of Moray*, but they continue in a comparatively neglected state. Cattle improved by crossing with the Skye and Argyleshire breeds. Stock in both counties supposed to amount to about 23,000. Sheep-farming not carried on to any very great extent. Sheep principally the old white or yellow-faced breed; but others have been largely introduced. There is a considerable extent of natural wood and of plantations. Average rent of land in 1842-3, 4*s*. 7*d*. an acre. Lead, iron, lime, marl, freestone, and slate, are met with; but the first two are not wrought, and of the others only the freestone to any extent. The salmon fisheries on the Spey, which divides Banff from Moray, are very valuable; there are fisheries, but of inferior importance, on the Findhorn. Exclusive of the above, the Nairn is the principal river. Parishes, 30. The two counties jointly return a member to parliament, and the burghs of Elgin and Nairn join with others in returning members. Principal towns: Elgin, Forres, and Nairn. Population of counties in 1841: Moray, 35,012; Nairn, 9,217. Valued rent, 80,766*l*. Scotch. Annual value of real property in 1815, 88,140*l*.; ditto in 1842-3, 3,114,911*l*.

27. *Inverness-shire*, a maritime county, and the most extensive of those of Scotland. It stretches quite across the island, being bounded on the south by the counties of Argyle and Perth; on the east by those of Aberdeen, Banff, Moray, and Nairn; on the north, by the Moray Frith and Ross-shire; and on the west by the Atlantic Ocean, in which Skye, and many other islands attached to it, are situated. It contains 2,716,800 acres, of which the mainland occupies 1,943,920, and the islands 773,760; the former having 84,480, and the latter 37,760, acres of water. The mainland of Inverness-shire is exceedingly wild, rugged, and mountainous, containing a great extent of moss and moor. It is believed, indeed, that there is only about a *fortieth* part of the surface not naturally covered with heath; but a good deal of the heathy ground is arable, and a considerable extent of it has been improved

and cultivated. Ben Nevis, 4,370 feet above the level of the sea, being, next to Ben Mac-Dhu, the highest mountain in Great Britain, is situated in the lordship of Lochaber, near Fort William, in this county. The mountains in Badenoch, contiguous to Perthshire, and on the confines of the south-western part of Aberdeenshire, are also very high and rugged. The cultivated land is chiefly to be found in the low district contiguous to Inverness, along the innermost part of the Moray Frith; in Badenoch, along the Spey; and in some narrow glens along the other rivers and lochs. Climate very various; but, speaking generally, it may be said to be wet and stormy on the western coast, severe in the interior, and comparatively mild and dry on the Moray Frith. In 1808, the landed property of Inverness-shire was divided among 83 proprietors, as follows, viz.:—

7 estates of above 3,000*l* a-year (Scots) valued rent; 6, from 1,000*l*. to 3,000*l*.; 23, 400*l*. to 1,000*l*.; 33, 100*l*. to 400*l*.; 14 under 100*l*.

Farms of all sizes. Some grazing farms extend over several square miles of country, while some of the small arable farms include only a few acres; but a certain extent of hill pasture is for the most part joined to the latter. The number of these small holdings has, however, rapidly decreased since the introduction of sheep-farming; and there has, in consequence, been a great saving as well of the labour of horses as of men, a great increase of disposable produce, and also a great increase of comfort and industry. Large farms uniformly let on lease; but many small ones held from year to year, a sort of tenure which insures the sloth and poverty, as well as the dependence, of the occupiers. The farm-houses built within the last 40 years, for gentlemen or the wealthier class of store-farmers, are in general well constructed and substantial; but those of the poorer tenants and cottagers are, in most places, mean beyond description. "The huts of the Indians, bordering on the lakes of the St. Lawrence, cannot be worse in point of structure and accommodation."—(*Robertson's Survey of Inverness*, p. 56.) Rearing of cattle and sheep the principal employment. The former are mostly of the Skye or Kyloe breed, the entire stock being supposed to amount to from 40,000 to 45,000. The flocks of sheep have been very greatly increased during the last 30 years. In 1798 the stock of sheep was estimated at about 25,000. Mr. Robertson supposes that in 1808 it had increased to 50,000; but both these estimates are believed to have been below the mark; and, allowing for this and the increase that has taken place since, we are assured that the present standing sheep stock is considerably above 120,000. Lintons and Cheviots have been widely diffused. It has been stated in proof of the extraordinary increase in the value of land in this county, that the rental of the pastoral estate of Glengarry, in 1788, did not exceed 800*l*. a-year, whereas it produced in 1828 from 6,000*l*. to 7,000*l*.!—(*Parliamentary Paper*, No. 175, Sess. 1828, p. 63.) A great sheep fair is held annually at Inverness, in the month of July, where dealers and agents from the south meet the sheep farmers of this and the adjoining counties, and sales to a very great extent are effected. Probably 100,000 sheep and 100,000 stones of wool are, at an average, disposed of at this fair.—(*Anderson's Highlands*, p. 12.) Natural

woods extensive and valuable, and there are, besides, a good many extensive plantations. The character and condition of the people of this, as well as of the other Highland counties, are vastly superior to what they were in the earlier part of last century. "The enormous crimes of bloodshed, of rapine, and plunder, carried on during the feuds of former ages, and not entirely abolished even a century ago, in open defiance of law and government, are now never heard of. The domestic and social virtues are now more revered and cultivated by all ranks. The comforts of life, and the friendly intercourse of society, are enjoyed by the higher orders as much as in any country; and the condition of the lower ranks was never as happy in these respects as at present. The law is everywhere predominant, and the administration of it upright and impartial. Single individuals travel unarmed in all directions through the Highlands, with thousands of pounds in their pockets, to purchase cattle, without dread or annoyance."—(*Survey*, p. 83.) The greatest part of this wonderful improvement must be ascribed to the excellent roads constructed by General Wade, and more recently by the parliamentary commissioners. They have been carried through every part of the county, and have rendered various districts, that were formerly almost inaccessible, pervious to civilization and good order. Their influence has been, in some respects, quite astonishing. Previously to the formation of these roads, neither carts nor any other sort of carriage could be used, the whole intercourse of the country being carried on by means of Highland ponies or *garrons*. Until 1755, the mail between Inverness and Edinburgh was conveyed by men on foot! And in 1740, the magistrates of Inverness advertised for a saddler to settle in the burgh!—(*Chambers's Gazetteer of Scotland*, art. Inverness-shire.) In 1760, the first post-chaise was brought to Inverness; and it was, for a considerable period, the only four-wheeled vehicle in the district. In 1803 there were 5 post chaises in the town of Inverness; and so rapid has been the progress of improvement, that at present there are several coach manufactories in the town, and hundreds of coaches, gigs, &c., are annually assembled at the Inverness races. Average rent of land, including islands, in 1842-3, 1*s*. 2¾*d*. an acre. Limestone, slate, and marble, abound in many parts. Lead has been discovered at two or three places, but it is not wrought: and the want of coal renders the limestone of little value. Principal rivers: Spey, Ness, and Beauly; on all which, but especially the first two, there are valuable salmon fisheries.

The Gaelic language prevails throughout almost all Inverness-shire, and a pretty large proportion of the inhabitants of its western parts do not even understand English. Owing to the thinness of the population, and the consequent difficulty of establishing schools, education in this and the other Highland counties is not nearly so extended as in the Lowlands. Recently, however, a good deal has been done to make it more available.

This county is divided into two nearly equal portions, by the great glen or valley, stretching in a south-west direction from the town of Inverness, on the Moray Frith, to Loch Linnhe, opposite to the Island of Mull, on the western coast. It is very narrow, and consists principally of Loch Ness, Loch Oich, and Loch Lochy. The surface

being nowhere in this glen more than 94 feet above the level of the sea, advantage was taken of this circumstance, and of the facilities afforded by the contiguous chain of lakes, to open a navigable communication between the eastern and western coasts, and consequently to avoid the tedious and dangerous navigation of the Pentland Frith. The entire length of the Caledonian Canal, inclusive of the lakes, is rather more than 60 miles; but little more than 23 miles is artificial. In point of dimensions, it exceeds every other canal in the island. It was constructed at the expense of government: though a splendid, it is a most unproductive, undertaking; and but for the invention of steamboats, would have been nearly useless. Inverness-shire contains 35 parishes. The county sends a member to parliament; and the borough of Inverness joins with Fortrose, Nairn, and Forres, in returning a representative. Inverness, the only town of any importance, has a population of 14,324. Population of county in 1831, 97,799. Valued rent, 73,188*l.* Scotch. Annual value of real property in 1815, 185,565*l.*; ditto in 1842-3, 182,064*l.*

28, 29. *Ross* and *Cromarty Shires* form a maritime district of great extent. Cromarty, however, is but a small county, and consists of various straggling and widely separated patches, almost entirely surrounded by parts of Ross-shire. Ross and Cromarty are bounded on the south by Inverness-shire and the Beauly, and Moray Frith; on the east, by the latter; on the north, by the Frith of Dornoch and Sutherland; and on the west, by the Atlantic Ocean, in which are situated the islands attached to Ross. They contain together 1,904,000 acres, of which 1,532,800 are mainland, and 375,200 islands; the freshwater lakes cover a space of 44,800 acres on the mainland, and of 12,800 in the islands. The eastern parts of the district, consisting of the *Black Isle*, or the peninsula between the Beauly and Moray Friths and the Frith of Cromarty; and *Easter Ross*, or the peninsula between the Friths of Cromarty and Dornoch, from Alness Kirk to Tain and Tarbet Ness, are comparatively flat and fertile. There is in Easter Ross a considerable extent of clayey loam, and of light sandy soil. The soil of the Black Isle is very various. Much of it is poor. The cultivated portion consists principally of clayey loam, good black mould, and sandy loam. In Strathpeffer, and the country round Dingwall, the soil is clayey; but, with these exceptions, the rest of the country is wild, dreary, rugged, and mountainous, interspersed with lakes and narrow glens, that afford pasture for sheep and black cattle. Estates for the most part very large; but there are several that are not of much value. Farms of all sizes; but the number of small occupancies, though still very considerable, is much diminished. The native breed of cattle is hardy, compact, and well suited to the country; but in the western parts of the county the Skye and Argyleshire breeds, or one closely allied to them, is most prevalent. Cattle formerly much more abundant than at present. Sheep-farming has, for many years past, engrossed almost the whole attention of the principal farmers and improvers; so that, besides a decrease in the numbers, it is also said that the breed of cattle has deteriorated. This, however, has been denied by others; and, at all events, the baneful practice of overstocking is no longer carried to

anything like the extent to which it was formerly practised in this as well as in other Highland counties. At no very distant period oxen were extensively employed in field labour in this district, and in Inverness and others; but at present they are almost wholly disused. All sorts of improvements, both in breeding and cropping, have been tried by the principal proprietors, and by the many intelligent and enterprising sheep farmers that have immigrated into Ross-shire from the south. Most part of Easter Ross, great part of the Black Isle, with the country round Dingwall, and along the north-west shore of the Inner Frith of Cromarty, now ranks with the finest districts in Scotland. It is traversed in every direction by excellent roads; has a more than usual number of gentlemen's seats and plantations; the fences consist principally of hedge and ditch; and it has a goodly display of hedge-row trees. Agriculture has been wonderfully improved; and the crops of wheat and turnips are at present nowise inferior to those in the more southern counties. (For further particulars see note below.*) But exclusive of these districts, a great

* At the commencement of the present century, from the difficulty of conveyance for exportation, cultivation was almost entirely confined to narrow strips of land situated along the sea coast, and in the immediate neighbourhood of the few sea-port towns; and even here was not brought to that state of perfection which, since the introduction of implements of a less defective description than those formerly used, it has of late years attained. As an instance of the improvement that has taken place in Ross-shire, now the most beautiful and highly cultivated county in the Highlands, I may mention, that there is at present in the service of Major Gilchrist of Ospisdale, in Sutherland, as farm manager, the individual who first introduced the ploughing of land into regular ridges, and the division of fields into anything like systematic management in that county; the fields being formerly detached pieces of land, ploughed irregularly, as the ground with the least labour suited. The carts generally used were of the poorest description, with a kind of tumbler or solid wheel, and wicker conical baskets; little or no lime was used for agricultural purposes. "I succeeded to a farm in this county about 30 years ago (says Major Gilchrist), when the working strength consisted of *sixteen oxen and twenty-four small horses called garrons; that farm is now laboured by three pair of horses.*"

"The total amount of wheat then raised in the county (Ross and Cromarty) was not equal to what is now produced on many single farms. It was not until 1813 that the first barley mill, north of the Cromarty Frith, was erected, and in 1821 the first flour mill (at Drummond, on the estate of Fowles) by the same individual. To such an extent, however, has cultivation of late years been carried, that the growth of wheat alone is now (1828) estimated at 20.000 quarters annually, and the exportation of grain to London, Leith, Liverpool, &c., during the last year, amounted to upwards of 10,000 quarters; besides the supply of the extensive and populous pastoral districts of the county, and the towns of Dingwall, Tain, Inverness, &c., to which places, I am credibly informed, upwards of 10,000 bolls of flour are now annually sent for the consumption of the inhabitants. Among other exports may likewise be mentioned the produce of various extensive distilleries situated in different parts of the county, and a considerable quantity of salted pork, bacon, &c., from the ports of Cromarty and Inver Gordon. I understand that, in the year 1819, the sum estimated to have been expended on the purchase of the latter commodity amounted to about 30,000*l.* Indeed, a marked improvement in domestic animals of every description has taken place in the northern counties, since the improved communication with the south. I need hardly allude to the introduction of Cheviot sheep,—to the pains taken in improving the breed of cattle, by the importation of the most improved sorts from the West Highlands, and of cows from Ayrshire. Considerable attention has been recently paid to the breed of horses, both for the purposes of agriculture and draught; and in some instances, those of the finest description have been successfully reared. Nor has the breed of pigs been neglected, several valuable species, both pure and crosses, having been introduced. In short, a

extent of mountainous country is still occupied by the old Highland tenantry. These are a brave and hardy race, but poor, and without either enterprise or industry. They occupy the straths or valleys between the mountains and along the banks of the rivers which, in some places, are so thickly tenanted, that there is a family for every Scotch acre of arable land! On this they raise oats, bear or bigg (a species of barley), and potatoes; frequently cultivating the ground with a crooked spade (*caschrom*) instead of a plough. The mode of ploughing which was formerly general over the whole country, and which is still practised by the smaller tenants, deserves to be noticed. "The plough is extremely rude. It was drawn by four horses abreast. Between the plough and the horses was a long apparatus of twisted birch twigs, by which they were united. The halters were fixed in 4 holes, made in a piece of wood about 6 feet long, which was held by the driver, who was thus enabled to pull all the horses at once, and encourage them to move forward, by occasionally applying his stick to their noses. He walked backwards, with his face towards the ploughman, and directed the breadth of the furrow slice. A man attended, whose office was to keep the plough in the ground, by pressing on the end of the beam with his whole weight. A fourth followed with a crooked spade; with which he turned over such parts of the ground as the plough had missed, and he also turned over such slices as had fallen back. The seed was scattered in great profusion, and slightly covered by means of harrows with wooden teeth. There are many of the country people who still disapprove of harrows with iron teeth, because they tear up the roots of the grass.* Mr. Downie was the first person who introduced an improved plough, worked by a pair of horses without a driver. This was done only about 1790, and caused great astonishment among the natives." — (*Mackenzie's Survey*, p. 249.) The smaller tenants uniformly possess a considerable extent of grazing ground, which is commonly contiguous to, but sometimes at a considerable distance from, their arable possession. Their huts are, for the most part, wretched; few of them have either chimneys or windows; they prefer living in the midst of smoke and filth; and, in winter, the cattle are generally housed under the same roof with the family. Except for a few months, when sowing or reaping their crops, preparing and saving their fuel, &c., the greater part of their time is spent in the pursuit of game, in fishing, or in idleness. Previously to the reduction of the duties on whiskey, in 1823, illicit distillation was very prevalent, and is still carried on, though to a comparatively small extent. "It cannot be said with truth, that the class of people, of which the great majority of the population consists, enjoy the comforts of life in even a moderate degree. Poorly fed, scantily clothed, and miserably lodged, theirs is a life of penury and toil. Exposed to the temptations of idleness, without its ease, and to the slavery of labour, without its rewards, they drag out a wretched existence, suffering under the continual fear of impending want, and uncheered by any

general spirit of approximating these counties, in as far as the soil and climate will permit, to the more advanced counties in the south, seems everywhere to prevail."— (*Parl. Paper*, No. 175. Sess. 1828, p. 60.)

* This is no longer the case.

prospect of amendment in their condition."—(Art. Parish of Glenshiel, *New Statistical Account of Scotland*, No. 12, p. 200.) Under these circumstances, no reasonable man can doubt that the measures adopted by many landlords during the last half century for consolidating the small possessions held by the native tenants, and introducing farmers possessed of capital and skill, have been, in a public point of view, eminently beneficial. In some instances the change may have been harshly effected; but we hesitate not to say that it has, on the whole, been highly advantageous to the peasantry themselves. Having been obliged to repair to villages, or to emigrate, they have also been obliged to lay aside their slothful habits; so that, in point of fact, not only the wealth and industry, but even the population of the country, has gained materially by the introduction and extension of that sheep-farming system that has been the theme of so much unfounded animadversion. In proof of this, we may observe that the population of the district amounted, according to the enumeration of Dr. Webster, in 1755, to 47,456. In 1800 it had increased to 55,877; and notwithstanding the increase of sheep farming, and the prevalence of emigration in the interim, the population in 1831 amounted to 74,820. Minerals and manufactures of no importance. Average rent of land, including islands, in 1810, 1*s.* 1*d.* an acre; in 1842-3, 1*s.* 3¾*d.* per ditto. Principal rivers: Conon, Orin, and Beauly. Parishes, 33. A member is returned to parliament for the united counties of Ross and Cromarty. The burghs of Dingwall, Tain, and Cromarty, are associated with Kirkwall, Wick, and Dornoch, in the choice of a representative; and Fortrose is associated for the same purpose with Inverness, &c. Principal towns: Tain, Fortrose, and Dingwall. Population of district, inclusive of islands, in 1841, 78,685. Valued rent, 87,940*l.* Scotch. Annual value of real property in 1815, 121,557*l.*; ditto in 1842-3, 143,215*l.**

30. *Sutherland*, a maritime county, occupying the north-western extremity of the island, is bounded on the south by Cromarty and Ross; on the east by the Frith of Dornoch and Caithness; and on the north and west by the Atlantic. It contains 1,152,640 acres, of which 30,080 are water. The aspect of the country is wild, bleak, and, in many parts, savage. The eastern shore has a small fringe of good arable land; but the rest of the surface is rugged and mountainous, being, however, interspersed with various narrow straths or glens, and some considerable lakes and morasses. Sutherland, like the other Highland counties, was, till recently, occupied by native tenants, similar, in all respects to those of Ross. These, however, have, for the most part, been recently removed either to villages on the coast, or have emigrated; and the lands have been divided into extensive sheep farms, furnished with excellent houses and offices. The native breed of cattle is small, but when crossed with those of Argyle and Skye, it is said to be equal to any that the Highlands can produce. Galloways, and other varieties, have also been introduced. Owing to the extraordinary extension of sheep-farming in this county, the stock

* Sir George Mackenzie's Survey of Ross and Cromarty is an able work. It gives a good account of the whole method of occupying and farming land in the Highlands, and of the advantages that have resulted from the introduction of sheep-farming.

of cattle has been diminished in a still greater degree than in Ross-shire; but sheep being much better suited to the country, the change has been, both locally and in a public point of view, highly advantageous; vast tracts having been, through its means, coupled with a very extensive drainage, rendered considerably productive, that were formerly almost useless. Cheviots are found to thrive remarkably well in almost all parts of Sutherland. About 40,000 sheep and 180,000 fleeces are said to be annually sent to the south from this county.—(*Anderson's Highlands*, p. 12.) Four-fifths of the county belong to the Duke of Sutherland, who has expended vast sums in the formation of roads and inns, the building of bridges, piers, farm-houses, and villages, and other expensive and substantial improvements. Since 1811, above 100 miles of road have been made in this county by the Parliamentary Commissioners, and above 350 by individual exertion and statute labour! * The fringe of arable land along the east coast of the county has been divided into moderate-sized farms, well inclosed and drained, and presenting as good a specimen of the improved turnip husbandry as is to be found in any part of the island. In 1821 there was not a gig in the county; in 1840 there were above 50, which far exceeds the number of carts in 1821. In 1796 there were only *two* blacksmiths between Bonar Bridge and the Ord of Caithness, whereas in 1830 there were 38, and their number has since increased! Nowhere, indeed, in Scotland have improvements been attempted on a greater scale, or prosecuted with more zeal, skill, and success than in this remote county. Whether the change should not have been more gradually introduced, we shall not undertake to say; but there cannot be a doubt, that the character and habits of the people, as well as the rural economy of the district, have been signally improved. From being indolent, and attached to old practices, the peasantry have become comparatively active, laborious, and enterprising; and are decidedly better lodged, clothed, and fed than at any former period. They have also improved in cleanliness, beyond what could have been expected. There are three great deer forests; and ptarmigan, grouse, and black-cock, alpine hares, &c., are abundant. Limestone and freestone are met with. Average rent of land in 1842–3, 7*d.* an acre. The herring fishery is carried on with spirit and success, both on the east and west coasts, but principally from Helmsdale. Principal rivers: Oickel, Fleet, Brora, and Helmsdale. Sutherland contains 13 parishes. Dornoch, the principal town, has a population of only 504. Population of county in 1841, 24,782. Sutherland returns 1 member to Parliament; and the borough of Dornoch unites with Kirkwall, Wick, &c., in choosing a representative. Valued rent, 26,093*l.* Scotch. Annual value of real property in 1815, 33,878*l.*; ditto in 1842–3, 36,113*l.*

31. *Caithness*, a maritime county, occupying the north-east extremity of Scotland, is bounded on the west by Sutherlandshire; and on the south, east, and north by the ocean. It contains 446,080 acres, of which 6,400 are water. About three-eighths of the surface are supposed to consist of mountains, high moors, and hilly pasture. The mountains lie along the confines of Sutherland, Morven, the highest,

* Some very striking statements, as to the influence of these roads, are given in *Parl. Paper*, No. 175. Sess. 1828, p. 61.

having an elevation of 2,324 feet. This mountainous ridge terminates to the south in the stupendous precipices, called the Ord of Caithness, that overhang the sea on the Sutherland border. The rest of the county is so flat that it may be described as a broad undulating plain: it consists for the most part of vast tracts of moss and moorish ground, covered with stunted heath, intermixed, however, with some spots of superior fertility. Being destitute of wood, as well as of hills, this level district has a bleak, dismal appearance. Owing to the position of the county, which, on all sides but the west, is surrounded by the sea, the winters, notwithstanding its high latitude, are mild; but more rain falls here than in any other district on the east side of the island, so that the summers are both cold and wet. Property in a few hands, and mostly under entail. Farms frequently let in small patches, and only from year to year; and in addition to this pernicious tenure, the tenants are not unfrequently burdened with almost indefinite servitudes.* But despite these untoward circumstances, improvements of all sorts have, within these few years, been carried on in Caithness with a spirit and success that no one could previously have conceived possible. Formerly it was almost inaccessible except by sea; but now the mail-coach from Inverness regularly reaches Wick, and even Thurso, on the extreme northern coast of the island. Within the last few years above 200 miles of road have been made at the expense of the gentlemen of the county, exclusive of about 50 miles made by the Parliamentary commissioners. In agriculture the advance has been equally great. A great deal has been done in the way of draining, inclosing, taking in waste land, consolidating small farms, and introducing an improved system of husbandry. Oats and bear or bigg are the principal corn crops: wheat has been raised, but the climate is not suitable for it. Potatoes are largely cultivated; and the extent of land under turnip is now vastly greater than at any former period. The greatest change has taken place in the vicinity of Wick and Thurso, but especially the former. Wick has now become the principal seat of the British herring fishery. Its important suburb, Pulteney town, built on the south side of the bay, on land feued by the British Fishery Society, has grown up with something like the rapidity of a manufacturing village. During the fishing season, from 1,500 to 2,000 boats, having each at an average a crew of about five men, rendezvous here. Of these about 500 belong to the town, the others being collected from all parts of the coast, from Northumberland on the east round to the remotest of the Hebrides on the west. Much wealth has in consequence been brought to the town; and a great demand has been created for the produce of the surrounding country. Cultivation has, however, more than kept pace with the increased demand; for, besides supplying the wants of the immense population engaged in the fisheries, large quantities of grain and wool are annually exported. The refuse herrings make excellent manure. At no very distant period, the breed of cattle in Caithness was the very worst in the Highlands. The lands were so much overstocked, that the cattle were not half-fed, and many died each spring. But now, through the patriotic exertions of the

* These were noticed, and justly reprobated, by Pennant.—(*Tour in Scotland*, vol. i. p. 203.)

late Sir John Sinclair, and other gentlemen, a great change for the better has been effected. The Argyle and Skye breeds of cattle have been extensively introduced; the stocks of different individuals are no longer allowed to herd together in the winter season; and the stock is more nearly adjusted to the pasture. The breed of sheep has also been improved by the introduction of Cheviots. In consequence of these and other circumstances, the value of property in this remote county has advanced astonishingly; and but for the embarrassed state of some proprietors, and the want of capital, the advance would have been still greater. Average rent of land in 1842-3, 2*s.*7½*d.* an acre. The inhabitants of Caithness are clearly of Scandinavian or Gothic origin. This is evinced as well by their tall figures and fair countenances as by their language. It is only on the borders of Sutherland that we find any trace of the Gaelic. In all the rest of the county English is spoken in considerable purity. The houses of the peasantry have in some parts been materially improved; but speaking generally, their huts are poor and miserable. Many farm-houses and offices of a very superior description have been constructed within the last few years. Limestone is abundant; and Pennant says it used to be carried to be burned with turf on the backs of the fair Caithnesians! Principal rivers, Thurso, Wick, and Dunbeath. It contains 10 parishes. Caithness sends a member to Parliament; and Wick unites with Kirkwall, Dornoch, Tain, Dingwall, and Cromarty, in choosing a representative. Principal towns, Wick and Thurso. Population of county in 1841, 36,343. Valued rent, 37,256*l.* Scotch. Annual value of real property in 1815, 35,469*l.*; ditto in 1842-3, 65,869*l.**

ISLANDS.

Exclusive of the mainland, Scotland has an immense number of islands attached to it, some of which are of great extent, though few are of much value.

Islands in the Frith of Clyde.—These which form the county of Bute, consist of Bute itself, Arran, the Cumbraes, and Inchmarnock. Their total area may be estimated at about 150,000 acres; viz., Arran 115,000, Bute 30,000, and the Cumbraes, &c., 5,000. The north part of Arran consists principally of lofty, bare, and rugged, granite mountains, connected by steep ridges, and intersected by deep valleys and ravines. Goatfell, the highest summit in the island, rises to the height of 2,865 feet above the sea. The southern and largest portion of the island consists principally of undulating, hilly ground, the eminences of which are of a flattened or rounded configuration, and covered, for the most part, with a deep stratum of peat. The arable land may amount to about 12,000 acres. The northern portion of Bute, though less mountainous than Arran, is bleak and rugged; but its central and southern portions consist in general of undulating ground with moderately good soil, on a limestone bottom, fit either for tillage or pasturage. Climate moist but exceedingly mild. The system of agriculture in these islands was at no distant period as bad as can well be imagined. It was reasonable to suppose that Bute, being naturally

* Some of the statements with respect to this, as well as most of the other Scotch counties, have been derived from private, but authentic, channels.

more fertile and more accessible than Arran, should make the first advances in improvements, and such has been the case. Notwithstanding what had previously been done, the progress of Bute since 1816, when the survey of the county was published, has been astonishingly great. Drainage had not then been introduced; turnips were almost unknown, and a rotation of crops, little, if at all attended to; the farm stock and farming implements were alike bad; and instead of attending to their farms, the occupiers were eager to engage in the lottery of the herring fishery. In consequence, however, of the encouragement afforded by the judicious liberality of the Marquis of Bute, (the proprietor of by far the larger portion of the island,) of the facilities of communication with the mainland by the employment of steamers, and of the ready market that has thus been opened to its produce, the change for the better in its agriculture and appearance, and in the condition of its inhabitants, has been quite as great as in most other parts of Scotland. "A complete system of drainage has been introduced; the most approved rotation of crops is observed; the use of the sub-soil plough is beginning to prevail; and an enterprising tenantry are ready to import the most recent discoveries in husbandry. The duration of leases is 19 years. The farm-houses have for the most part been rebuilt, and are remarkably neat and commodious. The grounds are well enclosed, chiefly with thorn hedges."—(*Buteshire, in New Statistical Account of Scotland*, p. 90.) And we may add, from the same authority, that the existing farmers and their families are strongly attached to their employment, and have almost wholly renounced having anything to do with the fishery.

In Arran the change has been, if possible, still greater. There were there, down to a comparatively late period, neither roads nor wheel-carriages; the cottages of the inhabitants were of the most miserable description; and the cattle, though diminutive and hardy, died by hundreds every severe spring. Lands were held jointly by several tenants on the common or *run-rig* plan (See *ante* notice of Argyleshire), and were scourged by a constant course of corn crops, which succeeded each other in a series, unbroken, except by the occasional introduction of potatoes, as long as the land would produce anything. But since 1815, the Duke of Hamilton, who is proprietor of nearly the whole island, has laboured strenuously and successfully to introduce a better system; partly by letting farms to individuals for a fixed term of years, excluding sub-tenants and assignees, partly by introducing conditions into leases fitted to ensure a better system of management, partly by introducing improved breeds of cattle, and partly by expending large sums on the building of houses, enclosing, making drains, roads, &c. The people were, at first, very much opposed to the change; but their prejudices have gradually given way, and they are now, in general, sensible that it has been still more advantageous to themselves than to the proprietor. Extensive districts are now divided into moderate sized farms, enclosed, subdivided, and comparatively well cultivated, having valuable stocks of cattle, and comfortable farm-houses and offices, where in 1814 nothing was to be seen but ridges running in all directions without a single enclosure or subdivision, and with only a few huts, destitute of chimneys and windows.

Wheat is raised on some of the best farms; but the climate is too moist for this species of grain, and oats is the most profitable crop. The manufacture of kelp has been wholly relinquished; but despite the falling off in this respect, the value of the exports of corn, cattle, and other produce from the island has been vastly increased, while the increase of the rental yields an ample return to the proprietor. It may, indeed, be safely affirmed, notwithstanding the drawbacks under which the population continues to labour, that no part of the United Kingdom has been more improved, since 1815, than Arran. But to ensure the full development of its capabilities, it will be necessary vigorously to follow up the new system by preventing subletting and subdivision, increasing the size of farms and the length of leases, and rebuilding cottages. It would also be very desirable were the Duke of Hamilton to grant facilities for the building of villas, and for the increase of the villages of Lamlash and Brodick.*

The county of Bute is divided into 5 parishes, and sends 1 member to the House of Commons. Population in 1841, 15,740, of which Bute had 8,078; and Arran 6,241. The town of Rothsay, on the east coast of Bute, with a population of 5,789, has an old castle, once a favourite residence of the Scottish sovereigns. Annual value of real property in the county of Bute in 1815, 22,541*l.*; ditto in 1842-3, 31,162*l.*

Hebrides or Western Islands.—The islands that lie to the west of Scotland, excluding those in the Frith of Clyde, are denominated the Hebrides, or Western Islands. (The *Hebudes* or *Ebudes* of the ancients.) They are usually divided into the Inner and Outer Hebrides; the former consist of the islands nearest to the mainland, including Skye (the second in point of extent of the Hebrides), Mull, Islay, Jura, Coll, Rum, Tiree, &c. The outer Hebrides, popularly called the Long Island, consist of the lengthened range of islands, stretching in a continuous N.N.E. and S.S.W. direction, from Barra Head, in lat. 56° 49′ N., to the Butt of the Lewis, in lat. 58° 51′ N. The principal islands in this range, commencing with its southern extremity, are Barra, South Uist, Benbecula, North Uist, with the districts of Harris and Lewis: the last 2 form 1 large island, being in fact a good deal more extensive than all the rest put together. Exclusive of the above, there belong to the Outer Hebrides a vast number of smaller islands, and islets or rocks. The greater islands are separated from each other by sounds, or arms of the sea, of varying magnitudes, but in no case above 10 or 12 miles wide, and generally interspersed with smaller islands; so that the range has all the appearance of having at one time formed one entire island. The Outer are separated from the Inner Hebrides, and the mainland of Scotland, by the channel called the Minsh. This, where narrowest, between Skye and North Uist, is from 15 to 16 miles across. In all, the Hebrides are supposed to contain about 200 islands, of which about 80 are inhabited. They are distributed among the shires of Argyle, Inverness, and Ross. —(See *ante*, p. 227.) They have never been surveyed with any considerable degree of accuracy, so that but little dependence can

* See art. Arran, in *Geographical Dictionary*; and the accounts of the parishes of Kilbride and Kilmore in *New Statistical Account of Scotland.*

be placed on the accounts of their measurement. But, according to the best attainable data, their total area is supposed to amount to about 2,739 square miles, or 1,688,960 acres, of which about 64,000 acres are fresh-water lochs, or lakes. Some of the islands, particularly Skye, Mull, and Jura, contain extensive tracts of high rugged, and mountain land; and this, also, is the case in some parts of the district of Harris. The surface in many places, particularly in the Long Island, or Outer Hebrides, consists of extensive dreary tracts of moss and moor; and in most islands there is a greater or less extent of hill pasture. The soil varies considerably; but, except in Islay, deservedly styled the Queen of the Hebrides, and a few favoured districts in Skye and the other islands, it is, in general, miserably poor. About two-thirds of the whole are supposed to consist of peat earth, resting mostly on granite or gneiss, the points of which frequently protrude through the moss. Along the western shores of the Long Island, and in some other places, there is a large extent of sandy soil. In parts the sand is so loose as to drift with the winds; but where it is mixed with peat and the clay found on some of the declivities, it is tolerably productive. Climate mild, but variable, tempestuous, and humid. In the Outer Hebrides spring commences towards the end of March, summer about the end of May, autumn about the middle of August, and winter towards the end of October. "The winters are generally mild as to temperature, snow seldom lying long on the ground, especially near the shores, and the lakes being hardly ever frozen. But heavy and continued rains, accompanied with westerly winds and violent gales from the Atlantic, with showers of sleet and hail, and sometimes thunder, are frequent at this season. Upon the whole, however, the winters are less severe than on the mainland, and especially than on the east coast of Scotland. The commencement of spring is generally colder than the winter, and is always wet and boisterous. As it advances, dry easterly winds prevail, and cause much drifting of the sand and newly-turned soil. Summer is frequently ushered in with continued rains, and is extremely variable, as is the early part of autumn. When the summer is dry and hot, the grassy pastures are burnt up, and the crops, which are chiefly on sandy soil, are deficient. At all seasons heavy gales are occasionally experienced. In winter the huts are frequently unroofed by these gales, boats broken to pieces, and the sands blown to an immense distance. It is needless to say that the ocean, during these tempests, presents a magnificent spectacle, its huge billows dashing over the low rocks and islets, and ascending the precipitous shores, often to an astonishing height, the spray being carried far inland. Judging by the shaggy covering which black cattle and horses assume at this season, one might be apt to imagine the winters more severe than they really are; but this circumstance may depend upon other causes than the lowness of temperature. There is certainly a much greater difference between the pile of an English horse and a Shetland pony than between the winter temperatures of their places of residence. Westerly and southerly winds are predominant, and generally bring rain. The rapidity with which iron becomes covered with rust is remarkable, and veneered articles of furniture are apt to warp and

burst in the joining."* The arable land, which in the greater number of the islands is of very small extent, is, for the most part, light and sandy. It is supposed by Mr. M'Donald to amount in the entire Hebrides, inclusive of the islands in the Frith of Clyde, to 170,000 Scotch, or 212,000 statute acres, which he distributes as follows, viz.: Gigha, 1,500; Islay, 22,000; Jura, 3,000; Kerreray, 1,000; Collonsay and Oronsay, 3,500; Luing, Saoil, Shuna, Lunga, Scarba, 5,000; Mull, with Ulva, Gometra, Icolmkill, &c., 10,000; Lismore, 4,000; Tiree, 5,000; Coll, 4,500; Skye, with its islets, 30,000; Eigg, Muck, and Cannay, 2,500; Uists and Barra, with Valay, Heisker, Borreray, and islets, 40,000; Raasay and Ronay, 3,000; Rum, 1,000; Harris and Lewis, 26,000; Hirta, 500: in all, 170,000 Scotch acres, or between an *eighth* and a *ninth* part of the total surface. Assuming the whole extent of the Western Islands (including those in the Clyde) to be equal to 1,592,000 Scotch, or about 2,000,000 statute acres, Mr. M'Donald supposes it may be distributed as follows:—

	Acres.
Mountains, morasses, and undrained lakes, scarcely yielding any specified rent to the proprietors	600,000
Hill pasture, appropriated to particular farms, and sometimes enclosed, or at least limited by acknowledged marches, as lakes, rivulets, &c., and paying rent	700,000
Arable and meadow land, under grass, hay, corn, or potatoes	180,000
Kelp shores, dry at ebb-tide, regularly divided among the tenantry, and producing 5,000 tons of kelp, besides manure, annually	30,000
Ground occupied by villages, farm-houses, gardens, gentlemen's parks, &c.	20,000
Ground occupied by peat mosses annually, and by roads, ferry-houses, and boats	22,000
Barren sands, tossed about by the winds, and pernicious to their vicinity	25,000
Ground employed as glebes, or in lieu of glebes, by established clergymen, manses, churches, and church-yards	8,000
Ground occupied by schoolmasters	2,000
Ground (under), natural woods, coppices, and new plantations, chiefly in Bute, Islay, Mull, and Skye	5,000
Total	1,592,000

In Islay, Collonsay, and some parts of Skye, Mull, &c., agriculture in all its branches has been very much improved; but in the Long Island, and in the greater part of the Inner Hebrides, it continues in an exceedingly backward state. The *caschrom*, or crooked spade, is frequently used, particularly in the Long Island. The plough, indeed, cannot be employed except in districts that have been drained and levelled; and these unfortunately bear, in most places, a very small proportion to the others. About 12 men suffice to turn an acre a-day with the caschrom. The old plough of the Hebrideans is a miserable instrument; it has only one handle, and is usually drawn by 4 horses driven by a boy: it is now, however, rarely used. Wheat of good quality has been raised in Islay, but with doubtful advantage. Oats and barley may, indeed, be said to be the only white crops raised in the Hebrides, being cultivated to about an equal extent. The barley is of the variety called bere or bigg (*Hordeum hexastichon*). Nine-tenths

* *Macgillivray's Account of the Outer Hebrides, Quarterly Journal of Agriculture*, No. XI. p. 274.

of the population of the Outer Hebrides, and of Tiree and Coll, when they use bread, use that made of barley. The old Scotch gray oat is the species most commonly cultivated; it is very unproductive, and has no good quality, except that it does not easily shake: but other and better kinds of oats are now frequently met with. Except in Islay, and a few farms in the more improved islands, there is hardly anything like a rotation of crops; and it is customary for lands to be sown with successive crops of oats and barley till they be quite exhausted. The crops are, in consequence, far below what they would be under a better system. It is surprising that the landlords should not vigorously exert themselves to check this abuse; its suppression would redound alike to their own advantage and that of their tenants. Instead of selecting the best, it is, perhaps, the more usual practice for the Hebridean farmers to select the lightest and worst portion of their oats and bere as seed! Good turnips are raised in Islay, and in parts of Skye, and some of the other islands, but only on lands in the hands of a few public-spirited individuals. Potatoes were introduced for the first time in 1743; and so rapidly has their culture extended, that they now furnish *four-fifths* of the food of the people. Except in some of the more improved districts, they are mostly planted in the Irish fashion, or in lazy beds. Sea-weed is the manure most commonly used in raising potatoes, and, indeed, all other species of crops; and it has been surmised that it may be owing to this that the Hebridean potatoes are generally viscid and watery. Small quantities of flax are sometimes raised for family use. Carts are but partially introduced. Except in Skye, Islay, and Jura, where they have been made by the parliamentary commissioners, roads can hardly be said to exist; and, in the less improved islands, all sorts of articles are either conveyed by sea in boats, or in panniers slung across horses' backs. Black cattle constitute the staple product of the Hebrides. The breed called Kyloes, or West Highlanders, is small, hardy, easily fed, and admirably adapted to the country. Stock supposed to amount to 110,000 or 120,000,* of which about a *fifth* part are annually ferried over to the mainland. The management of cattle has been materially improved in most of the islands within the present century: formerly overstocking was universal, and large numbers used to perish every winter and spring for want of food; but losses from this cause, though they still occur, are now much less frequent. The native breed of sheep is very small, weighing only from 15 to 20 lbs.; face and legs white, wool of various colours, and these frequently occurring in the same fleece. Weight of fleece varies from ½ lb. to 1 lb. Latterly, however, both the black-faced, or mountain breed of sheep, and the Cheviots, have been successfully introduced; but the black-faced appears to be increasing faster than the other. Mr. M'Donald estimated the number of sheep in the islands at rather less than 100,000; but it has increased since 1811, when his excellent work was published. Owing to a better distribution of the land, the number of horses has latterly been a good deal reduced. They are small, but not diminutive, like those of the Shetland Islands, hardy, easily kept, and docile.

* Mr. M'Donald says 110,000.—(*Survey*, p. 422.) Mr. Youatt supposes there may be, at present, 150,000 head of cattle in the Hebrides (*Cattle, their Breeds, &c.* p. 67); but we have been assured that this is beyond the mark.

They are not a fine breed, the head being generally large, and the hair shaggy. The Hebrides are divided among about 50 proprietors, of whom several have very large and pretty valuable estates. Land generally held by tacksmen, tenants, and subtenants, including cottiers, or crofters. The tacksmen correspond to the middle-men of Ireland, holding considerable tracts, which they relet in smaller portions to subtenants. The tenants hold directly from the landlords. Their farms, though sometimes of great extent, are mostly of small value, varying from 5*l.* to 50*l.* a-year of rent. They seldom have leases, but mostly hold at will, being liable to be turned out at pleasure. This, also, is generally the case with the subtenants. Sometimes a number of small tenants take a farm conjointly, and hold it on the *run-rig*, or partnership plan, which used to be the common method of occupying land in the Hebrides; and, though discouraged by most landlords, and suppressed in Islay, on Lord Macdonald's estate in Skye, &c., still prevails to a great extent. The crofters, or cottiers, are a very numerous class, many of them paying their rents in services instead of money. The want of leases, and occupancy by partnership, are all but insuperable obstacles to improvement. The dependence, too, which the cottiers place on their small patches of ground, is found to be exceedingly pernicious: it gives them a sort of security against absolute want, and, by making them in some degree their own masters, fosters that sloth and apathy for which they are so remarkable. In consequence of the minute division of the arable land, and of the general cultivation of the potato, there is, in some places, a great excess of population. Within these few years, some proprietors have exerted themselves to abate this evil by preventing the further division of the land and encouraging the emigration of the surplus population. Their efforts have, in some instances, been quite successful; and, while the proprietors have increased their rentals, and been able to avail themselves of the capabilities of their estates for improvement, the interests of those who emigrated, and for whose labour there was no demand at home, have been signally advanced. The total rental of the Hebrides may amount to about 110,000*l.* a-year. It was probably, at one time, larger; or, if it has not been reduced, it must, at all events, have been prevented from rising so high as it would otherwise have done by the decline of the kelp manufacture, and of prices since the peace. The total population of the Hebrides, in 1841, amounted to 92,615. The condition of the people differs much in different islands; but, speaking generally, it is exceedingly depressed. Pennant's account of the inhabitants of Islay, though no longer applicable to them, Islay having been most materially improved in the interim, is still strictly applicable to those of most of the other islands:—"A set of people worn down by poverty, their habitations scenes of misery, made of loose stones, without chimneys, without doors, excepting the faggot opposed to the wind at one or other of the apertures, permitting the smoke to escape through the other, in order to prevent the pains of suffocation. The furniture perfectly corresponds: a pot-hook hangs from the middle of the roof, with a pot pendant over a grateless fire, filled with fare that may rather be called a permission to exist than a support of vigorous life: the inmates, as may be expected, lean, withered, dusky, and smoke-dried."—(*Tour in*

Scotland, vol. ii. p. 263.) The huts frequently afford shelter, in winter, to the cattle of the cottier as well as to his family; and the dung and other filth gathered during the season, is allowed to accumulate untouched till May, when it is removed, and when it is not unusual, also, to unroof the hut. It is no doubt true that some of the cottages on the estates of Mr. Campbell of Islay, Lord Macdonald, and a few other proprietors, have been greatly improved since Pennant's time; but the above is, we are sorry to say, a correct description of those that still exist in the Long Island, in the greater number of the other islands, and along the coast of the Western Highlands. The principal tenants are, however, well and comfortably lodged. From September to May, the inhabitants live chiefly on the potato, with some coarse oat or barley bread, and occasional but scanty supplies of fish and flesh. In summer they subsist principally on bread and milk; but in some of the islands these are so deficient that, at this period, the inhabitants have for the most part a very emaciated appearance, and are obliged to resort to the shores in search of sand-eels and shell-fish. When the crops fail, they are exposed to the greatest privations. On such occasions, large quantities of oatmeal are imported. The spirit of improvement has, however, been widely diffused, and will, it is to be hoped, gradually extend itself to all the islands. The embarrassed state of some of the great landholders has hitherto been one of the most formidable obstacles to improvement. Recently, however, the Lewis, the largest and most neglected property in the Hebrides, has been purchased by Mr. Mathieson, M.P., a wealthy and intelligent capitalist, who is determined to leave no means untried by which to improve its condition and that of the inhabitants. And, notwithstanding the difficulties interposed by the variableness of the climate, the nature of the soil, and the ignorance and prejudices of the people, he will, no doubt, succeed in effecting some very material improvements. The abolition of the common or *run-rig* system would, in itself, be an immense advantage; and many other changes may be brought about by the interference and exertions of the landlords, and by none else. What has been done in Skye is an earnest of what may be anticipated in the Lewis and elsewhere from liberal and judicious management. In 1800, there was hardly a mile of practicable road in that island; and it did not contain more than two or three small slated houses, and, perhaps, a dozen carts. But, in the interval, the island has been intersected by good roads; and the late Lord Macdonald is said to have expended 100,000*l.* on the erection of buildings and other improvements on his estates! In consequence, the aspect of the country has been materially changed, its agriculture has been wonderfully improved, and the condition of its inhabitants, though still much depressed, is decidedly preferable to what it has ever been at any former period.—(*Parl. Paper*, No. 175, Sess. 1828.) Turf is the common fuel of all the islands: in most places it is exceedingly abundant; but in Muck, Tiree, Cannay, and Icolmkill, it is now procured with very great difficulty; a third part of the industry of the inhabitants being required to supply themselves with fuel. Their utmost efforts are, at times, insufficient, and the distress thence resulting is extremely severe. The Hebrides are estimated to have in all nearly 4,000 miles of sea-

coast! They have, besides, many excellent harbours; the surrounding seas are well stocked with fish; and the inhabitants being familiarised to the sea, in passing from one island to another, it might be supposed that the fisheries would be in a flourishing condition; but, however it may be explained, such is not the case. Most part of the fishing villages erected by public co-operation have totally failed; and the herring fishery, in particular, has greatly declined. Even the abolition of the salt duties has not contributed to improve the Hebridean fisheries to anything like the extent that was anticipated. Stornaway in Lewis, Tobermory in Mull, and Portnahaven in Islay, are the principal fishing stations. The kelp manufacture was carried on to a very large extent on the shores of some of the islands during the late war, and formed a prolific source of wealth both to landlords and tacksmen; but the heavy fall in the price of kelp, caused by the abolition of the duties on salt, and the reduction of those on barilla, have gone far to destroy the manufacture, which has shrunk within comparatively narrow limits. It may, however, be doubted whether the loss, though severely felt at first, has been in the end so great as was imagined. The close attention required by the kelp manufacture during the summer months was extremely unfavourable to all sorts of agricultural operations, which were uniformly neglected, and in a peculiarly backward state in the islands where the greatest quantity of kelp was made. The marine plants, so valuable as a manure, were mostly also employed in the manufacture of kelp; so that it not only withdrew the necessary labour from the land, but took away the principal means by which its fertility could be either maintained or increased. Limestone is found in several of the Hebrides; and large quantities are used in Islay, and exported from it. In the latter island lead mines have been wrought for ages, but not with much spirit. Slates of good quality are quarried in Easdale and the adjacent islands, and are largely exported. Marble is found in Tiree and other places. Fingal's Cave, in Staffa, and its basaltic columns, are well known (*antè*, p. 251). Manufactures, in the common acceptation of the term, are quite unknown: every family prepares its own articles of clothing. The women spin the wool and flax, and convert them into clothing. Every head of a family makes most part of the implements and furniture that they require. A few boat-builders, joiners, shoemakers, and tailors supply all the other articles wanted. In some places there are pretty good mills; but in others, corn is still principally ground by querns, or hand-mills. Trees do not grow well in the Hebrides, or only in a few sheltered spots, so that timber is scarce and dear, and considerable quantities are imported. The other imports are salt, iron, groceries, oatmeal, &c. The exports are principally black cattle, kelp, sheep, wool, cod and ling, herrings and fish-oil. The introduction of steam navigation has contributed more, perhaps, than anything else to the improvement of the Hebrides, particularly the southern islands. They are now annually visited by great numbers of strangers; and the steam-packets create an extensive market for various articles for which they had formerly no demand, and furnish them with a ready means of conveying others to Glasgow, Greenock, &c. The Hebrides are divided into 26 parishes, and are attached to the counties of Argyle,

Inverness, and Ross. There is a good deal of Scandinavian blood in the Hebrideans; but the Gaelic is, notwithstanding, the prevailing language; and many of the inhabitants are ignorant of English. There used to be a great deficiency of churches, and there is still a great deficiency of schools. There are no poor rates in the islands, and no public beggars. The Catholic religion prevails in some parts.—(For further particulars, see the *Agricultural Survey of the Hebrides*, by James M'Donald, A.M.; *Anderson's Highlands*, &c.; the valuable tract of Messrs. Fullarton and Baird on *The Highlands and Islands of Scotland*, Glasgow, 1838; the account of the Outer Hebrides, by William Macgillivray, A.M., in the 11th number of the *Quarterly Journal of Agriculture*, &c.)

Orkney and Shetland Islands.—These, most probably the *Thule* of the ancients, lie in two groups to the north of Scotland, and form between them a county, which returns a member to parliament. The Orkneys (*Orcades*), the most southerly, are separated from the county of Caithness by the Pentland Frith, about 6 miles broad. They are comprised between the parallels of 58° 44′ and 59° 24′ north lat., and 2° 25′ and 3° 20′ west long. There are about a dozen principal islands; Pomona, or the mainland, being decidedly the largest. But, including the smaller islands (provincially, *holms*) and islets, the total number is estimated at about 67, of which about 40 are uninhabited. They are supposed to comprise an area of about 281,600 acres, and had, in 1841, a population of 30,507.

The Shetland, or Zetland, Isles, the most northerly group (perhaps the *Ultima Thule* of the ancients), are separated from the Orkneys by a channel 48 miles across, and lie principally between the parallels of 59° 52′ and 60° 50′ north lat., and 30′ and 1° 40′ west long. Including islets, they are supposed to exceed 100 in number; but the Mainland, or principal island, is a good deal more extensive than all the others put together. Between 30 and 40 are inhabited. They are about twice as extensive as the Orkneys, their total area being estimated at 563,200 acres. In 1841 they had a population of 30,558.

The aspect of these islands is pretty similar, but the Shetland group is the more rugged, wet, and barren of the two. They are generally fenced, particularly on the western side, with high, black, precipitous cliffs, against which the sea, when vexed by storms, dashes with astonishing fury. They are destitute of high mountains, the altitude of Mount Rona, in Shetland, the highest, not exceeding 919 feet. Their general appearance is that of dreary, heathy wastes, interspersed with rocks, varied sometimes with swamps and lakes, and in a few places with beds of moveable sand. In some parts, however, particularly in Orkney, the land is abundantly fertile, producing good crops of corn and luxuriant herbage. Some of the islets, or holms, appear like gigantic pillars, rising perpendicularly from the sea: these are the resort of vast numbers of sea-fowl; and, in the breeding season, hunting for eggs and young birds forms one of the principal and most dangerous employments of the natives. Climate similar to that of the Outer Hebrides, except that the days are a little longer in summer and shorter in winter. During the latter, the aurora borealis is uncommonly brilliant. The cultivated lands bear but a very small proportion to the

others, being supposed not to exceed 25,000 acres in Orkney, and 22,000 in Shetland. Farms generally very small: few having more than 10 acres of arable land, and many not nearly so much. Agriculture is considered, particularly in Shetland, of subordinate importance, and, though a good deal improved, is still very backward. In Shetland most part of the ground is turned over with the spade; but in Orkney ploughs are in pretty general use. Oats and bere, or bigg (*hordeum hexastichon*), are the only white crops cultivated; and, except on a few improved farms, they follow each other alternately so long as the land will bear anything, which it does for a very long time when well manured with sea-weed. The barley of Orkney is a great deal more abundant and of a much better quality than could have been anticipated; and, besides supplying the home demand, considerable quantities are exported. Potatoes are cultivated in all the islands, and form an important part of the food of the people. Turnips have also been planted, and have succeeded very well. At present no trees can be made to grow, and hardly a shrub is to be met with, which is the more singular as the trunks of large trees are not unfrequently found imbedded in moss and sand, both in Orkney and Shetland. The hardy, spirited little horses, known by the name of *Shelties*, are bred in Shetland, and are exported in considerable numbers. The stock kept in the islands is estimated at from 10,000 to 12,000: they are never housed, nor receive any food, except what they gather for themselves. Some of them are exceedingly well-proportioned, active, and strong for their size. The horses of Orkney are in inferior estimation. Cattle very small, sometimes not weighing more than from 35 to 40 lbs. a quarter; they are shaggy, and not well shaped; but they are hardy, feed easily, and, when fattened, their beef is fine and tender. The stock in both islands is supposed to amount to about 45,000 head. The native sheep are of the small dun-faced breed; they yield short wool, which, though generally soft and fine, is sometimes as hairy as that of a goat. Recently the black-faced and Cheviot breeds, and even pure merinos, have been introduced into Orkney with considerable success. The stock in both groups of islands is believed to exceed 135,000. A small breed of swine is very abundant: they roam at large, and are not a little destructive. Rabbits are abundant in both islands, but particularly in the Orkneys; as many as 36,000 skins having been exported in a single season from the port of Stromness. Fowls are plentiful, and large quantities of eggs are exported from Orkney. The fisheries, however, in Orkney, as well as Shetland, are the grand object of pursuit. The islands are periodically visited by vast shoals of herrings; while the surrounding bays and seas are uniformly well supplied with cod and other species of white fish. *Divitiæ eis sunt a mari, ab omni parte summa piscandi commoditate objecta.*—(Buch., lib. i., § 50.) Brassey Sound, in Shetland, has always been one of the principal stations of the Dutch herring fishers; but the fishery there is now principally carried on by the islanders. The produce is very various, the exports of herrings from the Orkneys fluctuating from about 18,000 to 30,000 barrels. During the year ending 5th of April, 1844, 2,913 barrels of herrings, and 39,154 cwt. of cod, were cured in Shetland; but the herring "take" is occasionally

much more considerable. About 100,000 lobsters are supposed to be annually shipped from the Orkneys for London. Vessels from British ports, bound for the northern whale fishery, mostly touch at Orkney or Shetland, and, besides taking on board supplies of provisions, usually complete their crews with seamen belonging to the islands, whom they put on shore on their way back. Rye straw grown in Orkney has been found pretty well fitted to serve as a substitute for the straw used in Italian plait; and the manufacture of this straw into plait was carried on for several years to a considerable extent, and with tolerable success; but latterly it has declined. Kelp, though comparatively unprofitable, continues to be produced. Woollen stockings and gloves, sometimes of extraordinary fineness, are exported from Shetland. Messrs. Anderson, in their valuable work on the Highlands, give the following account of the—

Sums received in Orkney, in 1833, *from Farm Produce, Manufactures, Fisheries, &c.*

	£.	s.	d.
Bere, or bigg, 5,178 bolls, at 15*s.* per boll of 6 bushels, or 20*s.* per quarter	3,883	10	0
White oats, 1,515 bolls, at 12*s.* ditto of ditto, or 16*s.* per quarter	909	0	0
Malt, 10,696 bushels, sent to Leith, say 3*s.* per bushel	1,604	8	0
Peas, 234 ditto, at 3*s.*	35	2	0
Oatmeal, 40 bolls, at 14*s.* per boll of 140lb. imperial	28	0	0
Horses, cows, and oxen, 954. 1 quarter horses, at 9*l.*; 3 quarter cows at 3*l.*	4,290	0	0
Ditto, not entered at custom-house, about 246, at ditto	1,104	0	0
Eggs sent to Leith, 50 tons, 100 dozen per cwt., 100,000 dozen at 6*d.*	2,500	0	0
Sheep and swine, 40 of each, at 1*l.*	80	0	0
Butter, about 2,000*l.*; hides, about 700*l.*	2,700	0	0
Rabbit skins, more than 2,000 dozen, at 5*s.* 6*d.* per dozen	600	0	0
Feathers, about	250	0	0
Kelp, supposed scarcely to exceed 500 tons, at 4*l.* 10*s.*	2,250	0	0
Straw manufacture, including rent, cutting, planting, &c.	4,800	0	0
Herrings, 34,000 barrels, at 10*s.* per barrel	17,000	0	0
Cod, fished by about 40 sloops of 30 tons, 14 tons each, at 13*l.* per ton	7,280	0	0
Lobsters, caught by 432 men, in 216 boats	1,800	0	0
Whale fishing, about 25 ships, taking 20 men each, 500 men, at 15*l.*	7,500	0	0
Hudson's Bay Company pay annually for the wages of men employed in Hudson's Bay, about	1,500	0	0
Total	60,114	0	0

We regret we have no similar account for Shetland; but we believe the sums received by its inhabitants do not differ materially from those received by their neighbours in Orkney. The shipping of the islands is considerable. In 1845 there belonged to the Orkneys 64 registered vessels, carrying 4,820 tons; and there belonged at the same time to Shetland 72 vessels, mostly under 50 tons, their aggregate burthen being 2,025 tons.

The people of these remote islands being of Scandinavian, and not Celtic origin, neither the Gaelic dress nor language has ever prevailed amongst them. All of them now speak English; but, of old, Norse was the prevalent language. The cottages of the poorer ranks are, in general, miserable hovels, affording accommodation in winter to cows and fowls, as well as to the family. Owing to the scarcity or exhaustion of the moss, the want of fuel is in some islands very severely felt. On

the whole, however, the inhabitants are decidedly better off than those of the Outer Hebrides, being comparatively industrious, civilized, well clothed, and well fed. Kirkwall, in Orkney, and Lerwick, in Shetland, the only towns of consequence in the islands, had, in 1841, the former a population of 2,205, and the latter of 2,787. The society in both is good, and the inhabitants hospitable.

Shetland, and parts of Orkney, suffer much from the exaction of tithes: they are not only charged upon the produce of the land, but on that of the fisheries; and, being generally farmed, they are rigidly collected, are productive of much irritation, and are a formidable obstacle to improvement. Seeing the good effects that have resulted everywhere else in Scotland from the abolition of tithes, it is singular that they have not been commuted here. The feu duties payable to the Crown, or rather to its donatory Lord Zetland, have also contributed materially to check improvement. Marl, though neglected, is common in Orkney. Lead ore, also, has been met with; and limestone is of frequent occurrence. These islands are divided into 40 parishes. The gross rental of Orkney amounted, in 1842-3, to 21,431*l.*, and that of Shetland to 17,457*l.* Annual value of real property in both, in 1842-3, 42,787*l.**

CHAPTER III.—IRELAND.

SECT. 1.—*Name and Extent.—Face of the Country.*

Name.—It is believed by many that the Phœnicians visited Ireland; but, however this may be, it is mentioned by Aristotle and Strabo, by the name of *Ierne*, derived, most probably, from the native name, Erin. Cæsar, Tacitus, and Pliny call it *Hibernia;* and Pomponius Mela, and some manuscripts of Ptolemy, *Juverna.*—(*Cellarii, Notitia Orbis Antiqui*, tom. i., p. 440.) About the period when the Romans withdrew from Britain, the Scoti, or Scotch, began to be distinguished as one of the principal Irish tribes; and the country seems to have then received from them the name of *Scotia*, or Scotland. This appellation was applied to it by the monkish writers, till the eleventh century, when the term Scotia was transferred to the northern parts of Great Britain, by means of a colony of Scotch, from Ireland, which established itself in the West Highlands. The old name of Hibernia began to be revived; and, at a later period, it gave way to the Gothic term Ireland, supposed by some to be a modification of the native name, Erin, or land of the west.—(*Camden's Britannia,*

* For further information as to the Orkney Islands, see (exclusive of Messrs. Anderson's work, already referred to) *Wallace's Description of the Orkney Islands*, 8vo., Lond., 1700; *Barry's History of Orkney*, 4to., Edinburgh, 1805; and *Sheriff's Agricultural Survey of Orkney*, 8vo., Edinburgh. As to the Shetland Islands, see *Edmonston's View of Zetland*, 2 vols. 8vo., Edinburgh, 1809; *Hibbert's Description of the Shetland Islands*, 4to., Edinburgh, 1822; and *Sheriff's Agricultural Survey of Shetland*, 8vo., Edinburgh, 1814. Various tracts and works have been published on the fisheries and antiquities of the islands.

Gibson's ed., vol. ii., p. 1310; *Pinkerton's Geography*, ed. 1802, vol. i., p. 210.)

Situation.—Ireland lies to the west of Great Britain, between the parallels of 51° 25′ and 55° 23′ north latitude, and of 6° and 11° west longitude. Its figure approaches to that of a rhomboid; and, though it is in various places, particularly on the west coast, deeply indented by the sea, it is decidedly more compact than Great Britain. The Atlantic surrounds it everywhere except on its eastern shores, which are separated from Britain by the Irish sea; or, rather, by St. George's Channel, the Irish sea, and the North Channel. The first, or St. George's Channel, includes that portion of the sea lying between the coast of Wales and the coast of Ireland from Carnsore Point to Dublin; the second, or the Irish sea, properly so called, extends from Dublin to Donaghadee, having the Isle of Man in its centre, North Wales on its south, Lancashire and Cumberland on its east, and Galloway on its north side; while the third, or North Channel, extends from Donaghadee to Rathlin Island, having on the opposite Scotch coast the Rhynns of Galloway, the Mull of Cantire, &c. From St. David's Head in Wales, across to Carnsore Point, the distance is about 47 miles; from Port Patrick, in the Rhynns of Galloway, to Donaghadee, the distance is 22 miles; but from the Mull of Cantire to Tor Point, in Ireland, is only 13½ miles.

Extent.—The longest line that can be drawn in Ireland on the same meridian, (very nearly the 8th deg. W. long.,) extends from Ballycotton Flagstaff in Cork, (lat. 51° 49′ 42·8″ N.,) to near Hornhead Tower in Donegal, (lat. 55° 12′ 59·3″ N.,) a distance of 234·2 miles. The greatest diagonal length of Ireland is between Mizen Head in Cork, (lat. 51° 27′ 47·5″ N., long. 9° 48′ 35·9″ W.,) and Fairhead in Antrim, (lat. 55° 13′ 32·7″ N., long. 6° 9′ 3·8″ W.,) being 301 miles. The greatest breadth of Ireland, or the longest line that can be drawn cross-wise in the island, in the same parallel of latitude, (54° 16′ 10″ N.,) extends between Doonamo Point, off Erris Head, in Mayo, (long. 10° 5′ 12″ W.,) and a point on the coast of Down, a little to the north of Ardglass Lighthouse, (long. 5° 34′ 49″ W.,) a distance of 182 miles. But in other places the breadth is much less. Thus between Ballyshannon and Dundalk it is only 85 miles; and between Tyrone, at the bottom of Galway Bay, and Dublin, the distance is not more than 108 miles. So conveniently, indeed, is Ireland situated, in respect of water communication, that there is no part more than 50 or 55 miles distant from the sea, or from one of its arms.

Area.—Having few well-ascertained data to go upon, the estimates of geographers have differed materially as to the area of Ireland. The first entitled to attention is that of Sir William Petty, employed by the government of Cromwell to complete a survey of the lands forfeited during the great rebellion of 1641. This has been called the Down Survey. Considering the time when, and the circumstances under which it was executed, it is a work of wonderful accuracy; and continues, to this day, to be referred to as evidence in courts of law.* It

* Copies of part of the maps composing the Down Survey were taken by Sir William Petty, for his own use; but, being shipped for England, the vessel in which

scarcely, however, embraced any part of the province of Connaught; and, in consequence partly of this circumstance, and partly of errors arising from other sources, Sir William Petty materially underrated the area of Ireland, having represented it as containing only about 10,500,000 Irish, or about 17,000,000 English acres.—(*Political Anatomy of Ireland*, p. 1.) Mr. Templeman, of Bury, estimated the area of Ireland at 27,457 square miles, or 18,372,480 acres. But this was little better than a guess; and all previous estimates were thrown into the shade by that of Dr. Beaufort. Having carefully collated the best county and other maps, and rectified not a few of their errors, the Doctor computed the area of the entire kingdom at "considerably more than 18,750 square Irish miles, or several thousand acres above 12,000,000 Irish measure; which is equal to 30,370 English square miles, or 19,436,000 English acres."—(*Memoir of a Map of Ireland*, p. 14.) But even this estimate is more than a million of acres under the mark. For it appears from the authentic data furnished by the Ordnance Survey, that the total area of Ireland amounts to 32,513 square miles, or to 20,808,271 acres. (*See Table opposite.*)

Face of the Country.—Compared with Scotland, Ireland, though in many parts mountainous, may be said to be decidedly flat; and, notwithstanding the great extent of bog, the arable land bears a far larger proportion to the whole country than in Scotland; while the grass lands, when in tolerable order, have generally a deeper verdure and a more luxuriant vegetation. When compared with England, Ireland seems almost destitute of timber; there not being, in many extensive districts, a natural wood, plantation, or even a hedge, to be seen. The farm buildings and cottages are, for the most part, mean and wretched, and strongly impress the traveller with the most unfavourable conclusions as to the condition of their occupiers, which are but too much confirmed by their dress, habits, and appearance. The cultivated land seems to every one, however little acquainted with agriculture, to be ill-managed and dirty. But, perhaps, there is nothing that makes a deeper impression on an Englishman or a Scotchman, visiting Ireland for the first time, than the contrast between what are called the *desmesnes* (parks) of the nobility and gentry and the immediately contiguous parts of their estates. In Britain, it is frequently very difficult, when one cannot see the wall or fence, to discriminate between what is, and what is not, park. But in Ireland this is a matter about which there can be no mistake. They differ as widely as light and darkness. Within the park we have wood, neat cottages, moderately good farming, good teams, fine pasture land, and perhaps deer; but the instant we cross its boundaries, we seem to be in a totally different region; and, in nine cases out of ten, not a tree is to be seen, and we meet only with hovels, the vilest management, miserable teams, and the most unequivocal symptoms of a want of

they were embarked was captured by a privateer and carried to France, when the maps came into the possession of the French court. A number of the originals, that remained in Ireland, were subsequently much injured by fire, and some of them altogether destroyed; but their place has been supplied by copies taken by General Vallancey, and others, from the captured maps, now in the Royal Library at Paris. —(See *Report on the Survey and Valuation of Ireland*, Appendix, p. 133, &c.)

Table showing the Baronies and Parishes in each of the several Counties and Provinces of Ireland; the extent of each in Square Miles and English Statute Acres: specifying separately the extent of Cultivated Land (including Area of Towns) and of Uncultivated Land, Plantations, and Water; and showing the Fractional Part of the entire Area of Ireland, supposing it to be 1000, *contained in each County and Province.*

Territorial Divisions.			Area in Square Miles.	Area in English Statute Acres.	Distribution of Area.				Corresponding Proportions of each County to 1000, assumed as the Total Area of Ireland.
Provinces and Counties.	Number of Baronies.	Number of Parishes.			Cultivated, including Towns.	Uncultivated.	Plantations.	Water.	
Leinster.									
Carlow	7	47	346	221,342	184,661	31,249	4,927	505	10·637
Dublin	10	99	354	226,414	201,583	19,312	5,519	..	10·881
Kildare	14	116	654	418,436	357,277	51,854	8,288	1,017	20·109
Kilkenny	11	140	796	509,732	471,651	21,126	13,899	3,056	24·497
King's	12	51	772	493,985	338,158	145,836	8,258	1,733	23·740
Longford	6	26	421	269,409	192,187	58,937	4,610	13,675	12·947
Louth	6	64	315	201,906	180,172	15,603	5,318	813	9·703
Meath	18	146	906	579,899	547,855	16,033	12,767	3,244	27·869
Queen's	11	53	664	424,854	343,539	69,289	11,630	396	20·417
Westmeath	12	63	709	453,468	365,846	56,392	8,803	22,427	21·793
Wexford	9	144	901	576,588	513,094	45,501	14,325	3,668	27·709
Wicklow	8	59	781	500,178	280,734	200,754	17,600	1,090	24·038
Totals	124	1,008	7,619	4,876,211	3,976,757	731,886	115,944	51,624	234·340
Munster.									
Clare	11	80	1,294	827,994	455,737	296,033	8,304	67,920	39·791
Cork	23	251	2,885	1,846,333	1,315,397	465,889	52,180	12,867	88 731
Kerry	8	87	1,853	1,186,126	415,421	726,775	11,169	32,761	57·003
Limerick	13	131	1,064	680,842	529,635	121,101	11,575	18,531	32·720
Tipperary	12	193	1,659	1,061,731	846,246	178,183	23,779	13,523	51·024
Waterford	8	82	721	461,553	326,870	105,496	23,408	5,779	22·181
Totals	75	824	9,476	6,064,579	3,889,306	1,893,477	130,415	151,381	291·450

Table showing the Baronies and Parishes in each of the several Counties and Provinces of Ireland, &c.—continued.

Territorial Divisions.			Area in Square Miles.	Area in English Statute Acres.	Distribution of Area.				Corresponding Proportions of each County to 1000, assumed as the Total Area of Ireland.
Provinces and Counties.	Number of Baronies.	Number of Parishes.			Cultivated, including Towns.	Uncultivated.	Plantations.	Water.	
Ulster.									
Antrim	15	75	1,190	761,877	517,808	180,423	10,358	53,288	36·614
Armagh	8	28	513	328,076	266,021	35,117	8,996	17,942	15·767
Cavan	8	36	746	477,360	375,975	71,918	7,325	22,142	22·941
Donegal	6	51	1,865	1,193,443	393,670	769,587	7,079	23,107	57·354
Down	10	70	957	612,495	516,391	78,317	14,355	3,432	29·435
Fermanagh	8	23	714	457,195	289,438	114,847	6,155	46,755	21·972
Londonderry	6	43	810	518,595	319,841	180,709	7,718	10,327	24·923
Monaghan	5	23	500	319,757	286,189	21,585	5,816	6,167	15·367
Tyrone	4	42	1,260	806,640	450,996	311,867	11,981	31,796	38·765
Totals	70	391	8,555	5,475,438	3,416,329	1,764,370	79,783	214,956	263·138
Connaught.									
Galway	18	120	2,447	1,566,354	744,606	708,000	23,718	90,030	75·276
Leitrim	5	17	613	392,363	249,350	115,869	3,396	23,748	18·856
Mayo	9	73	2,131	1,363 882	498,435	800,111	8,360	56,976	65·545
Roscommon	9	58	950	607,691	441,290	130,299	6,732	29,370	29·204
Sligo	6	41	722	461,753	291,156	151,723	6,134	12,740	22·191
Totals	47	309	6,863	4,392,043	2,224,837	1,906,002	48,340	212,864	211·072
General Totals	316	2,532	32.513	20,808,271	13,507,229	6,295,735	374,482	630,825	1,000·000

Table showing the extent of Unimproved Pasture and Bog Land in the different Counties of Ireland, distinguishing its Elevation and the quantities Improveable and Unimproveable, &c. (compiled by Mr. Griffith for Land Occupation Commission).

Counties.	Coarse Pasture above 800 feet over Sea Level.	Coarse Pasture below 800 feet, including Flow Bogs, &c.	Improveable for Cultivation.	Improveable for Pasture.	Unimproveable.	Total.
Leinster.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Carlow	16,500	15,500	17,000	6,000	9,000	32,000
Dublin	19,000	. .	1,500	6,000	11,500	19,000
Kildare	8,000	44,000	16,000	31,000	5,000	52,000
Kilkenny	18,000	3,000	7,500	6,000	7,500	21,000
King's	9,000	137,000	45,000	94,000	7,000	146,000
Longford	3,500	55,500	18,000	38,000	3,000	59,000
Louth	11,500	3,500	3,000	5,000	7,000	15,000
Meath	3,500	12,500	6,000	8,000	2,000	16,000
Queen's	39,000	30,000	18,000	26,000	25,000	69,000
Westmeath	3,000	53,000	18,000	37,000	1,000	56,000
Wexford	16,000	29,000	16,000	18,000	11,000	45,000
Wicklow	164,500	36,500	20,000	70,000	111,000	201,000
Totals	311,500	419,500	186,000	345,000	200,000	731,000
Ulster.						
Antrim	108,500	68,500	40,000	70,000	67,000	177,000
Armagh	22,000	13,000	12,000	13,000	10,000	35,000
Cavan	45,000	27,000	20,000	28,000	24,000	72,000
Donegal	253,000	516,000	150,000	250,000	369,000	769,000
Down	45,000	33,000	20,000	30,000	28,000	78,000
Fermanagh	34,000	81,000	40,000	50,000	25,000	115,000
Londonderry	69,000	112,000	50,000	60,000	71,000	181,000
Monaghan	14,500	6,500	7,000	8,000	6,000	21,000
Tyrone	127,000	185,000	80,000	120,000	112,000	312,000
Totals	718,000	1,042,000	419,000	629,000	712,000	1,760,000
Connaught.						
Galway	95,000	613,000	160,000	250,000	298,000	708,000
Leitrim	55,500	60,500	30,000	36,000	50,000	116,000
Mayo	163,000	637,000	170,000	300,000	330,000	100,000
Roscommon	2,000	128,000	40,000	80,000	10,000	130,000
Sligo	55,000	97,000	30,000	60,000	62,000	152,000
Totals	370,500	1,535,500	430,000	726,000	750,000	1,906,000
Munster.						
Clare	29,000	267,000	60,000	100,000	136,000	296,000
Cork	170,000	296,000	100,000	150,000	216,000	466,000
Kerry	217,000	510,000	150,000	250,000	327,000	727,000
Limerick	41,000	80,000	30,000	40,000	51,000	121,000
Tipperary	111,000	67,000	30,000	60,000	88,000	178,000
Waterford	66,000	39,000	20,000	30,000	55,000	105,000
Totals	634,000	1,259,000	390,000	630,000	873,000	1,893,000

ABSTRACT.

Provinces.						
Leinster	311,500	419,500	186,000	345,000	200,000	731,000
Ulster	718,000	1,042,000	419,000	629,000	712,000	1,760,000
Connaught	370,500	1,535,500	430,000	726,000	750,000	1,906,000
Munster	634,000	1,259,000	390,000	630,000	873,000	1,893,000
Totals	2,034,000	4,256,000	1,425,000	2,330,000	2,535,000	6,290,000

capital and enterprise. The fields in Ireland are generally smaller than even the smallest of those in England; and, if they be divided at all, it is usually with what are called turf dykes, which neither make good fences nor afford shelter, at the same time that they have a poor, miserable look. Such seem to be the leading characteristics in the appearance of Ireland. It must not, however, be supposed that they are everywhere to be met with; unfortunately, they are far too prevalent; but, in various parts, the aspect of the country is such as would do no discredit even to the best districts of England. May these exceptions to the general rule daily become more considerable!

Sect. 2.—*Mountains, Level Lands, &c.*

Though some of the Irish counties are hilly, and others mountainous, it would be incorrect to say that such is the general character of the country. Several counties, to use the words of Dr. Beaufort, are tolerably level, and others quite flat.—(*Memoir of a Map of Ireland*, p. 10.) With the exception of the Wicklow mountains, and those of Mourne, in Down, the most mountainous parts of Ireland are on the west coast, particularly in Kerry, Clare, Galway, Mayo, Sligo, and Donegal. Macgillicuddy's reeks, near Killarney, in Kerry, are the highest of the Irish mountains. Carn Tual, the most elevated summit, has been determined by the Ordnance Survey to be 3,404 feet above the level of the sea. Mangerton, in the immediate vicinity of Killarney, formerly supposed to be the highest mountain in Ireland, is only 2,754 feet high. The general direction of the Kerry mountains is from west to east: a ridge runs from them along the south side of the Black-water, by which it is crossed, as far east as Cappoquin. North of this, in the south-western part of Tipperary, are the Knock-mei-le-down and the Galtee mountains. The Devil's-bit and the Sliebhbloom mountains run in a south-east and north-west directions for more than 30 miles, dividing the King's and Queen's counties: they form the line of demarcation between the rivers falling into the Shannon on the north-west, and the Suir, Nore, Barrow, &c., flowing to the east. The Keeper, the highest point in this ridge, has an elevation of 2,265 feet. The famous pass, called the Gap of Glandine, leads across these mountains. The Wicklow mountains occupy an area of about 30 miles in length, and 12 in breadth. The highest amongst them, Lugnaquilla, has an elevation of 3,039 feet. Some of the glens in this mountainous tract are justly celebrated for their picturesque beauty. The Mourne mountains in Down lie to the north of Carlingford bay, and approach close to the sea. Sliebhdonard, the highest of the group, has an elevation of 2,796 feet. Donegal is much encumbered with mountains, but they do not, speaking generally, attain to any very great height: the highest, Errigal, has an elevation of 2,462 feet. The western parts of Connaught present a formidable barrier of mountains to break the fury of the Atlantic storms. Nephin in Mayo, one of the most remarkable mountains in this province, has been measured by Mr. Bald: the mean of whose observations gives its height 2,639 feet above the level of the sea. The height of Croagh-Patrick, overhanging the south side of

Clew Bay, is 2,499 feet. It may, perhaps, be worth mentioning, that, according to the legendary history of Ireland, St. Patrick, having collected all the snakes and other venomous reptiles of Ireland on this mountain, precipitated them headlong into the sea! An altar or cairn is erected on its summit in memory of the event; and to it pilgrimages are still sometimes made. Muilrea in Mayo, on the north side of Killery harbour, has an altitude of 2,680 feet. The mountains called the Twelve Pins, in Connamara, a little to the west of Ardbear harbour, are very conspicuous landmarks, the highest of them rising 2,396 feet above the level of the sea. Generally, the Irish mountains are of easy ascent, admitting of cultivation a considerable way up their sides; but some of them are precipitous, terminating in cones or spires.

Altitudes of the principal Mountains in Ireland, as determined by the Ordnance Survey.

	Feet.		Feet.
Knocklayd, Co. Antrim	1,685	Sliebhdonard, Co. Down	2,796
Throstan, ,,	1,810	Sliebhbingian, ,,	2,449
Slemish, ,,	1,437	Eagle Mountain, ,,	2,084
Djvis, ,,	1,568	Sliebhcroob, ,,	1,755
Sawel, Co. Londonderry	2,236	Sliebhgullion, Co. Armagh	1,893
Benbradagh, ,,	1,531	Belmore, Co. Fermanagh	1,312
Carntogher, ,,	1,521	Carnmore, ,,	1,034
Sliebhgallion	1,730	Cuilcagh, Co. Cavan	2,188
Errigal, Co Donegal	2,462	Benbo, Co. Leitrim	1,365
Muckish ,,	2,190	Lackagh, ,,	1,448
Sliebhsnaght, east, ,,	2,019	Sliebhanierin, ,,	1,922
Bluestack, ,,	2,113	Brandon, Co. Kilkenny	1,696
Truskmore, Co. Sligo	2,113	Keeper, Co. Tipperary	2,265
Benbulbin ,,	1,697	Devil's Bit, ,,	1,572
Sliebhbon, north, Co. Roscommon	839	Sliebhnaman	2,362
——— south, ,,	85	Galtymore	3,008
Carnclonhugh, Co. Longford	912	Craig, Co. Clare	1,715
Nephin, Co. Mayo	2,369	Knockaness, ,,	1,305
Croagh-Patrick, ,,	2,499	Callan, ,,	1,288
Muilrea, ,,	2,680	Knockfecrna, Co. Limerick	937
Twelvepins, Co. Galway (highest of)	2,396	Seefin, ,,	1,706
		Brandon, Co. Kerry	3,120
Beinnacoire, ,,	2,337	Carn Tual, ,,	3,404
Carlingford, Co. Louth	1,935	Mangerton, ,,	2,754
Ravensdale, ,,	1,674	The Paps, ,,	2,280
Kippure, Co. Dublin	2,473	Mount Gabriel, Co. Cork	1,335
Great Sugarloaf, Co. Wicklow	1,651	Caherbarna, ,,	2,234
Lugnaquilla, ,,	3,039	Shehy, ,,	1,796
Mount Leinster, Co. Carlow	2,604	Hungra Hill, ,,	2,248
Sliebhbloom Arden Erin, Queen's County	1,689	Monavullagh, Co. Waterford	2,598

Level Lands.—There is not in Ireland any fen land, and there are few or none of what are in England called valleys. But there are, notwithstanding, very large tracts of level land. From Dublin to the Bay of Galway, a vast plain stretches across the kingdom. It consists partly of rich cultivated land; but it contains within it a number of very extensive bogs, lying partly in Kildare, King's County, and Roscommon, and partly in Meath, Westmeath, and Queen's County. These bogs are included under the general designation of the Bog of

Allen. Though flat, this bog has a mean elevation of about 250 feet above the level of the sea; and several rivers that flow in opposite directions have their sources in it; the summit level of the grand canal which passes through its centre, is about 270 feet above the mean tide level in Dublin bay. The flat or red bogs, in different parts of the kingdom, are supposed to occupy nearly 1,600,000 acres.—(See *post.*) Exclusive also of the plain now mentioned, and of the flat bogs, there are very extensive tracts of flat rich land in Tipperary, Limerick, Meath, Clare, and other counties.

Sect. 3.—*Rivers and River Ports.—Lakes.*

Owing to the greater similarity of the surface of the two countries, the rivers of Ireland partake much more of the character of those of England than those of Scotland. Flowing, in general, for the greater part of their course, through a flat country, they are rarely rapid, and are but seldom interrupted by cataracts or ledges of rock. They are mostly navigable for a considerable way; and sometimes, indeed, as in the case of the Shannon and the Barrow, to within a short distance of their sources. They consequently give greater facilities to the commerce of the country; affording convenient means for the exportation of its native produce, and for the importation of foreign materials of manufacture and consumption.

Shannon.—This is by far the largest and most important of the Irish rivers; and is hardly, indeed, inferior, if it be not superior, to any in the British Isles. It has in many respects, particularly in its nearly insulating an extensive province, in the direction of its course, the length of its navigation, and the magnitude of its æstuary, a striking resemblance to the Severn. Its source is generally traced to the base of Cuilcagh Mountain, in the north-west part of Cavan. After running a few miles, it falls into Lough Allen, about 10 miles long, and from 4 to 5 broad; its course thence to Limerick being south, with a small inclination to the west. Issuing from Lough Allen, it passes Leitrim, Carrick, Tarmonbarry, &c., expanding at Lanesborough into Lough Ree. This, which is a very irregularly shaped extensive sheet of water, is about 17 miles in length. Leaving it, the river, now greatly augmented, passes Athlone, and then winds by Shannon Bridge, and Banagher to Portumna, near which it expands into Lough Derg, a narrow lake 23 miles in length, with deep bays and inlets, covering an area of 29,570 acres, from which it flows on to Limerick. Here, having met the tide, it takes a west-south-west direction; and, gradually spreading out into a noble æstuary, unites with the Atlantic between Kerry Head and Loop Head, about 70 miles lower down.

From the Head of Lough Allen to its mouth, the Shannon has a course of about 214 miles; viz. Lough Allen, 10 miles; Lough Allen to Lough Ree, 43 miles; Lough Ree, 17 miles; Lough Ree to Lough Derg, 36 miles; Lough Derg, 23 miles; Lough Derg to Limerick, 15; and thence to the river's mouth, 70 miles. Loop Head and Kerry Head are about 8 miles apart.

But the distance to which it has been rendered navigable is the

most extraordinary circumstance connected with the Shannon. In this respect, indeed, it is superior to the Thames, Severn, Trent, or any English river. If Lough Allen, be (as it is considered by some), reckoned its source, it is navigable to its very head; but, tracing its origin to the base of Cuilcagh Mountain, there are only 6 or 7, out of its entire course of about 220 miles, that may not be navigated! It is unnecessary to insist on the value of a river of this sort flowing through the very centre of Ireland, insulating the great province of Connaught, and "washing the shores" of *ten* out of the *thirty-two* counties which the island comprises.

Unluckily, however, the navigation of the Shannon, like that of most other rivers not of very great depth, is, in certain places, and at certain seasons, a good deal obstructed. It may be navigated, with no very serious difficulty, from the sea to Limerick by ships of 400 tons burden. But immediately above the city, and in some other places, its course is impeded by rocks and rapids, and large sums have been expended in improving those parts of the navigation, partly by making lateral cuts, and partly by deepening the bed of the river. The level of Lough Allen is about 144 feet above high-water mark at Limerick; the ascent being overcome by locks, mostly placed in situations where lateral cuts have been made to avoid the rapids. But till recently the navigation of the Shannon, considering its paramount importance, was by no means in a satisfactory state. In dry seasons it was impeded by shallows, on which there were sometimes only from 2 to 3 feet water; and during floods the channel of the river, owing to its frequently expanding into extensive lakes, and the lowness of its banks, was not easily discovered. Had it been an English river, these difficulties would have been overcome long ago; and the money expended upon it might, had it been properly and effectually applied, have sufficed to obviate them. Formerly, however, the works were very inefficiently managed; but such has not been the case since they were placed under the superintendence of the Board of Works; and the navigation of this fine river is now, especially in the upper part, in a greatly improved state. The introduction of steam tugs and steam vessels on the loughs of the Shannon has been of infinite service. They have, in fact, done as much for it as for the Caledonian Canal.

The importance of the Shannon, as a commercial river, has been materially increased by its junction with the Grand and Royal Canals from Dublin. Though defective both in their plan and execution, and made at an immense expense, still it is not to be denied that they are, particularly the Grand Canal, of great public utility. In connection with the Shannon, they have opened a communication by water across the island, so that persons living in its centre may send their produce, at a moderate expense, to Dublin or Limerick, as they find most advantageous. This laying open of new and almost boundless markets has given a stimulus to the improvement of the central parts of Ireland, of which it is not easy to overrate the influence, and which will, no doubt, be as permanent as it is powerful.

From its situation at the head of the æstuary of the Shannon, in a country naturally of the most exuberant fertility, 70 miles from the sea, Limerick is the principal emporium of the west of Ireland; and

its commerce is extensive and rapidly increasing. The value of the produce, such as corn, flour, bacon and pork, butter, beef, &c., shipped from the port in 1820, amounted to 525,625*l.*, whereas, in 1832 it amounted to 1,005,726*l.*, in 1835, when prices were very low, to 726,000*l.*, and now (1846) probably exceeds 1,200,000*l.*

The badness of the accommodation for shipping is, however, a heavy drawback upon its trade. At low water ships are obliged to lie aground; and as the bottom consists of hard, rugged, limestone rock, *which has not even been smoothed*, vessels of considerable burden, and those that are sharp built, are liable to be seriously injured; and, in point of fact, a great deal of damage is annually sustained by the shipping in the port.

To obviate these inconveniences, the 4 Geo. IV., c. 94 provides for the construction of floating docks in the bed of the river opposite the city. This, however, is a project which should not be rashly gone into. It may be doubted whether it be possible, at least with any reasonable outlay, to make Limerick a good port. The truth seems to be, that it is built 15 miles too high up. The navigation immediately below the city is, in many places, narrow and encumbered with rocks; so that, even supposing a floating dock were constructed at the city, it would be necessary, to provide the requisite facilities for shipping, to expend a large additional sum on the removal of the obstructions in the river: and the tolls required to defray the cost of the dock and of these excavations would form a very heavy burden on the shipping using the port, and might go far to neutralise the influence of the improvement. Perhaps, therefore, the better plan would be to construct piers and warehouses about 15 miles lower down, alongside which large ships might lie safely afloat at low water; and, while this could be done for half the expense that a floating dock could be constructed, it would save all the expense of removing obstructions in the channel. The barges that navigate the Shannon above Limerick could carry down their cargoes to the new port, conveying back the imported goods destined for the city and for the interior. There may, no doubt, be difficulties in the way of this project of which we are not aware; but at present we are disposed to think it would be preferable to any attempt to improve the existing port. Something, however, should be done in the matter one way or another. In its present situation, the harbour of Limerick is a disgrace to its inhabitants, to Ireland, and to the empire.

The Shannon is easy of access. Both Loop Head and Kerry Head are bold and prominent; and, to prevent ships mistaking the one for the other, a lighthouse has been erected on the former. The first good anchorage within the river, without the reach of the tide, is in Carrigaholt Bay, to the east of Kilkadrane point, 3 leagues from Loop Head. A lighthouse has been erected on this point, and it is proposed to carry from it a pier, to protect the south side of the bay. There is also excellent anchorage in 6 fathoms water, farther up the river, on the east side of Inniscattery Island; but the best anchorage is said to be still higher up, to the south of Tarbert Island, and in the bay between Mountshannon and Rinallen Point, and between the latter and Ilanagranoch Island, in from 6 to 12 and 13 fathoms, with the

ground clean and good. There is, indeed, within this noble river, ample and excellent accommodation for the largest fleets.

The Suck, the principal tributary of the Shannon, rises in Roscommon. Its course is south, inclining to the east, dividing the counties of Roscommon and Galway, by Castlerea, Athleague, and Ballinasloe, till it unites with the Shannon at Shannon Bridge. On its east side the Shannon receives the Inny, the Upper and Lower Brusna, Mulkerna, Maig, Fergus, &c. The last two are navigable to a considerable distance.

Bandon.—Leaving the Shannon, and turning eastward by Cape Clear, the Bandon is the first river we meet with of any importance. It is described by Spencer as "the pleasant Bandon, crowned with many a wood." But most part of the timber that ornamented the country through which it flows in the reign of Elizabeth, has been cut down, and its place is but very indifferently supplied by modern plantations. It was anciently called Glasheen: its course from the mountains of Carbery, where it rises, is nearly west to Bandon Bridge; it then winds north-east to Innisshannon, whence it pursues a south-east course, till it falls into the sea, a little below Kinsale, built on its æstuary. Kinsale is a good harbour for all sorts of ships, having, at ebb tide, 12 feet water over the bar at its mouth.

Lee.—This river has its source in the small lake of Guogaun Barra, in the western part of the county of Cork, on the confines of Kerry, 7 or 8 miles north from the bottom of Bantry Bay. Soon after it issues from its parent lake, it expands into Lough Lua. On its exit from the latter, it flows eastward for about a dozen miles, when it receives a large accession of water from the Muskerry mountains. It pursues its easterly course through Cork to Little Island, 5 miles below the city, where it unites with the arm or inlet of the sea forming Cork Harbour.

The Lee is navigable as far as Cork for vessels of from 150 to 200 tons burden. But its port is properly at Cove, in Great Island, in Cork Harbour, where the largest men-of-war may lie in perfect safety. The trade of Cork, including that of Cove, is very extensive. (For an account of the harbour see description of Sea Coast.)

Blackwater.—This, which is sometimes called the Broadwater, though inferior in commercial importance, is a larger river than either the Bandon or Lee. It rises in the mountains, on the confines of Limerick and Kerry, which it divides for a short way. Leaving Limerick, its course is almost due south, forming for about 16 miles the line of separation between Cork and Kerry. At the round tower of Nohovaldaly it takes an easterly direction, passing near Kanturk, Mallow, and Fermoy, till it reaches Cappoquin. It then turns suddenly south, and, after a further course of about a dozen miles, it expands into Youghal Bay, meeting the sea immediately below the town. Its entire course may be estimated at about 100 miles.

Along its southern side, from Drishane to Cappoquin, the Blackwater has a ridge of lofty mountains, while on the other side it has a large extent of flat and fertile country. It is rather rapid, and is more than usually liable to overflow its banks. At present it is hardly navigable beyond the reach of the tide, or, under favourable circum-

stances, as far as Cappoquin; but formerly it is said to have been navigable, up to Mallow, for vessels of considerable burden.—(*Lord Orrery's Letters*, p. 134.) There is a bar at the mouth of the river, which has only from 4 to 5 feet water at low, and but 13 feet at high water neaps, so that it is not accessible by vessels drawing more than 12 feet water, which lie afloat in the river off the middle of the town. This deficiency of water, combined with the proximity of the harbours of Cork and Waterford, has done much to circumscribe the trade of Youghal within the narrowest limits. Still, however, it is a pretty considerable port for the exportation of corn and other raw produce.

The Blackwater receives several considerable tributaries, of which the Allua, Awbeg, Funcheon, and Bride are among the most considerable. Spencer lived on the banks of the Awbeg, and has immortalised it under the more poetical name of "the gentle Mulla."

The Bandon, Lee, and Blackwater belong, the first two entirely, and the latter almost entirely, to the county of Cork. They run nearly parallel to each other, the Bandon about 7 miles south, and the Blackwater about 14 north from the Lee. They are all pretty well supplied with salmon.

Suir or *Sure.*—This important river rises in the Sliebhbloom mountains, in the north-east angle of Tipperary, near the source of the Nore: its course is south, inclining to the west through Tipperary, till, below the village of Ardfinnan, it takes a south-easterly direction. But, on receiving the Nyre from the west, it fetches a sudden compass by the north to Clonmel: during the remainder of its course, past Carrick, till it falls into its æstuary below Waterford, its course is generally south. From its junction with the Nyre, it forms the line of demarcation between the counties of Tipperary and Kilkenny, and Waterford.

In a commercial point of view, the Suir is one of the most valuable rivers in Ireland. Vessels of 500 tons burden come up to Waterford, 15 miles from the sea, and lie safely in deep water alongside the quays; and the river is farther navigable by large barges as far as Clonmel. Owing to its favourable situation, and the excellence of its harbour, Waterford has a great and rapidly increasing trade. Besides being the natural emporium of the rich and extensive county of Tipperary, with the southern part of Kilkenny, and the west part of Waterford, a good deal of the produce brought down by the Nore and the Barrow is shipped from it. Hence its commerce, which is already very extensive, will no doubt continue to increase with the improvement of the territory of which it is the grand outlet. The exports principally consist of corn and flour, butter, beef, bacon and pork, hides, tallow, &c. Their total value amounted, in 1835, to the immense sum of 1,821,245*l.*

Nore.—This river has its source, as already mentioned, in the Sliebhbloom mountains, a little to the north-east of the source of the Suir. It flows southerly, but inclines to the east, through Kilkenny, Thomastown, and Inistioge, falling into the Barrow, about 2 miles above New Ross. For a considerable part of its course it is rather rapid, but it is navigable for considerable vessels as far as Inistioge, and for barges to Thomastown. It has been attempted, but found

impracticable, to render it navigable as far as Kilkenny; and, in consequence, it is now in contemplation to cut a canal from that city to the Barrow.

Barrow.—Next to the Shannon, the Barrow is decidedly the most important of the Irish rivers. Like the Suir and the Nore, it rises in the Sliebhbloom mountains, in the barony of Tinnehinch, in Queen's County. Its course is first north-east to Portarlington, then east to Monasterevan, and thence nearly due south, past Athy, Carlow, Graig, and New Ross, about 8 miles below which it falls into the grand æstuary of Waterford Harbour, of which it forms the right arm.

The Barrow divides Queen's County from Kildare, and, after partially intersecting Carlow, it forms the boundary between it and Kilkenny, and between the latter and Wexford. It used to form the line of demarcation between the English pale and the native Irish.

Considering its moderate magnitude, the Barrow is navigable to a great distance, large ships ascending it as far as New Ross, which is its port, and barges as far as Athy (above 60 miles in a direct line from the sea), where it is joined by a branch from the Grand Canal. This length of navigation has not, however, been effected except at a very considerable expense, incurred in removing obstructions and deepening the bed of the river; and, like most other works of the kind in Ireland, it is not in a very satisfactory state.

But, notwithstanding its defects, the navigation of the Barrow has been of singular utility to Kildare, Queen's County, Carlow, and Kilkenny, seeing that it has not only opened to them a ready access to the important markets of Waterford and New Ross, but also to those of Dublin. It is not, therefore, very easy to exaggerate the stimulus it has given to improvement.

The basin of the three sister rivers, Suir, Nore, and Barrow, which have their embouchure in Waterford harbour, is very extensive. It includes Tipperary, Queen's County, Kilkenny, part of Kildare, Carlow, with parts of Wexford and Waterford.

Slaney.—This, which is the last of the southern Irish rivers of any importance, rises in the barony of Talbotstown, in the Wicklow mountains. It flows south, with a good many windings through the county of Carlow. Having entered the county of Wexford, at Newtown Barry, it takes a south-easterly course to Enniscorthy; and then, turning south, it falls into the arm of the sea denominated Wexford Haven, a little above the town of Wexford. It is navigable for barges as far as Enniscorthy, about 14 miles from Wexford.

Liffey.—With the exception of the Boyne, the Liffey is the only river on the east coast of Ireland that seems to require any notice in a work of this description; and it is distinguished more by having the city of Dublin on its banks than by its own magnitude or importance. It rises in the Wicklow mountains, about 2 miles north from Blessington. Its course is circuitous, being successively south-west, west, north-east, and east. After intersecting the capital, it falls into Dublin Bay. The Liffey is navigable as far as Carlisle-bridge in the city: there are about 10 feet water over the bar at its mouth at ebb-tide.——(See description of Sea Coast.)

Boyne.—This, which is the largest and most celebrated of the rivers

on the east coast of Ireland, rises in the Bog of Allen, near Castlecarbery in Kildare, at an altitude of about 225 feet above the level of the sea. It flows north-east by Trim, Navan, and Slane, to Oldbridge, where it takes an easterly course to Drogheda, uniting with the sea about 2 miles lower down. It receives in its course several considerable rivers, of which the Blackwater, from Lough Ramor, in Cavan, is the greatest.

The bar at the mouth of the Boyne has only about 2 feet water at low spring ebbs, and from 9 to 10 feet at high water. None, therefore, but the smaller class of vessels can come up to Drogheda. The river has been rendered navigable for barges as far as Navan.

The Boyne is celebrated for the important and ever memorable battle fought on its banks at Oldbridge, about 3 miles west of Drogheda, on the 1st of July, 1690; when the forces under our great deliverer, William III., defeated those under James II., and decided the fate of the British empire.

Bann.—Of the northern rivers of Ireland, the Upper and Lower Bann and the Foyle are the most considerable. The Upper Bann rises in the plain called the Deer's or King's Meadow, in the northern part of the Mourne mountains in Down. Its course at first is winding; but its general direction is north-west. After passing Gilford and Portadown it falls into Lough Neagh, at Bannfoot Ferry. Near Portadown it is joined by the Newry canal, and is thence navigable by barges to the lake.

The Lower Bann issues from the north-west arm of Lough Neagh, and flowing north, with a little inclination to the west, falls into the sea 5 miles below Coleraine. The current of the Lower Bann is rapid, and in some places it is precipitated over ledges of rock. The salmon and eel fisheries on this river are both highly important and valuable. There are only 3 feet water over the bar at the mouth of the river at spring ebbs, and 10 feet at high water springs, and 8 at high water neaps. About half a mile up the river dries at low water. It is, however, navigable as far as Coleraine, but only by boats, and that with difficulty.

Foyle.—This important river is formed by the concourse of various streams, which unite near Strabane in Tyrone. Hence it flows north by St. Johnstown and Londonderry, below which it falls into the inlet or arm of the sea called Lough Foyle. It is navigable to Londonderry by the largest class of merchantmen. From the city to St. Johnstown it is navigable by barges, and the navigation has been continued from the latter to Strabane by a canal constructed at the expense of the Marquis of Abercorn.

In the lengthened coast from Lough Foyle, round to the Shannon, there are several rivers; but none of them of magnitude or importance enough to call for our notice.

Lakes.—Ireland has an immense number of lakes, provincially called loughs, some of which are very extensive. They are commonly divided into salt-water lakes and fresh-water lakes; but, as the former are really arms or inlets of the sea, they will be described with the sea-coast; so that, at present, we shall confine ourselves to the fresh-water loughs or lakes properly so called.

Lough Neagh is not only the largest lake in Ireland, but one of the largest in Europe. It lies in the centre of the province of Ulster, having the county of Armagh on the south, Tyrone on the west, Londonderry on the north-west, Antrim on the north and east, and Down, which barely touches it, on the south-eastern angle. It is about 17 miles in length, by about 10 in breadth, occupying, inclusive of Lough Beg (3,144 acres), which is joined to it, an area of 101,379 statute acres, at ordinary high water mark.—(See *Report on the Drainage of Lough Neagh*, by John Macmahon, Esq., Dublin, 1846.) It is fed by several rivers of considerable magnitude, while the Lower Bann is the only channel through which its refluent waters find a passage to the sea. Its mean level is about 46 feet above the level of the latter. And it appears from the Report of Mr. Macmahon, that about 25,000 acres of land, contiguous to its banks, and now annually flooded, might be made available for agricultural purposes by expending about 200,000*l.* in deepening and improving the channel of the Lower Bann. Though by far the largest, it is by no means the most beautiful of the Irish lakes. Its shores consist mostly either of a level strand, or marshy border, liable to frequent floods, and are, of course, deficient in those varied banks and bold promontories, without which such extensive sheets of water want picturesque effect, except when their uniformity is broken by islands; and of these there are only two small and uninteresting ones in this lake. Frequent squalls and want of shelter render its navigation rather dangerous for sailing vessels; but these inconveniences have been in great measure obviated by the introduction of steam-vessels, which carry on a considerable commerce, collecting goods and passengers at the various ports on its northern and western shores, and conveying them to the termini of the Belfast and Newry canals, the Ulster railway, &c. The waters of Lough Neagh are celebrated for their petrifying quality.

Lough Erne appears sometimes as a river, and sometimes only as a lake. It is situated in the province of Ulster, and county of Fermanagh, stretches, in a straight line, north-west and south-east about 30 miles, and divides the county into two pretty equal portions. It, however, consists properly of two lakes, the upper and the lower, connected by a broad, winding channel; the latter, which is the most extensive, comprises an area of 27,645 acres, and the former of 9,278 acres, making together 36,923 acres.* Both lakes, but especially the upper, are full of islands, some of them large and thickly inhabited, many of them well wooded, and the whole so disposed, and accompanied by such a diversity of coast, as to form a vast number of rich and interesting prospects. The ancient and well-built town of Enniskillen stands on an island between the upper and lower lakes, being connected with the mainland

* Dr. Beaufort assigned to these lakes an area of 76,311 English acres (*Memoir of a Map of Ireland*, p. 32). Its area, as measured by Mr. Wakefield, on Arrowsmith's map, is 85 square miles, or 54,400 acres (*Account of Ireland*, vol. i. p. 9). Mr. Griffith, the engineer, estimated the area of all the lakes in Fermanagh at 48,797 acres, making the area of Lough Erne about 40,000 acres; and the measurements given above from the Ordnance Survey show that this, though in excess, was not far from the mark. Mr. Gorton (*Topographical Dictionary*, article Lough Erne) tells us that Lough Erne is 43 miles in length; but this is bestowing upon it an imaginary elongation of at least 13 miles.

by bridges on each side. On another island is a magnificent seat of the Marquis of Ely. This lough is elevated about 150 feet above the level of the sea. It receives the Erne and several other rivers, and discharges itself at its north-west extremity by a rapid current of about 9 miles, which, after falling over many ledges of obstructing rocks, precipitates its waters down a grand cataract into the sea at Ballyshannon.

Lough Corrib, in the province of Connaught, and partly in the county of Mayo, but chiefly in that of Galway, has a good deal of resemblance to Lough Erne. It is 24 miles in length, being 14 wide in the broadest part; but in the middle it is contracted to a narrow channel crossed by a ferry. According to the Ordnance survey, it covers an area of 43,484 acres. It is of considerable importance as a channel of navigation for facilitating the transport of turf, lime, grain, seaweed, &c., to a great extent of country. Its southern extremity is within less than 5 miles of the town of Galway, into the sea at which it discharges its superfluous waters; and as the level of the lough, even when highest, is said to be only 16 feet 9 inches above that of the sea, it appears not a little surprising that a canal has not been cut across the isthmus between them. Were this done, and Lough Corrib united to Lough Mask by another canal, Galway would become the centre of an extensive inland navigation, which would not only be of the greatest advantage to that town but to a large extent of highly improveable country; for, though the country on the south and west sides of Lough Corrib be rugged, wild, and mountainous, that on its east and north sides is comparatively level and fertile.

Lough Mask, referred to above, lies about 3 miles north from Lough Corrib, being partly situated in Galway, but chiefly in Mayo. It is of an irregular shape: its area, according to the Ordnance survey, comprises 22,219 acres.

Lough Conn (including Lough Cullin), in Mayo, stretches about 11 miles in a north-north-west and south-south-east direction, but its greatest breadth does not exceed 4 miles; while, in one place, the distance across is less than 1 mile. It comprises about 14,000 acres, and its surface is said to be elevated about 30 feet above the level of the sea.

Exclusive of the above, and of the loughs of the Shannon already mentioned, there are an immense number of loughs in different parts of Ireland. Of these, Lough Melvin, in Leitrim and Fermanagh, covering 5,541 acres, is one of the most important. Exclusive of part of Lough Ree, there are, in Westmeath, seven considerable lakes, and in Clare, Cavan, and some other counties, they are still more numerous. Lough Derg, in the most southerly part of Donegal, is celebrated in the history of Irish superstition. A small island in it, called St. Patrick's Purgatory, is reckoned peculiarly holy, and was much resorted to in the dark ages. Boate, in his *Natural History* (p. 75, ed. 1652), says that the frauds practised on the ignorant devotees having been detected and exposed in the reign of James I., "the pilgrimage to it had come to nothing, and had not since been undertaken." But, if so, the practice has been again revived, for St. Patrick's Purgatory is at present annually visited by crowds of pilgrims, who perform certain religious

rites, which they believe to be of the greatest efficacy.—(*Inglis's Ireland in* 1834, vol. ii., pp. 169—181.)

The Lakes of Killarney, more celebrated for their beauty than their extent, lie in the midst of the Kerry mountains. They are three in number, but contiguous, and vessels pass from the one into the other. The largest, or lower lake, occupies an area of about 3,000 Irish acres: its western shore is bounded by the mountains of Toomies and Glena, the former 2,150, and the latter 2,090, feet above the level of the sea, having their precipitous sides well clothed with forest trees: on the opposite shore there is the fine and striking contrast of flat land, in a high state of cultivation. There are no fewer than 33 islands, many of them extremely picturesque, in the lower lake. This lake is, in some parts, very deep. Between Glena Mountain and Ross Island, the soundings give 42 fathoms; and as the surface of the lake is about 50 feet above the level of the sea, it follows that its *bottom* is 202 feet below that level. The middle lake occupies about 640 Irish acres; it lies immediately under the Torc or Turk Mountain, elevated about 1,900 feet above the level of the sea. The strait which joins the middle and upper lake is about 3 miles in length, having in many places the appearance of a beautiful river. The upper lake contains about 720 Irish acres. It lies in a hollow, formed by some of the most stupendous mountains in Ireland, among which are Mangerton and Carn Tual, already alluded to, so that its scenery is in the highest degree magnificent and sublime. "Here," says Mr. Wakefield, "Nature assumes her roughest and most terrific attire to astonish the gazing spectator, who, lost amid wonder and surprise, thinks he treads enchanted ground; and, while he scarcely knows to which side he shall direct his attention, can hardly believe that the scenes he sees around him are not the effects of delusion, or the airy phantoms of the brain, called into momentary existence by the creative powers of a fervid imagination. Here rocks piled upon rocks rise to a towering height; there one mountain rears its head in succession above another, and sometimes a gigantic range seems to overhang you, forming a scene that may be more easily conceived than described. Such sublime scenes cannot be beheld but with a mixed sensation of pleasure and awe, and on a contemplative mind they must make a deep and lasting impression."—(i. 66.) In other places, however, especially on the eastern shores of the lower and middle lakes, the scenery is of the softest and most agreeable kind, consisting of finely wooded promontories, ornamented with rivers and seats, verdant islands, &c. And it is in the contrast between these and whatever is most wild and rugged that we find the great charm of Killarney. These lakes have been often described, but never so well as by Mr. Young.

The total area of the Irish lakes amounts, according to the Ordnance Survey, to 630,825 statute acres: of which 51,624 acres are in Leinster; 151,381 in Munster; 214,956 in Ulster; and 212,864 in Connaught.

The Waterfall at Hungra Hill, in Cork, may be mentioned in this place. It is described by Dr. Smith in his *Ancient and Present State of the County of Cork*. "Not far," says he, "from Ross Mac Owen is one of the highest and largest waterfalls in this kingdom. This

cataract is very visible from the town of Bantry, at least 14 miles distant from it. The water is collected from various small rivulets and springs, forming a large lake on the top of a vast, high, rocky, and almost perpendicular mountain called Hungra Hill, at least 700 yards above the level of the bay of Bantry. The water cascades from the top of this mountain in a beautiful sheet at least 10 yards broad, which expands as it falls: about half the height of the mountain it dashes perpendicularly on a prominent rock, from whence a mist arises, almost the third part of the hill, which, in some particular stations, the sun's rays playing upon it and meeting the eye of the spectator, must make a charming appearance; these kind of mists, in such positions, generally reflecting the colours of the iris: hence it falls from rock to rock, till it has passed the rugged declivity of Hungra Hill; and, before it joins the ocean, it has another fall, cascading in an arch over a lower hill, all which make a fine sight as one sails up and down the bay."—(Vol. i. p. 28, ed. 1774.) It may, however, be worth while to observe, that doubts are entertained as to the accuracy of some of the measurements given by Dr. Smith.

Sect. 4.—*Sea Coast and Sea Ports.*

Ireland has a circuit of about 250 leagues of coast, great part of which is deeply indented, particularly on the west and south-west, by arms of the ocean, forming some of the noblest havens in the world. It is said to possess, in all, 14 harbours for the largest ships, 17 for frigates, and from 30 to 40 for coasting vessels, exclusive of upwards of 24 good summer roads.

The æstuary of the Shannon is one of the largest and safest asylums for shipping on the Irish coast; but, having noticed it in our account of the rivers of Ireland, we shall begin our survey with the coast to the south of the Shannon, and, proceeding round by Cape Clear, &c., complete the circuit of the island by returning to its æstuary.

Immediately to the south of Kerry Head, a bold, bluff, promontory at the southern extremity of the Shannon, there is a large expanse of water, the northern part of which is called Ballyheigh, and the other, within Machri Point, Tralee Bay. The former is very dangerous, and the latter by no means safe anchorage ground; but ships, mistaking Kerry Head for Loop Head, sometimes enter here, to their great risk, supposing it to be the Shannon. Seven small islands, called the Hogs, lie off Machri Point. Near this part of the coast are many sand-hills, formed by the wind, and on some parts the sea gains considerably. Other parts of the Kerry coast are extremely rugged; and offer to the view some of the highest mountains in Ireland. The peninsula of Dingle terminates in Dunmore Head in lat. 52° 13′ N., long. 10° 54′ W., being the most westerly point of Ireland, and, consequently, of what may be called the mainland of Europe. It is full of mountains. Mount Brandon, on the north coast of the peninsula, a noted landmark, rises 3,120 feet above the sea. Brandon Bay derives its name from this hill. Off Dunmore Head lie the Blasquet islands, 13 in number: tradition reports that the largest was formerly joined to the mainland. The intervening sound is of great depth, a consequence,

probably, of the violence with which the currents of ebb and flood run through it. One of the ships belonging to the Spanish Armada was wrecked here in 1588. Dingle Bay, a large arm of the sea, having Dunmore Head at its northern, and Valentia island at its southern, extremity, stretches inwards to the bottom of Castlemaine harbour. Dingle harbour, on the north side of this bay, is fit for small vessels only, and these lie aground on soft mud at low water. Ventry harbour, a little to the west of Dingle harbour, is of easy access, and capable of receiving the largest ships; but in westerly winds it is subject to heavy squalls. Castlemaine harbour, at the bottom of the bay, is of difficult access; it has a bar at its mouth, on which there are only 9 feet water. Valentia island, at the southern extremity of Dingle Bay, has a very excellent roadstead called Valentia harbour, between its north-eastern extremity and Inchbeg island. A pier has been constructed here at Ringlass; and it has been proposed to establish steam-packets from this place to New Brunswick. Valentia harbour is decidedly the best on the coast of Kerry, and is, besides, an excellent fishing station. The rocks called the Skelligs lie south-south-west from Valentia island, and about 7½ miles west from Bolus Head. Two light-houses have been erected on the greater or outermost Skellig. This is a high, precipitous, and not very accessible rock. Formerly, however, it was the residence of some monks; and was, from its supposed sanctity, visited by numbers of pilgrims. —(*Smith's Kerry*, p. 113, ed. 1756.)

Turning Bolus Head, Ballynaskelligs Bay opens to the north; and at about half a dozen miles from its eastern extremity, we meet the great arm of the sea, called Kenmare Bay, and sometimes, with little propriety, Kenmare River. It has deep water and clean ground in almost every part. Kilmichalog harbour, on its south side, is well sheltered, and is capable of receiving large ships.

After doubling the peninsula of Bear, having Dursey island at its extremity, we arrive at Bantry Bay in the county of Cork. This is one of the finest and most capacious harbours in Europe. It stretches inwards, in a north-easterly direction, nearly 30 miles, with a breadth varying from 4 to 6. Near the entrance of the bay, on its north-west side, is Bear island, separated from the mainland by a crooked strait about a mile broad, having from 10 to 30 or 40 fathoms water, and affording a safe retreat for the largest vessels. Farther up the bay is Whiddy island, on the south side of which, nearly opposite to Bantry town, there is an admirable roadstead, where ships lie landlocked in from 24 to 40 feet water. Bear island forms, as it were, a natural breakwater, protecting the bay from the south-west winds. There is close to both shores a considerable depth of water; it is not encumbered by any shoals or rocks that may not be easily avoided even at night; and the anchoring-ground being everywhere good, it furnishes throughout its whole expanse convenient shelter and accommodation.

Having no considerable town on its shores, which are wild and rugged, nor any communication with the interior, this noble bay is but little frequented by shipping. Occasionally, however, it has been resorted to by large fleets, and has been the theatre of naval warfare, an indecisive action having been fought in it on the 30th of April,

1689, between a portion of the French fleet that conveyed King James to Kinsale and the English fleet under Admiral Herbert, afterwards Earl of Torrington. It was in it, also, that the French under Hoche disembarked in 1796.

Dunmanus Bay is separated from that of Bantry by a narrow peninsula, terminating in the promontory of Sheep's Head; opposite to which, on the southern side of the bay, is Three-Castle Head. This bay runs about 15 miles up the country: it is easy of entrance, has deep water, and good anchorage-ground almost all over; but, being open to the western gales, and so near Bantry Bay, it is seldom visited. Two and a half miles south from Three-Castle Head, is Mizen Head, formerly supposed to be the most southerly promontory of the mainland of Ireland, and hence the name of *Notium Promontorium* given to it by Ptolemy; but it is now ascertained that this distinction is due to Browhead, about 2 miles east from Mizen-Head. North-east from Browhead, distant 4 miles, is Crookhaven, which, as Dr. Campbell has observed, would, in any other country except Ireland, and even anywhere else in it except Cork, be deemed an admirable port.—(*Survey of Britain*, vol. i., p. 435.) It is of a medium size, easy of access; has secure anchoring-ground, and about 3 fathoms water at ebb tide. The only swell in it is occasioned by the easterly winds, but it rarely occasions any inconvenience.

From Mizen Head to Cape Clear, the course is east by south, 4 leagues. This cape, in lat. 51° 24′ 55″ N., long. 9° 29′ W., rising high above the sea, is the southern promontory of Clare island, about 6 miles from the mainland of Ireland. It has been surmounted by an excellent light-house; and is the point from which ships leaving St. George's Channel for the westward usually take their departure, and those arriving prefer making it their land-fall. The Fastnet rock lies about 6 miles south-west from Cape Clear.

North by east from Cape Clear, is Baltimore peninsula, forming the east side of a spacious bay, in which there are many islands and ports. From Baltimore Point to the Old Head of Kinsale, the general direction of the coast is north-east, presenting, in succession, Castlehaven harbour, Glandore harbour, Ross Bay, Clonakilty Bay, and Courtmacsherry Bay; none of which, however, are very suitable for the purposes of navigation. The Old Head of Kinsale, a narrow peninsulated promontory, at the extremity of which is a light-house, has on its east side the entrance to Kinsale harbour. This safe and excellent port is formed by the æstuary of the Bandon, at the mouth of which is a bar with 12 feet water at ebb tide. At the anchorage within the bar, off Cove or a little higher up, there are from 4 to 5 fathoms water within half a cable's length of the shore.

From Kinsale, the coast sweeps round by the north-east to Robert's Head, opposite to which is Poore Head, the two extremities of the bay, at the bottom of which is Cork harbour. Roche's Point, a bold headland, on which a light-house was erected in 1817, marks the eastern side of the fair way into the port. The entrance, which is deep and narrow, is guarded by Fort Camden on the west, and Fort Carlisle on the east, side. With a leading wind, men-of-war may enter at any time of the day, without regard to the tide. Within, the

harbour stretches out into a magnificent basin, interspersed with several islands, land-locked and sufficiently extensive to accommodate the entire navy of England. Cork itself is situated at the north-west extremity of the harbour, on the river Lee, and is accessible only by vessels of from 150 to 200 tons burden; so that Cove, a thriving town on the south side of Great Island, fronting the grand basin, is the proper emporium of the harbour. Besides the forts at the entrance, it is farther protected by fortifications constructed on Spike and Haulbowlin, two small islands opposite Cove. Ships of the largest class come close to the quays; the anchorage is excellent; nor is it possible, indeed, to imagine a finer port. During war, Cork harbour is the principal rendezvous for the West India fleets. The city has always enjoyed a large share of the victualling trade; and, notwithstanding the rivalry of Waterford, it is still decidedly at the head of the southern ports as a commercial emporium. The value of the exports from Cork, in 1835, amounted to 2,909,746*l.*: they consisted almost entirely of provisions, corn and meal, and live stock.

Leaving Cork, the coast trends north-easterly to Youghal, at the mouth of the Blackwater. The sea has evidently encroached on the shore in its vicinity, the beach at low-water mark being a bog covered with sea sand, under which are found the remains of trees. Youghal lies on the west side of the river immediately within its mouth. At ebb tide there are only 4 feet water on the bar, and 13 feet at high water neap tides. Generally, therefore, it is not accessible to ships drawing more than 12 feet water.—(See *antè*, p. 330.)

From Youghal the coast of Waterford runs east to Ram Head, and thence north-east to Mine Head and Helwick Head. North and west of the latter are Dungarvan Bay and harbour. At the town of Dungarvan there are only 9 feet water at springs; and the anchoring ground in the bay is narrow and indifferent.

About 20 miles east from Dungarvan is Tramorè Bay, one of the most dangerous places on the Irish coast. In hazy weather it is sometimes mistaken by ships for Waterford harbour; most of those that have fallen into this error having been wrecked on its inhospitable shores. The flood sets with great force into the bay: the winds from the south-south-east round to the west-south-west also throw in a heavy sea; and, as the ground is foul and rocky, the only chance of escape, for a vessel embayed under such circumstances, consists in her being able to run ashore on the north-west coast. Conspicuous beacons have been erected on Newtown and Brownstown heads, on the west and east extremities of the bay; and ships in passing ought to keep a good offing, lest, by getting entangled in the tide, they be drawn on to almost certain destruction.

About 5 miles east from Brownstown Head is Red Point, the south-western extremity of Waterford harbour. Hook Head, at the extremity of the opposite shore of the harbour, is surmounted by a conspicuous light-house. The distance across is about 2 miles. On the western side of the harbour, about a mile within Red Point, is the artificial port of Dunmore. It has a lengthened pier, and is the station of the steam-packets that ply between Milford Haven, Bristol, and Waterford harbour. The city of Waterford and the town of

New Ross lie, the former on the river Suir, 15 miles from sea, and the latter on the Barrow, nearly 20 miles inland. Such is the depth of water in this excellent harbour that, as already mentioned, vessels of 500 tons burden ascend to Waterford, and at low water, lie afloat in the river opposite the city.—(See *ante*, p. 330.)

Carnsore Point, the southern headland of the east coast of Ireland, bears from Hook Head east by north, distant about 27 miles. The intervening coast has no good harbours, and is fenced by several dangerous rocks and islands. A light-vessel is moored off Coningbeg, the most southerly of these rocks or islets, nearly 8 miles from shore.

About 7 miles east by north from Carnsore Point is the Tuscar, a remarkable rock, elevated 20 feet above the level of the sea at high water. A light-house, modelled on that of the Eddystone, has been erected on this rock, which not only warns the mariner of his approach to it, but of the still more dangerous sunken rocks by which it is surrounded.

North-west from the Tuscar rock, distant about 14 miles, is the entrance to Wexford harbour. It is spacious, but shallow, encumbered with shifting sands, and has a bar at its mouth. From Wexford to Dublin Bay there is not a single tolerable port; and the coast is fenced throughout by dangerous banks, particularly off Arklow. The limits of Dublin Bay are Dalkey Island on the south, and Howth Head on the north, about 6 miles apart. The south shore rises like an amphitheatre towards the lofty mountains of Wicklow; the north shore being lower and more level, except at its extremity formed by the head. The bay is exposed to the easterly gales, and the bar at the entrance of the harbour had only 6 feet water at ebb tide; but of late years its depth has been increased several feet by dredging. In the view also of lessening the bar, and obtaining a greater depth of water by preventing the current of the Liffey from diffusing itself over the banks, called the Bulls, two immense walls have been constructed, that called the south wall, from its bounding the south side of the river, projects about 3 miles direct from the city into the bay, having a light-house at its termination. The other, or north wall, about 1½ miles in length, projects from Clontarf on the north side of the bay to within a short distance of the extremity of the former, the angle between them comprising the harbour. But these works, though they have partially succeeded, not having had all the effect that was anticipated, an extensive deep-water harbour, capable of accommodating the largest ships, has since been constructed at an immense expense at Dunleary or Kingston, on the south side of the bay. A railway, 6 miles in length, connects this new harbour with Dublin, to which it bears nearly the same relation that the East and West India Docks do to London. Immense sums have also been expended on the construction of a harbour to the north of Howth Head opposite to the little island called Ireland's Eye, but the water is not sufficiently deep to allow of large ships riding in the harbour at ebb tide. Spring tides rise in Dublin Bay 12 feet, and neap tides 6 feet; so that ships of 18 or 20 feet draught may sail into the harbour at high water springs, and those of 12 or 14 feet draught at high water neaps.

Dunany Point, in Louth, bears from Howth Head north by west,

distant about 10 leagues. In the intermediate coast is Drogheda, already referred to (*ante*, p. 332), and some other tide havens, but no good harbour. Between Dunany Point on the south, and Cooley Point on the north side, lies the extensive bay of Dundalk. It is generally shallow; and mostly, indeed, dries at low water.

A little to the north-east of Cooley Point is Greenore Point, the south-western extremity of Carlingford Lough, an arm of the sea stretching north-west to Narrow-water, below Newry. It is about 2 miles wide at its mouth, across which is a bar with only 9 feet water over it at low spring ebbs, so that it is available only at certain times of the tide. A light-house has been erected on each side the entrance to the bay.

The shores on the north side of Carlingford Lough, and round to Dundrum, are bold and precipitous, the Mourne mountains coming down close to the water's edge.

From Dundrum Bay, on which are some fishing havens, the coast runs north by east to Lough Strangford, having Killard Point at the western, and Ballyquintin Point at the eastern extremity of its embouchure. The channel leading to the Lough is about 6 miles in length, when it expands into a very large basin, extending north to Newtownardes, about 15 miles, and having a mean breadth of 5 or 6 miles. It is well sheltered, has deep water, and the anchoring-ground is good.

According to Mr. Mackenzie, who surveyed the coasts of Ireland by order of the Admiralty, there is a bar at the entrance to Lough Strangford with only 12 feet water at ebb tide; and a recent authority, Captain Mudge, says that with a weather tide the sea breaks with great violence over the bar except at slack water.—(*Norie's Sailing Directions for St. George's Channel, &c.*, p. 87.) But Mr. Nimmo, the engineer, in his evidence before the committee of the House of Commons, on the survey and valuation of Ireland, in 1824, stated that he had sounded the entrance, and found 5 fathoms water over the place where the bar is laid down in the Admiralty charts! It is, indeed, clear, from the rapidity with which the ebb tide runs out of the lough, that no bar, unless it consisted of rocks or other very solid matter, could exist in its mouth. The rapidity of the tides, and some sunken rocks on the east side of the entrance, are the only dangers to be encountered, and they are considerable enough to make the bay be shunned by all strangers.—(*Min. of Evidence*, p. 92.)

North by east, about 2 leagues from Ballyquintin Point, is the South Rock, one of a dangerous cluster of rocks lying off Kerry Point. A light-house has been erected on it.

From Kerry Point the coast runs north, inclining a little to the west, to Donaghadee. Its harbour is naturally very indifferent; but, owing to the importance of its situation, which is the best for the despatch and reception of the mails to and from Port Patrick, large sums have been expended on its improvement, and it is now rendered a pretty good pier harbour.

The Copeland Islands lie about 2 miles north-north-east from Donaghadee. A light-house is erected on one of the most northerly.

This light-house serves to mark the entrance to Belfast Lough. This considerable arm of the sea lies between Ballymacormick point in Down,

and Blackhead in Antrim, about 8 miles apart, whence it extends as far inwards as Belfast, situated at its southern extremity. It is of easy access, and has, in many places, good anchorage. But the water shoals before it reaches Belfast, so that large vessels can only come up with the flood tide. Carrickfergus lies on the north shore of Belfast Lough, near Kilroot Point.

To the geologist, the coast of Antrim is the most interesting in Ireland. It is generally bold and precipitous, consisting in several places, particularly at Fair Head, Bengore Head, the Giants' Causeway, &c., of vast masses of basaltic columns. With the exception of Larne Lough, fenced from the sea by the narrow and lofty peninsula called Magee Island, it has no good harbour. Fair Head, the *Robogdium Promontorium* of Ptolemy, and the north-eastern extremity of Antrim and of Ireland, is elevated, according to the Ordnance Survey, 636 feet above the level of the sea. It presents a vast mass of rude, coarse, columnary stones, some of them being above 280 feet in length; and at the base of these gigantic columns lies a wild waste of natural ruins, of an enormous size, which, in the course of ages, have been tumbled down from their foundation by storms, or some more powerful operations of nature. A savage wildness characterises this great promontory, at the foot of which the ocean rages with uncommon fury. Scarcely a single mark of vegetation has yet crept over the hard rock, to diversify its colouring; but one uniform greyness clothes the scene all around. —(*Hamilton's Letters on the Coast of Antrim*, 12mo. ed. p. 96.) North by east from Fair Head, distant about 3 miles, is the crescent-shaped island of Rathlin or Ragherry, the *Ricina* of Ptolemy. It is 5 or 6 miles long, but only about three-fourths of a mile in breadth. Its shores are steep and rocky, with deep water all round. The phenomenon of the mirage, similar to the *fata morgana*, is often observed in the strait that separates this island from the mainland.

From Fair Head the coast bends inwards to Ballycastle, a harbour fit only for small vessels; and thence north-west to Ballintoy Head, about 5 miles west by north from which is Bengore Head. This remarkable promontory is made up of a number of capes. Of these the most perfect and striking is Pleaskin. "Its summit," to use the words of the Rev. Mr. Hamilton, "is covered with a thin grassy sod, under which lies the natural rock, having generally a uniform hard surface, somewhat cracked and shivered. At the depth of 10 or 12 feet from the summit, this rock begins to assume a columnar tendency, and forms a range of massy pillars of basalt, which stand perpendicular to the horizon, presenting, in the sharp face of the promontory, the appearance of a magnificent gallery or colonnade of upwards of 60 feet in height.

"This colonnade is supported on a solid base of coarse, black, irregular rock, near 60 feet thick, abounding in blebs and air-holes; but though comparatively irregular, it may be evidently observed to affect a peculiar figure, tending, in many places, to run into regular forms, resembling the shooting of salts and many other substances during a hasty crystallisation.

"Under this great bed of stone stands a second range of pillars, between 40 and 50 feet in height, less gross and more sharply defined than those of the upper story, many of them, on a close view, emulating

even the neatness of the columns in the Giants' Causeway. This lower range is borne on a layer of red ochre stone, which serves as a relief to show it to great advantage.

"These two admirable natural galleries, together with the interjacent mass of irregular rock, form a perpendicular height of 170 feet; from the base of which, the promontory, covered with rock and grass, slopes down to the sea, for the space of 200 feet more, making in all a mass of near 400 feet in height, which, in beauty and variety of its colouring, in elegance and novelty of arrangement, and in the extraordinary magnitude of its objects, cannot readily be rivalled by anything of the kind at present known."—(*Letters on the Coast of Antrim*, 12mo ed. p. 91.)

Proceeding westward from Bengore Head, we very soon fall in with the Giants' Causeway. This extraordinary basaltic promontory consists of three distinct piers or quays, rising from the bottom of a precipitous cliff full 400 feet above the level of the sea. The chief pier is seen at low water extending above 1,000 feet in length, and the others not quite so much. They consist of polygonal stone pillars, from 40 to 55 feet long, having from 3 to 8 sides; but those having 6 sides are by far the most common. The surface formed by the summits of the pillars is smooth, and the joints so close that the blade of a knife can hardly be introduced into them. The pillars are divided into segments, admirably fitted to each other, varying from 6 inches to a foot in thickness. At Fair Head and Bengore Head, the columns are higher, but their angles are not so sharp, and they are altogether of a coarser texture than those of the Giants' Causeway. The same sort of basaltic columns, though of a less perfect form, extend along the coast for several miles, and, being sometimes detached from the shore, have at a distance the most grotesque appearance. Rathlin Island contains similar columns: they extend a good way inland.

From the Giants' Causeway the coast continues bold and rocky, till we reach the mouth of the Lower Bann, when it becomes low and flat, and continues so nearly to the magnificent headland of Magilligan, situated at the mouth of Lough Foyle. This is an extensive triangular basin, 18 miles long, by about 10½ in its greatest breadth. At its mouth, between Magilligan Point and Green Castle, it is contracted to less than a mile in width, having, on the west side, from 8 to 10 fathoms water. On the east side of the entrance, there is a large sand bank called the Great Tuns, over which the sea sometimes beats with much violence. The navigation of the Lough is confined to a narrow channel along the Donegal or Innishowen shore, the rest being occupied by extensive shoals and sand-banks; part of which have been effectually reclaimed from the sea, and a design is now on foot for reclaiming more. Vessels of 400 tons may ascend the Lough and the Foyle as far as Derry, about 23 miles from the entrance to the Lough. On the whole, however, its navigation is rather contracted and difficult, and requires considerable attention. Two light-houses have been erected on Innishowen Head, intended to serve as guiding lights past the Great Tuns bank, and into the navigable channel leading to the city.—(*Ordnance Survey of Londonderry*, p. 242.)

The coast of Donegal is mountainous, wild, and dreary. Its northern extremity, Malin Head, in lat. 55° 22′ N., long. 7° 23′ 30″ W.,

is the most northerly land in Ireland. Leaving this point, the coast turns southerly into the capacious inlet known by the name of Lough Swilly, supposed to be the *Argita* of Ptolemy. Dunaff Head is its eastern, and Fanad Point, crowned with a light-house, its western extremity. From its mouth it extends nearly 25 miles into the interior. It is a fine basin: the water is deep; and opposite to Buncrana, on its eastern side, is a roadstead where the largest men-of-war may anchor in perfect safety. But this capacious haven, which might shelter half the fleets of Europe, has hardly even a considerable village on its shores, and is seldom visited by ships. From Lough Swilly round to the bay of Donegal, the coast is deeply indented with bays, and is in several places fenced with islands. Killybegs Bay, on the south-west shore of Donegal, has a narrow entrance; but it is free from danger, even for ships of any burden, which, when in, lie in safety in from 6 to 8 fathoms water. Donegal Bay is a broad arm of the sea, lying between St. John's point on the north-west, and Mullaghmore Point, in Sligo, on the south-west. It contains within its expanse several harbours and creeks, of which Donegal and Ballyshannon are the principal, but neither is accessible to large vessels.

Sligo Bay is capacious. The harbour of Sligo lies to the east of Coney Island. A pier has lately been erected outside the bar; and, though rather troublesome of access, the port is now a very tolerable one, and its trade and shipping are both rapidly increasing. The value of the exports in 1835 amounted to 369,490*l*.

From Sligo Bay the coast runs nearly due west as far as Erris Head, the north-western extremity of Mayo; but it has no harbour of consequence with the exception of Killala Bay and Broadhaven; the former shallow, and fit only for small craft, and the latter, though deep, confined and open to the north.

At Erris Head the coast takes a southerly direction. Within the narrow peninsula, called the Mullet, is Blacksod Bay, opening to the south, and stretching northwards about ten miles. It has water sufficient to float the largest ships; but the shelter is indifferent.

To the south of Blacksod Bay is Achill Island, separated from the main land by a narrow, shallow strait. Clew Bay lies to the south-west of this island. It is a large rhomboidal-shaped sheet of water, the violence of the heavy seas thrown in from the west being broken by Clare Island, lying in its mouth. Its mean depth is about 15 fathoms; and its east end is studded with a vast number of islands. Newport-pratt and Westport, the latter a tolerably large and increasing town, are situated, the former on the south-east, and the latter on the north-east corner of the bay.

The coast of Galway is rugged in the extreme, being everywhere indented with arms of the sea. Roundstone Bay, Birterbuy Bay, Kilkerrin Bay, &c., on the Connemara and Moycullen coast have all, particularly the first, deep water, and excellent accommodation for the largest ships; but they are rarely visited except by fishing-boats.

The great arm of the sea called Galway Bay, is bounded on the north and east by Galway, on the south by Clare, and on the west, where it opens to the Atlantic, it is protected by a natural break-water formed by the south isles of Arran, which extend north-west and south-east, about a dozen miles across its mouth. There are two entrances to

the bay, one to the north, and the other to the south, of the islands; the first is somewhat dangerous, from shoals and rocks, but the latter is deep, safe, and open. There are many harbours and inlets within this spacious bay. The town of Galway is situated at its north-western extremity. A light-house has been erected on one of the isles of Arran; and another on Mutton Island, off Galway harbour. The latter has been most materially improved within these few years, by the construction of a floating dock, 9 acres in extent, and fitted to accommodate ships of 500 tons burden. The importance of Galway as a commercial entrepôt, would be still further increased by the opening of the proposed canal, connecting it with the inland navigation of Loughs Corrib and Mask.

In various places along the coasts of Donegal, Sligo, Mayo, and Galway, large tracts of valuable land have been destroyed by being covered with drifting sand from the shore, impelled forward by strong north-westerly gales. This evil may, however, be arrested by planting the sand with bent, which binds it together, and effectually prevents its further progress.

From Black Head in Galway Bay, the coast of Clare trends south-west to Loop Head, at the mouth of the Shannon. It is destitute of any good harbour; and vessels embayed between Hag's Head on the north, and Ballard's Point on the south, or in what is called Malbay, have but little chance of escaping shipwreck.

Principal Headlands and Places on the Coast of Ireland, with the Latitude and Longitude, as given by the best Authorities.

PLACES.	Latitude.	Longitude.
	° ′ ″	° ′ ″
Kerry Head	52 29 0 N.	9 52 0 W.
Dunmore Head	52 13 0	10 19 30
Bray Head (Valentia Island)	52 2 0	10 16 30
Crow Head	51 33 0	10 9 0
Brow Head	51 26 0	9 44 0
Cape Clear	51 26 3	9 29 20
Old Head of Kinsale (Lighthouse)	51 36 45	8 32 16
Cork	51 53 54	8 30 0
Youghal	51 57 0	7 51 0
Hook Tower (Lighthouse)	52 7 25	6 55 58
Waterford	52 16 0	7 7 0
Carnsore Point	52 1 0	6 18 30
Tuscar Rock	52 12 9	6 12 37
Wicklow Head	52 58 22	5 58 0
Dublin	53 21 30	6 17 0
Kerny or Cairney Point (Down)	54 22 0	5 27 30
Belfast	54 35 0	5 56 0
Fair Head	55 14 0	6 3 30
Bengore Head	55 16 10	6 23 20
Malin Head	55 22 0	7 23 30
Bloody Foreland Point	55 8 0	8 17 0
Tillen Head	54 38 0	8 43 0
Sligo	54 22 0	8 22 0
Erris Head	54 19 0	9 57 0
Achill Head	54 0 0	10 11 0
Slyne Head	53 25 0	10 12 0
Galway	53 16 0	9 0 0
Loop Head	52 34 0	9 56 11

Sect. 5.—*Soil, Bogs, &c.*

Soil.—There is in Ireland a considerable diversity of soil, but not nearly so great as in England. It has little clay soil, meaning by that term such clays as are found in Oxfordshire, and in some parts of Essex, Suffolk, and Surrey; that is, soils of uncommon strength, stubbornness, tenacity, and retentiveness. Sandy soils are also rare in Ireland; and there are no chalky soils, or such as abound in Surrey, Sussex, Hants, Wilts, &c.

The prevalent soil of Ireland is a species of *loam*, of which there are many varieties. In the county of Tyrone, it is so strong as to make good bricks; but, speaking generally, it is comparatively light, and is in most places rather shallow. The rockiness of the soil is remarked by Mr. Young as the thing which struck him most in the appearance of Ireland. Indeed, by far the largest part of the kingdom rests on a stratum of rock. In some large districts it is everywhere appearing upon the surface; and where the soil is richest, as in the most fertile parts of Limerick, Tipperary, Meath, Roscommon, &c., rock is uniformly met with at no great depth. Much of this rock is limestone, a circumstance which contributes most materially to increase the productiveness of the soil. In most countries so shallow a soil would be accompanied by great sterility; but in Ireland the moisture of the climate renders it conducive to abundance. "If," says Mr. Young, "as much rain fell upon the clays of England as falls upon the rocks of her sister island, they could not be cultivated. But the rocks here are clothed with verdure; those of limestone, with only a thin covering of mould, have the softest and most beautiful turf imaginable."—(*Tour in Ireland*, part ii. p. 3, 4to. ed.)

The friable and sandy loam, which forms a large proportion of the soil of Limerick, Tipperary, Roscommon, Meath, Longford, &c., is, perhaps, all things considered, equal to any land in Europe. Its fertility is such that it is not materially injured by the miserable system of cultivation practised upon it. If preserved clean, it will yield an almost endless series of corn crops. "It is equally well adapted to grazing and tillage, and, I will venture to say, seldom experiences too wet or too dry a season. The richness of the land, in some of the vales, may be accounted for by the deposits of soil carried thither from the upper grounds by the rains. The subsoil is calcareous, so that the very richest manure is thus spread over the land below, without subjecting the farmer to any labour."—(*Wakefield's Ireland*, vol. i. p. 80.)

The famous pastures, called the *corcasses* or *caucasses*, on the banks of the Shannon and Fergus, are not surpassed by the best in Lincolnshire.

One of the most remarkable divisions of soil is that formed by the Barrow. To the west of that river limestone is met with in abundance, whereas it is nowhere to be found throughout the counties of Wexford and Wicklow. It is the general opinion, that the limestone in the neighbourhood of Carlow is the best in Ireland. In the county of Waterford there is no limestone north of the Blackwater.

In point of natural fertility, Mr. Young is decidedly of opinion that Ireland is, acre for acre, superior to England; and in this view of the matter he is supported by Mr. Newenham and Mr. Curwen. Mr

Wakefield is, however, of a different opinion. At all events it is certain that, including bogs, the proportion of waste land is much larger in Ireland than in England. And though it were conceded, as we believe it must be, that the cultivated land of Ireland is superior to that of England, it can hardly, we think, be contended that this superiority is such as to make up for the greater extent of waste and barren land in the former.

All that portion of the soil of Ireland which rests on a calcareous and rocky subsoil never deteriorates, but, when let alone, rapidly improves, and clothes itself with the finest herbage.—(*Newenham on the Natural and Political Circumstances of Ireland*, p. 82.) This quality of the soil may, in some measure, account for the mischievous practice, so common in Ireland, of cropping land till it be completely exhausted, and then leaving it to itself to recruit. In most countries, an abuse of this sort would be so very fatal that it could not long exist on any very large scale. But the natural fertility of the Irish soil is such that, however exhausted, the land is sure, if let alone for a few years, to recover its pristine richness, when it is again subjected to the same abusive treatment.

" The exuberant fertility of the soil of Ireland," says Mr. Curwen, " enables the husbandman to proceed in a manner which, if pursued in England, would long ago have made that garden a desert. A century ago Swift complained of the ruinous custom of over-cropping: in later times it has been carried to an extent far exceeding the practice of his days; and, though still persisted in, there is no deficiency of produce." —(*Letters*, vol. ii. p. 72.)

Bogs.—The greatest drawback on the fertility of Ireland is the vast extent of the bogs with which the surface is, in many places, covered. These bogs consist " of moist vegetable matter, covered more or less with unproductive vegetables, and containing a great deal of stagnant water." Some are, of course, more or less wet than others. They vary also in depth, consistency, &c. The colour of the matter of which they are composed is, for the most part, reddish, whence they are usually called *red bogs*. Exclusive of the red or flat bogs, a very large proportion of the mountains of Ireland are covered with peaty or bog soil; and hence the term *mountain bogs*.

Commissioners were appointed by parliament in 1809 to inquire into the nature and extent of the several bogs in Ireland, and the practicability of draining and cultivating them. These gentlemen drew up some Reports, illustrated by plans and sections, and containing a great deal of information in regard to the subjects they were appointed to investigate. In their First Report, the Commissioners observe, that if two lines were drawn, one from Wicklow Head to Galway, and another from Howth Head to Sligo, the intervening space would comprise about six-sevenths of the flat red bogs in the island, excluding those less than 500 acres. This great belt is divided into two portions by the Shannon; the division to the west of that river containing more than double the extent of bog that is contained in the division to the east. The Commissioners further state, that if the bogs of Ireland, exclusive of mountain bogs and flat bogs of less than 500 acres, be supposed to be divided into 20 parts, about 17 of them will be included within the

great belt or zone already mentioned; viz., 12 to the westward, and 5 to the eastward of the Shannon; and of the 3 remaining parts, 2 will lie to the south, and 1 to the north of this belt. Most of the bogs lying to the eastward of the Shannon, and which occupy a considerable portion of King's and Queen's Counties, and of the county of Kildare, are generally known by the name of the Bog of Allen. This, however, is not one great morass: on the contrary, the bogs so called are perfectly distinct from each other, being often separated by ridges of dry ground, with their waters flowing to different rivers. In general it may be said, that there is no part of the bogs to the eastward of the Shannon, so much as 2 Irish miles distant from the upland and cultivated districts.—(*First Report*, p. 4.)

In their Fourth Report (printed 28th April, 1814, p. 16), the Commissioners state as the result of their inquiries and surveys, that "the extent of peat soil in Ireland exceeds 2,830,000 English acres, of which at least 1,576,000 consist of flat red bog; and that the remaining 1,255,000 acres form the covering of mountains."

Cultivation of the Bogs.—Considering the vast extent of the bogs of Ireland, their drainage and cultivation become a matter of great national importance. Almost all the engineers employed by the parliamentary Commissioners are of opinion that it may be accomplished at no very heavy expense. The bogs are generally, indeed, at such an elevation above the level of the sea, as to allow of drains being cut to a depth sufficient to permit the escape even of the bottom water. But the Commissioners observe, that "the bogs partake of the nature of a sponge, and are completely saturated with water." Although, therefore, a vent were made for the bottom water, it does not follow that the water held in suspension by the bog would also be carried off. On the contrary, experience shows that, when drains are cut through a bog, though at no considerable distance from each other, the intermediate portion continues nearly as wet as ever. But supposing that this apparently insuperable difficulty were overcome, and that the bogs were completely drained, still we have to inquire whether any advantageous result would follow. According to Mr. Wakefield, the drainage of the bogs would render them "masses of dry inert vegetable matter; and, unless some means were discovered of bringing them into a state of putrefaction, one might as well attempt to cultivate an immense woolpack. The fact is, that in the present state of bogs, nothing but a covering of earth, clay, marl, or limestone and gravel, will do any good; and this can be applied better without large surface drains (recommended by the Commissioners) than with them.—(*Account of Ireland*, vol. i., p. 105.)

The elaborate estimates given in the reports of the engineers employed by the Commissioners, of the expense of draining and improving bogs, are altogether hypothetical, and are entitled to very little weight. Had a single extensive bog been drained by speculators, and brought into a state of profitable cultivation, there would have been some foundation to go upon. This, however, has not been done; and, till it be done, there are plainly no data to refer to in relation to this subject on which any reliance can be safely placed. We do not mean to insinuate that we look upon the cultivation of the bogs of Ireland as imprac-

ticable. Should the wealth of the country increase, they will, no doubt, be gradually, though, we believe, very slowly, reclaimed. At present, however, we confess it appears to us that there are no good grounds for thinking that their cultivation, if undertaken upon a great scale, would be otherwise than ruinous. Even in Great Britain, most of those who have distinguished themselves by attempts at bog improvement have been heavy losers. Blair Drummond moss, in Perthshire, has not been improved, but exterminated.—(See *Appendix to General Report of Scotland*, vol. ii., p. 42.) And it is abundantly obvious, that in Ireland the chances of loss from any public improvement would be incomparably greater.

The bogs of Ireland are of considerable importance, considering the want of timber, and that coal can only be used by the wealthy classes, in furnishing the mass of the people with an inexhaustible supply of cheap fuel. Mr. Bicheno remarks, in reference to this subject, that "the rainy climate of Ireland, and the wet occupations of the people, with the nature of their food, make a fire more important to them than to most others; and, in fact, is frequently the substitute for clothing, bedding, and, in part, shelter. Had it not been for the bog, the measures taken in former times to extirpate the nation might probably have succeeded; but the bog gave them a degree of comfort upon easy terms, and enabled them to live under severe privations of another kind."—(*Ireland and its Economy*, p. 28.)

In corroboration of this statement we may observe that, in many parts of the north of Ireland, where the bogs were of a comparatively limited extent, they have long been considered as the most valuable part of the soil. Many of the smaller ones have, indeed, been wholly cut out; and the neighbouring inhabitants have, in consequence, been subjected to considerable privations. Some gentlemen think that, owing to its saving a great deal of labour, English coal would really be cheaper in most parts of Ireland than turf. But in Ireland there is a glut of labour; and we incline to agree with those who contend that little stress can be laid on the time spent in cutting and saving turf, seeing that the chances are that, were the peasantry not employed in this way, they would either not be employed at all, or quite as unprofitably. The above remark is applicable to England, but not to Ireland.

Sect. 6.—*Geology.*

The geology of Ireland has hitherto been but imperfectly explored; and part of its surface, containing nearly 3,000,000 statute acres, is covered with turf bogs to the depth of from 5 to 30 feet, concealing many of its mineral features. Sufficient, however, is known to exhibit an outline of its physical structure and mineral geography. The geology of Ireland has this striking peculiarity, that almost all its great mountain groups and ranges, consisting of primary and transition rocks, are situated near its coasts; and that the centre of the island, except where it is broken by spurs from the external mountains, is spread out into an immense undulating plain of secondary formations. On the north-east side of Ireland there is a very small extent of the

upper secondary strata, similar to what occurs on the eastern side of England, and nearly the whole county of Antrim is covered by basaltic rocks.

For the convenience of description, we shall divide the mountainous parts of Ireland into five districts; the southern, the south-eastern, the north-eastern, the northern, and the western.

The southern district comprises the counties of Kerry, Cork, and Waterford, extending along the coast from the mouth of the Shannon to Waterford Harbour: it includes also parts of the neighbouring counties of Clare, Limerick, and Tipperary. The mountains in this district are the highest in the island; they generally run in a direction from east to west, in distinct chains or ridges, to which the beds in the axes of each ridge are vertical. On each side of the axes, the beds dip north and south, diminishing in inclination as they recede from the centre, and form a succession of troughs between the different ridges. Towards the north the beds decline gradually, and finally pass under the old red sandstone and the limestone of the midland counties. In the county of Kerry, Carn Tual, one of the mountains called Macgillicuddy's Reeks, near the Lake of Killarney, rises 3,404 feet above the level of the sea. The rocks are principally of the transition class, consisting chiefly of greywacke, slate, limestone, and quartz rock; there are also beds of sandstone and conglomerate. Slate slabs for pavement of good quality are quarried in the island of Valentia. The transition rocks of Kerry and Limerick are prolonged into Cork and Waterford, preserving nearly the same character and composition.

The limestone in this district contains organic remains similar to those found in the transition limestone in other countries, such as orthoceratites, and several species of terebratula, spirifer, and productus.

In Clare, the clay-slate mountains are bordered by old red sandstone, over which occur mountain limestone, and a portion of the coal measures; but the coal is of rare occurrence, and of an indifferent quality. Contrary to what was at one time supposed, it is now ascertained that the coal formation of this province resembles, both in its geological position and the nature of its vegetable fossil remains, the regular coalfields in England. The beds of stone coal, or anthracite, near Killarney, are found to the north of Tralee, in highly inclined beds of indurated slate and sandstone. This coal is more extensively developed in the county of Cork, and is used for burning lime. Beds of similar coal occur in the county of Limerick, on the left bank of the Shannon.

In the counties of Kerry and Cork there are several mines of copper and lead. The mine of Allihies, or Berehaven, in Cork, discovered in 1812, yielded in 1836 from 6,000 to 7,000 tons of ore, and employed about 1,000 hands. Besides the beds and veins of ore which occur in the rocks in Cork, there is a very general diffusion of cupreous particles in this district. In 1812, a peat bog on the east side of Glandore Harbour was so much impregnated with copper that 40 or 50 tons of dried peat, when burned, yielded 1 ton of ashes containing from 10 to 15 per cent. of copper. The south-eastern primary and

transition district extends along the coast from Waterford Haven to the Bay of Dublin, comprising the counties of Wexford and Wicklow, and part of the county of Dublin. The mountain groups in this district range in a south-west and north-east direction; the loftiest summits rising from 2,000 to near 3,000 feet above the level of the sea. They rarely, indeed, attain the latter elevation; but their varied and picturesque outlines give greater interest to their appearance than many mountainous regions of far higher altitudes afford. The traveller who has seen the beautiful group of mountains that partly surrounds the Bay of Dublin will admit the correctness of this remark. A range of primary rocks, consisting chiefly of granite and mica slate, with some quartz rock, runs through the district from Dublin Bay to the junction of the rivers Barrow and Suir on the south. This primary range is about 11 miles in breadth, but is narrower near Dublin Bay. Lugnaquilla, the highest mountain in this range, is 3,039 feet above the level of the sea. The height of the conical mountain called the Great Sugar Loaf, composed of quartz rock, is 1,651 feet. The eastern side of the primary range is clay-slate, and there is also a strip of clay-slate on the north-west. The eastern side of the granite range contains numerous metallic veins, but they rarely occur on the western side. The clay-slate contains metallic beds and veins of lead-ore and blende, with some copper pyrites; very small quantities of gold, silver, and tin ores are also found in the slate. The most remarkable produce of this district is alluvial native gold; it was found in the bed of a small stream, on the eastern declivity of the mountain called Croghan Kinshela, at the southern extremity of the granite range. The mountain is stated to be composed of hornblende-slate and clay-slate, and is near the junction with granite.

The discovery of native gold in the Ballenvalley stream, at Croghan Kinshela, was accidental, and was at first kept secret; but being divulged in the autumn of 1790, almost the whole population of the immediate neighbourhood hastened to participate in what was supposed would prove to be a golden harvest. Soon after, government established regular stream works, which were destroyed during the rebellion, in 1798; government had, however, been fully reimbursed for its advances, the produce of gold having defrayed the expenses and left a small surplus in hand. In 1801, the operations were resumed, and researches were at the same time set on foot for the discovery of auriferous veins: these, however, were totally unsuccessful. In no instance was a particle of gold obtained, and government abandoned the enterprise. The mining operations equally failed in discovering tinstone, wolfram, or manganese, though all these minerals had been found in the stream bed which contained the gold. The stream gold at Croghan Kinshela occurred in lumps, and in smaller pieces and grains. One piece weighed 22 oz., another 18 oz., a third 9 oz., and a fourth 7 oz. The gold was found dispersed through a kind of stratum, composed of clay, sand, gravel, and fragments of rock, and covered by soil sometimes of considerable depth. The total quantity of gold collected by government amounted to 944 ounces, of which about 58 ounces were sold as specimens at 4*l.* per ounce. The aggregate value of the whole was 3,675*l.* 11*s.* Several trials were

made in the adjacent mountain streams, and some particles of gold were found, but not sufficient to repay the cost of seeking them.

At present (1846) there are wrought in Wicklow the Luganure and Glenmalur lead mines; and the Ballymurtagh, Cronebane, Connorree, and Ballygahan copper mines. The latter may employ in all about 1,000 hands, and may produce about 20,000 tons sulphur and copper ore, worth from 1*l.* 5*s.* to 4*l.* per ton.

The north-eastern primary and transition district is separated from the south-eastern by intervening beds of limestone and lower secondary strata, which cover the surface of the country, north of Dublin Bay, to near Dundalk Bay, and are connected with the great limestone and secondary formations that occupy the inland counties of Ireland. The north-eastern district comprises the counties of Down and Armagh, and part of Louth, extending along the coast from the south of Dundalk Bay to Belfast Lough, and westward to Lough Erne, including parts of the counties of Monaghan and Cavan. The prevailing rocks of this district are greywacke and greywacke slate; but from Dundrum Bay to Carlingford Bay there is a lofty group of primary rocks, composing the Mourne mountains, of which granite is the prevailing constituent part. On the skirts of this granitic range are beds of hornblende, and hornblende intermixed with felspar, called by some geologists primitive greenstone. This district is bounded on the north by red marl and sandstone, and by the basaltic beds in the county of Antrim. The highest of the Mourne mountains is nearly 2,800 feet above the level of the sea.

The northern district extends from Lough Foyle, on the north coast, to Donegal Bay, on the west; it comprises the counties of Londonderry and Donegal, and part of Tyrone. The prevailing rocks of this district are mica slate. It has been supposed that the mountains of this part of Ireland, composed of mica slate, with beds of porphyry and limestone, are a continuation of the Grampian range of mountains in Scotland, which extend in a nearly similar north-east direction, from the Mull of Cantire to the German ocean.

The granite and transition rocks of the north-east district have also been regarded as a continuation of the granite and transition rocks stretching from Port Patrick and the Mull of Galloway, on the south-west of Scotland, to its eastern coast. In Scotland, as in Ireland, the northern primary and transition are separated from the southern and eastern ranges by a tract of country containing strata associated with the coal formation. The highest mountains in the northern primary and transition district of Ireland have an elevation varying from 2,000 to nearly 2,500 feet.

The fifth or western primary and transition district is bounded on the coast by the Atlantic Ocean, from near Doonfeeney Bay, in the north-west part of the county of Mayo, to Galway Bay. It comprises great part of Mayo, with parts of Sligo and Galway, and is, perhaps, the wildest tract in Ireland. A chain of lofty mountains extends eastward from Achill Island to the Nephin mountains, on the west side of Lough Conn, and thence to the north-west of Mayo. Nearly the whole of the country, east and west of this chain, is covered with bog. There is also a northern range, extending westward from Doonfeeney Bay to

Broad Haven. A chain, called the Gauff, or Ox mountains, extends along the eastern portion of this district, in a north-east and south-west direction. Minor ranges of hills are situated between the mountain ranges. The latter are composed of gneiss and mica slate, with hornblende slate, quartz rock, and granite. In the lower parts occur greywacke, old red sandstone, and limestone. Mr. Griffith regards part of this limestone as a different formation from that of the great central limestone district; it contains large orthoceratites, called by the inhabitants cows' horns. This may be described as the lower transition limestone. On the eastern part of the district the mountain limestone forms entire mountains of considerable elevation, and contains oolitic beds, which, however, are distinct from the regular oolitic formation, and of a more ancient epoch.

The cliffs on the northern coast of Mayo are exceedingly precipitous, in parts overhanging the sea. The highest mountains vary in height from about 2,000 to 2,680 feet, the altitude of Muilrea, the highest in the district. The western coast of Mayo is, in parts, low, and covered by heaps of sand. The mineral treasures of this district have been almost entirely neglected; but it is known to contain ores of lead and zinc. According to a paper of Archdeacon Verschoyle, read to the Geological Society of London, there are 11 parallel basaltic or trap dykes intersecting the northern part of this district, in a north-east and south-west direction; they cut through all the rocks from gneiss to mountain limestone. One of these dykes he traced between 60 and 70 miles.

Besides the five mountain districts which surround the midland counties, there are some small isolated districts, or patches of primary and transition rocks, situated within these counties, where the rocks of this class rise through the surrounding secondary formations, at a considerable distance from the coast. Indeed, there can be little doubt that the rocks which compose the primary and transition districts dip down and extend under the secondary formations that cover the inland counties of Ireland.

We now proceed to describe the secondary and basaltic formations of Ireland. No vestiges of the more recent, or what geologists call the tertiary strata, have hitherto been discovered in any part of the country. The secondary formations occupy two districts, which may be called the central, and the northern secondary districts.

The central district comprises nearly all the inland and midland counties: it is surrounded by the five alpine districts before enumerated, except between Dublin harbour and Drogheda, where it is bounded by the Irish Sea; and on the north of the county of Sligo, and the west of Clare, it is bounded by the Atlantic. This central district comprises more than a third part of the surface of the island, extending north and south from the northern borders of Cork and Waterford to Sligo. It has sometimes been called the "Great Limestone Valley of Ireland," because limestone is the prevailing substratum, though in several parts it is covered with various detached coalfields and secondary strata connected with the coal formation. Mr. Griffith, in his Reports on the Bogs of Ireland, describes the Great Limestone Valley as including only a fourth part of the island; but he

abstracts from it those parts where the limestone is covered by secondary beds.

We should, however, form an erroneous idea of this extensive district if we supposed that it is really a valley. Surrounded for the greater part by alpine districts, containing lofty mountain ranges, it may be called a low country; but it is diversified with hills and valleys, and in some parts contains patches of primary and transition rocks, surrounded by lower secondary strata. Like the weald of Kent, it appears a plain when viewed from the lofty hills which nearly surround it; but, on passing through it, we find it rising in parts into considerable hills, and it is also intersected by valleys varying in breadth and depth. The plains and bottoms of the valleys in the central secondary district appear to have been particularly favourable to the formation of peat bogs. Of the 2,830,000 acres of bog, estimated to exist in Ireland, six-sevenths are situated within the limits of the district we are describing. "Nearly the whole surface of the Great Limestone Valley is covered by a bed of limestone gravel, and all the bogs in this valley are surrounded by steep ridges of hills, formed of this gravel, which prevent the immediate discharge of the water into the nearest river. Thus shallow lakes have been formed, in which the mosses and other aquatic plants vegetated, that have formed the peat bogs."—(*Fourth Report of Commissioners*, p. 181.) The limestone in the central district is chiefly, if not entirely, what is called by English geologists mountain limestone. In England this limestone forms lofty mountains, particularly in the north-west and western parts of Yorkshire, Northumberland, and Durham, and is in many parts rich in ores of lead. In Ireland, on the contrary, this limestone occurs in the valleys and plains; and the metallic treasures, which it may be reasonably believed to contain, are in a great measure concealed by the numerous peat bogs formed over it.

The limestone districts contain numerous beds, which the closeness of texture and the purity or variety of colour, render available for ornamental purposes, as marble. The black marbles of Kilkenny and Galway take a beautiful polish, and are largely exported. Connemara and Donegal supply pure white and grey marbles; and quarries of all sorts of finely variegated marbles have been opened in different parts of the country.

The coalfields of Ireland may be described in connection with the great limestone central valley of which they form a part; though coal occurs in some counties beyond its limits. Our knowledge of the different coalfields is, however, very imperfect. The coal measures or strata of what is called the Kilkenny coal district, occupy the south-eastern side of the central district, covering parts of Carlow, Kilkenny, Tipperary, and Queen's County, being bounded on the east, west, and south, by the rivers Barrow and Nore. The Leinster coal formation, like the great coal formations in England and Wales, rests upon mountain limestone; it is also surrounded with the same limestone, which rises from under the coal strata, and divides it into three distinct coalfields. The largest and most important of these is 15 miles in length from north to south, and 11 miles in breadth. The well known property of the Kilkenny coal, viz., that of burning slowly without either

flame or smoke, has obtained for it among mineralogists the name of stone or non-flaming coal. It is also called mineral charcoal, from its containing from 94 to 96 per cent. of pure carbon. The district contains 7 workable beds of coal, arranged in regular succession one above another. The collieries, particularly those in the neighbourhood of Castlecomer, in Kilkenny, and of Doonane, in Queen's County, have been worked for upwards of a century, and annually furnish considerable quantities of coal and culm. The coal is used for domestic purposes and malting, and the culm for burning lime.—(*Report of Railway Commissioners.*)

The Munster coal district is very extensive. The principal collieries are situated on the north bank of the Blackwater, and at present (1846) extensive works are being carried on at Dromagh collieries.

In Roscommon and Leitrim, in Connaught, there are coal formations situated within the Great Limestone Valley, which extend into the adjacent county of Fermanagh; the coal is bituminous, but little is known respecting its extent beyond a small distance from the outer edges of the beds.

The coal in the province of Ulster, beyond the limits of the central district, is of trifling importance. A small quantity is found in Donegal and Antrim. Near Ballycastle, on the coast of the latter, the works are very ancient; stone hammers and other implements of stone, that had most probably been used in the mines before iron tools were invented, having been found in some old workings. In Tyrone, a coal formation ranges from Dungannon northwards to Coal Island, but hitherto it has been but little worked. The coal of this province is bituminous.

Fourteen of the seventeen counties in Ireland, in which coal has been found in greater or smaller quantities, have been already mentioned: the remaining counties are Westmeath, where coal occurs near Athlone, at a considerable distance from the Kilkenny coal district, Monaghan and Cavan.

Of the ironstone, which accompanies coal in the regular coal formations in Ireland, we have little correct information; but there can be no doubt that abundance of that valuable mineral will be found should the coalfields in the central district be ever well and extensively worked. This great district, which, as before stated, comprises about a third part of the surface of the island, may be expected to afford coal in almost all situations where the limestone is covered by strata of sandstone and shale, and promises to furnish an almost exhaustless supply of fuel to future generations.

The mineral treasures of Ireland are, however, for the present concealed in many parts by the bogs that occupy so large a part of her surface. These not only cover tracts which may contain coal, but also hide from observation the metallic veins that, in all probability, traverse the mountain limestone; as similar limestone, in various parts of England and Wales, contains numerous rich metallic repositories, particularly veins of lead ore.

Clay slate rocks cover a considerable surface in various parts of Ireland. The most extensive and valuable slate district, occupying about 20 square miles, lies round Killaloe, in Clare and Tipperary.

At present (1846) two quarries are in operation in this district, producing about 10,000 tons a-year of valuable roofing slates. The slate quarries in the Island of Valentia supply slates of almost any size; but they do not split sufficiently fine to be used for roofs.—(*Kane on the Resources of Ireland*, p. 230.)

The northern secondary district of Ireland, consisting of the upper secondary strata, occupies parts of the counties of Tyrone and Armagh, and branches off, on the southern end of Lough Neagh, into two narrow tracts, inclosing the county of Antrim on its eastern and western sides. This district is chiefly composed of the new red marl and sandstone; it overlays the coal in some parts, and contains, like the same formation in England, salt springs and gypsum. As this district separates the north-eastern alpine district from the northern, it presents, like all other countries at the feet of alpine ranges, beds of conglomerate, formed of the ruins of the adjacent mountains. Part of the other secondary formations which abound on the eastern side of England, as the lias, the greensand, and chalk, occur in the county of Antrim, but are almost everywhere covered by thick beds of basalt. They are well exposed to observation in the cliffs on the coast, and at the bottom of the valleys that intersect the country. The basalt is said to cover 800 square miles of surface, to the average depth of 545 feet.

Below the basalt, in a descending series, are—

1. Chalk, thickness about 200 feet.
2. Mulatto or Green Sand.
3. Lias, Limestone, and Clay.
4. Red and Variegated Marl.

} The total thickness of these three formations, 800 to 1000 feet.

The thickness, however, varies in different situations; sometimes the greensand and lias are wanting, and the chalk rests immediately on red marl. The chalk and sand are remarkably constant in most parts: at Ballycastle, however, the basalt rests upon coal measures. Chalk extends also beyond the limits of the basalt, and, in some situations, may be seen resting in horizontal beds, on highly inclined beds of mica slate; but it is generally covered with basalt.

Dykes, or nearly vertical fissures, filled with basalt, intersect the beds of basalt and the rocks on which they repose; similar basaltic dykes also intersect the rocks of granite and mica slate on this side of Ireland.

It has been necessary to notice the basaltic beds on the north of Ireland, in connection with the upper secondary strata with which they are associated; but the remarkable geological phenomena which this district presents, demand attention. The origin of basaltic rocks was, a few years since, a subject of much controversy among geologists; some maintaining that they were aqueous deposit, and others that they were the products of igneous fusion, like compact lavas. An extensive examination of ancient and recent volcanic districts has since decided the question; and we believe no experienced geologists at present hesitate in ascribing an igneous origin to basalt. It would be foreign to our purpose to enter into an exposition of the facts by which this opinion is supported. It may suffice to mention, that the mineral composition of many basaltic and volcanic rocks is identical with that in

the volcanic district of Auvergne; in that district scoriaceous lava may be seen passing by gradations into compact basalt, and, in some situations, into columnar basalt: lastly, basaltic rocks, when in contact with limestone, often convert it into hard crystalline marble, the apparent result of intense or long-continued heat.

The north of Ireland as before stated, is covered, over an extent of 800 square miles, with various beds of basalt, the average thickness of which is estimated to exceed 500 feet. Some of these beds are elevated to the height of from 1,400 to 1,800 feet. It may be asked where are the volcanoes whence these beds have been poured forth? The answer will not be difficult. The largest beds of lava formed by modern volcanoes have not issued from the crater at the summits, but from vast fissures in the sides, or at the feet of the mountains; and we believe that the first volcanic eruptions have generally been from extensive fissures, which pour out the lava on each side, until the fissure becomes partially closed, and the eruptions are confined to distant apertures, which in time form volcanic cones. Now, in Ireland we have numerous instances of extensive perpendicular rents, more than 25 feet in width, which are filled with basalt: these may be seen cutting through the rocks on the coast. It is through these rents, in all probability, that the successive beds of basalt have been poured out, like liquid lava. It must also be remembered that the chalk, and secondary strata under the basalt, are filled with marine organic remains, and were originally deposited in a deep ocean: and various reasons might be stated in favour of the opinion, that the basalt of Ireland and many other countries was deposited by submarine eruptions, and under a great pressure of incumbent water, at a period antecedent to the elevation of the present land above the level of the sea.

The beds of basalt in Ireland, as they are displayed in the cliffs on the coast, present several ranges of magnificent columns, at different heights above the sea: the same range, dipping down gradually towards the sea in some parts of the course, and rising from it in other parts. A section near the Giants' Causeway, presents, according to Dr. Richardson, the following succession from the surface: —

	Feet.
1. Rudely Columnar Basalt	60
2. Red Ochre	2
3. Irregularly Prismatic Basalt	50
4. Columnar Basalt	7
5. Between Bole and Basalt	8
6. Coarsely Columnar	10
7. Columnar Basalt: this forms the upper range of pillars at Bengore Head	54
8. Irregular Columnar, with Wacke and Wood-coal	54
9. Columnar Basalt: this strata forms the Giants' Causeway, by its intersection with the plane of the sea	44
10. Bole or Red Ochre	22
11. 12. 13. Tabular Basalt, with seams of Ochre	80
14. 15. 16. Tabular Basalt, with Zeolite	80

The promontories of Fair Head, Bengore Head, and the Giants' Causeway, are parts of a vast basaltic range along the north coast of Antrim. Various ranges of columnar basalt, forming natural pillars, rise from the sea to the height of 500 feet, as described in the preced-

ing section; and form a pile of natural architecture, in which the regularity and symmetry of art is united with the wild magnificence of nature. Many of the columns in the ranges at Fair Head are 150 feet in height and 5 in breadth. At the base, along the shore, is a wild waste of rocky fragments, which have fallen from the cliffs: some of the masses resemble the ruins of enormous castles. At the Giants' Causeway the columns rarely exceed 1 foot in breadth, and 30 feet in height: the columns are generally sharply defined pentagons, or hexagons; but some of them have 8, and others not more than 3 sides. The columns are divided into smaller blocks or prisms, of 1 foot or more in length, which fit into each other by a convex and concave surface. At Fair Head the blocks are of great length, and lie flat on each other. The columnar basalt, as may be seen by the section, rests on and is covered by beds that are not columnar. At the Giant's Causeway the tops of ranges of pillars may be seen extending northward under the sea. It is not improbable that this great basaltic formation may have been united with similar formations in Scotland and the Hebrides. The basalt of this district is sometimes granular, and sometimes compact. Near the centre of the basaltic district, 7 miles east of Antrim, the basalt passes into porphyry and porphyritic pitchstone. The essential component parts of all these basaltic rocks is felspar and augite or hornblende, in different states of admixture and crystallization. The prismatic or columnar form is not uncommon in many other rocks: in some instances it may have been produced by slow refrigeration; it is also sometimes the result of crystallisation in aqueous deposits. One of the gypsum beds in the quarries at Montmartre, near Paris, is columnar. The chalk beds of Antrim are in some situations broken, and portions of chalk are enveloped in the basalt: this must have been effected when the latter was in a state of fusion: the chalk, in proximity with the basalt, rendered it hard and crystalline.

The bogs of Ireland present to the geologist few objects deserving particular attention, except their vast extent, and the organic remains which they contain. Though peat be now constantly accumulating, there can be no doubt that many peat bogs are of considerable antiquity, as the remains of an enormous distinct species of elk occur abundantly in them, and in the beds of shell marl under peat. Heads and horns of this animal, called the Irish fossil elk (*Cervus magaceros*), are most frequently found; but other bones, and even an entire skeleton, was discovered in 1825, and is preserved in the museum of the Royal Dublin Society. The length of each horn is 5 feet 9 inches; the distance of the extreme tips of each horn, 11 feet 10 inches; length of the spine, 10 feet 10 inches; height of the upper extremity of the dorsal spines, 6 feet 6 inches; height of the tip of the horn above the foot, 10 feet 4 inches, Though the species has been long extinct, there is much probability that these animals lived in the country after it was inhabited by man. The bones are harder and heavier than recent bone, but are in other respects similar: the cartilage and gelatine had not been perceptibly altered; and even fat, or adipocire, has been found in the shaft of one of the bones. Professor Jameson states that in one of the ribs of this animal, in the Dublin museum, he discovered an oval perforation, with a callus around

it, evidently caused by an arrow or some sharp-pointed instrument, which had remained fixed in the wound for some time without causing the animal's death. Numerous trunks of trees, with the wood considerably hardened, are found prostrate in the Irish bogs; as is frequently also the case in bogs in England.

Lough Neagh.—Referring to what has been previously stated in regard to this lake, it may now suffice to observe, that in almost all alpine countries, where the beds of rock are thrown up at high angles of elevation, indicating an upheaving force, acting along certain lines of the earth's surface, portions of the beds undergo a corresponding subsistence or depression, sinking into deep hollows, in which the waters from the mountains are collected and form lakes. In this manner the lakes, and many of the deeply indented bays on the coast, have been formed; the latter differing from the former in being directly open to the sea at one extremity. Lough Neagh, however, deserves some notice, from the property which its waters have long been stated to possess, of converting wood into a siliceous petrifaction, or, in other words, of impregnating wood with siliceous earth. Most of the rivers of Antrim, Armagh, and Down, run into Lough Neagh, and some of the rivers are said to possess the petrifying property in a greater degree than the lough itself. Siliceous earth is extremely rare in any water, except in some thermal springs in volcanic districts; but, as Lough Neagh adjoins a basaltic country, the presence of silex in its waters would be analogous to what is observed elsewhere. Mr. Tennant could not detect silex in the waters of Lough Neagh; but the fact of silicified trunks of trees being found in this lake is undoubted. In some instances the fissures only of the wood are lined with quartz crystals; in other instances the wood is entirely penetrated with siliceous matter; sometimes one end of the tree will be petrified, and the other end ligneous. This fact alone would appear to prove that the petrifying process is now going on, or has been so recently; for if we refer it to a remote geological epoch, it will be difficult, if not impossible, to explain how any part of the wood, that is not silicified, could have been exposed so long to the action of air or water without decomposition. The trees are also such as are now common in the country, viz., the oak, the holly, and the hazel. On inquiry, we found that, in the opinion of intelligent persons, inhabiting the borders of the lake, its petrifying properties are still in manifest action on recently submerged wood; and we are inclined to believe that this opinion has been rejected by naturalists without sufficient examination. We are not informed respecting the temperature of the waters of Lough Neagh, or of any of the Irish lakes; but we believe that no thermal springs have yet been discovered either in Ireland or Scotland, a circumstance the more remarkable, as both countries contain extensive basaltic districts, and it is in the vicinity of basaltic or volcanic rocks that thermal waters are most frequently met with.

Before concluding this brief survey of the geology of Ireland, it may not be irrelevant to state, that Dublin, Belfast, and the factories in the north are mostly supplied with coal from England, at about 10*s.* or 12*s.* per ton, on delivery, and that such, also, is the case in most parts of the country, where coal is used. The great mass of the Irish people

will probably be, for many ages, dependent on the neighbouring peat bogs for fuel. It has been imagined by persons unacquainted with the subject, that the drainage and cultivation of the bogs would deprive them of an article so essential to their subsistence; but the truth is, that the drainage of the bogs would vastly increase the supply of fuel. This may not appear obvious at first: but when it is considered that a bog is generally a spungy or pulpy mass of decomposed vegetable matter, and can only be worked round the edges, where it is nearly dry, it is easily seen that drainage, by rendering the whole extent of the peat bogs available for fuel, would add immensely to the supply of that article.

Sect. 7.—*Climate.*

The peculiarities in the climate of Ireland depend principally on its geographical situation; its exposure on all sides, except the east, to the Atlantic Ocean; and the nature of its soil and substrata. To these are to be ascribed its prevailing winds, its comparatively high mean temperature, and its humidity.

a. The winds in Ireland blow still more frequently from the west than in England. Round *Dublin*, the climate of which approaches most nearly to that of England, it was observed, during a period of forty years, that in *spring*, the east, north-east, and south-east winds were to the west, south-west, and north-west winds as 3 is to 4; in *summer*, the former were to the latter as $2\frac{7}{10}$ is to $5\frac{2}{10}$; in *autumn*, as $1\frac{8}{10}$ to $4\frac{8}{10}$; in *winter*, as $2\frac{8}{10}$ to 4.

At *Londonderry*, the winds, from 1795 to 1801 inclusive, were as follows:—From the north, 225 days; north-east, 225; east, 209; south-east, 376; south, 297; south-west, 476; west, 766; and from the north-west, 539.

At *Cork*, Dr. Smith states, that "it appears from a regular diary of the weather, kept for several years in that city, that the winds blow from the south to the north-west three-fourths of the year at least." The range of the *barometer* at Dublin has been calculated by Dr. Rutty and others at from $2\frac{8}{10}$ to $2\frac{4}{10}$ inches. At Londonderry, it has been observed about $2\frac{4}{10}$; at Belfast, $2\frac{5}{10}$; at Limerick, 2 inches; and at Cork, $1\frac{9}{10}$. Storms are most prevalent in Ireland during autumn and summer. South-west winds prevail in the winter months; west winds, in summer and autumn; and the east, north-east, south east, and north, in spring.

b. The mean annual temperature of Ireland is necessarily influenced by the circumstances already referred to as modifying the currents of air passing over it. The position of the island, in the Atlantic and near to Continental Europe, subjects it to westerly winds nearly three-fourths of the year, and to a much higher mean temperature than its distance from the equator would otherwise confer upon it; but this is owing more to the mildness of winter and spring, than to the heat of summer and autumn. Frost and snow are not frequent, and seldom continue long in the south and south-west districts of the country. In these, however, the falls of rain are frequent and heavy during autumn and winter. The winter, also, continues much longer than in England; and spring, summer, and autumn are later in their

approach. Owing to the humidity and mildness of the air, and abundant falls of rain in autumn, the country remains verdant, and the trees in leaf, until very late in the year. The temperature, however, is somewhat influenced by elevation above the level of the sea, by distance from the Western Ocean, by the number of inland lakes, and by the nature of the soil and substrata. The coast is much more mild and humid than the interior; and the southern and western, than the northern and eastern parts.

In his observations on the climate of Cork, Mr. Townsend observes, —"This county is remarkable for the mildness of its temperature, never experiencing those extremes of heat and cold to which the same degree of latitude is subject, not only on the Continent, but even in England. The difference is occasioned by our nearer approximation to the Atlantic Ocean, which loads this part of the island with vapours; seldom, indeed, to be complained of in winter, but too often interrupting the maturer rays of the summer sun. Cork, however, suffers much less in this respect than Kerry and other counties on the western coast, whose loftier mountains involve them still more in cloud and vapour. In such countries as abound more in pasture than tillage, this humidity of atmosphere affords, perhaps, no cause of complaint."—(*Survey of Cork*, vol. i. p. 2.)

The mean temperature of the north of Ireland is about 48°; of the middle, 50°; and of the south, nearly 52° Fah. According to Mr. Hamilton, the mean temperature of the north coast, about the latitude of 55°, is 48°; that of the west coast, in lat. 54° 48′, is 48° 6′; that of the eastern coast, near Dublin, in lat. 53° 20′, is 49° 4′; and that of the south coast, near Cork, lat. 51° 54′, is 51° 2′. Dr. Rutty states that the medium atmospheric heat in Dublin of the five years terminating with 1800, was 50° 15′; but elevation above the level of the sea, and distance from the coast, the former especially, cause a relative diminution of the mean atmospheric temperature. Dr. Bryan Robinson gives the following estimate of the comparative heat of the seasons in *London* and *Dublin*:—

	London.	Dublin.
Winter . . .	1·00	1·45
Spring	3·00	2·14
Summer . . .	5·00	4·68
Autumn . . .	3·00	3·80
	12·00	12·07

The following results have been assigned to thermometric observations, made in the following towns:—

	Highest.	Lowest.
Londonderry . . .	81°	21°
Belfast	78·80	25
Kilkenny	79	29
Limerick	75	28
Dublin	81·50	14·50

c. The quantity of rain that falls in Ireland is very various in different places, and even in the same place in different years. The geographical circumstances, however, of the country, and the prevailing winds from the Atlantic, occasion great falls of rain, especially in

the western and southern districts. At *Londonderry*, the rain-gauge has varied, in different years, from 26 inches to 35. At *Cork*, the annual fall has ranged from 30 to 54¼ inches. At *Dublin*, it has varied from about 20 to 31 inches; and at *Belfast*, from 20 to 35 inches. At Dublin the months may be arranged as follows, according to their dryness:—June, February, April, March, May, October, January, September, August, November, July, December. At Belfast, the order of the months, according to their dryness, is as follows:—June, March, April, February, May, November, October, August, December, January, September, July. But the falls of rain on the west and south coasts are certainly seldom below the highest amount just stated. The number, also, of cloudy, foggy, showery, and rainy days throughout Ireland is much greater relatively to the actual fall of rain than in England: the hygrometer, too, generally ranges very high, and often continues to indicate great humidity for long periods. The observations, however, that are requisite to an exact knowledge of the climate of Ireland are remarkably defective, more especially in respect to the western, northern, and southern districts, where the first impression of the Atlantic atmosphere, and, indeed, of the Atlantic Ocean, is especially made.

"The worst circumstance of the climate of Ireland," says Arthur Young, "is the constant moisture without rain. Wet a piece of leather, and lay it in a room where there is neither sun nor fire, and it will not, in summer even, be dry in a month. I have known gentlemen in Ireland deny their climate being moister than England; but if they have eyes, let them open them, and see the verdure that clothes their rocks, and compare it with ours in England, where rocky soils are of russet brown, however sweet the food for sheep. Does not their island lie more exposed to the great Atlantic? and does not the west wind blow three-fourths of the year? If there were another island still more to the westward, would not the climate of Ireland be improved?" —(*Tour in Ireland*, 4to ed., part ii. p. 4.)

This humidity of the climate renders Ireland decidedly better fitted for grazing than for agriculture; and would, no doubt, prevent, even though the cultivation were equal, the wheat, barley, and, perhaps, also the oats raised in it, from being so heavy or good as those raised in England. It may be worth remarking, that this peculiarity in the climate was noticed by Pomponius Mela:—"*Cœli*," says he, "*ad maturanda semina iniqui; verum adeo luxuriosa herbis, non lætis modo sed etiam dulcibus, ut*, &c.—(*De Situ Orbis*, lib. 3, cap. 6.)

Hence, in Ireland, still more than in Scotland, droughts rarely prove injurious. "It is a common saying in Ireland, that the very driest summers never hurt the land; for, although the corn and grass upon the high and dry grounds may get harm, nevertheless the country in general gets more good than hurt by it; and when any dearths fal. out to be in Ireland, they are not caused through immoderate heat and drought, as in most other countries, but through too much wet and excessive rain."—(*Boate's Nat. Hist. of Ireland*, p. 168, ed. 1652.)

The soil and substrata have considerable influence upon the climate. The cultivated soil consists of a light and fertile loam, resting chiefly

upon a limestone basis; the uncultivated soil principally of bogs and peat moors, which cover nearly 3,000,000 English acres. The bogs principally occupy a zone extending across the centre of the island, from coast to coast, but which becomes wider as it advances westward. They are situated at various elevations, ranging between 30 and 340 feet above the level of the sea. The prevailing shallow, loamy, and dry soils, resting upon a rocky and chiefly limestone substratum, are well adapted to the nature of the climate. They hinder the humidity of the atmosphere, and the heavy falls of rain, from being half so injurious as they would be were the soil deep, clayey, and retentive of moisture. The bogs, however, notwithstanding the moderate temperature of the climate, and the antiseptic nature of many of the plants of which they consist, have a more or less injurious tendency, both by lowering the temperature and diminishing the purity of the air.

The prevalence of westerly and south-west winds, the consequent humidity of the air, the remarkably broken and indented state of the western and northern coasts, the number of loughs, or lakes, and considerable rivers, and the tempering influence of the Atlantic Ocean, combine to render the winters mild in respect of temperature, but stormy and rainy; to prevent the continuance of frost; to promote vegetation; to give the face of the country a verdant appearance; to increase fertility; and to produce a greater irregularity and uncertainty of the seasons and weather than in England.

With respect to the influence of the climate upon the vegetable and animal kingdoms little need be said, inasmuch as the existing state of both is manifestly owing more to circumstances foreign to the climate, than to the climate itself. All the productions of the soil usually cultivated in England may be raised in Ireland, although the greater irregularity of the seasons in the latter renders the produce more uncertain; while the greater humidity of the air is, as already stated, unfavourable to the ripening of corn, particularly of wheat. Much, indeed, of the corn of Ireland could not be preserved, unless it were kiln-dried. The remarkable deficiency of forest trees is, however, owing infinitely more to circumstances connected with the political state of the country, than to differences of climate: several forests, which existed when Boate wrote his account of Ireland, have since disappeared; not in consequence of any deterioration of the climate, but of the wasteful, abusive treatment to which they have been subjected.—(See *post*) The mildness and moisture of the climate is such, that the pasture lands, particularly those resting on a limestone bottom, are always more or less verdant. Even the mountains of Kerry, Cork, and Tipperary are usually grazed throughout the year. In the southern counties the cattle are seldom, and in some places never, housed during winter. The eulogy of Giraldus Cambrensis, on the climate of Ireland, is more applicable at the present time than when he wrote:—"*Terra terrarum temperatissima, nec Cancri calor exæstuans compellit ad umbras, nec ad focos Capricorni rigor invitat, aëris amœnitate temperieque tempora ferè cuncta tepescunt.*"—(*Topog. Hib.*, cap. 25.)

The climate, as respects the human constitution, is, upon the whole, highly salubrious. With the slight exception already made, it can hardly be said to be materially less so than the climates of Scotland

and England. The greater prevalence of fevers and dysentery in Ireland, although partly attributable to the humidity of the atmosphere, in connexion with marsh exhalations, is mainly owing to other causes; more especially to very poor, and often unwholesome, diet, to famine, to imperfect clothing, to sleeping on the earthen floors of the cabins, to neglect of personal and domestic cleanliness, and to various circumstances which associate themselves with the poverty, ignorance, and bigotry of the lower classes, and with the imperfect civilisation to which they have as yet, in many places, attained.

The very remarkable differences in moral constitution, in temperament, and even in physical conformation, among the natives of the three kingdoms, and more especially between those of Ireland and Great Britain, cannot be explained by any appreciable differences of the climate or soil; they must, therefore, be referred, and are clearly, indeed, attributable, to other sources.

Sect. 8.—*Civil Divisions.*

Previously to the invasion of Ireland by the English in the reign of Henry II., it was divided, for ecclesiastical purposes, into the provinces of Leinster, Ulster, North and South Munster, and Connaught. But for a lengthened period after the invasion its principal divisions were *the country within and the country without the pale;* that is, within and without the district on the east and south coasts, principally occupied and settled by the English. The limits of the pale varied at different periods. In 1211 it was divided into 12 counties; viz., Dublin, Meath, Uriell (now called Louth), Kildare, Catherlough, or Carlow, Kilkenny, and Wexford, comprising most part of the province of Leinster, with Waterford, Cork, Kerry, and Tipperary, in Munster. In the reign of Queen Mary, King's County and Queen's County were formed; and, by statute of the 11th of Queen Elizabeth, Connaught and Ulster were divided into counties, as we now find them. Wicklow, which had previously been considered as belonging to the counties of Dublin and Carlow, was formed into a separate county early in the reign of James I. Since that epoch, Ulster has contained 9, Leinster 12, Connaught 5, and Munster 6 counties; making for the whole country a total of 32.

Baronies.—These correspond pretty closely with hundreds in England. They appear to have been formed successively in consequence of the submission of the chiefs who ruled over them; the territory of each constituting a barony. This accounts for their extreme inequality in respect of size, and for the territory belonging to one being frequently intermixed with that of another, as is particularly observable in the county of Cork. There are in all 316 baronies in Ireland, of which 70 are in Ulster, 124 in Leinster, 47 in Connaught, and 75 in Munster.

Parishes.—The division into parishes is of much greater antiquity than that into baronies. Originally it was purely ecclesiastical, and was introduced among the civil divisions merely from motives of convenience. Unluckily, however, the civil and ecclesiastical divisions do not always correspond, parishes frequently extending not only into

different baronies, but into different counties; and townlands are sometimes attached to one parish for the assessment of the county taxes, while, with respect to tithes and other ecclesiastical contributions, they are considered as forming part of another. This sort of confusion produced considerable inconvenience in the taking of the census.

Townlands.—This is the smallest subdivision of the country. The name, however, is not universal throughout Ireland, some counties having adopted in its stead the term Ploughland, which is supposed to contain 120 acres; but as the quantity has been taken by estimate, and not by measurement, their extent varies considerably even in the same county. Townlands, in many instances, have been subdivided.—(For further remarks on the subdivisions of Ireland, see the *Preliminary Remarks* prefixed to the *Census* of 1821.)

Sect. 9.—*Statistical Notices of the different Irish Counties.*

LEINSTER.

1. *Wexford*, a maritime county, being the most southerly of Leinster, is bounded on the south and east by St. George's Channel, on the north by Wicklow, and on the west by Carlow, Kilkenny, and Waterford Harbour. It contains 576,588 acres, of which 45,501* are unimproved mountain and bog. Surface pleasantly diversified; climate mild. Soils either light or stiff clays. Property in pretty considerable estates; farms of various sizes, but there is less extreme subdivision of land in this than in most other Irish counties. Dairies numerous, but indifferently managed. Some districts have been long noted for their great crops of barley. Land fetches a high rent, and the competition for small patches is carried beyond all reasonable limits.† The baronies of Forth and Bargy, occupying the south-western angle of Wexford, differ widely from the rest of the county, and, indeed, from every other district of Ireland. They were settled, at a distant period, by a colony from South Wales, and, till very recently, the Welsh language was spoken by every one, and is still understood by the older inhabitants. The people contrast strikingly with those in most other parts of Ireland, being industrious, provident, peaceable, and cleanly. "Their farms run from 10 up to 50 and 60 acres. The land is well manured for every crop, and cultivation has advanced far beyond anything I have seen in the south or west of Ireland. You see comfortable farmhouses, well thatched and whitewashed, with good farm-yards behind them, square fields, hedge rows, and sufficient wood to be ornamental. Cottages, also, are clean and comfortable. Rents are high—higher than in any other part of the south of Ireland, but they are well paid." —(*C. Foster's Letters on Ireland*, p. 474; see, also, to the same effect, *Inglis's Ireland in* 1834, vol. i., p. 49.) It would appear, from the evidence taken before the Land Occupation Commissioners, that agriculture in the other parts of the county is gradually improving. Seaweed and sea-sand are extensively used in this and in other maritime

* Unless where the contrary is expressed, all our references are made to the statute or Imperial acre.

† For details with respect to the rent of land in this and other counties of Ireland, see *post*, chapter on Agriculture.

counties as manure; and bones and guano, though in small quantities, are imported for the same purpose. Except lime, Wexford has no minerals of any importance. The woollen manufacture has been established in the town. Principal rivers, Slaney and Barrow. Wexford contains 9 baronies and 144 parishes, and returns 4 members to parliament, being 2 for the county and 1 each for the boroughs of Wexford and New Ross. Principal towns, Wexford and New Ross. Population of county in 1841, 202,033.

2. *Kilkenny*, an inland county, is bounded on the east by Wexford and Carlow, on the north by Queen's County, on the west by Tipperary and Waterford, and on the south by the latter. It contains 509,732 acres, of which 21,126 are uncultivated, and nearly 14,000 plantations. Surface diversified. Soil of various qualities; in a few places it is moorish, but for the most part it is light and dry, resting on a limestone bottom, some valleys being extremely fertile. Climate mild. Tillage in a backward state, but it has been materially improved during the last 20 years, both as respects the rotation of crops, the implements employed, the stock kept by the farmer, &c. According to the *Survey of Kilkenny*, by Mr. Tighe, published in 1802 (p. 253), of 66,361 Irish acres in cultivation, 26,000 were in wheat, 20,600 in potatoes, 10,000 in oats, and 8,000 in barley. In the interval, however, tillage has been much extended, and the proportion of wheat materially increased. Dairy husbandry extensively practised, but the details ill understood. Property in large estates. Farms of various sizes, but generally small, there being, of 16,490 farms of more than 1 acre, only 2,006 that exceed 30 acres. Partnership tenures not uncommon (see *Galway*). Farm-houses and other accommodations, for the most part very inferior. This is one of the highest-rented counties in Ireland. Mr. Inglis says, that all classes were unanimously of opinion that the condition of the labourers and small farmers had visibly deteriorated during the 12 or 15 years previously to his visit in 1834; and, whether this be really so or not, the details which he gives show that it was then exceedingly bad, and it has been but little improved in the interim. Manufactures of carpets and some other woollen articles have been attempted at Kilkenny on a pretty large scale, but the experiment has not proved successful.—(*Ireland in* 1834, vol. i., p. 91.) Coal mines have been long wrought at Castle-comer, in the northern part of the county, but, owing to the bad quality of the coal and expense of working, it is not much used. Sandstone, manganese, with iron and lead ores, have been found in various places. Principal rivers, Suir, Nore, and Barrow, which last divides it from Carlow and Wexford. Kilkenny contains 11 baronies and 140 parishes, and returns 3 members to parliament, being 2 for the county and 1 for the borough of Kilkenny. The principal town, Kilkenny, had, in 1841, a population of 23,625. Population of county in ditto, 202,420.

3. *Carlow*, or *Catherlough*, a small inland county, bounded on the south and east by Wexford and Wicklow, on the north by the latter and Kildare, and on the west by Queen's County and Kilkenny. It contains 221,342 acres, of which 31,249 are unimproved mountain and bog. The southern boundary is mountainous, but the rest of the sur-

face is, for the most part, gently undulating. The soil in the uplands is a light gravel, and in the lowlands a fertile loam. Estates middle-sized. Mr. Wakefield observes of this county, that, "it has very little of that minute division of land so injurious to other parts of Ireland. It has neither a temporal nor a spiritual peer resident within it; and, though destitute of manufactures, it is tenanted by more wealthy people than almost any other county in the island. There are extensive dairies in this county, and its butter, of which large quantities are exported to England, &c., is the best of any in Ireland." (i., 248.) But if this were an accurate statement at the time, it must have changed for the worse in the interval, it having had, in 1841, nearly 2,000 occupiers of pieces of land varying from 1 to 5 acres, and only 950 occupiers of farms of more than 30 acres. At present (1846) its agriculture is in a very depressed state, and it is doubtful whether it has improved of late years. Principal rivers, Barrow and Slaney; the former partly intersects the county, and partly divides it from Queen's County and Kilkenny. Carlow is divided into 7 baronies and 47 parishes, and returns 3 members to parliament, being 2 for the county and 1 for the borough of Carlow. The principal town, Carlow, had, in 1841, a population of 10,409. Population of county in ditto, 86,228.

4. *Wicklow*, a maritime county, is bounded on the east by St. George's Channel, on the north by the county of Dublin, on the west by Kildare and Carlow, and on the south by Wexford. It contains 500,178 acres, of which 200,000 are mountain and bog. This is a very mountainous county. In some places it is well wooded and extremely picturesque and beautiful. Estates mostly large; the most extensive, valuable, and best cultivated belongs to Earl Fitzwilliam. Farms of various sizes; many small; but, at an average, they are larger than in any other county of Ireland. Speaking generally, rents are too high, the labouring population not half employed, and their condition, and that of the small farmers, very unprosperous. Little wheat is raised, and that principally in the eastern parts of the county. Agriculture has slowly improved within the last few years, particularly in respect of green crops and tillage. Wicklow has to boast considerable mineral treasures. We have already noticed the fact of gold having been found in stream-works in this county (*ante*, p. 351). These, however, have been wholly abandoned, the produce of metal being insufficient to repay the expenses. About 1,000 persons are at present employed in copper mines at Cronebane, Ballymurtagh, Connorree, &c., and, in 1844, from 18,000 to 20,000 tons of ore were exported. Bismuth, manganese, zinc, &c., have also been found, but in inconsiderable quantities. Marl is very abundant in parts of the county, and is said to have wonderfully increased the fertility of some districts. Principal rivers: Slaney, Vartrey, and Ovoca. Wicklow contains 8 baronies and 59 parishes, and returns 2 members to parliament, both for the county. Wicklow, the county town, had, in 1841, a population of 2,794. Population of county in ditto, 126,143.

5. *Dublin*, the metropolitan county of Ireland, is bounded on the east by St. George's Channel; on the south by Wicklow; and on the

north and west by Meath and Kildare. It contains 226,414 acres, of which the unoccupied hill and bog only amount to 19,312. Soil, for the most part, shallow and naturally poor; substratum generally a cold retentive clay. Property much divided. Farms near the city very small; but, at a distance, larger. Agriculture backward, and but slowly improving. Though not of the best quality, land, from the advantage it enjoys of contiguity to the city of Dublin, fetches a comparatively high rent. Principal river, the Liffey, on which there is a considerable salmon fishery. Neither minerals nor manufactures important.

Dublin, the *Eblana* of Ptolemy, and the metropolis of Ireland, is situated near the bay of the same name, contiguous to the mouth of the Liffey. It labours under the disadvantage of having a naturally shallow and bad harbour; but we have previously seen that this serious drawback on its prosperity has been all but wholly obviated, and that there is no longer any physical obstacle to prevent Dublin becoming a great shipping port. (See *ante*, p. 340.) Dublin is a large, and, speaking generally, a well-built city. Some of its streets and squares are magnificent; and it has to boast of some of the finest public buildings in Europe; not a few of which have, indeed, been constructed on a ridiculously extravagant scale. There are, however, some very inferior quarters; and a considerable part of the population is in extremely depressed circumstances. Dublin is the seat of the only Irish university. It was supposed by many that it would be seriously injured by the Union, and the consequent removal of the Irish parliament; but this anticipation has been falsified by the event. The municipal boundaries of the city comprise 3,807 acres; and its population within these limits, according to the best attainable information, has been in—

1798 . .	182,370	1831 . .	203,650
1804 . .	167,899	1841 . .	232,726
1821 . .	185,881		

The population of the county, exclusive of the city, amounted in 1841 to 140,047, making the population of both 372,773.

6. *Kildare*, an inland county, is bounded on the south by Carlow; on the east by Wicklow and Dublin; on the north by Meath; and on the west by King's County and Queen's County. It contains 418,436 acres, of which 51,854 are unimproved bog and waste. Surface varied by some small hills and gentle declivities; but for the most part it is flat, and nearly level. Soil generally clayey, and very fertile. The curragh of Kildare, comprising about 5,000 English acres, has been long celebrated. "Nothing," says Arthur Young, "can exceed the extreme softness of the turf, which is of a verdure that charms the eye, and is highly set off by the gentle inequality of surface. The soil is a fine dry loam, on a sandy bottom."—(*Tour in Ireland*, vol. ii., p. 214.) There are some very large estates; but property is, notwithstanding, a good deal divided. Farms vary in size from 3 up to 15, 30, and even 300 acres: they are, in fact, less subdivided in this than in any Irish county, Wicklow excepted; a result which has been

ascribed to there having been no contested election in it for the 60 years previously to 1830; and to the landlords having, in consequence, no temptation to split their estates for the sake of multiplying freeholders. —(*Evid. Agricultural Committee of* 1833, p. 495.) Mr. Wakefield describes the husbandry of Kildare as being as wretched as can possibly be conceived.—(Vol. i., p. 419.) But it has been amended, as is generally indeed the case throughout Leinster, within the last 12 or 20 years; and many of the practices and implements which he justly reprobated, have since been partially superseded. The old plough of the country is now seldom met with. Potatoes are frequently drilled; corn crops do not follow each other in so interminable a succession; and a good deal more wheat is raised; and that, too, of better quality. The bog of this county consists principally of part of the bog of Allen. Principal rivers, Barrow, Liffey, and Boyne. It contains 14 baronies, and 116 parishes; and returns 2 members to parliament, both for the county. Principal towns, Naas and Athy. Population of county in 1841, 114,488.

7. *Queen's County*, an inland county, is bounded on the south by Kilkenny; on the east by Carlow, Kildare, and a detached portion of King's County; on the north by King's County; and on the west by the latter, and Tipperary. It contains 424,854 acres, of which 69,289 consist of unimproved bog and waste lands. Surface generally flat; and soil, except where bog occurs, for the most part very fertile. Estates mostly large; but many of them let on perpetual leases. The head lessees on these estates form the middle class of gentry. They have mostly let their farms, generally in smaller divisions, to inferior tenants; and these again have subdivided them to others; so that many of the occupancies are extremely small, and are held by persons so very poor as to be incapable of executing any improvement. In cases, however, where the farms have been let by the landlords on terminable leases, they are larger; and a comparatively improved system of agriculture is being introduced. A good deal of inferior cheese is made for the Dublin market. Coal and limestone are found in this county; but the former is no longer wrought. Principal rivers, Barrow and Nore. It contains 11 baronies, and 53 parishes; and returns 3 members to parliament; viz., 2 for the county, and 1 for the borough of Portarlington. Principal towns, Maryborough (the county town) and Portarlington. Population of county in 1841, 153,930.

8. *King's County*, an inland county, is bounded on the south by Tipperary and Queen's County; on the east by Kildare; on the north by Westmeath; and on the west by Roscommon, Galway, and Tipperary. It contains 493,985 acres. The bog of Allen occupies a considerable tract in the north-east division of the county, and the Sliebh-bloom mountains in the south: on the whole, it is calculated that the bog and mountain extend over 145,836 acres. The soil is, in some places, very rich, but in others it is light and gravelly: at an average, it may be reckoned of a medium degree of fertility. Estates mostly very large. Tillage farms small, but some grazing ones extensive. Partnership leases, and subtenancy less common than in some other parts of Ireland; but still the condition of the tillage farmers is

not much superior, and their accommodations are, for the most part, wretched. Agriculture is, however, improving, and more attention is paid to the rotation of crops, to drainage, and to manuring. Silver has been found at Edenderry, in this county. Limestone is met with everywhere. Principal rivers, Shannon and Great and Little Brusna. It contains 12 baronies, and 51 parishes; and returns 2 members to parliament, both for the county. The principal town, Birr, or Parsonstown, had, in 1841, 6,336 inhabitants. Population of county in 1841, 146,857.

9. *Westmeath*, an inland county, is bounded on the south by King's County; on the east by Meath; on the north by the latter and Cavan; and on the west by Longford and Roscommon. It contains 453,468 acres, of which 56,392 are unimproved bog and waste, and 22,427 lakes. Surface agreeably diversified with woods, lakes, streams, hills, and bogs. The substratum being limestone, the verdure of the fields is remarkably fine. Property in moderate-sized estates. Leases commonly granted for 21 years, and a life. Grazing-grounds extensive. Tillage farms much subdivided. Principal rivers, Shannon, Inny, and Brusna. It contains 12 baronies, and 63 parishes: and returns 3 members to parliament; viz., 2 for the county, and 1 for the borough of Athlone. Mullingar, the county town, had, in 1841, a population of 4,569, and Athlone of 6,393. Population of county in ditto, 141,300.

10. *Longford*, an inland county, is bounded on the south by Westmeath; on the east and north by Westmeath, Cavan, and Leitrim; and on the west by Roscommon. It contains 269,409 acres, of which 58,937 are unimproved bog and mountain, and 13,675 lakes. Arable soil, for the most part, level and fertile. Property in rather large estates. Farms extremely small, there being, in all, 10,732 of more than 1 acre, of which no fewer than 9,276 are under 15 acres. The Shannon forms the western boundary of the county, and it is intersected by the Inny, Curlew, and Tallen. The principal lake is Lough Gowna. It contains 6 baronies, and 26 parishes; and returns 2 members to parliament, both for the county. Principal towns, Longford and Granard. Population of the county in 1841, 115,491.

11. *Meath*, a maritime county, is bounded on the south by Kildare; on the east by Dublin, the Irish Sea, and Louth; on the north by Monaghan and Cavan; and on the west by Westmeath. It contains 579,899 acres, of which only 16,033 are said to be unimproved or waste. Surface for the most part flat; soil, clay or loam on limestone or gravel, and, in some places, of extraordinary fertility. Some large estates; but property on the whole a good deal subdivided. Grazing used formerly to be the principal occupation; but, since the close of the American war, tillage has been gradually extended, until, at present, about three-fifths of the county are under the plough. Notwithstanding the rich soil and favourable situation of Meath, the agriculture and the condition of the occupiers of land are, speaking generally, alike bad. The usual rotation is, wheat, oats, potatoes, and oats when the land is laid down for grass. Within these dozen years, however, some material improvements have been introduced into Meath and the adjoining counties, in regard to the implements employed in agriculture, the application of manure, &c.; but their influence has

not been, as yet, sufficient to change the general character of its rural economy; and the ground continues to be exceedingly dirty and overrun with weeds. Large portions of the land are let out in *con-acre*, and, notwithstanding the efforts to prevent it, subletting is still extensively carried on. The condition, too, of the greater number of those who are reckoned large farmers, that is, who occupy from 30 to 100 acres, is far from enviable: they are generally destitute of most sorts of comfortable accommodation. The cabins of the cottiers and inferior tenants are wretched beyond description. "They are often not sufficiently covered to keep out the rain: they are built of mud; and, as in the case of the farmers' houses, the clay is taken to build the walls from the spot on which they are raised, leaving the surface of the floor, and the ground immediately about the walls, the lowest part, and, of course, subject to receive all the surrounding damp; so much so, that I have often gone into a cabin and seen a hole dug in the floor to receive the water coming in at the door, or under the foundation, from whence it might be baled out with greater ease when collected. On this damp floor the family most commonly sleep, generally without a bedstead, none of them having a loft, except in town cabins, where the ground for building on is more valuable. The inside of their huts is as filthy as their outward appearance bespeaks them to be. The labouring cottagers immediately under gentlemen fare better: their houses are, for the most part, water-fast; but as to their having lofts to sleep on, proper windows either for light or ventilation, or the floors raised above the level of the immediately surrounding ground, it seldom is the case. Few of them have chimneys, and fewer still have any other means of admitting the light than by opening the door or a small hole in the wall, stopped up occasionally by a bundle of straw. The hog is generally the inmate; the hens constantly; and, if they are possessed of a cow, she also is introduced, and becomes one of the family."—(*Thompson's Survey of Meath*, p. 71.) In some instances, farm-houses and cabins have been improved since this passage was written; but it faithfully depicts their general condition at this moment in Meath, and throughout by far the larger portion of the island. The fare of the occupiers and cottiers is as mean as their habitations are wretched. Potatoes constitute three-fourths of the food of the mass of the people; oatmeal and churned milk are sometimes added; but they seldom taste butchers' meat, the pig being usually sold to assist in paying the rent. The rents paid for land in this county are about the highest of any in Ireland. The linen manufacture is carried on in some parts of the county. The Irish language is very generally spoken. Meath contains 18 baronies and 146 parishes, and returns 2 members to parliament, both for the county. Principal river, the Boyne; but there are some small streams. Principal towns, Navan and Kells. Population of county in 1841, 183,828.

12. *Louth*, a maritime county, being the most northerly in the province of Leinster, is bounded on the south by Meath; on the east by the Irish Sea; on the north by Armagh; and on the west by Monaghan and Meath. It contains 201,916 acres, of which 15,603 are mountainous and waste. Surface mountainous towards the north; but in other parts undulating. Soil generally fertile. Estates of a

moderate size. Farms of all sizes; but many very small; so much so, that in some parishes there is hardly one above 20 acres. Wheat, oats, and potatoes, principal crops. Clover and turnips raised by proprietors only. Improvements, though their sphere be very circumscribed, have been introduced; and some of the superior tenants are in comfortable circumstances. Condition of sub-tenants and cottiers same as in Meath. Principal rivers, Boyne and Dee. Louth contains 6 baronies and 64 parishes, and returns 4 members to parliament, viz., 2 for the county, and 1 each for the boroughs of Drogheda and Dundalk. Principal towns, Drogheda (which is a county and city) and Dundalk. Population of county in 1841, 128,240.

MUNSTER

1. *Cork*, a maritime county, and the largest in Ireland, is bounded on the south by St. George's Channel; on the east by Waterford and Tipperary; on the north by Limerick; and on the west by Kerry and the Atlantic Ocean. It contains 1,846,333 acres, of which 465,389 are unimproved mountain and bog, and 12,867 water. This extensive district exhibits every variety of surface and soil: on the west it is rugged, rocky, and mountainous; the northern and eastern parts are distinguished by their richness and fertility; and but for the want of timber, the country would be eminently beautiful. The largest tract of low ground lies to the north of the Blackwater, the most fertile soils being those which rest on limestone. Estates, in general, very extensive. Tillage farms, for the most part, very small. Of a total number of 45,526 farms in the county in 1841, 29,473 were under 15, and 5,691 above 30 acres. Where tillage farms exceed 12 or 15 acres, they are frequently held in partnership, and used to be divided among the family of the occupant. "A farmer," says Mr. Townsend, "often estimates his riches by the number of his sons, whose labour precludes any necessity of mercenary aid; but this lasts only for a short time. They marry at an early age, new families arise, a separation of interest takes place, and with it a partition of the farm."—(*Survey of Cork*, i. 208.) And, notwithstanding the influence of the subletting Act, this baneful practice is still carried on. Under the management of such persons, agriculture cannot but be in the most backward state. Potatoes, on which the small farmers depend for subsistence, engross almost all their manure and all their labour. A great deal of work is done by the spade. Occasionally ploughing is performed by a species of combination—some supplying the plough, others the horses, and others the attendants. "The predilection for the plough," says Mr. Curwen, speaking of the country near Macroom, "is universal, and white crops succeed each other as long as the land will produce them; when these fail, they have recourse to grass, which rises luxuriantly without cultivation; and what is unaccountable, exhausted as the soil must be considered by this treatment, the grass is not less nutritious than abundant. As far as I was able to judge, in spite of this barbarous treatment, deterioration from repeated cropping does not follow as a consequence here, except on strong clays."—(*Letters on Ireland*, vol. ii. p. 2.) But, though the general character of farming

in Cork be highly objectionable, it has, happily, some exceptions. In Ireland infinitely more depends on the conduct of the landlord and his agents than in England; and when they act on sound and liberal principles, and oppose themselves to the endless subdivision of the land, agriculture is in a greatly improved state; and the condition of the occupiers, though not to be compared with the condition of the same class in England, is much preferable to what it is on the estates of less intelligent and less considerate landlords. Several of the landlords of Cork have acted in the way now stated. Generally, however, agriculture is in the most backward state, the condition of the occupiers exceedingly depressed; and, though improvements have been made within these few years in certain districts, others remain nearly stationary. Vast quantities of sea-weed and sand are employed as manure, the value of which, as well as of drainage and a better rotation of crops, is beginning to be better understood. Wheat, as well as oats, is largely produced. There are some considerable dairies in the vicinity of Cork and other places; and very large quantities of butter, bacon, and other articles of provision, are exported from Cork. A considerable extent of new and level road has recently been constructed, partly at the expense of government, throughout districts hitherto in a great degree inaccesssible. This is an improvement that cannot fail to have the most beneficial influence. Minerals, with the exception of limestone, of little importance. Some branches of the linen manufacture have been established at Cork and other towns; and there are some considerable distilleries. Principal rivers, Lee, Bandon, Blackwater, Ilen, Funcheon, Bride, and Awbeg. The shore is, in many places, deeply indented by the sea. Cork Harbour and Bantry Bay are among the finest asylums for shipping in the world.—(*Antè*, pp. 337, 338.) Cork contains 23 baronies and 251 parishes, and returns 8 members to parliament, viz., 2 for the county, 2 for the city of Cork, and 1 each for the boroughs of Bandon, Mallow, Youghal, and Kinsale. Principal towns, Cork, Youghal, Bandon, Kinsale, Mallow, and Fermoy. Population of county in 1841, 854,118.

2. *Kerry*, a maritime county, is bounded on the south and east by Cork and Limerick; on the north by the æstuary of the Shannon; and on the west by the Atlantic. It contains 1,186,126 acres, of which 726,775 are unimproved mountain and bog, and 32,761 water, including the lake of Killarney. This is one of the wildest, most rugged, and mountainous of all the Irish counties. Mac-Gillicuddy's Reeks, the highest mountains in Ireland, lie to the west of Killarney; and there are other mountainous ridges rising to between 2,000 and 3,000 feet in height. The scenery round the lake of Killarney has been often described, and is frequently visited, and deservedly admired.—(See *antè*, p. 335.) The coast of Kerry is deeply indented by the sea; and is not only the most westerly land in Ireland, but in Europe. The climate is uncommonly mild, but it is also particularly moist. The soil in the low grounds generally rests on a limestone bottom, and is often exceedingly fertile. Property in very large estates; but some of them leased for ever. A considerable portion of the county is held under partnership leases. Agriculture generally wretched, and hardly, if at all, improved of late years. In the mountainous districts, cultivation

is almost wholly performed by the *loy*, or spade; and when Mr. Young travelled in Ireland, there were some parishes in which there was not a single plough. Large flocks of goats are kept on the mountains, and are of infinite use to the poor people. There are some pretty considerable grazing and dairy-farms; and the native breed of Irish middle-horned cattle is said to be found in greater purity and perfection, perhaps, in Kerry than in any other county. "The cow of Kerry is truly a poor man's cow, living everywhere, hardy, yielding, for her size, abundance of milk of a good quality, and fattening rapidly when required."—(*Youatt on Cattle*, p. 179.) But, with the exception of the farms appropriated to grazing and the dairy, the rest of the arable land is divided into very small portions, there being in 1841, 19,519 holdings of less than 15 acres. The occupiers of these are, for the most part, destitute of capital, and of every sort of comfortable accommodation. The potato is almost the only produce they reserve for themselves, everything else being required to make up rent. "I have written to you, in former letters, much about miserable hovels in other parts of Ireland; they are more than equalled in Kerry. I have described the half naked and potato-fed people I have met with elsewhere. Here their nakedness is not less, and they know no other food. They starve in filthiness and squalid poverty on a rood of land. The poor Kerry farmer exists in contented wretchedness."—(*Campbell Foster*, p. 388.) Scarcities also are more frequent and severe in the southern and western districts than elsewhere. It would, however, be unjust not to mention that improvements have, in some instances, been undertaken in this county, and carried on with a degree of success, which it may be expected will lead to others. Those executed by Lords Headley and Lansdowne, especially the first, on two of the wildest properties in the county, show what may be effected by judicious management in increasing the productive capacities of the soil, and in ameliorating the condition of the occupiers. The estate of Mr. Daniel O'Connell is situated near Cahirciveen, in this county; it is partly freehold and partly leasehold: the "Liberator" being "a middleman, and exacting three times the rent from his sub-tenants that he pays to the head-landlord;" (*C. Foster*, p. 394.) Under these circumstances the reader will not, perhaps, be surprised to learn that the property under his control, is, even here, distinguished by the badness of its management, and the wretchedness of the occupiers and cottiers. Subdivision is permitted upon it to any extent.—(*C. Foster*, p. 396.) Sea-weed, which abounds along the coast and in the bays, furnishes an exhaustless supply of manure; and here and elsewhere in Ireland, it is not unfrequently carried to its destination in hampers on the backs of the women. The exports of wheat and other species of grain from Tralee are on the increase; but there has been a decrease in the exports of butter. Many parts of Kerry have been little explored by strangers; and, owing to the want of roads, they were formerly, in numerous instances, nearly inaccessible; but this deficiency has been recently, in some degree, obviated. The Irish language is almost universally spoken; and ancient customs and superstitions preserve their ascendancy in a remarkable degree. Mr. Inglis mentions, that in the district round Dingle, in this county, marriages are contracted at from 13 to 15 years of age; and

that there are instances of their being contracted at the premature age of 12! The common people of this county have been long remarkable for their proficiency in classical learning. "I accidentally," says Dr. Smith, "arrived at a little hut in an obscure part of this county, where I saw some poor lads reading Homer, their master having been a mendicant scholar at an English grammar school at Tralee."—(*Kerry*, p. 108). And we have heard of recent and well-authenticated instances of the same kind. With the exception of Donegal, the rent paid for land in Kerry is believed to be the lowest of any county in Ireland. Manufactures can hardly be said to exist. The mineral riches of this county, though but little explored, are very considerable. Sir William Petty established iron-works at Blackstones, on the river Carra, which were wrought till about 1740 or 1750, when they were abandoned, in consequence of the exhaustion of the woods in their vicinity.—(*Smith's Kerry*, p. 95.) Copper mines have also been wrought at Mucross, on the lower lake of Killarney, and at Ross Island in the same lake; and they are said to have been abandoned more through ignorance on the part of the miners, than from their being unproductive.—(*Smith*, p. 125; *Kane's Industrial Resources*, p. 187.) Variegated marbles are found near Tralee, and in other parts of the county; and slate slabs may be procured of any size from Valentia Island. Principal rivers, Feale, Laune, Raughty, and Mang. Kerry contains 8 baronies, and 87 parishes; and returns 3 members to parliament, being 2 for the county, and 1 for the borough of Tralee. Principal towns, Tralee and Killarney. Population of county in 1841, 293,380.

3. *Limerick*, an inland county, is bounded on the south by Cork; on the east by Tipperary; on the north by the Shannon, which divides it from Clare; and on the west by Kerry. It contains 680,842 acres, of which 121,101 are unimproved bog and mountain, and 18,531 water. Except on the southern, western, and north-eastern extremities, the surface is generally flat. Soil for the most part excellent. Mr. Young characterises a large tract, the "Golden Vale," as "the best he had ever seen." Tillage not so much extended as in some other counties. Property in large estates. Some grazing farms very extensive; but Mr. Wakefield affirms, that when he was in Ireland, "the grazing farms were rapidly colonising; and that the large farmers were taking in all the cottier tenants they could collect."—(Vol. i. p. 267.) This baneful practice has not been since materially checked, and the occupiers are as "beggarly" at this moment, as in the days of Arthur Young. The land in the vale has been almost all ploughed within the last few years; and though subjected to the worst possible management, such is its natural fertility, that it produces a good sward almost immediately after it is allowed to run to grass. From 10*l.* to 14*l.* an acre, are paid for *con-acre* land in the "Vale," and from 6*l.* to 8*l.* in other parts of the county.

Limerick is the leading port on the west coast of Ireland, for the shipment of raw produce. The following table shows the quantities of the principal articles shipped here in each year, from 1826 down to 1843, both inclusive; and it further shows, which we were hardly prepared to anticipate, that with the exception of oats, the exportation of most other articles has declined since 1838. (*See* next page.)

Return of the Quantities of the principal Articles Shipped from Limerick in each of the following Years, ending the 1st September.

Year.	Beef.		Pork.		Firkins of Butter.	Cwts. of			Barrels of					Cwts. of	
	Tierces.	Barrels.	Tierces.	Barrels.		Bacon.	Lard.	Hams.	Wheat.	Oats.	Barley.	Beans.	Rape Seed.	Flour.	Oatmeal.
(a) 1826	2,819	388	6,109	5,403	51,581	15,550	1,780	No acct.	51,555	290,557	13,533	823	4,426	2,796	500
(b) 1827	1,643	..	6,474	5,924	68,517	33,370	3,328	..	73,913	283,346	7,798	1,593	2,887	1,720	3,612
(c) 1828	1,376	146	5,965	4,198	83,038	39,030	4,260	..	150,585	446,290	6,607	4,070	335	6,823	77
(d) 1829	1,321	221	9,176	6,962	76,382	46,160	5,240	..	115,788	234,514	11,310	3,603	No acct.	19,762	9,024
(e) 1830	1,952	..	9,961	6,700	80,738	49,990	3,050	..	102,069	266,823	32,898	7,103	..	24,098	17,748
(f) 1831	702	..	6,458	6,348	67,669	55,618	5,221	..	119,938	298,994	36,489	3,281	..	9,815	11,160
(g) 1832	845	..	8,972	5,690	69,781	53,454	6,260	..	194,144	408,849	18,017	4,316	..	33,226	25,438
(h) 1833	1,338	116	6,879	5,718	75,159	76,526	6,760	..	218,915	345,016	11,774	2,963	329	37,664	31,978
(i) 1834	1,186	..	7,943	7,222	72,680	82,497	6,316	..	180,590	241,405	16,275	4,031	550	35,247	13,730
(j) 1835	364	7	7,250	7,013	72,630	81,839	9,697	..	117,874	285,623	32,847	8,786	70	22,725	16,320
(k) 1836	404	..	7,330	7,309	81,072	83,246	9,621	..	123,917	438,964	35,697	6,791	65	137,425	27,992
(l) 1837	1,182	..	7,623	6,936	75,463	68,780	8,768	..	81,858	487,286	31,333	8,757	386	73,259	40,021
(m) 1838	102	..	5,657	8,400	59,965	77,992	13,967	..	112,751	537,286	14,067	4,149	198	113,489	49,550
(n) 1839	25	40	7,846	13,840	64,018	69,449	9,660	..	76,683	461,565	11,131	4,628	366	102,684	48,658
(o) 1840	1,097	48	9,573	15,726	71,513	56,542	11,328	8,269	54,528	325,901	10,454	1,883	..	55,840	29,660
(p) 1841	1,381	530	10,099	12,130	85,385	46,056	11,135	8,111	65,704	496,282	4,668	1,303	..	37,048	53,226
(q) 1842	1,053	543	11,577	7,251	67,344	44,934	6,840	8,934	59,898	344,052	..	1,027	..	45,780	21,898
(r) 1843	1,454	940	8,259	7,868	62,179	46,180	7,895	8,612	52,072	526,590	12,161	1,338	633	37,177	27,270
(s) 11 Months of 1844, to 1st Aug.	11	52	4,959	8,459	47,400	41,453	8,411	10,469	125,410	495,959	8,562	1,411	1,014	27,325	18,380

(a) 957 Hides and Skins, 495 bags Feathers, and 20 puncheons Whiskey.
(b) 264 doz. Skins, 409 bags Feathers, and 110 puncheons Whiskey.
(c) 165 doz. Skins, 657 bags Feathers, and 110 puncheons Whiskey.
(d) 133 Hides, 345 doz. Skins, and 378 bags Feathers.
(e) 433 Hides, 180 doz. Skins, and 296 bags Feathers.
(f) 330 doz. Skins, 500 bags Feathers, and 242 puncheons Whiskey.
(g) 72 Hides, 183 bags Feathers, and 445 puncheons Whiskey.
(h) 180 doz. Skins, 238 bags Feathers, and 236 puncheons Whiskey.
(i) 150 doz. Skins, 254 bags Feathers, and 144 puncheons Whiskey.
(j) 87 bags Feathers, and 248 puncheons Whiskey.
(k) 198 bags Feathers, and 6 puncheons Whiskey.
(l) 229 bags Feathers, and 52 puncheons Whiskey.
(m) 3,467 Hides, 7,539 doz. Skins, 619 bags Feathers, and 50 puncheons Whiskey.
(n) 50 tons Feathers, and 84 tons Hides.
(o) 560 bales Hides, and 40 tons Feathers.
(p) 786 packs and 148 bags Feathers, and 150 bundles Leather.
(q) 34 tons Hides, 1,110 packs Feathers, and 40 puncheons Whiskey.
(r) 1,000 packs and 100 bags Feathers, 50 tons Hides, and 30 bales Leather.
(s) 900 packs Feathers, 120 bales Leather, and 100 tons Hides.

These numbers must not, however, be supposed to represent the exports from the county of Limerick only; a large proportion of the produce being brought down the Shannon from other counties for shipment at the city of Limerick. Along the Shannon, sea-sand is now very generally used as manure. Notwithstanding the increased production in Limerick and the contiguous counties, it is doubtful whether the condition of the small farmers and cottiers be at all improved. It was said, indeed, by some of the witnesses examined before the Agricultural Committee of 1833, to have become perceptibly worse. (*Min. of Evidence*, p. 373.) And this statement has been repeated by well-informed witnesses before the Land Occupation Commission in 1845. (Part ii., p. 792.) The condition of the larger farmers is, however, comparatively good; and considerable improvements have been effected of late years on some estates in which the subdivision of the land has not been carried to such an extent as in others. There are also a few exceptions which deserve to be specified, to the generally depressed condition of the small occupiers. Early in the beginning of last century, some families of German protestants from the Palatinate were settled in the vicinity of Adare, and other places in this county; and though they have lost the use of the German language, they still continue to be, in many respects, a distinct and peculiar race. Both men and women are industrious; their cottages are neat, clean, and well furnished; their farms are comparatively well managed; and their condition is, in all respects, decidedly superior to that of their aboriginal Irish neighbours.—(*Mr. and Mrs. Hall's Ireland; Kohl's Ireland*, p. 41, &c.) The condition of the poor in the city of Limerick is as wretched as can well be imagined; and is, in fact, disgraceful to a country calling itself civilized.—(*Inglis's Ireland in* 1834, vol. i., p. 304.) Some of the best long-horned cattle in the empire are produced and fattened in this county. Three lace factories have been established in the city. Principal rivers, exclusive of the Shannon, Maig, Deale, and Mulkerna. Limerick contains 13 baronies, and 131 parishes; and returns 4 members to parliament, being 2 for the county, and 2 for the city of Limerick. The latter had, in 1841, a population of 48,391. Population of county in ditto, 330,029.

4. *Tipperary*, an inland county, is bounded on the south by Cork and Waterford; on the east by Kilkenny and Queen's County; on the north by King's County and Galway; and on the west by Clare and Limerick. It contains 1,061,731 acres, of which 178,183 are unimproved mountain and bog, and 13,523 water. The mountainous districts are in the south-west, adjoining Waterford and Cork; in the south-eastern angle is Sliebhnaman mountain; and a chain of mountains runs across the county from Limerick to King's County. The bog is mostly a portion of the great bog of Allen. With these exceptions, Tipperary consists principally of extensive and fertile plains, with a calcareous subsoil, forming as rich land as is to be met with in any part of the empire. Some very large estates; but many of a moderate size. Tillage farms generally small, 13,032 holdings being under 5 acres, and 12,587 ranging from 5 to 15 acres. Many of them are held under middle-men. The *con-acre* system is very prevalent in some parts of this county, as it is indeed in most counties of Ireland, though

it be carried to the greatest extent in Connaught. By con-acre is meant a custom prevalent among the landlords and occupiers of the larger class of farms, of letting to the peasantry or cottiers small slips of land, varying from a perch to half an acre, for a single season, to be planted with potatoes or cropped. Old grass land is frequently let out on this system; and then it is usual to allow the surface to be pared and burned! The rent got for this land is enormous, running from 7*l.* to 12*l.* or 15*l.* an acre! Potatoes are invariably planted on con-acre land when it is broken up from grass; and afterwards it is usual to take from it successive crops of corn. Wherever this practice exists, there cannot, of course, be the least improvement; and nothing but the extraordinary fertility of the soil could enable it to produce anything under so destructive a system. In many parts the entire dependence of the peasantry being on these *con-acre* lands, when the crop fails they are reduced to the extreme of distress, and have rarely any choice between starvation and begging, unless it be to enlist under the banners of Captain Rock. *Con-acre* tenants dare not remove the crop from the ground without permission, which is seldom granted till the rent be paid. In most cases they are allowed to abandon the crop for the rent, but this is an alternative they make every sacrifice to avoid, as it involves the loss not merely of their labour, but of their only means of supporting themselves during the ensuing season. (See *Appendix* F. *to Poor Inquiry, Ireland*, passim.) In some parts agriculture is slowly improving, but, in general, it is stationary or retrograde. In many districts the subdivision of the land is carried to a ruinous extent; and it is all but impossible to introduce a better system, or to get the occupiers to leave it. Perhaps no part of Ireland is more demoralized than this. Tipperary has long been disgraced by systematic assassination, and by every sort of outrage. A landlord who should attempt to introduce an improved system on his estate, would run a very great risk of being shot; and it is really astonishing that any individuals able to live elsewhere, should continue to reside in such a country. It is wholly unfit for any save a military government; and the sooner it is subjected to it, the better will it be for the peaceably-disposed part of the inhabitants. Grazing was formerly, and still is, a principal employment in Tipperary. The native Irish breed of long-horned cattle attain to a large size, and are found in the greatest perfection in this county. Several thousands are annually exported. There are, also, many fine flocks of long-woolled sheep. The manufacture of broad-cloth is carried on to some extent at Carrick. Tipperary has mines of copper, lead, coal, and slate; the latter, near Killaloe, being the most extensive in Ireland. Exclusive of the Shannon, the principal river is the Suir. Tipperary contains 12 baronies, and 193 parishes; and returns 4 members to parliament, 2 being for the county, and 1 each for the boroughs of Clonmel and Cashel. Principal towns, Clonmel, Carrick-on-Suir, Nenagh, Thurles, Cashel, Tipperary, and Roscrea. Population of county in 1841, 435,553.

5. *Waterford*, a maritime county, is bounded on the south by St. George's Channel; on the east by Waterford harbour, which separates it from Wexford, and by Kilkenny; on the north by Tipperary; and on the west by Cork. It contains 461,553 acres, of which 105,496

are unimproved mountain, with but little bog. Though in general coarse, there is a considerable extent of fine land in this county, particularly in the south-east quarter; and the mountains afford good pasturage for cattle. Estates for the most part very large: the management of the largest, which belongs to the Duke of Devonshire, was severely censured by Mr. Wakefield. But this censure is no longer applicable, it having been, during the last twenty years, managed on the most liberal principles, and greatly improved.—(*Bicheno's Ireland and its Economy*, p. 103.) Here, indeed, and generally throughout Ireland (and we believe that the same may be truly affirmed of England), tenants and occupiers on large estates are decidedly better off than those on the smaller class of properties. This is the principal dairy county of Ireland. When it was visited by Mr. Young, not one thirtieth part was under the plough.—(*Tour in Ireland*, 4th ed. p. 329.) The proportion in tillage is now, however, much larger. This has principally arisen from the vicious custom of dividing farms. "In this county," says Mr. Wakefield, "when the eldest daughter of a farmer marries, the father, instead of giving her a portion, divides his farm between himself and his son-in-law; the next daughter gets a half of the remainder; and this division and subdivision is continued as long as there are daughters to be disposed of. The sons are left to shift for themselves the best way they can."—(Vol. i., p. 280.) But the Subletting Act, and the experience of its consequences, have contributed to check, though they have not suppressed this vicious custom. Some of the dairy farmers are in easy circumstances; but the condition of the tillage farmers and cottiers is much the same as in other parts of Munster. Some material improvements have been introduced within the last twenty years into this and the contiguous counties. Improved swing-ploughs, made of iron, drawn by two horses driven by the ploughman, are now become very general. Land is kept cleaner; there has been a great increase in the quantity of lime used as manure; and green crops have been more attended to; still, however, it is doubted whether, on the whole, there has been any considerable improvement of late years. Waterford ranks as one of the first ports of Ireland, and, indeed of Europe, for the exportation of raw produce; the average annual value of the shipments from it of native Irish articles being supposed to amount at present to about *two millions* sterling. Minerals, copper, iron, &c. Manufactures not very important; a considerable cotton manufacture has, however, been established at Portlaw, and some glass is made at Waterford. Principal rivers, Blackwater, Suir, and Bride. Waterford contains 8 baronies, and 82 parishes; and returns 5 members to Parliament, being 2 for the county, 2 for the borough of Waterford, and 1 for Dungarvan. Principal towns, Waterford, Dungarvan, and Lismore. Population of county in 1841, 196,187.

6. *Clare*, a maritime county, is bounded on the south by the river Shannon, which separates it from Kerry and Limerick; on the east by Tipperary; on the north by Galway; and on the west by the Atlantic. It contains 827,994 acres, of which 296,033 are unimproved mountain and bog, and 67,920 water. The arable land is, for the most part, light, but very fertile. The low grounds, known by the name of the *Cor-*

casses, on the Shannon and Fergus, are celebrated for the richness of their pastures, which are equal to the fattening of the largest bullocks. Property in large estates. A considerable extent of land employed in grazing. Tillage farms, more subdivided than in any other county in Munster, varying from 1 or 2 acres to 15 or 20; those above 30 being comparatively few. Partnership tenures not so common as formerly, many proprietors, impressed with a conviction of their pernicious tendency, having exerted themselves to effect their abolition. Oats and potatoes are the principal objects of attention; but wheat and barley are now extensively raised. Husbandry improving, but still in a very wretched state. The practice, in many places, used to be either to burn or manure, for, 1st, potatoes; 2nd, potatoes; sometimes, 3rd, potatoes; 4th, wheat; and then followed repeated crops of oats, till the soil was completely exhausted: it remained then for several years almost wholly unproductive, not even producing weeds but of the humblest growth.—(*Dutton's Survey of Clare*, p. 69.) And though in some parts there has been a material improvement in the interval, in others the old system continues to be acted on. Along the coast sea-weed and sea-sand are a good deal used as manure. In the mountainous parts the *loy* is extensively employed. Habitations similar to those in the contiguous counties; with this difference, that the cottages, instead of being of turf or clay, are mostly built of stone, without cement. Limestone abounds; and coal and ironstone have been found, but not wrought. Lead mines have, however, been wrought in different parts of the county, but seldom with much success. Manufactures can hardly be said to exist. Principal river, Shannon: it has also the Fergus, and some smaller streams. Clare contains 11 baronies and 80 parishes, and returns 3 members to parliament, being 2 for the county, and 1 for the borough of Ennis: the latter, the principal town, had, in 1841, a population of 9,318. Population of county in ditto,286,394.

ULSTER.

1. *Cavan*, an inland county, is bounded on the south by Longford, Westmeath, and Meath; on the east by Monaghan; on the north by Fermanagh; and on the west by Leitrim and Longford. It contains 477,360 acres, of which 71,918 are unimproved mountain and bog, and 22,142 water. Surface hilly, and soil generally poor. There are two large estates, but the rest are of moderate size. About four-fifths of the land is under tillage. Occupancies so very small, that of a total number of 25,641 of 1 acre and upwards, no fewer than 23,015 were under 15 acres! The competition for land is excessive; and the remission of rents all but unknown. "Agriculture in the most wretched state imaginable. The rotation is—1st, potatoes from ley; 2nd, potatoes repeated with some manure; 3rd, wheat, flax, barley, or oats; 4th, 5th, and 6th, oats; 7th, potatoes manured; and so on, as long as they can. Not much wheat is grown. If they have a field in ley, likely to yield a better crop on which to exercise this scourge system, they leave the land that they have deprived of its productive powers, to come round by time for a repetition of their former operations."—(*Appendix* F. *to Report of Poor Inquiry Commissioners*, p. 418.) There has, however, been some little improvement, especially as regards

draining, in the interval. At no very distant period, oats were supposed to be to other grain in the proportion of 70 to 1; but their preponderance, though still great, has been diminished in the interim. Numbers of farms are held in common; but the practice is declining. Clauses are rarely inserted in leases enforcing any particular system of management. Spade cultivation general; in some parishes there is hardly, in fact, a plough; and the miserable implements called ploughs, that do exist, are not unfrequently "made by the occupiers themselves, at an expense of 7*s.* or 8*s.* each." Condition of the farmers and labourers quite as bad as any in Ireland: it is said to have changed for the worse of late years. Notwithstanding the extreme lowness of wages when the people are employed, they are said to spend more than 1*d.* a day in smoking: on the other hand, however, the pernicious habit of dram-drinking has considerably diminished; so much so, that we are told there is not at present one-tenth part of the drinking that there was some years since; but this is, most probably, a good deal exaggerated. Linen manufacture much declined.—(*Binn's Miseries and Beauties of Ireland*, pp. 309—325.) Minerals various, but little known. The Shannon has its principal source in this county; and there are, besides, the Erne, Woodford, Annalee, &c. Cavan contains 8 baronies, and 36 parishes; and returns 2 members to parliament, both for the county. Cavan, the principal town, had, in 1841, a population of 3,749. Population of county in ditto, 243,153.

2. *Fermanagh*, an inland county, is bounded on the south by Cavan; on the east and north by Monaghan, Tyrone, and Donegal; and on the west by Leitrim. It contains 457,195 acres, of which 114,847 are unimproved bog and mountain, and 46,755 water. Surface varied and picturesque. Lough Erne is a fine sheet of water.—(See *ante*, p. 333.) This county is better wooded than most others in Ireland. Soil tolerably fertile. Estates generally large. Farms of all sizes; some large, but by far the greater number under 10 acres. A good many cattle bred on the high grounds. Agriculture is more advanced in the northern part of Fermanagh than in any other district of Ulster; but in the other parts of the county it is, though slowly improving, still very backward. Not many years ago the peasantry were accustomed to yoke their plough to the horses' tails! and the burning of land continues to be extensively practised. Oats, barley, wheat, flax, and potatoes, principal crops. Protestants are numerous in this county, and they are said by Mr. Wakefield to be a fine race of people, much superior to those in the other northern counties, or to their Catholic neighbours. The latter are, for the most part, miserably poor, the cottiers living in wretched huts. Mr. Inglis says, that the condition of the land occupiers in Fermanagh is superior to the condition of the same classes in most other parts which he visited. Notwithstanding the high rents paid for the land, he found all admit, Catholic as well as Protestant occupiers, that they could afford to eat butchers' meat three times a week, having in addition, as much milk and butter as were required for their family; or that if they choose to live more abstemiously, they could lay aside a little money.—(*Ireland in* 1834, vol. ii. p. 168.) Iron ore is found in different places. Linen manufacture extensively introduced. Fermanagh contains 8 baronies, and 23

parishes; and returns 3 members to parliament, 2 for the county, and 1 for the borough of Enniskillen. The latter, which is the principal town, had in 1841, a population of 5,686. Population of county in ditto, 156,481.

3. *Monaghan*, an inland county, is bounded on the south by Meath and Louth; on the east by the latter and Armagh; on the north by Tyrone; and on the west by Fermanagh and Cavan. It contains 319,757 acres, of which 21,585 are unimproved mountain and bog, and 6,167 water. The face of the country resembles that of Cavan: it is hilly, but the hills are not of large dimensions, and are mostly arable. It is moderately fertile. There are a few very large estates, and a great many small ones. Competition for land extreme, and farms very small. Some years since it was estimated that the larger class would not average 25 acres, nor the smaller, and far more numerous class, 6 acres.—(*Wakefield*, vol. i. p. 270.) And such is still the case; there being at present above 12,000 occupancies varying between 1 and 5 acres, and only 317 of more than 30 acres. *Con-acre* general here, and in most parts of Ulster. Agriculture in the most depressed state, and it is doubtful whether it has made any progress of late years. Spade more in use than the plough; the latter being an implement that requires the exertions of several occupiers to bring into operation. Principal crops, oats, potatoes, and flax; the latter being very extensively cultivated. Wheat and barley more raised now than formerly. Horses ill-fed, weak, and incapable of effectual labour. A good deal of butter is made, but there are no large dairies. Breed of cattle a good deal improved. Goats kept by the cottiers for the sake of their milk. The linen manufacture is very widely diffused over this and the adjoining northern counties. Those who carry it on are, at the same time, mostly all engaged in agriculture. It may, however, be doubted whether this combination of employments has had any good effect. On the contrary, it seems injurious both to the interests of agriculture and of the manufacture. The former has made no progress whatever; and the latter, after being forced forward by the aid of bounties and prohibitions, appears, now that these have been repealed, to be in a very unsatisfactory state. Those who compare the progress made by the linen manufacture at Dundee, during the last 20 years, and in the north of Ireland, will see the wide difference between a business conducted by people of capital and skill, addicted wholly to that particular department, and by poor cottiers, unable to avail themselves of machinery, and having their attention constantly withdrawn to the culture of their little plots of ground. Monaghan contains vast beds of limestone; lead ore of a rich quality; and indications of coal have also been discovered. There are no rivers of any importance. It contains 5 baronies, and 23 parishes; and returns 2 members to parliament, both for the county. Monaghan, the principal town, had in 1841, a population of 4,130. Population of county in 1841, 200,442.

4. *Armagh*, an inland county, is bounded on the south by Louth; on the east by Down; on the north by Lough Neagh and Tyrone; and on the west by Monaghan. It contains 328,076 acres, of which 35,117 are unimproved bog and mountain, and 17,942 water, being part of Lough Neagh. Surface varied and interesting, being mountainous in

some places and undulating and flat in others. Soil generally fertile. A large portion of this county belongs to church and college establishments, and to corporations: some noblemen and gentlemen have good estates; minor estates numerous, and the tenures by which they are held such as to divide them into the minutest portions. Farms smaller in this than in any other county in Ireland. They generally run from 2 to 5 and 15 acres; those that amount to 40 or 50 acres are reckoned very large, and are generally found in the Fews mountains. Out of 1,500 tenants on the Gosford estate, in the barony of Fews, there are not more than 60 or 70 who hold so much as 20 acres. This is the estate on which Mr. Blacker originally introduced his system of green crops and stall feeding into the economy of the smallest farms, or at least of those from 3 to 6 acres. Though productive of considerable improvement, it has been praised far beyond its deserts. There can be nothing like really good and efficient agriculture on farms of 6, or even of 12 or 20 acres. Potatoes, oats, and flax, principal crops; but good wheat is raised in various parts, particularly in the vicinity of the city of Armagh, and in the whole north-east district of the county. Near Loughgall, Charlemont, &c., there are some very productive orchards, whence a good deal of fruit is sent to Belfast, and some is even said to find its way to Glasgow. Some dairy cows are kept, and a considerable quantity of butter is made. Cattle of a small stunted breed are reared in the mountainous districts; sheep few and inferior. Linen manufacture diffused over the county, as in Monaghan. Middlemen but little known. Habitations of the bulk of the lower orders decidedly preferable to those of the same class in most other parts of Ireland, excluding the neighbouring counties of Down and Antrim. They are generally whitewashed, well thatched, and have a clean and comfortable appearance. Notwithstanding their alleged propensity to jockeyship, the inhabitants may be advantageously compared, in respect of character, with those of most other districts. There are some beautiful marbles. Principal rivers, Bann and Blackwater, which run into Lough Neagh, and Newry, into Carlingford Bay; the latter is joined to the Bann by the Newry canal, completing the navigation between the sea and the lake. Some very extensive flour mills have been erected on the Blackwater. Armagh contains 8 baronies and 28 parishes, and returns 3 members to parliament, being 2 for the county and 1 for the city of Armagh. Principal towns, city of Armagh and Lurgan. Population of county in 1841, 232,393.

5. *Down*, a maritime county, is bounded south and east by the Irish Sea and the North Channel; north, by Belfast Lough and Antrim; and west, by Armagh and a small part of Louth. It contains 611,919 acres, of which 78,317 are unimproved mountain and bog, and 3,432 water. The mountains of Mourne, in the southern part of Down, are amongst the highest in Ireland, and there are some considerable hills in other parts; but, with these exceptions, the surface is abundantly level. Soil of a medium degree of fertility. There are some very large estates; but property is, notwithstanding, a good deal subdivided. Large farms of from 200 to 500 acres were, about the middle of last century, common in Down and other districts in the north of Ireland; but these have now entirely disappeared. Those occupied by farmers

who have recourse to no other business may, at present, run from 20 to 50, and in a few instances to 100 acres; while those occupied by persons partly engaged in the linen trade, which is here universally diffused, and partly only in agriculture, are of all sizes from 1 to 20 acres, probably averaging about 4 acres. In consequence of the decline of the linen manufacture, and of the population having nothing but the land to depend upon, the size of occupancies has been materially diminished of late years. The competition for small patches of land is quite intense. On estates where the tenants, though they hold at will, are not disturbed, provided they pay their rents, they frequently get, on assigning their holdings to others, sums that would elsewhere appear almost incredible. As much as 100*l.* have been paid for the "tenant-right" to a holding of only seven acres, burdened with a rent of 1*l.* an acre! and the usual price obtained for the "tenant-right" to land let at rack-rent, is 10*l.* an acre!—(*Binn's Miseries and Beauties of Ireland*, vol. i. p. 85, 114, &c.) Notwithstanding this practice, a good many improvements, especially as regards drainage and cropping, have been made within the last dozen years; but the poverty of the occupiers and the smallness of their possessions render the general introduction of anything like a good system of farming next to impossible. Turnips are but rarely seen, and potatoes are still frequently planted on the "lazy bed" plan. Corn crops too frequently follow each other, only partially interrupted by potatoes, peas, and flax; the culture of the latter having increased very materially during the last seven years. A good number of cows are kept, and horses are reared in the mountainous districts. Many hogs fattened. There are numerous bleaching grounds. The houses of the farmers are, many of them, whitewashed, and have a neat appearance; but there are a great number of houses of a very inferior description. "The weavers," says Mr. Wakefield, "may be divided into a number of classes, according to the property they possess. Some are poor, but others live in comparative affluence. It is common for a manufacturing farmer, who occupies not more than 10 acres of land, to let a part of his 'take' to a subtenant at will, who erects thereon a wretched cabin, and employs one or two more looms for the benefit of his landlord. The condition of this sub-tenant is not calculated to inspire a high idea of his domestic comfort; but, however mean his living, there is a class still lower, that of the person who occupies what is called a 'dry cot,' or a habitation without any land. The owner of such a dwelling purchases con-acres, and raises some oats and potatoes. The mere manufacturers of yarn are a still lower class."—(ii. 740.) The population, however, though far from being in a comfortable situation, is, generally speaking, decidedly better off than in most other Irish counties. Had it not been for the prevalent custom of splitting the land, a custom to which most part of the poverty and distress existing in Ireland may be immediately ascribed, the peasantry of Down would not have had much reason to envy those of most British counties. Minerals few and of little importance. Principal rivers, Bann, Lagan, and Newry. Down contains 10 baronies and 70 parishes, and returns 4 members to parliament, being 2 for the county, and 1 each for the boroughs of Newry and Downpatrick. Newry had in 1841, 11,972 inhabitants. Population of county in ditto, 361,446.

6. *Antrim*, a maritime county, is bounded on the south by Down and Belfast Lough, on the east by the North Channel, on the north by the Atlantic, and on the west by Londonderry and Lough Neagh. It contains 745,177 acres, of which 176,335 are mountain and bog, and 53,288 water, being part of Lough Neagh, which lies principally in this county. Surface very various. On the north and east it is mountainous and destitute of wood; there is, also, a mountainous ridge between Belfast and Lough Neagh, and a good deal of rugged ground in other places. The flat ground bordering on Lough Neagh is, in many places, boggy. Still, however, there is a large extent of fertile land; and, in the vicinity of Belfast especially, the neat whitewashed houses of the manufacturers give it a cheerful appearance. Estates mostly very large. Those of Viscount O'Neil, the Marquises of Hertford and Donegal, and the Antrim family, being among the largest and most valuable in the empire; but large portions of the last two are let in perpetuity. Except in the mountainous districts, farms are small. Agriculture, in most respects, similar to that of Down. Improved implements and practices have been extensively introduced, and would have made a much greater progress but for the minute division of land. Breed of cattle bad, but in the course of being meliorated; many goats kept in the mountains. Belfast, and the country round, have more of an improved appearance, and the people look more cheerful and happy than in any other part of Ireland. This has been ascribed to the linen manufacture; but we agree with Mr. Wakefield in opinion, that it is rather to be ascribed to the commerce of which Belfast is the centre, and to the introduction of the cotton manufacture. Where the linen manufacture alone is established, the condition of the peasantry seems little, if at all, better than in districts without manufactures. A coal mine is wrought at Bally-castle, in this county; but the coals are bituminous, and of bad quality; so that those used in Belfast are brought from Britain. On the north coast of Antrim is the splendid assemblage of basaltic columns denominated the Giants' Causeway.—(See *Sea Coast*, p. 343.) Principal rivers, Bann and Lagan; the former constituting, in great part, the western, and the latter the southern boundary of the county. Antrim contains 15 baronies and 75 parishes, and returns 6 members to parliament, being 2 for the county, 2 for the borough of Belfast, and 1 each for Carrickfergus and Lisburn. Belfast, the principal commercial town in Ireland, had, in 1821, 37,277 inhabitants; in 1831, 58,287; and in 1841, 75,308, of which 6,697 belonged to the suburb of Ballymacarret, in Down. In 1835, the total value of the exports from Belfast was estimated at 4,341,794*l.*, whereof the value of linen manufactures was reckoned at 2,694,000*l.*, and that of provisions at 906,597*l.* The customs' duties amount to about 340,000*l.* a-year; but the foreign trade of the port, though extensive, is very inferior to the cross channel trade with Glasgow, Liverpool, &c. Population of county in 1841, 360,875.

7. *Londonderry*, a maritime county, is bounded on the south by Tyrone, on the east by Lough Neagh and Antrim, on the north by the Atlantic and Lough Foyle, and on the west by Donegal and Tyrone. It contains 518,595 acres, of which 180,709 are uncultivated mountain and bog, and 10,327 water; being mostly part of Lough Neagh. Sur-

face in many parts mountainous; but the vales are extensive and fertile. With the exception of the lands belonging to the church, and to corporations, the entire property of this county was granted by James I. to the principal London Companies; so that the land is mostly held from them, either under terminable or interminable leases. Mr. Sampson, in his survey of this county, states, in reference to the size of farms, that they vary from 2 to 200 acres. "Both these," he observes, "are extremes; the average is from 5 to 20. Where there has been a perpetuity, or a long lease, it is *split*; that is, the children are settled upon divisions of the father's farm; by which means leases of 40 acres come to be parcelled, in two or three generations, into patches of 4 or 5 acres. It seems as if the newly let lands were disposed of under some similar system of parcelling. I could give instances where whole districts are subdivided into 6 or 7 acres, and rarely can boast a farm of 12 or 14."—(p. 249.) In fact there were, in 1841, 16,621 occupancies, varying from 1 to under 15 acres. Latterly, however, the owners of a good many estates have become sensible of the injurious influence of this system, and have, where an opportunity has been afforded, exerted themselves to prevent its being carried further, and to consolidate some of the small occupancies; but their efforts have not hitherto been such as materially to affect the average size of farms in the county, which is not believed to exceed 12, or, at most, 14 English acres. It is almost needless, seeing the way in which the land is occupied, to add that agriculture, though in some respects improved, is still, generally speaking, in a very low state. Principal crops, potatoes, oats, and flax. Mr. Wakefield thought, that owing to the wetness of the climate, it would be useless to attempt introducing wheat. But, even at the time when his work was published, its cultivation was carried on to a considerable extent, and it has since considerably increased, not in this only, but in most other counties in the north of Ireland, and, indeed, throughout the whole country. Condition of the small farmers and cottiers very unprosperous. Some of the houses of the latter are rough-cast and white-washed, like those of the same class in Down; but the houses of the greater number, particularly in the mountainous districts, are alike filthy without and within. Linen manufacture widely introduced. Various minerals have been found, but of no great importance. Besides the Bann, which, for the most part, divides Londonderry from Antrim, the principal rivers are the Foyle, the Faughan, and the Roe. Londonderry is divided into 6 baronies and liberties and 43 parishes, and returns 4 members to parliament, being 2 for the county, 1 for the city of Londonderry, and 1 for the borough of Coleraine. Londonderry, the capital, had in 1841 a population of 15,196. Population of county in 1841, 222,174.

8. *Tyrone*, an inland county, is bounded on the south by Fermanagh, Monaghan, and Armagh; on the east by Lough Neagh; on the north by Londonderry; and on the west by Donegal. It contains 806,640 acres, of which 311,867 are unimproved mountain and bog, and 31,796 water, being in part a fraction of Lough Neagh. Surface in many places, especially on the north and west, rough and mountainous; but there is, notwithstanding, a large extent of fertile land. Property

mostly in very large estates. Farms of various sizes; those in the mountainous districts large, and seldom much subdivided. Tillage farms extremely small, many being held under partnership leases.—(See *Galway*.) Wherever this mode of letting land prevails, agriculture is execrable, and it is doubtful whether it has in any degree improved of late years. A great deal of work is done by the spade, and where ploughs are used, they are sometimes drawn by horses, bullocks, and milch cows, all yoked together! Potatoes and oats the principal crops. Cattle and sheep very inferior. "Tenants may do what they will in regard to the management of their farms, if they only pay the rent." (*Poor Inquiry, Appendix* F., p. 323.) Habitations of the bulk of the people extremely mean; they live principally on oatmeal and potatoes, rarely tasting butcher's meat. A coal mine is wrought between Dungannon and Stewartstown, but the coal is inferior. There is a good pottery near Dungannon. This is one of the counties in which illicit distillation was most prevalent. Principal rivers, Blackwater, Foyle, Ballinderry, with several others of inferior importance. Tyrone contains 4 baronies and 42 parishes, and returns 3 members to parliament, being 2 for the county, and 1 for the borough of Dungannon. Population of county in 1841, 312,956.

9. *Donegal*, a maritime county, occupying the north-west corner of Ireland, is everywhere bounded by the sea, except on the south-east, where it touches Fermanagh; and on the east, where it is bounded by Tyrone and Londonderry. It contains 1,193,443 acres, of which 769,587 are unimproved mountain and bog, and 23,107 water. Donegal is deeply indented by arms of the sea; and its surface is, in most places, mountainous, rugged, and dreary. There are, however, extensive tracts of good land, particularly on its east side, which, under proper management, would yield abundant crops. Climate wet and backward. Property in very large estates; but some of them leased for ever. Farms of all sizes; in the low grounds they vary from 2 to 20 acres; but in the mountainous districts, they run from 40 to 500. Partnership tenures common, but diminishing. Agriculture, though still very bad, has been somewhat improved of late years. A great deal more labour performed by the spade or *loy*, than by the plough; but in some of the mountainous districts, where the spade is principally used, the plough could hardly be introduced. Potatoes raised everywhere, and the great dependance of the people; oats and flax also largely cultivated, but comparatively little of any other sort of grain. Cattle, a small stunted breed. The average rent of land in this county is, perhaps, the lowest of any in Ireland. People very badly off. "Cabins tolerably snug, but intolerably unclean, as, in general, the cattle and hogs herd with the family; and in summer, when all the mountains are dry, a marsh of filth surrounds the cabin door."—*M'Parlan's Survey of Donegal*, p. 65.) The burning of land is practised, but principally in the reclaiming of bog or mountain. The bays and creeks round the shores of this county afford inexhaustible supplies of sea-weed, and every facility for fishing; but the latter is greatly neglected. English language little spoken in many districts. The barony of Innishowen, famous for its illicit whiskey, and the prevalence of smuggling among its inhabitants, is in this county. Prin-

cipal rivers, Fin, Erne, Deele, Gweebarra, and Swilly. Donegal contains 6 baronies, and 51 parishes; and returns two members to parliament, both for the county. Population of county in 1841, 296,448.

CONNAUGHT.

1. *Galway*, a maritime county, the most westerly in this province, is bounded on the south by Galway Bay, Clare, and Tipperary; on the east by King's County and Roscommon; on the north, by the latter and Mayo; and on the west by the ocean. It contains 1,566,354 acres, of which 708,000 are unimproved mountain and bog, and 90,030 water, including part of Lough Corrib. The southern and western parts of this county are mountainous and wild; but the extensive tract to the eastward of Lough Corrib and Galway town is, for the most part, flat. The soil of this portion is dry and fertile; it rests on a substratum of limestone, and is, in some places, so thin as not to be fit for tillage, though it yields the finest pasture. Climate mild, but there is an excess of moisture. There are several very large estates. Connemara, of which the greater part belongs to Mr. Martin, occupies the whole north-western portion of the county; but it is almost in a state of nature, and is worth comparatively little. Farms of all sizes: those in tillage, for the most part very small, there being about 28,000 occupancies, varying between 1 and 5 acres. It has been the common practice to grant partnership leases to an indefinite number of tenants, very often twenty or more. "These people divide the land, and give portions to their children, which consist of one-fourth or one-fifth of what they call a man's share; that is, of the land which originally belonged to one man in the lease. A certain portion of the whole farm, or *take*, is appropriated for tillage, and this portion is then divided into lots, perhaps 20 or 30 These lots are again subdivided into fields, which are partitioned into smaller lots, each partner obtaining one or two ridges; but these ridges do not continue in the hands of the same occupier longer than the time they are in tillage. The pasture is held in common, and the elders of the village are the legislators, who establish such regulations as may be judged proper for their community, and settle all disputes that arise among them. Their houses stand close to each other, and form what is here called a village."—(*Wakefield*, i., 260.) As illustrative of the extent to which this destructive system is at present practised, it may be mentioned, that Mr. Williamson, (a gentleman employed on the valuation of the county,) informed the Land Occupation Commissioners, (Part II., 537,) that the townland of Liscanawn, comprising 587 Irish acres, of which 416 are liable to be flooded, is parcelled out among 110 co-tenants. He adds, as every one might anticipate, that they are in the last degree poor and miserable. The same gentleman states, that he knows a district, comprising 700 Irish acres, held by small occupiers, who have only 3 cows amongst them! But even in cases where the subdivision has not been carried to this extreme, the condition of the occupiers is but little better. The spade is all but universally in use, and the burning of land, though opposed by some landlords, is practised to a ruinous extent. Except on the larger farms, drainage and the rotation of crops are all but unknown. Potatoes and oats the most common crops; but the former are not so

extensively cultivated as in some other parts of Ireland. Very good wheat is produced, particularly to the south-east of Galway; and there has, within the last 20 years, been a great increase in the growth of wheat and oats; but it is doubtful whether this has been, to any material extent, the result of an improved system of tillage, and whether it be not wholly ascribable to that improvident breaking up of pasture land that has been carried to the most injurious excess here, and throughout the whole province.—(*Report of Agricultural Committee of* 1833, *Min: of Evid.*, p. 348; and *Evid. before Land Occupation Commissioners*, passim.) The improved Scotch plough, drawn by 2 horses, is met with in some places; but the old plough of the country, drawn by 4 or more horses, having, exclusive of the ploughman, one or two drivers, and a man to press on the beam to keep the instrument in the ground, is in common use. Sea-weed and sea-sand much used as manure. Excellent long-horned cattle are met with in this county. Mr. Wakefield says that they are fully equal to any in England. There are also some excellent flocks of sheep. The habitations of the lower ranks are, with few exceptions, quite as wretched as any to be found in Ireland. The farm-houses are also poor, miserable, and ill situated. After the Shannon, the most considerable rivers are the Suck and the Black River. Galway contains 18 baronies and 120 parishes; and returns 4 members to parliament, being 2 for the county, and 2 for the borough of Galway. The latter had, in 1841, a population of 17,275. Population of county in ditto, 440,198.

2. *Mayo*, a maritime county, is bounded on the south and east by Galway, Roscommon, and Sligo, and on the north and west by the ocean. It contains 1,363,882 acres, of which no fewer than 800,111 are unimproved mountain and bog, being a greater extent of waste land than in any other county of Ireland. It has also 56,970 acres of water, consisting principally of Lough Mask, Lough Con, Lough Carra, &c. Here are some of the highest mountains in Ireland, intermixed, however, with many fertile valleys; but, owing to the limestone protruding through the surface, considerable portions of the flat country are unfit for tillage, though they afford excellent pasture. Property in immense estates. The land is divided, and a good deal of it let on the partnership or village system, as described in Galway. It is said, however, that this system is on the wane; and it is to be hoped that this is the case, as it opposes an effectual obstacle to the introduction of anything like good agriculture, and to the growth of industrious habits. It would seem, however, that the ruinous practice of *con-acre*, is rapidly extending itself, not only over this county, but over Galway, and the entire extent of Connaught. It threatens, indeed, unless its progress should be arrested, of which there seems to be no near prospect, to spread itself over all the pasture land of the province. "The competition for land in Connaught is almost incredible: there is no rent you ask that will not be promised."—(*Agricultural Committee of* 1833, *Min. of Evid.*, p. 352.) It is astonishing, too, how well these exorbitant rents are paid. In fact, the peasantry have no means of existing without land; so that we need not be surprised that pasturage is rapidly diminishing. In the small tillage

farms, everything, except potatoes and a little oatmeal, is sold to make up the rent. "In travelling through the country," says Mr. Wakefield, "I could see nothing but bad tillage and a thin population. The people in general were dressed in woollen clothes of a dark colour, and their cabins, which seemed to be more confined than in other parts of Ireland, had a most miserable appearance, and gave a dull and gloomy aspect to the whole country."—(i., 35.) It would seem from the statements of Mr. Inglis, and of the witnesses examined before the Land Occupation Commission, that but little, if any material improvement has taken place since the publication of Mr. Wakefield's work. The former says, that the linen manufacture, which had been extensively carried on in the vicinity of Castlebar, Westport, Newport, &c., and had there, as everywhere else, led to a division of the land, had materially declined, and that, in consequence, the condition of the occupiers "had very much deteriorated." (*Ireland in* 1834, vol. ii., p. 98.) And while some of the witnesses referred to, say, that agriculture is slowly improving, others doubt whether such be the case. No effectual check seems to have been given to the burning of land. In some instances, sea-weed and sea-sand are carried more than 30 miles inland. Cattle long-horned, and improved by crossing with the English breed. Forty years ago, some graziers used to hold as much as 3,000 acres; but at present few occupy more than the tenth part of this extent of land. The best grazing lands are said to fetch about 40*s.* the Irish acre. Iron was formerly made in this county; but the business was abandoned from the want of fuel. Though the houses are all thatched, there is abundance of excellent slate. Principal rivers, Moy, Guishden, Deel, Owenmore, and Robe, besides inferior streams. The coast is deeply indented by the sea; and on the west it is fenced with numerous islands. There are some excellent harbours. Mayo contains 9 baronies, and 73 parishes; and returns 2 members to parliament, both for the county. Principal towns, Castlebar, Ballina, and Westport. Population of county in 1841, 388,887.

3. *Roscommon*, an inland county, has Galway on the south and south-west; on the east it is separated from Longford, Leitrim, and King's County by the Shannon; on the north and north-west it has Sligo and Mayo. It contains 607,691 acres, of which 130,299 are unimproved bog and mountain, and 29,370 water. There are some mountain tracts in the northern parts of the county and elsewhere, but, in general, its surface is nearly flat, exhibiting, for the most part, either green fields or bogs. Substratum principally limestone. Pastures most luxuriant. The employment of stone fences is nearly peculiar to this county. Estates very large; but many of them let on perpetual leases, the holders of some of which form an intermediate class between the great proprietors and the occupiers. A large proportion of land in pasture; but latterly tillage has been rapidly extending. Several improvements have been introduced in drainage, in the plan of husbandry, and in the instruments employed in carrying it on. But now, as formerly, "the general system of agriculture, excepting on lands held by wealthy individuals, remains still in a very imperfect state; and the smaller farms are cultivated in a manner at once slovenly and

wasteful."—(*Weld's Survey of Roscommon*, p. 654. Dublin, 1832.) Partnership tenures diminishing. Tillage farms very generally small, by far the greater number being under 10 acres. Oats and potatoes principal crops; but wheat is now rather extensively cultivated. A good deal of work done by the *loy*. Cattle long-horned; sheep long-woolled; both breeds good; few dairies. The pernicious practice of burning land is more extensively carried on in this than in, perhaps, any other county. Some landlords endeavour to prevent it; but others appear to be indifferent to, or careless about, the mischief it occasions. "There is nothing," says Lord Crofton, "upon which there seems to be a greater difference than that of burning; one landlord permits it, and another does not. The one who does permit it is, of course, liked; and the one who does not is held up as a great Tartar. Unquestionably it is the ruin of the land. There is one district that, from constant burning and the repetition of crops, is not worth the public cess, which I remember, ten years ago, able to feed a heifer to an acre."—(*Evidence, Land Occupation Com.*, I. 350.) His Lordship further states that, in his district, within the last ten years, several hundred acres of grass land had been broken up and divided into farms from the increase of population. The burning principally takes place on *con-acre* land, which sometimes fetches the enormous rent of 12*l.* and 14*l.* an acre! so that we need not be surprised that *con-acre* should be, as Lord Crofton says it is, a principal source of agrarian outrages. Some new cottages, on a few estates, are neat and comfortable; but the great majority continue to be as bad and as filthy as possible. The same may be said of the farm-buildings. There are veins of coal and ironstone in the northern parts of this county, to the west of Lough Allen. These had been occasionally wrought to some extent for a considerable period; but, in general, to the heavy loss of those by whom the works were carried on. It was, however, contended that this happened from the want of capital, or want of skill on the part of those employed; and the most exaggerated and delusive accounts were, at the same time, published of the value of the mines. At length, during the memorable year 1825, three companies were formed for working the coal and iron mines near Arigna and other places in this county. But one of these, after examining the ground, prudently declined proceeding any farther; the energies of another were paralysed by the fraud, jobbing, and mismanagement of some of its directors and agents: and the agent of the third, an enterprising and well-conducted association, having been shot, the works have since been abandoned. The linen manufacture was at one time pretty extensively diffused over this county; but it is now nearly extinct. Being washed throughout its whole extent by the Shannon, there are not many Irish counties that have greater facilities than Roscommon for the easy and convenient disposal of their products. It contains 9 baronies and 58 parishes; and returns 2 members to parliament, both for the county. Principal towns, Roscommon, Boyle, and Elphin. Population of county in 1841, 253,591.

4. *Leitrim*, a maritime county, is bounded on the south-east by Longford; on the east by Cavan and Fermanagh; on the north by Donegal Bay; and on the west and south-west by Sligo and Roscom-

mon. It contains 392,363 acres, of which 115,869 are unimproved mountain and bog, and 23,748 water. This is a very mountainous county; the mountains are not, however, completely barren, but afford sufficient herbage for the breeding of cattle. In the valleys and low grounds there is a good deal of dark soil, incumbent on limestone, and very fertile. Estates very large. Tillage farms small, not exceeding from 2 to 15 acres; and these sometimes let in partnership to a number of tenants. Agriculture is, consequently, in a very depressed, but, perhaps, slightly improving state. Potatoes, oats, and flax are the principal crops; clover and turnips unknown, at least to the tenantry. Every man tills according to his fancy or convenience, and "nothing is known of a rotation." The usual course is two successive crops of potatoes, followed by as many of oats as will yield any return. In most cases two and three oat crops are taken, and frequently many more, sometimes to the extent of eleven and even nineteen!—(*Poor Inquiry, Appendix* F., p. 210.) Cattle improved by the introduction of English breeds; a good deal of butter made. Sheep small, and few in number. Habitations of the people, mostly miserable huts; even the recently erected farm-houses and offices, if so they may be called, are said not to cost more than 12*l.* or 20*l.*! There are several bleach-fields, some coarse potteries, and some coarse linen is made for home consumption. Leitrim is said to have been at one time covered with wood; but at present it is very destitute of plantations. One of the sources of the Shannon is in this county. It contains 5 baronies and 17 parishes; and returns 2 members to parliament, both for the county. Principal towns, Mohill and Carrick-on-Shannon. Population of county in 1841, 155,297.

5. *Sligo*, a maritime county, is bounded on the north by the Atlantic Ocean; east, by Leitrim; south-east, by Roscommon; and south-west and west, by Mayo. It contains 461,753 acres, of which 151,723 are unimproved mountain and bog, and 12,740 water. This county, though rough, mountainous, and boggy, contains no inconsiderable quantity of very good land; though a good deal of the arable soil is but indifferent. A few pretty large estates; but a considerable portion of the county is divided into small properties. Lands are let and managed in most respects similarly to those in Leitrim. The system of partnership leases has been abolished, and some considerable improvements effected on some of the larger estates; but elsewhere little if any improvement has been made of late years; and the condition of the smaller class of occupiers is as wretched as in the other parts of Connaught. Sligo is one of the principal ports on the west coast of Ireland for the shipment of raw produce. Its exports of late years have amounted to about

60,000 pigs, worth	£200,000
6,000 cattle, worth	60,000
50,000 firkins butter, worth	125,000
22,600 tons oats, worth	132,000
12,000 tons meal	132,000

Making in all a gross sum of 649,000*l.*, exclusive of a farther and very considerable sum for wheat, poultry, eggs, and salmon.—(*C. Foster's Letters on Ireland*, p. 160.) Extensive tracts of this, and of other counties on the west coast of Ireland, have been devastated by the

drifting of the sea-sand during strong north-westerly gales. Lord Palmerston, who is one of the best landlords in this part of the country, has planted above 1,000 acres of sand with bent, which not only prevents its drifting, but gradually converts it into good pasture. But other landlords do not take this precaution, and the sand is slowly extending itself over their estates.—(*C. Foster*, p. 164.) Here, as in Leitrim, the *con-acre* system has made much progress within the last 20 years. The competition for land is intense; and the occupier of any over-rented patch, that chooses to leave it, never fails to get a considerable sum for the "tenant's right." Principal rivers, Sligo, Arrow, Awinmore, Easky, Moy, &c. It contains 6 baronies and 41 parishes; and returns 3 members to parliament, being 2 for the county, and 1 for the borough of Sligo. Principal town, Sligo. Population of county in 1841, 180,886.

ISLANDS.

A great number of islands and islets lie along the south-west, west, and north-west coasts of Ireland; but there are very few off the east coast. Their distance from the mainland is, in most instances, inconsiderable. The largest of these islands, called Achill, or Eagle Island, from the number of eagles by which it is frequented, is situated on the west coast of Mayo, at the north-west extremity of Clew Bay. It contains 35,283 acres, with a destitute population of about 4,500. It is mountainous and barren; and is separated from the mainland by a narrow channel, which is, in parts, fordable at low water. Clare Island, the south isles of Arran, at the mouth of Galway Bay, and Valentia Island, on the south side of Dingle Bay, are, after Achill, among the most considerable islands on the west coast. Their inhabitants, and those of the other islands, subsist partly by fishing and partly by agriculture. They use chiefly the Irish language; are barely acquainted with the rudiments of civilisation; and are mostly in a state of extreme poverty. Rathlin Island, off the north coast of Ireland, is principally celebrated for its basaltic columns.—(*Ante*, p. 342.) There are reckoned to be, in all, nearly 200 islands in the seas and bays (principally the latter) round Ireland, of which, from 130 to 140 are inhabited. Their population, which in most instances is very dense, amounts to about 45,000.

PART II.

POPULATION.

SECT. 1.—*Population of England and Wales.*

Races of Inhabitants.—There can be no reasonable doubt that Britain received its first inhabitants from the contiguous shores of the Continent. The best critics are of opinion that the original immigrants were Celts; being denominated *Gael* (Guydels of the Welsh), no doubt, from their having passed over from Gaul. At some subsequent period these original immigrants were followed by the Cimbri, or Northern Celts.* It is believed that, after the invasion of the latter, a considerable portion of the Gaelic Celts emigrated to Ireland, where the Gaelic dialect of the Celtic language still predominates. But, however, this may be, the Cimbric Celts seem to have obtained a complete ascendancy over their predecessors. Their descendants continue to this day to occupy the principality of Wales, where the Cymraig dialect of the Celtic language, "the genuine daughter of the ancient British spoken in the time of the Romans," is still in common use.† The epoch of the Gothic immigration is not known; but, at a period which must have long preceded the Christian æra, the Goths, who are believed to have emigrated from the countries between the Black Sea and the Caspian, were in possession of the north-western parts of Germany and Gaul as far south as the Seine. That portion of the great Gothic family that settled in the Low Countries and the north of France were called by the Romans *Belgæ*, and are represented as a brave and warlike nation.—(*Cæsar, De Bello Gallico*, lib. i. § 1.) From Gaul they passed over to Britain, where they occupied, when it was invaded by Julius Cæsar, its south-eastern and most fertile provinces.—(*De Bello Gallico*, lib. v. § 12.) The Belgian colonists were, undoubtedly, the principal ancestors of the modern English nation. The Saxons, who invaded England after it had been abandoned by the Romans, were a congenerous race with its Belgic occupants; but the latter, enfeebled by being long subject to the Roman power, seem to have lost that valour for which they were once so conspicuous, and were easily subdued by the Saxons. There is, however, no reason to think that the latter came over in such numbers as to have been able fully to occupy the country, or to have given it a new language, had their own differed materially from that already in use in it. ‡ The population of all the eastern, southern, and more level part of the island may, therefore, be looked upon as having been

* For proofs that the Cimbri were Celts, see Pinkerton's *Dissertation on the Scythians*, annexed to his *Inquiry into the History of Scotland.*

† *Percy's Introduction to the Translation of Mallet's Northern Antiquities*, p. 5. There cannot, as the same learned writer, Pinkerton, and others have shown, be a doubt as to the identity of the ancient Britons and the Celtic Gauls. The French call Wales, *Pays de Galles*, that is, country of the Gauls.

‡ *Pinkerton's Geography*, vol. i., p. 20, ed. 1802.

at this period essentially Gothic, and as derived rather from the Belgian than the Saxon Goths.

The temporary conquest of England by the Danes, and its subsequent subjugation by the Normans, however important in other respects, made no sensible change in the stock of the inhabitants. The Normans, though long settled in France, where they had acquired the use of the French language, originally emigrated from Norway, and belonged, as well as the Danes, to the Gothic family. Except, therefore, in so far as we may suppose the Celtic and Belgic inhabitants to have been blended together, the Gothic blood would seem to have been preserved pretty pure in all the country to the north and east of the Severn and the Exe.

Within the last few years, however, an immigration has taken place into England, and also into Scotland, that has already had a great, and promises to have a still greater, influence over the blood and character of the people. We allude to the immigration of Irish, or Celtic, labourers into Great Britain. Considering the want of employment, and the low rate of wages in Ireland, the temptation to emigrate to England is all but irresistible; and steam communication has reduced the expenses of transit to almost nothing; having established, as it were, floating bridges between Dublin and Liverpool, Belfast and Glasgow, Waterford and Bristol. In consequence, very many thousands of Irish labourers have established themselves in Lancashire, Lanarkshire, and other places, principally on the west coast of England and Scotland. So great, indeed, has been this immigration, that, at present, it is believed about a *fourth part* of the population of Manchester and Glasgow consists of native Irish and of the descendants of such; and in other places the proportion of Irish blood is even greater. Instead of being diminished, this influx, great as it has been, has latterly been augmented, and threatens to entail very pernicious consequences on the people of England and Scotland. The wages of the latter have been reduced by the competition of the Irish; and, which is still worse, their opinions in regard to what is necessary for their comfortable and decent subsistence have been lowered by the contaminating influence of example, and by familiar intercourse with those who are content to live in filth and misery. It is difficult to see how, with the existing facilities of intercourse between the two countries, the condition of the labouring classes in them should not be pretty much approximated; and there is too much reason to fear that the equalisation will be brought about rather by the degradation of the English than by the elevation of the Irish. Hitherto the latter have been very little, if at all, improved by their residence in England; but the English and Scotch with whom they associate have been certainly deteriorated. Though painful and difficult, the importance of the subject gives it the strongest claims on the public attention. It were better that measures should be adopted to check, if that be possible, the spread of pauperism in Ireland, and to improve the condition of its inhabitants; but, if this cannot be done, it seems indispensable that we should endeavour to guard against being overrun by a pauper horde.

Having premised these few observations with respect to the races

of men by which the kingdom has been peopled, we proceed to an inquiry more germane to statistics, or to investigate the amount of the population.

Progress of Population.—The determination of the magnitude of the population of a country is one of the most important problems that can engage the attention of the politician. There are various indirect methods by which it may be approximated with more or less accuracy; but it cannot be precisely ascertained otherwise than by making a census or enumeration of the inhabitants, under such precautions as may insure its correctness.

This, however, is a measure that cannot be carried into effect except by order of government, which has not always had the power, and has oftener wanted the inclination, to interfere for such purpose. In this country no census was taken previously to 1801; and our knowledge of the amount of the population at antecedent periods becomes proportionally vague the further we recede from this recent æra. It has been concluded, from the enumeration in Domesday Book, that there were, at the æra of the Conquest, 300,785 families, or (at 5 individuals to a family) 1,504,925 persons, in England. Wales, however, and the four northern counties of Northumberland, Cumberland, Durham, and Lancaster, are excepted from this enumeration. And allowing for these, and other omissions, perhaps the entire population of England and Wales, at the æra in question, may have amounted to 2,150,000, or thereabouts.*

In 1377, a poll tax of 4*d.* was imposed on every lay person, whether male or female, of 14 years of age, mendicants only excepted; and it appears that 1,367,239† persons paid this assessment, exclusive of those in Wales, Chester, and Durham, which do not appear in the roll. But besides these, there must, no doubt, have been very many omissions in the counties of which we have the assessments; so that it is plain little or no authentic information respecting the state of the population can be learned from this document. Mr. Chalmers has, however, concluded that the population of England and Wales was, at the epoch in question, about 2,350,000; and perhaps this is not very wide of the mark; but the data are obviously too loose and unsatisfactory to enable any one to pronounce with any certainty with respect to it.—(*Chalmers' Comparative Estimate*, p. 13, ed. 1802.)

The dreadful pestilence that raged in 1349 is said to have dispeopled England of more than half its inhabitants. This, however, is most probably a very exaggerated statement; but if the mortality amounted to a third, it is hardly possible it could have been filled up by the year 1377. No doubt, however, the increase in the rate of wages consequent to the pestilence, and which the Statute of Labourers (passed after the mortality had subsided) vainly attempted to prevent, must have given a considerable stimulus to the principle of increase, and materially augmented the proportion of children to adults; so that it is probable they amounted to considerably more than a third part of

* Mr. Turner thinks that the population of England only, at the epoch of the Conquest, exceeded *two* millions.—(*Hist of Anglo-Saxons*, 5th ed., vol. iii., p. 258.)

† This is the sum obtained by adding together the items on the record; the quota stated in it is 1,376,442.

the entire population, at which they are estimated by Mr. Chalmers. The small population of several of the great towns, as deduced from this subsidy roll, would seem to show pretty conclusively that, in 1377, the country had not recovered from the pestilence of 1349; and that the population was then under its average amount. London, for example, is said to have contained only 35,000 inhabitants in 1377, Bristol under 10,000, Norwich under 6,000, and so on. These statements seem to be quite inconsistent with the most authentic evidence as to the extent, importance, and wealth of these cities in the 14th century; and there would consequently appear to be little doubt, unless we suppose some great error to have insinuated itself into the subsidy roll, that the cities referred to had not recovered in 1377 from the preceding mortality.—(See *Paper by Mr. Amyot, Archæologia*, vol. xx.)

In 1528, commissioners were appointed for taking an account of the stock and grain throughout the kingdom; and fragments of these returns, for certain districts in Wilts, Essex, and Kent, have been preserved, along with a statement of the number of their inhabitants. The districts in question contained, at the above-mentioned epoch, a population of 16,425, while in 1831 the population of the same districts was 52,392. If we suppose this rate of increase to have been uniform throughout the kingdom, the population in 1528 will be found to be 4,356,000. But it is needless to say that no safe inferences can be deduced from facts and inferences of the kind now alluded to.

Harrison and Sir Walter Raleigh state the number of fighting men, in 1575 and 1583, at 1,172,000. But there is no reason to think that this estimate was made with anything like due care; and unless—of which there is no evidence—it included all the able-bodied individuals between certain specified ages, it affords very slender means from which to deduce the actual amount of population at the time. Perhaps, however, we may infer from it that the population was not then much above, nor much below, *five* millions. Notwithstanding the influence of the civil wars in the reign of Charles I., there can be little doubt that the population increased considerably during the seventeenth century, particularly in the period between the Restoration and the Revolution; but, unfortunately, we have no means of estimating this increase, nor even of deciding on sure grounds in regard to the amount of the population at the accession of William III. Previously, indeed, to the Revolution, a hearth tax, proportioned to the number of fireplaces in each, was payable by all houses in the kingdom; and the celebrated political arithmetician, Gregory King, availing himself of the returns obtained under this tax, framed an estimate of the population in 1696, entitled to much more attention than any of those by which it was preceded. King found that the number of houses in the books of the Hearth Office, in 1690, was 1,319,215. But the hearth duty being charged on the tenant, the divided houses stand in this account as so many separate dwellings; and deducting for these, and for uninhabited houses, smiths' shops, &c., and allowing for the increase in the preceding 6 years, he concluded that there were in England and Wales, in 1696, 1,300,000 inhabited houses; viz., in London and the Bills of Mortality, 105,000; in other cities and market towns,

195,000; and in villages and hamlets, 1,000,000. He then estimates the population per house, and the total population, as follows:—

	Inhabited Houses.	Souls per House.	Number of Souls.
The 97 parishes within the walls . .	13,500	5·4	72,900
The 16 parishes without the walls . .	32,500	4·6	149,500
The 15 out parishes in Middlesex and Surrey	35,000	4·4	154,000
The 7 parishes in the city and liberty of Westminster	24,000	4·3	103,200
So London and the Bills of Mortality contain	105,000	4·57	479,600
The other cities and market towns .	195,000	4·3	838,500
The villages and hamlets	1,000,000	4	4,000,000
In all	1,300,000	4·09	5,318,100

"But considering that the omissions in the said assessments may well be,

In London and the Bills of Mortality .	10 per cent.,	or	47,960 souls.
In the cities and towns	2 „		16,500 „
In the villages and hamlets	1 „		40,000 „
In all . . .			104,460,

it follows that the true number of people, dwelling in the 1,300,000 inhabited houses, should be 5,422,560 souls, being at the rate of 4·17 heads per house." King adds to this 77,440, for soldiers, sailors, vagrants, &c., having no regular domicile; making the entire population in 1696, 5,500,000.

Errors may have crept into this statement, either through inaccuracies in estimating the number of houses, or the number of persons to a house. On the whole, however, we are inclined to think that it is not very wide of the mark, and that it is entitled to as much credit as most estimates not deduced from actual enumeration.

The hearth tax was abolished at the Revolution. A duty on windows was imposed in 1696; but cottages exempted from the usual taxes to church and poor, being also exempted from the window duties, many of them were left out of the returns made by the collectors of the latter, so that it speedily became next to impossible to construct any probable estimate of the population on the basis assumed by Gregory King. Had the registers of births and deaths been accurately kept, they would have shown satisfactorily whether the population was increasing or diminishing; and its actual amount might have been learned, by observing the ratio which they bore to the population in as many districts of the country as might have been supposed to give a fair average of the whole. But both these registers were very defective, and not being published, but being dispersed piecemeal all over the country, they were accessible to a few only. Under these circumstances, we need not wonder that the most conflicting statements were put forth as to the amount of the population. Dr. Price, first in his *Treatise on Annuities*, and subsequently in a tract published in 1780, contended that the population of England and Wales had been progressively decreasing since the Revo-

lution; and that, at the period when he wrote, it only amounted to 4,763,000! This essay excited a good deal of attention and controversy. Of the numerous answers which it elicited, those by the Rev. Mr. Howlett,* vicar of Dunmow, in Essex, and Mr. Wales,† mathematical master of Christ's Hospital, were by far the best. They showed that the statements on which Dr. Price built his conclusions were most erroneous, and that his reasonings were, besides, illogical and inconclusive. But though a bill for taking a census was introduced into parliament in 1753, the measure was not carried into effect, nor the disputes as to the amount of the population terminated, till 1801. Since then the census has been repeated at four different decennial periods, or in 1811, 1821, 1831, and 1841, so that we possess a very satisfactory account of the progress of population in Great Britain during the present century. See following page for a statement of the Population of England and Wales in 1801, 1811, 1821, 1831, 1841 and 1851.

Mr. Finlaison, of the National Debt Office, availing himself of the returns as to births, marriages, and deaths obtained under the Population Acts, as well as of various other sources of information, has framed the following statement of the population during last century, which may be regarded as approaching as near to accuracy as the subject will admit of:—

Population of England and Wales, from the Year 1700 *to the Year* 1801, *including the Army, Navy, and Merchant Seamen.*

Years.	Population.	Years.	Population.	Years.	Population.
1700 . .	5,134,516	1740 .	5,829,705	1780 .	7,814,827
1710 . .	5,066,337	1750 .	6,039,684	1790 .	8,540,738
1720 . .	5,345,351	1760 .	6,479,730	1801 .	9,172,980‡
1730 . .	5,687,993	1770 .	7,227,586		

It appears from this statement that the population declined during the first 10 years of last century, and that it increased but slowly during the 40 years ending with 1750. In fact, it was not till after that period, or rather till after the peace of Paris in 1763, that England began to take the lead among European powers as a commercial and manufacturing nation. But since then, and especially since the memorable period (1767–1770) when the inventions of Hargraves and Arkwright laid the foundations of the cotton manufacture, our progress in manufactures and commerce, and, consequently, also in wealth and population, has been great beyond all former example.

Density of the Population.—More stress has been laid on the determination of this point than it probably deserves, from its being supposed that, where there is a considerable density of population, the

* *An Examination of Dr. Price's Essay on the Population of England and Wales.* Maidstone, 1781.

† *An Inquiry into the present Population of England and Wales.* Lond. 1781.

‡ This number is found by adding to the population of 8,872,980, given by the Census, 300,000 for the share belonging to England, of the 470,598 soldiers and sailors belonging at that epoch to the United Kingdom. See *post*, section iv. on the Population of the United Kingdom.

Population of England and Wales, exclusive of Army and Navy, as determined by the Censuses of 1801, 1811, 1821, 1831, 1841, *and* 1851; *showing its Amount in each of these Years in each County, with the Ratio of its Increase in the intervening decennial Periods.*

Counties.	1801	Incr. per Cent.	1811	Incr. per Cent.	1821	Incr. per Cent.	1831	Incr. per Cent.	1841	Incr. per Cent.	1851
Bedford	63,393	11	70,213	20	84,032	14	95,483	13	107,936	16	124,473
Berks	110,480	7	119,480	11	132,689	10	146,234	10	161,759	5	170,065
Buckingham . .	100,122	9	112,065	14	128,128	9	146,977	6	156,439	5	165,223
Cambridge . . .	89,346	13	101,109	21	122,397	18	143,955	14	164,459	14	185,405
Chester	192,305	18	227,094	19	270,098	24	334,391	18	395,660	15	455,725
Cornwall	192,281	14	220,525	18	261,045	15	301,306	14	342,159	4	355,558
Cumberland . . .	117,230	14	133,665	17	156,124	8	169,282	5	178,038	10	195,492
Derby	161,567	14	185,487	15	213,651	11	237,170	15	272,202	9	296,094
Devon.	340,396	12	382,778	15	438,417	12	493,908	7	533,959	6	567,098
Dorset.	114,452	9	124,718	16	144,930	10	159,305	10	175,054	5	184,307
Durham	149,384	10	165,294	17	193,511	24	239,256	22	307,968	27	390,997
Essex	227,092	11	252,473	15	289,404	10	317,507	9	344,979	7	369,318
Gloucester . . .	250,733	14	285,955	18	336,110	15	387,398	11	431,495	6	458,805
Hereford	89,436	6	93,526	10	102,669	8	110,617	2	113,272	2	115,489
Hertford	97,338	14	111,225	17	129,731	10	142,864	10	156,660	7	167,298
Huntingdon . . .	37,568	12	42,208	16	48,946	9	53,192	10	58,549	10	64,183
Kent	308,667	20	371,701	15	427,224	12	479,558	12	549,351	11	615,766
Lancaster. . . .	673,486	92	828,409	27	1,052,948	27	1,336,854	24	1,667,054	22	2,031,236
Leicester	130,082	15	150,349	16	174,571	13	197,003	10	215,967	7	230,396
Lincoln	208,625	14	237,814	22	288,958	12	317,465	14	362,502	12	407,322
Middlesex . . .	818,129	16	950,774	20	1,145,057	19	1,358,340	16	1,576,636	20	1,886,576
Monmouth . . .	45,568	35	62,105	22	75,801	29	98,126	36	134,368	17	157,418
Norfolk	273,479	7	291,947	18	344,368	13	390,034	6	412,664	7	442,714
Northampton . .	131,525	7	141,354	15	163,097	10	179,336	11	199,228	7	212,480
Northumberland .	163,078	19	193,269	15	222,589	11	236,959	12	266,020	14	303,508
Nottingham . . .	140,350	16	162,964	15	186,873	21	225,327	11	249,910	8	270,427
Oxford	111,777	7	120,276	15	138,224	11	153,526	6	163,127	5	170,439
Rutland	16,000	Stz.	16,486	13	18,487	5	19,345	10	21,302	6	22,593
Salop	169,246	9	184,973	7	198,411	6	213,518	6	225,820	2	229,341
Somerset	273,577	10	302,836	17	353,789	13	403,795	8	435,599	2	444,916
Southampton . .	219,290	12	246,514	15	282,697	11	313,976	12	354,682	13	405,370
Stafford	242,693	21	294,540	17	345,072	18	407,480	24	509,472	20	608,716
Suffolk	214,404	9	234,963	16	271,541	9	296,317	6	315,073	7	337,215
Surrey	268,233	20	324,851	23	399,417	22	486,434	20	584,036	17	683,082
Sussex.	159,471	19	190,343	23	234,328	17	272,644	10	300,075	15	348,944
Warwick	206,798	10	228,906	20	274,432	23	338,645	19	401,703	19	475,013
Westmoreland . .	40,105	12	45,078	12	51,459	7	55,041	3	56,454	3	58,287
Wilts	184,329	4	191,853	14	219,574	8	237,244	8	256,230	—1	254,221
Worcester. . . .	146,441	15	168,982	15	194,074	15	222,655	12	249,460	12	276,926
York, East Riding .	111,162	20	133,975	15	154,643	9	168,891	15	194,936	12	220,983
City	16,846	13	19,099	14	21,711	21	26,260	10	29,842	28	38,403
North Riding .	158,027	7	170,127	11	188,178	9	192,206	6	204,701	5	215,214
West Riding .	502,168	16	602,875	22	734,363	22	984,609	18	1,163,580	14	1,325,405
Totals of England	8,350,839	14	9,553,021	18	11,281,883	16	13,090,528	14	14,997,427	13	16,921,888
Anglesey	33,606	9	37,045	22	45,063	7	48,325	5	50,891	12	57,327
Brecon	32,235	16	37,735	16	43,826	9	47,768	16	55,604	11	61,474
Cardigan	42,956	17	50,260	15	57,784	12	64,790	6	68,786	3	70,706
Carmarthen . . .	67,317	14	77,217	17	90,239	12	100,710	6	106,926	4	110,832
Carnarvon	41,921	19	49,635	17	58,009	15	66,818	21	81,073	8	87,870
Denbigh	60,299	6	64,249	19	76,428	8	82,685	7	88,478	5	92,821
Flint	39,469	16	45,737	17	53,563	12	60,244	11	66,919	2	68,156
Glamorgan	70,879	19	85,067	20	102,073	21	123,612	35	171,188	3	231,849
Merioneth	29,506	4	30,854	11	34,382	3	35,315	11	34,232	—1	33,943
Montgomery. . . .	48,184	8	52,184	15	60,245	11	66,844	4	69,607	—3	67,345
Pembroke	54,280	8	60,615	22	73,788	10	81,425	8	88,044	6	94,140
Radnor	19,135	7	20,417	10	22,583	10	24,743	3	25,458	—3	24,716
Totals of Wales .	541,677	13	611,285	18	718,354	12	806,284	13	911,705	10	1,005,721
Totals of England and Wales .	8,892,536	14	10,164,256	18	12,000,236	16	13,896,797	14	15,914,148	13	17,927,609

division of labour will be carried to a corresponding extent, and that the competition and judiciously combined efforts of the inhabitants will be productive of a much greater amount of wealth and enjoyments than would fall to the share even of a larger population, dispersed over a wider surface. Generally, perhaps, this is true; at least, when any considerable part of the population is collected into great towns. It is hardly possible to suppose that these should exist without there being at once a strong spirit of emulation and competition, and a considerable division and combination of employments among the inhabitants, with a consequent development of industry and an accumulation of wealth. But if large towns be wanting, the results may be materially different. A country divided into small farms, like Ireland,

may have a dense population, and be, notwithstanding, very far behind in the arts, and have but a very limited command of comforts and conveniences; while a country divided into large farms, like Scotland, and having a comparatively thin population, may be distinguished for its proficiency in manufactures, the extent of its commerce, and the general wellbeing of its inhabitants. It is necessary to keep this distinction in view, as great density of population in a country that is purely or principally agricultural is oftener an evidence of poverty and of backwardness in the arts than of anything else.

Table showing the Number of Acres in the several Counties of England and Wales, with the Number of Parishes and the Population of each County in 1851; *and showing also the Number of Inhabited Houses, and the Number of Acres to each Person, with the Number of Persons to a House in each County.*

Counties.	Statute Acres	Parishes.	Population Returns, 1851.			Inhabited Houses, 1851.	Number of Acres corresponding to each Person	Number of Persons corresponding to each House
			Males.	Females.	Totals of both Sexes			
Bedford	295,582	123	59,941	64,537	124,478	24,673	2·4	5·1
Berks	451,040	151	81,927	85,138	170,065	33,481	2·7	5·1
Buckingham	466,932	207	81,074	82,649	163,723	33,196	2·9	4·9
Cambridge	523,361	165	92,699	92,706	185,405	37,226	2·8	5·0
Cheshire	707,078	91	222,385	233,399	455,725	85,260	1·6	5·3
Cornwall	871,600	205	171,646	173,292	355,338	67,987	2·5	5·2
Cumberland	1,001,273	105	96,744	99,248	195,492	36,761	5·1	5·3
Derby	658,803	140	147,737	148,347	296,084	59,571	2·2	5·0
Devon	1,657,180	465	269,593	277,515	547,098	98,837	2·9	5·7
Dorset	632,025	275	89,204	95,004	184,207	36,138	3·4	5·1
Durham	622,476	76	186,700	194,297	380,997	64,977	1·6	6·0
Essex	1,060,549	414	185,399	183,919	369,318	74,530	2·9	5·0
Gloucester	805,102	338	218,187	240,618	458,805	86,359	1·8	5·3
Hants	1,070,216	223	202,014	203,356	405,370	75,238	2·7	5·3
Hereford	534,622	134	56,114	57,375	113,489	23,890	4·6	4·8
Hertford	391,141	102	82,831	84,467	167,298	32,573	2·3	5·1
Huntingdon	230,865	113	31,933	32,250	64,183	13,285	3·6	4·8
Kent	1,041,479	67	307,041	308,725	615,766	107,748	1·7	5·7
Lancaster	1,219,221	213	991,090	1,040,146	2,031,326	349,938	·6	5·8
Leicester	514,164	630	112,937	117,371	230,308	48,953	2·2	4·7
Lincoln	1,776,738	197	205,083	202,139	407,222	81,325	4·4	5·0
Middlesex	180,168	123	882,823	1,003,753	1,886,576	239,362	·1	7·9
Monmouth	366,399	748	92,449	75,060	157,418	26,939	2·4	5·4
Norfolk	1,334,301	303	215,284	227,460	442,714	93,142	3·1	4·8
Northampton	630,858	94	105,984	106,396	212,380	43,942	3·0	4·8
Northumberland	1,249,299	212	149,515	154,053	303,568	47,737	4·1	6·3
Nottingham	526,076	218	132,263	138,164	270,427	55,019	1·9	4·9
Oxford	472,887	51	85,524	84,915	170,439	34,378	2·8	5·0
Rutland	95,605	217	11,801	11,152	22,953	4,588	4·2	5·0
Salop	826,055	474	114,340	115,001	229,341	45,648	3·6	5 0
Somerset	1,047,290	318	211,145	232,871	445,016	85,054	2·4	5·2
Stafford	729,466	151	310,032	298,684	608,716	116,273	1·2	5·2
Suffolk	947,681	509	166,308	170,007	337,215	69,252	2·8	4·9
Surrey	478,792	144	325,041	358,041	683,082	108,822	·7	6·3
Sussex	934,851	314	165,772	171,072	336,844	58,663	2·8	5·7
Warwick	563,946	201	232,411	242,602	475,013	96,731	1·2	4·9
Westmoreland	485,432	92	29,079	29,208	58,287	11,217	8·3	5·2
Wilts	865,092	303	125,728	128,493	254,221	51,667	3·4	4·9
Worcester	472,165	178	136,956	139,970	276,926	53,630	1·7	5·0
York, East Riding	768,419	187	109,443	111,540	220,983	44,363	3·5	4·9
City and Ainsty	3,720	48	16,977	19,226	36,203	7,007	·7	5·1
North Riding	1,350,121	192	106,710	108,504	215,214	44,446	6·3	4·8
West Riding	1,709,026	196	650,619	665,976	1,325,495	264,302	1·3	5·0
Totals of England	32,590,420	9,942	8,281,784	8,640,154	16,921,888	3,076,620	1·9	5·5
Anglesea	193,453	74	28,101	29,226	57,327	12,124	3·4	4·7
Brecknock	460,156	69	31,314	30,160	61,474	12,221	7·5	5 0
Cardigan	443,387	68	35,961	37,835	70,796	14,978	6·3	4·7
Caermarthen	606,331	76	53,076	57,556	110,632	22,465	5·5	4·9
Caernarvon	370,273	68	42,978	44,892	87,870	18,005	4·2	4·9
Denbigh	386,052	60	46,708	45,875	92,583	19,124	4·2	4·8
Flint	184,905	25	34,452	33,704	68,156	14,041	2·7	4·8
Glamorgan	547,494	125	120,746	111,101	231,849	43,202	2·4	5·3
Monmouth	293,291	34	19,151	19,692	38,843	8,159	9·9	4·8
Montgomery	468,383	52	33,694	33,701	67,395	13,350	7·2	5·0
Pembroke	401,691	141	48,675	50,465	94,140	19,136	4·3	4·9
Radnor	272,128	52	12,698	12,023	24,716	4,614	11·0	5·4
Totals of Wales	4,734,485	838	499,491	506,230	1,005,721	201,419	4·7	5·0
Totals of England and Wales	37,324,915	10,780	8,781,255	9,146,384	17,927,609	3,278,039	2·1	5·5

The preceding Table embodies all the information obtained under the late census in regard to the population and the number of inhabited houses in England and Wales. We have added to it columns showing the number of square miles and acres in each county and in the kingdom, with the population per square mile, and the number of acres corresponding to each person, and the number of persons corresponding to each house.

Population of Great Towns.—It would have been desirable, had it been possible, to have discriminated between the town and country population, and to have exhibited the amount of each. But the details in the late census, though minute and valuable, do not afford the means of making such a separation. There are in Great Britain 815 towns of various magnitudes from London downwards, including cities, county-towns, and market-towns. But many of these towns embrace a considerable extent of surrounding country, the population of which is included in that of the towns. In proof of this statement it is enough to mention that the Census Commissioners estimate the area of the towns of Great Britain and the Channel Islands at no less than 2,024,648 acres. And hence it is obvious, that a considerable portion of the population said to belong to the towns really belongs to the country; and though it had been possible accurately to distinguish between the urban and rural population, that would not, as many seem to suppose, afford the means of discriminating between those engaged in agriculture and in other businesses. In most cases, a large proportion of the smaller class of towns, that is, of those having under 6,000 or 7,000 inhabitants, is either directly engaged in some department of husbandry, or in departments intimately connected with it; and this, indeed, is more or less the case with a portion of the inhabitants of almost all towns. On the other hand, however, there are not a few of the smaller class of towns and villages that are almost entirely occupied by manufactures; so that no accurate inference could be drawn as to the occupations of the inhabitants, even had we been accurately informed as to the numbers resident in towns and villages.

There, however, can be no doubt that a much greater proportion of the population of England and Wales is resident in towns than that of, perhaps, any other country. This is partly a consequence, and partly a cause, of our superiority in manufacturing industry: and it is partly owing to our improved communications by canals, railroads, and otherwise, which enables the inhabitants of towns to obtain most sorts of raw products nearly as cheap as if they lived in the country.

An Account of the Population of the Principal Cities and Towns of England and Wales in 1801, 1811, 1821, 1831, 1841, *and* 1851.

N.B.—The same limits have been preserved throughout, or as near as was practicable.

Cities or Towns.	1801	1811	1821	1831	1841	1851
London	958,863	1,138,815	1,378,947	1,654,994	1,948,417	2,362,236
Manchester and Salford	94,876	116,874	163,635	237,832	311,009	401,321
Liverpool	82,295	104,104	138,354	201,751	286,487	375,955
Birmingham	70,670	82,753	101,722	143,986	182,922	232,841
Leeds	53,162	62,534	83,796	123,393	152,074	172,270
Bristol	61,153	71,433	85,108	104,408	125,146	137,328
Sheffield	45,755	53,231	65,275	91,692	111,091	135,310
Wolverhampton	30,584	43,190	53,011	67,514	93,245	119,748
Bradford	13,264	16,012	26,307	43,527	66,715	103,778

An Account of the Population of the Principal Cities and Towns of England and Wales—continued.

Cities or Towns.	1801	1811	1821	1831	1841	1851
Plymouth and Devonport	39,787	50,886	55,169	65,963	70,340	90,401
Newcastle upon-Tyne	33,048	32,573	41,794	53,613	70,337	87,784
Hull	29,580	37,005	44,520	43,510	67,308	84,690
Stoke-upon-Trent	23,278	31,557	40,237	51,589	68,444	84,027
Oldham	21,677	29,479	38,201	50,513	60,451	72,357
Portsmouth	33,226	41,587	46,743	50,389	53,032	72,096
Brighton	7,440	12,205	24,741	41,994	49,170	69,673
Preston	12,174	17,360	24,859	33,871	50,887	69,542
Norwich	36,238	36,748	49,705	60,505	61,846	68,195
Sunderland	24,998	25,821	31,891	40,735	53,335	67,394
Merthyr Tydvil	10,127	14,945	20,959	27,281	43,031	63,080
Bolton	17,966	24,799	32,045	42,245	51,029	61,171
Leicester	17,005	23,453	31,036	40,639	50,806	60,584
Nottingham	28,861	34,253	40,415	50,680	53,091	57,407
Bath	33,196	38,408	46,700	50,800	53,196	54,240
Stockport	14,830	17,545	21,726	25,469	50,154	53,835
Blackburn	11,980	15,083	21,940	27,091	36,629	46,536
Exeter	17,412	18,896	23,479	28,242	37,231	40,688
Derby	10,832	13,043	17,423	23,627	32,711	40,609
Macclesfield	13,255	17,143	23,154	30,911	32,629	39,048
Dudley	10,107	13,925	18,211	23,430	31 232	37,962
Coventry	16,034	17,923	21,448	27,298	31,032	36,812
York	16,846	19,099	21,711	26,260	28,842	36,303
Southampton	7,913	9,617	13,353	19,324	27,744	35,305
Cheltenham	3,076	8,325	13,396	22,942	31,411	35,051
Halifax	12,010	12,766	17,056	21,552	27,520	33,582
Ipswich	11,277	13,670	17,186	20,201	25,384	32,914
Wigan	10,989	14,060	17,716	20,774	25,517	31,941
Swansea	10,117	11,963	14,896	19,672	24,604	31,461
Bury	9,152	11,302	13,480	19,140	24,846	31,262
Huddersfield	7,268	9,671	13,284	19,035	25,068	30,880
Yarmouth	16,573	20,448	21,007	24,535	27,865	30,879
Ashton-under-Lyne	5,727	7,037	9,222	12,441	22,678	29,791
Rochdale	8,040	10,392	12,998	18,351	24,272	29,195
Tynemouth	13,171	17,548	23,173	23,206	25,416	29,170
South Shields	11,011	15,165	16,503	18,756	23,072	28,974
Chatham	12,940	15,787	19,177	21,124	24,269	28,424
Oxford	11,694	12,931	16,364	20,649	24,258	27,943
Cambridge	10,087	11,108	14,142	20,917	24,453	27,815
Chester	15,052	16,140	19,949	21,344	23,866	27,666
Worcester	11,460	13,814	17,023	18,610	27,004	27,528
Northampton	7,020	8,427	10,793	15,351	21,242	26,657
Carlisle	9,415	11,476	14,416	18,865	21,550	26,310
Walsall	10,399	11,189	11,914	15,066	19,857	25,680
Gateshead	8,597	8,782	11,767	15,177	20,123	25,568
Birkenhead	110	105	200	2,569	8,223	24,285
Dover	7,084	9,074	10,327	11,922	17,795	24,244
Warrington	11,321	12,682	14,822	18,184	21,116	23,363
Wakefield	10,581	11,393	14,164	15,932	18,842	22,057
Reading	9,742	10,788	12,867	15,595	18,937	21,456
Burnley	3,918	5,405	8,242	10,026	14,224	20,828
Maidstone	8,027	9,443	12,508	15,790	18,086	20,801
Stalybridge	..	..	..	..	..	20,760
Totals	2,164,290	2,602,190	3,216,307	4,102,802	5,073,141	6,267,011

It appears from this statement that above a third part of the population of England and Wales resided, in 1851, in towns, having a population of about 20,000 and upwards. It appears, too, that while during the 10 years ending with 1850, the entire population increased at the rate of 13 per cent., that of the great towns increased at the rate of 23½ per cent. But, if we compare the population of 1831 with that of 1851, deducting the population of the great towns, as given above, at each of these periods, the ratio of the increase of the rural population, including the smaller class of towns, will be found to be much under the increase of the great towns.

This extraordinary increase of the urban, as compared with the increase of the rural population, is a natural consequence of the rapid progress of manufactures and commerce. Speaking generally, the former can only be successfully carried on in towns or in localities where there is a large population, for there only can labour be sufficiently divided, and the various departments of any great manufacture so distributed and combined that the general results may be brought about most expeditiously and economically.

Table showing the Population of Twenty-one of the Principal Cities and Towns of England and Wales in 1851, *the Number of Houses in each, and the Number of Persons to a House.*

Cities and Towns.	Population in 1851.	Inhabited Houses in 1851.	Number of Persons to a House.
The Metropolis	2,027,528	255,890	7·9
Manchester, Salford, and Suburbs	401,321	68,546	5·8
Liverpool, with Toxteth Park	375,955	54,310	6·9
Birmingham and Suburbs	232,841	45,844	5·0
Leeds Borough	172,270	36,165	4·4
Bristol	137,328	20,873	6·5
Plymouth, Devonport, &c.	90,401	8,960	10·0
Sheffield	135,310	27,099	4·9
Norwich	68,195	14,988	4·6
Nottingham	57,407	11,549	4·9
Portsmouth, including Portsea	72,096	12,825	5·6
Preston	69,542	11,348	6·1
Newcastle-on-Tyne	87,784	10,441	8·4
Leicester	60,584	12,805	4·7
Brighton	69,673	10,843	6·5
Rochdale Parish	98,013	19,048	5·1
Stoke-upon-Trent Parish	57,942	9,195	6·3
Ashton-under-Lyne Parish	56,959	10,294	5·5
Oldham	52,820	9,900	5·3
Hull	84,690	16,634	5·0
Merthyr Tydvil Parish	46,378	8,741	5·3
Totals	4,455,037	676,298	6·5

The subjoined table exhibits the town and country population of Great Britain as given in the census of 1851, constructed from the Parliamentary returns.

Town and Country Population of Great Britain in 1851.

	Number		Population of Towns.	Population of Villages and Detached Dwellings of the Country.	Area in Acres of Towns.	Area in Acres of the Country surrounding the Towns.	Total Area.	
	Of Counties.	Of Towns.*					In Acres	In Square Miles.
England and Wales	52	580	8,990,800	8,936,800	1,724,406	35,600,509	37,324,915	58,429
Scotland	33	225	1,497,079	1,391,663	†267,134	19,780,328	20,047,462	31,434
Islands in British Seas	2	10	68,409	74,726	19,103	236,892	256,000	894
Great Britain and Islands in British Seas	87	815	10,556,288	10,403,189	2,024,643	55,599,729	57,624,377	90,089

* London is here considered as one Town; so also are Manchester and Salford, Edinburgh and Leith.

† The area of the Scotch towns is not known; but it has been assumed, in estimating the area of the towns in Great Britain and the Channel Islands, that the number of persons to an acre is the same in the Scottish and Island towns as it is in the English towns.

It appears, from the foregoing tables, that in England and Wales generally there are 5·5 individuals to a house; while in the great towns there are 6·5. Plymouth, Newcastle, and London, have the greatest number of individuals to a house. In the metropolis the number is nearly 8 individuals to every house.

The following table embraces some interesting particulars in respect to the ages of the population, and the country of their birth.

Account of the Population of each County of England and Wales in 1841; *showing also the Numbers of Males and Females in each, under and above* 20 *years of Age, with the Numbers respectively born in England and Wales, Scotland, Ireland, &c.*

Counties.	Total of Persons.	Ages.				Born in England and Wales.	Born in Scotland.	Born in Ireland.	Place of Birth not specified.
		Under 20 Years.		20 Years and upwards.					
		Males.	Females.	Males.	Females.				
Bedford	107,936	25,970	25,076	26,220	20,770	106,689	172	235	640
Berks	161,147	37,214	36,481	43,017	44,435	157,665	512	900	2,070
Bucks	155,978	37,032	36,637	39,450	43,164	154,001	269	367	1,346
Cambridge	164,459	39,367	39,219	42,214	43,629	162,234	292	863	1,110
Chester	395,660	93,692	95,149	99,954	106,865	379,182	1,808	11,577	3,093
Cornwall	341,279	84,625	82,703	90,132	93,819	337,567	960	981	2,351
Cumberland	178,038	41,111	41,038	45,181	50,708	165,050	6,355	4,881	1,752
Derby	272,217	64,450	64,425	71,170	72,172	268,354	487	1,849	1,527
Devon	533,460	129,795	121,773	131,975	158,927	524,209	1,040	4,084	4,067
Dorset	175,043	40,868	41,220	43,672	50,209	173,296	224	645	878
Durham	324,284	77,632	76,488	82,441	87,723	307,947	7,272	5,407	1,658
Essex	344,979	81,264	81,076	91,084	91,555	330,640	647	2,216	2,486
Gloucester	431,383	95,611	98,377	109,932	127,463	420,065	1,235	5,779	4,305
Hereford	113,878	25,088	24,811	31,890	32,089	112,703	126	322	727
Hertford	157,207	37,444	36,515	40,173	43,075	154,538	391	526	1,752
Huntingdon	58,549	14,080	13,991	14,992	15,486	57,954	74	185	336
Kent	548,337	125,279	123,037	147,253	152,748	524,781	4,515	10,401	8,640
Lancaster	1,667,054	388,901	394,009	425,946	458,198	1,526,932	21,747	105,916	12,459
Leicester	219,967	50,138	50,665	55,479	63,586	213,376	376	970	945
Lincoln	362,602	84,982	84,025	96,776	96,819	357,623	588	1,244	3,147
Middlesex	1,576,636	304,723	322,044	434,181	515,686	1,457,279	20,921	58,068	39,988
Monmouth	134,355	30,741	29,473	39,865	34,276	130,116	320	2,923	996
Norfolk	412,664	94,982	95,967	104,119	117,596	408,612	557	924	2,571
Northampton	199,228	46,608	45,995	52,469	54,256	196,753	376	966	1,131
Northumberland	250,278	56,708	56,954	64,560	72,056	231,179	11,910	5,218	1,971
Nottingham	249,910	57,606	59,036	64,125	69,143	240,189	634	1,522	1,565
Oxford	161,843	37,045	37,725	42,491	43,482	159,863	226	430	1,124
Rutland	21,302	5,071	4,923	5,630	5,736	21,097	25	36	144
Salop	239,048	55,645	54,624	63,710	65,069	236,130	391	1,199	1,319
Somerset	435,962	99,468	99,765	109,915	126,834	430,720	717	2,122	2,423
Southampton	355,004	81,115	80,247	94,908	99,734	346,876	2,024	3,402	2,702
Stafford	510,504	125,113	122,766	133,751	128,854	500,975	1,064	4,003	3,462
Suffolk	315,073	74,537	74,245	79,538	86,733	312,631	356	773	1,311
Surrey	582,676	123,570	126,304	154,643	178,091	554,003	4,642	13,922	10,151
Sussex	299,753	70,927	71,220	76,977	80,929	293,962	1,055	1,319	3,497
Warwick	401,715	96,890	92,931	104,799	118,105	390,3 5	1,456	6,383	3,629
Westmoreland	56,454	13,242	13,045	14,971	15,196	55,240	431	242	491
Wilts	258,733	61,370	60,194	66,870	70,299	255,965	284	605	1,879
Worcester	243,336	58,681	54,578	60,983	64,094	230,139	364	1,111	1,404
York, East Riding	194,986	43,079	43,278	52,939	55,640	189,466	1,129	1,945	2,396
City and Ainsty	38,321	7,712	8,277	10,381	11,871	37,234	275	534	278
North Riding	204,122	46,822	45,572	54,160	58,068	201,202	868	905	1,147
West Riding	1,154,101	262,957	282,179	291,163	297,802	1,129,217	3,888	15,177	6,019
Totals of England	14,995,138	3,421,639	3,448,737	3,893,748	4,223,014	14,461,950	102,065	284,128	146,995
Anglesey	50,891	11,952	11,738	12,432	14,779	50,502	45	137	207
Brecon	55,603	12,448	12,452	15,626	15,077	54,997	155	282	269
Cardigan	68,766	16,144	16,320	16,071	20,231	68,387	35	70	274
Caermarthen	106,826	25,720	25,782	24,956	29,868	105,743	63	168	852
Caernarvon	81,003	18,870	18,504	20,755	22,564	80,837	86	292	678
Denbigh	88,866	21,226	20,462	23,202	23,976	88,138	116	316	302
Flint	66,919	16,345	15,367	17,463	17,544	65,919	90	370	540
Glamorgan	171,188	39,974	38,738	47,895	44,581	166,471	401	3,174	1,142
Merioneth	39,332	8,844	8,616	10,435	11,437	39,109	21	52	150
Montgomery	69,219	16,479	16,527	17,804	18,409	68,720	81	95	346
Pembroke	86,044	20,242	21,313	20,006	26,481	87,304	91	293	966
Radnor	25,356	6,036	6,026	6,790	6,504	25,211	12	43	100
Totals of Wales	911,603	214,280	212,445	233,427	251,451	900,721	1,173	5,276	4,433
Persons ascertained to have been travelling by railways and canals during the night of June 6, 1841	5,016	542	120	3,568	786				
Totals of England and Wales	15,911,757	3,644,461	3,661,302	4,130,763	4,475,231	15,362,671	103,238	289,404	151,428

Proportion of Males and Females.—It appears from the experience of all countries in which correct censuses of the population have been taken, that there is uniformly a small excess in the number of male over that of female births; the one being to the other generally as 16 to 15, or as 22 to 21, or some nearly similar proportion. The following Table (p. 409) shows that, during the 10 years ending with 1840, there were registered of male baptisms 1,991,818; and of female baptisms 1,932,632; the former being to the latter nearly in the ratio of 20 to 19. We believe, however, that the excess of male over female births is not really quite so great as it appears to be from this table; inasmuch as more care is usually supposed to be taken in the registration of male than of female births. But the error thence arising cannot be material.

But, notwithstanding this excess of male births, it is found that, owing to the greater risks and casualties to which men are exposed in the military and naval service, and otherwise, their greater emigration, &c., there is, in almost all old settled countries, a larger amount of female than of male population. Thus, in 1841, there were in Great Britain, including the army and navy, 9,342,127 males, and 9,582,308 females, showing an excess on the part of the latter of 240,181.

Proportion of Births, Marriages, and Deaths to the Population.—It is of importance, not only with a view to statistical inquiries, but in reference also to the civil rights of individuals, which may be seriously affected by the want of such information, that all births, marriages and deaths should be entered in public registers. But here, as in most other countries, the register of these events was, until very recently, far from being either complete or accurate. A good deal was left to the discretion of the parties; and while this is the case, it were idle to expect completeness in the registers. The clergy were required, so far back as 1538, to keep a register of every marriage, christening, and burial within their respective parishes; and in 1603 the injunction was renewed, and a form prescribed in which the register should be kept. In 1822, an Act was passed for the better regulating and preserving parish and other registers; and through its influence the register of baptisms was a good deal improved. But the vice of the old system of registration was, that being too much connected with the church, it was looked upon rather as a sort of religious ceremony than as a civil act; and was in this way rendered an object of jealousy and aversion to most classes of dissenters. But though the registers had been in other respects as complete as they were defective, their diffusion would have deprived them of a large portion of their utility; for being distributed in immense numbers all over the country, it often became a matter of extreme difficulty to learn in which register certain facts were specified. Hence the obvious importance, not merely that births, marriages, and deaths should be recorded, but also that the records of the events should be brought together into a safe place of deposit, where they may be easily accessible to any one wishing to consult them.

The register of baptisms has been the most defective of any. Many dissenters who bury in the cemeteries of the established church baptize after their own manner; so that though their deaths appear in the

register, their births do not. In large towns, the rite of baptism is not unfrequently neglected altogether; so that the registers in very many places are so inaccurate as not to afford any materials on which reliance can be placed. The total number of deaths in England and Wales, during the 10 years ending with 1830, is believed to have amounted to 2,657,797; and to balance these deaths, and to provide for the increase of population that took place in that period, the births must have been 4,636,672. But, according to the register, the births during these 10 years were only 3,753,493,—being 883,179, or about 24 per cent below what they ought to have been!—(*Preliminary Remarks to Census of* 1831, p. 45.)

The proportion of registered baptisms to the population, during the 5 years ending with 1830, appears according to the Returns prefixed to the census of 1831, to have been as 1 to 34; and it further appears that the total number of births registered in 1830, was 382,000, of which 20,039, or 1 in 19, were illegitimate. But the more accurate returns obtained under the new registration system (see p. 413) show that the proportion of births to the population, amounted during the six years, ended with 1844, to 1 in 31. The total number of births registered during the year 1842 was 517,739, of which 34,796, or 1 in 14·8 was illegitimate.—(*Sixth and Seventh Reports of Registrar-General.*)

Till 1754, the marriage register was worth very little; but the Act of the 26 Geo. II., for the better prevention of clandestine marriages, having come into operation that year the register has been since nearly correct. The Act in question made the registration of marriages indispensable to their validity. In the northern counties it was evaded to some extent, by marrying in Scotland; and the Quakers and Jews marry according to their own forms, and in their own congregations. But the deficiency thence arising is inconsiderable, and does not affect the comparative amount of marriages in different years. During the 5 years ending with 1830, the proportion of marriages to the population was as 1 to 128.

Table showing the Number of Marriages in each Year from 1754 *to* 1800, *with the Average Number of Marriages for every Five and every Ten Years since* 1754.

Number of registered Marriages in each Year from 1755 to 1900.						Periods	Medium Average of Five Years.	Medium Average of Ten Years.
Years.	Marriages	Years.	Marriages.	Years.	Marriages.			
1755	49,379	1771	60,612	1786	68,992	1755–1760	52,666	56,275
1756	50,972	1772	60,337	1787	76,448	1761–1765	59,883	
1757	48,300	1773	59,769	1788	70,032	1766–1770	59,043	59,892
1758	50,672	1774	60,512	1789	70,696	1771–1775	60,741	
1759	55,537	1775	62,473	1790	70,648	1776–1780	64,238	64,479
1760	57,848	1776	65,462	1791	72,590	1781–1785	66,722	
1761	58,101	1777	65,020	1792	74,919	1786–1790	71,363	71,784
1762	56,543	1778	62,727	1793	72,880	1791–1795	72,205	
1763	62,233	1779	63,671	1794	71,797	1796–1800	74,998	79,231
1764	63,310	1780	64,309	1795	68,839	1801–1805	83,465	
1765	59,227	1781	63,768	1796	73,107	1806–1810	82,953	85,985
1766	57,043	1782	63,071	1797	74,997	1811–1815	89,012	
1767	55,324	1783	66,287	1798	79,477	1816–1820	93,073	100,064
1768	58,331	1784	68,935	1799	77,557	1821–1826	103,363	
1769	61,825	1785	71,509	1800	69,851	1826–1830	107,056	
1770	62,693							

This proportion is, however, liable to be seriously affected by the prosperous or unprosperous condition of the people at the time; and

consequently, therefore, by variations in the price of the principal article of subsistence. Thus, the average price of wheat in 1798 and 1799, was 3*l.* 0*s.* 5*d.* a quarter, and the average annual number of marriages during the same 2 years was 78,527: but during 1800 and 1801, the average price of wheat rose to 5*l.* 16*s.* 8*d.*, while the annual average number of marriages was reduced to 68,539, being a decline of very near 10,000 a year! In 1802 and 1803, prices fell off to near their old level, and the annual average number of marriages in these years, increased of course, by deferred engagements, rose to 92,387, being an excess of 23,848 a year above what they had been during the scarcity, and of 13,860 a year above their amount during the preceding biennial period! The comparative number of births and burials, especially the latter, is also materially influenced by the same cause.

It, must, however, be observed that these effects depend entirely, or almost entirely, on the *suddenness* of the rise or fall of prices. A series of years of high prices may not be, and most frequently indeed is not, accompanied by an increased number of deaths and a diminished number of marriages, nor a series of years of low prices by a diminished number of deaths and an increased number of marriages. In such cases the rate of wages is, in some measure, accommodated to the state of prices: so that their absolute magnitude, provided it be pretty constant, has, in general, comparatively little influence. But such is seldom or never the case with sudden and considerable variations of prices; and, unless modified by some countervailing circumstances, they hardly ever fail of having a powerful and marked influence.

The average fruitfulness of marriages depends on a variety of circumstances, such as the age of the parties when they are contracted,* the prosperous or unprosperous condition of the country, and so on. During the 6 years ending with 1842, there were, in England and Wales, according to the accurate accounts of the Registrar-General, 487,152 registered marriages, and 2,024,774 registered births; being at the rate of 415·6 births to each 100 marriages. This, however, is too much, seeing that it includes the illegitimate births; and, allowing for them, there will be found to have been about 400 births to each 100 marriages, or 4 births to each marriage. And we incline to think, that those who suppose this to represent the mean fruitfulness of a marriage in England in ordinary periods will be pretty near the mark.

The register of burials is believed to have been more accurate than that of births, but much less so than that of marriages. Many congregations of Dissenters have their own burying ground, the interments in which have not appeared in the registers; and this, also, is the case with Roman Catholics and Jews resident in London and some other places. There are also some persons, who, from motives of economy, or otherwise, inter without any religious ceremony. And, exclusive of these, and other causes of omission, many persons are lost at sea, or

* There seem to be good grounds for thinking that, at an average, births are more frequent among females married at from 27 to 30 than among those married at from 17 to 18 or 19 years of age.—(*Report of* 1825 *on Friendly Societies*, p. 90.) But this certainly gives no countenance to the extraordinary opinion that "whatever the period of marriage is, the number of children reared is not in the least affected thereby!"—(*Ibid. in loc. cit.*) A notion of this sort is too obviously absurd to deserve notice.

die abroad, of whose demise no account is kept. During the 3 years 1838-40, the burials at the church were 883,912; the deaths in the country 1,041,160; consequently 15 per cent. of the deaths were not recorded in the parish registers.—(*Reg. Gen. Seventh Rep.*) During the 6 years ending with 1844, the average rate of mortality in England and Wales was 1 in 46; the meaning of this being, that 1 out of every 46 persons existing in the kingdom died annually. The extremes vary from 1 in 37 in Lancashire, to 1 in 55 in Sussex, Surrey, and North Wales. We subjoin from the Census of 1851—

An Account of the Baptisms, Burials, and the Excess of Baptisms over Burials, in England and Wales, 1801-1840*: also Births, Deaths, and the Excess of Births over Deaths in England and Wales,* 1841-1850.

Years	Persons.			Males.			Females.		
	Baptisms	Burials.	Excess of Baptisms over Burials	Baptisms	Burials	Excess of Baptisms over Burials	Baptisms.	Burials.	Excess of Baptisms over Burials.
1801	237,029	204,434	32,595	120,521	101,352	19,169	116,508	103,082	13,426
1802	273,837	199,889	73,948	139,889	99,504	40,385	133,948	100,385	33,563
1803	294,108	203,728	90,380	150,220	102,459	47,761	143,888	101,269	42,619
1804	294,592	181,177	113,415	150,583	91,538	59,045	144,009	89,639	54,370
1805	292,201	181,240	110,961	149,333	91,086	58,247	142,868	90,154	52,714
1806	291,929	183,452	108,477	147,376	92,289	55,087	144,553	91,163	53,390
1807	300,294	195,851	104,443	154,787	97,996	55,791	146,507	97,855	48,652
1808	296,074	200,763	95,311	151,565	102,614	48,951	144,509	98,149	46,360
1809	299,989	191,471	108,518	152,812	97,894	54,918	147,177	93,577	53,600
1810	298,853	208,184	90,669	152,591	104,907	47,684	146,262	103,277	42,985
1811	304,857	188,543	116,314	155,671	94,971	60,700	149,186	93,572	55,614
1812	301,954	190,402	111,552	153,949	95,957	57,992	148,005	94,445	53,560
1813	314,432	186,477	127,955	160,685	93,726	66,959	153,747	92,751	60,996
1814	318,806	206,403	112,403	163,282	103,525	59,757	155,524	102,878	52,646
1815	344,931	197,408	147,523	176,233	99,442	76,791	168,698	97,966	70,732
1816	330,199	205,959	124,240	168,801	103,954	64,847	161,398	102,005	59,393
1817	331,583	199,269	132,314	169,337	101,040	68,297	162,246	98,229	64,017
1818	331,384	213,624	117,760	169,181	107,724	61,457	162,203	105,900	56,303
1819	333,261	214,564	119,697	171,107	106,749	64,358	162,154	106,815	55,339
1820	343,660	208,349	135,311	176,311	104,329	71,982	167,349	104,020	63,329
1821	355,307	212,352	142,955	181,811	107,482	74,329	173,496	104,870	68,626
1822	372,571	220,415	152,156	190,508	111,299	79,209	182,063	109,116	72,947
1823	369,760	237,386	132,374	189,144	119,649	69,495	180,616	117,737	62,879
1824	371,444	244,074	127,370	189,401	124,027	65,374	182,043	120,047	61,996
1825	375,053	255,018	120,035	192,003	129,727	62,276	183,050	125,291	57,759
1826	380,413	268,161	112,252	194,527	136,100	58,427	185,886	132,061	53,825
1827	374,186	251,871	122,315	191,428	128,991	62,437	182,758	122,880	59,878
1828	392,454	255,333	137,121	200,334	130,015	70,318	192,121	125,318	66,803
1829	380,245	264,230	116,015	191,089	134,525	59,564	186,156	129,705	56,451
1830	382,060	254,067	127,993	194,200	129,290	64,910	187,860	124,777	63,083
1831	389,122	278,619	110,503	198,232	142,185	56,047	190,890	136,434	54,456
1832	387,971	298,161	89,810	197,255	150,938	46,317	190,716	147,223	43,493
1833	400,048	290,508	109,535	203,348	147,393	55,955	196,695	143,115	53,580
1834	405,875	283,097	122,778	205,935	143,550	62,385	199,940	139,547	60,393
1835	405,067	281,545	123,522	206,137	144,287	61,850	198,930	137,258	61,672
1836	405,137	281,685	123,452	204,985	143,982	61,003	200,152	137,703	62,449
1837	462,893?	386,994	89,278	234,301	171,597	44,558	228,592	165,397	44,718
1838	377,114?	292,650	133,020	191,021	144,864	66,690	186,093	143,286	66,930
1839	368,068?	29,855	139,415	186,621	146,115	69,583	181,442	140,740	69,832
1840	364,440?	304,407	121,863	184,917	154,299	60,822	179,523	150,108	61,041
	Births.	Deaths.	Excess	Births.	Deaths.	Excess.	Births	Deaths	Excess
1841	512,158	343,847	168,311	262,714	174,198	88,516	249,444	169,649	79,795
1842	517,739	349,519	168,220	265,204	176,594	88,610	252,535	172,925	79,610
1843	527,325	346,445	180,880	270,577	175,721	94,856	256,748	170,724	86,024
1844	540,763	356,933	183,830	277,436	181,126	96,310	263,327	175,807	87,520
1845	543,521	349,366	194,155	278,418	177,529	100,889	265,103	171,837	93,266
1846	572,625	390,315	182,310	293,146	198,325	94,821	279,479	191,990	87,489
1847	539,965	423,304	116,661	275,658	214,375	61,283	264,307	208,929	55,378
1848	563,059	399,833	163,226	288,346	202,949	85,397	274,713	196,851	77,862
1849	578,159	440,853	137,306	295,158	221,801	73,357	283,001	219,052	63,949
1850	593,422	368,986	224,436	302,834	186,459	116,375	290,588	182,527	108,061

NOTE.—From 1841-50, the above numbers show the Births and Deaths registered under the Registration Act. The returns of Baptisms and Burials from 1801-1840 were procured by Mr. Rickman, and the Census Commissioners (1841) from the clergy of the Established Church. The introduction of the Act for the Registration of Births in 1837 produced a considerable disturbance in the number of baptisms during that and the three following years. Approximate numbers have for those years been substituted for the excess of baptisms over burials actually returned.

We subjoin the tables of births, deaths, marriages, &c., given in the preliminary remarks to the census of 1831, extended in part to 1840, from information, supplied by the Commissioners for taking the late census. (See p. 409.) Though not quite accurate, they do not involve any very material error, and are often referred to.

Corrected Table of the Annual Proportions of Baptisms, Burials, and Marriages, to the Population of England; calculated upon an Average of the Totals of such Baptisms, Burials, and Marriages, in the Five Years preceding the several Enumerations of 1801, 1811, 1821, *and* 1831; *and distinguishing the several Counties.*

[N.B. In this Table by the late Mr. Rickman the proportion of baptisms, burials, and marriages are understated. They should have been compared with the population in the middle and not at the end of the five years.]

COUNTIES.	1796–1800			1806–1810			1816–1820			1826–1830		
	Baptisms.	Burials.	Marriages.	Baptisms.	Burials.	Marriages.	Baptisms.	Burials.	Marriages.	Baptisms.	Burials.	Marriages.
Bedford	35	51	114	32	48	131	33	57	123	35	54	129
Berks	34	51	148	33	53	144	33	54	140	32	52	149
Bucks	37	50	129	32	49	129	33	53	139	34	52	140
Cambridge	33	45	118	30	30	131	30	55	117	31	45	123
Chester	39	51	130	32	49	132	34	52	127	37	52	139
Cornwall	33	58	120	31	62	142	32	69	146	33	64	147
Cumberland	38	54	145	34	52	132	32	54	151	32	54	163
Derby	35	52	138	32	58	138	34	59	146	35	54	135
Devon	36	49	109	32	50	113	32	59	132	35	58	132
Dorset	41	62	142	34	56	139	34	63	144	35	58	140
Durham	38	43	116	32	49	131	32	53	134	32	52	138
Essex	35	44	126	32	45	130	34	58	146	35	52	154
Gloucester	37	55	127	35	61	120	35	60	111	35	61	117
Hereford	40	65	183	35	60	144	36	60	170	37	57	152
Hertford	38	54	161	33	57	168	33	53	171	36	56	175
Huntingdon	33	46	104	32	49	134	33	61	127	34	46	131
Kent	30	41	116	28	38	115	30	50	130	33	49	143
Lancaster	34	47	114	28	49	115	31	51	116	34	46	115
Leicester	35	49	130	36	58	134	34	56	126	36	53	127
Lincoln	32	50	117	30	49	125	31	59	134	32	51	134
Middlesex	39	37	95	39	36	94	36	45	101	31	41	103
Monmouth	56	72	169	45	64	146	46	66	148	45	69	131
Norfolk	32	47	126	31	50	135	31	59	129	32	52	139
Northampton	42	51	130	35	53	132	34	55	129	35	50	135
Northumberland	47	57	139	35	54	160	37	57	139	36	52	134
Nottingham	32	51	116	32	52	119	32	54	124	31	51	122
Oxford	35	53	139	33	56	141	33	57	148	32	53	141
Rutland	33	50	131	33	54	161	34	62	143	33	52	137
Salop	34	54	142	34	59	142	34	54	148	35	53	140
Somerset	39	55	139	34	53	128	35	61	140	35	58	147
Southampton	34	46	104	30	46	102	31	61	128	34	56	131
Stafford	34	49	124	31	52	118	31	51	123	32	51	126
Suffolk	34	56	129	31	54	132	33	65	134	35	59	137
Surrey	37	42	134	35	44	129	38	49	139	38	49	129
Sussex	31	55	126	28	52	128	32	68	142	33	58	142
Warwick	35	52	116	34	43	119	35	48	118	34	58	120
Westmoreland	35	50	142	31	53	137	33	52	149	32	56	152
Wilts	41	60	142	34	57	138	35	63	134	35	57	148
Worcester	34	46	137	31	51	129	33	53	140	31	51	127
York—East Riding	39	55	129	29	48	108	33	54	122	35	51	118
City and Ainsty										36	52	113
North Riding	36	53	142	30	51	124	34	61	147	33	55	144
West Riding	35	49	124	31	51	123	33	57	124	35	51	131
Summary of England, not including Wales	36	48	123	32	49	121	33	55	127	34	51	128

New System of Registration.—The previous statements have sufficiently evinced the defects of the old system of registration, and the necessity that existed of having it superseded by a better; which we are glad to say, was accomplished by the Act 6 and 7 Will. IV.,

cap. 86. This Act, passed in pursuance of the recommendation of a committee of the House of Commons on parochial registers (1833), embodies a plan for the effectual registration of births, deaths, and marriages in England and Wales. To give uniformity to the system, it is conducted under the superintendence of a registrar-general resident in London; and there also a central place of deposit is provided for certified copies of all parochial registers, with ready means of finding any entry in them. It is provided, that in every case of *birth* the following circumstances shall be recorded, viz.: the time and place of birth; the name (if any) and sex of child; name and surname of father; name and maiden surname of mother; rank or profession of father; the signature, description, and residence of the informant; and also the baptismal name of child, if added after registration of birth. In every case of *death* the register is to record the time and place of death; the name and surname, sex, age, and rank or profession of the deceased; *the cause of death;* and the signature, description, and residence of the informant. In all cases the entries must be signed by the informant, and also by the registrar, who discharges this duty without any immediate expense to the parties requiring registration, his remuneration being derived from moderate fees paid out of the poor's rates. The insertion of the cause of death, along with the period of death, and the residence, sex, age, and occupation of the deceased, will, in time, afford data of the utmost importance to medical science, and to the improvement of vital statistics.

The central office at Somerset House, in London, for the deposit of certified copies of registers, and the general supervision and conduct of the business of registration, is called the General Register Office. It is presided over by the registrar-general, who is appointed under the great seal, and has under him a chief clerk and a numerous body of subordinate clerks. From this office communications emanate to all superintending registrars, registrars of births and deaths, and registrars of marriages, who all act within their respective districts, under the directions of the registrar-general, in whom is vested the power of dismissal.

There are at present (1846) 620 superintendent registrars, who may each appoint a deputy, with the approval of the registrar-general. Each superintendent registrar serves within the district to which he is appointed, which comprises one or more registrar's districts.

There are 2,185 registrars of births and deaths, who may each appoint a deputy, with the approval of the guardians, or of the poor law commissioners. Each registrar is appointed to some one of the 2,185 registrars' districts, into which the whole of England and Wales has been divided and he must reside in that district, and register *all* births and deaths that occur in it.

Marriages are registered, 1st, by clergymen of the established church, of whom nearly 12,000 have been furnished with books for this purpose. 2ndly, by registrars of marriages, of whom there were, in 1846, 945: these last are appointed by the superintendent registrars, and register marriages solemnized in their presence in registered places of worship; or in the superintendent registrar's office. 3rdly, by the registering officers of quakers, 88 in number; and 4thly, by 37 secretaries of synagogues.

The clergymen, and the various officers, amounting in all to about 15,000, to whom the business of registration is committed, are bound to make quarterly deliveries of *certified copies* of all entries in their respective registers during the previous quarter to the superintendent registrars of the district to which they respectively belong; and these certified copies are transmitted by the superintendent registrars to the registrar-general. The certified copies are made on separate leaves of paper of a uniform size and peculiar texture, having a distinguishing water-mark. On being received at the General Register Office in London (whither they are sent by post), they are carefully examined; and any defects being noted, are made the subject of communication with the person from whom the defective copy came, who is required either to furnish another copy, or a satisfactory explanation. They are then arranged, paged, and inserted in books for reference.

Alphabetical indexes of births, deaths, and marriages, are prepared and kept in the General Register Office: and any person, on payment of 1*s.*, may search these indexes for any entry, and, on finding it, may, if he wish, obtain, for 2*s.* 6*d.*, a stamped copy of such entry, which will be "received as evidence of the birth, death, or marriage to which the same relates, without any further or other proof of such entry." There are separate alphabetical indexes for the births, the deaths, and the marriages in each quarter; and the twelve indexes, comprising references to the registrations of one year (1844), contain not less than 1,162,211 names. In the 7 years 1838-44, the marriages of 1,762,572, the births of 3,556,649, and the deaths of 2,437,922 persons were registered. The total number of names entered on the register from July 1, 1837, to Dec. 31, 1844, were 8,146,918. The registrar-general is bound to furnish, once a year, one of the principal secretaries of state with a *general abstract account* of the births, deaths, and marriages, registered during the foregoing year, to be laid before parliament. The first of these abstracts was prepared towards the close of 1838, and comprised the births, deaths, and marriages, registered during the year ending 30th June of that year.

These abstracts have since been regularly continued, and they now embody a great mass of the most valuable and accurate information in respect to the numbers, ages, health, diseases, and condition of the population. Mr. Graham, the present registrar-general, has introduced numerous improvements into the arrangements of the office. The returns from the 15,000 clergymen and officers in every part of the kingdom are got in, examined, corrected, and indexed; so that the information is available to the public in the shortest possible time. In ten months from the date of registration the entry of any marriage, birth, or death can generally, on the mere mention of the name, without intimation of the exact date, or of the part of the kingdom in which it occurred, be discovered in a few minutes, and a certified copy given. Books of blank certificates, and a statistical nosology, have been distributed among all the qualified medical practitioners of England—nearly 11,000 in number; and the causes of death are certified in nine cases out of ten by the medical attendant. When persons die, unattended by qualified medical men, the assigned cause of death is entered as "not certified;" or it is stated that no medical man was in attendance. This has already had a beneficial effect. Thousands of children are

still suffered to fall victims to disease, ignorance, neglect, and quackery; but the number is diminishing; and parents have been recalled to a sense of duty by the dread of seeing their delinquencies registered. Mr. Graham has also addressed a circular letter to the coroners of England, and suggested a consistent method of returning the causes of violent and sudden deaths. The information obtained from this source is now as specific and accurate as it was formerly vague and unsatisfactory. The births, deaths, and causes of death, in the metropolis, of the previous week, are published every Wednesday in the *New London Bills of Mortality*, with a valuable meteorological table, deduced by the astronomer royal from the observations at Greenwich. A quarterly table of the deaths in the principal districts of the kingdom appears in less than a month after the close of every quarter. The abstracts of all the marriages, births, and deaths, registered in the year 1844, are laid before parliament in 1846; and so of other years.

Two inspectors visit and report periodically on the progress of registration in the hands of the superintendent registrars and registrars all over the kingdom. This measure, so well calculated to check abuses and errors, enables the registrar-general to exercise an efficient and salutary control over the officers appointed by the local authorities.

Mr. Farr, whose great mathematical and medical talents have been of infinite service to this department, has added to these abstracts some elaborate and valuable papers on various points connected with vital statistics.

The following returns of the registrar-general in regard to deaths and marriages, during the years 1839, 1840, 1841, 1842, 1843, and 1844, may be regarded as approaching very near to perfect accuracy. The births are not yet all registered.

Corrected Table of the Annual Proportions of Baptisms, Burials, and Marriages to 100 Persons living, and to the Population of England; calculated upon an Average of the Totals of such Baptisms, Burials, and Marriages, in the Six or Seven Years ending with 1844.

		To 100 Persons Living (50 Males and 50 Females).			One Marriage	One Birth	One Death
		Marriages.	Births.	Deaths.	To Persons Living.		
	ENGLAND . . .	·773	3·215	2·189	129	31	46
No.	*Divisions.*						
1	Metropolis	·968	3·084	2·547	103	32	39
2	South Eastern . . .	·684	2·933	1·918	146	34	52
3	South Midland . . .	·697	3·260	2·091	143	31	48
4	Eastern	·696	3·083	2·021	144	32	49
5	South Western . . .	·706	3·014	1·957	142	33	51
6	Western	·771	3·228	2·188	130	31	46
7	North Midland . . .	·734	3·259	2·072	136	31	48
8	North Western . . .	859	3·612	2·616	116	28	38
9	York	·802	3·438	2 186	125	29	46
10	Northern	·710	3·358	2·107	141	30	47
11	Welsh	·700	3·002	1·948	143	33	51

Corrected Table of the Annual Proportion of Baptisms, &c.—continued.

		To 100 Persons Living (50 Males and 50 Females).			One Marriage	One Birth	One Death
		Marriages.	Births.	Deaths.	To Persons Living.		
	2. *South Eastern Counties.*						
1	Surrey (part of)	·499	2·697	1·809	200	37	55
2	Kent (except Greenwich)	·710	3·019	1·974	141	33	51
3	Sussex	·673	2·967	1·839	149	34	54
4	Hampshire	·770	2·881	1·934	130	35	52
5	Berkshire	·664	2·967	1·985	151	34	50
	3. *South Midland Counties.*						
6	Middlesex (part of)	·465	2·584	1·945	215	39	51
7	Hertfordshire	·596	3·224	1·974	168	31	51
8	Buckinghamshire	·671	3·302	2·132	149	30	47
9	Oxfordshire	·721	3·163	2·094	139	32	48
10	Northamptonshire	·790	3·457	2·129	127	29	47
11	Huntingdonshire	·794	3·636	2·141	126	28	47
12	Bedfordshire	·803	3·586	2·122	125	28	47
13	Cambridgeshire	·784	3·429	2·210	128	29	45
	4. *Eastern Counties.*						
14	Essex	·648	3·070	2·020	154	33	50
15	Suffolk	·727	3·170	1·968	138	32	51
16	Norfolk	·710	3·029	2·065	141	33	48
	5. *South Western Counties.*						
17	Wiltshire	·643	2·959	2·029	156	34	49
18	Dorsetshire	·680	3·018	1·917	147	33	52
19	Devonshire	·771	2·854	1·878	130	35	53
20	Cornwall	·688	3·305	1·940	145	30	52
21	Somersetshire	·688	3·014	2·040	145	33	49
	6. *Western Counties.*						
22	Gloucestershire	·847	3·003	2·192	118	33	46
23	Herefordshire	·633	2·685	2·071	158	37	48
24	Shropshire	·655	2·697	2·040	153	37	49
25	Worcestershire	·817	3·533	2·129	122	28	47
26	Staffordshire	·795	3·526	2·250	126	28	44
27	Warwickshire	·734	3·331	2·288	136	30	44
	7. *North Midland Counties.*						
28	Leicestershire	·751	3·292	2·185	133	30	46
29	Rutlandshire	·646	3·095	1·879	155	32	53
30	Lincolnshire	·740	3·266	1·937	135	31	52
31	Nottinghamshire	·738	3·290	2·126	136	30	47
32	Derbyshire	·714	3·204	2·125	140	31	47
	8. *North Western Counties.*						
33	Cheshire	·649	3·167	2·322	154	32	43
34	Lancashire	·903	3·707	2·680	111	27	37
	9. *Yorkshire.*						
35	West Riding	·797	3·606	2 232	125	28	45
36	East Riding (with York)	·903	2·978	2·189	111	34	46
37	North Riding	·705	3·015	1·908	142	33	52

Corrected Table of the Annual Proportion of Baptisms, &c.—continued.

		To 100 Persons Living (50 Males and 50 Females).			One Marriage	One Birth	One Death
		Marriages.	Births.	Deaths.	To Persons Living.		
	10 *Northern Counties.*						
38	Durham	·800	3·651	2·252	125	27	44
39	Northumberland . . .	·714	3·256	2·051	140	31	49
40	Cumberland	·567	3·095	1·976	176	32	51
41	Westmoreland . . .	·621	2·885	1·950	161	35	51
	11. *Monmouthshire and Wales.*						
42	Monmouthshire . . .	·762	3·245	2·224	131	31	45
43	South Wales	·721	3·173	1·958	139	32	51
44	North Wales	·648	2·676	1·830	154	37	55

Average Annual Marriages, Births, and Deaths to 100 *Persons Living, and to the Population, in the Divisions and Counties of England, arranged in the order of the Mortality, beginning with Counties in which the Mortality is highest.*—(Seventh Report of Registrar-General.)

No.	Divisions.	Counties.	To 100 Persons Living (50 Males and 50 Females).			One Marriage	One Birth	One Death
			Marriages.	Births.	Deaths	To Persons Living.		
8	North Western	Cheshire; Lancashire . . .	·859	3·612	2·616	116	28	38
1	Metropolis	Middlesex (part of); Surrey (part of); Kent (part of) .	·968	3·084	2 547	103	32	39
	ENGLAND.	. . .	·773	3·215	2·189	129	31	46
6	Western	Gloucestershire; Herefordshire; Shropshire; Worcestershire; Staffordshire; Warwickshire	·771	3·228	2·168	130	31	46
9	York	North Riding; East Riding; West Riding	·802	3·438	2·186	125	29	46
10	Northern	Durham; Northumberland; Cumberland; Westmoreland	·710	3·353	2·107	141	30	47
3	South Midland	Middlesex (part of); Hertfordshire; Buckinghamshire; Oxfordshire; Northamptonshire; Huntingdonshire; Bedfordshire; Cambridgeshire .	·697	3·260	2·091	143	31	48
7	North Midland	Leicestershire; Rutlandshire; Lincolnshire; Nottinghamshire; Derbyshire . . .	·734	3·259	2 072	136	31	48
4	Eastern	Essex; Suffolk; Norfolk . .	·696	3·083	2·021	144	32	49
5	South Western	Wiltshire; Dorsetshire; Devonshire; Cornwall; Somersetshire	·706	3·014	1·957	142	33	51
11	Welsh	Monmouthshire and Wales .	·700	3·002	1 948	143	33	51
2	South Eastern	Surrey (part of); Kent (except Greenwich); Sussex; Hampshire; Berkshire . .	·684	2·933	1·918	146	34	52

Average Annual Marriages, Births, and Deaths, &c.—continued.

No.	Counties.	To 100 Persons Living (50 Males and 50 Females).			One Marriage	One Birth	One Death
		Marriages.	Births.	Deaths.	To Persons Living.		
34	Lancashire	·903	3·707	2·680	111	27	37
33	Cheshire	·649	3·167	2·322	154	32	43
27	Warwickshire	·734	3·331	2·288	136	30	44
38	Durham	·800	3·651	2·252	125	27	44
26	Staffordshire	·795	3·526	2·250	126	28	44
35	West Riding	·797	3·606	2·232	125	28	45
42	Monmouthshire	·762	3·245	2·224	131	31	45
13	Cambridgeshire	·784	3 429	2 210	128	29	45
22	Gloucestershire	·847	3·003	2·192	118	33	46
36	East Riding (with York).	·903	2·978	2·189	111	34	46
28	Leicestershire	·751	3·292	2·185	133	30	46
11	Huntingdonshire	·794	3·636	2·141	126	28	47
8	Buckinghamshire	·671	3·302	2·132	149	30	47
25	Worcestershire	·817	3·533	2·129	122	28	47
10	Northamptonshire	·790	3·457	2·129	127	29	47
31	Nottinghamshire	·738	3·290	2·126	136	30	47
32	Derbyshire	·714	3·204	2 125	140	31	47
12	Bedfordshire	·803	3·586	2·122	125	28	47
9	Oxfordshire	·721	3·163	2·094	139	32	48
23	Herefordshire	·633	2 685	2·071	158	37	48
16	Norfolk	·710	3·029	2·065	141	33	48
39	Northumberland	·714	3·256	2·051	140	31	49
21	Somersetshire	·688	3·014	2·040	145	33	49
24	Shropshire	·655	2·697	2·040	153	37	49
17	Wiltshire	·643	2·959	2·029	156	34	49
14	Essex	·648	3·070	2·020	154	33	50
5	Berkshire	·664	2·967	1·985	151	34	50
40	Cumberland	·567	3·095	1·976	176	32	51
7	Hertfordshire	·596	3·224	1·974	168	31	51
2	Kent (except Greenwich)	·710	3·019	1·974	141	33	51
15	Suffolk	·727	3·170	1·968	138	32	51
43	South Wales	·721	3·173	1·958	139	32	51
41	Westmoreland	·621	2·885	1·950	161	35	51
6	Middlesex (part of)	·465	2·534	1·945	215	39	51
20	Cornwall	·688	3·305	1·940	145	30	52
30	Lincolnshire	·740	3·266	1·937	135	31	52
4	Hampshire	·770	2·881	1·934	130	35	52
18	Dorsetshire	·680	3·018	1·917	147	33	52
37	North Riding	·705	3 015	1·908	142	33	52
29	Rutlandshire	·646	3·095	1·879	155	32	53
19	Devonshire	·771	2·854	1·878	130	35	53
3	Sussex	·673	2·967	1·839	149	34	54
44	North Wales	·648	2·676	1·830	154	37	55
1	Surrey (part of)	·499	2·697	1·809	200	37	55

Number of Marriages, Births, and Deaths, registered in 1838, *and the six following Years.*—(Seventh Report, Registrar General.)

	1838	1839	1840	1841	1842	1843	1844
Marriages	118,067	123,166	122,665	122,496	118,825	123,818	132,249
Births	463,787	492,574	502,303	512,158	517,739	527,325	540,763
Deaths	342,547	338,979	359,634	343,847	349,519	346,446	356,950
Excess of Births over Deaths	121,240	153,595	142,669	168,311	168,220	180,879	183,813
Calculated increase of Population					214,100	216,900	219,800

Table showing the Proportion of Marriages, Births, and Deaths, 1838–44.

Years.	Annual Number of Marriages, Births, and Deaths, to a Population of 100.			Numbers living out of which a Marriage, Birth, or Death took place.		
	Marriages.	Births.	Deaths.	One Marriage in	One Birth in	One Death in
1838	..	..	2·240	..	..	45
1839	·794	3·177	2·187	126	31	46
1840	·781	3·197	2·290	128	31	44
1841	·769	3·217	2·160	130	31	46
1842	·736	3·209	2·167	136	31	46
1843	·758	3·226	2·120	133	31	47
1844	·799	3·265	2·155	125	31	46
Mean	·773	3·215	2·189	129	31	46

The probable Duration of Life—meaning, by such probable duration, the chances that any individual of a given age has of attaining to any other specified age—differs at different periods and in different countries, and has not been ascertained in any with sufficient precision. To determine a question of this sort with the required accuracy, it would be necessary to take a large number of individuals, as 400,000 or 500,000, indiscriminately selected from all ranks and orders of the community, and to trace their lives from the moment of their birth, marking the exact period of the demise of each individual. The results being collected in a *Table of Mortality*, we should be able to deduce from them the expectation of life at any given age. But governments, which alone have the means of framing such tables on an adequate scale, and with the necessary precautions, have been singularly inattentive to their duty in this respect. And until a very few years since, when Mr. Finlaison was employed to calculate tables of the value of annuities from the ages of the nominees in public tontines, and of individuals on whose lives government had granted annuities, all that had been done in this country to construct tables of mortality, and, by consequence, to lay a foundation on which to construct the vast fabric of life insurance, was the work of a few private persons, who had, of course, but a limited number of observations to work on. Subjoined is an account of the ages of 3,938,496 persons buried in England and Wales (of whom 1,996,193 males, 1,942,301 females), during eighteen years, 1813—1830. (See page 418.)

Mr. Farr has calculated a Table of Mortality, given in the Fifth Report of the Registrar-General, founded on the population enumerated, and the births and deaths registered in 1841 (see page 419). From the two series of observations, the mortality at each age, and consequently the probability of living from birth, and from year to year, was calculated. We subjoin the table (p. 419), which, for the facility of reference, takes 100,000 children as the basis of the calculations.

The Tables of Mortality that have been most commonly used in England, in calculating insurances on lives, &c., are, that formed by Dr. Price, from observations made at Northampton; and that formed by Mr. Milne, from observations made by Dr. Heysham on the rate of mortality at Carlisle. The latter gives a decidedly lower

Age.	Males.	Females.	Both Sexes.	Age.	Males.	Females.	Both Sexes.	Age.	Males.	Females.	Both Sexes.
Under One Year.	436,946	341,137	778,083	40	16,209	17,304	33,513	80	20,666	24,951	45,617
				41	10,083	10,906	20,989	81	13,146	14,279	27,425
				42	13,423	14,073	27,566	82	15,523	17,582	33,105
1	139,426	127,137	266,443	43	10,828	11,489	22,317	83	12,072	13,721	25,793
2	78,114	75,900	154,014	44	12,292	12,666	24,958	84	15,920	18,477	34,397
3	47,860	46,773	94,663								
				45	15,532	14,548	30,080	85	12,245	14,187	26,432
4	33,693	32,076	65,769	46	12,601	12,334	24,935	86	8,854	10,437	19,291
5	24,854	23,340	48,194	47	12,633	12,103	24,736	87	7,070	8,489	15,559
6	19,376	18,091	37,467	48	13,801	13,230	27,031	88	6,762	8,325	15,087
7	16,467	14,668	31,135	49	12,203	11,486	23,689	89	4,468	5,637	10,105
8	13,895	12,363	26,258								
9	12,671	11,270	23,941	50	17,468	16,059	33,527	90	4,549	6,624	11,173
				51	10,792	10,119	20,911	91	2,293	3,057	5,350
10	11,610	10,527	22,137	52	14,544	13,875	28,419	92	2,038	2,867	4,905
11	10,441	9,777	20,218	53	13,050	12,009	25,059	93	1,598	2,258	3,856
12	9,996	9,800	19,796	54	13,148	12,346	25,494	94	1,129	1,685	2,814
13	9,688	10,261	19,949								
14	10,589	11,790	22,379	55	16,303	15,209	31,512	95	977	1,582	2,559
15	10,096	12,527	22,623	56	15,705	14,589	30,294	96	715	1,182	1,897
16	11,385	13,737	25,122	57	14,067	12,995	27,062	97	494	846	1,340
17	12,568	14,212	26,780	58	14,287	13,414	27,701	98	426	708	1,134
18	14,212	14,998	29,210	59	13,479	12,303	25,782	99	267	495	762
19	15,144	16,061	31,205								
				60	21,835	21,438	43,273	100	239	468	707
20	15,245	16,041	31,286	61	13,533	12,551	26,084	101	133	225	358
21	15,834	16,237	32,071	62	16,693	16,253	32,946	102	70	174	244
22	16,188	17,597	33,785	63	18,631	18,282	36,913	103	63	134	197
23	14,850	16,803	31,653	64	17,761	17,629	35,390	104	41	90	131
24	14,515	16,722	31,237								
25	14,569	16,586	31,155	65	18,911	18,723	37,634	105	29	72	101
26	13,785	16,318	30,103	66	20,160	20,332	40,492	106	17	29	46
27	13,623	16,133	29,756	67	19,352	19,523	38,875	107	13	21	34
28	13,778	16,272	30,050	68	18,315	18,298	36,613	108	10	18	28
29	12,199	14,431	26,630	69	16,816	16,222	33,038	109	6	12	18
				70	26,187	27,766	53,953	110	7	11	18
30	14,513	16,514	31,027	71	16,008	16,154	32,162	111	2	3	5
31	10,338	11,963	22,301	72	21,085	21,868	42,953	112	1	1	2
32	12,597	14,427	27,024	73	20,562	21,363	41,925	113	1	1	2
33	12,409	14,227	26,636	74	20,652	21,163	41,815	114	0	2	2
34	11,605	13,279	24,884								
35	13,741	15,200	28,941	75	21,936	22,684	44,620	117	0	1	1
36	13,234	14,950	28,184	76	19,595	20,522	40,117	118	1	0	1
37	11,873	13,409	25,282	77	21,012	21,845	42,857	119	1	0	1
38	12,519	14,268	26,787	78	19,595	21,030	40,625	120	2	1	3
39	11,167	12,611	23,778	79	15,576	16,433	32,009	124	1	0	1

rate of mortality than the other; and it is seen, by the returns of the ages of nearly 4 millions of persons, who died in England and Wales between 1813 and 1830, that the mortality, as represented by it, does not differ materially from the actual rate in most parts of England; though it was not to be supposed that a table founded on so narrow a basis should give a perfectly fair view of the average mortality of the entire kingdom.

In computing tables of mortality, males and females ought always to be distinguished. The probable life of the latter, at all periods from infancy to old age, somewhat exceeds that of the former. This superiority is set in the clearest point of view by the researches of Mr. Finlaison and Mr. Farr, as exhibited in the tables given above.

Supposing the burial registers to have been all the while about equally accurate, it appears (Table, p. 410) that, during the 5 years ending with 1800, 1 in every 48 of the population died annually; during the 5 years ending with 1810, the ratio of mortality was 1 in every 49; during the 5 years ending with 1820, it was reduced to 1 in 55; and during the 5 years ending with 1830, it again increased, as already observed, to 1 in 51. But, owing to the defects in the

registration, there can be no doubt, that the mortality represented in those returns is less than its real amount. It has been already seen, that the proportion of deaths to the population amounted, according to the accurate returns of the registrar-general, during the 7 years ending with 1844, to 1 in 46.

Mr. Farr's Table of Mortality in England.

Age.	Living.	Males.	Females.	Dying in the next Year.	Males.	Females.	Age.	Living.	Males.	Females.	Dying in the next Year.	Males.	Females.
0	100,000	51,274	48,726	14,631	8,170	6,461	55	42,796	21,355	21,441	849	449	400
1	85,369	43,104	42,265	5,287	2,716	2,551	56	41,947	20,906	21,041	909	485	424
2	80,102	40,388	39,714	2,710	1,370	1,340	57	41,038	20,421	20,617	961	511	450
3	77,392	39,018	38,374	1,853	954	899	58	40,077	19,910	20,167	1,018	537	476
4	75,539	38,064	37,475	1,383	679	659	59	39,064	19,373	19,691	1,068	565	503
5	74,201	37,385	36,816	1,047	542	505	60	37,996	18,808	19,188	1,122	582	530
6	73,154	36,843	36,311	834	432	402	61	36,874	18,216	18,658	1,176	618	558
7	72,320	36,411	35,909	676	346	330	62	35,698	17,598	18,100	1,230	645	585
8	71,644	36,065	35,579	563	278	285	63	34,468	16,956	17,515	1,283	670	613
9	71,081	35,787	35,294	469	223	246	64	33,185	16,293	16,902	1,333	694	639
10	70,612	35,564	35,048	362	179	213	65	31,852	15,599	16,263	1,383	717	666
11	70,250	35,385	34,865	364	179	185	66	30,469	14,872	15,597	1,427	737	690
12	69,886	35,206	34,680	331	178	173	67	29,042	14,135	14,907	1,470	757	713
13	69,555	35,028	34,527	415	218	197	68	27,572	13,378	14,194	1,505	771	734
14	69,090	34,810	34,280	463	237	226	69	26,067	12,607	13,460	1,536	784	752
15	68,627	34,573	34,054	497	240	257	70	24,531	11,823	12,708	1,560	792	768
16	68,130	34,333	33,797	507	246	261	71	22,971	11,031	11,940	1,575	796	779
17	67,623	34,087	33,536	514	250	264	72	21,396	10,235	11,161	1,582	796	786
18	67,109	33,837	33,272	521	254	267	73	19,814	9,439	10,375	1,581	791	790
19	66,588	33,583	33,005	529	259	270	74	18,233	8,648	9,585	1,569	781	788
20	66,059	33,324	32,735	537	264	273	75	16,664	7,867	8,797	1,544	764	780
21	65,522	33,060	32,462	545	268	277	76	15,120	7,103	8,017	1,511	743	768
22	64,977	32,792	32,185	552	273	279	77	13,609	6,360	7,249	1,463	715	748
23	64,425	32,519	31,906	561	278	283	78	12,146	5,645	6,501	1,407	683	724
24	63,864	32,241	31,623	569	283	286	79	10,739	4,962	5,777	1,341	646	695
25	63,295	31,958	31,337	576	287	289	80	9,398	4,316	5,082	1,268	604	658
26	62,719	31,671	31,048	585	292	293	81	8,136	3,712	4,424	1,178	557	616
27	62,134	31,379	30,755	592	297	295	82	6,963	3,155	3,808	1,082	510	572
28	61,542	31,082	30,460	601	302	299	83	5,881	2,645	3,236	981	458	523
29	60,941	30,780	30,161	609	307	302	84	4,900	2,187	2,713	879	407	472
30	60,332	30,473	29,859	617	312	305	85	4,021	1,780	2,241	774	355	419
31	59,715	30,161	29,554	624	316	308	86	3,247	1,425	1,822	670	304	366
32	59,091	29,845	29,246	632	321	311	87	2,577	1,121	1,456	571	257	314
33	58,459	29,524	28,935	639	326	313	88	2,006	864	1,142	477	212	265
34	57,820	29,198	28,622	648	331	317	89	1,529	652	877	389	171	218
35	57,172	28,867	28,305	654	335	319	90	1,140	481	659	311	135	176
36	56,518	28,532	27,986	663	340	323	91	822	346	483	242	104	138
37	55,855	28,192	27,663	669	344	325	92	597	242	345	182	77	105
38	55,186	27,848	27,338	676	349	327	93	405	165	240	135	56	79
39	54,510	27,499	27,011	685	354	331	94	270	109	161	96	40	56
40	53,825	27,145	26,680	691	358	333	95	174	69	105	64	25	39
41	53,134	26,787	26,347	698	362	336	96	110	44	66	42	16	26
42	52,436	26,425	26,011	705	367	338	97	68	28	40	26	10	16
43	51,731	26,058	25,673	711	371	340	98	42	18	24	17	7	10
44	51,020	25,687	25,333	719	376	343	99	25	11	14	9	4	5
45	50,301	25,311	24,990	724	379	345	100	16	7	9	6	2	4
46	49,577	24,928	24,649	730	383	347	101	10	5	5	4	2	2
47	48,847	24,540	24,308	737	386	349	102	6	3	3	2	1	1
48	48,110	24,151	23,949	741	390	351	103	4	2	2	1	1	1
49	47,369	23,771	23,598	748	395	353	104	2	1	1	1	1	1
50	46,621	23,376	23,245	753	398	355	105	1	..	..	1	..	..
51	45,868	22,978	22,890	757	401	356							
52	45,111	22,577	22,534	764	405	359							
53	44,347	22,172	22,175	766	407	359							
54	43,581	21,765	21,816	765	410	355							

It may be, and, indeed, frequently has been, supposed that this diminution in the proportional number of deaths indicates a corresponding improvement of human life. Such, however, is not the case. No conclusions of this sort can be drawn, unless allowance be made for the increase of population; for it is plain that, if the population be progressively augmented by an increasing number of births, the ratio of deaths to the population will not fairly represent the rate of

mortality, or entitle us positively to infer whether it has been diminished or not.

The proportion of marriages, in an increasing population, is affected by the same cause. Owing to the greater proportion of children in such a population, the proportion of marriages seems less than it really is.

There can, however, after allowing for the circumstances now mentioned, be no doubt that the rate of mortality in England has been materially diminished since the American war. The number of burials, estimated by averages of 5 years, did not differ considerably during the entire period from 1780 to 1815, though the population increased about 3,300,000 in the interval.—(*Preliminary Discourse to Census of* 1831, p. 35.) Neither was this increase occasioned by any increase in the number of births as compared with the bearing women, but by the increased number of children that were reared, and passed through the different stages of life. "About 100 years back," says Mr. Griffith Davies, "if any dependence can be placed on the registers, the number of annual births did not exceed the number of annual burials, so that the population could not then have been on the increase. The increase since that period must, therefore, be attributed to an increased fruitfulness of the female sex, to immigration, to a diminution in the rate of mortality, or to two or more of those causes combined. But it does not appear that the first of these causes has had any sensible operation; and the second can have had none, otherwise the number of burials must have increased in comparison with the number of births, which is contrary to the fact; the increase of population must, therefore, be entirely attributable to a diminution in the rate of mortality."—(*Report of* 1827 *on Friendly Societies*, p. 38.)

There cannot, in fact, be a question that the value of life, in England and Wales, regularly increased from 1740 or 1750 down to 1815; and there are good grounds for thinking that it then exceeded its value in any other country, with the exception of Scotland. Mr. Finlaison has calculated three Tables, which are subjoined in an abridged form, that set this improvement in a very striking point of view. The first gives the expectation of life, as deduced from the ages of the subscribers to the Million Tontine of 1695; the second, the expectation of life among the government annuitants, in the interval between 1785 and 1825; and the third, the expectation of life for the whole population, as deduced from the deaths and ages recorded in the parish registers from 1813 to 1830: distinguishing, in all cases, between male and female life. Those on whom the estimates in the first two tables are founded, being annuitants, and generally, therefore, in comfortable circumstances, must be regarded as picked lives; whereas the latter embrace all sorts. Now, it appears from these tables, that the probable life of a male annuitant, 20 years of age, in 1695, was 29·34 years; while, in 1830, the probable life of a male of the same age, taken indiscriminately from the mass of the population, was 39·65 years; exceeding that of the former by more than *ten* years! The improvement in female life has been equally great; but, for obvious reasons, it is not so great when we compare females taken from the mass of the people with female annuitants.

Statement of the Expectation of Life in England and Wales at every Fifth Year of Age, deduced from the Ages of the Subscribers to the Million Tontine of 1695; *the Annuitants from* 1785 *to* 1825; *and the Deaths in the Parish Registers from* 1813 *to* 1830.

Age.	Million Tontine of 1695.			Annuitants, 1785-1825.			Parish Registers, 1813-1830.		
	Expectation. Males.	Difference.	Expectation. Females	Expectation. Males.	Difference.	Expectation. Females.	Expectation. Males.	Difference.	Expectation. Females.
Under 1 Year	37·61	..	..	50·16	5 35	55·51	39·96	3·24	43·20
1	38·49	5·36	43·85	50·13	5·46	55·59	47·78	2·36	50·14
5	39 03	3·41	42 44	48·93	5·30	54·23	49·80	1·49	51·29
10	35·71	4·72	40 43	45·57	5·48	51·05	46·83	1·12	47·95
15	32 05	5·27	37·32	41·76	5·43	47·19	43 08	1·00	44·08
20	29·34	4 91	34·25	38·39	5·60	43·99	39·65	1·03	40·68
25	27·96	3·71	31·67	35·90	4·91	40·81	36·55	1·09	37·64
30	26·27	2·71	28 98	33·17	4·40	37·57	33·34	1·29	34·63
35	24·12	2·20	26·32	30·17	4 14	34·31	30·03	1·48	31·51
40	21·74	1·91	23·65	27·02	4 10	31·12	26·75	1·63	28·38
45	19·15	1·47	20 62	23·75	4·06	27·81	23·48	1·66	25·14
50	16·86	·92	17·78	20 30	4·05	24·35	20·31	1·52	21·83
55	14·52	·94	15·46	17·15	3 64	20·79	17 19	1·32	18·51
60	11·65	1·60	13·25	14·39	2 93	17·32	14·20	1·08	15·28
65	9·30	·93	10 23	11·63	2·37	14·00	11·43	·89	12·32
70	7·19	·60	7·79	9·22	1·77	10·99	8·94	·73	9·67
75	5·61	·05	5·56	7·12	1·34	8·46	6·78	·55	7·33
80	4·92	1·13	3·79	4·94	1 56	6·50	5·05	·41	5·46
85	3·58	·22	3 80	3·12	1·72	4 84	3·85	·37	4·22
90	2 01	·53	2 54	1·95	·88	2 83	3·42	·28	3·70
95	1·18	·46	1·64	1·18	·37	1·55	3 06	·16	3·22
100	0 00	..	0·00	·0	·50	·50	2·78	·06	2·72
Sums of Ages	370·68	..	411·37	465·79	..	535·80	474·30	..	495·76

This wonderful improvement must, no doubt, be ascribed to a variety of causes: partly to the drainage of bogs and marshes, by which agues and marsh fevers have been entirely banished from many districts; partly to improvements in the diet, dress, lodgings, and other accommodations of the mass of the people; partly to the greater prevalence of cleanliness; and partly, and, since 1800, chiefly, perhaps, to the discoveries in medical science, and the extirpation of the small-pox.

Mr. Farr has deduced the following table of the expectation of life in England from his Life Table (p. 419). See page 422.

It appears probable, however, that the rate of mortality had been reduced to a *minimum* in 1815, and that it increased somewhat in the interval between that and 1830. Probably this was only, in part at least, a temporary effect, caused by the distress resulting from the sudden transition from a state of war to one of peace; and by the severe shock that the fall of prices in 1815, and the destruction of country banks, and of country bank paper, in that year, gave to almost every species of industry. If the increased mortality should be maintained, the causes that have produced it will afford matter for interesting investigation. Perhaps it will be found that the Irish immigration, already alluded to, has had a good deal to do in bringing it about. We incline, however, to think, that latterly there has been a diminution in the rate of mortality; at least such has been the case during the three years ending with 1845, as compared with the previous three years. But it would be wrong, considering the depressed situation of the

country during the three years ending with 1842, and its flourishing situation during the next three years to lay much stress on this decrease.

Mr. Farr's Table of Expectation of Life in England.

Age.	Persons.	Males.	Females.	Age.	Persons.	Males.	Females.
0	41·16	40·19	42·18	48	21·88	21·34	22·43
1	47·13	46·71	47·55	49	21·22	20·68	21·75
2	49·19	48·82	49·57	50	20·55	20·02	21·07
3	49·89	49·52	50·29	51	19·88	19·36	20·39
4	50·11	49·74	50·48	52	19·20	18·70	19·71
5	50·01	49·64	50·38	53	18·52	18·03	19·02
6	49·71	49·36	50·07	54	17·84	17·36	18·32
7	49·28	48·94	49·62	55	17·16	16·68	17·63
8	48·74	48·41	49·08	56	16·50	16·03	16·96
9	48·12	47·78	48·47	57	15·85	15·40	16·30
10	47·44	47·08	47·81	58	15·22	14·78	15·65
11	46·70	46·31	47·10	59	14·60	14·18	15·02
12	45·94	45·54	46·35	60	14·00	13·59	14·40
13	45·17	47·77	45·58	61	13·41	13·01	13·79
14	44·44	44·05	44·84	62	12·83	12·45	13·20
15	43·74	43·35	44·13	63	12·27	11·91	12·63
16	43·05	42·65	43·46	64	11·73	11·38	12·07
17	42·37	41·95	42·80	65	11·20	10·86	11·52
18	41·69	41·26	42·13	66	10·68	10·36	10·99
19	41·01	40·57	41·47	67	10·18	9·87	10·48
20	40·34	39·88	40·81	68	9·70	9·40	9·98
21	39·67	39·19	40·15	69	9·23	8·95	9·50
22	38·99	38·51	39·49	70	8·78	8·51	9·03
23	38·32	37·83	38·83	71	8·34	8·08	8·58
24	37·66	37·15	38·17	72	7·92	7·67	8·14
25	36·99	36·47	37·52	73	7·51	7·28	7·72
26	36·33	35·80	36·86	74	7·12	6·90	7·31
27	35·66	35·13	36·21	75	6·74	6·53	6·92
28	35·00	34·46	35·55	76	6·38	6·18	6·55
29	34·34	33·79	34·90	77	6·03	5·85	6·19
30	33·68	33·13	34·25	78	5·69	5·52	5·84
31	33·02	32·47	33·60	79	5·37	5·21	5·51
32	32·37	31·80	32·94	80	5·07	4·92	5·20
33	31·71	31·14	32·29	81	4·78	4·64	4·90
34	31·06	30·49	31·64	82	4·50	4·37	4·61
35	30·40	29.83	30·99	83	4·24	4·11	4·34
36	29·75	29·17	30·34	84	3·98	3·87	4·07
37	29·10	28·52	29·68	85	3·75	3·64	3·83
38	28·44	27·87	29·03	86	3·52	3·42	3·59
39	27·79	27·21	28·38	87	3·30	3·22	3·37
40	27·14	26·56	27·72	88	3·10	3·03	3·16
41	26·49	25·91	27·07	89	2·91	2·85	2·96
42	25·83	25·26	26·41	90	2·74	2·68	2·77
43	25·18	24·61	25·75	91	2·57	2·53	2·60
44	24·52	23·96	25·09	92	2·43	2·40	2·44
45	23·86	23·30	24·43	93	2·30	2·30	2·29
46	23·20	22·65	23·76	94	2·19	2·23	2·16
47	22·54	22·00	23·10	95	2·13	2·22	2·06

This Table is read thus:—At Birth, a Child's expectation of life is 41·16; if a Boy, 40·19 years; if a Girl, 42·18 years. At the age of 40, the expectation of life is 27·14 years.
The mean age to which persons who attain the age of 40 live is therefore 40 + 27·14=67·14 years.

The mortality in infancy being greater than at any subsequent period of life, it follows that in a country, the population of which is rapidly increasing, not by immigration, but by births, the probable duration of life at birth, deduced from the deaths alone, and without reference to the existing population, appears to be less than it would be, other things being the same, were the population stationary, or increasing less rapidly.

The determination of the average expectation of life at birth is, however, of comparatively little practical importance. The great object is to ascertain the probability of life and the expectation of life at any given period. The "expectation of life" must not be confounded with the probable life, or the time which it is an even chance a person will live. The expectation of life in England, by the preceding table of Mr. Farr, is 40·19 years for a male at birth; while the "probable life" is 44·13 years. Of 51,274 boys born alive, 25,686 live to the age of 44; and 25,588 die before attaining that age. It is, therefore, 25,686 to 25,588, or nearly "an even bet," that a boy just born will live 44 years. Extending the time to 44·13 years, the chances are even, and this may, therefore, be called the *probable lifetime*. If the 51,274 boys were followed to the end of life, the numbers of the years each lived noted down, and added up, the sum divided by 51,274 would give about 40·17 years as the average duration of their lives, or the average number of annual payments which they would receive under a life annuity. "Expectation of life" would be less ambiguously expressed by mean "lifetime." The French have the corresponding terms *vie probable* and *vie moyenne*. The expectation of the life of a male 5 years of age is 49·64, and of a female 50·38; at 10 years of age the expectation of life is 47·08 for a male, 47·81 for a female, &c. From the same table the "mean joint lifetime" has been calculated. It appears that the mean duration of marriage in persons who marry at 30 is 24·63 years; if the husband be 30 and the wife 25 or 20, the duration of marriage is 25·65 years and 26·46 years. Wives married at the age of 25 to husbands of 30, if they survive their husbands, live after them at an average 11 86 years. The husbands who survive their wives live after them 7·48 years at an average. Leases held on the longest of two lives, a male and a female, put in at the age of 20, expire at an average every 51 years; and every 64 years, if boys and girls of 4 years of age are nominated.—(See *App. to Reg. Gen. Sixth Rep.*, pp. 581, 582.)

Proportion of Ages to the Population.—This proportion may be ascertained by taking an account of the ages of the population when a census is made. No compulsory return of this sort has been obtained in England; but in 1821 it was left to the option of the overseers to inquire into the ages of individuals, when they thought it might be done in a manner satisfactory to themselves, and not inconvenient to the parties; and it is a remarkable proof of the zeal of the overseers and the good will of the public, that, under this recommendation, the ages of no fewer than 10,530,671 persons were ascertained in England and Wales. The results of this enumeration are given in the subjoined Table. From this it appears that, supposing the enumerated population to be represented by 1,000, nearly half the whole, or 490, were under

20 years of age; 275·4 were between 20 and 40; 159·3 between 40 and 60; and so on.

Ages of Persons enumerated in England and Wales, May 28, 1821, with Proportions annexed, supposing each Sex and the Total to have been 10,000,000.

Ages.	Males.		Females		Total.	
Under 5 Years	791,579	1,536,732	774,689	1,440,044	1,566,268	1,487,339
5— 9	693,858	1,347,022	682,457	1,268,597	1,376,315	1,306,958
10—14	603,613	1,171,824	569,366	1,058,376	1,172,979	1,113,869
15—19	509,586	989,285	535,569	995,552	1,045,155	992,487
20—29	755,780	1,467,234	901,338	1,675,468	1,657,118	1,573,611
30—39	593,662	1,152,506	649,507	1,207,348	1,243,169	1,180,522
40—49	482,329	936,370	500,977	931,250	983,306	933,755
50—59	342,204	664,338	352,160	654,619	694,364	659,373
60—69	231,509	449,440	249,184	463,200	480,693	456,470
70—79	115,032	223,317	124,648	231,704	239,680	227,602
80—89	29,587	57,438	36,315	67,505	65,902	62,581
90—99	2,253	4,378	3,280	6,097	5,533	5,254
100 and upwards . .	60	116	129	240	189	179
Totals . .	5,151,052	10,000,000	5,379,619	10,000,000	10,530,671	10,000,000

The ages of the population were omitted in the census of 1831, but they were again taken in the census of 1841. And the subjoined Table, from the Fifth Report of the Registrar-General, contains a statement of the ages of the population, as given in the census, with corrections for the increase of population down to the 1st of July, 1841, and for the ages that were omitted; it exhibits also the deaths at different ages in 1841, with the per centage mortality, &c.

Ages, Population, Deaths, and Per-centage Mortality of England, 1841.

Age.	Population, Calculated for July 1st, 1841.*			Deaths Registered, 1841.			Annual Mortality per Cent.			*One* Death to Persons Living.
	Persons.	Males.	Females.	Persons	Males.	Females.	Mean.	Males.	Females.	
0—1	429,419	210,507	218,912	74,210	41,444	32,766	17·355	19·726	14·984	6
1—2	429,803	215,493	214,310	27,268	13,987	13,281	6·358	6·503	6·204	16
2—3	437,276	218,208	219,068	15,027	7,516	7,511	3·441	3·451	3·432	29
3—4	410,077	203,653	206,424	9,914	5,028	4,886	2·422	2·474	2·370	41
4—5	401,555	201,238	200,317	7,164	3,620	3,544	1·786	1·802	1·771	60
0— 5	2,108,130	1,049,099	1,059,031	133,583	71,5 5	61,988	6·349	6·838	5·860	16
5—10	1,906,576	953,893	952,683	17,868	9,093	8,775	·938	·955	·922	107
10—15	1,733,652	881,129	852,523	9,116	4,478	4,638	·527	·509	·545	190
15—20	1,588,340	782,425	805,915	12,056	5,604	6,452	·759	·718	·801	132
20—25	1,551,708	724,018	827,690	13,922	6,633	7,289	·900	·918	·882	111
25—30	1,284,020	611,390	672,630	12,880	6,045	6,844	1·005	·991	1·019	100
30—35	1,167,954	565,226	602,728	11,414	5,422	5,992	·978	·961	·995	102
35—40	885,306	435,480	449,876	11,195	5,385	5,810	1·266	1·239	1·293	79
40—45	888,806	435,991	452,815	10,510	5,251	5,259	1·185	1·207	1·163	84
45—50	639,202	313,709	325,493	10,244	5,322	4,922	1·607	1·700	1·514	62
50—55	634,904	307,435	327,469	10,811	5,673	5,138	1·710	1·849	1·571	58
55—60	392,166	189,816	202,350	10,552	5,418	5,134	2·700	2·860	2·540	37
60—65	440,110	209,248	230,862	13,813	7,090	6,723	3·155	3·395	2·915	32
65—70	259,839	120,829	139,010	14,071	6,881	7,190	5·442	5 706	5·178	18
70—75	224,431	104,133	120,298	15,569	7,630	7,939	6·974	7·341	6·607	14
75—80	120,015	55,653	64,362	14,525	6,992	7,533	12·152	12·566	11·717	8
80—85	70,494	31,136	39,358	11,681	5,356	6,323	16·662	17 242	16·088	6
85—90	24,008	10,149	13,859	6,550	2,841	3,709	27·418	28·047	26 790	4
90—95	6,541	2,493	4,048	2,243	898	1,345	34·677	36·091	33·264	3
95-100	1,421	497	924	604	220	384	42·972	44·252	41·592	2
100 and upwards	249	82	167	110	29	81	41·829	35·221	48·438	2
All Ages .	15,927,867	7,783,781	8,144,086	343,847	174,198	169,649	2·160	2·238	2·083	46

* The columns 2, 3, and 4 may be held to represent the average number of persons living who incurred the risk of death in England in the year 1841. The annual rate of increase was assumed to be the same as in the ten years 1831-41, namely, 1·334 per cent.; and the ages of those whose ages were not specified, to be the same as those whose ages were specified. The columns include the army, persons travelling on railways, and 1,366 men on the river Thames.

The totals of the columns 5, 6, and 7 contain 521 persons (340 males and 181 females) whose ages were not specified.

The columns 8, 9, 10, and 11 may be read thus:—At the age of 35-40, of 100 men living, 1·239 died; of 100 women, 1·293 died. The mean mortality of the two sexes (50 of each) was 1 266, which is equal to 1 in 79.

The columns 8, 9, and 10, read without reference to the decimal point, show the deaths out of 100,000 living at each age.

The *mean age of the male population* at the last Census (1841) was 25¼ years: owing to the increase of population the young predominate; if the population were stationary, and subject to the same law of mortality as the Life Table, the mean age of the people would be 32 years. In a stationary community of 41,159 persons, 1,000 annual deaths would be compensated by 1,000 births; the mean age of death would be 41 years (or, more exactly, 41·159 years); the mean age of the 41,159 living, taken any time at a census, would be found to be 32 years; and the 41,159 would live, upon an average, 32 years from the date of the Census. (For the various results deducible from this new form of Table, see *App. to Reg. Gen. Sixth Rep.*, 8vo., pp. 647-662.)

Sect. 2.—*Population of Scotland.*

Races of Inhabitants.—It is generally allowed that the first immigrants into Scotland, like those into England, belonged to the great Celtic family; and Mr. Chalmers and others have endeavoured to prove that the population continued to be purely Celtic till it was alloyed first by Roman, and subsequently by Gothic, invaders.—(*Caledonia*, vol. i., p. 496, &c.) But this opinion does not seem very tenable. Tacitus expressly affirms that the Caledonians or inhabitants of Scotland, were of Germanic or Gothic origin: "*Rutilæ Caledoniam habitantium comæ, magni artus, Germanicam originem asseverant.*"—(*Vit. Agricolæ*, cap. 11.) Agricola, however, from whom Tacitus derived his information, was but very slenderly acquainted with the country to the north of the Grampians. There is, indeed, every reason to think that Berwickshire, the Lothians, Fife, and other parts of the low country on the east coast of Scotland, were, like the same tracts in England, early occupied by Belgic or other Gothic colonists from the opposite continental coast; and it seems most probable that Tacitus, in ascribing to the Caledonians a Germanic origin, had these only in view. The fair presumption is, that, in the northern as in the more southerly part of the island, the old Celtic inhabitants maintained their ascendancy in all the mountainous and comparatively inaccessible districts; and this reasonable presumption is corroborated by various circumstances.

In the third century, the terms Picts and Pictland began to be substituted for Caledonians and Caledonia. It is pretty generally believed that these terms apply to the same people and the same country. It seems, indeed, to be perfectly clear that the Picts were descended from the Scythians or Goths;* and if we be right in our statement as to the origin of the Caledonians, it follows that, if the Picts were not identical with them, they belonged, at all events, to a kindred race.

We have already stated (*antè*, p. 225), that at an early period a colony of a people called *Scoti* or *Attacotti* (the *Dalriads* of the venerable Bede) passed from Ireland into the Western Highlands. The origin of the Scoti is involved in impenetrable mystery. If, as is

* See Pinkerton's chapter on the origin of the Picts in his *Inquiry into the early History of Scotland.*

believed by many, they were of Gothic or Scythian origin, they had lost their ancient speech; and had, with the language, adopted the manners and institutions of the Irish Celts or Gael. The Scoto-Irish colonists in Argyle received, at subsequent periods, reinforcements from Ireland; and they are said by some to have conquered the Caledonians or Picts, and, in the sequel, to have succeeded in establishing their language and customs in all that part of Scotland known by the name of the Highlands. But there is no evidence of any such conquest actually taking place; and the whole story seems destitute of any solid foundation. As already stated, the probability appears to be that all the western and central parts of the Highlands were occupied, at the period when the Scotch established themselves in Argyle, by a congenerous race, or by Celts. The Scotch colonists, had, however, a written language, which the old inhabitants of the country had not; and they were, also, superior to the latter in most sorts of knowledge and civilisation.* These circumstances sufficiently account for the ascendancy they acquired, and for their being able to give their name to the country. But it is inconsistent alike with historical evidence, and with probability, to suppose that the Scotch came over in sufficient numbers to change the language of the country, had it differed very materially from their own. It is generally admitted that they had lost their original language during their residence in Ireland; and no doubt they would have lost the newly-acquired language they brought into the Highlands, had it not been, in all its most essential particulars, the same with that in common use in the country.

After the Romans withdrew from Britain, some Gothic or Saxon tribes, following the example set by those who had previously settled in the more southerly parts of the island, established themselves, during the sixth century of our æra, between the Tweed and the Frith of Forth.—(*Turner's Anglo-Saxons*, 5th edit., i. p. 299.) These new immigrants were afterwards followed by others, at the same time that they drew recruits from their brethren established in England; and Mr. Chalmers supposes that, their power being thus progressively augmented, they gradually acquired a complete ascendancy in all the southern parts of the country, and communicated to it their language and manners.—(*Caledonia*, ii., 7.). This, however, would have been an extremely difficult task; but if, which seems abundantly certain, we conclude with Pinkerton, that the Picts, who were in possession of all the low country in the sixth century, were congenerous with the Saxons, by whom it was then invaded, the two races would readily amalgamate; and the early prevalence of the Scandinavian or Gothic tongue in the Lowlands is rationally accounted for.

After the Saxons or Goths in the Lowlands, and the Celtic colonists from Ireland, and other Celtic inhabitants of the Highlands, had been united under one government, the name Scotland, which had previously been given to the country to the north of the Friths of Forth and Clyde, was used to distinguish the whole country to the north of England.

Towards the end of the eighth century, a fresh colony from Ireland

* *Pinkerton on the early History of Scotland*, vol. ii. p. 160.

established itself in the district now known by the name of Galloway, in the south-west part of Scotland. But though these colonists succeeded in giving a name to the country, they were not sufficiently numerous to introduce their language into common use.* And for these several centuries, long indeed before the inhabitants had any considerable intercourse with other parts of the kingdom, the Anglo-Saxon tongue has been in as universal use in Galloway as in any part of the Lowlands of Scotland.

Exclusive of the Celts, Goths or Picts, Romans, Scoto-Irish, and Saxons, colonies of Danes and Norwegians established themselves in Caithness and other parts of the mainland, as well as in Orkney and Shetland, and parts of the Western Isles. Generally, however, it may be said that at present the inhabitants of the Lowlands of Scotland are principally of Saxon, while those of the Highlands, with the exception of Caithness, are almost entirely of Celtic extraction.

Progress of Population in Scotland.—Number of Inhabitants.—The notices of the population of Scotland in remote periods are few and of little authority. It is plain, however, from the sterile nature of the greater part of the country; its generally unsettled and turbulent condition, marked by the prevalence of insurrections and civil wars; the want of large towns, manufactures, and commerce; and the frequent recurrence of destructive scarcities,† that the population in remote periods must have been extremely small. It began to increase after the accession of the house of Stuart to the throne of England, when a more powerful government was established; but at the period of the Union, in 1707, it is not supposed to have exceeded 1,050,000.

Until after the rebellion of 1745, Scotland reaped but little advantage from the Union. That event, however, though disastrous at the time, was in the end highly beneficial. It stimulated government to adopt measures for suppressing those feudal institutions that had long been the bane of Scotland, and for introducing civilisation and good order into the Highlands. The Act of 1748, for the abolition of all sorts of hereditary jurisdictions, and the appointment by the crown of

* "Galloway, in the Latine writers of the middle tyme, *Gaelvallia sive Gallovidia*, so called be the Irish who sometyme dwelt there, and terme themselves, in their awne language, *Gael.*"—*Timothy Pont's Galloway*, in the *Appendix to Symson's Galloway*, p. 114.

† Some of these scarcities were very severe, and extended their ravages over a great extent of country. Those of 1635, 1688, the period from 1693 to 1700—emphatically termed the "seven ill years," 1740 and 1782, and 1783, were particularly severe. During the "seven ill years" the distress was so great that several extensive parishes in Aberdeenshire, and other parts of the country, were nearly depopulated; and some farms remained unoccupied for several years afterwards. In 1783, vast numbers of the small Highland farmers were ruined; and many persons died of want.—(*Sinclair's Statistical Account of Scotland*, vol. vi., p. 121. *Malthus, on Population*, 5th ed., vol. ii., p. 125.)

But, though the population be now nearly double what it was in 1783, such distressing calamities no longer occur. This is owing, partly to the improved state of agriculture, partly to the greater comforts enjoyed by all classes, which enables them to retrench in periods of scarcity, and partly to the extensive intercourse carried on with other countries, whence supplies of corn, &c., may be brought in scarce years.

stipendiary sheriffs and other judicial officers, has been in the highest degree advantageous, as well by preventing abuse as by insuring the cheap and impartial administration of justice. The construction of military roads, that laid open the more inaccessible parts of the Highlands, was also a most important measure. After this had been done, it ceased to be possible for any chieftain or clan to brave the law with impunity; its empire was everywhere established, and, in consequence, the energies of the people began to be turned from projects of rapine, vengeance, or petty wars, towards other and more beneficial objects of pursuit.

Improvements of all sorts—in agriculture, manufactures, and commerce—began to make rapid advances in Scotland after the peace of Paris in 1763. And we believe we are warranted in affirming that, from the close of the American war down to the present day, the progress of Scotland, in civilization and the accumulation of wealth, has not been surpassed, if it ever have been equalled, by that of any other European country.

In 1755, the population of Scotland was determined for the first time with tolerable precision. It was then ascertained, principally from returns furnished by the clergy to Dr. Webster, the omissions and deficiencies being supplied from the most approved data, that it contained 1,265,380 inhabitants. The population of 1801, according to the census of that year, amounted to 1,599,068, being an excess of 333,688 individuals over that of 1755. The population at the last-mentioned epoch, with its progress during the present century, is seen in the following Table:—

Account of the Population of Scotland in 1801, 1811, 1821, 1831, 1841, *and* 1851; *showing its Amount in each County, with the Ratio of its Increase in each decennial period since* 1801.

Counties.	1801.	Incr. per Cent.	1811.	Incr. per Cent.	1821.	Incr. per Cent.	1831.	Incr. per Cent.	1841.	Incr. per Cent.	1851.
Aberdeen. . . .	121,965	10	133,871	16	155,049	15	177,657	8	192,307	10	212,032
Argyll	81,277	6	86,341	12	97,316	4	100,973	—4	97,371	—9	89,298
Ayr	84,307	23	103,910	23	127,298	14	145,055	13	164,356	15	189,886
Banff	37,216	3	38,433	14	43,663	11	48,337	3	49,679	9	54,171
Berwick	30,206	2	30,892	6	32,385	2	34,046	1	34,438	5	36,297
Bute	11,791	2	12,033	15	13,797	3	14,151	11	15,740	5	16,606
Caithness. . . .	22,600	4	23,419	25	29,181	18	34,529	5	36,348	6	38,709
Clackmannan . .	10,858	10	12,010	10	13,263	11	14,729	30	19,155	20	22,951
Dumbarton . . .	20,710	16	24,189	13	27,317	22	33,211	33	44,206	1	45,108
Dumfries	54,497	15	62,960	13	70,878	4	73,770	—1	72,830	7	78,122
Edinburgh . . .	122,107	21	148,097	29	191,514	15	219,443	2	225,454	15	259,435
Elgin or Moray. .	27,700	1	27,967	12	31,348	10	34,493	1	35,013	11	38,959
Fife	93,743	8	101,272	13	114,556	12	128,439	9	140,140	10	153,846
Forfar.	99,058	8	107,187	6	113,855	23	139,606	22	170,453	12	191,364
Haddington . . .	29,986	3	31,050	13	35,127	3	36,145	—1	35,886	1	36,386
Inverness. . . .	72,672	7	77,671	16	89,961	5	94,707	3	97,799	—2	96,506
Kincardine . . .	26,349	4	27,439	6	29,118	8	31,431	5	33,075	5	34,578
Kinross	6,725	8	7,245	7	7,762	17	9,072	—3	8,763	2	8,924
Kirkcudbright . .	29,211	15	33,684	15	38,903	4	40,390	1	41,119	5	43,121
Lanark	147,602	29	191,291	28	244,387	30	316,919	34	426,172	24	530,169
Linlithgow . . .	17,844	9	19,451	17	22,845	3	23,291	15	26,872	12	30,132
Nairn	8,922	2	9,096	2	9,268	1	9,344	—1	9,217	2	9,436
Orkney and Shetland	46,824	—1	46,153	15	53,124	10	58,239	5	61,065	2	62,388
Peebles	8,735	13	9,935	1	10,046	5	10,578	—1	10,499	2	10,736
Perth	125,593	7	134,310	3	138,247	3	142,166	—3	137,457	1	138,680
Renfrew	78,501	18	93,172	20	112,175	19	133,448	16	155,072	4	161,091
Ross and Cromarty	56,818	8	60,858	13	68,762	9	74,620	5	78,685	5	82,707
Roxburgh . . .	33,721	10	37,220	10	40,892	7	43,663	5	46,025	12	51,642
Selkirk	5,889	9	6,389	13	6,637	3	6,833	17	7,990	23	9,809
Stirling	50,825	14	58,174	12	65,376	11	72,621	13	82,057	5	86,237
Sutherland . . .	23,117	2	23,639	1	23,840	7	25,318	—3	24,733	4	25,703
Wigtown	22,918	*17	26,891	24	33,340	6	35,254	8	38,195	11	42,389
Totals of Scotland	1,608,420	13	1,805,864	16	2,091,521	13	2,364,386	11	2,620,184	10	2,888,742

The progress of population, as evinced in this table, though very considerable, has been less than its progress during the same period in England and Ireland; while there are good grounds for thinking that the wealth of Scotland has increased more rapidly than that of either of these countries. This desirable result seems to have been owing principally to the consolidation of farms in the low country; the introduction of sheep-farming into the Highlands; and the obstacles opposed by the law of Scotland as to leases, and the operation of the poor laws, to the subdivision of the land, and the building of superfluous cottages. These circumstances, combined with the moral and religious habits of the people, and the general diffusion of education, have made marriages be deferred to a later period than in other parts of the empire, and have also led to a very extensive emigration. But however it may be accounted for, the fact is certain that, as compared with the increase of wealth, the population of Scotland has increased less rapidly than that of England, and much less so than that of Ireland. In consequence, the Scotch have advanced more rapidly than the English or Irish in wealth, and in the command of the necessaries and conveniences of life. Their progress in this respect has, indeed, been quite astonishing. The habits, diet, dress, and other accommodations of the people have been signally improved. It is not too much to affirm, that the peasantry of the present day are better lodged, better clothed, and better fed than the middle class of landowners a century ago.

Density of Population.—The population of Scotland is much less dense than that of either England or Ireland. This is occasioned principally, no doubt, by the greater sterility of the soil; but it is also owing, in no inconsiderable degree, to the circumstances that have checked the subdivision of the land, and prevented the too rapid increase of population in the country parishes. The following table embodies all the existing information on this interesting subject.

Table showing the Number of Acres of Land in the several Counties of Scotland, exclusive of the Lakes, and the Number of Males, Females, and Inhabited Houses in each in 1851; *showing also the Number of Acres corresponding to each Person, and the Number of Persons corresponding to each Inhabited House in* 1851.

Counties.	Area in Statute Acres.	Population in 1851.			Inhabited Houses, 1851.	Acres of Land to an Individual.	Individuals to a House.
		Males.	Females.	Totals.			
	Acres.						
Aberdeen . . .	1,260,625	100,050	111,772	211,822	31,743	5·9	6·7
Argyll	2,058,126	43,816	45,363	89,179	15,039	23·0	5·9
Ayr	650,156	92,183	96,913	189,096	23,554	3·4	8·0
Banff	439,219	25,469	28,596	54,065	10,662	8·1	5·1
Berwick	309,375	17,423	18,864	36,287	6,363	8 5	5·7
Bute	109,375	7,492	9,087	16,579	2,335	6·6	7·1
Caithness. . . .	455,708	18,209	20,380	38,589	6,952	11·8	5·6
Clackmannan . . .	29,744	11,283	11,604	22,887	2,950	1 3	7·8
Dumbarton . . .	174,532	22 206	22,698	44,904	4,792	3·8	9·4
Dumfries . . .	722,813	37,154	40,937	78,091	13,300	9·3	5·9
Edinburgh . . .	254,300	118,807	140,019	258,826	20,946	1·0	12·4
Elgin	340,000	18,118	20,768	38,886	7,642	8·7	5 1
Fife	322,031	72,917	80,365	153,282	21 610	2·1	6·2

Table showing the Number of Acres of Land, &c.—continued.

Counties.	Area in Statute Acres.	Population in 1851.			Inhabited Houses, 1851.	Acres of Land to an Individual.	Individuals to a House.
		Males.	Females.	Totals.			
	Acres.						
Forfar	568,750	87,976	102,925	190,901	22,446	3·0	8·5
Haddington	185,937	17,601	18,776	36,377	6,444	5 1	5·6
Inverness	2,668,658	44,811	51,539	96,350	17,536	27·8	5·5
Kincardine	252,250	17,004	17,590	34,594	6,636	7·3	5·2
Kinross	45,531	4,305	4,619	8,924	1,662	5·1	5·4
Kirkcudbright	610,734	20,187	22,898	43,085	7,009	14·2	6·1
Lanark	631,719	255,972	273,072	529,044	37,504	1·2	14·1
Linlithgow	64,375	15,123	14,937	30,060	4,059	2·1	7·4
Nairn	137,500	4,647	5,261	9,908	2,022	13·8	4·9
Orkney and Shetland	598,726	27,335	35,028	62,363	11,334	9 6	5·5
Peebles	226,488	5,364	5,374	10,738	1,796	21·1	6·0
Perth	1,788,438	66,311	72,323	138,634	22,528	12·9	6·2
Renfrew	150,000	75,295	85,384	160,679	10,760	·9	14·9
Ross and Cromarty	1,993,875	38,945	43,695	82,640	15,941	24·1	5·2
Roxburgh	460,938	25,212	26,430	51,642	7,255	8·9	7·1
Selkirk	170,313	4,850	4,959	9,809	1,331	17·4	7·4
Stirling	286,188	42,073	44,003	86,076	11,312	3 3	7 6
Sutherland	1,207,188	11,917	13,876	25,793	4,943	46 8	5·2
Wigtown	326,736	20,209	23,054	43,263	6,902	7·5	6·3
Totals	19,500,348	1,370,264	1,513,109	2,883,373	370,308	..	..
Average of Acres to an Individual, and of Individuals to a House, in Scotland	..	..	..	..	..	6·7	7·8

Population of Principal Towns.—The following Table exhibits the *Account of the Population of the principal Towns in* 1841 *and* 1851, *showing the Ratio of their increase or decrease, with the Number of Inhabited Houses in each in* 1851, *and the Average Number of Persons to a House.*

Cities and Towns.	Population in 1841.	Inc. per Cent.	Population in 1851.	Inhabited Houses in 1851.	Persons to a House in 1851.
		Inc.			
Edinburgh and Leith	158,961	20	191,221	9,870	19·3
Glasgow	255,650	28	329,097	11,965	27·5
Aberdeen	61,923	16	71,973	5,839	12·3
Paisley	47,695	½	47,920	3,565	13·4
Dundee	62,873	23	78,931	5,040	15·6
Greenock	35,645	2	36,689	1,714	21·4
Perth	20,167	18	23,835	1,991	11·9
Kilmarnock	19,398	10	21,443	1,652	12·9
Dunfermline	13,296	4	13,836	1,487	9·3
Montrose	14,252	6	15,238	1,473	10·3
Dumfries	13,088	½	13,166	1,582	8·3
Inverness	11,568	10	12,793	1,704	7·5
Ayr	15,749	11	17,624	1,855	9·5
Falkirk	8,203	6	8,752	949	9·2
Wick	5,522	21	6,722	885	7·5
Stirling	10,701	19	12,837	1,270	10·1
Airdrie	12,408	16	14,435	1,239	11·6
Hamilton	8,689	10	9,630	967	9·9
Arbroath	14,568	16	16,986	1,734	9·7
Forfar	7,981	16	9,311	1,023	9·1
Totals	798,137	19	952,439	57 804	16·4

It appears, from this and the Table on p. 428, that, while the entire population of Scotland increased, during the 10 years ending with 1850, 10 per cent., the population of the great towns increased, during the same period, 19 per cent. At an average of the 16 principal towns in Scotland in 1841, there were 16·4 persons to a house, whereas, in 1851, there would appear to be only 5·428 to ditto. In truth and reality, however, the number of persons to a house has varied very little since 1831, the difference being apparent only, and depending almost wholly on a change in the mode of enumerating houses.

A good deal of difficulty and confusion has prevailed in regard to the proper definition of a house. In Edinburgh (more especially in the Old Town), and in Glasgow, Aberdeen, and the other large Scottish towns, houses are very frequently divided into stories, or as they are there called, *flats*, access to these being obtained by means of a common stair, reaching from the ground-floor to the highest story. In some places houses vary in height from 3 and 4 to 5, 6, 7, and 8 stories; and as each story accommodates one, and sometimes two families, who are nowise connected with each other, the population under the same roof is often very great. Previously to the late census a house was sometimes regarded as comprising the whole building included within the basement, the roof, and the party-walls by which it is separated from others, without respect to the number of distinct lodgings or dwellings into which it might be divided. Sometimes, however, a different rule was adopted, and each story or flat was taken for a house. To obviate the confusion occasioned by this want of classification, it was ordered at the last census, that each distinct building should be deemed a house, without regard to the mode in which its interior might be distributed.

In illustration of the results derived from these different modes of estimating houses, we may observe that, under the late census, there are said to have been 13,385 inhabited houses in Glasgow, which, as the population amounted to 358,951, gives no fewer than 26·8 individuals to a house.* But in truth and reality there were, at the above period, 68,289 distinct dwellings in Glasgow, giving a population of 5·2 to each.—(*Dr. Strang's Report on Census of Glasgow, in* 1851.)

Previously to the late census it was usually supposed that there were more persons to a house in Edinburgh than in Glasgow. But it is now seen that this is a mistake; and that while there are about 27 persons to a house in the latter, there are only about 19 in the former. We, however, incline to think that this is not occasioned by the greater subdivision of houses in Glasgow, but rather by the greater crowding of the inferior classes into lodging-houses.

Age and Place of Birth.—The following table shows the numbers of people above and below 20 years of age in Scotland in 1841, with the places of their birth, &c.:—

* In the Parliamentary Borough there were, in 1851, 11,965 inhabited houses, and 329,097 inhabitants, giving 27·5 to each house.

Account of the Population of each County of Scotland in 1841, *showing the Numbers of Males and Females in each under and above* 20 *Years of Age, with the Numbers respectively born in Scotland, England and Wales, Ireland, &c.*

Counties.	Total of Persons.	Ages.				Born in Scotland.	Born in England and Wales.	Born in Ireland.	Place of Birth not specified.
		Under 20 Years.		20 Years and upwards.					
		Males.	Females.	Males.	Females.				
Aberdeen . . .	192,387	44,013	44,450	45,694	58,230	188,350	1,711	1,087	1,239
Argyll	97,371	24,497	23,183	23,298	26,393	94,354	415	962	1,640
Ayr	164,356	40,660	40,174	38,323	45,199	150,078	1,041	12,035	1,202
Banff	49,679	11,765	11,664	11,484	14,766	49,118	233	88	240
Berwick . . .	34,438	8,098	7,905	8,460	9,975	32,494	1,566	154	224
Bute	13,740	3,582	3,609	3,573	4,976	15,178	101	288	173
Caithness . . .	36,343	8,748	8,488	8,368	10,725	35,766	140	65	370
Clackmannan .	19,155	4,813	4,595	4,573	5,174	18,640	215	150	150
Dumbarton . .	44,296	10,668	10,241	11,874	11,513	38,293	668	4,891	439
Dumfries . . .	72,830	17,562	17,270	16,575	21,423	69,244	1,977	1,032	577
Edinburgh . .	225,454	48,754	49,970	58,912	72,818	207,984	9,012	7,100	1,358
Elgin or Moray .	35,012	7,964	8,067	8,126	10,855	34,475	318	85	134
Fife	140,140	33,614	33,447	32,101	40,998	127,521	1,223	804	592
Forfar	170,520	39,861	39,529	40,014	51,616	161,364	1,738	6,474	949
Haddington . .	35,886	8,595	8,345	8,684	10,272	34,704	617	368	197
Inverness . . .	97,709	22,807	23,093	22,731	29,169	96,365	440	268	736
Kincardine . .	33,075	7,662	7,577	8,107	9,669	32,620	271	73	111
Kinross . . .	8,763	2,031	1,923	2,164	2,645	8,664	47	19	33
Kirkcudbright .	41,119	9,548	9,689	9,306	12,304	38,662	768	1,504	185
Lanark . . .	426,972	96,645	100,693	109,667	117,967	360,270	8,299	55,915	2,488
Linlithgow . .	26,872	6,265	6,100	7,532	6,975	24,938	277	1,322	335
Nairn	9,217	2,041	2,019	2,100	2,907	9,107	46	10	54
Orkney and Shetland . . .	61,065	14,818	13,927	12,689	20,121	60,501	143	30	391
Peebles . . .	10,499	2,559	2,595	2,559	2,786	10,190	104	94	111
Perth	137,300	30,758	30,361	34,220	42,051	134,032	1,108	656	674
Renfrew . . .	155,072	36,526	38,071	36,333	44,142	132,186	1,829	20,417	640
Ross and Cromarty	78,685	18,191	17,684	18,588	24,222	77,942	223	81	439
Roxburgh . . .	46,025	10,698	10,623	11,243	13,261	43,760	1,765	316	184
Selkirk . . .	7,909	2,022	1,899	1,950	2,119	7,777	132	31	50
Stirling . . .	82,037	19,520	18,992	21,484	22,061	76,579	903	4,256	419
Sutherland . .	24,782	5,765	5,702	5,619	7,696	24,496	96	24	166
Wigtown . . .	39,195	9,490	9,575	8,600	11,530	32,750	475	5,772	198
Total . . .	2,620,184	611,534	611,814	630,328	766,508	2,439,269	37,796	126,321	16,798

Registers.—The Act 6 and 7 Will. IV., cap. 86 (*ante*, p. 410), did not extend to Scotland; and the Scotch registers of births, marriages, and deaths are so exceedingly defective, that, except in a very few parishes, they are good for nothing. Previously to 1783, it was usual, both with persons belonging to the established church and the principal classes of dissenters, to register the baptisms of their children. In 1783, however, a tax was imposed on registration, and it was so very unpopular as to cause an instant and almost total cessation of the practice. This injudicious impost was repealed in 1794; but the practice of registration has not been more than partially revived. In proof of this we may mention that, in Edinburgh, in 1834, only 480 births were registered in the 13 city parishes, being little more than a *fifth part* of what they must have really amounted to!

In Scotland, it is not necessary that marriages should be solemnised by clergymen of the established church, or, indeed, by clergymen at all; the simple declaration of the parties that they are married being, under certain circumstances, quite enough to give validity to the contract. Generally, however, marriages are performed *faciæ ecclesiæ*; and most persons that have been irregularly united subsequently appear before the session of the parish, and acknowledge their fault. But, notwithstanding, the marriage register is, in nine cases out of ten, a register of the *publication of banns* merely, and not of marriages. Sometimes the proposed marriage never takes place; and when, as is frequently the case, the man resides in one parish, and the woman in

another, there is a double proclamation of banns, so that the register affords few conclusions, except such as are false and misleading.

In many parishes there is no register of burials; and in those, where it is kept, it is, in general, very little to be depended on. It is common, particularly in country parishes, in Scotland, for persons to be buried, not in the parish where they resided at the time of their death, but in some contiguous parish where their ancestors have been buried, so that, although the registers of burials were accurately kept, they would not afford any means of fairly estimating the mortality in particular parishes. Poor persons pay no burial fees, and are not usually registered.

It is much to be wished that something effectual were done to put an end to a state of things so adverse to the interests of individuals, as well as to the progress of statistical science. Various bills in relation to it have been introduced into parliament; but none of them has hitherto passed into a law. It will be essential to the success of any measures that may be taken with respect to it, that the registration should be compulsory on all individuals, and that it should be committed to the care of respectable parties,—perhaps the parish schoolmasters would be the best of any,—who should have an interest in seeing that it was made as complete and perfect as possible.

SECT. 3.—*Population of Ireland.*

Races of Inhabitants.—The first inhabitants of Ireland of which history preserves any account, are generally admitted to have belonged, as well as their neighbours in Britain, to the great Celtic family. The question, whether the island was first colonised by emigrants from Britain, Gaul, or Spain, has been much agitated. Its investigation was hardly worth the learning and ingenious conjecture expended upon it. The proximity of Britain to the Continent affords the strongest grounds for supposing that she was peopled antecedently to Ireland; and the contiguity of the latter to Britain affords, also, a strong presumption in favour of the conclusion that her first occupants proceeded from the latter. It appears, indeed, to be exceedingly probable that the Phœnicians visited Ireland; and, if so, colonists might have been carried to her shores from Cadiz, and other parts of Spain, in Phœnician ships. But there is no really authentic evidence to prove that such was the case; and, considering the length, and (which it must have been in those days) the dangerous nature of the voyage, though it were admitted that Spanish colonists had early settled in Ireland, there seems no reason to think that they did so in any considerable numbers, or that their descendants ever occupied the country. On the whole, therefore, the fair presumption seems to be that the original population of Ireland was principally derived from Britain, but partially also from Gaul.

We have already noticed the emigration of the Gaelic Celts from Britain to Ireland, subsequent to the invasion of the former by the Cimbric Celts.—(*Ante*, p. 394.) A great diversity of opinion exists, and an almost impenetrable obscurity hangs over every circumstance respecting the establishment of the *Scoti* in Ireland. Colonists from

Belgium are known to have settled in it, and Pinkerton supposes that they were the progenitors of the Scotch; but this is disputed by Moore and others, who contend that the settlement of the Scotch in Ireland is of a comparatively recent date, and that they were of Scandinavian origin.

But though these Belgian or northern invaders succeeded in obtaining an ascendancy in parts of Ireland, they were not sufficiently numerous to make any considerable change in the language, character, or institutions of its ancient Celtic inhabitants. "The conquering tribes themselves, one after another, became mingled with the general mass, leaving only in those few Teutonic words, which are found mixed up with the native Celtic, any vestige of their once separate existence."—(*Moore's Ireland*, vol. i., p. 98.)

The first permanent change in the population of Ireland was not effected till its invasion by the English under Henry II., in 1172. But the number of English settlers in Ireland was, for a long period, inconsiderable. For some centuries the English dominions were confined within the narrow limits of the *pale*, which seldom extended beyond the modern province of Leinster, and was frequently much less considerable. The rest of the country continued to be occupied by the natives, their chiefs yielding little more than a mere nominal obedience to the crown of England; and the few Englishmen that settled among them, having adopted their manners, are said to have become, in no very long period, *Hibernis ipsis Hiberniores!* During the reign of Elizabeth, an Irish chief, the Earl of Tyrone, raised a formidable rebellion; but this was suppressed by the exertions of the deputy, Lord Mountjoy, who succeeded, for the first time, in establishing the English authority in most parts of the island. In the following reign, an attempt was made to eradicate the seeds of future disorders, by abolishing some of the distinguishing laws and customs of the Irish, which served only to perpetuate their barbarism; and the lands in the greater part of Ulster, having fallen to the crown by forfeiture, were assigned partly to companies of the city of London, and partly to others, by whom great numbers of English and Scotch colonists were settled upon them.

These judicious measures contributed to introduce civilization, industry, and good order into the country. Unfortunately, however, the most efficient of all methods for changing the habits of a people—the general establishment of schools, where the natives might have been instructed in the English language, and in the duties enjoined by religion and morality—was neglected. The English newly settled in Ireland having also adopted the reformed faith, while the greater number of the old English of the *pale*, and the entire body of native Irish, were bigoted adherents of the Catholic creed, a new and most potent element of discord was brought into the field. The Catholic religion was, indeed, tolerated; but the churches and ecclesiastical revenues that had once been enjoyed by its priests having been assigned to others, they naturally became the implacable enemies of the English and the English connexion, and took every opportunity to excite against them the prejudices and rancour of their countrymen. In 1641, when England was deeply agitated by those dissensions that soon after

ended in a civil war, the Irish, inflamed by these and other causes of discontent, contrived and carried into effect a simultaneous massacre of the English in all parts of the country. The unsuspecting victims—men, women, and children—were involved in one common destruction. Not satisfied with taking their lives under the most aggravated circumstances of atrocity and indignity, they pillaged and burned their property, and seized and destroyed their houses! So complete was the devastation, that had it not been that the authorities in Dublin got notice of the insurrection before it actually broke out, and took measures to guard against it, almost every memorial of the English name would have been annihilated in Ireland; for that part of the English that were Catholics had lost most of the distinguishing characteristics of their ancestors, and some of them, indeed, emulated the native Irish in their cruelty to their Protestant countrymen.

The English ascendancy in Ireland was again partially restored during the concluding part of the distracted reign of Charles I. But it was not till the vigorous administration of Cromwell that vengeance was taken for the massacre of 1641, and that the supremacy of England was completely re-established. Still, however, no effectual measures were taken for extirpating the seeds of future rebellions, by providing for the incorporation of the English and Irish; or for removing those religious animosities that had been productive of so much mischief.

In consequence of the prevalence of Catholicism in Ireland, the people generally espoused the cause of the Stuart family. But the arms of William III. being successful, the revolutionary government was established there as well as in England. Unhappily, however, the Catholics were deprived, contrary to the stipulations of the treaty of Limerick, of some of the most important privileges enjoyed by their Protestant countrymen, and were regarded by government with contempt and aversion; and, notwithstanding the growing liberality of the times, and the repeal of some obnoxious statutes, they were left, despite their rapidly increasing numbers, to labour under degrading disabilities, that have been but lately removed. Even now, the only established or endowed religion is that of the church of England, the adherents of which do not exceed a tenth part of the entire population; so that the Irish Catholic priests and laity still continue subject to some of those irritating influences that did so much to promote the rebellion of 1641.

Progress of Population in Ireland.—The first authentic account of the population of Ireland is given by Sir William Petty, in his tract entitled *The Political Anatomy of Ireland.* Sir William was employed by government to superintend the survey and valuation of the forfeited estates, instituted during the Protectorate; and so well did he execute his task that this survey continues, after the lapse of near two centuries, the standard of reference in the courts of law as to all points of property. He had, therefore, the best means of obtaining accurate information with respect to the numbers and condition of the people; and as the results of his researches on these points are exceedingly curious, we shall give them in his own words:—

"The number of people now in Ireland (1672) is about 1,100,000, viz, 300,000 English, Scotch, and Welsh Protestants, and 800,000 Papists; whereof one-fourth are children unfit for labour, and 75,000 of the remainder are, by reason of their quality and estates, above the necessity of corporeal labour; so as there remains 750,000 labouring men and women, 500,000 whereof do perform the present work of the nation.

"The said 1,100,000 people do live in about 200,000 families or houses, whereof there are about 16,000 which have more than one chimney in each, and about 24,000 which have but one; all the other houses, being 160,000, are wretched, nasty cabins, without chimney, window, or door-shut; even worse than those of the savage Americans, and wholly unfit for the making merchantable butter, cheese, or the manufactures of woollen, linen, or leather.

"By comparing the extent of the territory with the number of people, it appears that Ireland is much underpeopled; forasmuch as there are above ten acres (Irish) of good land to every head in Ireland; whereas in England and France there are but four, and in Holland scarce one!"—(*Pol. Anatomy of Ireland*, ed. 1719, pp. 114, 118.)

In 1695, Captain South estimated the population at 1,034,102; but it is impossible to say what credit should be given to his statement.

Mr. Dobbs, the second part of whose valuable *Essay on the Trade and Improvement of Ireland* was published in 1731, gives (p. 6) an account of the number of houses in the kingdom in 1712, 1718, 1725, and 1726. From this account the population has been inferred—supposing 6 inhabitants to belong, at an average, to each house—to have been, in 1712, 2,099,094, and, in 1726, 2,309,106.*

Returns obtained through an inquiry instituted by the Irish House of Lords in 1731 make the population of Ireland in that year only 2,010,221; but this result is not believed to be entitled to much confidence. It should, however, be observed, that at this period, and for long after, Ireland was essentially a grazing country. To such an extent, indeed, was the pasturage system carried, that, in 1727, during the administration of Primate Boulter, a law was made to compel every occupier of 100 acres of land to cultivate at least 5 acres, under a penalty of 40*s.*!

The following estimates of the population have been made on the basis of returns obtained from the hearth-money collectors, supposing, as before, each house to have, at a medium, 6 inhabitants:—

Years.	Population.	Years.	Population.
1754	2,372,634	1777	2,690,556
1767	2,544,276	1785	2,845,932

Since 1785, the population has increased with astonishing rapidity. In 1788, it was estimated, from the hearth-money returns, and other data, by Mr. Parker Bushe, at 4,040,000. In 1805, Mr. Newenham published his *Inquiry into the Population of Ireland*, in which he showed that its increase, during the preceding 20 years, had been great beyond all former precedent; and that there were good reasons for thinking that it then amounted to 5,395,456. An incomplete census

* There is reason to think that this estimate of six inhabitants to a house is not far from the mark; but Mr. Dobbs himself makes no such supposition, his data not being, in his opinion, sufficient to determine it. The writer of the *Preliminary Remarks to the Irish Census of* 1821 should have stated this, when he quoted Mr. Dobbs's authority for the population at the periods referred to.

was taken in 1813, from which the population was concluded to be 5,937,858. At length, in 1821, a complete census was taken for the first time, when the population was found to be 6,801,827; and, since then, censuses have been taken in 1831, 1841, and 1851. The results of these enumerations may be seen in the following Table.

Table exhibiting the Population of Ireland in 1821, 1831, 1841, *and* 1851, *according to the Censuses of these Years, and showing the Increase or Decrease per Cent. in the intervening periods.*

Counties, &c.	1821.	Increase or Decrease per Cent.	1831.	Increase or Decrease per Cent.	1841.	Increase or Decrease per Cent.	1851.
Leinster		Inc.		Inc.		Dec.	
Carlow	78,952	3	81,088	5	86,228	21	68,059
				Dec.		Inc	
Dublin County	150,011	22	176,012	25	140,047	4¾	146,731
				Inc			
Dublin City	195,881	9	204,155	14	232,726	11	258,361
						Dec	
Kildare	90,065	9	108,124	6	114,488	16	95,688
Kilkenny County	138,716	6	169,945	7¾	183,349	23	138,773
				Dec		Inc	
Kilkenny City	23,230	2	23,741	20	19,071	4¼	19,973
						Dec.	
King's County	131,088	9	144,225	2	146,857	23	112,080
Longford	107,570	4	112,559	2	115,491	28	82,350
Louth	101,011	7	107,481	4	111,979	18	90,812
		Dec.		Dec.		Inc	
Drogheda Town	18,118	4	17,365	4½	16,261	3½	16,845
		Inc.		Inc		Dec.	
Meath	150,183	11	176,826	4	183,988	24	140,750
Queen's County	144,275	8	143,851	5	153,940	28	111,624
Westmeath	128,819	6	136,672	3	141,400	24	111,409
Wexford	170,806	7	182,713	11	202,033	10	180,159
Wicklow	110,767	10	121,557	3	126,143	21	98,978
		Inc.		Inc		Dec	
Total	1,757,492	9	1,909,713	3	1,973,731	15½	1,672,501
Munster.							
Clare	208,089	24	258,822	11	286,304	25	212,428
Cork County	629,786	12	703,716	9	774,398	28	563,326
				Dec		Inc.	
Cork City	100,658	6	107,016	25	80,720	6	85,745
				Inc.		Dec.	
Kerry	216,185	22	263,126	12	294,980	19	238,239
Limerick County	218,432	6	248,801	13	281,688	28	206,683
				Dec		Inc.	
Limerick City	59,045	12	66,554	27½	48,391	10	53,448
				Inc		Dec.	
Tipperary	346,896	16	402,563	8	435,553	25	331,487
Waterford	127,842	15	148,233	11	172,971	21	136,754
						Inc.	
Waterford City	28,679	..	28,821	..	23,216	8½	25,207
		Inc		Inc		Dec	
Total	1,935,612	15	2,227,152	8	2,396,161	22½	1,857,412
Ulster.							
						Dec.	
Antrim	217,683	23	268,685	2⅝	276,188	9	251,391
						Inc.	
Belfast	45,177	6⅝	48,224	56	75,308	33	100,300
						Dec.	
Carrickfergus	8,028	8	8,706	8	9,379	11	8,320
Armagh	197,427	11	220,134	6	232,904	15	196,085
Cavan	195,076	17	227,983	7	243,158	28	174,071
Donegal	248,276	16	289,149	3	296,448	14	255,100
Down	325,410	8	352,012	3	361,446	11	320,917
Fermanagh	130,997	14	149,788	4	156,481	25	116,007
Londonderry	193,869	15	223,012	1-20th	222,174	13	191,668
Monaghan	174,697	8	195,536	8	200,442	29	141,813
Tyrone	261,865	16	304,468	3	312,956	18	255,734
		Inc.		Inc.		Dec.	
Total	1,978,494	14	2,180,622	4	2,386,873	16	2,011,756

Table exhibiting the Population of Ireland, &c.—continued.

Counties, &c.	1821.	Increase or Decrease per Cent.	1831.	Increase or Decrease per Cent.	1841.	Increase or Decrease per Cent.	1851.
Connaught.		Inc.		Inc.		Dec	
Galway	309,399	27	381,564	10½	422,923	29	296,1 6
				Dec.		Inc.	
Galway Town	27,775	19	33,120	48½	17,275	27	23,695
				Inc.		Dec.	
Leitrim	124,785	13	141,524	9	155,297	28	111,841
Mayo	293,112	25	366,428	6	388,887	29	274,612
Roscommon	206,729	19	249,613	1	253,511	31	173,417
Sligo	146,229	17	171,765	5	180,886	28	129,510
		Inc.		Inc.			
Total	1,110,229	21	1,343,914	5	1,418 859	29·6-10	1,010,211

SUMMARY.

Provinces.		Inc.		Inc.		Dec.	
Lemster	1,757,492	9	1,909,713	3	1,978,731	15½	1,672,501
Munster	1,935,612	15	2,227,152	8	2,396,161	22½	1,857,112
Ulster	1,994,494	14	2,286,622	4	2,386,373	16	2,011,756
Connaught	1,110,229	21	1,343,914	5	1,418,859	28½	1,010,211
		Inc.		Inc.		Dec.	
Total	6,801,827	14	7,767,401	5	8,175,124	20	6,551,970

Causes of the Increase of Population.—It is obvious from these statements, that the population of Ireland increased after 1785 with extraordinary rapidity. The wealth of the country was also, no doubt, materially augmented after that epoch; but we doubt whether it increased in a corresponding proportion. The condition of the bulk of the people seems to have been nearly as depressed from 1790 downwards as at any former period. Their increase, as compared with that of the means of subsistence, was such as to keep them constantly in poverty, and to prevent them profiting by the wonderful discoveries and improvements of the last half century. We shall briefly notice some of the more prominent circumstances that appear to have conspired to stimulate the progress of population in Ireland subsequently to 1785.

1. The Bounty Act of 1783 and 1784 seems to have given the first considerable stimulus. When the efforts of Grattan and the volunteers achieved the nominal independence of Ireland, and procured the abolition of those oppressive restrictions with which the narrow jealousy of the British Parliament had fettered her foreign commerce, the Irish Parliament made a powerful effort to stimulate the industry and energies of the people; but, unfortunately, the means resorted to for the accomplishment of this desirable purpose were not of a kind that could be productive of any lasting or real advantage. Instead of contenting themselves with breaking down the restraints under which they laboured, and giving freedom to commerce, they had recourse to all the artificial expedients of the restrictive system. In imitation of the erroneous policy of England, they granted high bounties on the exportation of corn, and other raw produce (3*s.* 4*d.* per barrel on

wheat, and other grain in proportion), at the same that they laid prohibitory duties on their importation from abroad. In vain did one or two members urge that, though the bounty system might be apparently beneficial for a few years, it could not be otherwise than injurious in the end. Their feeble and, as it was considered, anti-national opposition was drowned amid general acclamations, and measures which have done irreparable mischief to Ireland were hailed with the enthusiastic plaudits of her choicest patriots!

Previously to the passing of the Bounty Acts (23 and 24 Geo. III. cap. 19), Ireland was, as already stated, essentially a *grazing* country; but no sooner had they been passed, than the artificial enhancement of prices, caused by the bounty and the restriction on importation, occasioned an immediate and extraordinary increase of cultivation. Unluckily, however, there was in 1784, as at present, very little capital in Ireland; and the impossibility, resulting from this circumstance, of finding tenants capable of occupying and cultivating large tillage farms, tempted the proprietors to divide their estates into small portions, and even to let them on the ruinous system of *partnership* leases. Hence the stimulus intended to act exclusively on agriculture had a still more powerful effect in causing the subdivision of farms, and the increase of population.

In 1806, the previously existing restraints on the trade in corn between Great Britain and Ireland were wholly abolished. And, while the markets of England were opened to the free competition of the Irish growers, the high prices obtained during the war continued the impulse originally given by the Bounty Acts, and occasioned a further and very great extension of tillage. More recently, this impulse was continued, by the greater facilities afforded by steam navigation to the intercourse between the two countries; the introduction of improved processes, &c.; and, more than all, by the progressive diminution of pasture land, owing to the enormous rents offered for small tillage farms.

2. But the effect of the Bounty Acts, and of the opening of the markets of England, would have been comparatively trifling, had it not been for the peculiar customs and manners of the people, and the nature of their civil and political institutions. The custom of *gavelkind*, or of equally dividing the paternal property, whether freehold or leasehold, among all the children of a family, has always prevailed among the Irish. Sir John Davies particularly specifies this as one of the customs that had mainly tended to perpetuate the barbarism and poverty of the people; and it still continues to exert a very powerful and disastrous influence.

So long, however, as the rearing of cattle formed the principal employment of the Irish farmers, the custom of *gavelkind*, or the equal partition of property among children, was comparatively harmless; for, as the pasture-lands were generally let in immense tracts to opulent graziers, only a few individuals were required to feed and take care of the cattle, and these were not usually permitted to occupy any land. But the passing of the Bounty Acts gave birth to a new order of things. Even though capital had been as abundant in Ireland, as it was deficient, it would have been impossible for a tillage farmer to have

managed such large tracts of land as were previously held by single graziers. Not only, however, was the size of the farms greatly reduced, but the new occupiers, being for the most part exceedingly poor, were glad to buy whatever labour they could obtain by granting the peasantry allotments of small pieces of ground, whereon they might erect cabins and raise potatoes. And the stimulus that was thus given to population did not cease (as might, indeed, have easily been foreseen) when a sufficient supply of labourers was obtained to cultivate the country. The habits of idleness and of early marriage, caused by the equal partition of the paternal farm, operate quite as powerfully on the descendants of the occupier of a farm of 50 as of 500 acres. There are, in fact, everywhere throughout Ireland, innumerable instances of farms of from 300 to 500 acres let, from 40 to 50 years ago, to single tenants possessed of capital sufficient for their cultivation, and now split, perhaps, among 20, 30, or 40 families, by means of the repeated divisions that have taken place in consequence of the death of fathers, the marriage of children, the introduction of sub-tenants, &c.—(For examples of this, see *ante*, pp. 378, 379, &c.)

It should, however, be observed that the practice of subdividing and subletting farms and patches of land, was checked in 1825, by the Subletting Act passed in the course of that year. And the reduced rate at which the population of Ireland increased during the 10 years ending with 1841, as compared with the previous 10 years, is in a considerable degree to be ascribed to the salutary influence of the above Act, which, though it did not wholly prevent subletting and subdivision, diminished their prevalence.—(See *post.*)

3. The passion for political influence has always had a powerful sway in Ireland; and subsequently to 1792, when Catholics were permitted to exercise the elective franchise, most landlords split their estates for the purpose of creating voters, and the population was, in consequence, much augmented.

"The passion for acquiring political influence prevails," says Mr. Wakefield, "throughout the whole country; and it has an overwhelming influence upon the people; to *divide and subdivide for the purpose of making freeholders is the great object of every owner of land;* and I consider it one of the most pernicious practices that has ever been introduced into the operations of political machinery. It reduces the elective franchise nearly to universal suffrage, to a population who, by the very instrument by which they are made free, are reduced to the most abject state of personal bondage. * * * The little freeholder is ordered to vote for the object of his landlord's choice, with as little ceremony as the Jamaica planter would direct his slave to the performance of the meanest offices."—(*Account of Ireland*, vol. ii., p. 301.)

The experience of the last few years has shown that the influence of the landlords over the voters on their estates was very far, indeed, from being so well established as Mr. Wakefield seems to have supposed. It has been, in fact, diverted, to a great extent, into other channels; and this circumstance contributed more, perhaps, than anything else to facilitate the passing of that part of the Catholic

Emancipation Act which materially diminished the number of small freeholders.

4. Had there been a compulsory provision for the support of the poor in Ireland similar to what has been long established in England, the foregoing causes of increased population might have existed without producing the results we have witnessed. Few Irish gentlemen were able to resist the double temptation to split their estates caused by the desire to extend their political influence, and by the exorbitant rents offered for small patches of land; but had their estates been made liable for the support of these small occupiers and their families and descendants in all time to come, in the event of their becoming infirm, destitute, or unable to support themselves, they would have felt that increased political influence and the promise of high rents were not sufficient to countervail such indefinite responsibility; and would undoubtedly have opposed themselves to the practice of subdivision, and have soon found means to prevent it. Unfortunately, however, there was no check of this sort in existence, nor anything, indeed, to oppose the strong tendencies of a contrary kind; so that we need not wonder at the extent to which the process of splitting farms was carried, or at the swarms of cottiers hutted all over the land.

5. The almost universal dependence placed by the people on the potato has also contributed, and that in no common degree, to increase their numbers. It appears to be satisfactorily established, that a given extent of land planted with potatoes will support at least double the number of persons that it could do, were it sown with wheat, or any species of corn, and five or six times the number that it could support were it employed to produce butchers' meat. Hence it is, that a country like Ireland, the great bulk of the people of which subsist almost wholly on potatoes, may have an exceedingly dense population without considerable manufactures, large towns, or any trade save the exportation of raw produce.

Unhappily, however, a population which, like that of Ireland, is principally dependent on the potato for subsistence, is necessarily poor, and is always placed under the most critical circumstances. It is admitted on all hands that the rate of wages is principally determined by the species of food made use of in a country. Now, as the potato forms that species which is produced at the very least expense, it may be fairly presumed, on general grounds, that wages will be reduced to a minimum wherever the labouring classes are mainly dependent on that root; and the example of Ireland shows that this conclusion is as consistent with fact as with principle. It is clear, however, that when the crop of potatoes happens to be deficient in a country thus situated, the condition of its inhabitants must be in the last degree unfortunate. When the standard of natural or necessary wages is high, when wheat and beef, for example, form the principal part of the food of the labourers, and porter and beer the principal part of their drink, they can bear to retrench in periods of scarcity. Such men have room to fall; they may give up their drink, and resort to cheaper sorts of food, such as barley, oats, rice, and potatoes. But those who are habitually fed on the cheapest species of food are without the power to economise, and have nothing to fall back upon when it happens to be deficient.

You may take from an Englishman, but you cannot take from an Irishman. The latter is at all times placed on the very verge of existence. His wages being regulated by the price of potatoes, will not buy wheat, or barley, or oats; and whenever, therefore, the supply of potatoes fails, it is next to impossible he should escape, by any efforts of his own, from starving.

The history of the scarcities that so frequently occur in Ireland affords many illustrations of the accuracy of the statements now made. Owing, for example, to the failure of the potato crop in 1821, a large proportion of the peasantry of Clare, Limerick, and other counties bordering on the Shannon, were reduced to a state of almost absolute destitution, and had nothing save a miserable mixture of oatmeal, water-cresses, and nettles to subsist upon. In some instances the potatoes, after being planted, were dug up and eaten; and in consequence of the deficiency and bad quality of the food, disease became exceedingly prevalent, and typhus fever, in its worst and most malignant form, carried its destructive ravages into every corner of the country. But it is unnecessary to go back to 1821 for an example of this sort. The failure of the potato crops of 1845 and 1846 was attended by consequences that were still more destructive. And it is of importance to remark that, notwithstanding the urgency of the distress, which, in several districts, amounted to a famine, the exportation of corn and other articles of provision to England, continued down to the very moment when the contributions of government and of the public were applied to purchase food for the peasantry. And it is, indeed, obvious, that to whatever extremity a potato-feeding peasantry may be reduced, they cannot relieve themselves by purchasing corn. If wheat, or even oats, formed the principal part of the food of the Irish, corn would be poured into Ireland in the same way that it is poured into England, whenever the crop is known or supposed to be materially deficient. But a people habitually dependent on the potato cannot become purchasers of corn; nor can they even become purchasers of foreign potatoes, inasmuch as the freight of so bulky a commodity would raise its price far above their limited means. In a period of scarcity men cannot go from a low to a high level; they must always go from a higher to a lower. But to the Irish this is impossible; they have already reached the lowest point in the descending scale; and a scarcity of potatoes is in their case synonymous with famine.

It may be said, perhaps, that, had potatoes not been introduced, wheat, or barley, or oats would have been the lowest species of food; and that, whenever it happened to fail, the population would have been as destitute as if they had been subsisting on potatoes. It must, however, be observed, that the proportion which the price of wheat, or any species of grain, bears to the price of butcher's meat, tea, beer, &c., is always decidedly greater than the proportion which the price of potatoes bears to these articles; and it therefore follows that a people who have adopted wheat, or any species of corn, for the principal part of their food, are much better able to make occasional purchases of butcher's meat, &c., and will, consequently, be more likely to have their habits elevated, so as to consider the consumption

of a certain quantity of animal food, &c., as indispensable to existence. And hence it appears reasonable to conclude that a people who chiefly subsist on corn would, in most cases, subsist partially on butcher's meat, and would enjoy a greater or less quantity of other articles; so that it would be possible for them, in a period of scarcity, to make such retrenchments as would enable them to elude the severity of its pressure.

But, though the population in corn-feeding countries were dependent on the cheapest species of grain, not for a part only, but for the whole, of their food, their situation would, notwithstanding, be far less hazardous than that of a population subsisting wholly on potatoes. For, in the *first* place, owing to the impossibility, as to all practical purposes, of preserving potatoes, the surplus produce of a luxuriant crop cannot be stored up or reserved as a stock to meet any subsequent scarcity. The whole crop must necessarily be exhausted in a single year; so that, when the inhabitants have the misfortune to be overtaken by a scarcity, its pressure cannot be alleviated, as is almost uniformly the case in corn-feeding countries, by bringing the reserves of former harvests to market. Every year is thus left to provide subsistence for itself. When, on the one hand, the crop is luxuriant, the surplus is of comparatively little use, and is wasted unprofitably; and when, on the other hand, it is deficient, famine and disease necessarily prevail: in the *second* place, it is abundantly certain that the variations in the quantities of produce obtained from land planted with potatoes are greater than the variations in the quantities of produce obtained from land on which wheat, or any other species of grain, is raised. There has been no instance on record of any such failure of the crops of corn as occurred in the case of potatoes in many parts of Ireland in 1821, 1845, and 1846. It is true that, in the latter years, the failure was not confined to Ireland, but extended to many other parts of Europe, and even to America. Owing, however, to the population being so very dependent on the potato in Ireland, the deficiency of the crop was productive of incomparably more suffering in that country than anywhere else: and, *lastly*, owing to the great bulk and weight of potatoes, and the difficulty of preserving them on shipboard, the expense of conveying them from one country to another is so very great, that, as already stated, a scarcity can never be materially relieved by importing them from abroad. In consequence, those who chiefly depend on potatoes are practically excluded from participating in the benevolent provision made by nature for equalising the variations in the harvests of particular countries by means of commerce, and are thrown almost wholly on their own resources.

It is, therefore, of the utmost consequence to the well-being of every people, and to their protection in years of scarcity, that they should not subsist principally on the potato. In Britain the pressure of a scarcity is evaded by resorting to an inferior species of food, such as potatoes, and submitting to a lower standard of comfort; but if our people were habitually fed on the potato, this would be impracticable. The chances of famine would thus be vastly increased; while, owing to the low value of the potato as compared with most other things, the labourers would have less chance of preserving or acquiring a taste

for animal food, or other necessaries and luxuries; and, consequently, of changing at any future period their actual condition for a better.

It may, therefore, be concluded, on solid grounds, not only that the population of Ireland would have been less dense, but, also, that its condition would have been more secure and prosperous had the potato not been introduced into it. Perhaps its introduction into England has not hitherto had any mischievous consequences. But the dependence on it being very apt to increase, and being, at the same time, so very dangerous, we shall not regret should the increasing uncertainty of its produce make its culture be gradually abandoned.

Decrease of Population since 1845.—*Emigration.*—The decrease of population in Ireland since 1845, is far more extraordinary than its previous increase. Experience of the extremely injurious influence of the minute division of the land, and of the poverty and misery of the population which it called into existence, made many landlords set themselves strongly against the practice of subdivision. Their efforts were, as already seen, powerfully assisted by the Act against subletting passed in 1825; and the introduction of a compulsory provision for the support of the poor in 1838, made it evident to all proprietors that if they could not reduce the cottiers on their estates to something like the necessary numbers, they would have to maintain the surplus at a heavy expense in workhouses. Owing to the combined influence of these and other causes the population of Ireland increased but little during the 10 years ending with 1840, and, perhaps, nothing in the subsequent 5 years.

The fearful reaction which commenced in 1845, was the result of the partial failure of the potato-crop of that year, and of the still more extensive failure of the crop of 1846. These failures, notwithstanding all that was done to mitigate their influence by the exertions both of government and individuals, occasioned an extent of destitution, disease, and death, which has probably never been paralleled in any civilized country in a period of peace. But the excess of mortality, though great, had but a comparatively limited influence in lessening the numbers of the inhabitants. That has been principally a consequence of the extensive emigration which the scarcity occasioned in the first instance, and which has since been kept up by other causes. The all but unlimited demand for labour in the United States and Canada, the facility with which emigrants are carried to these countries, and the extraordinary zeal evinced by those who have already emigrated to induce their friends and others to follow them, have conspired to make the practice of emigration be carried on to a vast extent. Indeed, it has been supposed by some that it has been already too much extended, and that the country will eventually suffer from the want of hands to engage in industrious undertakings. There is, however, no room or ground for any such apprehensions. The rise of wages which emigration never fails to bring along with it, is sure to hinder it from being carried to excess; and it may certainly be carried much farther than hitherto without having any but advantageous results. The truth is, that Ireland is not a tillage but a grazing country; and as she has, owing to the want of coal, no peculiar aptitude for manufactures, her population might, it is evident, be advantageously reduced much below its present amount. According

as labour and population become distributed among the nations of the earth, more nearly in proportion to their respective capacities for their profitable employment, so will Ireland be more and more devoted to pastoral purposes, and her people be gradually transferred to other countries. This, in as far as can at present be seen, is the course on which she is now entering; and if she continue in it, it will conduce in no ordinary degree to her prosperity. A well-fed, well-clothed, and well-housed population, have not merely comfort and respectability, but in a high degree, also, national power and consideration. Holland, or Scotland, each with about three millions of people, was more opulent, had a larger revenue, and was more powerful than Ireland when she had a population of above eight millions. And to show how little mere numbers have to do with national importance, it is not necessary to travel out of Ireland—her public revenue being greater now than when her population was at its maximum.

Density of Population.—The following Table embodies all the existing information with respect to the density of population in Ireland. —(See page 446.)

Population of Great Towns.—A comparatively small part of the population of Ireland is resident in great towns; and, with few exceptions, their increase since 1820 has been comparatively slow.—(See p. 447.)

Considering the great extent of bogs in Ireland, the backward state of its agriculture, the deficiency of manufactures and trade, and the fewness of the great towns, its population is even yet dense. There was, in fact, in 1851, at an average of the entire kingdom, an individual for every 3 acres; whereas in England, notwithstanding the number and magnitude of her great towns, and the vast amount of her manufacturing and commercial population, there were about 2 acres for every individual; and in Scotland there was only an individual to every 6·7 acres! This wonderful density of population in Ireland, notwithstanding its recent diminution, is entirely ascribable to the division and subdivision of the land, and the general dependence on the potato. But, however it may have originated, there can be no question that it has been the immediate cause of the poverty and depressed condition of the great bulk of the people. And it is not too much to say, that at present there are a million of persons in Ireland more than it is, with its existing means of production, able either fully to employ or to maintain in a moderate state of comfort.

The *Registers of Births and Deaths* are in a still worse state in Ireland than in Scotland; and, as the legislature knew this, no provision was made, under the Acts for taking the census in Ireland, for obtaining returns of the same from the ministers of churches and chapels. We have not, therefore, any information of any sort to lay before the reader under this head. It is, however, to be hoped that measures may be speedily taken for supplying so important a desideratum, by providing for the registration of all births and deaths; and this may be the more easily effected, as the machinery of the Act of 1844, the 7 and 8 Victoria, c. 81, which provides for the registration of marriages, might, in part at least, be applied to the registration of births and deaths.

Table showing the Number of English Statute Acres, exclusive of Lakes, in each of the Provinces and Counties of Ireland; the Number of Males, Females, and Inhabited Houses in each in 1851; *the Number of Acres corresponding to each Person, and the Number of Persons corresponding to each House.*

Provinces and Counties.	Number of Acres, exclusive of Lakes.	Population Returns of 1851.			Inhabited Houses, 1851.	Acres of Land corresponding to each Person.	Persons corresponding to each House.
		Males.	Females.	Totals.			
Leinster.							
Carlow	220,837	33,014	35,061	68,075	11,177	3 2	6 0
Dublin	226,414	187,254	217,738	399,992	45,894	5	8·7
Kildare	417,419	48,519	47,205	95,721	15,831	4·3	6·0
Kilkenny	506,676	76,490	82,256	158,746	25,960	3 2	6·1
King's	492,252	55,285	56,795	112,080	18,793	4 3	5·9
Longford	255,734	41,042	41,308	82,350	13,858	3 1	5·9
Louth	201,093	52,253	55,404	107,657	19,460	1·8	5·5
Meath	576,655	70,815	69,935	140,750	24,044	4·0	5·8
Queen's	424,458	55,543	56,080	111,623	19,185	3 8	5·8
Westmeath	431,041	56,089	55,320	111,409	18,737	3 8	5·9
Wexford	572,920	86,770	93,020	179,790	29,479	3 1	6·0
Wicklow	499,088	50,232	48,746	98,978	15,544	5·0	6·3
Total	4,824,587	813,306	858,868	1,672,174	257,965	..	..
Averages	..	..	..	..	..	2·9	6·4
Munster.							
Clare	760,074	103,931	108,497	212,428	31,422	3·5	6·7
Cork	1,833,466	317,742	331,161	648,903	93,607	2·8	6·9
Kerry	1,153,365	116,492	121,747	238,239	33,572	4 8	7·0
Limerick	662,311	127,387	134,749	262,131	36,380	2·5	7·2
Tipperary	1,048,208	159,961	171,526	331,487	48,566	3 1	6 8
Waterford	455,774	78,436	85,075	164,051	23,427	2 7	7·0
Total	5,913,198	904,489	952,755	1,857,244	266,974	.	..
Averages	..	..	..	..	..	3·1	6·9
Ulster.							
Antrim	708,589	218,383	242,501	460,884	78,575	1 5	6·2
Armagh	310,134	95,718	100,367	196,085	35,073	1·5	5·5
Cavan	455,218	86,610	87,461	174,071	30,050	2·6	5 7
Donegal	1,170,336	124,691	130,469	255,160	44,618	4 5	5·7
Down	609,063	156,538	172,216	328,754	59,519	1·8	5·6
Fermanagh	410,440	56,807	59,200	116,007	20,214	3·5	5·7
Londonderry	508,268	93,032	98,836	191,868	33,339	2 6	5 7
Monaghan	313,590	68,791	72,967	141,758	25,742	2 2	5·5
Tyrone	774,844	126,254	129,565	255,819	45,037	3·0	5 6
Total	5,260,482	1,026,824	1,093,582	2,120,406	367,167	..	..
Averages	..	..	..	..	..	2·4	5·8
Connaught.							
Galway	1,476,324	157,613	164,646	322,259	51,748	4·5	6·2
Leitrim	368,615	56,122	55,793	111,915	18,922	3·2	5 9
Mayo	1,306,906	133,459	141,371	274, 30	46,940	4·7	5·8
Roscommon	578,321	86,896	87,596	174,492	29,526	3·3	5·9
Sligo	449,013	62,879	65,631	128,510	22,163	3·4	5·7
Total	4,179,179	496,969	515,037	1,012,006	169,299	..	..
Averages	..	..	..	..	..	4·1	5·9
General Total	20,177,446	3,241,588	3,420,242	6,661,830	1,061,405	..	..
Average number of Acres corresponding to each Person, and of Persons to each House						3·0	6·2

Population of the principal Cities and Towns of Ireland in 1841 *and* 1851; *with the Number of Inhabited Houses in each in* 1851, *and the average Number of Persons to a House, &c.*

Cities and Towns.	Area, inclusive of Rural District	Area, exclusive of Rural District.	Population in 1841.	Population in 1851.	Inhabited Houses in 1851.	Persons to a House.
	Acres.	Acres.				
Dublin (County of City) .	4,954	3,304	232,726	258,361	22,276	11·5
Cork (County of City) . .	48,006	2,683	106,055	90,022	9,419	9·5
Limerick (County of City) .	33,863	2,618	65,296	57,935	5,561	10·4
Belfast	1,872	1,872	75,308	102,103	13,806	7·3
Galway (County of Town)	24,132	628	32,511	23,695	2,538	9 3
Waterford (County of City)	10,059	669	29,288	25,297	3,238	7 2
Sligo	3,001	416	14,318	13,320	1,840	7·2
Londonderry and Liberties	13,678	497	20,379	20,479	2,446	8 3
Kilkenny (County of Town)	17,012	921	23,625	19,973	2,530	7·7
Drogheda (County of Town)	5,780	472	19,260	17,533	2,957	5 9
Wexford	762	762	11,252	12,819	2,632	6·3
Kinsale	290	290	6,918	6,440	806	8·0
Carlow	572	572	10,409	11,582	1,375	8·4
Dundalk	450	450	10,782	10,983	1,679	6·5
Youghal	504	504	9,939	9,211	1,117	8·2
Bandon	496	496	9,303	8,561	1,028	8 3
Killarney	98	98	7,127	10,387	752	13 8
Clonmel	364	364	13,505	15,336	1,374	11·1
Carrick-on-Suir	300	300	8,369	7,512	1,022	7·3
Armagh	269	269	10,215	9,781	1,378	7·1
Athlone	491	491	6,393	7,984	914	8·7
Tralee	546	546	11,363	15,156	1,293	11·7
Thurles	321	321	7,523	8,682	988	8·7
Nenagh	179	179	8,618	9,292	1,134	8·1
Newry	2,543	629	13,227	14,074	1,976	7·1
Dungarvan	8,499	392	12,382	7,310	919	7·7
Ennis	484	484	9,318	12,165	1,174	10·3

Age and Place of Birth; Account of the Population of each County of Ireland in 1841; *showing also the Number of Males and Females in each under and above* 20 *Years of Age, with the Numbers respectively Born in Ireland, England, Scotland, &c.*

Counties.	Total of Persons.	Ages				Born in Ireland.	Born in England.	Born in Scotland.	Place of Birth not Specified
		Under 20 Years.		20 Years and upwards.					
		Males.	Females.	Males.	Females.				
Antrim	360,875	88,485	81,602	93,906	99,482	357,182	1,648	1,707	338
Armagh	232,393	58,319	57,195	55,573	61,306	231,653	467	227	76
Carlow	86,228	20,065	19,061	22,363	23,839	85,067	161	58	42
Cavan	243,156	64,764	64,224	57,050	59,140	242,736	180	64	156
Clare	286,304	73,560	71,484	70,540	70,901	286,037	228	67	42
Cork	854,118	205,305	202,804	215,246	230,763	850,962	2,391	318	447
Donegal	296,448	76,882	74,921	68,939	75,706	295,844	346	182	76
Down	361,446	87,847	87,402	85,691	100,506	351,381	677	909	179
Dublin	372,773	75,982	79,630	94,948	122,214	369,030	6,853	1,895	995
Fermanagh	156,481	40,410	39,221	36,572	40,278	156,107	203	102	69
Galway	440,198	112,128	109,228	107,476	111,466	439,392	521	182	103
Kerry	293,880	75,803	74,669	71,504	72,904	293,265	442	75	98
Kildare	114,488	27,858	26,466	30,172	29,992	113,887	406	141	54
Kilkenny	202,420	46,988	45,862	52,146	57,444	202,003	260	92	63
King's	146,837	36,818	36,045	36,833	38,161	146,366	293	109	69
Leitrim	155,227	41,068	41,029	36,413	36,757	155,046	97	40	114
Limerick	330,029	80,429	79,996	81,586	88,036	329,106	560	224	139
Londonderry	222,174	55,612	54,844	51,213	60,505	221,068	419	514	153
Longford	115,491	30,302	29,577	27,308	28,304	115,107	173	30	121
Louth	128,240	30,348	30,744	31,954	35,199	127,480	424	278	58
Mayo	388,887	101,226	99,780	92,972	94,909	388,252	457	97	81
Meath	183,828	45,204	43,490	47,290	47,854	183,422	258	68	80
Monaghan	200,442	50,040	49,165	48,031	52,606	200,008	198	153	83
Queen's	153,230	37,120	36,869	39,283	41,199	153,461	328	66	77
Roscommon	253,591	66,030	65,092	60,077	61,408	254,108	253	75	70
Sligo	190,896	46,435	46,104	43,128	45 219	140,342	276	171	97
Tipperary	435,533	106,592	103,777	110,058	115,106	434,805	499	149	100
Tyrone	312,956	80,477	78,461	72,986	81,032	312,311	295	244	106
Waterford	196,187	45,105	44,405	50,471	56,200	195,256	692	147	90
Westmeath	141,300	35,618	34,500	34,785	36,417	140,902	224	77	97
Wexford	202,033	45,458	44,845	52,466	59,270	201,128	698	103	109
Wicklow	126,143	31,658	30,794	31,631	31,060	125,533	427	121	62
Total . .	8,175,124	2,019,543	1,969,645	2,000,033	2,165,903	8,140,516	21,552	8,565	4,471

SECT. 4.—*Population of the United Kingdom.*

It may now be useful to bring into one point of view the following details with respect to the population of the United Kingdom:—

I. *Progress of Population in the different Portions of the United Kingdom.*

England and Wales.		Scotland.		Ireland.		United Kingdom.	
Years.	Population.	Years.	Population.	Years.	Population.	Years.	Population.
1696	5,500,000	1707	1,050,000	1672	1,100,000	1760	7,650,000
1710	5,066,337			1712	2,099,094		
1730	5,687,993						
1750	6,039,684	1755	1,265,380	1754	2,372,634	1750	9,670,000
1760	6,479,730			1777	2,690,556		
1780	7,814,827			1785	2,845,932		
1801	9,187,176	1801	1,599,058	1805	5,395,456	1800	15,800,000
1851	17,927,600	1851	2,888,742	1851	6,661,830	1851	27,478,161

II. *Summary Account of the Population of Great Britain and Ireland, including the Army and Navy, at the periods at which Censuses have been taken, with the Ratio of Increase in the intervening decennial periods.*

—	1801.	Inc. per Cent.	1811.	Inc. per Cent.	1821.	Inc. per Cent	1831.	Inc. per Cent	1841.	Inc or Dec. per Cent.	1851.
England . . .	8,331,434	14½	9,538,827	17½	11,261,447	16	13,091,005	14·5	14,995,138	12·8	16,921,888
Wales	541,546	13	611,788	17	717,438	12	806,182	13·0	911,603	10·3	1,005,721
Scotland . . .	1,559,068	14	1,805,688	16	2,093,456	13	2,365,114	10·7	2,620,184	10·2	2,888,742
Army, Navy, &c.	470,598	..	640,560	..	319,360	..	277,017	..	193,469	..	210,474
Islands in the British Seas .	..	..	..	..	89,508	15·3	103,710	19·6	124,040	15·3	143,126
Total . .	10,942,646	15·1	12,596,803	14·2	14,481,149	14·9	16,643,028	13·2	18,844,434	12·3	21,169,951
Ireland . . .	..	..	..	..	6,801,827	14½	7,767,401	5·2	8,175,124	Dec. 18½	6,661,830
Total Population of the United Kingdom . .	..	..	..	..	21,282,976	15·1	24,419,429	10·6	27,019,558	Inc 3·9	27,831,781

III. *Account of the Total Area (including and excluding Water) in Square Miles and Acres, of the Inhabited Houses, and of the Total Population per Square Mile (including and excluding Water) in the different Divisions of the United Kingdom, in* 1851.

—	Square Miles, including Water.	Statute Acres, including Water.	Square Miles, exclusive of Water.	Statute Acres, exclusive of Water.	Inhabited Houses.	Total Population.	Population per Square Mile, including Water.	Population per Square Mile, exclusive of Water.
England	50,922	32,590,429	50,922	32,590,429	3,076,620	16,921,888	332·5	332·5
Wales	7,398	4,734,485	7,398	4,734,485	201,409	1,005,721	135·9	135·9
Scotland	30,714	19,657,315	30,469	19,500,341	370,308	2,888,742	94·0	94·0
							Average of Great Britain.	
Total . .	89,034	56,982,230	88,789	56,825,262	3,648,337	20,816,351	233·8	234·4
Ireland :—								
Leinster . . .	7,619	4,876,211	7,510	4,824,537	257,965	1,672,174	219·4	222·0
Munster . . .	9,476	6,064,579	9,240	5,913,198	226,724	1,857,244	195·9	201·0
Ulster	8,525	5,475,488	8,219	5,260,482	385,167	2,120,406	247·0	257·9
Connaught . .	6,962	4,392,043	6,530	4,179,179	169,299	1,012,008	147·4	154·9
							Average of Ireland.	
	32,512	20,808,271	31,527	20,177,446	1,031,405	6,661,830	204·8	211·3
							Average of United Kingdom.	
Total of United Kingdom .	122,546	77,790,501	120,316	77,002,708	4,700,742	27,478,181	224·2	228·3
Channel Islands and Isle of Man	394	252,000	394	252,000	21,845	143,126	363·2	363·2

It appears from the second of the above tables, that the population of Great Britain, and the islands in the British Seas, increased during the 10 years ending with 1850, at the rate of 12·3 per cent., or of 1·23 per cent. a-year.

The population of Ireland increased, during the 10 years preceding 1841, at the rate of 5·2 per cent., or of ·52 per cent. a-year. But its decrease during the 10 years ending with 1850 was no less than 18·5 per cent., or at the rate of 1·85 per cent a-year.

It is not easy to form any accurate estimate of the subsequent progress of population either in Great Britain or Ireland, seeing that it has been strongly acted upon by extraordinary influences, such as the unparalleled prosperity that has latterly prevailed in the former, and the equally unparalleled emigration from both islands, but especially from Ireland. On the whole, however, we have little doubt that the population of Britain has increased since 1850 at the rate of about 1¼ per cent. a-year, while that of Ireland has continued to diminish.

PART III.

INDUSTRY OF THE UNITED KINGDOM.

HAVING described in the previous parts of this work the physical circumstances, civil divisions, &c., and given an account of the population of Great Britain and Ireland, we now proceed to lay before the reader some details with respect to the principal branches of industry carried on in them. We begin with agriculture, the first and most important of the useful arts.

CHAPTER I.—AGRICULTURE.

SECT. 1. — *State of Property in England and Wales.— Size of Estates, &c.*

Tenures.—The tenures under which land is held in this country have grown out of the feudal system, and have differed materially at different periods of our history. At present landed property is of three sorts,—*freehold*, *copyhold*, and *leasehold*. An estate belonging unconditionally to its owner, and held by him directly under the Crown, or rather, under the law and constitution of the country, is said to be freehold. But freehold property may be liable to regular and fixed annual payments, provided it be not liable to fine, heriot, or forfeiture. Copyhold estates are held of a subject as part of a royalty, honour, or manor, and are liable to fines on account of deaths, transfers, and other such circumstances, according to the customs of the royalty, honour, or manor of which they form a part. Leasehold property is of various descriptions, such as long leasehold, as for 1,000 years: life leasehold with a fine certain, or under certain limitations on renewal: life leasehold with an uncertain fine, payable to the proprietor or other superior; in this case, the latter reserves merely a conventional rent, the tenant having paid down a sum of money to obtain the lease and the right of alienation; this practice is common in the west of England. There is another kind of leasehold with an uncertain fine, payable to the proprietor, who receives the full rent of the land at the time of granting the lease, the lessor having a power of alienation; this is a common practice in Wales and some parts of England. The last species of leasehold property, is leasehold for an ordinary term with the power of alienation. A lease without the power of alienation, or transfer, is not called a tenure. But though it merely gives a right of occupancy for some specified period, it is practically one of the most important tenures; much of the prosperity of every country of which any considerable portion belongs to extensive proprietors, depending on the conditions in such leases.—(See *post.*)

Magnitude of Estates.—Number of Proprietors, &c.—Estates vary

exceedingly in size and value in most parts of England. The largest estate in the kingdom may be worth 100,000*l.* or upwards a year; and there are estates of most inferior degrees of magnitude, down to the annual value of 40*s.*! In some counties property is more, and in others it is less subdivided. In Cheshire, the East Riding of Yorkshire, and one or two other counties, there are comparatively few small proprietors; but the latter predominate in most parts of the west of England, in the north, and generally throughout the country. On the whole, we believe it may be safely affirmed, that by far the largest portion of the kingdom is parcelled into properties of less than 1,000*l.* a-year. It is not difficult to account for the prevalent misconceptions on this point. Though few in number, the owners of large estates engross the attention of common observers, and hinder them from fixing their eye on the mass of obscure, petty landowners that constitute the great bulk of the class. Dr. Beeke, whose authority as to such matters is deservedly high, estimated the total number of proprietors in England and Wales at 200,000; and supposing the gross rental of the kingdom to be 40,000,000*l.* a-year, the average annual income of each, in his capacity of landlord, will be only 200*l.*! and seeing that a few have much more, it follows that many must have a good deal less. Hence, it is, that few lead a more laborious life, or are more under the necessity of abstaining from luxurious indulgences, than the owners and occupiers of small landed properties. Nothing, in fact, can be a greater mistake, than to suppose, as is generally done, that the landowners are an extremely opulent, and an extremely indolent body. These may be the characteristics of a few individuals amongst them; but it would be quite as wide of the mark to affirm that they are generally applicable to the entire class, as that they are generally applicable to the classes of manufacturers and traders.

Estates of the larger class are, in general, managed by stewards. Much, of course, must depend on the judgment with which they are selected. They should not only be thoroughly conversant with all the most approved principles and processes of arable and stock husbandry, but with accounts, and with the laws in regard to leases, public burthens, the poor, &c. On the whole, we believe that the stewards of England, though inferior, perhaps, to the factors of Scotland, are a highly respectable, well-informed, and useful body of men.

SECT. 2.—*Division of the Kingdom into Agricultural Departments, — Size of Farms. — Conditions in Leases. — Buildings and Fences, &c.*

Agricultural Departments.— Exclusive of Wales, England may, in an agricultural point of view, be divided into 6 departments or districts: meaning by an agricultural district, a tract distinguished by uniformity or similarity of management, whether it be applied to grazing, sheep-farming, or arable or mixed husbandry, or by the production of some particular article, as dairy produce, fruit-liquor, &c. The 6 agricultural departments, distinguished from each other in this point of view, are the northern, western, midland, eastern, southern, and south-western.

The northern district includes Northumberland, Durham, Cumberland, Westmoreland, Lancashire, and York, (excepting the fens and marshes bordering on Lincoln,) with parts of Cheshire, Stafford, and Derby. This department is distinguished by a coldness of climate and backwardness of seasons, as compared with the more southerly parts of the island: but its mountains form its most striking natural feature. In respect of rural economy, it is also strongly distinguished from the other districts. On its western side, indeed, manufactures prevail over agriculture; but on its eastern side all the branches of the latter flourish. It would not be easy to point out any portion of the kingdom in which greater agricultural skill and industry are displayed, than in the eastern parts of Northumberland, and on the banks of the Tees.

The western department extends from the Mersey to the banks of the Somersetshire Avon; being bounded on the west by the Welsh mountains; on the east, by the lower hills of Staffordshire, and the uplands of Warwickshire and Oxfordshire; and on the south, by the chalk hills of Wiltshire, and Sedgmoor, in Somersetshire. It consists of a nearly uninterrupted succession of vale districts, including the basins of the Severn, the Avon, the Dee, and the Mersey. It is also distinctly marked by its agricultural produce; as almost the whole of it, with the exception of the high lands of Shropshire and Herefordshire, the Cotswold Hills in Gloucestershire, and the Mendip Hills in Somersetshire, may be said to be devoted to the dairy. It is further distinguished by its fruit-liquor, or cyder.

The extent lengthwise of the midland department is determined by the mountains of the northern, and the chalk hills of the southern departments; and its breadth, by the rising grounds which separate it from the western department, and the marshes which form the commencement of the eastern department. Compared with the great variety of soil and surface exhibited by the other departments, this may be regarded as a widely extended fertile plain, without a single eminence, except the Charnwood Hills. In an agricultural point of view, it is distinguished by its mixed cultivation, for which the nature of its soil and surface render it almost uniformly suitable. "As a wide field of agriculture (to use the words of Mr. Marshall), in which every branch of the profession is highly cultivated, it has been long known. Here not only the spirit of improvement, but of enterprise, may be said to inhabit. The art, science, and mystery of breeding has here been carried to a height, which, in any other country, probably it has never attained; the same enterprising spirit which led to this pre-eminence still continuing with little or no abatement."

The eastern department is strongly marked both in its natural and its agricultural character: in the former, by its fens and marshes, and its light sandy uplands; and in the latter, by its superior and extensive turnip husbandry. The pursuits of the farmers of this department are particularly directed to grazing, not only in the marshes and lower grounds, but on the uplands. Arable husbandry is also very intimately connected, throughout a considerable portion of this district, with the fattening of sheep and cattle. Its boundaries are distinctly marked, including the fen lands of Lincoln, Northampton, Cambridge, Hun-

tingdon, and Norfolk, with the rest of Norfolk, the counties of Suffolk and Essex, and those parts of the adjoining counties which lie close to them.

The natural character of the southern department is sufficiently marked by its including the chalk hills in the vicinity of the metropolis, as well as those in the more remote counties. The objects of the husbandry of that part of it which lies in the more immediate neighbourhood of London, depend, of course, upon the demands of its population, and are, therefore, very various. The more remote parts of this district are distinguished by flocks of sheep, fed on the chalk hills; the breeds of which, and their mode of management, differ much from those in the midland and eastern departments.

The situation of the last, or south-western department, is peculiar; it stretches away from the main body of the island, in a peninsular form, into the Atlantic. This peninsula is nearly 200 miles in length and is bounded on all sides by the ocean, except where it touches the southern and western departments. Its natural characters are also singular. It abounds in slate-rock hills, which are comparatively unknown in the rest of the kingdom, except in a small portion of the northern department. Its surface, too, with the exception of the north-eastern angle, has a peculiar character, consisting of bare steep-sided hills, separated by narrow valleys; the hills being, in general, productive to their very summits. Its agricultural character and pursuits are not less remarkable; the husbandry carried on in it being more nearly allied to that of ancient Rome, than any practised in any other part of the island. Arable, as well as pasture and dairy husbandry, are pursued; but the way in which they are united, the practices that prevail in each, and their more prominent features, are peculiar, and strongly distinguished.

Besides this general division of the kingdom into agricultural departments, it may be proper to specify the counties principally devoted to the three great branches of agricultural industry, that is, to tillage; the dairy; and the breeding and fattening of cattle and sheep.

Tillage, or arable husbandry, is pursued to the greatest extent in Kent, Essex, Suffolk, Norfolk, Hampshire, Berkshire, Bedfordshire, Surrey, Sussex, Hertfordshire, part of Yorkshire, part of Lincoln, Durham, and Northumberland. The principal dairy counties, whether for butter or cheese, or both, are Cheshire, Salop, Gloucester, Wilts, Buckingham, Essex, Suffolk, York, Derby, Cambridge, Dorset, and Devon. Lincoln, Somerset, Leicester, Northampton, Teeswater in Durham, and Cleveland and Holderness in York, are the counties and districts most distinguished for breeding and fattening cattle and sheep. It will be evident, however, that in most of the counties thus specified, more than one of the three great divisions of agricultural industry, and sometimes all, are carried on. In some counties, arable husbandry is closely connected with the fattening of sheep, but seldom with the dairy husbandry; while the latter is often connected with breeding and fattening.

Wales.—Considered as an agricultural district, Wales is chiefly distinguished, as compared with England, by its mountainous surface,

and by the greater moisture of its climate. The mountains and wastes are principally depastured by sheep and lean cattle. The valleys and low grounds are generally devoted to a mixed system of husbandry, or to tillage, breeding, and the dairy. Generally speaking, agriculture is at a lower ebb in Wales than in any other large district of Great Britain.

We shall now proceed briefly to notice, 1st, the size of farms; 2nd, the conditions under which they are mostly held; 3rd, the buildings and fences; and, 4th, the principal implements employed in husbandry. The rotation of crops, and the species of crops commonly cultivated, will form the subject of next section.

1. *Size of Farms.*—A great deal of discussion has taken place as to the proper size of farms. This, however, is not a point as to which it is possible to come to any very precise conclusions. Much must obviously depend on the purposes to which farms are to be applied. Such as are wholly employed in pasture may be very much larger than those that are to be employed partly only in that way, and partly in tillage; and the latter again than those that are to be wholly employed in tillage. And in regard to tillage farms, it is plain that their size must depend on various circumstances, but principally, perhaps, on the amount of the tenant's capital. But supposing that those offering for farms have sufficient capital, their size should be mainly determined by considering what extent of land an individual may be able to manage in the most approved manner. Most practical farmers in this country seem to think that this size might run from 400 to 600 acres, or 500 at a medium. This conclusion has, however, been strongly denied; and it has been contended that the public interests are best consulted by letting land in small farms, or in farms of from 15 to 30, 40, or 50 acres. To enter fully into an examination of this question would encroach too much on our limits. But the opinions of the great majority of those who, from their acquaintance with agriculture, are best entitled to decide in regard to such matters, are exceedingly hostile to the small farming system; and their objections to it seem to be founded on the soundest principles, and to be consistent with the most extensive experience. It is plain that that system of occupation must, under all ordinary circumstances, be the best which gives the greatest scope to improvement, which allows of the division of labour being carried to the farthest extent, and which puts it into the power of the occupier to avail himself of every new improvement and increased facility of production. But it is almost superfluous to say that these objects can only be attained when land is occupied by large and opulent farmers. "Where," asks Arthur Young, "is the little farmer to be found who will cover his whole farm with marl at the rate of 100 or 150 tons per acre? who will drain all his land at the expense of *2l.* or *3l.* an acre? who will pay a heavy price for the manure of towns, and convey it 30 miles by land carriage? who will float his meadows at the expense of *5l.* per acre? who, to improve the breed of his sheep, will give 1,000 guineas for the use of a single ram for a single season? who will send across the kingdom to distant provinces for new implements, and for men to use them? who will employ and pay men for residing in provinces, where practices are found which

they want to introduce into their farms? At the very mention of such exertions, common in England, what mind can be so perversely framed as to imagine for a single moment that such things are to be effected by little farmers? *Deduct from agriculture all the practices that have made it flourishing in this island, and you have precisely the management of small farms."*—(*Travels in France*, 2nd ed., vol. i., p. 410.) Besides, though it were admitted that small farmers might accumulate capital, which, however, is not the case in one instance out of a hundred, they could not apply it in the most efficient manner. "The division of labour, which in every pursuit of industry gives skill and despatch, cannot take place on the greatest farms in the degree in which it is found in manufactures; but upon small farms it does not take place at all. The same man, by turns, applies to every work of the farm; upon the larger occupation there are ploughmen, thrashers, hedgers, shepherds, cow-herds, ox-herds, lime-burners, drainers, &c. This circumstance is of considerable importance, and decides that every work will be better performed on a large than on a small farm. One of the greatest engines of good farming, a sheepfold, is either to be found on a large farm only, or at an expense of labour which destroys the profit.—(*Travels in France*, vol. i., p. 409.)

It is of importance, too, as connected with this question, to observe that small farms do not afford sufficient employment for their occupiers, except, perhaps, during seed-time and harvest. But when a country is so parcelled out, the occupiers of one farm, though they may have nothing to do at home, cannot go elsewhere to seek for work. In consequence, they contract indolent and most commonly, also, dissipated habits, and become incapable of that continuous and vigorous exertion that is natural to those that live in districts where there is a proper distribution of employments.

The example of the crofters, or occupiers of small farms, in the Highlands of Scotland, and of the cottiers of Ireland, may be quoted in proof of what is now stated. They are incurably idle, and have all the vices, with but few of the virtues, of civilization. "The families of cottiers," says an undoubted authority, "are universally in rags, and their children are uneducated; *industry is unknown to them*, and their habitations are filthy in the extreme. The labour which is required for small farms occupies but a small portion of the time of the tenants; but they are so perversely indolent and careless that while the people from other districts are employed in fishing, making kelp, &c., and receiving high wages, none of them can be engaged for such labour." * And Mr. Wakefield states that in Ireland, though the whole dependence of the cottier population be on the potato crop, their indolence is such that they frequently allow the potatoes to remain in the ground till they be injured, or, it may be, destroyed by frost!—(*Account of Ireland*, i., 517 and 583.)

It is needless to waste the reader's time by entering into any lengthened statements, to show the fallacy of the complaints made against large farms, on the ground of their being unfavourable to population. The truth is that they are distinctly and completely the reverse. The improved and skilful management carried on upon

* *Survey of Ross and Cromarty*, by *Sir George Mackenzie*, p. 84, 257.

large farms occasions the production of a much greater quantity of produce; and it is needless to say that whatever has this effect is, instead of being unfavourable, highly favourable to population. It is true, perhaps, that a large farm, managed according to the best principles, may not employ, or rather keep, so many people as if it were split into smaller portions; but the large surplus obtained from such a farm, and which goes partly to the landlord as rent and partly to the farmer as profit, is not retained by them; they exchange it for the various products of art and industry for which they have occasion; so that, in this way, population is increased proportionally to the increased produce of the land, at the same time that labour is properly distributed, that indolence and apathy are banished, and that a provision is made for the successful prosecution of all those arts that improve and embellish society.

Nothing, therefore, can be a greater mistake than to suppose that the well-being of a country is promoted by dividing its lands into minute portions, and covering them with cottages. We believe, indeed, that hardly anything can happen to it that is, in all respects, so destructive of its best interests.*

In England, farms seem to be, generally speaking, of a medium size. In Northumberland, Norfolk, Suffolk, Essex, the downs of Wiltshire, Dorsetshire, Hampshire, &c., and the wolds of Lincolnshire and Yorkshire, there are some very large farms; but even in these counties, and generally throughout the kingdom, the number of small and middle-sized farms preponderates very decidedly. According to the numerous minutes taken by Arthur Young, in his *Tour through the Northern Counties in* 1769, the average size of farms in them appears to have been 287 acres; † and, probably, this is not far from their size at present; for though in several instances small farms have been consolidated, some of the very large Northumbrian farms, included in Mr. Young's average, have been subdivided in the interim. According to the averages taken by Mr. Young in his *Eastern Tour* (vol. iv., p. 381), excluding 9 very large sheep farms, principally in Dorsetshire, the medium size of farms would appear to have been 342 acres. But the number of instances taken were not sufficiently numerous to warrant our depending on the conclusion drawn from them. There can be no doubt, indeed, that this is much above the present average size of farms in the district in question; and we believe that such, also, was the case when Mr. Young made his tour.

According to the returns collected under the late Population Act, it appears that, in 1841, there were in England only 212,455 farmers and graziers, which, as the entire area of England, excluding Wales, is 32,247,680 acres, gives $\frac{32,247,680}{212,455} = 151{\cdot}78$ acres for the average size of farms throughout the kingdom.

But this result cannot be depended on. Many individuals occupy villas with a few acres of land attached to them, carrying on business at a distance, perhaps in another parish. This is the case to a great

* See this subject treated at greater length in the art. *Cottage System*, in the new edition of the *Ency. Britannica*.

† *Northern Tour*, 2nd ed., vol. iv., p. 195.

extent round the metropolis, and in the vicinity of the great manufacturing and commercial towns in the north. There are also great numbers of individuals occupying houses and small patches of land in all parts of the country, who derive their principal means of subsistence from the interest of money in the funds or elsewhere, half-pay, profits of railways or other public works, and so forth. None of these persons belong, properly speaking, to the agricultural class, but they are all occupiers of land, and would, we suppose, generally be, and we know sometimes were, classed as such. A very considerable number of the small occupiers are in a somewhat similar predicament, carrying on other businesses on which they mainly depend, and having a very doubtful claim to be called farmers. It is difficult to say what deduction should be made from the numbers in the returns to get at the number of those who are really farmers, that is, of those who make farming their sole or principal pursuit. No doubt, however, it would be very considerable, and would probably increase the average size of farms to 160 or 170 acres.

Hence, as already stated, farms in England may be truly said to be of a middle size; and it is to be hoped that no circumstance may ever occur to occasion their diminution, or to realize, in any degree, the pernicious theory of those who suppose, in the teeth of principle and of fact, that countries are improved by being split into small portions.

2. *Occupancy of Land by Tenants.—a. Advantage of Leases.*—There is no single circumstance, perhaps, on which the prosperity of agriculture, and the well-being of the rural population, is so much dependent, as on the nature of the contract entered into between landlords and those who occupy their estates. The interests of the parties, though in many respects the same, are in others materially different. The one has a permanent, the other only a temporary, interest in the land. The landlord is anxious that his estate should not be deteriorated during the period it is occupied by another, but that, on the contrary, it should be improved and rendered more valuable; the occupier, however, has no such anxiety, and, speaking generally, his principal or sole object is to make the most of the land during the period he occupies it, without caring about its state when he leaves it. Hence the grand desideratum in contracts of occupancy should be to provide as much as possible for the interests of both parties, by taking care that the land shall not be deteriorated, and that the tenant or occupier shall have every inducement to introduce improvements, and to cultivate the farm in the most approved manner. The difficulty is to find the means of combining these advantages; that is, of affording sufficient protection to the landlord, without fettering the enterprise of the tenant, or lessening his ability or inclination to lay out capital, and to avail himself of new discoveries. But this difficulty is not insuperable, and the granting of leases of a reasonable length, and under proper conditions as to rent and management, seems to be well calculated to promote alike the interests of the landlords, the occupiers, and the public.

The plan of letting lands on lease for a number of years certain is so obviously superior to every other, that little need be said in its recommendation. Where a tenant is secured in the possession of his farm for a fixed and reasonable period, he has every inducement to

exert himself, and to apply whatever capital and skill he may possess to its improvement.. But a tenant at will, or a tenant who may be turned out of his farm at any time, without having any grounds for affirming that he has been ill-treated, dares not venture upon any outlay. Such a tenant is really, in so far as the business of farming is concerned, destitute of the security of property. Having no guarantee that he will be allowed to occupy his farm for a period sufficient to enable him to reap the advantage of improvements, he never once thinks of undertaking any. He moves on in the accustomed routine of the district to which he belongs; and should he be so fortunate as to accumulate a little capital, which is but seldom the case, he either employs it in some other business, or in taking a greater extent of land: but he scrupulously abstains from laying out anything on improvements, unless they happen to be such as promise an almost immediate return. There can, therefore, be no question, that the granting of leases for a fixed and reasonable number of years is of the utmost consequence to agriculture; and those best acquainted with the business affirm, that it has done more for its improvement than all the other encouragements that have been given to it.

The term "tenants at will" is sometimes, but improperly, applied to tenants who have no leases, but who, notwithstanding, either from the custom of the estate or district, or the promises of the landlord, have a reasonably good security that they will not be capriciously ejected, and that their rents will not be raised immediately upon their making an improvement. Still, however, the security afforded by such a tenure, though considerable, is short of what is afforded by a lease. Where the rights of both parties are not clearly defined, disputes may unintentionally arise: the tenant is in such cases kept in a state of degrading dependency upon his landlord; and, however well he may be treated by the individual now in possession of the estate, he cannot foretell what may be the views and objects of his successors. And hence, as Mr. Loudon has justly observed, "no prudent man will ever invest his fortune in the improvement of another person's property, unless, from the length of his lease, he has a reasonable prospect of being reimbursed with profit: and the servility which a holding at will necessarily exacts, is altogether incompatible with that spirit of enterprise which belongs to an enlightened and independent mind."—(*Encycl. of Agriculture*, p. 699.)

There are but few tenants at will, properly so called, in England; the tenants to which this designation is applied, being, in fact, tenants from year to year. In this latter species of tenancy, the landlord and occupier are respectively bound to give half a year's notice before either party can put an end to the tenancy; whereas tenancy at will may be terminated at any time by either party without notice.—(*British Husbandry*, vol..i. p. 60.)

b.. Conditions as to Management.—Much difference of opinion has existed as to the expediency of inserting conditions in leases with respect to management. Those who are adverse to such conditions argue, that, being generally framed by the landlord, whose knowledge of the practical business of farming is seldom very accurate or extensive, they are exceedingly apt to proceed on mistaken views, and are,

for the most part, either vexatious or impossible; that the strict observance of conditions can rarely be enforced; that, if it were, it would reduce the occupiers to the condition of mere machines; that it would prevent them from taking advantage of such discoveries as might be made during the currency of their leases; and that, having no means of escaping from the prescribed mode of management, they would cease to interest themselves in the progress of agriculture, and would become indifferent to every sort of improvement.

But these objections, though enforced by some high authorities, are really entitled to very little weight. Conditions as to management may not always be framed in the most judicious manner; but they are universally almost sufficient to hinder the tenant from overcropping or exhausting the farm previously to the termination of the lease; and this is quite enough to recommend them. In East Lothian, Berwickshire, Northumberland, and all the best cultivated counties, leases invariably contain regulations in regard to the rotation of crops, and the proportion of the farm to be appropriated to culmiferous crops, green crops, grass, &c.; and, instead of its being true that these regulations have cramped the enterprise of the tenants, these are the very counties in which agriculture is in the highest state of advancement, and in which every new improvement is soonest introduced and tried.

In many parts of England leases are almost entirely unknown, and it is believed that the practice of granting them is on the decline. This is, no doubt, one of the main causes of the backward state of agriculture in several very extensive districts. Tenants holding from year to year, seldom think, upon so uncertain a tenure, of making any expensive improvements, or of leaving their accustomed routine; and vicious practices are thus frequently followed in some counties, that have been abandoned in others for more than half a century. In fact, a tenant is, in some cases, rather anxious not to improve.* In parts of England, about the middle of last century, the inhabitants had a proverb—

> He that havocks *may sit*;
> He that improves *must flit*!

Or, in other words, he that exhausts the land may continue in the farm for an indefinite period; whereas he that improves must pay an advanced rent, or be obliged to quit; and, even at the present day, this detestable practice is followed in some of the finest English counties. Speaking of Berks, Messrs. Kennedy and Grainger tell us, that "owing to the system acted upon, the soil, generally speaking, is very much out of condition. A tenant, up to the last one or two years of his lease, drives it as hard as he possibly can, and, in fact, leaves it entirely *run out*: thus, the labour of several years is required to put it into any thing like good condition; whilst, by the time A has brought his land tolerably round, his neighbour B, perhaps, intends to relinquish his farm; and thus is kept up the neglected appearance of the country.

* In Italy, when the husbandman's time of holding is nearly expired, it is his custom to ruin the vineyard he rents, by forcing the trees to bear till they become barren. Such treatment is called by the neighbourhood, *lascia podera*, or adieu farm.—*Harte's Essays on Husbandry*, 2nd edit, p. 160.

When a farmer cultivates his own property, it is, in consequence of this system, generally seen to the greatest advantage, like a fat sheep among a lean flock." (i. 145.) And the practice is nearly similar in Bucks, Oxford, and several other counties. It is unnecessary to add, that all parties—landlords, farmers, and the public—are deeply interested in the suppression of such miserable practices.

c. Payment of Rents.—Rents are sometimes paid in money, and sometimes in produce. With respect to the former, it may be observed, that, when the lease is only for a few years, during which no great change in the value of money, or in the price of corn, can be expected, it is, perhaps, the best of any; but when the lease embraces a period of nineteen or twenty-one years, which is believed to be the most proper for ordinary tillage farms, the safer plan is to fix the rent at a certain quantity of produce, convertible into money at the current prices of the day. By this means the disturbing effects of changes in the value of money are averted, at the same time that the effect of those which occur in the cost of producing corn is mitigated. The plan is, however, defective, inasmuch as it obliges the tenant to pay more than the fair value of his farm in scarce years; while, on the other hand, it improperly reduces the landlord's rent in years of unusual plenty. A device has, however, been fallen upon, which has gone far to remove these defects. This consists in fixing a *maximum* and a *minimum* price; it being declared in the lease that the produce to be paid to the landlord shall be converted into money according to the current prices of the year; but that to whatever extent prices may rise above the maximum price fixed in the lease, the landlord shall have no claim for such excess of price. By means of this check, the tenant is prevented from paying any great excess of rent in scarce years: and to prevent, on the other hand, the rent from being improperly reduced in very plentiful years, a minimum price is agreed upon by the parties; and it is stipulated that, to whatever extent prices may sink below this limit, the landlord shall be entitled to receive this minimum price for the fixed quantity of produce payable to him. It is impossible, indeed, under any system, however complicated, so to regulate the rent of land that it shall always be the fair equivalent of the rent contemplated by the parties when the lease was contracted. But it seems that, all things considered, a fixed produce rent would, with the proposed checks to counteract the disturbing effects of unusual scarcity or abundance, afford the greatest attainable security both to landlord and tenant. Nor is this a mere speculative opinion: this very plan has been introduced into some of the best cultivated districts of the empire, particularly East Lothian and Berwickshire. And the experience of the estates in which it has been adopted shows that it is as effectual as can well be desired for the protection of the just rights of both parties, and for securing the progress of agriculture.

d. Reduction of Rents.—When it has been ascertained that a farm is let at too high a rent, that is, when the utmost exertions of industry and economy on the part of a skilful tenant cannot enable him to pay his rent, and to gain a fair return for his outlay and trouble, the landlord, if he consult his own interest, ought to make an adequate reduction. If he attempt to hold the farmer to the letter of his agreement,

he will most likely occasion his ruin; but in the efforts of the latter to save himself and his family, the farm is sure to suffer. It will not be properly manured or tilled; scourging crops will be resorted to; so that though the landlord should succeed in squeezing the stipulated rent out of the occupier, during the currency of the lease, the bad state of the farm at its close, and the bad character the landlord will have justly acquired in the vicinity, will cause a far greater reduction of rent than would have taken place had it been made at the proper period.

e. Objections to the Contract of Lease.—It is of importance, however, to observe that the circumstances now mentioned, that is, the propriety, or rather the necessity, of granting a reduction of rent to a tenant who has engaged to pay more for a farm than it is really worth, forms the ground-work of the only plausible objection that has ever been made to the custom of granting leases. There is said to be no equality in the contract,—that while it binds one of the parties, it leaves the other free. If a farm be too low rented, the tenant will, it is alleged, continue to enjoy that advantage until the expiration of the lease; whereas, should it happen to be too high rented, it is next to certain that the landlord will be compelled to reduce the rent to what the farm is really worth. A transaction of this kind throws, it is contended, all the risk on the landlord, and gives all the advantage to the tenant; so that the only fair plan is, to let from year to year, or at most, for very brief periods. But, though specious, this reasoning will, on examination, be found to be without any good foundation. The complaint that a farm is too low rented, is one that can hardly ever be made with any degree of justice at the commencement of a lease; and when made, it is entitled to very little attention; for, as the proprietor might either let or not let, and as he has, in most instances, a choice of tenants, it is pretty clear he would not have let it, unless the stipulated rent had been, at the time, its fair value. It is true that the rent may become too low, or, rather, it may happen that the farm would let for more, after a few years of the lease have expired, than the rent actually paid for it. If the rent be a money rent, it will, of course, be affected by changes in the value of money; but if it be a certain quantity of produce, convertible into money, according to the prices at the time, the fair presumption is, if the farm become worth more during the currency of the lease, that it has done so in consequence of its being granted. The security which it gives to the tenant encourages him to lay out capital on the land, to follow the best system of cropping, and to execute various improvements that add permanently to the productive powers of the soil. Although, therefore, the sum paid for a farm let on a corn rent, and for a reasonable number of years, should appear to be low towards the middle or during the latter part of the lease, the landlord must not imagine that he has, by letting the farm, deprived himself of an advantage he would otherwise have enjoyed; for in point of fact, the apparent inadequacy of the rent arises from the improvements effected by the tenant; and these would not have been so much as thought of, but for the lease. Hence it is apparent, that in granting it, the landlord made no sacrifice, but the reverse. He obtained all the rent for his farm it was worth when it was let; while the improvements

and meliorations effected under the lease will ensure a greater rent at its termination.

There are, therefore, no substantial reasons for impeaching the contract of lease, on the ground of its not placing both parties on a footing of equality. The inadequacy of a corn rent is, in ninety-nine out of every hundred cases, apparent only, or, in other words, is occasioned by improvements effected by the tenant. All that can be fairly said in support of the alleged want of reciprocity, is reducible to this, that if a landlord, through accident or simplicity, let a farm for less than it is worth at the period when the lease is entered into, he will not be able to get the rent raised during its currency; while, if a tenant should, from too anxious a desire to get a farm, or over-sanguine expectations as to its value, promise more for it than it is really worth, it will, generally speaking, be impracticable to hold him to his bargain. This is the whole amount of that want of equality of which so much has been said; and it appears to us to be very little indeed. The loss that a tenant sustains who takes a farm at too high a rent before he gets it reduced, supposing him to be ultimately successful in that respect, is always very severely felt by him; whereas, the fact, that a farm has been let below its value, warrants the conclusion that the additional rent that might have been obtained is of trifling importance to its proprietor. A landlord may be assured, that if the rent at which he lets a farm be such as a prudent and industrious tenant can pay, it will be paid either by the party in possession or by some one else. And no liberal landlord would wish, even if he had the power, to exact more from a tenant than the value of his lands; nor would a prudent landlord choose to add to his income, for a few years, by sums drawn from the capital of those engaged in the cultivation of his estate.

Nor is this all: not only does the granting of a lease of reasonable duration tend, by facilitating improvements on the part of the occupier, to raise the value of the farm, and, consequently, its rent, at the expiration of the lease, but it also puts a greater immediate rent into the hands of the landlord. There are very few arable farms that will let for so much for a short lease as for one of 19 or 21 years. So that, in granting such a lease, a landlord is really providing most effectually, not only for the future increase of his income, but is immediately adding to its amount.

f. Duration of Leases.—These, when granted in England, are seldom for longer periods than 7 or 14 years; the longest of which is decidedly too short to make it prudent for a tenant to undertake various improvements that do not promise a very immediate return. On the whole, the most intelligent farmers seem to be of opinion that 21 years is the most proper term for the endurance of a lease. If it be longer, it tempts the tenant to delay commencing improvements; and if it be shorter, it prevents his reaping a full return for his outlay. A life lease is, perhaps, the worst of any. The period at which the occupancy is to terminate ought always to be fixed and ascertained, and not dependent upon any contingent or accidental circumstance. Hence, letting by lives is a very objectionable practice.

There are few things that seem more remarkable to a person

acquainted with the agriculture of Scotland, on his visiting England for the first time, than the uniformity that prevails in the cultivation of extensive districts. The farms seem to be all managed on the same principle, and the farmers to be about equally skilful. In Scotland, on the contrary, there is the greatest diversity in the management of farms on the same estate, and even in the same parish: some being cultivated in a style far superior to, and in a manner wholly different from, others. This discrepancy has been variously accounted for. In our view of the matter, however, it is principally ascribable to the non-existence of leases in most parts of England, and to their existence in Scotland. The competition for farms in the former, and the uncertain tenure on which they are held, obliges the occupiers to farm each about as well as his neighbours; while it hinders any one from attempting new modes of management, or from making any expensive improvements. In Scotland, on the other hand, where leases for 19 or 21 years are universal, the tenants know that they will reap all the advantage of superior enterprise and industry, and are, therefore, led to put forth all their energies, and, if possible, to make new improvements; so that there is the greatest diversity in the modes of managing contiguous farms. If agriculture had attained to perfection, and it were desirable to keep it in the same uniform state, the English system would be most admirably suited for that object; but if, as is the case, agriculture be still very imperfect, and its improvement be a matter of vast national importance, then is the Scotch system of occupancy, by well-contrived leases of reasonable endurance, infinitely superior to the English.

g. Letting by Fine.—Letting lands for a number of years, generally 7, by *fine*, was formerly customary in England; but is now rarely practised, except upon estates belonging to the church and to the universities. It is one of the very worst modes of letting that can be adopted. It deprives the tenant of his capital at the moment when he enters on the farm; and, consequently, incapacitates him, were he otherwise disposed, from attempting any improvements.

The practice of letting land by fine was latterly beginning to make considerable progress in Scotland, at least on the estates of entailed proprietors; and, had it been valid, it would, no doubt, from its giving heirs in possession the means of procuring an immediate advantage at the expense of their successors, have been pretty generally followed. Luckily, however, the House of Lords found, on the question being brought before them, that the practice was illegal, and by this means crushed a system inimical to agriculture, and obviated the principal objection to entails. It seems highly expedient that the legislature should interfere to put an end to the practice of letting church and college lands by fine.

h. Entry to Farms.—The ordinary term of entry to farms in England is Lady-day; but Candlemas, Whitsuntide, and Michaelmas are also common terms in some parts of the kingdom. Michaelmas and Lady-day are the customary terms of payment; the first payment commences 6 months after entry to the possession of the farm. There is a very great difference in different places as to the conditions under which one tenant succeeds to another. The practice in Kent, and most of the southern counties, is to oblige the incoming tenant to pay the

outgoing tenant, by a valuation, for the crop on the farm, for work done in ploughing, fallowing, &c., and for manure and other items. Messrs. Kennedy and Grainger have shown, in their valuable work on the *Practice of Tenancy*, that this custom is highly objectionable, and that it has a powerful influence in keeping agriculture in a backward and depressed state. It obviously obliges the new tenant to pay for articles which, probably, he does not want, and for work which he has not superintended, and which, perhaps, is not well executed, or executed to his mind. In consequence, too, of this vicious practice, a large proportion of the tenant's capital is swallowed up at the moment of his entering the farm, and when, of course, it is of most importance that he should have his entire funds under his control. The gentlemen now referred to affirm that, "in many counties in England, a farmer entering upon 200 acres of land, with a capital of 1,500*l.*, has to pay, according to the custom of the place, 1,200*l.* upon a valuation, and for stock, leaving him only 300*l.* to carry on his business; whilst in the north, and in Scotland, a farmer may enter upon the same quantity of land, having no valuation to pay, with only 800*l.*, and, after stocking his farm to the best advantage, have the same sum left that the other has, with much better opportunittes of employing it profitably." —(*Introduction*, p. 16.) The same gentlemen observe, in reference to Kent, where a very large sum has usually to be paid by the incoming to the outgoing tenant, that "if his (the new tenant's) first year turns out bad, he is irretrievably ruined; which is and has been the case with hundreds, who, having entered upon a farm with all the money they could raise, have nothing left to carry it on, in the event of declining markets, or a wet season, affording them an unfavourable price for the produce of their first harvest."—(p. 250.)

The sooner this pernicious practice is changed, the better. In Scotland, the usual term of entry to a farm is Whitsuntide; the outgoing tenant having liberty to cut the crop, and to use the barns for its thrashing, but being obliged to leave the straw to his successor. The outgoing tenant is always compelled by the terms of his lease to leave a certain proportion of his lands in green crop or fallow; but for this the new tenant pays nothing; and as, speaking generally, the outgoing tenant enters into some other farm where the like practice prevails, no injustice is done to any one; while each commences operations with an unimpaired capital, which he disposes of according to the best of his judgment. This, and the plan of granting leases for periods of 19 years certain, with judicious stipulations as to management, form the peculiar excellence of the Scotch system. "It is these that render estates in Scotland so much more valuable than in England, the rents in the former being nearly double what they are in the latter. It is true that in Scotland the tenants pay no taxes or rates; but, after deducting for this, rents would still be higher, (allowing for the measure,) by 5*s.* an acre than they are in England; and under the Scotch system a farmer would derive a greater advantage from paying an additional 5*s.* per acre, than he would by entering upon a farm subject to a valuation, even at a deduction of 5*s.* per acre; thus making a difference of no less than 10*s.* an acre."—(*Practice of Tenancy, Introduction*, p. 16, and see *Post* on the "Tenants right" in Ireland.)

i. Burdens falling on the Tenant.—Farmers in England, besides the rent payable to the landlord, have, in most cases, to pay tithes, poor-rates, &c. The latter are widely different in different periods, and in the same parish, at not very distant periods. Tithes are now, in most parts, commuted, and are comparatively regular in their amount. Perhaps, together, the public burdens may amount, at a rough average, to from one-third to two-fifths of the rent.

k. Property in Leases.—In some countries, as in Scotland, leases are considered in the light of an inalienable estate, and descend, unless some *special provision* to the contrary be made in the lease, to the heir at law of the tenant, to the exclusion of assignees and sub-tenants. In other countries again, as in England, leases are regarded in the same light as moveable property, and, unless prevented by a positive stipulation, descend equally to the children of the occupier, or may be assigned, or sublet. The question, which of these modes of letting should be preferred, is not without difficulty; but on the whole we are inclined to give a decided preference to the former. Under it, both the landlord and farmer see clearly what they are about: the former knows who is to occupy his lands, and that they can neither be subdivided nor sublet without his authority; and the latter, being aware that he, or his heir at law, will have to occupy the farm during the entire currency of the lease, sets immediately about making the necessary improvements; and, instead of attempting to assign, sublet, or subdivide, founds all his hopes of success on the superiority and greater economy of his management. It must, indeed, be admitted, that in England the circumstance of leases being moveable property has not hitherto been productive of any very material inconvenience; but this is to be ascribed to the adventitious and powerful checks that have counteracted their naturally pernicious operation. Among the most prominent of these seem to be the great extent of land in England occupied by tenants at will, or by tenants whose tenure does not depend on any precise agreement with their landlords, but on the *custom* of the estate or district. The owners of such lands do not, speaking generally, permit them to be divided amongst the children of the occupiers, in the event of the death of the latter; and when estates are let on lease, it is usual to insert conditions prohibiting subdivision. In addition to these checks, the poor laws have contributed to inspire the landowners with a salutary dread of the too rapid increase of the agricultural population, and have stimulated them to take very strong measures to prevent the splitting of farms, and the building of cottages.

But in Ireland, where the law as to leases is the same as in England, and where the checks that have prevented its operation in this country have either not existed at all, or have been comparatively inefficient, it has been, as will be elsewhere shown, productive of the greatest mischief.

The effects of the opposite system in Scotland have been equally striking and beneficial. A Scotch tenant can neither sublet nor subdivide his farm, and at his death it must descend entire to his heir at law. The younger children are not, as in Ireland, taught from infancy to look to the land for support; on the contrary, they are early made aware that farming is not a business on which they can enter, and that

it is indispensable they should apply to something else. In consequence, they either establish themselves in towns, or emigrate to other countries; and, perhaps, there is no one circumstance that has contributed so much as this to inspire Scotchmen with that adventurous, enterprising spirit for which they are celebrated, and few that have done more to increase the size of farms, and to accelerate the progress of agriculture.

3. *Farm Buildings.*—These, in England, are of every variety of magnitude, shape, and materials. Generally, however, they have, when contrasted with those in the south of Scotland, a more antique, rural, and comfortable appearance. The farm-house is always either entirely detached, or is separated by a party wall from the offices. It is sometimes one and sometimes two stories high, being fitted up according to the taste and condition of the occupiers, but generally with a good deal of attention to comfort. The material of the walls and roofs of the buildings depend as much on the facility with which it may be obtained, as on anything else. Sometimes, and most frequently, perhaps, the walls are of brick, sometimes of wood, sometimes of stone and flint, and in the older class of houses they frequently consist of lath and plaster. Tiles, thatch, and wood, but particularly the first two, are the materials most generally used in roofing farm-houses and offices in England; but whenever slates can be had at a reasonable expense they should be preferred, as they make a better, and in the end a cheaper, covering.

The older class of farm buildings are, in very many instances, inconveniently situated, and ill-suited for the purposes to which they are now applied. During the present century, however, improved houses and offices have been erected in most districts. But these have been not unfrequently constructed on too expensive a scale; and instances might be pointed out where the rent obtained for farms is little more than sufficient to pay the interest of the money expended on buildings!

In England, farm buildings are mostly constructed at the expense of the landlord. It is customary to put them into repair at the entry of a new tenant to the farm, who is bound to leave them in what is called a tenantable state. Sometimes, when buildings have to be erected, the outlay is defrayed, in the first instance, by the tenant, who is allowed a corresponding deduction from his rent. But this is an objectionable practice, inasmuch as it diverts the capital of the tenant from the cultivation of his farm, and cripples his means at the very moment they are most wanted.

Cottages in England differ as much in form and materials as the farm buildings. They appear to be quite as much celebrated for their comfort, neatness, and cleanliness as they deserve; for there are great numbers of cottages, in many parts of the country, of which these are anything but prominent characteristics. Arthur Young says of the Suffolk cottages, that "they are in general bad habitations, deficient in all contrivance for warmth and for convenience; the state of reparation bad, and the deficiency of gardens too general."—(*Survey of Suffolk*, p. 11.) And this statement may, with little alteration, be applied to the common sort of cottages in most other counties. Much, however,

depends on the prevalence of peculiar habits and practices, and on the conduct of landlords. Some of the latter laudably exert themselves to improve and beautify the cottages on their estates; and there are not many ways in which a landlord can do more good at so little cost to himself.

Gardens are attached to many English cottages. As these may be wrought at extra hours, they are of great advantage to the occupiers, by furnishing them with a supply of potatoes and pot-herbs. Some benevolent individuals have proposed increasing the quantity of land attached to cottages, and giving a cow to each. But the proposal has met with little favour, and we do not think it deserved much. Were cottagers generally placed in the situation alluded to, they would speedily lose their industrious habits, and would, at no remote period, become half employed, petty occupiers, depending for subsistence wholly on the little patch of land in their possession. We certainly have seen quite enough of the wretched effects of a system of this sort in Ireland to hinder us from seeking to introduce it into England.

Enclosures and Fences.—There are few things that contribute more to the improvement of agriculture than the division of lands into fields of a suitable size, properly fenced. This, however, has not been so much attended to in England as it ought. It is, indeed, impossible to lay down any general rules in regard to the size of enclosures, seeing that these should vary according to the size of the farms of which they are parts, the nature and exposure of the ground, &c. There can, however, speaking generally, be no manner of doubt that, in most parts of England, the enclosures are a great deal too small, and that much valuable land is occupied by unnecessarily large and numerous fences. A well-built stone wall is, though not the most beautiful, perhaps, for agricultural purposes, the best of all fences. But the scarcity of stones is, in many parts of England, sufficient to prevent the construction of such walls; and being more costly at the outset than a hedge, and less beautiful, they are only met with in a few districts. It is true, also, that, in an economical point of view, hedges would be far less objectionable were they properly trimmed, and not allowed to grow to too great a height; but this is seldom the case. On the contrary, they are most frequently, especially alongside lanes and country roads, left to flourish in a state of nature, spreading to a great breadth, the thorns being intermixed with forest trees, briars, brambles, &c., and the underground covered with a luxuriant crop of nettles and other noxious weeds. Hence they not only occupy a great extent of land, but, also, afford a convenient and safe retreat for vast numbers of birds, and for all sorts of vermin. It is estimated that, in very many parts of England, not less than 10 per cent. of the arable land is occupied by fences! Much stress has, no doubt, been laid on the shelter given to the crops and cattle by the number and size of the latter; but the most intelligent persons are of opinion that, even in this respect, they have been multiplied to a vicious excess. For, besides the loss of land, the destruction of crops growing under the shade of the trees, and the depredations of birds and vermin, the healthiness and vigour of the crops are impaired, and their ripening retarded by the want of a free circulation of air occasioned by the height of the fences, and the too

small size of the enclosures. Even in grazing lands the enclosures should be pretty extensive, it being well ascertained that all animals thrive best where they have a pretty wide range of pasture. And, independently of these considerations, the small size of the fields occasions a great waste of labour in ploughing, and most other field operations in which horses are employed. Indeed, there are few things connected with agriculture in England in which a change of system is more required than in all that regards fences. Besides their too great breadth, they are frequently twisted in the extreme; and the opinion of the best judges is that the produce of many parts of the country would be increased from a fourth to a third part by laying them out in fields of a proper size, surrounded with suitable fences. In some places the latter are formed of wooden palings; and, when well executed, they are not only very suitable for the purpose, but much more durable than might be expected. Hedges, however, if properly trimmed, and not allowed to exceed four or five feet in height, would in most parts be the best as well as the most beautiful fence. They are sometimes planted and trained at the expense of the landlord, under the superintendence of workmen employed by him; sometimes, on the other hand, the expense of their planting and training is devolved wholly on the tenant; and sometimes it falls partly on the one and partly on the other. But it is uniformly almost for the interest of the landlord to plant and superintend hedges. If neglected at first, they rarely become good fences; and, as it requires much labour and time to train them, and bring them to maturity, the interest most tenants have in their farms is not sufficient to make them give that care and attention to hedges that are essential to their growth, excellence, and preservation.

4. *Implements.*—As respects the

> ——— "Duris agrestibus arma,
> Queis sine, nec potuêre seri, nec surgere messes,"

our remarks must be very brief; for it would lead us far beyond our limits were we to attempt to particularise, much more to describe, the various agricultural implements used in England. We cannot, however, forbear remarking that their construction is of the greatest importance, inasmuch as improved implements not only enable every agricultural operation to be performed better, but also more expeditiously, and at a less cost; so that they increase, at one and the same time, the disposable produce of the soil, the profits of the farmer, and the rent of the landlord.

Ploughs.—Considering the vast importance of the plough as an agricultural instrument, and the many ages that have elapsed since

> ——— "Ceres ferro mortales vertere terram
> Instituit,"

one should have thought that its structure would have been long since thoroughly investigated, and that all would have been agreed as to the best form of ploughs to be used for different purposes, and in different soils. But, in point of fact, few instruments have attracted so little attention. Perhaps it was supposed that an operation, apparently so rude as that of turning over the ground, might be performed with any

sort of implement; and that it would be useless to bestow art or nicety on one that was to be guided by the clumsy hands of illiterate peasants. But, in whatever way it may be accounted for, it is certain that few or no efforts were made till the latter part of last century to investigate the construction of ploughs on scientific principles.* Fortunately, however, this has been at length satisfactorily accomplished; the best form of the instrument has been ascertained; it is now, also, manufactured with the greatest precision, and at a very cheap rate, by common artisans in many parts of the country; and, while the work executed by the best of the improved ploughs is infinitely superior to that of the barbarous and cumbrous implements formerly in use, it is executed at less than half the expense!† But, despite all this, such is the tenacity to established practices, that unimproved ploughs still maintain their ground in not a few districts; and there is the greatest difference, in different parts of the empire, even where the soils are similar, in the description of improved ploughs in general use.

The ploughs at present in common use in England may be divided into the three great classes of swing-ploughs, wheel-ploughs, and turn-wrest ploughs. The first, or swing-plough, is supposed to be the oldest variety in England: formerly it was exceedingly heavy, clumsy, and ill made; but an unimproved swing-plough is now rarely met with. That which is at present most commonly used in the northern, north-western, and some of the midland counties, is known by the name of the *Scotch plough*, and is by far the best implement of the sort. It was much improved by Mr. James Small, to whom the agricultural interest is, on this account, under the greatest obligations. It has a feathered sock, or share, a curved mould-board, and is now usually made wholly of iron. In Scotland it is uniformly drawn by two horses abreast, driven by the ploughman. Owing to the diminution of friction, the draft is less in it than in wheel-ploughs; but it requires considerable skill and attention on the part of the ploughman. A statute acre is, under ordinary circumstances, about the average quantity ploughed in a day by a man and two horses with this plough. Ploughs with one or two wheels are common in the southern and south western, as well as in some of the midland counties: a peculiar plough of this construction is almost exclusively seen in Norfolk. The chief recommendations of wheel-ploughs are, that they require little skill on the part of the ploughman, and that the depth and width of the furrow may be correctly adjusted; but, on the other hand, the friction caused by the wheels adds to the heaviness of the draught; while they are more expensive, and liable to be choked with earth, and put out of order, than the Scotch plough. Turn-wrest ploughs are general over Kent, and on the chalk-hills of Sussex and Hertfordshire; but they are not common in other parts of the kingdom. They admit of having the mould-board removed from one side to another at the end of each furrow, so that the earth may be always thrown on one side. Besides these three principal varieties, and innumerable subvarieties of each, double-

* The best essays on the construction of the plough are by Mr. Arbuthnot, in *Young's Eastern Tour*, ii. pp. 523—560; and by Mr. Bailey, in his *Survey of Durham*. pp. 390—404.

† *Brown on Rural Affairs*, i. p. 224.

moulded ploughs, &c., are used; but their use is by no means general, nor is it very likely to increase. The old Welsh plough, which is still in pretty common use in Wales, is a most defective implement. "It is not calculated to cut a furrow, but to tear it open by main force The share is like a large wedge; the coulter comes before the point of the share sometimes, and sometimes stands above it; the earth-board is a thing never thought of, but a stick (a hedge-stake or anything,) is fastened from the right side of the heel of the share, and extends to the hind part of the plough: this is intended to turn the furrow, which it sometimes performs, and sometimes not; so that a field ploughed with this machine looks as if a drove of swine had been moiling it."—(*Davies's Agriculture of South Wales*, vol. i., p. 187.) Several proprietors and farmers have introduced improved ploughs; but they are not in nearly such general use as might have been supposed.

Waste of Labour in Ploughing.—Perhaps the imperfect construction of the ploughs, their great weight, and the extensive employment of those with wheels, may be one cause why, in England, a much greater number of horses than are necessary are employed in them. If we except the counties of Norfolk, Suffolk, and Essex, in the south of England, and those of Northumberland, Cumberland, Durham, and Westmoreland, in the north, there is, perhaps, none in which more than two horses will not sometimes be seen in a plough. In some counties, teams of three, four, and very frequently five horses are employed in the tillage of the lightest soils; and on heavy soils a greater number are sometimes made use of.* Notwithstanding this excess of horses, the furrow is seldom above four inches deep on light, and six inches on heavy, soils; nor is there, generally, more than three-fourths of an acre ploughed in a day. Of course, where there are more than three horses, a driver, as well as a ploughman, is necessary. The horses are invariably, almost, yoked in line; so that when the fields are small, and the turnings, consequently, numerous, most part of the work is done by two, or rather by one horse.

This waste of the labour of men and horses in ploughing is, perhaps, the greatest defect in the agriculture of England; and it is one that does not seem to be disappearing, at least in any considerable degree. It is not meant to be affirmed that all lands may be ploughed with two horses; but such is the case with by far the largest proportion. We do not, in fact, think it would be going too far to affirm that a third part of the horses at present employed in farming, in most of the southern, western, and midland counties, might be advantageously dispensed with, were the practice as to ploughing adopted in them that is universally followed in the north. Hence the great importance, in a national point of view, of the discontinuance of the present vicious system. "Wherever teams of two horses are used, the work is decidedly better done than where they are more numerous."—(*Young's Southern Tour*, 2nd edit. p. 288.) On the one hand, therefore, the supply of food for man would be most materially increased by the saving in the keep of horses, and to some extent also by the improved tillage, that would result from the abandonment of the present practice; while, on the other hand, the rents payable to the landlords would be augmented in

* In the Vale of Gloucester *seven* horses are occasionally used.

consequence of the reduction of the farmer's expenses. It is not easy, indeed, to see how the landlords could do anything that would tend so much to advance their own interests and those of the public as their insisting, in the letting of farms, on stipulations calculated to put an end to this waste of labour. This would be the easiest, as well as the most effectual, mode of getting rid of the abuse.

There is nothing in the harrows or other instruments used in the cultivation of the soil in England, that seems to call for any particular notice in a work of this sort. Almost constant changes are making in them; but simplicity of principle and construction are generally believed to be too little attended to. Some of the drill machines, or machines for sowing grain and other small seeds in rows, have been contrived so as to execute their work with the greatest regularity and precision. In all the southern counties, four-wheeled waggons, drawn by two, three, or more horses, are in common use; while in the northern counties single-horse carts, similar to those now universally used in Scotland, are generally met with. A great deal of discussion has taken place respecting the comparative advantages and disadvantages of waggons and carts; but it is only under peculiar circumstances that they can be fairly compared. Where roads are good, and the ground firm and dry, there would seem to be little doubt that the preference should be given to carts; but where roads are bad, and the ground clayey, soft, and tenacious, waggons may, perhaps, be the most suitable. There is a great variety in the form and construction of waggons, most counties having one or two varieties peculiar to itself.

The *thrashing machine* is now pretty common. In the southern counties, indeed, into which its introduction was comparatively recent, it became, within these few years, the object of popular attack; and to such an extent was the prejudice against it carried, that in many districts the farmers were obliged to demolish such as had been erected! Conduct like this is as destructive of the interests of the peasantry as it is disgraceful to their intelligence. The employment of thrashing machines relieves the labourers from the severest drudgery incident to agriculture; they enable the work to be done at the time there is a demand for corn, and, by doing it better, or separating the corn (particularly wheat) more completely from the straw, they add both to the wealth of the farmer and the produce of the country; enabling the former to employ, and the latter to feed, more labourers. This latter is, indeed, a most important consideration. It is estimated by the best informed agriculturists, that 5 per cent., or one-twentieth part more produce is afforded by a crop thrashed by machinery than by the old method; and, estimating the total produce of the corn crops of Great Britain and Ireland at 50,000,000 quarters, we should, on this hypothesis, have an additional annual supply of no less than 2,500,000 quarters, were thrashing machines universally substituted for flails! So great an increase of produce in the hands of the farmers would obviously enable them to employ far more labourers than would be superseded by the use of the machine.—(*Brown on Rural Affairs*, vol. i., p. 332.)

Thrashing machines were at first worked either by horse power or by water. But when horses are made use of, it frequently happens that

they have to be taken from some other necessary employment; and owing to the continuance of the draught, and their confined position, the labour is severe. Water, when it can be commanded at all times in sufficient abundance, affords the best and most economical means of working the machine. But, except in a few peculiar situations, the supply of water is very apt to be occasionally deficient; and hence, of late years, steam has begun to be extensively applied as a moving power to the thrashing machine. There are, indeed, but few improved tillage farms of any considerable extent in the best cultivated districts of Scotland, and in the north of England, without their steam engines; and the extent to which they have been already introduced, is a sufficient proof of the advantage resulting from their employment. It is singular, however, that very few thrashing mills worked by steam should be met with in the midland and southern counties of England: in this respect, indeed, as in some others, the latter are decidedly less advanced than those more to the north.

Mr. Stevenson seems inclined to think that the ploughs, and most of the other agricultural implements in common use in England, are not generally constructed on scientific principles, or with that degree of skill as to enable them to do their work in the best manner, and with the least cost of time and labour. This, however, is not occasioned by the want of the best models in every department, but, as already stated, by the tenacity with which old practices are persevered in. So much is this the case, that, even in the vicinity of the metropolis, where the best workmen and best implements of all sorts are to be found, the ploughs are peculiarly unwieldy and ill contrived; and such is their general character in many other counties. It is plain, therefore, that the general introduction of the improved Scotch plough, at least on all light lands, would be a most material improvement.

But, notwithstanding these defects, the implements used at present by the mass of the English farmers are, speaking generally, very superior to those in ordinary use in most other countries; and, though a good deal remains to be accomplished, the improvements that have been already made in their construction have powerfully contributed to the superiority of our agriculture.

Horse and Ox Labour.—Innumerable dissertations have been written on the question as to the comparative advantage of employing horses or oxen in agricultural operations. It is plain, however, that this question may be differently decided under different circumstances, and that in one case horses, while in another case oxen, may be most profitable. But, on the whole, the superiority of horses seems, in this country at least, to be great and obvious; and, notwithstanding the efforts of various amateur farmers to the contrary, the employment of oxen in field operations appears to be every day diminishing, and is now principally restricted to Devonshire, Herefordshire, Sussex, and Glamorgan. But, even in these counties, a great deal of work is done by horses. The inferiority of oxen to horses, for general purposes, is admitted by every one; and, even in tillage, ox teams are not to be compared, in point of economy, with the two-horse plough.

Sect. 3.—*Tillage Husbandry.*

Fallows.—Before an improved system of tillage was introduced into England, there appears to have been little or no fallow land. At length, however, it was perceived that the loss of a crop every year that a fallow occurred was more than balanced by the improvement it occasioned in the crops of the other years. When the practice had been introduced, it rapidly extended, and appears to have been carried, about the middle of last century, to an excess. This occasioned a reaction, and several writers of eminent talent exerted themselves to show that fallowing might be nearly, if not entirely, laid aside. A great deal of controversy has taken place as to this important point.

But as experience has proved that most descriptions of land may be effectually cleaned and prepared for wheat by the substitution of crops of drilled turnips, beans, potatoes, &c., in the place of naked fallows, the latter have been fast losing ground in most districts, but especially in the light or turnip soils. In strong clay lands, however, the practice of fallowing seems to be pretty stationary. In the southern counties, indeed, which are favoured with a comparatively long and dry summer, attempts have been made to dispense with fallows by substituting beans in their stead; and it is believed that, even on heavy clays, when properly attended to, they have in most respects answered the object in view.

Mr. Bailey has the following observations on the subject of fallowing:—

"It has been disputed, whether fallowing was necessary to the fertility of land or not. The difference of opinion, I am inclined to think, is, in a great measure, owing to the idea annexed to the term, or to some small remains of prejudice for ancient customs; as, before the introduction of turnips, it was thought absolutely necessary to summer-fallow the dry soils as well as the wet, under the idea of renewing their fertility by a naked summer-fallow, or year of rest; but experience has proved that the dry soils can bear a crop of turnips of considerable value, and after that a crop of wheat equal, if not superior, to what it would have been from a naked summer-fallow, and the land left in an equal state of fertility. It therefore appears that, in this case, the land has received no injury by not being left naked or uncovered by the turnips. The restorative fertility must, therefore, be owing to another cause, which is common to both modes, and may probably be sufficient ploughings, clearing of pernicious weeds, and proper manures.

"Upon strong loams it has been found, that if beans are drilled at 30 inches intervals, and properly hand-hoed amongst the stems, and horse-hoed or ploughed between the rows, the land may be left as clear of weeds, and the crop of wheat succeeding the beans be equally good, as one obtained after naked fallow.

"From these instances it appears, that it is not necessary to the fertility of land to let it lie in a naked or uncultivated state through the summer; but that it is necessary to keep it clear of weeds, and in a duly pulverized state, supposing the manures in both cases to be equally the same.

"But there are many parts of this country where the soils are moist, thin loams, upon ochrey clay, that are so addicted to the production of agrostis nigra, alba, and stolonifera, that it is scarcely possible to effect their destruction without a naked summer-fallow, at least in their present state; but it is probable that superior cultivation may remove the necessity of having recourse to this measure so often as has been the prevailing practice."—(*Survey of Durham*, p. 106.)

Alternation of Crops.—The courses of crops commonly cultivated vary much, not only with the variations of soil and climate, but even where these are similar. In the best farmed counties, such as Nor-

folk, Suffolk, Essex, Lincoln, Kent, and Northumberland, two white crops are rarely sown in succession. A green or a pulse crop, or a plain fallow, is interposed between every two white crops. These green crops not only preserve the fertility of the soil, but, when sown in rows, as most of them usually are, they afford, as has been just mentioned, an opportunity of extirpating weeds by the use of the horse and hand-hoe; and even when sown broad-cast, by their taking complete possession of the ground, if it be properly prepared, the growth of weeds is effectually checked. In other respects, these intermediate crops are of the utmost importance in every good course of management. Whether they be eaten on the ground, or carried to the farm-houses and straw-yards, much valuable manure—the plentiful supply of which is essential to all good husbandry—is obtained from their consumption; and on sandy or gravelly soils, when a part only of a turnip crop is eaten by the sheep on the ground, the greatest defect of such land is removed by their treading; and, in many cases, it is rendered as capable of producing a valuable crop of wheat as soils of a closer texture. This alternate course of husbandry forms the grand distinction between the old and the new or improved systems. Wherever it is not introduced, husbandry must necessarily be in the most backward state; and such, we regret to say, is its present condition in very many districts. Oats or barley after wheat, wheat after oats, and two, or even three, crops of oats in succession, are by no means uncommon. On light soils, the rotation commonly pursued by the best agriculturists is borrowed from the county of Norfolk, and is thence called the Norfolk, or four-shift system: it consists of, 1st, turnips or potatoes; 2nd, barley or wheat; 3rd, clover; and 4th, oats, or where barley followed turnips, clover is sown along with it, and succeeded by wheat. No one rotation is nearly so common on heavy soils as this is on light soils and inferior clays. Those most pursued on the former are, 1st, fallow; 2nd, wheat; 3rd, beans; 4th, oats; and then, 5th, fallow: or, 1st, fallow; 2nd, wheat; 3rd, clover, for one or two years; 4th, oats; 5th, beans; 6th, wheat; 7th, fallow. Barley is sometimes, but not often, introduced into the rotations on strong lands; and tares, rape, or cabbages are occasionally, though seldom, substituted for fallow. In the Isle of Sheppey, in Kent, and in a few other spots of uncommon fertility, wheat and beans are grown alternately, without the intervention either of a fallow or of any other crop.

Besides these rotations, which are applicable only to grounds kept constantly under the plough, there are others which form what is called the *convertible husbandry*. In this system, the ground, after being laid down to grass for two, three, five, or more years, is broken up and sown with different species of corn, intermixed with green crops, or fallows, for some years, after which it is again laid down to grass. This system is making its way into the best farmed districts of England; so that more grass-land (not permanent, but for a few years) is now seen in the strictly arable districts than was formerly met with; while a greater breadth of ground is under the plough in many of those counties which formerly were almost exclusively in grass.

Crops cultivated.— *Wheat* (*Triticum*) is by far the most important,

and most extensively cultivated species of bread-corn raised in England. It appears, from the previous statements, that it is sown after fallow, turnips, cabbages, potatoes, beans, &c. In light soils it follows clover and the cultivated grasses; but it never, at least in the best farmed districts, follows any other white crop. Wheat may be raised on all sorts of soils; but those of a clayey nature are the most suitable. So peculiarly, indeed, is wheat adapted to heavy, stiff lands, that they are usually termed "wheat soils." The lighter the soil, the less is it suited to this species of grain; and it is an error in practice to force the cultivation of wheat on soils, and, under circumstances, better suited to the production of other grain. In this country, it does not admit of being raised at a great elevation. As it is a crop on which the farmer mainly depends, the preparation for it, in whatever rotation it comes, should be an object of great care and attention. If it be intended to sow wheat after fallow, the land is repeatedly ploughed, harrowed, and well manured; if after clover, only one ploughing is given, and seldom more after beans: where tares have been previously sown, they are got off the land in sufficient time to plough it more than once: when wheat follows turnips or cabbages, it must, unless they be stored or eaten, be sown in the spring months.

The kinds of wheat grown in England seem mostly all to be varieties of two species—the *Triticum hybernum*, or winter wheat, and the *Triticum turgidum*, or turgid wheat. The culture of the latter is mostly confined to clays; the cone, or bearded wheat, being the most esteemed of its varieties: it enjoys this pre-eminence, not because it yields the finest flour, but because it is comparatively productive, and not subject to disease on wet soils.

The varieties of wheat are perpetually changing, in consequence of variations of culture, climate, and soil. Those most in use are distinguished by different local terms. They may, however, be divided into the two great classes of *red* and *white*, the latter being superior as respects quality of produce, and the former of hardiness. In general, the thin and smooth-chaffed varieties are preferred to those that are woolly and thick-chaffed. Wheat sown in the spring is called *spring wheat;* but the species is quite the same as that sown before winter; though, by being sown in the spring, its period of ripening is changed. It is always sown before winter when the ground can be got ready; but when it follows turnips, cabbages, and such like crops, it has frequently to be deferred to the spring.—(*Low on Agriculture*, 4th ed., pp. 328—343.)

Winter wheat is seldom sown in any part of England before the beginning or middle of September, or later than the end of November. Spring wheat is generally sown between the middle of March and the middle of April. The seed is invariably pickled or steeped; a process intended to prevent *smut*. The quantity of seed allowed to an acre, when sown broad-cast, usually varies from 2 to 3 and 3½ bushels.

The drill husbandry, as applied to wheat, is practised to a considerable extent in many parts of England; and in some places it is not unfrequently planted with the dibble: but by far the greater portion is sown broad-cast. While growing, but little attention or labour is bestowed upon it. When drilled, it is generally hoed; and when

sown broad-cast, it is sometimes hand-weeded, and occasionally, though rarely, harrowed and rolled in the spring. But these operations are generally, perhaps, prosecuted as much in the view of covering the clover and grass seeds, that are then frequently sown in the wheat fields, as of improving the wheat crop.

Wheat harvest generally commences, in the south of England, about the 25th of July or the beginning of August: in the midland counties it is about 10 days, and in the northern counties from a fortnight to three weeks, later. There is a striking difference in the harvest-field operations, with respect to this as well as other kinds of grain, between the north and south of England: in the former, during harvest, the corn-field exhibits a large number of reapers, perhaps 50, 60, or even 100, all working together, and presenting an interesting and animating spectacle. In the south of England, on the other hand, and over the greater part of the midland counties, wheat is reaped by small sets of individuals, who contract to cut a field or a certain number of acres; so that, in general, the field merely exhibits one or two men, with, perhaps, their wives, working in different parts of it. Wheat is seldom cut down with the scythe, but is either reaped with the common sickle, or, as is the practice in some of the counties near the metropolis, as well as in some of the south-western counties, it is *bagged*, that is, struck down near the ground with a large and heavy hook. It is universally bound in sheaves, which are set up in *shocks* or *stooks*, each containing 12 or 14 sheaves. Perhaps no circumstance marks the difference of climate in the south and north of England more strongly, than the difference in point of time during which it is necessary to keep wheat and other grain in the field before it is carried home. In the southern counties, it is generally ready in a week or ten days: whereas in the north it is necessary to let it stand out for two or three weeks. In the southern, eastern, and midland counties, it is frequently put into barns: in the north, it is almost universally stacked.

As this grain is so extensively cultivated, frequently on very inferior soils, and after very imperfect preparation, the produce per acre varies materially in different counties and districts; it is also very liable to injury from a bad seed time, a wet winter, or a blight during the period of its flowering (which last is the most common cause of the failure or deficiency of our wheat crops); so that its produce varies as much in different seasons on the same farms, and under the same management, as it does during the same season on different farms. The lowest quantity of produce, except where an absolute deficiency from blight occurs, may, perhaps, be rated at from 14 to 15 bushels an acre; and the highest at from 56 to 66 bushels. Occasionally, indeed, even more than this has been reaped on the deep loams near Chichester, in Sussex, on the calcareous loams near Epsom, and in some of the more favoured and highly cultivated parts of Kent, Essex, Lincoln, Somerset, &c.

The wheat counties are Kent, Essex, Suffolk, Rutland, Hertford, Berks, Hants, Hereford, and parts of Lincoln; that is, these are the counties most distinguished for the quality as well as the quantity of their wheat. In the north, this grain is sometimes raised of a very fine quality; but generally it is inferior; being colder to the feel,

darker coloured, thicker skinned, and yielding less flour. In the best wheat counties, and in good years, the weight of an imperial bushel of wheat varies from 62 to 65 lbs. In the Isle of Sheppey, in Kent (where, perhaps, the best samples are produced), it sometimes weighs, in favourable seasons, 66 lbs. a bushel. Where the climate is naturally colder, wetter, and more backward, or in bad seasons, the weight of the bushel does not exceed 57 or 58 lbs. It is calculated that, at an average, a bushel of good English wheat weighs 60 lbs.; and that the average yield of flour is 12½ lbs. of flour to 14 lbs. of grain. The weight of the straw is supposed to be about double that of the grain; so that an acre yielding 32 bushels of wheat, at 60 lbs. per imperial bushel, would yield 3,840 lbs. of straw.

Rye (*Secale cereale*), the bread-corn of Germany and Russia, was at one time very extensively cultivated in this country; so much so, that Mr. Charles Smith estimated there were in England and Wales, in 1765, 880,000 individuals, or about *one seventh* part of the then population, who were consumers of rye (*Tracts on the Corn Trade*, 2nd ed., p. 182); but it is now very little cultivated in a separate state, and has ceased to be consumed by man, unless when mixed with wheat. This is ascribable to two causes: in the first place, the farmers have discovered that the light lands, which were formerly deemed fit only for rye, may, by proper management and attention, be made to produce excellent crops of barley or wheat, and, in the second place, the increased wages and improved circumstances of the labouring classes have made them prefer wheaten bread to rye bread, or, indeed, to bread made of any other sort of grain. Rye is still, however, raised in Northumberland and Durham. In the latter it is very rarely grown alone; but a mixture of rye and wheat, provincially termed *maslin*, is rather extensively grown, and a few years ago a greater breadth of fallow land was covered with it than with wheat. It is mixed in all proportions, from ⅛th of wheat to ⅞ths of rye; and from ⅛th of rye to ⅞ths of wheat, according as the grower thinks the ratio will best suit his soil. Mr. Bailey says it has been long remarked, that individual grains of each species are plumper and better perfected than when grown separately; and that a bushel of good maslin weighs more than a bushel of either good wheat or good rye. Bread of excellent quality, made of this mixture, used to be in general use throughout Durham, and in many parts of Wales.—(*Survey of Durham*, p. 124.) Rye is frequently grown as green food for cattle. It comes early in the spring to maturity, allowing time for a subsequent crop the same year.

Barley (*Hordeum*).—The culture of this grain has been supposed, but probably on no very good grounds, to be on the decline in England. In 1765, Mr. Charles Smith estimated the number of barley consumers in England and Wales at 739,000; and, as a large proportion of the population of Wales, Westmoreland, and Cumberland still subsist chiefly on barley bread, we are inclined to think that this estimate may not, at present, be very wide of the mark. But the great demand for barley in England is by the manufacturers of beer, porter, and British spirits: and, though the consumption of these articles has not increased proportionally to the increase of population and wealth, there is no reason to conclude that it has diminished. Barley is also ex-

tensively used in fattening black cattle, hogs, and poultry. It is a most important crop in the rotation best adapted to light lands. The principal barley counties are Norfolk, Suffolk, Cambridge, Bedford, Leicester, Nottingham, and the upper parts of Hereford, Warwick, and Shropshire. Where its culture is best understood, and most extensively followed, as in Norfolk, it is generally preceded by turnips, or other green crops; after these are drawn or eaten off, the land is twice or thrice ploughed, the seed furrow being given when it is dry, and immediately before the barley is sown. The season for sowing extends from the middle of March to the end of April. It is, perhaps, more generally drilled than wheat; but this mode of culture is by no means common: when it is drilled, about 2 bushels of seed are sown per acre; in the broad-cast method, 3 or 3½ bushels. There are two leading species of this grain in cultivation, the *hordeum distichon*, two-rowed, or common barley, of which there are several varieties; and the *hordeum hexastichon*, or six-rowed barley. One of the best known varieties of the latter is called in this country bere, or bigg. Its culture is, however, almost entirely confined to the northern counties and Scotland. Barley harvest, in the south of England, commences nearly about the same time as the wheat harvest, or perhaps a little later; in the north it is often cut down before wheat. The practice of mowing it, which has long been followed in the south, is becoming very general; but the carrying it in a loose state, without being bound in sheaves, is confined to the southern counties; and is, even there, attended with a good deal of risk. It is seldom housed in any part of England. The produce varies from 24 to 64 bushels an acre; the most usual crop is from 30 to 45 bushels: the usual weight of an imperial bushel of barley is 54 or 55 lbs.; but the best Norfolk barley sometimes weighs 56 or 57 lbs. When barley is raised on strong land (which had better, however, be sown with wheat), a summer-fallow preparation is sometimes given. The practice of sowing barley after wheat or oats is, luckily, on the decline.

Oats (*Avenæ*).—In 1765, Mr. Charles Smith estimated the number of consumers of oats in England and Wales at 623,000; but there can be no doubt that they are now considerably fewer. The feeding of horses has at all times occasioned the greatest consumption of oats in this part of the kingdom; and as the number of horses kept for business and pleasure has been vastly increased within the last 30 or 40 years, the culture of oats has been much extended. As, however, they do not suit so well with a warm and early, as with a more moist and backward, climate, the crops in the former being neither so abundant nor of such good quality as in the latter, the cultivation of oats is more attended to in the north and in Wales than in the southern counties. They are raised most extensively in Northumberland, Durham, Cumberland, Westmoreland, Lancashire, and in the fens of Lincoln, Huntingdon, Northampton, Cambridge, and Norfolk. It has been supposed that about a third part of the oats grown in England are the produce of the fens; they are also grown on the high lands of Cheshire, Derbyshire, and Staffordshire, and in most of the Welsh counties, particularly in Caermarthen. In the midland counties their cultivation is less extensive; though they are grown in Leicester, and on the Trent bank

land of Nottingham. There are very fine crops of oats in the Isle of Thanet, and in other parts of Kent.

There are three leading varieties of the common oat (*Avena sativa*) cultivated in England,—black; gray, dun brown, or red; and white. The first two varieties, being comparatively hardy, may be raised on very inferior soils, and in situations unsuitable for the other. The black oat is now, however, hardly known in England; and the dun, or red oat, is principally confined to the moors of Cheshire, Derbyshire, and Staffordshire. White oats are, speaking generally, less hardy than either of the other varieties, and require a better soil; but they are, at the same time, earlier, heavier, and yield a greater quantity of meal. There are numberless, and some widely different, sub-varieties of this kind. That which is called the potato-oat has long enjoyed the highest reputation in this country, and is almost the only one that is at present raised on land in a good state of cultivation in most parts of England and the south of Scotland, and usually brings a higher price in the London market than any other variety. It was discovered growing in a field of potatoes in Cumberland in 1788; and from the produce of this single stalk, which there sprang up by accident, most probably from the manure, the entire stock now in general use has been obtained! Besides the above, a species of naked oat (*Avena nuda*), provincially called *pillar* (*ante*, p. 214), is grown in Cornwall.

Oats are almost always, in every part of the kingdom, the first crop on old grass land, to which they are more suitable than any other species of grain. They are also sown generally on strong land, after clover ley; and in the north of England they succeed clover on most kinds of soil. Besides coming in this rotation, they are sometimes sown after turnips; and where the husbandry is indifferent, they are taken as the last crop before fallow, even when the ground is dirty and exhausted. In the southern counties the end of February, and in the midland and northern counties the middle or end of March, is the usual seed time. They are very seldom drilled. Five bushels is the ordinary quantity of seed to the acre. Perhaps the produce of no species of grain varies more than that of oats. Where the ground is foul and exhausted, not more than 20 bushels an acre are obtained; but on rich soil, well managed, and in favourable years, 60, 70, and sometimes even 80 bushels and upwards, have been reaped. Oats weigh from 35 to 48 lbs. a bushel, yielding 9 lbs. meal for 14 lbs. corn; but the proportion of meal increases as the oats become heavier. In most parts of England they are mown, except when the crop is very strong. In the south, they are generally carried loose into the barn-yard; but in the north, where they are frequently cut with the sickle, they are tied in sheaves. Being liable to lose much by shaking, it is usual to cut oats before they are quite ripe.

The *Bean* (*Faba vulgaris*) is grown on almost all the strong lands under the plough. The quantity sown has probably continued stationary. According to the rotation pursued by our ancestors, when most of the land was in common fields, beans, preceded by wheat and followed by fallow, formed the whole course of husbandry. They were then, however, generally sown broad-cast; and, instead of benefiting the ground, were often of incalculable detriment. But in the modern

system they are drilled and horse-hoed. Hence, they have become a very important crop, particularly on clay lands not suitable for turnips; heavy crops being not only raised, but the ground being, when suitable attention is paid to their culture, kept clean and in good order. Still, however, there are but few counties in which their culture is well conducted. Perhaps Gloucester, Kent, and Essex, may be specified as those where it is carried on with most judgment, skill, and success. In these and some other counties, they are drilled, and carefully horse and hand-hoed; affording a valuable crop, and the means of cleaning and fertilizing the land without resorting to a fallow. They generally precede wheat, and are put into the ground as soon in the spring as the weather will permit. The bean harvest in every part of the kingdom is late, generally ten days or a fortnight after all the white corn is cut down. The produce varies from about 20 to about 44 bushels an acre.

The *Pea* is commonly divided into two species—the *Pisum sativum*, or white pea of the gardens, and the *Pisum arvense*, or gray field-pea. The first is largely cultivated as a garden crop; and is grown to a considerable extent in the fields in Middlesex, Kent, Suffolk, and some other counties. Gray peas are pretty extensively grown in some parts of England; and they are the only sorts raised in the fields in Scotland. When grown as a field crop, the pea generally succeeds clover, rye, wheat, barley, or oats; but its proper place in the rotation is as a preparation for wheat. "The produce of the pea is very uncertain. Perhaps none of our cultivated crops presents such frequent failures. This arises partly from the diseases to which the plant is subject, and partly from the effects of late ripening and unfavourable weather. Thirty bushels an acre are held to be a good crop in most districts of this country. Perhaps the average of the kingdom does not exceed 20 bushels an acre." (*Low's Agriculture*, p. 382.) Peas ought not to be grown more than once in eight or ten years. If grown oftener, the crop frequently fails, and the land is covered with weeds. In Middlesex, the average produce of the early crops of green peas in the husk is estimated at from 25 to 30 sacks an acre, worth from 8*s*. to 18*s*. a sack. The average produce of green peas about Dartford, in Kent, is said to be 40 sacks an acre, and that as many as 50 sacks have been gathered.—(*Loudon*, 2d ed. No. 5213.)

The *Tare* (*Vicia sativa*) is principally grown as spring food for sheep, cattle, or horses. In the south of England it is sown either in the autumn or spring. That which is sown in the former is ready for cutting in April or May, but it does not come to perfection in the northern counties; that which is sown in the spring (March) is cut in autumn. Tares are a nourishing and excellent food for all sorts of cattle. Cows give more butter when fed with tares than with any other sort of food. Horses, also, are said to thrive better upon them than upon clover or rye-grass. Ten or twelve tons per acre is reckoned a large crop.

Buck Wheat (*Polygonum fagopyrum*) is seldom seen in England. A little of it is cultivated in Norfolk and some other counties, on light and poor soils, and allowed to ripen; in other parts it is ploughed down as a manure while in flower.

Clover (*Trifolium*).—Red, Dutch, and yellow clover, or trefoil, are very generally and largely grown; but to a greater extent, and with more success, in the eastern, southern, and northern counties, than in the western or midland. The culture of red clover after barley, as a preparation for wheat, is considered a mark of superior husbandry in those districts where it is best understood. Clover is rarely sown along with rye-grass, where hay is the object; but they are usually mixed when the land is intended to remain two or three years in pasture. In the south, and particularly in the vicinity of the metropolis, clover is frequently sown alone. Dutch, or white clover, is used principally in laying down land to grass. Owing to the comparatively small extent of old pasture, or meadow land, in Scotland, the Scotch farmers pay more attention than those of England to the culture of artificial grasses.

Sainfoin (*Onobrychis sativa*), not thriving well, except where the soil or subsoil is calcareous, is not generally met with. But it is extensively cultivated on the Cotswold Hills, and on the chalk soils of Dorset, Hants, Wilts, Hertford, Surrey, Sussex, and Kent. It generally remains for 8 or 10 years—a much longer period, according to A. Young, than it is found to do in France. It is made into hay, the after-crop being eaten by sheep or cattle.

Lucerne (*Medicago sativa*), nearly allied to sainfoin in its character, habits, and properties, though requiring a different soil, is not grown to any considerable extent, except in parts of Kent and Sussex.

Potatoes.—The culture of this exotic (*Solanum tuberosum*) was first introduced, and it is still grown in the greatest perfection, in Lancashire and Cheshire; in the former about Altringham, and in the latter about Frodsham. Potatoes are also grown to a considerable extent in Yorkshire, particularly on the warp-land, or the soil on which the sediment of the rivers is deposited, and in Essex, Cumberland, and Cornwall. They are, however, less extensively used and cultivated in the western counties than in any other part of England. They are frequently grown on the light soils in the low parts of Wales. March and April are the usual seasons for planting, and October for taking up the crop. Wherever the husbandry is good, they are planted in rows, and are carefully horse-hoed and hand-weeded; being taken up either by the plough or by a particular kind of fork. The produce varies from 8 to 10 and 12 tons an acre. Potatoes are most commonly used as a preparation for wheat or oats, the latter being, in general, the best following crop. In Lancashire and Cheshire, however, they are not unfrequently planted on lands broken up from grass for the purpose.

Capacity of the Potato to support Population.—There is a considerable discrepancy in the statements of the best authors as to the number of individuals that might be supported on an acre of land planted with potatoes, as compared with those that might be supported on an acre sown with wheat; some stating the proportion as high as 6 to 1, and others at only 2 to 1. According to Arthur Young, 1 lb. of wheat is about equal in nutritive power to 5 lbs. of potatoes. But Mr. Newenham, who has carefully investigated this subject, states, 'that 3 lbs. of good mealy potatoes are, undoubtedly, more than equivalent to 1 lb. of bread.'—(*Newenham on the Population of Ireland*, p. 340); and his estimate is rather above Wakefield's. Supposing,

however, that 1 lb. weight of wheat is fully equal to 4 lbs. of potatoes, still the difference in favour of the superior quantity of food derived from a given quantity of land planted with the latter is very great. According to Arthur Young, the average produce of potatoes in Ireland may be taken at 82 barrels the Irish acre; which, at 20 stone the barrel, is equal to 22,960 lbs.; and this being divided by 4, to bring it to the same standard, in point of nutritive power, as wheat, gives 5,740 lbs. Young further estimates the average produce of wheat, by the Irish acre, at 4 quarters; which, supposing the quarter to weigh 480 lbs., gives in all 1,920 lbs., or about one-third part of the solid nourishment afforded by an acre of potatoes.—(*Tour in Ireland*, Append. pp. 12, 24, &c. 4to. ed.) This estimate must, however, be somewhat modified when applied to Great Britain, the soil of which, while it is better adapted to the growth of wheat, is generally supposed not to be quite so suitable for the potato as that of Ireland. But it, notwithstanding, admits of demonstration, that, even here, "an acre of potatoes will feed double the number of individuals that can be fed from an acre of wheat."—(General Report of Scotland, vol. i., p. 571; Commercial Dictionary, art. POTATOES; and see *ante*, p. 442, for some remarks on the consequences to a population of depending principally on potatoes.)

Turnips (*Brassica rapa*, common turnip; *Ruta baga*, Swedish turnip).—The county of Norfolk was for a long time famous for its great breadth of turnips, and for the skill and success with which they were cultivated. At present, however, this useful and valuable root is grown, to a greater or less extent, in almost every county of England; but in a superior manner, and to a larger extent in Norfolk, Suffolk, Northumberland, and Lincoln, than anywhere else. The turnip culture seems to have made the least progress in Cheshire, Lancashire, and some of the south-western counties. In the best cultivated parts of Norfolk, Northumberland, and Lincoln, turnips are almost uniformly drilled. They are also partially drilled in other places; but broadcast is still the most common mode of sowing them in the western parts of England. They mostly follow wheat or oats; but they occasionally, also, follow barley and peas. They are principally grown on light soils, serving, especially when drilled, the same purpose as a naked fallow. Turnips are, therefore, of peculiar value to a farm; for, besides enabling it to keep and fatten a much larger quantity of stock, and, consequently, to accumulate a much larger quantity of manure, they give a crop where there was none before, without diminishing in any degree the means of cleaning the land. Their produce, when cultivated in the broad-cast manner, varies from 5 to 15 tons an acre; the latter being reckoned a very good crop. In Northumberland and Berwickshire a good crop of white globe turnips, drilled, weighs from 25 to 30 tons; the yellow and the *Ruta baga*, or Swedish, a few tons less. It has been well observed by Mr. Brown, in his valuable *Treatise on Rural Affairs*, that the introduction of the improved turnip culture into the husbandry of Great Britain "occasioned one of those revolutions in rural art which are constantly occurring among husbandmen; and though the revolution came on with slow and gradual steps, yet it may now be viewed as completely and thoroughly established. Before

the introduction of this root, it was impossible to cultivate light soils successfully, or to devise suitable rotations for cropping them with advantage. It was likewise a difficult task to support live stock through the winter and spring months; and as for feeding and preparing cattle and sheep for market, during those inclement seasons, the practice was hardly thought of, and still more rarely attempted, unless where a full stock of hay was provided, which only happened in very few instances. The benefits derived from turnip husbandry are, therefore, of great magnitude. Light soils are now cultivated with profit and facility; abundance of food is provided for man and beast; the earth is turned to the uses for which it is physically calculated; and, by being suitably cleaned with this preparatory crop, a bed is provided for grass seeds, wherein they flourish and prosper with greater vigour than after any other preparation."—(Vol. ii. p. 90.) The application of bone manure and guano to the raising of turnips ranks among the greatest of the recent improvements in agriculture. It has not only occasioned a great increase in the produce of this valuable root, but in the crops of corn and grass by which it is followed.

Cole, or *Rape* (*Brassica napus*), is cultivated either on account of its seed to be expressed for its oil, or as green food for sheep. That raised for crushing is principally produced in Yorkshire and Lincolnshire; while that raised for sheep is cultivated to the greatest extent in the southern and south-western counties, and in Northampton, Leicester, &c. It is seldom grown for either purpose north of Yorkshire, or in the western counties. The culture of rape for seed has been objected to on account of its supposed great exhaustion of the land; but Mr. Loudon says that, where the soil and preparation are suitable, the after-culture properly attended to, and the straw and offal, instead of being burnt, as is the common practice, converted to the purposes of feeding and littering cattle, it may, in many instances, be the most proper and advantageous crop that can be raised by the farmer. Where the plant succeeds well, and the season is favourable for securing the seed, it produces sometimes from 40 to 50 bushels an acre; but the produce is very various and uncertain. The leaves are scarcely surpassed, as green food for sheep, by any other vegetable.

Cabbage (*Brassica oleracea*) has been partially cultivated as food for cattle and sheep for several years; but the practice does not seem to be extending. Cabbages are principally grown in Suffolk, Leicester, and Lincoln. Mr. Brown affirms that their culture is much more hazardous, far less profitable, and attended with infinitely more trouble, than that of turnips. But when they are grown on soils too heavy for turnips, they may be an advantageous crop.

Mangel Wurzel, or *Beet* (*Beta vulgaris var.*), has of late years been extensively cultivated in the most improved districts. It is of great value as food for cattle, standing next to Swedish turnips in its feeding properties. It may be preserved in perfection in pits: the produce varies from 18 to 40 tons an acre.

This plant abounds in saccharine matter; and a large proportion of the sugar used in France and other parts of the continent is now prepared from beet-root. The extraction of sugar from beet was also beginning to be attempted in this country; but it having been enacted,

that all sugar made from it should be subjected to the same duty as colonial sugar, the manufacture has been discontinued.

Carrot (*Daucus carota*) has been long cultivated for the London market, and as food for farm horses, on the sandy soil of Suffolk; but its application as food for cattle is comparatively recent. It is also cultivated as a farm crop to a considerable extent in Worcestershire; Wolverly sands having been long famous for the growth of this root, and for the saving of carrot seed. For several years past, carrots have been cultivated on a large scale, and with much success, by some intelligent Norfolk farmers. According to Arthur Young, the produce of an acre of carrots in Suffolk is, at an average, 350 bushels; but under the best management the crops have averaged as much as 800 bushels, which considerably exceeds the largest crop of potatoes. Horses are remarkably fond of carrots; and Mr. Loudon affirms that, if they be mixed with cut straw and a little hay, they will keep them in excellent condition for performing all kinds of ordinary farm labour. About 40 or 50 lbs. a day are allowed for each horse.

The *Parsnip* (*Pastinaca sativa*) resembles the carrot in its uses and the method of its cultivation; but requires a stronger soil, and is more nutritive. It is not raised any where in this country on a large scale, except in Jersey and Guernsey, where it is extensively used in the feeding of cattle.

The following crops are generally confined to a very few parts. Canary seed, radish seed, spinach seed, &c., are scarcely seen any where, except in the Isle of Thanet, where they are raised in large quantities. Saffron, which was formerly cultivated in various parts of the kingdom, is now grown almost solely between Saffron-Walden, in Essex (which takes its name from this plant), and Newmarket, in a circuit of 10 miles. Another singular product of Essex is a kind of treble crop of coriander, carraway, and teazle; the two former on account of their aromatic seeds, the latter for its prickly heads, used by the manufacturers in raising the nap on woollen cloths. Teazles are also grown in some parts of the West Riding of Yorkshire; but neither there nor in Essex to nearly their former extent, in consequence of their being in a great measure superseded by the use of machinery. Madder and woad are grown, though not to any considerable extent, on the chalk hills of Surrey, near Banstead, and in West Kent: mustard, near Wisbeach, in the Isle of Ely, and in some parts of Essex: liquorice, principally in the neighbourhood of Pontefract, in the West Riding of Yorkshire. In Derbyshire, a good deal of land is planted with camomile. Various medicinal plants are raised near Mitcham, in Surrey; among which are peppermint, pennyroyal, savin, angelica, horehound, camomile, wormwood, hyssop, poppy, lavender, and roses.

Flax and Hemp.—After the American war, government endeavoured, by means of bounties, to encourage and extend the cultivation of flax and hemp; but the bounties were soon withdrawn, because, as is said, they went to the landlords instead of the tenants; the former expecting an increased rent for their lands in proportion to the bounties given. But, supposing that the bounties had gone entirely into the pockets of the tenants, their withdrawal is not to be regretted. It is

admitted, by the best informed agriculturists, that the culture of flax is, on the whole, decidedly less profitable than the culture of corn; and it would, therefore, be most impolitic to attempt to force the growth of the former rather than of the latter. The flax grown in England is raised chiefly between Bridport and Beaminster, in Dorsetshire; in the neighbourhood of Frome, Crewkerne, &c., in Somersetshire; at Upwell and Chatteris, in the Isle of Ely; in some parts of Lincolnshire; and on the strong lands of High Suffolk.

The *Hop* (*Humulus lupulus*) has long been cultivated in the southern parts of England, particularly in the neighbourhood of Canterbury and Maidstone, in Kent, where there is a larger extent of ground appropriated to its growth than in any other county. The quality of the hops raised round Farnham in Surrey, and in the adjoining parts of Hants, is, from better management, or other causes, so superior, that they always command the highest price: they are also grown in Herefordshire, particularly on the confines of Worcestershire; in the latter, in the vales of the Severn and the Team; in the vicinity of Stowmarket in Suffolk, and near Retford in Nottinghamshire, but in these two places only to an inconsiderable extent; in Essex about Castle Hedingham; and in some parts of Sussex. The hop is so much affected by changes of weather, blights, and other distempers, that its produce varies more than that of any other plant, being sometimes as low as 1 or 2, and sometimes as high as 15 or 20 cwt. an acre! In 1825, for example, the produce of the hop crop amounted to only 5,080,000 lbs., whereas in the following year it was 57,227,000 lbs.! The average produce during the 4 years ending with 1834, was about 30,000,000 lbs. In 1845, the land under hops in the different parts of England and Wales comprised an area of 48,058 acres, whereof there were in Kent 24,888 acres; in Sussex, 11,016 ditto; in Hereford, 6,597 ditto; in Worcestershire, 1,225 ditto; in Hants, 2,765. During the same year the duty of 2*d.* per lb., produced 274,788*l.*, showing that the crop had amounted to 32,974,608 lbs. Grounds planted with hops fetch a higher rent per acre than any other kind of land not possessed of some peculiar local advantages, bringing from 5*l.* to 12*l.* per acre; and about Farnham considerably more. From their great uncertainty, they are believed to be, speaking generally, an unprofitable species of culture. They afford ample room for, and great temptations to, speculation, and are apt to divert the attention of the farmer to pursuits not very compatible with his peculiar business. The late Mr. Ellis, of Westbury Manor, in the Rochester collection, was the greatest hop-grower in the empire, having about 500 acres under this crop. He sometimes employed, in the picking season, as many as 4,000 people! He gave but an unfavourable account of the business. The increase of the quantity of land under hops in Kent, would seem, however, to show that their culture is either more profitable than is commonly imagined, or that the supposed advantages attending it more than countervail its drawbacks.—(See *Report on Hops* by the Commissioners of Excise Inquiry).

Apples, Cyder, &c.—There is scarcely a farm of any extent in the southern and south-western counties without an orchard attached to it, containing a stock of apple-trees sufficient to supply the farmer's

family with cyder. It might, in fact, be produced in most parts of the empire. The finer garden apples are not required for the production of cyder. Those employed for this purpose are of the less improved and harsher kind, approaching somewhat to the wild apple; the goodness of the liquor depending more on the manner in which it is made than on the kind of fruit. Cyder is not, however, made in large quantities for sale, except in the counties of Devon, Hereford, Worcester, Gloucester, Monmouth, and Somerset; but in these the management of the cyder orchards is an affair of considerable importance. Perry is made chiefly in Worcestershire; and the cyder of Hereford and Gloucester is deemed superior to that of Devon. The quantity of cyder annually manufactured has not been ascertained. Mr. Marshall supposed that the produce of Worcester, Gloucester, Hereford, and Monmouth, might, at an average, be reckoned at 30,000 hogsheads, of which Worcester was supposed to supply nearly 10,000 hogsheads, besides 1,000 hogsheads of perry. But there can be little doubt that the consumption has materially increased since the abolition of the duties. Exclusive of cyder and perry, which are sent to all parts of the kingdom, the cyder counties export largê quantities of fruit, chiefly to the north. The average weight of fruit sent from Worcestershire alone, to the north, is supposed to amount to from 2,000 to 2,500 tons. Kent is famous for its orchards of cherries and filberts. The former are common in most parts of the county; the latter are principally confined to the vicinity of Maidstone, where they extend over several hundred acres.

Sect. 4.—*Agriculture of Scotland.*

Having dwelt at so much length on the agriculture of England, a comparatively short notice will suffice for that of Scotland.

In comparing England and Scotland together, it is evident, even to the most superficial observer, that a more severe spirit of economy is prevalent, in all that respects field operations, in the latter, than in the former. In England, there is not, generally speaking, that strict subserviency of the parts to the principal business of the farm that is observable in Scotland. In the latter, all the best cultivated farms appear as if the only thing that occupiers ever thought of was, how the greatest quantity of produce might be raised and sent to market, at the least expense. All that can forward this grand object is found in the highest state of perfection; but there is no outlay on anything else. In England the factory system, if we may so call it, has made less way in agriculture. A greater extent of land is devoted to purposes of pleasure; hedges are kept up, though unnecessary, or even injurious, because of their beauty: more horses and labourers are maintained in proportion to the work to be done; and there is a much larger outlay on what is merely ornamental. Both systems have their exceptionable as well as unexceptionable points. The economy of the Scotch is carried in some respects to an excess; but the English have run much further into the opposite extreme; their expenditure upon useless horses, to notice only one item, being in the last degree prejudicial to the landlords, the farmers, and the public.

The grand characteristics of Scotch agriculture are, 1st, the nearly universal prevalence of leases of a reasonable endurance, and containing regulations as to management which, while they do not improperly shackle the tenant, prevent the land from being exhausted previously to the termination of the lease; 2nd, the absence of tithes, and, in most cases, also of poor-rates, and of all oppressive public burthens; 3rd, the prevention of assignment and subletting by tenants, and the descent of the lease to the heir-at-law; and 4th, the general introduction of thrashing machines and other improved implements, and the universal use of two-horse ploughs and one-horse carts. These circumstances, combined with the extraordinary progress of manufactures, and the general increase of opulence and civilisation, which have created a proportional demand for the produce of the soil, and introduced improved habits and modes of living, seem to afford a satisfactory explanation of the wonderful progress of agriculture in Scotland since the middle of last century.

Agricultural Departments.—In the General Report, Scotland is divided into *nine* agricultural districts; but this seems to be an unnecessary multiplication. It may perhaps, be sufficient to divide it into three; of these the first, or most southerly division, extends from the English border to the rivers Forth and Clyde. It contains a large extent of mountainous and pasture land. But extensive tracts in Berwickshire and the Lothians, on the east coast, are naturally fertile, and are farmed with a degree of skill, economy, and success, unequalled almost in any other part of the empire. There are also large tracts of fertile and well-farmed land in Lanark, Renfrew, Ayrshire, Galloway, and Dumfries; but the climate on the west coast is not so favourable, and agriculture is not so far advanced on that side the island as on the east. The second agricultural division stretches from the Forth and Clyde to the great chain of lakes connected by the Caledonian Canal, that runs from Inverness to the Island of Mull. The mountains in this division are on a grander scale than in the southern division, and the proportion of waste land much greater. It, however, contains some of the finest land in the empire. The carse of Gowrie, stretching from Perth to Dundee, consists of the richest alluvial soil; but its agriculture is not equal to that of some other districts. Strathern, lying to the west of Perth, is also very fertile. Most part of the extensive county of Fife is arable, and is, in general, highly improved. There are also large tracts of fine land in Forfarshire and Angus; and smaller portions in Aberdeenshire and Moray. The third division of Scotland, or that which embraces the country lying to the north of the Caledonian canal and the lakes, is, with the exception of the eastern parts of Ross-shire, and a few patches besides, wild and mountainous. Black cattle, sheep, and wool, are the only agricultural products it furnishes.

Buildings.—Down to the close of the American war, the farm buildings in most parts of Scotland were mean and inadequate in the extreme. In the Lothians they were commonly ranged in a row, having the dwelling-house in the middle, with a barn at the one end and cattle houses at the other. In other parts, they were frequently huddled together without any sort of order. The walls were always

low, in most instances of stone and clay, the roof being invariably thatch. The dunghill was universally opposite to the door; and so near it, that in wet weather it was no easy matter to get into the house with dry feet. The change that has taken place in these respects during the last half century, has been signal and complete. In none but the least accessible and least improved districts are any of the old houses now to be met with. Perhaps, indeed, the other extreme has not been sufficiently avoided; buildings having, not unfrequently, been erected that seem to be both larger and more expensive than necessary. The offices are mostly constructed in the form of a square. In some instances, the dwelling-house makes one of its sides; but in the better class of farms it is removed to some distance from the offices. It is generally two stories high, and is well, and sometimes handsomely fitted up. Both houses and offices are almost always slated. The expense of buildings is uniformly defrayed by the landlord; but the tenant, for whose accommodation they are in the first instance erected, sometimes pays a per centage upon the money laid out upon them. Sometimes, also, the tenants undertake to carry the materials used in building.

Fences.—These, in many parts of Scotland, consist of dry stone walls; which, though destitute of beauty, make, when properly built, a capital fence. This species of enclosure seems to have originated in the south. Kirkcudbright and Wigtown were early subdivided with excellent stone dykes, that are now celebrated all over the kingdom by the name of "Galloway dykes." They are of very various height, built, and degrees of goodness; but the best are built double to a certain height, when they are capped with broad flat stones projecting a little on each side, over which others are usually laid single; but sometimes those laid over the cap-stone are made to lock firmly together. The best dykes vary from 5½ to 6 feet in height; and where they have been carefully founded, well built, and constructed of good stones, they make a most excellent and a very durable fence. Examples are not rare of their standing for 60 or 70 years without receiving almost any repair. In a few instances they have been found at above 100 years of age, in a state of perfect preservation! But, unless they be of superior material and workmanship, they seldom last more than from 25 to 30 years. Most of the dry stone walls now to be met with all over Scotland have been built, sometimes with more and sometimes with less success, after the Galloway model.*

Implements.—In respect of farming implements, Scotland has very much the advantage over England. The improved Scotch plough is everywhere met with in the agricultural districts, and is uniformly drawn by two horses, driven by the ploughman. Iron harrows are universal. Thrashing-machines are introduced far more extensively than in England: there is hardly, indeed, a considerable farm in any part of the country without one, and in most instances, they are now worked by steam. The Scotch labourers have never been so absurd as to attempt to advance their interests by destroying these valuable engines.

* There is a good account of the Galloway dykes, with judicious remarks on their construction, in Smith's *Survey of Galloway*, pp. 80—93.

Crops.—In the lowland districts, the practice of taking two corn crops in succession is almost entirely abandoned. Wheat is raised to the greatest extent in Berwickshire, the Lothians, Perth and Fife; but, speaking generally, the climate of Scotland is not so well suited for the growth of wheat as that of the southern counties of England. It is, however, worthy of remark, that some of the best samples of British wheat brought to the London market, have come from the shores of the Moray Frith. The climate is particularly well suited to the growth of oats; and this no doubt is one of the principal causes of their being far more extensively cultivated in Scotland than any other species of grain, perhaps in the proportion of 7 or 10 to 1. The potato oat is raised, to the exclusion of most other varieties, in almost all the best cultivated districts. On inferior land, dun oats, and in a few exposed Highland districts, improved black oats are raised. The produce varies with the soil, preparation, &c.; but, in general, it is greater than in England, and the grain is heavier. Sixty bushels an acre are reckoned a very good crop, and twenty-five an indifferent or bad one. Oatmeal formed, at no very distant period, the principal part of the food of all classes except the very highest: but wheaten bread is now very generally used in towns and villages, and even in country districts. Oatmeal is still, however, in extensive demand. Barley, or rather bear or bere, is also largely cultivated. The culture of beans is confined to a few districts.

Turnips and potatoes are cultivated with success in most of the lowland districts of Scotland. They are uniformly, almost, planted in drills, hand-hoed, and horse-hoed. The raising of potatoes for the London market has recently been very extensively practised in some of the eastern counties of Scotland, and has been found sufficiently profitable, notwithstanding the crops are less abundant in this part of the empire than in England or Ireland. The turnip husbandry is nowhere, perhaps, so well understood, or practised on so large a scale, as in East Lothian and Berwickshire; but it has latterly been greatly extended and improved in all parts of the country. Clover and rye-grass are more extensively raised in Scotland than in England.

Grasses.—In the management of meadows, the saving of hay, the selection of cattle, and all that respects grazing husbandry, Scotland is considerably behind England. During the late war, indeed, great efforts were made by several individuals to improve the breeds of live stock, which have been attended with a corresponding degree of success. Dairy husbandry is principally carried on in Ayrshire, where Dunlop cheese is made, and in Renfrewshire; and is beginning to be introduced into Galloway, Dumfriesshire, and other counties.

Sect. 5.—*Grazing Husbandry of Great Britain.*

It will be afterwards seen, that a full half or more of the arable land of England is applied to grazing husbandry, or to the rearing and feeding of cattle, sheep, &c., for the dairy and the shambles. In Scotland, a larger proportion of the arable land is under crop than in England; and in Ireland, where pasture land preponderated very much half a century ago, the proportion in tillage is now decidedly the largest.

Various circumstances have conspired to account for the prevalence of pasture in England. It is partly, no doubt, ascribable to the humidity of the climate, and the natural adaptation of the soil to bear luxuriant crops of grass; partly to the taste of the inhabitants for butchers' meat; and partly, also, to the serious obstacle opposed by tithe to the extension of tillage. We have neither time nor means to compare and weigh the conflicting statements put forth by the advocates of grazing and of tillage. That system of agriculture is generally admitted to be the best in which they are judiciously combined. We believe, however, that few things in rural economy require more mature consideration than the breaking up of old pasture land; and that many estates were materially injured by the extent to which this was done during the period of high prices from 1809 to 1815. It is needless, however, on a point of this sort to seek to establish, by reasoning, which system of management is best, or which is worst, that being a matter that can only be ascertained experimentally. If greater profits, all things considered, be made by keeping land in pasture than would be made by bringing it under the plough, it is not for the interest of the landlord, the farmer, or the public that it should be so brought. The true way to extend tillage is to lessen or remove the various burdens that affect the cultivators of the land. This would tend to make that balance of profits, which seems at present pretty equally poised, incline in favour of tillage; and, if so, its progress would be insured.

The richest grazing lands in England are, the vale of Aylesbury in Buckinghamshire, the marsh lands of Somersetshire, the Great Level of the Fens, Romney Marsh in Kent, and the midland counties of Leicester, Northampton, &c. In Cheshire and Gloucester there is a great extent of rich pasture land, chiefly appropriated to the dairy. The natural fertility of some of the grazing districts, and the fertility bestowed on others by the skill, capital, and industry of the farmer are quite astonishing. On the rich grazing lands of Lincoln an acre will feed a bullock and 5 or 6 sheep during summer, and 3½ sheep, or 7 sheep to 2 acres during winter.

Hay made in Britain consists sometimes of natural grasses, sometimes of clover and rye-grass, or of clover only, and sometimes of saintfoin. The first description, or, as it is commonly called, meadow hay, is principally produced in the western counties of England, where comparatively little clover is sown, and in the pastoral districts of Scotland. Middlesex, which has nothing else to boast of in respect of agriculture, has carried the art of making meadow hay to the greatest perfection, particularly in the districts immediately adjoining the metropolis. Mr. Middleton states that 70,000 acres of the metropolitan county consist of upland meadows and pastures, chiefly clay. He then adds, "This large district would have been of little or no value in a state of aration. The difficulty of tilling it; the expensive teams that must have been employed on it; the few months in every year when it could be ploughed with success; and the uncertain produce of such a soil, are circumstances which would have kept down its value to little or nothing: but mark the difference,—laying it down to a permanent grass has been the means of it annually producing, at a medium of seasons, a ton and a half of hay per acre, of the highest

quality, for the feed of horses, and of enabling the farmer to pay a much higher rent for it than they can do for the best land in a state of aration."—(*General View of Middlesex*, 2nd ed. p. 287.) Clover hay, either pure or mixed with rye-grass, is most common in the southern, eastern, and northern counties of England, and in the cultivated districts of Scotland. Saintfoin hay is confined to those districts which have a calcareous soil, for it is on these only that it can be profitably grown. The usual weight of a crop of meadow hay is from 1 to 1½ tons per acre; of clover hay from 1 to 3 tons; and of saintfoin from about 1 to 2 tons. In those counties in which the soil is dry, and the climate peculiarly favourable, clover is sometimes permitted, after it has been once cut, to stand for the purpose of saving its seed; but there is great uncertainty as to its produce. Clover hay generally sells 20 per cent. higher than meadow hay, or than clover and rye-grass mixed.

Sect. 6.—*Live Stock of Great Britain.*

Horses.—Of the various animals domesticated by man, and made subservient to his purposes, the horse is by far the most important. In England horses are used to a much greater extent than in any other country. Oxen, as has been already seen, are but little employed amongst us in farm labour; and, besides the horses kept by the agriculturists, vast numbers are employed in the conveyance of goods and passengers in waggons, street carriages, &c., while a still greater number are kept by private individuals as saddle and carriage horses, hunters, racers, &c. Most manufacturers, warehousemen, wharfingers, coal merchants, &c., in extensive business, employ a greater or smaller number of horses. There are, indeed, but few industrious pursuits in which they are not in some way serviceable; and many of the greatest importance could not be carried on without them; while they, at the same time, contribute, in no ordinary degree, directly to augment our comforts and enjoyments.

Breeds of Horses.—There are in England many varieties of this noble animal, differing in size and other qualities, but all admirably adapted for the purposes for which they are intended. The largest horses are bred in the midland counties, particularly Northampton and Leicester: they are generally of a deep black colour, and are peculiarly well fitted for draught. This breed is understood to have been formed, or, at least, brought to its present perfection, by means of stallions and mares imported from the Low Countries. They are extremely docile; and, from their great strength and weight, are able to move an immense load. The principal demand for heavy horses is in London, where they may be seen in full perfection in the dray-carts of the brewers. They are altogether very fine and useful animals, though said by some to be deficient in spirit. Yorkshire has been long celebrated for its breed of horses, both for the saddle and for draught, but especially the former. The Cleveland bays are esteemed one of the best breeds in the empire. Coach, chariot, and stage-coach horses are derived, many of them, from the Cleveland bays, improved by an ad-

mixture of blood. Suffolk has a peculiar breed of very valuable farm horses; they are short, well-compacted, and active. Much pains has been taken in improving this breed, so as to render them fit for heavy as well as light work. The best show of Suffolk horses is at Woodbridge Lady-day fair. Some of the finest stallions and mares bring high prices. The old English road horse, a valuable breed, and particularly serviceable, before roads began to be improved, for their capacity for carrying loads, is now nearly extinct. The Clydesdale horse has long been in high esteem in Scotland and the north of England; and, for husbandry purposes, is probably not excelled by any other British breed. The Welsh horse is small and active, and bears a strong resemblance to the best native horses of the Highlands of Scotland. The genuine Galloway breed, so called from the province of that name in Scotland, is now rarely met with. It is somewhat larger than the Welsh horse, hardy, well adapted for the saddle, and distinguished by a peculiar smallness of the head and neck, and cleanness of bone. Galloway is now, however, used as a term to designate any horse between the pony size and the hack. The *ponies* and *shelties* of the Highlands and islands of Scotland are the smallest animals of the kind in the empire. They are the same with the Norway breed: the best of them being handsomely shaped, active, sure-footed, and capable of enduring much fatigue. Hunters and hackneys are now principally derived from the crossing of horses of entire blood with select mares of the native breed. Their speed has been, in consequence, a good deal increased; but what they have gained in this respect they are said to have lost in strength and bottom. The old English hunter is nearly extinct. Cavalry horses are found among the larger sort of hackneys: they are reckoned equal, if not superior, to those of almost any other country.

The race-horses of England are descended, in a nearly right line, from the Arabian, the Persian, and the Barb. Their breeding and training have been attended to with the utmost care; and the best English race-horses are now, perhaps, unrivalled for symmetry, swiftness, and capacity of exertion. The feats performed by some of them have been truly astonishing. Bay Malton ran, at York, 4 miles in 7 minutes 43 seconds: Childers went sometimes at the rate of 82½ feet in a second; and the performances of many others have been hardly less wonderful. No inconsiderable part of the improvement in some of the other breeds has been owing to judicious crosses with race-horses; and the influence which proper care in breeding, training, &c., was seen to have on the latter, made similar attentions be paid, in a greater or less degree, to the breeding and training of carriage, draught, and saddle-horses.

With the exception of the Arabs, there is, perhaps, no people more attached to their horses than the English, or who take greater pleasure in having them well kept and in good order. London is, in fact, the paradise of horses. Rapid driving in stage-coaches used to be the severest work to which they were subject in this country; but owing to the shortness of the stages, and the high keep of stage-coach horses, it was less destructive than might have been supposed. And the construction of late years of railways between all the principal

towns has gone far to put an end to the employment of horses in stage-coaches.

It has been justly observed that, "one will hardly be at a loss to determine the character of a farmer from the condition of his horses. Very fine high-bred horses, exhibiting an appearance of being prepared for the market, may rather suggest the idea of idleness than of labour; but, on the other hand, lean, spiritless creatures, worn out by toil and hunger, are the certain indications of a bad farmer, of one who is not thriving, and who does not deserve to thrive. The man who uses bad instruments cannot have his work well done; and one important and primary step towards good farming is to keep the labouring stock in good condition. Horses regularly fed and regularly wrought will perform a great deal of labour without falling off either in strength or appearance: it is of great importance, therefore, to distribute the labour as equally as possible through the various seasons of the year; and if, as must sometimes be the case, an extraordinary exertion ought to be made, they are in a proper condition for it. When horses do fall off it requires much more to restore them than might have kept them in a good state."—(*Somerville's Agriculture of East Lothian*, p. 197.)

Number and Value of Horses in Great Britain.—The number of horses used in Great Britain for different purposes is very great, though less so, perhaps, than has been generally supposed. Mr. Middleton (*Survey of Middlesex*, 2nd ed. p. 639) estimated the total number of horses in England and Wales, employed in husbandry, at 1,200,000, and those employed for other purposes at 600,000. Dr. Colquhoun, contrary to his usual practice, reduces this estimate to 1,500,000 for Great Britain; and, in this instance, we are inclined to think he is not very wide of the mark. According to the *Parl. Paper*, No. 688, sess. 1830, there were in England and Wales, in 1814, when those used in husbandry were taxed, 1,204,307 horses; but this account does not include stage-coach, mail-coach, and hackney-coach horses, nor does it include those used in posting. Poor persons, keeping only one horse, were also exempted from the duty, as were all horses employed in the regular regiments of cavalry and artillery, and in the volunteer cavalry. These and other deficiencies might, probably, raise the total stock to 1,400,000; and though there has since been a great falling off in a few departments, others have proportionally increased; so that, on the whole, the number of horses is believed to have varied but little in the interval. The horses in Scotland, engaged in agriculture, were estimated to amount, in 1814, to 243,489; but they have since greatly increased.—(*General Report*, Appendix ii. p. 185.) Hence, it may be fairly estimated that there are, in Great Britain, 1,500,000 horses employed for various purposes of pleasure and utility. They may be worth, at an average, from 12*l.* to 15*l.*, making their total value from 18,000,000*l.* to 22,500,000*l.* sterling, exclusive of the young horses.

Expense of feeding Horses.—Land required for their Maintenance.—The expense of horses depends partly on their size and partly on the purposes for which they are kept; partly on the situation where they are kept, and partly on the condition in which they are kept. Hence, the yearly expense of the keep of a horse has been estimated at almost

any sum from 10*l.* to 50*l.* Farm horses, properly kept, and in good condition, may require, for their maintenance during a year, as follows:—

Oats, 10 quarters.
Soiling, 1 acre of clover, and rye-grass, and tares.
Hay, part of October and November, March, April, and May, 1¼ ton.
Straw, for other 4 months, half the price of hay.
Potatoes, yams, or Swedish turnips ¼ acre.

The extent of land required for a horse's maintenance, supposing the soil to be of a medium quality, may be about 5 acres; that is, for oats 3 acres, soiling 1, and 1 more for hay and roots. On rich soils 4 acres will be sufficient; but on poor soils, and wherever horses are kept at pasture, the produce of 6½ or 7 acres will be consumed by one of them, when properly worked. The straw of about 2 acres must be allowed for fodder and litter, the last of which has not been stated above; because, at a distance from towns, what is allowed for litter must, at any rate, be converted into manure. If 60 acres, therefore, should be assumed as the average extent of land that may be kept in cultivation by two horses, according to the best courses of modern husbandry, the produce of 10 acres of this will be required for their maintenance; or, in other words, a horse consumes the produce of 1 acre out of every 6 which he cultivates, according to a 4 or 6 years' course; and something more than 1 acre out of every 5 which he ploughs annually.—(*General Report of Scotland*, vol. iii. p. 192.)

Cattle.

Britain has been distinguished from the earliest period for the excellence of her pastures, and the preference by the inhabitants of stock husbandry to tillage. Cæsar represents the ancient Britons as possessing large herds of cattle (*pecoris magni numerus*), and living principally on milk and flesh (*Lacte et carne vivunt*, De Bello Gallico, lib. 5, §§ 13, 14); and no period has since elapsed in which the same thing might not have been affirmed of their descendants. This seems to be principally owing to natural causes. "The climate of Great Britain is, above all others, productive of the greatest variety and abundance of wholesome vegetables, which, to crown our happiness, are almost equally diffused through all its parts: this general fertility is owing to those clouded skies which foreigners mistakenly urge as a reproach on our country; but let us cheerfully endure a temporary gloom which clothes, not only our meadows, but our hills with the richest verdure. To this we owe the number, variety, and excellence of our cattle, the richness of our dairies, and innumerable other advantages."—(*Pennant's British Zoology*, art. Ox.)

Though the extensive variety of breeds of cattle that exists amongst us has, no doubt, been principally caused by differences of situation and pasture, it has, also, been partly caused by accidental and intentional intermixture. To describe these varieties, or even to enumerate them in detail, would far exceed our limits. They have been intermingled in every possible way, and run into each other by almost im-

perceptible gradations. They may, however, be divided with sufficient precision for our purpose into the four classes of *middle-horned*, *long-horned*, *short-horned*, and *polled*. We shall merely glance at a few of the more celebrated varieties of these great classes.

North Devonshire Breed.—This is supposed to be an aboriginal British breed: the peculiar district in which they are found not having been much occupied by either the Romans or Saxons, the inhabitants preserved the habits, practices, and stock of their ancestors comparatively pure. Devonshire cattle are of a high red colour, with horns of middle size; their hair is short and curly, and their hide thin and flexible; they are active, admirably calculated for draught, fatten easily, and afford excellent beef. Weight of the cows from 30 to 40 stone, of the oxen from 40 to 50 stone. As milkers they are inferior to the long and short-horned breeds. The Herefordshire cattle appear to be descended from the same stock as the North Devons: but, compared with the latter, they are larger and of a darker red colour: their faces, throats, and bellies are white, hair thicker, hides harder, and fatten on coarser and more deficient pastures. Though stronger, they are not so active as the Devons; and they are inferior to them as milkers. The Herefords have been greatly ameliorated since about 1760, when Mr. Tomkins, of Kingspion, near Hereford, began to direct his attention to the improvement of the breed.

The old Gloucester breed of red cattle, supposed to be a variety of the Devonshire breed, is now rarely met with. But the cattle of Sussex closely resemble those of North Devon, and are evidently of the same stock. Mr. Youatt says, that "the Sussex ox holds an intermediate place between the Devon and the Hereford, with all the activity of the first, and the strength of the second, and the propensity to fatten, and the beautiful fine-grained flesh of both. When the Sussex has been crossed with the Devons, a lighter breed has resulted; but not gaining in activity, while it is materially deteriorated in its grazing properties."—(*Cattle, their Breeds, Management, &c.*, p. 41.) This breed is principally met with in Sussex and Kent.

The Lancashire or Long-horned Breed.—So called from the enormous length of their horns, which bend downwards. The earliest seat of this valuable breed is said to have been the district of Craven, in the West Riding of Yorkshire, and the immediately contiguous parts of Lancashire; but they are believed to be originally of Irish extraction. They are of various colours, of a large size, hardy, and have long been extensively diffused. It was on this breed that Bakewell principally tried his experiments in breeding; and the result was the celebrated New Leicester or Dishley variety. But, since Mr. Bakewell's death, the fame of this variety has not been supported; and it has been at many places, and even at Dishley itself, nearly superseded by the short-horned or Teeswater breed. But, notwithstanding this circumstance, it is certain that the efforts of Bakewell conferred great and lasting advantages on Lancashire, Staffordshire, and the midland counties in general; the cattle of which, consisting principally of long-horns, have been materially improved by his exertions, influence, and example.

The Short-horned Breed includes the varieties known by the names

of the Holderness or Yorkshire, Teeswater or Durham, and Northumberland breeds. The improved Teeswater is, at present, deservedly held in very high estimation. Bulls and cows from this stock, purchased at exceedingly high prices, are spread over all the midland and northern counties of England, and the border counties of Scotland. This breed unites the supposed incompatible qualities of being superior milkers and of fattening rapidly. The beef is excellent; and, from its great thickness, which makes it retain the juices for a lengthened period, it is peculiarly fitted for the victualling of ships engaged in long voyages.

The breeds of Fife and Aberdeen, belonging to the class of middle-horns, are amongst the most valuable of those of Scotland. Cows of the genuine Ayrshire or Cunningham breed are particularly celebrated as milkers. In their native country each cow is supposed to yield at an average about 600 gallons a year of milk; and, as 3½ gallons produce 1½ lbs. of butter, the average annual yield of a cow may be estimated at 257 lbs. butter. It is said, however, that, when Ayrshire cows are sent to England, they lose their superiority as milkers, and begin to accumulate flesh. But, in their capacity to fatten easily, they are inferior to the Highlanders, the Galloways, and the improved short-horns. The cattle of the Highlands, one of the aboriginal breeds, also belong to the middle-horns. They are divided into several varieties, of which the Argyle or western variety is decidedly the best; but, in consequence of the coarse and scanty pasture, the rugged nature of the country, and the severity of the climate, they are *all* small, active, and hardy. Their beef, when fattened on the rich pastures of the low country, is beautifully grained, and is, indeed, the very best that is brought to table. The number of cattle in the Highlands has been materially diminished within the last 30 or 40 years, in consequence of its being found more profitable to raise sheep.

The Welsh cattle, one of the indigenous British breeds, mostly belong to the class of middle-horns. They are larger than the cattle of the Highlands, but not so hardy; and their beef, though preferred by some, is not generally allowed to be so good. The Glamorgans are the largest of the Welsh varieties. Recently they have been crossed with the Ayrshire breed; and the mixed breed thence resulting, are found to yield a greater quantity of milk than the old Glamorgans, at the same time that they are hardier, and can be kept at a good deal less expense.

Polled Breeds.—The most celebrated of the polled breeds is found in the district of Galloway, including the counties of Wigtown and Kirkcudbright (see *ante*, p. 266), in the South of Scotland. The prevailing colour is black or brindled. The weight of bullocks, at 3 or 3½ years old, when they are driven to the south, may be estimated at about 40 st. avoirdupois. When fattened in England they have sometimes weighed from 80 to 100 st. They have great hardiness of constitution; and, when full fed, there is, perhaps, no breed that sooner attains to maturity. Their beef is second only to that of the Highlanders. They do not give much milk; but what they do give is of a superior description. The late Mr. Mure, of Grange, near Kirkcudbright, an intelligent and skilful agriculturist, reared some of the finest

specimens of this valuable breed. From 18,000 to 25,000 Galloway cattle used annually to pass through Dumfries, principally on their way to Norfolk and Suffolk, where they were fattened with turnips; but they are now, not unfrequently, fattened at home, and sent by steam to Liverpool.

The cattle of Suffolk are said by Culley to be a variety of the Galloway breed. They used to be called *Suffolk duns*, from their dun colour; but this is now generally regarded as a mark of inferiority; the prevailing and most esteemed colours being red and white, brindled, and a yellowish cream colour. They differ from their progenitors, the Galloways, in yielding large supplies of milk, 6 gallons a-day not being an unusual quantity; but the yield of butter is not in proportion. They do not fatten so easily as the Galloways; and are rarely bred for the mere purpose of grazing.

Wild Cattle, once so common in Britain, are now found only at Chillingham, in Northumberland, and Hamilton, in Scotland. They are long-legged, cream-coloured, with black muzzles, and about the middle size, very fierce and wild. Horns fine, white with black tips, and bent upwards. Some of the bulls have thin upright manes, about an inch and a-half or two inches long. On being approached, the herd instantly take to flight, and gallop away at full speed; but, wheeling round at a certain distance, they advance in a threatening manner towards those by whom they have been disturbed. When within 40 or 50 yards they again set off at full speed; and, again wheeling round, advance nearer to the object of their alarm, till, on the least motion being made, they set off as before, to advance afresh. They continue to repeat this sort of retreat and advance, but each time come nearer and look fiercer, till most persons think fit to retreat, without provoking them to extremities. When any one happens to be wounded, or is grown weak or feeble, through age or sickness, the rest of the herd set on it, and gore it to death. They never associate with the tame species, nor come near a house, unless constrained by hunger in very severe weather.

Improvement in the Breed of Cattle.—No efforts for this purpose seem to have been made with judgment, or properly persevered in, till after the middle of last century, when Mr. Bakewell, of Dishley, Leicestershire, Mr. Culley, of Northumberland, and Mr. Tomkins, of Herefordshire, commenced their operations. The success by which their efforts were attended roused a spirit of emulation in others; and the rapid growth of commerce and manufactures, since 1760, having occasioned a corresponding increase in the demand for butchers' meat, improved systems of breeding and improved breeds have been generally introduced.

The introduction and universal extension of the turnip and clover cultivation have had, in this respect, a most astonishing influence; and have wonderfully increased the food of cattle, and, consequently, the supply of butchers' meat.

It is stated, in the First Report of the Select Committee of the House of Commons on Waste Lands (printed in 1795), that cattle and sheep had, at an average, increased in size and weight about *a fourth* part since 1732; but there seem to be good grounds for supposing that

the increase had been much more considerable than is represented by the committee. According to an estimate framed by Dr. Davenant in 1710, the average weight of the *nett* carcass of black cattle was then 370lbs., of calves 50lbs., and of sheep only 28lbs. But, according to Sir F. M. Eden (*Hist. of the Poor*, vol. iii., App., p. 88), and Mr. Middleton (*Agric. of Middlesex*, 2nd ed., p. 541), the average nett weight of the carcass of bullocks killed in London might be taken, towards the end of the last and the beginning of the present century, at 800lbs., calves at 140lbs., sheep at 80lbs., and lambs at 50lbs. And though we suspect, from what we have heard stated by well-informed practical men, that these weights were decidedly beyond the mark at the period when the last-mentioned estimates were framed, the improvements in the breeding and feeding of cattle during the present century have been so very great, that they are now (1846) probably nearly accurate. At all events, it may be regarded as all but certain that the nett weight of the cattle and sheep killed in London has more than doubled since 1710.

It may be worth while, however, to remark, that much injury has arisen from injudicious attempts to improve native breeds of cattle. This has generally been occasioned by endeavouring to increase their size, which is always determined by *natural causes*, such as the climate, the quantity and species of food the animals can readily obtain, &c. In point of fact, too, the size is quite an inferior matter. The grand object that ought to be kept steadily in view by the prudent agriculturist is the obtaining of the greatest possible return for his outlay; and he will prefer that kind of stock, and that breed of any kind, which will pay him best for the food consumed. The value to which an animal may be ultimately brought is a subordinate consideration; the profits of breeding, as of everything else, being determined, not by the absolute price of the produce, but by its price as compared with the expenses incurred in bringing it to market. It is only where food is abundant in quantity, and may be procured without much fatigue, that large animals, if of a good breed, may be safely preferred to those of a more moderate size. A notion has been pretty prevalent that, in breeding, the larger males ought to be preferred; but this is believed by the best judges to have been productive of much mischief. The principal improvement in the breed of race and saddle horses is said to have been effected by the introduction of Barbary and Arabian stallions, of a comparatively small size; and, in heavy draught horses, by the introduction of mares from Flanders. Mr. Culley's opinion is, that "of all animals, of whatever kind, those which have the *smallest*, *cleanest*, and *finest bones* are, in general, the best proportioned, and covered with the best and finest-grained meat. I believe they are also the hardiest, and healthiest, and most inclinable to feed; able to bear the most fatigue while living, and worth the most per pound when dead."—(*Observations*, p. 222.) It is certain that animals, whether originally too large or too small, will gradually accommodate themselves to the size best adapted for their pastures; but while the larger animal becomes unhealthy, and degenerates in its form and valuable properties, the smaller animal increases in size, and improves in every respect.

It should be observed that the breeds of cattle and sheep differ according to the purposes to which they are to be applied. A breed of cattle equally well adapted to the butcher, the dairymaid, and the plough or cart, is a *desideratum* nowhere to be found. It would seem, too, that very fine wool cannot be obtained from sheep that are well formed and fat. The farmer must select his stock according to the objects he has in view, breeding only from the best animals, and carefully checking any tendency to defect, which, if it exist, though but in a very slight degree, in both parents, will, in general, preponderate in their produce.—(*Loudon's Encyclopædia of Agriculture*, §§ 2020-2065.)

Number of Head of Cattle in Great Britain.—It would, on many accounts, be very desirable to have an accurate estimate of the number and value of the stock of cattle in Great Britain, and of the proportion annually killed and made use of; but, owing to the little attention that has been paid to such subjects in this country, there are no means of arriving at any conclusions that can be depended upon. The following details may not, however, be unacceptable:—

Arthur Young has given, both in his *Eastern* and *Northern Tours*, estimates of the number and value of the different descriptions of stock in England. They differ widely in their results; but, without attempting to explain these, Mr. Young gives, in the second part of his *Political Arithmetic* (p. 28), an estimate of the stock of England, in 1779, being the average of those in the *Tours*. This is, most probably, nearer the truth than either of the separate estimates on which it is bottomed, though even it can be regarded only as a very rude approximation:—

Cows	1,039,754
Fatting beasts . .	758,425
Young cattle . .	1,571,308
Total . .	3,369,487

In the same estimate Mr. Young sets down the number of "draught cattle," including, not only the horses, but also the oxen, employed in husbandry, at 927,610. We have no means of accurately separating between horses and oxen; but, probably, as more oxen were then employed in husbandry than at present, we may estimate the latter at 150,000; so that, on this hypothesis, the total stock of cattle in England and Wales in 1779 would be 3,519,487.

Notwithstanding the increase of tillage, there can be no doubt, from the greatly increased demand for beef, and the extension of the turnip culture, that the stock of cattle in the country has been materially increased in number as well as weight since 1779. Different opinions have been pronounced as to this increase; but, taking it at 1,000,000, and adding to the numbers for England and Wales 1,100,000 for the cattle of Scotland (*General Report of Scotland*, iii., Addenda, p. 6), we shall have about 5,620,000 as the total head of cattle of all sorts in Great Britain. The common estimate is, that about a *fourth* part of the entire stock is annually slaughtered; which, adopting the foregoing statement, gives 1,405,000 head for the supply of the kingdom; a result which all we have heard inclines us to think is pretty near the mark.

It appears from the returns under the late Census that there were in Ireland in 1841, 1,863,116 head of horned cattle. Cattle and beef are among the principal exports from Ireland to this country, the home consumption being comparatively inconsiderable.

Dairy.—The business of the dairy is carried on to a great extent, and with much success, in England; and it is also prosecuted to a considerable extent in Scotland and Ireland. The principal products are milk, butter, and cheese.

Milk is only raised for direct sale in the immediate vicinity of large towns, where it forms a very important article. Mr. Middleton estimates (*Survey of Middesex*, 2nd ed., p. 419), that in 1806 no fewer than 8,500 milch cows were kept for the supply of London and its environs with milk and cream; and he estimates the average quantity of milk obtained from each cow at *nine quarts* a-day, or 3,285 quarts a-year; leaving, every deduction being taken into account, 3,200 quarts for marketable produce. But Mr. Youatt, in his valuable work on cattle, their breeds, &c., estimates the number of dairy cows at present kept in London and its environs at 12,000; affording, on Mr. Middleton's hypothesis, an annual supply of 38,400,000 quarts of milk. Now, as milk is sold by the retailers at from 3*d.* to 4*d.* a-quart, after the cream is separated from it, and as the cream is usually sold at from 2*s.* 6*d.* to 3*s.* a-quart, and there is reason to suspect that a good deal of water is intermixed with the milk, we should hardly be warranted in estimating that the milk, as obtained from the cow, is sold at less than 5*d.* a-quart, which gives 800,000*l.* as the total price of the milk consumed in the city and its immediate vicinity. In most other places milk is a good deal cheaper; but, as it is, in consequence, more liberally consumed, the great expenditure on this article, which, to a cursory observer, might seem of little importance, will be obvious.

Butter is very extensively used in Great Britain. That produced in Epping Forest and Cambridgeshire is in the highest repute in London. The cows which produce the former feed, during summer, in the shrubby pastures of the forest; and the leaves of the trees, and numerous wild plants which abound in it, are supposed to improve the flavour of the butter; probably, however, it owes more to superior dairy management, as the butter preserves its character during the time the cows are removed from the forest. It is brought to market in rolls, from 1 to 2 feet long, weighing a pound each. The Cambridgeshire butter is produced from cows that feed one part of the year on chalky uplands, and the other on rich meadows or fens: it is made up into long rolls, like the Epping butter, and is generally salted or cured before being brought to market. The London dealers, having washed it, and wrought the salt out of it, frequently sell it for Epping butter.

The butter of Suffolk and Yorkshire is often sold for that of Cambridge, to which it is little inferior. Mr. Youatt says that 25,000 cwt. (1,250 tons) are annually sent from the former to London. Somerset butter is thought to equal that of Epping; it is brought to market in dishes, containing half a pound each, out of which it is taken, washed, and put into different forms by the dealers of Bath and Bristol. The butter of Gloucestershire and Oxfordshire is very good; it is made up

in half-pound packs or prints, packed up in square baskets, and sent to the London market by waggon. The butter of the mountains of Wales and Scotland, and the moors, commons, and heaths of England, is of excellent quality, when it is properly managed; and, though not equal in quantity, it is confessedly superior to that produced by the richest meadows.—(*Loudon's Ency. of Agriculture.*)

Considerable quantities are made in Ireland, and it forms a prominent article in the exports of that country; generally it is a good deal inferior to that of Britain, but this is a consequence rather of the want of skill and attention than of any inferiority in the milk. Some of the best Irish butter brought to London, after being washed and repacked, is sold as Dorset and Cambridge butter.

The production and consumption of butter in Great Britain is very great. The consumption in the metropolis may, it is believed, be averaged at about 10 lbs. per annum for each individual; and, supposing the population to amount to 2,000,000, the total annual consumption would, on this hypothesis, be 20,000,000 lbs., or 8,928 tons; but to this may be added 3,000 tons for the butter required for victualling ships, and other purposes; making the total consumption, in round numbers, nearly 12,000 tons, or 26,880,000 lbs., which, at 10*d.* per pound, would be worth 1,120,000*l.*

The produce per cow of the butter dairies was estimated by Marshall at 168 lbs. a year; but, owing to the great improvements that have been made, both in breeding and feeding, in the interim, the yield per cow may now be safely estimated at 180 lbs., so that, supposing we are nearly right in these estimates, about 150,000 cows will be required to produce an adequate supply of butter for the London market.

Cheese.—England is particularly celebrated for the abundance and excellence of its cheese. Cheshire and Gloucester are, in this respect, two of its most famous counties. It is estimated that, in the former, above 100,000 cows are kept for dairy purposes, and that they yield, at an average, 3 cwt. of cheese, making the total annual produce of the county 15,000 tons. At 6*d.* per pound, this quantity would be worth 840,000*l.* There are two kinds of Gloucester cheese, double and single; the first is made of the milk and cream, and the latter of the milk deprived of half the cream. The cheeses are of various sizes, from 20 to 70, and even 80 lbs., running generally from 50 to 60 lbs. A great deal of cheese is also made in that part of Salop which borders upon Cheshire, and in North Wilts. The former goes under the name of Cheshire cheese; the latter was, till lately, called Gloucester cheese, now it receives its appellation from the county where it is made. A strong cheese, somewhat resembling Parmesan, is made at Chedder, in Somerset. The richest and best of all the English cheeses, Stilton, is principally made in Leicestershire, in the country round Melton Mowbray. It is not reckoned sufficiently mellow for cutting till two years old, and it is not saleable unless decayed, blue, and moist. It is said that, including all sorts, more than 1,500 tons of cheese are annually made in Leicestershire, and that 5,000 tons are annually sent down the Trent from this and the neighbouring counties. A rich cheese is made at Leigh, in Lancashire. The other cheeses

made in England which have acquired a peculiar name, either from the quantity made or from the quality, are the Derbyshire, Cottenham, and Southam cheeses. The last two are new milk cheeses, of a peculiarly fine flavour: the places where they are made are in Cambridgeshire. The cream cheeses of Bath and York have been much commended. Warwickshire and Banbury, in Oxfordshire, are also remarkable for cheese, the former for the quantity made, very large supplies being sent from it to London and Birmingham. Banbury cheese is distinguished for its richness.

Scotland is not particularly celebrated for its cheese; the best is called Dunlop, from a parish of that name in the district of Cunningham, in Ayrshire, where it was originally manufactured.—(See *ante*, p. 270.) Dunlop cheeses generally weigh from 20 to 60 lbs. each, and are, in most respects, similar to those of Derbyshire, except that they are larger. Dunlop cheeses are now made in many other districts, and the dairy system has extended considerably in the south-west of Scotland.

According to Mr. Marshall, the average yearly produce of cheese from the milk of a cow in England is from 3 to 4 cwt., or more than double the weight of the butter.

Sheep.

Of the domestic animals belonging to Great Britain, sheep are, with the exception, perhaps, of horses and cattle, by far the most important. They can be raised in situations and upon soils where other animals would not live. They afford a large supply of food, and one of the principal materials of clothing. Wool has long been a staple commodity of this country, and its manufacture employs an immense number of people. "The skin, dressed, forms different parts of our apparel, and is used for covers of books. The entrails, properly prepared and twisted, serve for strings for various musical instruments. The bones calcined (like other bones in general), form materials for tests for the refiner. The milk is thicker than that of cows, and, consequently, yields a greater quantity of butter and cheese; and, in some places, is so rich that it will not produce the cheese without a mixture of water to make it part from the whey. The dung is a remarkably rich manure, insomuch that the folding of sheep is become too useful a branch of husbandry for the farmer to neglect. To conclude: whether we consider the advantages that result from this animal to individuals in particular, or to these kingdoms in general, we may, with Columella, consider this, in one sense, as the first of the domestic quadrupeds. *Post majores quadrupedes ovilli pecoris secunda ratio est; quæ prima sit si ad utilitatis magnitudinem referas. Nam id præcipue contra frigoris violentiam protegit, corporibusque nostris liberaliora præbet velamina; et etiam elegantium mensas jucundis et numerosis dapibus exornat.*"—(*De Re Rustica*, lib. vii., cap. 2.) And, in addition to what Mr. Pennant has here so forcibly stated, sheep are particularly deserving the attention of the agriculturist, both from the influence of improvements on the breed and from their generally affording larger profits than can be obtained from the rearing and feeding of cattle.

Breeds.—In Great Britain sheep are commonly divided into two great classes, those which produce *long* or *combing* wool, and those which produce *short* wool. They may also be distinguished by the presence and absence of horns, and by other criteria.

Long-woolled Breeds.—The principal varieties of this species are the *Teeswater*, the *Lincoln*, the *Dishley* or *New Leicesters*, and the *Romney Marsh* breeds. These have no horns. The mutton of the first two and of the last is, comparatively, coarse-grained and large, weighing from 25 to 30 lbs., or upwards, a quarter. The wool is from 8 to 18 inches long. They are fattened only on the very richest land, such as the banks of the Tees, the fens of Lincolnshire, Romney Marsh, &c. The Dishley breed owes its celebrity and its name to the exertions for its improvement made by the famous breeder, Mr. Robert Bakewell. The length of the wool varies from 6 to 14 inches; the weight of the quarter of two-year old wethers varies from 20 to 30 lbs. This breed is peculiar, not only for its mutton being fat, but for the fineness of its grain and superior flavour, qualities in which it excels all other long-woolled sheep.

Short-woolled Breeds.—Of these there are an immense variety. Those most extensively reared in Great Britain are the *South Downs*, the *Cheviots*, the *black-faced* or heath breeds, and the *dun-faced* or mountain breed. But there are a variety of other breeds, which are objects of great attention in different parts of the country, such as the *Dorset*, the *Hereford*, the *Wiltshire*, the *Norfolk*, &c. The fleece of the South Downs is short and fine, weighing from 3 to 4 lbs.; mutton fine in grain, and of an excellent flavour; weight of two-year old wethers about 18 lbs. a quarter. The South Downs were first cultivated with success in that part of Sussex whence they derive their name; but they are now widely diffused over all the dry chalky soils in the south. The wool of the pure Hereford breed is in the highest esteem. The Wiltshire variety is the heaviest of the short-woolled English breeds. The fleece of the Cheviots is of a medium degree of length and fineness, and weighs about 3 lbs.; mutton good; weight from 12 to 18 lbs. a quarter. Within the last 30 years the Cheviots have been largely introduced into the Highlands of Scotland, where, though not so hardy as the black or dun-faced breeds, they are found to answer extremely well, and have been a most valuable improvement. They have now nearly superseded the black-faced breed in some of the principal pastoral districts in the south of Scotland. Black-faced sheep are smaller than any of those previously mentioned; their weight varies from 10 to 16 lbs. a quarter, and they carry from 3 to 4 lbs. of long, coarse, shaggy wool. They are seldom fed till they be three, four, or five years old, when they fatten well, and furnish the best and highest flavoured mutton. They are hardy, and widely diffused throughout the mountainous districts of England and Scotland, and, were their fleece better, would be the best of our upland breeds. The dun-faced breed, said to have been imported into Scotland from Denmark or Norway, at a very early period, still exists in some of the counties north of the Frith of Forth, though only in very small flocks. Of this ancient race there are now several varieties, produced by peculiarities of situation and different modes of management, and by occa-

sional intermixture with other breeds. The sheep of the Shetland Isles and of the Hebrides belong to this variety; the last is the smallest animal of its kind, weighing only from 4 to 5 lbs. a quarter.

The *Merino* or Spanish breed of sheep was introduced into this country towards the close of last century. Its fleece, which consists of remarkably fine white short wool, weighs from about 2½ to about 3¾ lbs.: the quarter of a two-year old wether weighs from 14 to 16 lbs. George III. was an especial patron of this breed, which was for several years a very great favourite. But it has been ascertained that, though the fleece does not much degenerate here, the carcass, which is naturally ill formed, and affords, comparatively, little weight of mutton, does not improve; and as the farmer, in the kind of sheep which he keeps, must look to the butcher-market as well as to that for wool, he has found it for his interest to return to the native breeds of his own country, and to give up the Spanish. The latter have, however, been of considerable service to the flocks of England, having been judiciously crossed with the South Down, Hereford, &c.

When sheep are kept on mountainous districts, as in Wales or the Highlands of Scotland, the chief object in view is to breed them: when they are kept on grazing ground, or on arable pastures, the principal object is to prepare them for the butcher. In some parts of England they are kept on tillage farms, not only that they may be fattened, but that they may manure the fallows by being folded upon them during their hours of rest. This practice has, however, been reprobated by Arthur Young and Bakewell, and generally by the best farmers. Mr. Loudon says, that the only sort of folding ever adopted by the best breeders is on turnips, clover, tares, and other rich food, where the sheep feed at their ease, and manure the land at the same time.

The practice of folding on fallows has been very little followed in Scotland.

Number of Sheep in Great Britain and Ireland.—It is not possible to form any accurate estimate, either of the number of sheep or of the quantity of wool annually produced. With the exception of Mr. Luccock's, most of the statements put forth, with respect to both these points, seem very much exaggerated. But Mr. L's estimate, which is considerably under any that had previously appeared, was drawn up with great care, and is supposed to approach nearer to accuracy.

According to Mr. Luccock, the

Number of long-woolled sheep in England and Wales, in 1800, was	4,153,308	
Of short-woolled ditto	14,854,299	
Total number shorn		19,007,607
Slaughter of short-woolled sheep per annum	4,221,748	
Carrion of ditto	211,087	
Slaughter of long-woolled ditto	1,180,413	
Carrion of ditto	59,020	
Slaughter of lambs	1,400,560	
Carrion of ditto	70,028	
		7,140,856
Total number of sheep and lambs		26,148,463

In some parts of England there has been an increase in the numbers of sheep since 1800; but in others there has been a decrease. But we have been assured by competent judges that, on the whole, the number has not sensibly varied in the interval, though their weight and the weight of the fleece has been materially augmented.

In the *General Report of Scotland*, (vol. iii., *Appendix*, p. 6,) the number of sheep is estimated at 2,850,000; and allowing for the increase that has taken place since 1814, they may now be estimated at about 3,500,000. Hence the total number of sheep in Great Britain will be 29,648,000. It appears from the returns made under the late census, that there were in 1841, 2,106,189* sheep in Ireland. Of these about 1,500,000 are believed to be long-woolled, mostly of the improved breed, and producing fleeces weighing from 6 to 7 lbs.

Quantity of Wool produced annually in England.—According to the estimate in Mr. Luccock's Treatise on English Wool, the produce of all sorts of wool in England, in 1800, was 384,000 packs, of 240 lbs. a pack. But Mr. Hubbard, a very intelligent and extensive wool-stapler at Leeds, has shown that, supposing Mr. Luccock's estimate of the number of sheep to be correct, the quantity of wool produced in 1828, could not, owing to the greater weight of the fleece, be estimated at less than 463,169 packs; being an increase of 20 per cent. It is, therefore, clear, seeing the high price to which wool has recently attained, that, taking into account the greater weight of the fleece, as well as of the carcase, sheep must produce more at present to the farmer than at any former period Taking Scotland and Ireland into account, the total annual produce of wool in the British empire may be estimated, at present, (1846,) at about 540,000 packs.†

Change in the Quality of British Wool.—It appears to be sufficiently established, by the evidence taken before the House of Lords, in 1828, and other authorities, that a considerable change has taken place in the quality of British wool, particularly during the last 30 years. The great object of the agriculturist has been to increase the weight of the carcase and the quantity of the wool; and it seems very difficult, if not quite impossible, to accomplish this without injuring the fineness of the fleece. Mr. Culley says, that the Herefordshire sheep, that produce the finest wool, are kept lean, and yield 1½ lbs. each: he adds, "if they be better kept, they grow large, and produce more wool, but of an inferior quality." This would seem to be universally true. The great extension of the turnip husbandry, and the general introduction of a large breed of sheep, appear, in every instance, to have lessened the value of the fleece per lb. Speaking of the Norfolk fleeces, Mr. Fison, a wool-sorter, says, that 25 years ago, the weight was 2½ lbs. per fleece, and that now it is 3 or 3½ lbs.—(*Report*, p. 356.) But, according to a table furnished by the same gentleman, containing the results of his experience, it appears that, of 15 tods or 420 lbs. of clothing wool, grown in Norfolk in 1790, 200

* In the former edition of this work we estimated the number of sheep in Ireland at 2,000,000.

† See article Wool in *Commercial Dictionary*. The numbers of sheep and of packs of wool, in our notices of the different English counties, are mostly taken from Mr. Hubbard's tables.

lbs. were prime; while, in 1828, the same quantity of Norfolk wool only yielded 14 lbs. prime.—(*Report*, p. 207.) The statements of other witnesses are to the same effect.—(*Report*, pp. 383, 640, and 644.)

Exportation of Wool.—From 1660 down to 1825 the exportation of British wool was prohibited under very severe penalties. The motives for this were of a mixed nature. It was supposed that it would materially promote what used to be the principal manufacture of the country, by insuring an abundant and cheap supply of the raw material: and it was farther supposed, that no long wool, or wool fit for being made into worsted, was produced in any other country; so that, if we prevented its exportation, foreigners would be obliged to resort to us for the finished articles. None of these suppositions seems to have been very well founded. The prohibition of the exportation of short wool, by lessening the demand for it, must have lessened its growth; and, if it really was advantageous to the manufacturers, by furnishing them with a cheaper article, it must have been in an equal degree injurious to the farmers. Neither is there any evidence to show that the foreigner ever felt any material inconvenience from the prohibition of British long wools, which, indeed, were smuggled abroad in considerable quantities, in spite of all that could be done to prevent it; and, though such inconvenience had formerly been felt, the improvements made within the present century in machinery, by enabling wool of only 3 inches in the staple to be substituted, in the manufacture of worsteds, for long wool of 6 or 8 inches staple, put an end to every argument by which its prohibition could be excused. At length, in 1825, this unjust and oppressive restriction was abolished; and British wool of all sorts may now be exported duty free. Foreign wool has been at all times admissible into our ports, sometimes free, and sometimes on paying a low duty; at present, (1846,) it is duty free.

Mules and Asses, especially the former, are not very abundant in England; and are scarcely, if at all, used in husbandry. Asses are employed in drawing small carts, and in carrying burdens, by poor people, particularly those who live near commons, the barrenest of which will keep an ass.

Hogs, in an agricultural point of view, are of considerable importance. They afford a valuable and desirable species of food, at the same time that they subsist principally upon offal and other refuse, that, but for them, would be utterly lost. There is an immense variety of breeds; but the best are those which are short-legged, broad in the back, small-boned, compact, and easily fattened: their ears are sometimes pendulous, and sometimes erect. The Berkshire, Hampshire, Gloucester, and Hereford breeds are all af a large size; but the Rudgwick breed attains to, perhaps, the greatest weight of any. The Berkshire variety is hardy and valuable, and is found in most parts of the island, being the breed commonly fattened in distilleries. The Suffolk is small, and erect-eared: it feeds well, and is in great esteem.

Westmoreland and Yorkshire are distinguished for the quantity and quality of their hams, the goodness of which depends partly on the animal, but quite as much on the mode of cure. The best bacon is

made in Wilts, Hampshire, and Berks. It is stated by Dr. Mavor, (*Survey of Berks*, p. 452,) that at Farringdon, in the last-named county, fully 4,000 hogs are annually killed and cured. The exportation of bacon and hams is but inconsiderable.

There is much difference of opinion as to the profit to be derived from raising pigs. In most instances, they are viewed by farmers merely as a subordinate concern. Mr. Wakefield says, "I never knew them to be profitable, when kept in any number beyond that which could subsist by picking up the waste grain and acorns; for, the moment they were put upon a course of feeding, money was lost by them."—(*Account of Ireland*, i., 354.) But with millers, brewers, distillers, and dairymen, the case is certainly otherwise: they are to them objects of great importance; and return, for the offal they consume, a greater weight of meat, some say double, than could be obtained from cattle.

We extract from Mr. Vancouver's *Survey of Essex* the following judicious observations with respect to the management of hogs:—"There is no animal in the whole economy of good husbandry that requires more attention as to breed, number, and supply of food, or will better requite the care and trouble of the farmer, than a well-managed and proper stock of hogs. These things, however, are too much overlooked, or, rather, disregarded, by farmers in general; though all are ready to agree that an over-stock in other respects must ever prove fatal to the interests of the farmer. Hogs are too frequently conceived to be a trifling and unimportant part of the stock of a farm; whereas, if their first cost and the value of their food were duly considered, with their improving value, it would certainly bear them out against some of the more costly animals, and challenge more attention and care than are usually bestowed upon them. A due regard to the breed, which the peculiar circumstances of the farm may call for, is particularly necessary; as some breeds are much better suited to pasture, and to feed upon grass and herbs than others. The most hardy, and best qualified to prog for themselves, are the Chinese; a cross with which breed upon almost any other may, under most circumstances, be prudently recommended. Let the breed be what it may, a well-proportioned stock to every farm will most abundantly requite the care, and repay the expense, of the necessary food provided for them. A few acres of clover would be well applied to the use of the hogs in summer; but, in the stye, it would be well to restrain them to a certain quantity of water, and to lodge them clean and dry, notwithstanding the wilful neglect and too prevailing opinion to the contrary; for cleanliness is as essential to the preservation of their health and well-doing as to that of any other animal."

Scotch Hogs.—The best varieties of the English breed have been introduced into Scotland; but the native breeds, which are still, in many places, the most numerous, are very unprofitable animals. They are of a white colour, have light narrow carcases, with bristles standing up from nose to tail, long legs, and are very slow feeders, even at an advanced age. In the Highlands and Hebrides, the breed supposed by Dr. Walker to be the aboriginal is of "the smallest size, neither white nor yellow, but of a uniform grey colour, and shaggy, with long

hair and bristles. They graze on the hills like sheep: their sole food is herbage and roots; and on these they live the whole year round, without shelter, and without receiving any other sustenance. In autumn, when they are in the best order, their meat is excellent, and without any artificial feeding; but, when driven to the low country, they fatten readily, and rise to a considerable bulk."—(*Walker's Hebrides*, vol. ii., p. 17.)

Of the Scotch counties, Dumfries and Kirkcudbright are pre-eminent for the excellence of their hams and bacon, which rival those of York and Wilts. Dumfries is one of the greatest pork markets in the empire.

Goats are reared in the mountainous parts of England, Wales, and Scotland. Those bred in the former are the largest, and their skins the most valuable. The Cashmere-shawl goat has been bred in Essex; but, owing to the moisture of our climate as compared with its native country, its wool could not but degenerate.

Deer are kept only in the parks of opulent noblemen and gentlemen as an article of luxury. In a national point of view they are of no importance.

Rabbits are, for the most part, kept on sandy waste soils, unfit for other purposes. Their haunts are called warrens, and are most numerous in Norfolk and Cambridge, where, however, they are now greatly reduced. They sometimes extend to 2,000 and 3,000 acres. The annual produce is estimated at from 3 and 4 to 8 and 10 couple an acre, yielding a profit of from 5*s.* to 10*s.*, and sometimes even as much as 15*s.* an acre. But on the whole, the growth of rabbits seems to be wasteful and pernicious, unless when they can be confined to a sandy soil, applicable to no other purpose.

Poultry are objects of very considerable importance, directly and indirectly, on account of their eggs and feathers. Turkeys, geese, and ducks, are reared in all parts of the country in considerable quantities; but common fowls are by far the most numerous and valuable. The Dorking cock and hen, so called from the town in Surrey of that name, are the largest and most valuable of the common fowls, and are readily distinguished from other varieties by having five toes to each foot. North Chappel and Kensford, in Sussex, are famous for their poultry. Perhaps, however, Oakingham, in Berks, is, in this respect, the most celebrated. The fowls are sold, fattened, to the London dealers, and as much as 150*l.* has been paid for them in a single market day.—(*Mavor's Berks*, p. 462.) The trade in eggs between the country and the towns is of very considerable importance. Exclusive of immense importations of foreign eggs, London draws large supplies from the adjoining counties. The value of the eggs exported from Berwick only to the London market, previously to the peace of 1815, has been said to amount to 30,000*l.* a-year; though this is probably an exaggeration.—(*Penny Cyclopædia*, art. Berwick.) But this export has almost entirely ceased, French eggs being (notwithstanding the duty of 1*d.* per dozen) cheaper than those usually brought from the more distant counties. In 1796 it was calculated that the peasantry of Mid-Lothian drew about 8,000*l.* a-year for poultry and eggs; though, speaking generally, Scotch poultry of all descriptions is very inferior

to English. There are different breeds of ducks kept in Britain; but the most common are the white or English breed, and the brown or speckled. Perhaps as many of these birds are kept in Bucks as in any other county: they are of an early sort, and are bred by poor people for the London market. Ducks, from their feeding chiefly on pernicious insects and refuse, and being very harmless, are, probably, the most profitable species of poultry that can be kept by common farmers. Geese are bred in all parts of the country; but, on a great scale, principally in the fens of Lincolnshire, where, previously to the drainage of the fens, there were frequently as many as 1,000 breeders in a single flock; but their numbers are now much reduced. They are plucked once a-year for their quills, and four or five times for their feathers.—(*Ante*, p 179.) The best geese are found on the borders of Suffolk and Norfolk, and in Berks. Somerset furnishes the best goose-feathers for beds. Turkeys, though tender birds, are reared in all parts of the country, but especially in Norfolk and Suffolk. They are, also, which seems singular, common in Ireland. This, as Mr. Wakefield remarks, appears to be owing to the warmth of the cabins, into which fowls, as well as pigs, are always freely admitted.

Pigeons.—There are great numbers of these birds in England. A dovecot is reckoned an indispensable adjunct to a country gentleman's residence, and in many counties it is customary for farmers to keep a few pairs. They are occasionally reared in the view of supplying the market, but, for the most part, they are kept as articles of luxury. They are very voracious, and destroy great quantities of grain. There are some rather curious calculations on this subject in Vancouver's Survey of Devon. He supposes that there are, in all, 20,000 pigeon-houses and 1,125,000 pairs of dove house-pigeons in England and Wales, and that they consume 157,500,000 pints, or 4,921,875 Winchester bushels, of grain a-year! Of course there must be a good deal of looseness in this statement: it has been said by some to be much under, and by others to be much over, the mark. But, without giving any opinion on this point, there can, at all events, be no question that the number of pigeons is very great, and that the destruction they carry on, when considered in the aggregate, must be very considerable indeed. —(*Vancouver's Devon*, p. 357.)

Bees are the only insects domesticated in Great Britain. They furnish two valuable products—honey and wax. During the middle ages, and down, indeed, to the reign of Charles I., the imports of sugar were but inconsiderable, and honey was, in consequence, very extensively used as a sweet. But, since the foundation of the colonies in the West Indies, the importance of honey has very much declined. It is still, however, in considerable demand, while the consumption of wax is greater than at any former period. But both the produce and profit of bees are extremely uncertain. Inasmuch, however, as they are supported at almost no expense, require very little care and attention, and are most interesting animals, they make a desirable addition to the gardens of cottagers and farmers.

Sect. 7.—*Agriculture of Ireland.*

A large proportion of the surface of Ireland is covered with bogs and mountains; but, notwithstanding this deduction, it contains a great deal of most excellent land. The luxuriance of the pastures, and the heavy crops of oats that are everywhere raised, even with the most wretched cultivation, attest its extraordinary fertility. This is the more singular, since, as has been already observed, the soil is generally thin. But this deficiency is balanced, partly by its principally resting on a calcareous subsoil, and partly by the moisture of the atmosphere. "I think," says Mr. Young, speaking of extensive tracts in Limerick and Tipperary, "it is the richest soil I ever saw, and such as is applicable to every purpose you can wish: it will fat the largest bullock, and, at the same time, do equally well for sheep, for tillage, for turnips, for wheat, for beans, and, in a word, for every crop and circumstance of profitable husbandry."—(*Tour in Ireland*, 4to. ed. p. 313.) The appearance of the country is a most deceptive criterion of the quality of the soil. The fences are, for the most part, mere mounds of earth, full of gaps; there is little timber, and the land is often overgrown with thistles, ragwort, and other noxious weeds. "You must examine," says the intelligent observer just quoted, "into the soil before you can believe that a country which has so beggarly an appearance can be so rich and fertile."—(P. 315.) With a good system of agriculture, Ireland would certainly be about the most productive country in Europe, and would more than realise all that the old Roman writers have said of the fertility of Sicily. No one, indeed, who has ever been in Ireland, and contrasted the extraordinary richness of the soil with the poverty of the occupiers, their miserable implements, and modes of management, can doubt that, were security of property and a proper system of holding and managing land introduced, the produce of the country might be augmented to an extent not easily imagined—perhaps in a *quintuple* proportion!

Ireland is generally divided into larger estates than England; but the farms or occupancies are, notwithstanding, at an average, much smaller. This, however, has not been always the case. Previously to the close of the American war, though there were some very small occupancies in all parts of the country, but particularly in the north, farms seem, generally speaking, to have been pretty extensive. Since that period, however, they have rapidly diminished. "Farms," says Mr. Newenham, "appear to have been diminishing in Ireland for many years past. Large farms of from 500 to 1,500 and 2,000 acres, once so common in Ireland, hold actually no sort of proportion to farms of from 10 to 30 or 40 acres. In the county of Down, Mr. Dubordieu says that farms run from 20 to 40, 50, and in some instances so far as 100 acres. Such is the case in most other parts of Ireland. For several years past the landlords of that country have been much in the habit of letting their lands in small divisions.

"Another custom has been extremely prevalent, that of taking considerable tracts of mountain, bog, or other waste land, inclosing, improving them, and letting them in small farms of from 20 to 30 acres. Besides this, the cottier system, or giving a certain quantity of land as an equivalent for wages, prevails throughout most parts of Ire-

land. In fact, upwards of *four-fifths* of the Irish people are subsisted chiefly on the produce of the land which they occupy."* We subjoin a table which we have compiled from the returns embodied in the census of 1841 :—

Account showing the Number of Holdings of more than One Acre in the Rural Districts of the different Counties of Ireland in 1841, *according to the Report of the Census Commissioners, with the average Size of the Holdings of more than One Acre.*

Provinces and Counties.	Extent of Land, exclusive of Lakes, in Imperial Acres.	Farms above 1 to 5 Acres.	Farms above 5 to 15 Acres.	Farms above 15 to 30 Acres.	Farms above 30 Acres.	Total Number of Farms above 1 Acre.	Average Size of Farms above 1 Acre.
Leinster.							
Carlow . . .	220,235	1,933	2,357	1,056	950	6,296	34·979
Dublin . . .	220,894	1,866	1,285	749	1,102	5,002	44·161
Kildare . . .	416,929	3,104	2,123	991	1,845	8,063	51·709
Kilkenny . .	505,127	5,131	5,752	3,601	2,006	16,490	30·632
King's . . .	491,350	5,657	4,502	1,374	1,213	12,746	38·549
Longford . .	255,370	4,396	4,880	1,045	411	10,732	23·795
Louth . . .	199,893	3,992	2,589	628	632	7,841	25·493
Meath . . .	576,191	5,339	3,971	1,637	2,554	13,501	42 677
Queen's . . .	423,341	5,629	4,825	1,813	1,334	13,601	31·126
Westmeath . .	430,413	4,266	4,076	1,648	1,385	11,375	37·838
Wexford . .	570,528	5,219	6,313	4,151	2,457	18,140	31·451
Wicklow . .	498,747	2,620	2,922	1,891	2,000	9,433	52·816
Total . .	4,809,018	49,152	45,595	20,584	17,889	133,220	36·098
Munster.							
Clare . . .	759,346	11,593	12,049	2,234	1,052	26,928	28·199
Cork	1,826,951	13,683	15,790	10,362	5,691	45,526	40·130
Kerry . . .	1,152,558	8,689	10,830	4,068	2,172	25,759	44·744
Limerick . .	659,552	6,841	6,840	3,700	2,346	19,727	33·434
Tipperary . .	1,045,849	13,032	12,787	4,938	2,960	33,717	31 019
Waterford . .	454,249	3,190	3,024	2,179	2,336	10,729	42·338
Total . .	5,898,505	57,028	61,320	27,481	16,557	162,386	36·386
Ulster.							
Antrim . . .	689,981	6,855	10,563	4,220	1,888	23,526	29·328
Carrickfergus	16,571	136	203	94	34	467	35·484
Armagh . . .	309,356	11,632	9,428	2,072	666	23,798	12·999
Cavan . . .	454,716	10,807	12,208	1,958	668	25,641	13·833
Donegal . . .	1,169,857	15,567	12,931	3,527	1,699	33,724	34·689
Down . . .	606,852	13,753	11,991	3,865	1,508	31,117	19 470
Fermanagh . .	410,230	7,371	8,540	1,696	529	18,136	22 619
Londonderry .	506,709	7,866	8,755	2,675	1,143	20,439	24·791
Monaghan . .	313,286	12,275	9,702	1,216	317	23,510	13·326
Tyrone . . .	774,134	14,555	14,671	3,776	1,139	34,141	22·675
Total . .	5,251,692	100,817	98,992	25,099	9,591	234,499	22·395
Connaught.							
Galway . . .	1,474,523	27,992	12,663	2,030	1,645	44,330	33·262
Leitrim . . .	368,615	9,373	7,971	877	202	18,423	20 008
Mayo . . .	1,306,058	33,790	10,331	1,265	1,135	46,521	28·074
Roscommon .	577,553	17,472	8,066	913	895	27,346	21·120
Sligo. . . .	448,553	11,291	6,190	705	398	18,584	24·136
Total . .	4,175,302	99,918	45,221	5,790	4,275	155,204	26·902
Grand Total	20,134,517	306,915	251,128	78,954	48,312	685,309	29 3e0

The returns in the last column are all a little above the mark, from no allowance being made for the land occupied in holdings of one acre and under, which in many parts are very numerous. It will further be borne in mind that the average size of farms given above includes mountains and bogs, of which there are immense tracts, as well as the cultivable lands. If we exclude these, the average size of the holdings in Ireland of above one acre will be materially reduced.

* Inquiry into the Progress of the Population of Ireland, p. 270.

These returns set the smallness of the farms in Ireland in the most striking light. They show that of a total of 685,309 holdings of more than *one* acre, only 48,312 exceed 30 acres! With the exception of those in Kildare and a few other counties, by far the greater number of the holdings of arable land, excluding mountain and bog, do not exceed from 1 to 10 acres. With the exception of parts of France and Rhenish Prussia, the land of no country is so thoroughly subdivided. All the most intelligent persons who have either visited the country or described its agriculture, have been struck with this extraordinary subdivision, and have endeavoured to explain the circumstances by which it has been brought about. It is noticed over and over again by Mr. Wakefield. That intelligent agriculturist, the late Mr. Curwen, visited Ireland in 1813, and has, in his *Letters*, many striking passages in reference to this subject. "In some places," he says, "there is an inhabitant for every acre, while the cultivation of the soil, as now practised, does not afford employment for a third part of that population."—(*Letters*, vol. ii. p. 38.) And he adds that, owing to there being none or but very little demand for the labour of any part of the country population in towns or manufactures, the practice of subdividing was still on the increase, and that few occupiers, however small their own possessions, refused to sub-let portions to cottiers. "A farmer," says Mr. Townsend, "often estimates his riches by the number of his sons, whose labour precludes any necessity of mercenary aid; but this lasts only for a short time. They marry at an early age; new families arise; a separation of interest takes place, and with it a partition of the farm." The same system still going on, future sub-divisions have to be made, more or less productive of jealousy and quarrel.—(*Survey of Cork*, vol. i. p. 208.) Such was the universal practice all over the country. "One great obstacle to improvement," says Mr. Ross, "and which is too general in Ireland, is their notion of the equal and unalienable right of all their children to the inheritance of their father's property, whether land or goods. This opinion, so just and reasonable in theory, but so ruinous and absurd in practice, is interwoven in such a manner in the very constitution of their minds, that it is next to impossible to eradicate it. In spite of every argument, the smaller Irish occupiers continue to divide their farms among their children, and these divide on, till division is no longer practicable; and, in the course of two or three generations, the most thriving family must necessarily go to ruin."—(*Survey of Londonderry.*) The extent to which this ruinous practice has been carried is such as sometimes almost to exceed belief. Dr. Kelly, late Catholic Archbishop of Tuam, stated, in his evidence before the Committee of 1830 on the "State of Ireland," that he knew a farm in his neighbourhood which was originally leased, on the partnership system, to about 20 families, and he afterwards recollected to have seen 60 families living on the same farm, an augmentation that grew naturally out of the increase of population.

It appears from the evidence taken during the late inquiry into the occupation of land in Ireland, that this pernicious system still prevails in most parts of the country. Its ruinous consequences are now, indeed, pretty well understood; but though checked by the Subletting Act, and by the introduction of Poor Laws, and opposed by many land-

lords, it is hardly possible to prevent it. In general the children of the occupiers have no other resource. There are no manufactures to employ them, and if they do not obtain a patch of land they must emigrate. In consequence, subletting is very extensively carried on, despite every effort to hinder it; and when once it has taken place, it is both a difficult and a dangerous process to get the sub-tenants ejected.

This splitting of the land into minute portions, and the direct dependence of so large a portion of the people on it for subsistence, form the principal obstacles to the improvement of agriculture, and make the condition and prospects of the population exceedingly unfavourable. We shall afterwards briefly inquire into the circumstances which have produced a state of things so widely different from what exists in Britain; but, at present, it is sufficient to state, that the excess of the purely agricultural population, and the minute division of the land, give its peculiar and distinguishing features to the system of husbandry pursued in Ireland, and occasion almost all that is objectionable in it.

In general, it may be observed of Irish agriculture, that those who carry it on have very little capital, and are remarkably destitute of both skill and industry. The smallness of the farms, by rendering it impossible for many of their occupiers to keep horses, and the want of any efficient demand for labour, has led to the employment of the spade to an extent unknown in any other European country. Land being, in the vast majority of instances, held, not in the view of making a profit by it, but to obtain the means of subsistence, the rent is enormously high, and those crops are principally resorted to that furnish most food on the least space. Hence the extraordinary extension of the potato culture, which has diffused itself over every part of Ireland, and been at once a powerful cause and a striking consequence of the rapid increase of population. Improved systems of management are beginning to be introduced into most parts of the country; but it is still (1846) true that the great majority of Irish occupiers have no correct idea of a rotation of crops: corn very frequently follows corn, as long as the ground is capable of producing anything; and when the series is interrupted it is generally to make way for potatoes or flax, and but rarely for green crops; for though the cultivation of turnips and clover has increased materially of late years, it is mostly confined to farms occupied by landlords or agents, or to those of the superior and more enlightened class of tenants. Fallowing is sometimes attempted; but it is, for the most part, so ill executed, that it is difficult to believe it can be an improvement. Three ploughings are usually given to the land; but, from the imperfect manner in which they are executed, it is not unusual for the ground, at the end of the season, to be thickly covered with weeds. Except on the east coast of the island, the drill husbandry cannot be said to be introduced; for, so long as it is entirely neglected by the mass of the occupiers, the fact of its being carried on within the *demesnes* of a few noblemen and gentlemen can hardly be considered as an exception to the remark. To whatever cause it may be owing, a want of continuous industry is everywhere apparent. "An antipathy to labour," or an insensibility to its advantages, is now, as in the days of Fynes Moryson and Bishop

Berkeley,* a distinguishing trait in the character of the Irish people. Their extreme poverty is principally a consequence of their extreme sloth. Few occupiers seem to imagine that their crops would be improved, or the exhaustion of the land prevented, by clearing it of weeds. If any efforts be made to destroy them, which is seldom the case, it is only when they are found among potatoes. Docks, thistles, and other noxious plants flourish in corn-fields in unscathed luxuriance. Nay, such is the slovenliness of the mass of the occupiers, that even the potato, though their whole dependence be placed on it, is frequently injured, and sometimes wholly lost, by their allowing it to remain too long in the ground! † That a country of the extent of Ireland, and so encumbered with bogs and mountains, should be able, with such a system of agriculture, to support a population of above 8,000,000, and also to export large supplies of raw produce, is a sufficient proof of the fruitfulness of the soil, and of the economy forced on the inhabitants by the unhappy circumstances under which they are placed.

It has been said over and over again, and was frequently repeated in the evidence before the Land Occupation Commissioners, that the want of leases is a principal cause of the idleness of the occupiers; but we doubt whether this circumstance has any material influence. A thousand things might be, and would be done, by an industrious population, which are not done, nor attempted in Ireland, that would materially increase the means and comforts of the occupiers, without affording any means or temptation to raise rents. Whatever, also, may be alleged to the contrary, it is not the practice in Ireland, any more than in England, immediately to raise rents because improvements have been effected on the land. This, no doubt, may be sometimes done, though very rarely; and the granting of leases, *under proper and strictly enforced conditions in regard to management*, would certainly be an immense improvement. But it is very difficult, and indeed all but impossible, to enforce conditions in regard to management; and with ordinary leases there is an extreme want of industry and gross mismanagement in most parts of Ireland. The occupiers who hold under-leases are very apt to think that they have got a security against want, and seldom endeavour to do more than is required to enable them to subsist and pay their rent. "I have," says Mr. Campbell Foster, "been some scores of times shown farms held on lease, the most disgracefully cultivated of any in the neighbourhood," (p. 35); and the same thing has been repeatedly noticed by others. It should, also, be borne in mind, that farms let on lease run an extreme risk of being sub-let, or, at all events, subdivided among the families of the occupiers; and the wish, on the part of the landlord, to be able

* "Their slothfulnesse is so singular, that they hold it basenesse to labour."—(*Fynes Moryson's Itinerary*, Part III., p. 160, ed. 1617.)

"There still remains in the natives of this island a remarkable antipathy to labour. Never was there a more monstrous conjunction than that of pride with beggary; and yet this prodigy is seen almost every day in every part of this kingdom. At the same time these proud people are more destitute than savages, and more abject than negroes."—(Bishop Berkeley's *Word to the Wise*, p. 93 of his *Miscellaneous Tracts*, ed. 1752.)

† See Wakefield, i. 583. See also, to the same effect, the able work, entitled, *A Philosophical Survey of the South of Ireland*, (by Dr. Thomas Campbell,) p. 152.

easily to prevent this most baneful of practices, has been a principal cause of their disinclination to grant leases. On this point the evidence of an intelligent and liberal landlord, D. H. Kelly, Esq., of Galway, before the Land Occupation Commission, is entitled to great weight. "A man," says he, "who has a fixed tenure (a lease), considers that he cannot be put out. He immediately mismanages the farm; he sublets, subdivides, and so the whole thing is destroyed. A man who has it only at will, knows that if he conduct himself as he ought to do, his tenancy at will is as good as a lease, and he will use his best exertions to have his land in the most profitable and beneficial order. Tenants at will are better off themselves, and they are more satisfactory tenants."—(*Evid.*, part ii. 342.) It would be easy to corroborate this evidence by innumerable extracts from the evidence of those who lay the greatest stress on "fixity of tenure." But the truth is, that in Ireland the letting of land has hitherto been nearly synonymous with its subdivision; and unless this be effectually prevented, no improvement need be looked for. We may add, that some of the best managed estates in all parts of the country are held by tenants at will.

The indolence, carelessness, and bad cultivation of the smaller farmers is not the consequence of one, but of many conspiring circumstances: and we are disposed to think that the strongly marked indifference of the natives to improved accommodations, and their disposition to be satisfied with the merest necessaries, is one of the most prominent of these circumstances, and one which it will be the most difficult to eradicate or overcome. How else are we to account for the vastly superior condition of the descendants of the Welsh in Wexford, of the Palatines in Limerick, and of the Scotch and English in many parts of Ulster? They have been placed under the same circumstances as the native Irish; and they are, notwithstanding, comparatively industrious, orderly, and well off.

I. *Agricultural Implements and Operations.*—These, in Ireland, used to be universally of the rudest construction, and performed in the most awkward manner. The plough, the spade or *loy*, the flail, the car, are all clumsy and defective. The old Irish plough is almost identical with the old Scotch plough, still in common use in some parts of the Highlands.—(*Ante*, p. 302.) Like the latter, it does its work ill, and at an immense expense. It is commonly drawn by four or more horses, and sometimes by cattle and horses intermixed. Exclusive of the ploughman, it is invariably attended by one or two drivers; and by a man whose business is to sit on the beam, and to assist in keeping the instrument in the ground! Luckily, improved Scotch ploughs, drawn by two horses, managed by the ploughman, have been introduced, either to a greater or less extent, into most districts; though the old Irish plough is still in pretty general use in several counties.

The wheels of the car not unfrequently consist of large, rounded, solid pieces of timber, resembling grindstones; and sometimes it is what is called a *slide car*, and has no wheels at all. But wheels constructed with spokes, and carts, are gradually, and, in parts, rapidly displacing the old wheels and cars.

The *loy* is a long narrow spade, with room for only one foot to work on. Most kinds of hand tools have bad handles, and they are gene-

rally defective in their construction, or kept in bad order. The harness used to consist in a far greater degree of straw, than of either hemp or leather; but it also is materially improved.

But few *thrashing machines* are to be found in the island. Nor need this be wondered at; for even barns, taking the term in its English and Continental sense, are quite unknown in many extensive districts! and, as already stated, thrashing is not unfrequently performed on the public roads, the hardness of which makes them serve the same purpose as a barn floor! Most operations are, in fact, performed in a way that excites the astonishment of those acquainted with the mode in which similar operations are performed in Britain. Trenching land is very general; it is formed into beds, a deep trench being dug between them, the earth of which is thrown up.

Drainage, the greatest of all improvements in agriculture, and which may, in truth, be said to lie at the bottom of every other, is but little practised throughout the greater part of Ireland. It is too expensive to be executed by the bulk of Irish tenants; and until very recently but few landlords had done anything to benefit their estates by undertaking this improvement. But within these few years a considerable change for the better has taken place in this respect; and some of the more intelligent and enterprising landlords have not only effected considerable drainages on their own account, but have assisted such of their tenants as were willing to carry them on. Ireland may still, however, be said to be a stranger to the extraordinary ameliorations effected within the last twenty years in many parts of England and Scotland, by furrow draining; so that in this respect, as in most others, it offers an all but boundless field for the successful prosecution of improvements. Fortunately a large portion of Ireland rests on a limestone bottom, which renders drainage of less importance; but wherever this is not the case, the wetness of the land is universally complained of. The only substitute for drains to be found in many extensive districts, consists of the trenches between the beds of potatoes planted on the "lazy bed" system; and it is said that in some parts this system is continued from its being the only means, defective as it is, of removing the water from the land, and preventing the potatoes from being rotted.

Manures.—Bone-dust and guano have been introduced into Ireland, but that is all. Exclusively, however, of ordinary farm manure, and of ashes obtained by the destructive practice of burning the land, sea-weed, or wrack, and sea-sand are used to a great extent as manures, round all the northern, western, and southern coasts of the island. Sea-weed is most commonly applied in the raising of potatoes; and, when of good quality, it is believed to be equal, weight for weight, to ordinary stable manure. The supplies of it on the west coast are all but inexhaustible. Sea-sand, which is used to an extent of which few people in this country have any idea, contains in most instances a large proportion of shells and other calcareous matter. In Lough Foyle there are extensive banks consisting almost wholly of shells, of which about 60,000 tons are at present (1846) annually dug up and expended upon the land. On the shore opposite to the banks they are worth about 1*s.* a ton; their value, of course, increasing according

to the distance to which they are carried inland. They are applied with the greatest advantage to stiff wet clays. An intelligent correspondent of Dr. Kane estimates the total quantity of sand taken from the bays and creeks of the coast of Cork, and applied to agricultural purposes, at the immense amount of 1,000,000 tons, of which Youghal harbour supplies about 300,000! There may be some exaggeration in this statement, but when we consider the extent to which sand is used as a manure along the whole western and northern as well as the southern shores of Ireland, it is easy to see that its total consumption must be something quite gigantic. In some places sea-weed and sea-sand are carried 30 miles inland! We regret to have to add, that disputes have arisen in many parts with regard to the rights of private parties over those valuable products; and it were much to be desired that some general and easily applied regulations should be enacted on the subject.—(*Kane, on the Industrial Resources of Ireland*, pp. 271-276; and the *Evidence taken by the Commissioners of Land Occupation*, passim.)

It may be right to state, that the use of sea-weed and sea-sand as manures has been long known in Ireland: the latter is mentioned by Boate, in his Natural History of Ireland, published in 1652 (p. 99), as being used extensively in Munster, and with the best effect. The learned Dr. Smith, in his excellent account of Kerry, published in 1756, says that in the barony of Corckaguiny, "they are encouraged to pursue agriculture, because of the convenience of sea-sand, which is an excellent manure; and this barony is thereby esteemed the granary of the whole county."—(p. 173.) Smith also refers to it in his account of Cork, (ii. 384.)

II. *Farm-houses, Offices, &c.*—Everything in Ireland seems to have been at all times sacrificed to the *auri sacra fames*—taking the phrase in its most literal and degrading sense—to a desire to make the greatest amount of money in the least space of time, without caring much about the means. In travelling through the country, one cannot help thinking, that not merely the tenants, but also the landlords, have been uniformly impressed with the conviction that they had no permanent interest in the soil. It is in vain to look in it for those expensive and lasting improvements, those outlays of capital, of which posterity is to derive the principal benefit, that are everywhere to be met with in England and Scotland, and which add so prodigiously to the value and beauty of the land, and the comfort of its occupiers. Excepting only that the roads are generally good, one might suppose nine-tenths of the country not only to be occupied by, but to belong to, a race of people too poor to make any outlay, however indispensable. The reason is, the tenant has been ignorant, contented, and left to do everything for himself. Down to a comparatively recent period, if he did not construct or repair houses, offices, fences, drains, &c., he must have wanted them, or they might have gone to ruin. "*Nothing is ever built or repaired by landlords; these expenses, as well as those of every other improvement, are left to the tenant*, who generally comes into a dilapidated holding, without capital enough to stock it, still less to build, to fence, or to drain."—(*Survey of Kil-*

kenny, p. 412.) Hitherto the landlords of Ireland, speaking of them in the mass, for there are some exceptions, seem to have fixed their exclusive attention on their rentals; supposing that their duty to their tenants, to the public, and even to the lasting interests of their estates and families, was fully discharged when they had raised their rents to the utmost! There are circumstances, that will afterwards be glanced at, connected with the history and peculiar situation of Ireland, which satisfactorily explain this apparently anomalous conduct. But it is not easy to exaggerate its mischievous influence. It has led to a total separation of interests between landlords and tenants; making the former be too generally looked upon rather as the unfeeling collectors of an exorbitant land-tax, than as persons having a deep interest in the improvement of the soil, and in the prosperity of its occupiers. Proofs of what has now been stated are too numerous and striking not to arrest the attention of even the most superficial observer. The recent history of Ireland shows conclusively that the landlords have little influence over, and possess neither the respect nor esteem of their tenants; while the long-continued and culpable indifference of the former to everything that most materially affected the condition of their estates, was evinced by their not attempting to oppose any effectual obstacle to the endless subdivision of the land, till the evil had attained to a ruinous magnitude; by the want of all systematic efforts to introduce and enforce a proper system of agricultural management; and by their throwing on the tenants the burden of supplying themselves with houses and all other accommodations.

"With the exception," says Mr. Wakefield, "of those belonging to the gentry, *there is nothing in Ireland worthy of the name of a farm-house.*"—(Vol. i. p. 468.) In external appearance the houses of the middle class would, with a few exceptions, principally in the neighbourhood of Belfast and other large towns, hardly rank with the worst English cottages; while in all that respects cleanliness and internal comfort they are immeasurably inferior. The people have been so long accustomed to the vilest habitations, that when they get anything better they not unfrequently look upon it in the light of an incumbrance. Mr. Tighe observes of Kilkenny, a county in which there are more extensive tillage farms than in most others, that "A decent house, let to a common farmer, becomes, in a year, little better than a pigstye. The houses of rich farmers are generally far inferior to their means, and are such as to exempt them from window-tax, and often from hearth-money. But the greatest failing is in their offices: the barn is generally a shed to thrash in, with no floor but the natural soil; the stable a hovel; a cow-house is often not to be found; no yard is appropriated to pigs; the corn stands alone to mark the farm; a shed to protect the implements of tillage was never thought of; the richest farmers always leave the plough and harrow in the corner of the last field they tilled; such parts of harness as may not consist of gads or sugans is secured in the house; and, with the smaller farmers, if the car does not stop some gap, called a gateway, it may be against the ditch, or on the dunghill. The offices are sometimes

covered with potato stalks, which form a very bad thatch."—*Survey of Kilkenny*, p. 412.

Though written several years ago, this description is still generally applicable; but here, as in most other parts, improvements have begun to be introduced; and the houses on the Ormond estates, and on those belonging to Lord Kilkenny, have been considerably improved. It is now the practice on many estates in all parts of the kingdom, for the landlords to defray the cost of the timber and slates used in building houses; and in other instances allowances are made to the tenants proportioned to the value of the buildings; but it is still true that in the great majority of cases the landlords contribute little or nothing to the erection or repair of houses and offices. And unless where farms are of a reasonable size, it could hardly be expected that landlords, however liberal, should contribute to the erection of buildings, inasmuch as that would oppose an additional obstacle to that consolidation of small farms which is so desirable when it can be brought about without entailing any very peculiar hardships on the occupiers.

The habitations of the cottiers do not, speaking generally, deserve the name of houses; but are miserable cabins, inferior even to the wigwams of the American Indians. Part of the turf employed in building the walls is sometimes taken out of the inside, and when such is the case, the floor of the cabin is generally about a foot below the level of the ground on the outside, and is consequently always damp. They not unfrequently want chimneys; and are almost always pervious to the rain. The instances are rare in which their occupiers possess anything that an Englishman would call furniture.*

It may be worth while to observe, that Spenser saw, and clearly pointed out, the great injury the landlords of Ireland did themselves and the country by withholding leases from their tenants, and refusing to assist them in building houses on their farms, and in making fences, roads, &c. "By such buildings and enclosures," says he, "the tenant shall receive many benefits. First, by the handsomeness of his house, he shall take more comfort of his life, more safe dwelling, and a delight to keep his said house neat and clean; which now being, as they commonly are, rather swine-styes than houses, is the chiefest cause of his so beastly manner of life and savage condition; lying and living together with his beasts in one house, in one room, in one bed; that is, clean straw, or, rather, a foul dunghill. And to all those other commodities he shall, in short time, find a greater added; that is, his own wealth and riches increased, and wonderfully enlarged, by keeping his cattle in inclosures, where they shall always have fresh pastures, that now is all trampled and overrun; warm covert that now lieth open to all weather; safe being, that now are continually filched and stolen." —(See *View of the State of Ireland*, p. 1588, of *Spenser's Works*, London, 1715.)

Could the task of revising his book, written in the reign of Elizabeth, be performed by Spenser in that of Victoria, this is not one of the paragraphs that would require any material alteration. The habitations of the mass of the Irish people are quite as bad, at this moment,

* For a striking description of the huts of the peasantry, see *Philosophical Survey of the South of Ireland*, (by Campbell,) p. 145.

as they were three centuries ago; and are now, as then, crowded with cows and pigs as well as men;

"——————— Ignemque, laremque,
"Et pecus, et dominos communi clauderet umbra."
Juvenal, lib. ii. sat. 6.

It is unnecessary, perhaps, to inculcate on the reader the propriety of bearing in mind that the preceding remarks on the agriculture of Ireland refer only to its general state, and that there are great local discrepancies. Particular estates, even in the worst counties, are comparatively well farmed; while others, though situated in the best districts, seem to be occupied by none but beggars. When estates are let on leases, terminable at will, or in reasonable periods, their condition depends materially on the conduct of the landlord. If, he set his face strongly against subdivision; employ honest agents; abjure on his part and theirs, the practice so general in Ireland, and so disgraceful to the landlords, of accepting, or rather extorting presents from the tenants on the renewal of leases, &c.; give proper encouragement to industrious tenants; and look to character and capital, as well as rent, in the letting of his land, he may do a vast deal of good.

Estates in which subdivision has been prevented, and that have been otherwise subjected to a liberal and judicious system of management, are, for the most part, occupied by a respectable tenantry, and are under a reasonably good system of husbandry. But it is no easy matter when an estate has been much subdivided and mismanaged, even though it should be held at will, or under terminable leases, to bring it under a better system. Great tact and discretion are required in such cases. If too great a change be attempted at once, it is probable that outrage will ensue, and that the bad system will be perpetuated. The occupiers are so extremely suspicious, and set so high a value on their small patches of land, which, in truth, are everything to them, that it is necessary to proceed with extreme caution; and, if possible, to show that the contemplated improvements will be as beneficial to them as to the landlord. Some landlords have defrayed the expense of conveying a portion of the surplus population of their estates to the colonies; and when this can be effected it is, perhaps, the best mode in which such surplus can be disposed of.

III. *Tenant's Right.*—The existence of what is called "tenant right" (see *ante*, p. 384), which prevails over Ulster, and to a considerable extent in other parts, is a remarkable feature in the agricultural economy of Ireland. It has been described by a very competent witness, Mr. Hancock, agent to Lord Lurgan, as "the sum of money which the new occupier must pay to the old one for the *peaceable enjoyment of his holding*, or his *good will*."—(Occupation of Land Commission, i. 483), It varies in value, according to circumstances, from 5*l.* to 20*l.* and upwards per statute acre; and sometimes, in fact, is about equal in value to the fee simple of the land! Different opinions have been entertained as to the origin of this singular right; by some it is said to have had its source in old feudal relations; but the better opinion seems to be that it originated in payments made by tenants entering into possession for improvements made by those leaving the

land; and that it has grown into a custom, enforced in cases where no improvement whatever has been effected, from land being all but indispensable to the existence of the occupiers, and from the odium which attaches to any one who takes land held by another.

But however it may have originated, it appears to be a custom subversive, in a great degree, of the right of property, and highly injurious. It may, indeed, seem reasonable that a tenant who has made improvements should be paid for them at the end of his lease, or on his leaving his farm. But even in these cases the influence of this custom is anything but advantageous. When tenants hold under leases of a reasonable length, without any claim for compensation for improvements at their termination, they are prompted to make the necessary outlays as soon as practicable after entering to their farms, that they may be indemnified during the currency of their leases. When, however, a claim for improvements is allowed at the termination of leases, tenants have fewer and less powerful motives to exert themselves at their commencement; and many undertake improvements towards their close, because they are to be paid for them, the utility of which may be very questionable. In Scotland, where no tenant right exists, or ever was heard of, there is no disinclination on the part of the occupiers to lay out capital on improvements; and it is the concurrent opinion of those best qualified to decide upon such subjects, that it would be most inexpedient to introduce the practice of authorizing tenants to claim compensation for improvements at the end of their leases. Their own and the public interests require that they should make the necessary improvements as soon as possible after getting into their farm, and that they should reimburse themselves during their occupancy.

The same principle holds in the case of tenants at will. Though they have no lease they will not hesitate to lay out capital on improvements, provided they have a moral conviction that they will be permitted to profit by them; and as landlords are fully aware, in the event of their prematurely dispossessing tenants that have improved farms, that such improvements will not be made in future, it is for their interest that the occupiers should not be capriciously dealt with, and this, consequently, is the usual rule of their conduct. In fact, as already stated, the best managed and most highly improved estates in Ireland are occupied by tenants at will.

If, however, the sums to be paid to tenants for unexhausted improvements at the end of their leases, or of their periods of occupation, were in all cases paid by the landlord, something might be found to say in favour of the practice; but instead of this, they are uniformly paid by the entering tenant, who is thus, in the majority of cases, deprived of a large part, and frequently of nearly the whole of his capital, at the very moment when it is of most importance to him to be able to employ it on his farm; by his having to pay for improvements undertaken by others, and which may perhaps be of little or no real value. It is not easy to imagine any more ruinous system. Everybody is ready to admit that the letting of lands by fine, (Scottice *grassum*,) is mischievous, from its crippling the resources of the tenants, and preventing their setting about improvements on their entering to

farms, and for an indefinite period thereafter. And this is obviously the case with the tenant-right, even in the instances in which it is least objectionable, or in those in which improvements have been made by the outgoing tenant, for which he has not been fully indemnified.—(See *ante*, p. 463).

But this is not really the case in one instance out of ten, in which the existing tenant-right is paid for in Ireland. It has there become a custom, because it is regarded by the occupiers as a security against their being deprived of their land; and is enforced in every case, how bad soever the order in which the farm may be, and even when the tenant is ejected for non-payment of rent! And the tenants are so far right in considering it as a protection against their being ousted, that no one can come into their place, without being prepared to pay them the value of their right. But so far from being advantageous, the obstacles it opposes to the eviction of the tenantry are certainly injurious. It never can be for the interest of landlords to dismiss really good tenants; and, therefore, the fair presumption is, that they are seldom dismissed; but the tenant-right, by making it more difficult to get rid of bad tenants, weakens, in so far, the motives to industry and good conduct on the part of the occupiers; and contributes in this way to perpetuate the indolence and bad practices that disgrace Irish agriculturists.

In fact, the tenant-right is, in all respects, as injurious to the tenants, as it is to the landlords and to the public. The heavy sums, say 10*l.* per acre at an average, which tenants have to pay on entrance, by exhausting their means, incapacitates them from making those outlays which would be still more beneficial to themselves than to the owners of the land. It is further injurious to them, from its contributing to render landlords indifferent in regard to their conduct to their tenants. That it must have this effect is obvious from its going far practically to neutralize the difference, however great, between those that are liberal and those that are illiberal. A tenant entering to a farm belonging to a humane and generous landlord, invariably pays a proportionally larger sum as tenant-right, and conversely when the landlord is of an opposite character; so that the good qualities of the proprietors, under this preposterous system, really redound more to the advantage of the tenants leaving the estate, than of those who come to live upon it!

The comparatively flourishing state of Ulster has been ascribed to the prevalence in it of the tenant-right, whereas it is wholly a consequence of the greater industry and intelligence of the inhabitants, very many of whom are the descendants of English and Scotch settlers. The tenant-right is quite as prevalent in some of the most backward and depressed districts as in Down; and though in certain cases its influence may be overcome, by countervailing circumstances, there can be no reasonable doubt that it is every where a most formidable obstacle to improvement, and good management.

But however desirable, it is not easy, seeing the universality of the practice, to suggest any means by which it may be got rid of. But we are inclined to think that this might be effected by the landlords, on a change of tenants, paying the tenant-right to the out-going tenants,

and admitting the new tenants without any charge on that account, on condition of their renouncing all claim to any tenant-right on their leaving their farms, or being ejected from them. There would be no injustice to any one in an arrangement of this sort; and if steadily acted upon, it would get rid of a practice which is highly detrimental to agriculture; and which if let alone, will, most likely, end in the absorption of the entire rights of the present proprietors.*

IV. *Agricultural Departments.*—Mr. Wakefield divided Ireland into nine agricultural districts, each of them differing, in some respects, in the mode of culture from the others; but we believe that it will be sufficient to divide it into seven districts.

1st. The first district embraces the flat parts of Antrim, the eastern side of Tyrone, with Down, Armagh, Monaghan, Cavan, and Fermanagh. Throughout this district the farms are, for the most part, extremely small, and the land is often dug with a spade. About *three-fifths* are under tillage. Oats and potatoes are the principal crops; but wheat and flax, particularly the former, are now extensively raised. A proper rotation is too little attended to; and corn crops frequently follow in succession, or with the intervention merely of potatoes and flax, till the land is exhausted; when it is suffered to "lie at rest," till it recovers its strength, which it does in an incredibly short space. Sir Charles Coote says, that in Cavan oats used to be to other grain in the proportion of *seventy* to *one;* but this proportion is, at present, materially reduced. Agriculture in this part of the district is still, however, in "the most degraded state possible."—(*Appendix* F, *Poor Inquiry*, p. 418.) It is also very backward in Monaghan, where the ruinous practice of procuring manure for the potato crops by burning the land is carried on to a great extent.—

* Mr. Campbell Foster has a Letter (No. IX.) on Tenant Right, which is one of the most valuable in his work. We beg to recommend it to the attention of those who take an interest in the subject. We regret that Lord Devon and the Commissioners of Land Occupation should have recommended the introduction of a law giving outgoing tenants a claim to unexhausted improvements; and we regret still more that government should have in so far adopted this suggestion as to introduce a Bill into parliament authorising compensation to be made, under certain conditions, to tenants for buildings and drainages. These, indeed, are the cases in which the principle may be most easily enforced, and in which, also, it promises to be least prejudicial. But even in these cases we fear that in the event of its being carried out, it will be productive of little except mischief. If a landlord think that his estate will be improved by their means, he will not require to be compelled to assist in the raising of buildings and the cutting of furrow drains; and if he do not, on what pretence, if the right of property is to be supported, is his opinion on a matter of this sort to be overruled? On the other hand, if a tenant hold under a lease of a reasonable length, that is, of 21 years or thereby, he will be fully compensated during its currency for any judicious outlays he may make upon buildings or drains, provided he make them in the earlier part of his lease; and even in the case of tenants-at-will there is not, as shown in the text, the smallest necessity for legislative interference.

Should the proposed measure be passed into a law, and be acted upon to any considerable extent, it is abundantly certain it will give rise to no ordinary amount of litigation. It is not possible, do what you will, to make a fair or just valuation of the improvements referred to; and the attempt to do so will merely give additional complexity to the already sufficiently complicated relations existing between landlords and tenants in Ireland; encourage pettifogging, and promote a bad feeling between the parties; and throw a new obstacle in the way of that consolidation of farms which is so very essential.

(*Appendix* F, *Poor Inquiry*, p. 421.) But in other parts, particularly in Armagh, Down, and Fermanagh, various improvements have been effected. In the first, the system introduced by Mr. Blacker on the Gosford and other estates, of raising manure on small farms by cultivating green crops and stall feeding, has had a most material influence. But, as previously stated (*ante*, p. 383), its beneficial effect seems to be a good deal overrated. It is impossible that farms of the size of from 3 to 10 imperial acres, which is about the average size of those on the barony of Lower Fews, on which Mr. Blacker's system is principally introduced, can, after paying rent, afford anything but the most miserable subsistence to their occupiers. No doubt it is a vast improvement on the old burning and scourging system; but nothing short of the consolidation of these small patches into farms of from 50 to 100 acres can ever allow of the accumulation of capital by the tenants, or of the establishment of a really good system of agricultural management. Improved Scotch ploughs, constructed wholly of iron, are now very generally met with in the improved districts, as are improved single horse carts. On most considerable farms in Down, Armagh, and Antrim, potatoes are drilled and horse-hoed. But in most parts of Cavan, Tyrone, and Monaghan, the implements are still of the most wretched description. In some parts, three or four neighbours unite to set a plough in motion; one bringing his horse, another his bullock, another his cow, &c., and attending himself, lest his poor animal should be made to perform more than its "just share" of the labour. The other operations of agriculture are, in most instances, performed in an equally objectionable manner. The land is seldom fallowed; and when anything of the kind is attempted, it is very ill performed. Wheat is sometimes "lashed;" that is, the grain is knocked out by striking the sheaf across a beam placed above a cloth; the sheaf being afterwards subjected to the flail. Thrashing is not unfrequently performed in the highways; and cottiers dress their grain by letting it fall from a kind of sieve, held, during a pretty strong wind, breast high, by a woman. Corn is mostly brought to market in the shape of meal. The cottiers in many parts of this district used to be principally engaged in the linen manufacture; though, since the erection of thread-mills at Belfast and elsewhere, this is much less the case than formerly. Many of the linen weavers occupy cabins without any land attached to them; hiring an acre or two, for grass or potato land, from some farmer or manufacturer in their vicinity, for which they pay an exorbitant rent. The custom of hiring labourers to assist in field operations is nearly unknown: the neighbours all assist each other in their more considerable occupations, such as sowing and reaping. The cottages are but small, particularly as compared with the numerous inmates that issue from them; but many of them are whitewashed, have a neat appearance, and are clean and comparatively comfortable within. The competition for small patches of land in this district is extreme; and besides heavy rents, which are rarely, if ever, remitted, all new tenants have to pay a large sum to the outgoing tenant for "tenant's right," which sometimes fetches the enormous price of from 7*l.* to 10*l.* and 20*l.* an acre! It is invariably paid even when the outgoing tenant has been ejected for arrears of rent.—

(*Wakefield*, vol. i. p. 363; *Dubordieu's Down*, p. 39, &c., *Appendix* F, *Poor Inquiry*, passim.)

2nd. Under the second district, Mr. Wakefield comprises the northern part of Antrim, Londonderry, the north and west parts of Tyrone, and the whole of Donegal. Agriculture differs materially in different parts of this district. In most parts of Donegal it is in a very wretched state. A considerable part of Londonderry is divided into very small farms, not exceeding 5 or 6 acres. In other parts, however, the farms are much larger, exceeding, perhaps, 100 acres. Labourers on these farms are usually cottiers, who pay for their small slips of land by working for the principal lessees, who also supply them with other articles, but generally at an exorbitant price.—(*Curwen's Letters on Ireland*, vol. i. p. 221.) This part of the country used formerly to import grain; but such is no longer the case. On the contrary, the exports of corn, butter, and provisions from Londonderry, Coleraine, &c., are, at present, very considerable, and rapidly increasing. Large districts in the north of Ireland now produce very good wheat, that were formerly considered quite unsuitable for its growth.

3rd. The third district comprises Sligo, Mayo, Galway, Clare, Leitrim, and parts of Roscommon and Longford. In parts of this district, spade culture is extensively pursued; but the land is mostly cultivated by the common plough of the country, the improved Scotch plough being used only on the farms of a few improvers. The barbarous custom, long since prohibited by statute (*Leland's Hist. of Ireland*, vol. ii. p. 486) of yoking horses and cattle to the ploughs by the tails, is said by Mr. Wakefield to have been practised to some extent in Roscommon so late as 1811; but it would appear, from the statements of Mr. Weld, to be now wholly abandoned.—(*Survey of Roscommon*, p. 654.) Oats form the principal crop; but wheat and barley are both pretty extensively cultivated. A large extent of land is leased to several persons jointly, according to the village or *run-dale* system; but this pernicious practice is gradually decreasing, and has been eradicated on some considerable estates. It is quite the reverse, however, with the *con-acre* system.—(See *antè*, p. 378.) This ruinous practice has spread itself, in the course of the present century, over the whole province of Connaught, and is every day extending its ravages. When old grass land is let on the *con-acre* plan, it is usual, if it be very rich, to begin by planting potatoes on the grass; but the far more common practice is to prepare for potatoes by paring and burning the surface, and spreading out the ashes as manure. In either case, the potato crop is followed by four, five, or it may be ten or a dozen, corn crops in succession, till the land be reduced to a *caput mortuum*, when it is left to be recovered by the *vis medicatrix naturæ!* An intelligent witness, examined by the Agricultural Committee of 1833, stated that, when he left Mayo, "the country appeared as if *it were all on fire!* I should say that *a fifth part of the surface of the county is either burning, or is now covered with ashes.* I really do not think I am out of the way in saying a fifth."—(*Evidence of Thomas S. Linsay, Esq.*) No country was ever subjected to such abusive treatment; and we have already seen (*antè*, p. 391) that it does not appear to have been materially, if at all, varied in the interim. The burning of land has,

it is true, been prohibited under severe penalties by the legislature, and it is, also, opposed by many landlords; but, despite every obstacle, the practice continues to maintain its ground. Mr. Glendinning, agent for the Marquis of Sligo and other great proprietors, stated in his evidence before the Commissioners on the Occupation of Land, that "the burning even of the best lands, *the sod first, and then the clay*," was a common practice. "We do," he added, "our best to prevent it; but the tenants are so poor, the farms so small, and the process at law so expensive, that it is only in a very few cases we are able to enforce the penalty."—(*Evidence*, Part II., p. 414.) Mr. Dutton condemns, in severe terms, the indifference of most landlords of Galway as to the condition of the tenants and cottiers on their estates; but we regret to say that this indifference is not confined to this county, or even to the province of Connaught.—(*Dutton's Survey of Galway*, p. 340.) Mr. Wakefield says that the following extract from Dr. M'Parlan's account of the tillage of Leitrim exhibits a faithful picture of the general cultivation of Connaught in 1810. "The mode of culture is with a long narrow spade, commonly called a *loy*. This machine they prefer to ploughs, and assign many reasons for doing so. The hills, of which nearly the whole country is composed, are very steep, beset with stones, and, notwithstanding the soil being generally gravelly, so tough and retentive of wet as to render ploughing objectionable. They also complain of a scarcity of horses; but, above all, they assign, as a peculiar inducement, the abundance of crop produced by the loy culture, compared with that of the plough. In some of the more level parts, ploughing is in practice; and in some others they unite both, first ploughing, then mincing and dressing with the loy. The soil being in general of the stiff argillaceous kind, wherever it is so, the potatoes are planted by dibbling with the *steeven*. In a few places they plant by spreading the oats on the dung or green turf, and then digging up the furrows; and in still fewer places, near the sea, where the soil is light and friable, they plant the potatoes by drilling with a one-horse plough, particularly in stubble and old potato ground. From the middle of April to the middle of May is the common time of planting potatoes, and very little earlier that of sowing oats; as the coldness, the clamminess, and wetness of the soil require the vegetative inspiration of heat to be productive. The manner of preparing the soil for oats is censurable, particularly when it is seldom ploughed; but even when prepared with the loy, it is seldom sufficiently worked or minced; for, after sowing the seed and harrowing, which is often done here by trailing green bushes along the ridges, the whole banks of these ridges remain unbroken, and the vegetation appears as if the ground had been drilled, or the seed dibbled in irregular ranges."—(*Survey of Leitrim*, p. 25.) This paragraph was written five and thirty years ago; but it is seen from the evidence collected by the Commissioners of Poor Inquiry and of Land Occupation, that but little improvement has been effected in the interim. The land is usually foul and overrun with weeds; and, except in a very few instances, there is no rotation of crops. The custom still is to take one or two crops of potatoes; and to "follow them up by as many successive crops of oats as the land will produce," leaving it to recover,

as it best may, from the state of exhaustion to which it is reduced.—(*App.* F, *Poor Inquiry*, pp. 357-369.) The burning of land is, also, quite as common here as in Mayo. "It prevails to a very great extent; several of the small farmers have no other means of manure, and almost all occupiers burn more or less every year."—(*Evidence of Lindsey Burchell, Esq., before Land Occupation Commissioners*, Part II., p. 246.)

4th. The fourth district comprises Limerick, Kerry, Cork, and Waterford. Pasturage is more attended to in most parts of this district, particularly in Limerick, than tillage: the latter, though improving, is still in a very rude state. Land, especially in the southern parts of Cork, much subdivided, tillage farms very small, and much work done with the spade. Speaking of this county, Mr. Townsend says: "The size of farms admits all the variety that can be found in a country where none are large. The generality of those held by a single farmer are small; such as exceed 30 acres are often held in partnership. This species of tenure is further promoted by their common law of inheritance, which divides the land of the father among his sons. So much are they attached to this apparently equitable law, that, in case of joint tenants, they never take advantage of survivorship, but suffer the father's part to go to the sons. In consequence, subdivisions are every day multiplying, and little farms becoming still less."—(*Survey of Cork*, vol. i. p. 255, and 206.) The Subletting Act gave a check to this baneful practice; but it appears, from the evidence taken before the Commissioners on the Occupation of Land, that, despite the efforts to prevent it, the custom is still very prevalent. The system of agriculture, if we may so term the torture to which the soil was subjected, used to be as bad as possible. "Potatoes engross the whole manure of the little farmers, as well as the whole of their labour. Corn follows corn, as long as the ground is capable of producing it, after which it is left in a state of entire exhaustion to be recruited by the benignity of nature. Nothing is more common than to see, on land of good natural quality, crops not worth even the little labour that has been expended upon them. In the culture of oats, and sometimes also of barley, the whole process often amounts to no more than scattering the seed on the stubble, and ploughing it in.—(*Townsend's Cork*, vol. i. p. 207.) But though still very bad, considerable improvements have been effected within these few years in Waterford and other parts of this district. Scotch ploughs, carts, &c., have been pretty extensively introduced. Clover has, in some parts, got into general use; but turnips are only raised in small quantities by gentlemen; and the land is not half cleaned. The common Irish cow is the general dairy stock. It is said to yield a large supply of butter, but does not fatten easily, or to a large size. Some of the best English breeds have, however, been introduced; and most part of the principal dairymen keep English or half-bred bulls. Pigs of an improved species are very generally met with.—(*App.* F., *Poor Inquiry*, p. 416, &c.) Some estates in Cork are much better managed than others; and within the last twenty years the system of furrow draining has been introduced, and some material improvements have

been made in agriculture, and in the implements by which it is carried on.

5. The fifth district includes part of Tipperary, with Queen's and King's Counties. This is, perhaps, the best farmed district of Ireland. Still, however, a systematic course of husbandry is only pursued on the estates of a few proprietors, who employ Scotch and English stewards, and by a few of the larger class of tenants. The system followed by the great mass of occupiers may be still truly described as "wretched." Turnips are seldom met with; and one or more crops of potatoes, followed by successive corn crops, continues to be the prevailing practice. The stock of cattle has, however, been a good deal improved by the introduction of short horns and other English breeds. Improved implements are also in general use. The competition for small holdings is excessive.

6th. The sixth district comprises Wexford and part of Wicklow. Beans are here sometimes introduced; but they are mostly sown broadcast, and are seldom hoed. Ploughing is still sometimes performed according to the old method of the country; but improved Scotch ploughs, drawn by two horses, have been introduced, and will, it is to be hoped, at no distant period, supersede all others. In parts of Wicklow, the dairy system is generally introduced. The dairies vary in extent from 5 to 20 cows, and there is the greatest discrepancy as to the mode of their management. Very frequently there is a great want of cleanliness. The breed of cattle has been improved by the introduction of the Teeswater and other English breeds. The sheep kept on the Wicklow mountains have also been improved by crossing them with Cheviots, &c. (*Appendix* F., *Poor Inquiry*, p. 388.)

7th. The seventh district includes the northern part of Kilkenny, Kildare, the cultivated parts of Westmeath, Meath, and Louth. Tillage farms generally small. In Kildare, where they are largest, they vary in some places from 50 to 200 acres; but in many parts they do not exceed from 5 to 20 acres. There is a great deal of very fine land in this district, and wheat is largely cultivated. Clover has been introduced, but too frequently it is sown upon land that is foul and exhausted. The turnip culture has also been introduced, but not to any considerable extent, and only on farms occupied by proprietors and the superior class of tenants. The system of agriculture is still, in fact, backward to a degree not easily to be imagined. "There is almost a total neglect of anything like a regular rotation of crops. It is lamentable to see in many parts of Meath, in the neighbourhood of Trim, where there is an excellent wheat soil, the ruinous system of rotation followed. The land is cropped successively with corn till it is exhausted; then, when it becomes a hurdle of couch grass and weeds it is summer fallowed. If the season is favourable, that is, very dry, the land may be got into a good state for wheat; but if the season be unfavourable and the fallow neglected, it gets into the worst possible state. In Westmeath, all round the neighbourhood of Mullingar, where the soil is not naturally a wheat soil, there the system is still worse. They corn-crop till the land is exhausted; and then leave it to nature to recover as well as it can." (*Evidence of Patrick Lacy*,

Esq., before Commissioners of Land Occupation, Part III., p. 664.) In the barony of Kells, in Meath, a small tenant, who was remonstrated with by a Commissioner of Poor Inquiry, on the foul state of his crops and grass land, answered that the rag-weed and thistles sheltered and improved the grass; and that were he to pull the weeds from among his potatoes, the wind would break their stalks, and they would be injured! (*Appendix* F, p. 382.) Now it is material to observe, that there is nothing peculiar in this speech. It is difficult, indeed, to say, whether it evinces more of ignorance or of laziness; but such as it is, it embodies the opinion, and explains the practice, of at least nine-tenths of the small occupiers of Ireland. Still, however, there are clear evidences of amelioration even in this district. Improved ploughs and carts are very generally met with; though in some parts, the old plough of the country, drawn by 4 or 5 horses, and doing less work than the improved Scotch plough, and at more than double the cost, still keeps its ground. The system of planting potatoes in lazy beds has, in many parts, been superseded by the drill; turnips have been introduced; and the quality of the corn and cattle brought to market is better than at any former period. Rents here, as everywhere else in Ireland, are very high. This is owing to the demand for land created by an excessive population, who, not being half employed, could not exist without a patch of land on which to grow potatoes.

Mr. Wakefield gives the following table of the average produce per acre of the above nine districts:—

Districts.	In Pounds Avoirdupois.										In Gallons.	
	Wheat.		Bear.		Barley.		Oats.		Potatoes.		Flax	
	Seed	Prod.	Seed.	Prod.	Seed.	Prod.	Seed.	Prod.	Seed.	Prod.	Seed.	Prod.
1st district	224	2,272	203	3,500	209	2,682	333	2,636	2,302	22,248	80	785
2nd district	171	2,135	..	..	203	2,946	291	3,227	1,883	15,183	..	..
3rd district, no return	..	..	..	..	..	..	..	..	..	..	..	..
4th district*	233	2,024	196	3,364	244	2,765	308	2,749	2,144	22,289	..	..
5th district	243	2,537	261	4,490	249	3,024	296	2,970	2,592	24,328	..	972
6th district; the returns, being according to the English acre, are not taken into the average†	..	..	..	..	..	..	..	..	..	..	..	..
7th district	232	1,857	187	3,131	173	2,828	310	2,265	2,660	22,358	..	..
8th district	186	2,020	..	..	296	2,614	368	2,606	2,682	21,140	..	696
9th district	297	2,353	211	3,494	246	3,235	361	3,003	2,689	27,113	..	824
Average produce in Winchester bushel, per Irish acre	3·38	33·6	4·01	69·2	4·4	54·6	8·4	72·4	..	..	..	..
Average produce in Winchester bushel, per Imperial acre	2·086	20·74	2·47	42·7	2·71	33 7	5·18	44·5	..	..	..	..

* We have joined this district with the 2nd. † We have joined this district with the 5th.

We have no doubt, that the produce of oats and barley is overrated in this table; but whatever it may have been when it was framed, the average produce of the country, particularly of wheat, has certainly increased in the interval.

V. *Crops.—Wheat.*—In consequence of the moisture of the climate, and the practice of the cultivators, oats are a more suitable crop for most parts of Ireland than wheat or barley, and they are raised to a much greater extent than either or both of the latter. Wheat, however, is grown in considerable quantities in most parts of the kingdom,

but especially in the eastern counties. But, if we take the importation of wheat from Ireland into England as a test of the extent of its cultivation in the former, it would appear to have considerably diminished of late years; the average imports of Irish wheat and wheat-flour into Great Britain, during the three years ending with 1834, having amounted to 804,669 quarters a-year; whereas they only amounted to 544,243 quarters a-year, during the three years ending with 1845. Some portion of this falling off, may perhaps be ascribed to the greater consumption of wheat in Ireland; but there can be no doubt, that it is principally owing to the growing (and we believe, well-founded) conviction, that the cultivation of oats, is more profitable than that of wheat. Though a good deal improved, Irish wheat is still, for the most part, coarse and inferior in quality, not yielding so much saccharine matter by from 10 to 15 per cent. as average English wheat. Mr. Newenham says, that the badness of the seed is the principal cause of its inferiority.—(*Natural and Political Circumstances of Ireland*, p. 314.) Wheat is generally sown after potatoes or fallow.

Barley, Oats, &c.—Barley is not very largely cultivated. It is commonly sown after potatoes. Of all the species of grain, oats is by far the most extensively raised: it is believed that, throughout the kingdom, there are at least *ten* acres of oats for *one* of any other corn crop, and their culture is rapidly extending. Irish oats are inferior to the English, but their quality has recently improved. Potato oats have been generally introduced; though, in the mountainous districts, black oats continue to be the favourite species. The latter have, also, been extensively grown of late years in the lower parts of Waterford, and other counties; in consequence, it is said, of successive failures of the crops of the potato oat.—(*Appendix* F, *Poor Inquiry*, p. 415.) The exports of oats and oatmeal from Ireland to England have increased with unprecedented rapidity. This is evident from the table of the imports of Irish corn into Great Britain (see *post*), which shows that, while during the three years ending with 1813, they only amounted to 452,628 quarters a-year, they had increased, at an average of the three years ending with 1845, to no fewer than 2,414,775 quarters.

The Potato is, however, the distinguishing and peculiar crop of Ireland, and has contributed not a little to place her in the singular position she now occupies. The soil and climate are extremely well suited to its growth; and the country is celebrated as well for the excellent quality, as for the extraordinary quantity of the potatoes raised in it. They are grown on every species of soil, mostly in lazy beds, and rarely, except in some of the eastern counties, in drills. The produce is from about 800 st. to 1,000 st. an acre, at 21 lbs. the stone; that is, from 16,800 to 21,000 lbs.—(*Wakefield*, vol. i., p. 406.) The greatest attention is paid to the culture of potatoes. "The potato is the only produce the cottier reserves for himself. All the rest—cattle, corn, butter, pigs, poultry, and eggs—go to the landlord. As long as the potato lasts, he and his family have abundance. They thrive under it, and with plenty of ventilation, enjoy good health, and have the cleanest skins in the world. But if the crop fail, or the season should prove unfavourable for preserving it, the months of April and May are

trying seasons; then it is they are driven to subsist upon weeds, fevers spread, and the utmost distress prevails."—(*Ireland and its Economy, by I. E. Bicheno, Esq.*, p. 21.)

Flax and Hemp.—The first of these is extensively cultivated, especially in Ulster. There were, according to Mr. Crosthwaite, (who is quoted by Dr. Kane,) about 100,000 acres under this crop in all parts of Ireland (in 1843), the total produce being about 30,000 tons, worth, at an average, 50*l.* per ton.—(*Kane*, p. 314.) Its culture, owing, perhaps, to the withdrawal of the bounties, declined subsequently to 1815; but, since 1830, it has largely increased, particularly in Down, Antrim, and Derry. The culture of hemp, which was never very considerable, is now totally abandoned.

Turnips.—The turnip culture has made but little progress, though it has been introduced into all the best-farmed portions of the country.

The *indigenous grasses* of Ireland are not of any peculiar excellence. Notwithstanding all that has been said of fiorin grass, its superior value and utility may be questioned. Hay is seldom obtained from sown grasses, and consists generally of the spontaneous produce of the soil. Mr. Newenham, in his *View of Ireland*, (p. 314,) published in 1809, doubted whether there were then so many as 10,000, or even 5,000, acres under clover in the whole island! Latterly, however, it has been cultivated to a much greater extent.

There are few live hedges in Ireland; in the limestone districts, stone walls, and in other places turf banks, are the usual fences.

VI. *Grazing.*—Most parts of Ireland are admirably fitted, as well by the humidity of the climate as by the nature of the soil, for grazing. In this respect, she is as incontestably superior to Great Britain, as she is inferior to the latter in her corn-growing, or rather corn-ripening, capacities. As previously stated, this peculiarity was remarked by Pomponius Mela, "*Cæli*," says he, "*ad maturanda semina iniqui, verum adeo luxuriosa herbis, non lætis modo, sed etiam dulcibus, ut se exigua parte diei pecora impleant.*"—(Lib. 3, cap. 6.) * And Boate, whose accuracy is unquestionable, says, that "although Ireland, almost in every part, where the industry of the husbandry applieth itself thereto, bringeth good corn plentifully, nevertheless hath it a more natural aptness for grass, the which, in most places, it produceth very good and plentiful of itself, or with little help."—(*Natural History of Ireland*, Lond., 1652, p. 88.)

Even the mountains of Ireland yield, for the most part, a good deal of herbage, and are, in this respect, very superior to most of those of Scotland and Wales. Horses are bred on the mountains of Mourne; and immense droves of cattle in the mountainous districts of Galway, Kerry, &c. Arthur Young affirms, that on Macgillicuddy's Reeks, "which is the wildest and most desolate region in Kerry, sheep are fattened better than on the low grounds."

But, notwithstanding this superior adaptation of the land for pasture, the proportion in grass has been rapidly diminishing since 1784. This

* Mela adds a circumstance, which, though fabulous, shows the high opinion entertained in antiquity of the richness of the Irish pastures. "Se exigua parte diei pecora impleant, et *nisi pabulo prohibeantur, diutius pasta dissiliant.*"

has arisen partly from the stimulus given to cultivation by the Bounty Acts that were then passed; partly from the very high prices that corn bore during the greater part of the war; and partly, and principally, from the extraordinary demand and high rents given for small patches of land. It was thought by many that the passing of the Subletting Act would check the extension of tillage; but hitherto it does not seem to have had that effect; and in Connaught and other districts it is rapidly increasing. There can, however, be no doubt that a diminution of tillage, and an increase in the quantity of land in pasture, would be one of the least equivocal symptoms of an improvement in the rural economy of the country.

Irish cattle consist principally of two leading varieties—middle and long horns. The first are found principally in Kerry, Mayo, and, generally, in all the mountainous and rugged parts of the country. They are small, and not very well shaped, hardy and wild, with long coarse hair; in some places they are black, in others brindled: when removed from their native mountains to a better soil and climate, they fatten with the rapidity of the Welsh and Highland cattle. They are generally good milkers.

The other, or long-horned breed, is found in all the low and level tracts of Ireland, but principally in Tipperary, Limerick, Roscommon, East and West Meath, &c. They are much larger and heavier than the others; but mostly coarse and ill-shaped, with thick hides and enormously long curved horns, the points of which are mostly turned inwards. Latterly, however, they have, in many districts, been very considerably improved by crossing with improved breeds from England. Attempts have also been made to introduce the improved Teeswater, or short-horned, breed into Ireland. Owing to the richness of the soil, its extraordinary aptitude for grazing, and the extent (which, though now much reduced, is still very considerable) of land in pasture, cattle and beef have always formed prominent items in the list of Irish exports. Such, however, was the ignorance of commercial principles, and the jealousy of Ireland formerly entertained in this country, that, in 1666, the importation of Irish cattle, sheep, and swine, and of Irish beef, pork, and bacon, was declared to be a "common nuisance," and absolutely prohibited! The redundancy of lean stock, occasioned by this proceeding, first lowered their price, and eventually that of fat cattle, so as to give rise to a brisk foreign demand for Irish salted provisions. The navy of France used to be victualled from Cork, and was thus, in fact, supplied with British beef cheaper than the British themselves!—(*Newenham's View*, p. 108.) This unjust and absurd prohibition was repealed in 1759, and Irish lean cattle and beef have since been largely imported into Britain. But of late years, or since the introduction of steam navigation, it is usual to fatten cattle in Ireland before sending them to England; and Liverpool and Manchester are, at this moment, principally supplied with Irish beef.

Dairy.—The dairy, though in a backward state, is probably the best-managed department of Irish husbandry. Large portions of Kerry, Cork, Waterford, Carlow, Meath, Westmeath, Longford, and Fermanagh, as well as the mountains of Wicklow, Leitrim, and Sligo, are occupied by dairy farms. Butter is the chief produce. The

average number of cows on a dairy farm varies from 5 to 30; two acres of land, of middling quality, are deemed necessary for the subsistence of a cow; and the annual yield of butter may be estimated at 160 or 170 lbs. a-head. Cows of the native breed are the common dairy stock; but Ayrshire and other British breeds have been introduced. The quality of the butter differs materially. The best is said to be made in Carlow and Waterford, the worst in Limerick and Meath. These differences may in part, perhaps, be ascribed to differences of soil and pasture; but there can be little doubt that they are mostly ascribable to differences of management. This, though improved, is in many parts very defective, there being frequently an extreme want of cleanliness and attention. Besides what is sent to England, Irish butter is exported to the East and West Indies, Portugal, &c. That offered for sale was formerly inspected and branded by public officers appointed for the purpose; but this was found to be rather a protection to, than a security against, fraud; and the regulations have been advantageously abolished within these few years.

Sheep.—Roscommon, Galway, Clare, Limerick, and Tipperary are the chief breeding counties for sheep; and Galway, Clare, Roscommon, Tipperary, and Meath, those where they are fattened. With the exception of those in the mountainous districts of the country, Irish sheep are mostly long-woolled and very large. Mr. Culley, the famous English breeder, having attended the great cattle and sheep fair at Ballinasloe towards the close of last century, pronounced the Irish sheep to be the ugliest he had ever seen; affirming, moreover, that "they were almost in every respect contrary to what well-formed sheep should be." (*Culley on Live Stock*, p. 166.) Since then, however, a great change for the better has been effected in the character and appearance of the Irish sheep, by the importation of improved new Leicester rams* from England, and by the judicious selection and crossing of the native breed. "The improved stock struggled," says Mr. Youatt, "against prejudices and difficulties of every description, and at length completely triumphed. The bad and unsightly points of Mr. Culley disappeared one by one. The sheep became smaller, but more compact, and nearly or quite as heavy; more of them could be kept on the same space of ground, and they came to maturity 12 or 18 months sooner than they had previously done. They gradually spread over the whole of Ireland. A few of the short-wools were left, maintaining with them an unequal conflict; but every long-woolled breed was changed, ameliorated, or totally removed from the land; and the Irish sheep that are now brought so plentifully to the English market will scarcely yield to the best improved Leicesters that any part of Great Britain can produce. The fleece weighs from 6½ lbs. to 7 lbs., and the hoggett fleece from 5 lbs. to 5½ lbs."—(See Mr. Youatt's excellent work on *Sheep*, p. 351.) But

* In 1800 an incident happened singularly characteristic of the way in which improvements are welcomed in Ireland when they have nothing factious or quackish to recommend them. Mr. Cossan, a farmer near Tipperary, having hired one of the improved English rams, the animal had its throat cut the night after it arrived at his house! Had he brought a ploughman from East Lothian, a dairy-maid from Ayrshire, or a bailiff from Lincolnshire, the result would most likely have been the same.—(*Youatt*, p. 350.)

for the unfortunate prevalence of the small-farm system in Ireland, there can be little doubt that the breeding and fattening of sheep would become an important employment.

Hogs are in Ireland a very important stock; and yet the old Irish breed is about the worst that can be imagined, being long-legged, thin-sided, lank, haggard, and most unprofitable. Latterly, however, they have, in some districts, been crossed with the Berkshire and other improved English breeds, and have consequently been a good deal improved. "I have often," says Mr. Wakefield, "been at a loss to account for the number of pigs which I everywhere saw around me, not being able to discover where they could be bred. But it is to be observed that the pig is an inmate of every Irish cabin, and remains there for a considerable time: the hog, indeed, is as much a domestic animal in Ireland as the dog, and becomes so habituated to the warmth of the cottage that it seldom strays far from home."—(*Account of Ireland*, i. 254.) But hogs seem, in many parts of Ireland, to be now giving place, as cottage inmates, to goats. The latter are still more easily kept than pigs, and are particularly useful, by furnishing a considerable supply of very nutritious milk.

Large quantities of bacon and hams are cured in Ireland, and exported to England. They are comparatively coarse and ill-flavoured, but proportionally low-priced. Their inferiority results partly from the bad feeding of the animal, and partly from the want of proper skill and attention in the process of curing.

"The cow, the pig, the goat, the turkies, of which large numbers are raised," says Mr. Bicheno, "are as much a part of an Irish cottier's family as the children. They grow up together, eat of the same meat, drink of the same cup, and lie on the same bosom. The ordinary answer, when you remonstrate with them about these intrusions, is now, as of old, 'And sure hav'n't they a right, for don't they pay the rint?'"—(*Ireland and its Economy*, p. 32.)

VII. *Causes of the depressed State of Agriculture in Ireland.*—To enter fully into this inquiry would require a very long essay, or, rather, a pretty large volume. We shall, therefore, content ourselves with noticing a few only of those circumstances which seem to have had the greatest influence.

Law as to Leases—Division of Land.—We have already remarked that in England leases are regarded as personal property, and that they may be assigned by the individual in occupation, unless a special provision be made to the contrary. Peculiar circumstances, at the head of which must, perhaps, be placed the institution of the poor laws, have contributed to prevent this law from having any very injurious operation in England; but in Ireland, to which it also applies, these circumstances have not existed; and it has been productive of the most mischievous effects. It was customary among the Irish, from the earliest period, to divide all sorts of property, freehold as well as leasehold, equally amongst their children.* But as most part of the property of Ireland has, first by conquest, and subsequently by forfeiture, come into the hands of English families, estates have been exempted from the operation of this system. It has, however, continued to prevail

* *Davis's Discoverie of the True Causes, &c.*, p. 172, ed. 1747.

among the occupiers of the land, whose farms have been usually divided, sometimes during their lives, or at farthest at their death, amongst their sons; and it not unfrequently, also, happens that the daughters are portioned by assigning patches of land to their husbands.—(See *ante*, p. 379.) And this, combined with the stimulus given to the splitting of farms by the Bounty Acts, and the increased demand for corn, and by the desire to multiply freeholders, without being countervailed by the operation of a compulsory provision for the poor, led, as already stated, to that minute subdivision of the land, and excess of population, that now prevails everywhere in Ireland.

We believe, too, that this system, how different soever in its ultimate results, was at the outset by far the most profitable. Where land is occupied by tenants possessed of capital, and farming for a profit, it always fetches more rent, all things considered, when divided into considerable farms than when split into minute portions. But in Ireland, land has been sought after, not as in England and Scotland, as a means of carrying on an advantageous business, but to enable the parties to exist; and such has been the competition for small patches, that their occupiers have always been ready to pay as rent all that they would furnish above what was required for their own scanty subsistence. The rents promised under a system of this sort were frequently much larger than could have been afforded by tenants possessed of capital. This advantage, however, as might easily have been foreseen, could only be temporary. There were no means, except by fresh subdivisions of the land, for providing for the increased population such a system was sure to call into existence; and, owing to this, the whole produce of the soil has become in many places inadequate for the support of the paupers hutted upon it; and even where matters have not attained to this extremity, a deficiency in the crops of oats or potatoes never fails to disable a large proportion of the occupiers from paying their rents.

Other circumstances conspired to render this system universal. Had the landlords let their estates in tillage farms of moderate extent, it would have been necessary for them to expend considerable sums in erecting suitable buildings and accommodations. But this is a sort of outlay to which they have been always exceedingly averse; and upon which, indeed, with few exceptions, they have not, till very recently, expended a single shilling. The confiscations by which most of them originally acquired their estates, and the sudden revolutions to which property in Ireland was for a long time subject, generated feelings in their minds, and gave rise to systems of management, that have continued to exert a powerful influence long after the remembrance of the circumstances in which they originated might have been supposed to be effaced, or the circumstances themselves were entirely changed. From the first invasion of Ireland by the English in the reign of Henry II. down to the accession of George I., or rather to the suppression of the rebellion of 1715, the estates of Englishmen in it were held by a very insecure tenure, and were looked upon as a species of property of little prospective value, and useful only as the source of immediate supplies. Hence the origin of that deep-rooted disinclination, already alluded to, amongst the landlords to make any outlays that could be avoided, and their indifference as to the influence

of any measures over the future condition of their estates, provided they were immediately productive. The landlords of Ireland are neither better nor worse than those of England. The different circumstances under which they have been placed explains the differences in their conduct, and made them pursue a policy not less ruinous to their own interests than to those of the public.

Never feeling completely satisfied in regard to the security of their property, looking upon their tenants more in the light of hostile savages, whom it would be absurd to conciliate, than of rude dependents who might be attached by just and liberal treatment, ignorant of their language and habits, and despising or persecuting their religion, it was not in the nature of things that the landlords could feel much interest in the improvement of their estates, or in the condition of their tenants. Both parties looked only to immediate gain, and dealt with each other precisely as they would have done with Russians or Hindoos. Thus it is that "almost every proprietor in Ireland is a *trader in land.* He has never been in a situation to command opinions, or to feel the consequence this position imparts to the possessor, and therefore treats his land simply as an article of profit. Hence he resorts to methods of letting which are ruinous to the tenant, and, in the end, will be ruinous to himself. He lets by auction and tender, and encourages secret biddings; and as competitors have never been wanting in a country where the occupation of land furnishes the only employment, and the population presses so hard upon subsistence, he has never felt much restraint upon his cupidity. The necessity of holding land has existed to so great a degree, that the rent which the land would not pay has been derived from other sources, such as an illegal still, a little home-made linen, the earnings of labour from the landlord at a low price, and sometimes from savings acquired in England. Many proprietors have been known, and, indeed, they but thinly disguise their intentions, to favour smuggling, that they might obtain better rents."—(*Bicheno's Ireland and its Economy*, p. 123.)

It is but justice to observe that, though the Irish landlords had been aware of the pernicious consequences that were to result from parcelling estates, and disposed to prevent it, the task would have been exceedingly difficult. It was to no purpose to insert in the lease of a farm clauses prohibiting its being subdivided or sublet. The courts were hostile to such limitations; and instead of the forfeiture of the lease following its infraction, it was merely sent to a jury to assess damages; which, when they were given, were little more than nominal. In consequence of this vicious system, it frequently happened, as has been previously seen, that farms let to single tenants for a moderate term of years, were occupied at its expiration by some 20, 30, or 50 tenants, whom it was all but impossible to eject!

Subletting Act.—But, notwithstanding the circumstances now mentioned, it is obvious, had the majority of the landlords been alive to the consequences of their conduct, or had they been compelled, by means of a poor law, to provide for all who obtained a settlement on their estates, that they would, being a decided majority in parliament, have early altered the law as to the succession to farms, and obliged the courts to give effect to the conditions in leases. But, with very few

exceptions, they seem to have entertained no doubts as to the soundness of their policy, and had the infatuation to believe that they should be able to squeeze exorbitant rents out of multitudes of starving tenants. At length, however, the evil of subdivision and of a redundant population became so obvious and pressing as to arrest the attention of most landlords, who discovered, when it was too late, the signal error they had committed in allowing their estates to be split into minute portions. The disfranchisement of the 40*s.* freeholders, in 1829, took away one of the principal motives to subdivide estates; and some even of those who had been among the principal patrons of the practice became suddenly impressed with the conviction that, unless an effectual stop were put to subdivision in future, the whole country would be frittered down into potato gardens, and that it would be impossible to collect any rent. Under the influence of this feeling, the legislature passed the Subletting Act, by which the underletting of farms was prohibited without the landlord's consent in writing, and which also granted him a summary process for redress. The Irish demagogues raised a loud outcry against this Act; but, whatever may be thought of the conduct of some of those by whom it was approved, it was a highly proper measure, and has been productive of the greatest advantage.

Unfortunately, however, there is a large extent of Ireland to which the provisions of this Act do not apply. A great deal of the country is let on perpetual leases, the landlords having no other interest in the estates than the receiving their quit rents: a good deal, too, of that part of the country which is let on terminable leases, has been let for the lengthened periods of 3 lives, or 31 years. Under such circumstances, it is clear that any practical change in the nature of the tenures under which Irish farmers hold their lands can only be introduced slowly; and the result has shown that the apprehensions of those who feared, or affected to fear, any sudden shock to established practices and systems, by the introduction of the Subletting Act, were ill-founded.

Eviction of Tenants.—But the difficulties now alluded to in the way of the consolidation of farms are not the only, nor even the most formidable, with which proprietors have to contend. The possession of land is in Ireland, with the great bulk of the population, the *sine quâ non* of existence. It is, therefore, clung to with desperate tenacity; and those landlords who proceed to eject occupiers from their estates, and the parties by whom they are succeeded, usually become the objects of the most implacable vengeance. Hence the astounding prevalence of assassinations in Ireland. These, in almost every instance, originate in circumstances connected with the occupation of land; they are not, however, the results of the sudden impulses of passion; on the contrary, they are carefully discussed, planned, and deliberately carried into effect; and are applauded by the populace, who think that the case of the avenged parties to-day may be their own to-morrow. "If," say the Commissioners of Land Occupation, "a tenant is removed, even after repeated warnings, from land which he has neglected or misused, he is looked upon, in the districts to which we are now referring, as an injured man, and the decree too often goes out for ven-

geance upon the landlord and the agent, and upon the man who succeeds to the farm; and at times a large numerical proportion of the neighbourhood look with indifference upon the most atrocious acts of violence, and, by screening the criminal, abet and encourage the crime. Murders are perpetrated at noon-day, on a public highway; and whilst the assassin coolly retires, the people look on and evince no horror at the bloody deed." This is a fearful state of things, and one which is not easily grappled with. We have the firmest conviction that the too great subdivision of the land is the grand evil under which Ireland labours, the cause of a very large proportion of the want of employment, idleness, and misery, which is everywhere prevalent; and, if we be right in this conviction, it follows that whatever tends to lessen this subdivision must be, in so far, advantageous. On the other hand, however, the destitution of the cottiers, ejected from their little patches of land, is a circumstance that should not and will not allow itself to be forgotten. So long as numbers of people are deprived of their accustomed means of subsistence, without any resource on which they may fall back being provided for them, so long will outrage and assassination afflict and disgrace the country. Such being the state of the case, it is plain, if we would not, on the one hand, obstruct that consolidation of the land into larger occupancies, which gives the only real chance for the permanent improvement of Ireland, nor, on the other hand, drive the peasantry to despair, that a middle course should be taken. Ireland is not a country in which the rights of property can or should in all cases be exercised as they may be exercised in England. In it the *summum jus* may sometimes differ but little from the *summa injûria*. The private interest of a landlord and the public interest might, perhaps, be both promoted by the ejection of some 200 or 300 cottiers from an estate; but it is not enough to warrant this being done that such is the fact, and that their ejectment, as the law now stands, would be strictly legal. The question, what is to become of the outcasts? is not to be lost sight of. If they be moderately well off, or in a condition to emigrate, or to support themselves till they may reasonably expect to find employment elsewhere, there appears to be no ground for interfering in their behalf. But if, as usually happens in Ireland, the reverse should be the case, if the ousted cottiers be poor and destitute, it is the bounden duty of the legislature to interfere, and to prevent such an exercise of the rights of property as must necessarily be productive of all sorts of crimes and disorders.

Perhaps, on the whole, the better plan would be, in the event of the eviction of cottiers and small occupiers, to make it imperative on the landlords to allow them sums, to be determined by the extent of the patches of land which they occupied. Thus, for example, the occupier of a patch of an acre or under might, on being ejected, be entitled to get 3 or 4 years' rent; the occupier of a patch of from 1 to 5 acres, 2 or 3 years' rent, and so on. By adopting some such plan as this, a resource would be provided for the outcasts, and the landlords would be able to effect that consolidation of small occupancies which is so necessary, without driving the occupiers to despair, and subjecting themselves and their agents to the risk of assassination.

No doubt, also, were able-bodied parties out of employment, or

unable to provide themselves with subsistence, allowed to claim public relief, the stimulus to agrarian outrages would be materially diminished, and a more advantageous allotment of the land very greatly facilitated.

Absentees.—Middlemen.—Those even superficially acquainted with the history of Ireland are aware that more than four-fifths of its surface have been forfeited at various times, particularly under Cromwell and William III. The estates so forfeited were, for the most part, assigned to English noblemen and gentlemen, or to English incorporations. It was not to be expected that such parties should leave their own country to reside in Ireland; and, owing to the barbarous state of the latter, and the indifference of the new proprietors to its condition, they were glad to let their lands in large tracts to such speculators as could give them any reasonable security for the rent, allowing these to relet them in smaller portions to the inhabitants. Hence the origin of *absentees* and *middlemen*—both of them obviously growing out of the peculiar circumstances under which Ireland has been placed. These, as every one knows, have uniformly almost been reckoned among the prominent causes of her backward condition. But, without pretending to say that they have been altogether innocuous, it is abundantly certain that their injurious influence has been very much exaggerated. It would be foreign to our purpose to enter upon the disputed question respecting absentee expenditure. Our opinions in regard to it are already before the public, and nothing has occurred to satisfy us that they should be changed or in any degree modified.* We have always been ready to admit that the residence of landlords upon their properties may be, in many respects, highly advantageous. It is natural to suppose that they will be inclined, instead of spending their whole incomes in housekeeping, to lay out a part of them in beautifying and improving their estates, building houses for tenants, endowing schools, making roads, bridges, &c. It has, however, been affirmed that, in point of fact, the estates of resident Irish landlords are, in these respects, decidedly inferior to those of absentees; but without stopping to investigate the precise degree of credit due to this statement, those who consider that Scotland has quite as great a proportion of absentees as Ireland, must, we think, admit that the influence of absenteeism in depressing the latter has been very greatly overrated. It is not that many of the landlords have been absentees, but that, whether absent or resident, they have generally acted as if they had no permanent interest in the improvement of the soil, or the prosperity of the inhabitants, that the wretched condition of the population is, in great part, to be ascribed.

As to middlemen, we admit it would have been much better had they never been introduced. This, however, is merely another mode of saying that it would have been much better had Ireland never been in those circumstances that made middlemen necessary. In the situation in which the owners of Irish estates found themselves subsequently to the expulsion of James II., and down to a comparatively recent period, they seem to have had no better resource than the employment of middlemen. It is probable that their employment has

* *Edinburgh Review*, No. 85, art. 3; *Evidence before Irish Committee of* 1830.

been continued longer than necessary, it being always difficult to get rid of a system once firmly established. It is truly observed by Mr. Bicheno, that " The middlemen in Ireland, who have long leases, are, to all intents and purposes, the real and efficient owners of the estate, and have as deep an interest in the welfare of their tenants as if they were in possession of the fee. I know not that any difference exists between those estates which are in the hands of the original landlords and those which are sublet to intermediate persons. As far as I could observe, the same defects prevailed throughout, always making exceptions of certain individuals belonging to each class who had introduced a better system."—(*Ireland and its Economy*, p. 106.) Most, as it appears to us, of the mischievous influence ascribed to middlemen has really grown out of a gross defect in the law. It was not, and is not, uncommon in Ireland for 3 or 4, or more, intermediate tenants to be placed between the landlord and the cultivator of the soil; and though the latter had paid his rent to his immediate superior, from whom he acquired the land, yet, in the event of his failure, or of the failure of any other intermediate tenant, the landlord was authorized to come upon the cultivator, who was thus frequently obliged to pay his rent over again. The Subletting Act put an end to this flagrant injustice, by declaring that no landlord should be authorized to prosecute a subtenant, admitted to hold by his consent, for rent, in the event of the subtenant having made a *bonâ fide* payment of such rent to his superior. This change in the law has gone far to strip the middleman system of its most obnoxious feature; and should good order and security be ever established in Ireland, it will gradually disappear.

Partnership Tenures.—The same circumstances that gave rise to middlemen seem, also, to have given rise to the still more objectionable practice of letting lands in partnership, sometimes even to a whole village. The tenants being jointly and separately bound for the rent, it is pretty well secured to the landlord; but in all other respects the tenure is about the very worst that can be imagined. When the land is held for the purpose of grazing, it is always overstocked, and the tenants quarrel about the liberty of turning the greatest number of miserable beasts upon it. When, on the other hand, it is to be broken up for tillage, they divide it into shares; but they are so tenacious of every inch of land, and so apprehensive of being cheated, that a division is never effected without much altercation and difficulty. However small the separate portions, they do not generally lie together, but are most commonly dispersed in different quarters; so that a man having 2 acres of tillage land, may have 2 roods in coarse ground, 2 in deep, 2 in stony, and 2 in wet, if these varieties happen to occur. And even after the division is made, each of the holders is liable for the failures and deficiencies of all his neighbours; so that they are wholly divested of any portion of that security without which there can be neither industry nor civilisation! This monstrous system prevails in many extensive districts; and yet we wonder at the barbarism of the Irish.—(*Tighe's Survey of Kilkenny*, p. 418.)

Tithes have undoubtedly been far more injurious in Ireland than in Britain. This is not owing to their being heavier there than here, but

to the poverty of the occupiers, which made them feel more sensibly any burden of the sort; and to the circumstance of the great majority of them being Catholics. But tithes are now luckily placed on such a footing, that although the mass of the occupiers may disapprove of the object for which they are applied, they do not impose on them any considerable burden.

The abject poverty of the people has been said to be the real cause of the depressed state of Irish agriculture. But it would be more accurate to say, that this poverty has been a consequence as well as a cause of the depression in question. To whatever circumstances it may be ascribed, there can be no manner of doubt that the splitting of the land into minute portions has been at once the principal cause of the rapid increase and poverty of the population, and of the wretched condition of agriculture.

Improvement of Ireland.—It is alleged, indeed, that notwithstanding these unfavourable circumstances, and the unceasing agitation that prevails in Ireland, very material improvements have taken place in its rural economy during the last 20 years. And this, no doubt, is true, if reference be made to the introduction of improved breeds of cattle, sheep, hogs, &c.; and to the very general use of improved implements. But the previous statements, and those given in the Reports of the Commissioners of Poor Inquiry and Land Occupation, prove that improvements in husbandry are as yet confined to a limited number of estates and farms, and can hardly be said to affect its general character. In his tract on the poverty of Ireland (London, 1838), Lord Clements states distinctly that, "there has been no important amendment in the mode of cropping land since the days of Arthur Young. Improvements," he adds, "of other kinds may be noticed in Ireland; there are better markets and improved breeds of cattle, more mills, and better carts and ploughs, &c.; but *the course of tillage is still the same in all its essential features.* It consists simply in taking one or two crops of potatoes from the ley or grass sod, to which crops alone the manure of the farm is applied; and then taking a succession of corn crops, which follow one another without the intermission of a single season, till the powers of the soil are more or less exhausted; after which it is *let out to rest*, as the process is termed, clothing itself, for the first year or two, with weeds, and soon after, in an incredibly short space of time, with a 'skin' of self-sown grass, which goes on improving till the land is again subjected to a repetition of the same course of torture. Potatoes and corn are still the never-varying products."—(P. 24.)

The increase of the exports of raw produce from Ireland, is very generally referred to as furnishing an undoubted proof of the improvement of agriculture; and in so far as respects the increased exports of cattle, beef, butter, hogs, &c., the inference seems to be well founded. The breed of live stock has, as already stated, been generally improved, and the increased exports of animal products have been obtained, not only without any increase, but with a positive diminution of the land in pasture. But we apprehend it is quite otherwise with the increase in the exports of corn, meal, &c. It seems to be the result of an extended, rather than of an improved, system of cultivation, though

the influence of the latter must, no doubt, be felt in a few districts. "It is remarked," says Lord Clements, "that the export of grain has increased from all parts of Ireland, and very rapidly from those (Connaught) where no agricultural amendment whatever is visible; and as there is abundant evidence that the more substantial farmers do not increase their tillage, either by ploughing up more pasture or by inclosing wastes, but, on the contrary, that they are keeping more of their lands in grass, the extension of tillage must be attributed to the gradual subdivision of the farms among the poorer farmers, and to the work which has been achieved upon the bogs and mountains, which have been brought into cultivation by the same class of persons, as labourers on their own account. The inferior grain produced by the poorest cultivator is kept for home consumption, while the better description of corn is thereby spared for export to England."—(*Poverty of Ireland*, p. 27.)

No doubt, however, the facilities afforded by steam navigation, for a ready intercourse with Great Britain, are of vast advantage to Ireland. They have not only opened a ready access for her principal articles to our markets, but they are of equal or greater advantage, by affording profitable outlets for a variety of minor articles, such as poultry, eggs,* &c., that were formerly all but lost. The large sums of money that are thus brought into the country, can hardly fail to have, in the end, a marked influence over all employments carried on in it. But till tranquillity be established, and a complete check put to the subdivision of the land, the resources of the country cannot be developed. So long as the Catholics were treated as an inferior and degraded *caste*, neither tranquillity nor improvement could be rationally expected to grow up. Happily, however, this vicious policy has been wholly abandoned; and were adequate provision made for the Catholic clergy, every just ground of political complaint on the part of the Irish would be removed. What Ireland now wants, is a firm and consistent system of government, which, while it does justice to all classes, without either flattering or irritating popular prejudices, shall put down agitation, enforce the empire of the law, and give confidence to the capitalist, and to the landlord anxious to improve his estate. We are not prepared to say whether such a government can be established in Ireland without the suspension of some of those political privileges that may be safely entrusted to the people of England. But if not, they should be suspended. Security of life and of property is the one thing needful in Ireland; and were it fully established she might yet, perhaps, assume a respectable place among civilised nations; and be a stay and support, instead of a burden upon and a disgrace to England.

The future condition of Ireland must considerably depend on the conduct of the landlords. They have reaped nothing but disgrace from that which they have hitherto pursued, and it is high time that it were wholly renounced. But it is still in their power, by acting liberally and judiciously by their tenants and dependents, materially to accelerate the progress of improvement. Mr. Wakefield has made some obser-

* The price paid by England for these two articles may be estimated at from 250,000*l.* to 350,000*l.* a year.

vations on this important subject, which are so very sound and pertinent, that we shall make no apology for laying them before the reader. "Before the improvement I have in view can be accomplished, it is necessary the landholders should lay aside their former contracted ideas, and consider their tenants as fellow-men, and not as slaves born to maintain them in affluence and splendour. Such feudal ideas, thanks to the enlightened spirit of the times, are now banished from the greater part of Europe; and I sincerely trust that they have taken their departure never more to return. The people must not be kept in a state of oppression, nakedness, and misery; it is contrary to justice; it is contrary to the interest of the landed proprietors, and destructive of the commercial prosperity of the country. Let the restraints imposed be removed; give instruction sufficient to make them sensible of their own importance; encourage them to hope that, by honest industry, they may rise to a better condition; excite a desire of improvement, without which its progress will be slow; let them be taught to look for comforts not at present within their reach, and to seek enjoyments, to which they, as yet, are strangers. When they perceive that there are pleasures superior to those of mere animal gratification, they will be roused from their torpor; the finer feelings will be awakened; their thoughts be directed to more laudable objects; and their actions, instead of being guided by mechanical impulse or brutal passion, be subjected to the regular and systematical control of reason."—(Vol. ii. p. 67.)

Sect. 8.—*Produce of Timber.*

England.—Timber is entitled to rank high among the agricultural products of England. It grows in the royal forests, in the woods or plantations of individuals, and in hedge-rows. In some of the southern and in the greater number of the south-eastern and western counties, there are large stocks of timber in hedges and in pasture grounds; and the woods and plantations are, in many places, very considerable. The principal woodland counties are Kent, Sussex, Surrey, Hants, Worcester, Cheshire, with parts of Oxford, Northampton, Berks, Leicester, Nottingham, &c. In general, the western are better wooded than the eastern counties, and the southern than the northern. There are no means of forming anything like an accurate estimate of the value or quantity of timber in England. Dr. Beeke, to whose opinion on such subjects great deference is due, says that "an estate is in general considered as having less than its proportion of growing trees of all ages, if their value do not amount to near two years of the clear rent."—(*Observations on the Income Tax*, 2d ed. p. 36.) On this hypothesis, supposing the rental of England and Wales to be 40,000,000*l.*, the total value of the timber would be near 80,000,000*l.* The annual income from woods, after deducting for the cost of repairs, &c., may be taken at 4 per cent. on their value.

There can, however, be little doubt that Dr. Beeke's statement was, when published, far beyond the mark. The statements in the Appendix to the 14*th Report of the Commissioners of Naval Revision* show, also, beyond a doubt, that the stock of timber had been greatly reduced during the 15 years preceding 1807; and that the young plantations

made during that period were not nearly so extensive as the old woods that had been grubbed up. The stock of old wood, particularly of oak, continued progressively to decrease from 1807 to the end of the war; but, since then, there has been a material increase. The fall in the price of timber lessened the temptation to cut it down; and while comparatively few woods have been grubbed up since 1815, many new plantations have been formed in different parts of the country. But, notwithstanding all this, we doubt whether there be now so large a supply of timber in the kingdom as in 1800, when Dr. Beeke's tract was published. Perhaps, if we estimated the present value of the timber of England and Wales at from 40,000,000*l.* to 50,000,000*l.*, and its yearly product at from 1,500,000*l.* to 2,000,000*l.*, we should not be far from the mark.

Oak, though not the most abundant, is by far the most important and valuable of British trees. It affects a strong loam, or stiff clay soil; and is found in the greatest perfection in the weald of Kent, Sussex, and Surrey. It is also found in great perfection in hedge-rows in Cheshire, in Hereford, Monmouth, Flint, and many other parts of England and Wales. But in several counties the annual fall of oak timber does not exceed what is required for their consumption.

The importance to a naval power like Great Britain of having a home supply of timber sufficient, at all events, for the use of the navy, has been much insisted upon. We believe, however, that we should run little risk in depending on the imports of foreign oak, teak, and other timber, for ship-building, as we do on the imports of fir, &c., for house-building and other purposes. But, supposing the importance of having an independent home supply to be admitted, the interference of government becomes almost indispensable; for the slow growth of oak, requiring from 80 to 100 years or upwards to come to maturity, by preventing individuals from planting and preserving oak woods with a view to profit, renders it unsafe to trust to private sources for a supply. Hence, after the country acquired distinction as a naval power, the state of the royal forests began to attract attention; and it was recommended that they should be enclosed, planted, and preserved with due care, so that they might furnish an adequate supply of timber for the navy. But the available extent of these forests is much less than might be supposed; extensive encroachments having been made upon them at remote periods, and many individuals having acquired rights to pasturage, underwood, &c., within their bounds. In the reign of Charles II., however, an Act was passed for the adjudication of these claims in so far as respects the Forest of Dean in Gloucestershire, and for enclosing and planting the portion remaining to the crown. Little, however, seems to have been done in furtherance of this object till after the commencement of the late war; when, owing to the vast increase of the navy and of the mercantile shipping, a general conviction began to be entertained that it was necessary to take effective measures for providing an adequate supply of timber. In 1792, the Surveyor-General of Woods and Forests reported that there was a great and rapidly increasing deficiency in the supply of oak, and concluded by recommending that 100,000 acres, in the royal forests and elsewhere, should be set apart and planted with oaks. And, consistently with

this recommendation, enforced as it was by the statements in the *Report of the Commissioners of Naval Revision*, already referred to, various inclosures have been made at different periods; so that the entire extent of the royal forests, enclosed and bearing oak, may at present be estimated at from 50,000 to 60,000 acres. We subjoin a statement showing the extent of the different royal forests, and of the number of acres in each, enclosed and appropriated to the growth of timber for the navy.

Royal Forests.	Acres in each Forest.	Acres enclosed for the Growth of Timber.	Royal Forests.	Acres in each Forest.	Acres enclosed for the Growth of Timber.
New Forest . .	66,942	6,000	Salcey Forest . .	1,847	1,121
Dean Forest . .	23,015	11,000	Whichwood Forest	3,709	1,841
Alice Holt Forest .	1,892	1,892	Waltham Forest .	3,278	..
Woolmer Forest .	5,945	1,700	Windsor Forest .	4,402	4,402
Bere Forest . .	1,417	1,417	Delamere Forest .	3,847	3,847
Whittlewood Forest	5,424	3,895	Parkhurst Forest .	900	900
			Acres . .	122,622	38,015
Lands in Kent, Gloucester, Derby, Durham, &c., belonging to the crown, enclosed and planted with oak					6,612
Enclosures thrown open, and enclosed woods of spontaneous growth belonging to the crown, estimated at					7,000
Lands in New, Dean, and Woolmer Forests that *may be* planted . . .					11,000
			Total . . .		62,627

We have extracted this statement from the *Fourth Report* (p. 27) *of the Commissioners of Woods and Forests.* The Commissioners state that this is the utmost extent of land likely to be obtained from the royal forests, or from the crown estates, which it would be desirable to retain for the growth of timber. But, in order to provide a still more ample supply of oak for the use of the navy, the Commissioners recommended the purchase of such woodlands, or of such land suitable for the growth of oak, as might adjoin those royal forests which had establishments of officers, &c., adequate to undertake the management of the new grounds without additional expense to the public; but this recommendation has not been acted upon to any great extent. The best thing that could be done, for the preservation of the timber now in the country, would be to reduce, or rather abolish, the existing duties on foreign timber.

Scotland.—There can be no manner of doubt that, in ancient times, Scotland was a well wooded country. This is proved by the remains of trees found in the mosses in all parts of the kingdom, and by various other circumstances. But, excepting some Highland counties, the old woods were, long since, all but totally destroyed; and it was not till the early part of last century that they began to be replaced by modern plantations. The remarks of Dr. Johnson on the want of wood in Scotland are believed by many to have given a

considerable spur to planting. We doubt, however, whether such were really the case. But, about the time of his visit, Scotland was beginning rapidly to improve. Many mansions were soon after constructed in different parts of the country, which required woods for protection and embellishment; and, as the wealth of the proprietors increased, the beautifying of their estates, and their improval by means of planting, attracted more and more of their attention. Hence, during the last half century, many very large additions have been made to the plantations of Scotland. The total extent of woodland in that country was estimated, in the *General Report of Scotland* (vol. ii. p. 321), at 913,695 English acres, of which 501,469 were natural woods, and 412,226 plantations. If this estimate may be relied on, the total woodland must, at this moment (1846), considerably exceed 1,000,000 acres. But, notwithstanding this vast extent of wood, there are many extensive tracts in which hardly a tree is to be seen. This is owing to the want of hedge-rows, for which generally the country is not suitable, and to the wood being mostly in large masses. The largest and most valuable woods are in Perthshire, Aberdeenshire, Ross-shire, and Inverness-shire. The late Duke of Atholl was the greatest planter of his time in the empire: he planted about 15,000 statute acres.

Ireland.—Though now comparatively destitute of timber, Ireland was formerly very thickly wooded. Very large trees are still dug up in most of the bogs; and the timber so obtained, forms, in some counties, all that is made use of by the natives.* The black bogs abound with oak timber, the red ones with fir, and in all of them there are yew and holly. Giraldus Cambrensis, who came into Ireland on its invasion by Henry II., in 1171, represents it as overrun with woods. Boate, who refers to this statement, adds that the English, being settled in the country, exerted themselves to diminish the woods wherever they were masters, partly to deprive thieves and other banditti of safe and convenient hiding-places, and partly to increase the supply of cultivable lands.—(*Ireland's Natural History*, p. 119.) But long after this period Ireland could boast of very large and valuable forests. Spenser, in his panegyric on the country, says that it is "abundantly adorned with goodly woods, even fit for building of houses and ships; so commodiously, that if some princes in the world had them, they would soon hope to be lords of all the seas, and ere long of all the world."† In 1652, when Boate's *Natural History of Ireland* was published, there were many very extensive woods in the country, particularly in Wicklow, King's and Queen's Counties, and in Wexford, Carlow, Donegal, Fermanagh, Antrim, Down, Kerry, Tipperary, &c. (p. 123); and the facts collected by Mr. Wakefield prove that these were far from having entirely disappeared in the early part of the last century.—(*Account of Ireland*, vol. i. p. 530.)

Many causes conspired to occasion the destruction of the woods of Ireland. Of these the principal, perhaps, is to be found in the violent changes of property in that country down to the accession of Queen Anne, which, by generating a strong sense of uncertainty, stimulated

* M'Evoy's *Survey of Tyrone*, p. 188.
† *Spenser's Works*, Lond. 1715, p. 1526.

the holders of estates to make the most of them while they were under their control, at the same time that it made them abstain from undertaking any scheme of improvement that was either expensive or but remotely productive. While, therefore, there was on the one hand, little or no motive to plant new woods, or to protect the old from depredations, there was, on the other, a considerable temptation to cut them down. The quantity of tillage land was thus, in some instances, considerably increased: and in the seventeenth and eighteenth centuries, when iron was largely produced in Ireland, the demand for wood for the furnaces made it bring a high price, and occasioned the destruction of extensive forests.—(*Wakefield*, i. 528.) The disorderly state of Ireland was also, in the seventeenth and eighteenth centuries, as it had been in the twelfth, a prominent cause of the ruin of the woods. "By an order remaining in the council books of the 2nd of November, 1654, Commissary-General Reynolds was directed to fell and carry away as many trees which, the order says, were dangerous shelter for rogues, and obstructed the highway, so as to enlarge the road 20 yards on each side, which was executed accordingly."—(*Smith's Natural History of Waterford*, p. 92.) From the combined influence of these and other causes, Ireland has been wholly stripped of forests. Spenser's "goodly woods" are now no where to be found. "A traveller in Ireland finds timber, as he does shrubs and exotic plants, merely as appendages to a gentleman's place of residence; and, after leaving a favoured spot of this kind, he at once loses sight of green foliage, so agreeable to the eye, and enters dreary wastes, where there is scarcely a twig sufficient to form a resting-place to the birds fatigued with their flight. To so great an extent does this evil exist, that I have seen the remains of those who were gone 'to that bourne whence no traveller returns' wrapped up in mats, for want of a coffin, and in that state deposited in the earth. To a circumstance of this kind I was myself a witness during the summer of 1809, and Lord Enniskillen informed me that the same practice is common throughout the county Cavan."—(*Wakefield*, i. 531.) Latterly, however, the extent of woodland in Ireland has been increasing. An Act passed in 1783 (23rd and 24th Geo. III. c. 39), giving the occupying tenant an interest in the trees he has planted, under certain regulations, has promoted the growth of timber; and some noblemen and gentlemen have distinguished themselves by the extent of their plantations. It appears from the table previously inserted (p. 321), that the total extent of woodland in Ireland amounts to about 374,500 acres, or to about a third part of the extent of the Scottish woodlands.

Sect. 9.—*Distribution of Lands, Rents, Profits of Farmers, &c.*

Quantity and Value of Agricultural Produce, &c.—It would be exceedingly desirable to be possessed of authentic information on these important topics, and we have to regret that such is not within our reach. It could not be acquired without much trouble and expense, and the continued co-operation either of government or of numerous individuals. But neither the government nor the people of England has ever given any considerable encouragement to statistical

inquiries; and, notwithstanding the heavy expense that is annually incurred in preparing parliamentary reports and accounts connected with statistics, it is still true that the elements of the science are as little understood here as in almost any other country. No effectual means have ever been set on foot for getting accounts of the extent of land in tillage and in pasture, and of the proportion which one sort of crop bears to another, or of the numbers and value of the different breeds of cattle, horses, &c. In reasoning on these subjects, we have, therefore, nothing but the researches of a few meritorious individuals and analogies to trust to. Under such circumstances, precision is not to be expected: a rough average is all that can be looked for. We begin with—

I. England.

Number of Acres under Tillage.—In his eastern tour Arthur Young estimated the extent of land under crop in England, exclusive of Wales, at 12,707,000 acres (iv. 458). But as 1,000,000 acres would have had to be added to this estimate for fallow, there cannot be a doubt it was much too high. Mr. Couling, a land surveyor, laid before the Emigration Committee of 1827, tables in reference to this subject, which have been a good deal referred to. In these he estimated the arable and pasture land of England and Wales, exclusive of wastes, forests, roads, rivers, &c., at 28,749,000 acres, of which he supposed the arable or cultivated land and gardens to make 11,143,370 acres. We incline, however, to think, that Mr. Couling was as much under the mark in this estimate, as Mr. Young had been above it in his. And we are supported in this view of the matter by the authority of Mr. Middleton, Mr. Comber, Mr. Stevenson, and others. The last mentioned gentleman, to whose opinion on such subjects great deference is due, estimated the land under culture in 1812, at 11,500,000 acres. And, supposing it to have amounted at that epoch to that quantity, or, which is the more general opinion, to 12,000,000 acres, it may now be safely estimated at from 13,000,000 to 13,500,000 acres. The number of Acts passed since 1812 for the enclosure of commons and wastes, and the extent to which they have, in the interval, been enclosed and cultivated, make it all but certain that this estimate, if it be not within, is, at all events, not beyond the mark.

Distribution of Tillage Land.—According to Mr. Middleton, the tillage land of England and Wales, supposing it to amount to 12,000,000 acres, would be appropriated as follows:—

	Acres.		Acres.
Wheat	3,300,000	Clover	1,200,000
Oats and Beans . .	3,000,000	Fallows	2,400,000
Barley and Rye . .	900,000		
Roots	1,200,000	Total . .	12,000,000*

Mr. Comber, in an estimate framed, apparently, with considerable care in 1812, supposes the total acres under cultivation in England and Wales, to amount to 11,591,000, which he distributes as follows:—

* *Survey of Middlesex*, 2nd ed., p. 640.

	Acres.		Acres.
Wheat	3,160,000	Hop-grounds	36,000
Barley and Rye	861,000	Nursery-gardens	9,000
Oats and Beans	2,872,000	Fruit and Kitchen Gardens, cultivated by spade	41,000
Clover, Rye-grass, &c.	1,149,000	Pleasure-grounds	16,000
Roots and Cabbages, cultivated by plough	1,150,000		
Fallow	2,297,000	Total	11,591,000*

Even at the time the extent of ground under fallow appears to have been very considerably overrated in these estimates. At present (1846) we are disposed to believe, from the inquiries we have instituted in the quarters most likely to be best informed, that the extent of ground under tillage in England and Wales, may be estimated at 13,300,000 acres, distributed as follows, viz.:—

	Acres.		Acres.
Wheat	3,800,000	Beans and Bran	500,000
Barley	1,500,000	Clover	1,300,000
Oats and Rye	2,500,000	Fallow	1,500,000
Potatoes, Turnips, and Rape	2,000,000	Hops	50,000
		Gardens	150,000

It appears from a table deduced by Mr. Stevenson from the agricultural reports of the Board of Agriculture, that the average produce of wheat throughout England and Wales, might be estimated in 1812 or 1813, at from 20 to 24 bushels an acre, barley at 32 bushels, and oats at 36 bushels per ditto. Little dependence could, however, be placed on this table, even at the period when it was framed; and circumstances have changed most materially in the interval. Between 1813 and the present period, a vast improvement has taken place in agriculture. The supply of produce has been increased, partly by the extension of cultivation, but far more by its improvement. A much greater quantity of produce is now obtained from the same breadth of land than in 1812. So much so is this the case, that estimating the average produce per acre of wheat in England and Wales at the end of the war at 24 bushels an acre, we are well convinced it cannot now be reckoned at less than 32 bushels! making an annual increase of 30,400,000 bushels on the 3,800,000 acres of land supposed to be under wheat. This estimate has been approved by some of the best-informed agriculturists and corn merchants; and, as will be afterwards seen, it would be impossible, without a vast increase of production, to account for the increase of population. We subjoin—

An Account of the Extent of Land in England and Wales under the principal Descriptions of Crops; the average Produce per Acre; the total Produce; the Amount of Seed; the Produce under deduction of Seed; and the total Value of such Produce.

Crops.	Acres in Crop.	Produce per Acre.	Total Produce.	Seed (1-7th of Produce).	Produce under Deduction of Seed.	Price per Quarter.	Total Value.
		Quarters.	Quarters.	Quarters.	Quarters.		£ s. d.
Wheat	3,800,000	4	15,200,000	2,171,429	13,028,571	50s.	32,571,427 10 0
Barley	1,500,000	4½	6,375,000	910,714	5,464,286	30s.	8,196,429 0 0
Oats and Rye	2,500,000	5	12,500,000	1,785,714	10,714,286	20s.	10,714,286 0 0
Beans and Peas	500,000	3¾	1,875,000	267,857	1,607,143	30s.	2,410,714 10 0
Potatoes, Turnips, and Rape	2,000,000	77. per Acre					23,100,000 0 0
Clover	1,300,000						
Fallow	1,500,000						
Hops	50,000	15l. per Acre					750,000 0 0
Gardens	150,000	15l. per Acre					2,250,000 0 0
Totals	13,300,000		35,950,000		30,914,286		79,992,857 0 0

* *Comber on National Subsistence*, App. p. 52.

Produce of Pasture and Wood Land.—This may be determined in two ways; either by ascertaining the quantity and value of the different articles annually produced, or by taking a general rough average value per acre. The former would be the most satisfactory mode; but the details are too numerous and too loose to admit of their being brought forward with much confidence. We believe, however, that the annual value of the various products derived from pasture and wood land in England and Wales, may be estimated, at an average, at about 3*l.* 12*s.* an acre; being equivalent, on 16,500,000 acres, to 59,114,000*l.* But to this may be added about 2,500,000*l.* for the annual value of the waste lands, or of the mountain pastures, heaths, marshes, &c., not included in the pastures, making the total value of the produce of the various descriptions of grazing and wood grounds about 61,614,000*l.* a year. This produce may be distributed as follows:—

	£
Cattle, 1,200,000, at 12*l.* each	14,400,000
Calves, 200,000, at 3*l.* each	600,000
Sheep and Lambs, 6,800,000, at 1*l.* 10*s.* each	10,200,000
Wool (exclusive of slaughtered Sheep), 360,000 packs, at 12*l.* each	4,320,000
Hogs and Pigs, 555,000, at 1*l.* 16*s.* each	1,000,000
Horses, 200,000, full grown, annually produced, at 15*l.* each.	3,000,000
Poultry, Eggs, Rabbits, Deer, &c.	1,344,000
Meadow and Grass, for work and pleasure horses	13,000,000
Dairy produce, or Milk, Butter, and Cheese	12,000,000
Wood	1,750,000
Total	61,614,000

The total annual value of the agricultural produce of England and Wales may, therefore, be estimated at about 141,606,857*l.* (79,992,857*l.* + 61,614,000*l.*) In further corroboration of this estimate, we may remark, that Arthur Young, in the Agricultural Report of Essex, estimates the value of the farm produce of England at 145,800,000*l.* Mr. Middleton, in the Survey of Middlesex, estimates it at 126,690,000*l.*; and Mr. Stevenson, in the article "England," in the Edinburgh Encyclopædia, estimates it at 131,066,000*l.*, exclusive of the value of numerous gardens, orchards, &c. Considering the different circumstances under which it has been framed, the estimate we have given does not differ materially in the amount from the above. And though it differs widely from them in many of the details, we flatter ourselves that the advantage of superior accuracy is on our side. We may be mistaken on some points, and it is hardly, indeed, possible in any case to arrive at any thing better than a rough approximation, still we do not believe that, with the assumed prices, we can be more than a very few millions on either side the mark.

Rental of England and Wales.—The returns under the former and present Property Tax Acts, furnish very complete details in regard to the rent of land, houses, and other fixed property in England and Wales. And from these returns, and those of the number of acres in each county, we have compiled the following tables.*

* The statements in regard to the rental for 1810–11 have been derived from the Parl. Paper No. 64, Sess. 1813; those in regard to 1814–15, from a paper supplied

I. *Table showing the Aggregate Measurement of each County of England and that of Wales; the ascertained Gross Rentals of the Land of each, according to the Returns under the Property Tax Act for the Years* 1810–11 *and* 1814–15; *with the Average Annual Rent per Acre of the Land of each County at these respective periods, &c.**

Counties.	Acres.	Gross Rental for 1810–11.	Rent per Acre in 1810–11.	Gross Rental for 1814–15.	Rent per Acre in 1814–15.	Inc. or Dec. of Rent per Acre in 1814–15 over Rent per Acre in 1810–11
England.		£.	£ s. d.	£.	£. s. d.	£. s. d
Bedford	295,582	279,976	0 18 11¼	316,595	1 1 5	0 2 5¼
Berks	451,040	407,187	0 18 0¼	502,096	1 2 3	0 4 2¼
Bucks	466,932	497,158	1 1 3¼	548,630	1 3 5¼	0 2 2¼
Cambridge	523,861	457,732	0 17 5¼	541,325	1 0 8	0 3 2¼
Chester	707,078	689,731	0 19 6	805,141	1 2 9¼	0 3 3¼
Cornwall	873,600	564,607	0 12 11	629,259	0 14 4¼	0 1 5¼
Cumberland	1,001,273	469,250	0 9 4¼	561,468	0 11 2¼	0 1 10¼
Derby	558,803	619,472	0 18 9¼	707,250	1 1 5¼	0 2 8
Devon	1,657,180	1,217,529	0 14 8¼	1,360,812	0 16 5	0 1 8¼
Dorset	632,025	489,004	0 15 5	564,377	0 17 10¼	0 2 5¼
Durham	622,476	505,387	0 16 2¼	543,411	0 17 5¼	0 1 2¼
Essex	1,060,549	904,894	0 17 0¼	1,109,829	1 0 11	0 3 10¼
Gloucester	805,102	805,390	1 0 0	971,410	1 4 1¼	0 4 1¼
Hereford	534,823	441,343	0 16 6	524,781	0 19 7¼	0 3 1¼
Hertford	391,141	342,056	0 12 4¼	397,539	1 0 3¼	0 7 11¼
Huntingdon	230,865	202,076	0 17 6	277,463	1 4 0¼	0 6 6¼
Kent	1,041,479	864,294	0 16 7	961,368	0 18 5¼	0 1 10¼
Lancaster	1,219,221	1,270,345	1 0 10	1,463,183	1 4 0	0 3 2
Leicester	514,164	699,158	1 7 2¼	807,558	1 11 4¼	0 4 2¼
Lincoln	1,776,738	1,572,756	0 17 8¼	1,865,086	1 0 11¼	0 3 3¼
Middlesex	180,168	346,634	1 18 5¼	517,669	2 17 5¼	0 18 11¼
Monmouth	368,399	202,211	0 10 11¼	231,113	0 12 6¼	0 1 7
Norfolk	1,354,381	921,581	0 13 7	1,102,352	0 16 3¼	0 2 8¼
Northampton	630,358	695,691	1 2 0¼	846,172	1 6 1	0 4 0¼
Northumberland	1,249,299	909,997	0 14 5¼	999,951	0 16 1¼	0 1 8
Nottingham	526,076	534,678	1 0 3¼	604,220	1 2 11¼	0 2 7¼
Oxford	472,887	498,086	1 1 0¼	589,594	1 4 11	0 3 10¼
Rutland	95,805	99,149	1 0 8¼	123,296	1 5 8¼	0 5 0¼
Salop	826,055	730,099	0 17 8	823,845	0 19 11¼	0 2 3¼
Somerset	1,047,220	1,353,282	1 5 10	1,491,734	1 8 5¼	0 2 7¼
Southampton	1,070,216	593,259	0 11 1	707,127	0 13 2¼	0 2 1¼
Stafford	728,468	757,678	1 0 9¼	862,973	1 3 8¼	0 2 10¼
Suffolk	947,681	694,078	0 14 7¼	826,228	0 17 5	0 2 9¼
Surrey	478,792	368,457	0 15 4¼	437,958	0 18 3¼	0 2 11
Sussex	934,851	567,712	0 12 1¼	641,736	0 13 8¼	0 1 7
Warwick	563,946	651,306	1 3 1	838,993	1 9 9	0 6 8
Westmoreland	485,432	220,596	0 9 1	260,945	0 10 9	0 1 8
Wilts	865,092	812,292	0 18 9¼	964,611	1 2 3¼	0 3 6¼
Worcester	472,165	516,203	1 1 1¼	609,746	1 5 9¼	0 4 8
York	3,829,286	3,107,751	0 16 2¼	3,563,980	0 18 7¼	0 2 4¼
Totals for England	32,590,429	27,880,085	. .	32,502,824	. .	. .
Average Rent per Statute Acre of England	. .	. .	0 17 1¼	. .	0 19 7¼	0 2 6¼

* Under the old Property Tax Act, the profits, or clear taxable incomes, of the occupiers of land in England and Wales were estimated at *three-fourths*, and in Scotland at *one-half*, the rent, or annual value of their farms; and they were assessed accordingly.

by Mr. Wood, formerly Chairman of the Stamps and Taxes, and now of the Excise; and those in regard to 1842–43 from the Parl. Paper, No. 102, Sess. 1845.

* Had all the papers relating to the old property tax been preserved, they would have supplied a vast deal of authentic information, not only with respect to rent, but with respect to the numbers and incomes of the different ranks and orders of the community during the period of its existence. The voluntary destruction of so great a storehouse of curious information is an act of which it is difficult to say whether its folly or its barbarism be the more prominent feature. It has no parallel, unless it be the burning (which, however, is doubtful) of the Alexandrian Library.

I. *Table showing the Aggregate Measurement, &c.*—continued.

Counties.	Acres.	Gross Rental for 1810-11.	Rent per Acre in 1810-11.	Gross Rental for 1814-15.	Rent per Acre in 1814-15.	Inc. or Dec. of Rent per Acre in 1814-15 over Rent per Acre in 1810-11
Wales.		£.	£. s. d.	£.	£. s. d.	£. s. d.
Totals for Wales . .	4,734,486	1,622,985	. .	1,827,638		
Average Rent per Statute Acre of Wales	. .	. .	0 6 7¼	. .	0 7 8¼	0 1 1
Add for England, as before	32,590,429	27,880,085	. .	32,502,824	. .	. .
Totals for England and Wales	37,324,915	29,503,070	. .	34,330,462	. .	. .
Average Rent per Statute Acre of England and Wales	. .	. .	0 15 9¼	. .	0 18 4¼	0 2 7

II. *Account showing the Area of the different Counties of England and the Area of Wales; the Gross Rentals of each in* 1814–15 *and in* 1842–43, *as determined by the Assessments under the Property and Income Tax Acts, with the Rent per Acre of each in* 1814–15 *and in* 1842–43, *&c.*

Counties.	Acres.	Gross Rental for 1814-15.	Rent per Acre in 1814-15.	Gross Rental for 1842-43.	Rent per Acre in 1842-43.	Inc. or Dec. of Rent per Acre in 1842-43 over Rent per Acre in 1814-15.
England.		£.	£. s. d.	£.	£. s. d.	Inc. £. s. d.
Bedford	295,582	316,595	1 1 5	377,995	1 5 6¼	0 4 1¼
Berks.	451,040	502,096	1 2 3	594,903	1 6 4¼	0 4 1¼
Bucks	466,932	548,630	1 3 5¼	597,736	1 5 7¼	0 2 1¼
Cambridge	523,861	541,325	1 0 8	774,658	1 8 5	0 7 9
Chester	707,078	805,141	1 2 9¼	962,857	1 7 2¼	0 4 5¼
Cornwall	873,600	629,259	0 14 4¼	774,692	0 17 8¼	0 3 4
Cumberland	1,001,273	561,468	0 11 2¼	603,725	0 12 0¼	0 0 10
Derby	658,803	707,250	1 1 5¼	845,681	1 5 7¼	0 4 2¼
Devon	1,657,180	1,360,812	0 16 5	1,556,181	0 18 9¼	0 2 4¼
Dorset	632,025	564,377	0 17 10¼	613,507	0 19 4¼	0 1 6¼
Durham	622,476	543,411	0 17 5¼	538,781	0 17 3¼	Dec. 0 0 2
Essex	1,060,549	1,109,829	1 0 11	1,289,645	1 4 3¼	Inc. 0 3 4
Gloucester	805,102	971,410	1 4 1¼	1,121,125	1 7 1	0 2 4¼
Hereford	534,823	524,781	0 19 7¼	629,981	1 3 6¼	0 3 11¼
Hertford	391,141	397,539	1 0 3¼	438,226	1 2 4¼	0 2 1
Huntingdon	230,865	277,463	1 4 0¼	312,083	1 7 0¼	0 3 0
Kent	1,041,479	961,368	0 18 5¼	1,327,491	1 5 5¼	0 7 0¼
Lancaster	1,219,221	1,463,183	1 4 0	1,636,416	1 6 10	0 2 10
Leicester	414,164	807,558	1 11 4¼	899,063	1 14 6¼	0 3 2
Lincoln	1,776,738	1,865,086	1 0 11¼	2,340,625	1 6 4	0 5 4¼
Middlesex	180,168	517,669	2 17 5¼	387,861	2 3 0¼	Dec. 0 14 5
Monmouth	368,399	231,113	0 12 6¼	290,334	0 15 9	Inc. 0 3 2¼
Norfolk	1,354,301	1,102,352	0 16 3¼	1,644,994	1 4 3¼	0 8 0¼

II. *Account showing the Area of the different Counties, &c.*—continued.

Counties.	Acres.	Gross Rental for 1814-15.	Rent per Acre in 1814-15.	Gross Rental for 1842-43.	Rent per Acre in 1842-43.	Inc. or Dec. of Rent per Acre in 1842-43 over Rent per Acre in 1814-15.
		£.	£. s. d.	£.	£. s. d.	Inc. £. s. d.
Northampton . . .	630,358	846,172	1 6 1	973,144	1 10 10½	0 4 9½
Northumberland . .	1,249,299	999,951	0 16 1½	835,856	0 13 4½	Dec. 0 2 9½
Nottingham	526,076	604,220	1 2 11½	707,756	1 6 1½	Inc. 0 3 2½
Oxford	472,887	589,594	1 4 11	602,396	1 5 5½	0 0 6½
Rutland	95,805	123,296	1 5 8½	130,935	1 7 4	0 1 7½
Salop	826,055	823,845	0 19 11½	1,050,132	1 5 5	0 5 5½
Somerset	1,047,229	1,491,734	1 8 5½	1,715,497	1 12 9	0 4 3½
Southampton . . .	1,070,216	707,127	0 13 2½	777,636	0 14 6½	0 1 3½
Stafford	728,468	862,973	1 3 8½	1,104,151	1 10 3½	0 6 7½
Suffolk	947,681	826,228	0 17 5	1,147,536	1 4 2½	0 6 9½
Surrey	478,792	437,958	0 18 3½	433,505	0 18 1½	Dec. 0 0 2½
Sussex	934,851	641,736	0 13 8½	855,373	0 18 3½	Inc. 0 4 7
Warwick	563,946	838,993	1 9 9	905,869	1 12 1½	0 2 4½
Westmoreland . . .	485,432	260,945	0 10 9	269,418	0 11 1	0 0 4
Wilts	865,092	964,611	1 2 3½	1,021,706	1 3 7½	0 1 3½
Worcester	472,165	609,746	1 5 9½	716,498	1 10 4	0 4 6½
York	3,829,286	3,563,980	0 18 7½	3,989,937	1 0 10	0 2 2½
Totals for England .	32,590,429	32,502,824	. .	37,795,905	. .	. .
Average Rent per Statute Acre of England	. .	. .	0 19 7½	. .	1 3 2½	0 3 6½
Totals for Wales . .	4,734,486	1,827,683	. .	2,371,184	. .	. .
Average Rent per Statute Acre of Wales	. .	. .	0 7 8½	. .	0 10 0	0 2 3½
Add for England, as before	32,590,429	32,502,824	. .	37,795,905	. .	. .
Totals for England and Wales . . .	37,324,915	34,330,462	. .	40,167,089	. .	. .
Average Rent per Statute Acre of England and Wales .	. .	. .	0 18 4½	. .	1 1 6½	. .
Excess of Total Rent and of Rent per Acre in 1842-43 over ditto in 1814-15 . . .	. .	. .	. .	5,836,627	. .	0 3 1½

It is necessary, however, to bear in mind, on comparing these tables, that the currency was depreciated above 18 per cent. during the *five* years ending with 1815, though, probably, from the non-renewal of leases, rents might not be raised, in consequence, more than 10 per cent. And, supposing this to be the case, we must, in order fairly to compare the rental of 1815 with that of 1843, make a deduction of 10 per cent. on account of depreciation from the returns for the former period. This is done in the following table, which exhibits the real rise or fall of rent in the interval:—

III. *Account showing the Area of the different Counties of England and the Area of Wales; the Gross Rentals of each in* 1814-15 (*under Deduction of* 10 *per Cent. for the Depreciation of the Currency*) *and in* 1842-43, *as determined by the Assessments under the Property and Income Tax Acts, with the Rent per Acre of each in* 1814-15 *and in* 1842-43, *&c.*

Counties.	Acres.	Gross Rental for 1814-15 (under Deduction of 10 per Cent.)	Rent per Acre in 1814-15.	Gross Rental for 1842-43.	Rent per Acre in 1842-43.	Inc or Dec. of Rent per Acre in 1842-43. over Rent per Acre in 1814-15.
England.		£.	£. s. d.	£.	£. s. d.	Inc. £. s. d.
Bedford	295,582	284,935	0 19 3¾	377,995	1 5 6¾	0 6 3¾
Berks	451,040	451,886	1 0 0¾	594,903	1 6 4¼	0 6 4
Bucks	466 932	493,767	1 1 1¾	597,736	1 5 7¼	0 4 5½
Cambridge	523,861	487,192	0 18 7¼	774,658	1 8 5	0 9 9¾
Chester	707,068	724,627	1 0 6	962,857	1 7 2¾	0 6 8¾
Cornwall	873,600	566,333	0 12 11½	774,692	0 17 8¾	0 4 9¼
Cumberland	1,001,273	505,321	0 10 1	603,725	0 12 0½	0 1 10½
Derby	658,803	636,525	0 19 3¾	845,681	1 5 7¾	0 6 4
Devon	1,657,180	1,224,731	0 14 9½	1,556,181	0 18 9¾	0 3 11¾
Dorset	632,025	507,939	0 16 1	613,507	0 19 4¾	0 3 3¾
Durham	622,476	489,070	0 15 8¾	538,781	0 17 3¼	0 1 6½
Essex	1,060,549	998,846	0 18 10	1,289,645	1 4 3¾	0 5 5¾
Gloucester	805,102	874,269	1 1 8¾	1,121,125	1 7 1	0 5 4¼
Hereford	534,823	472,303	0 17 7½	629,981	1 3 6½	0 5 10¾
Hertford	391,141	357,785	0 18 3¾	438,226	1 2 4¾	0 4 1¼
Huntingdon	230,865	249,717	1 1 7½	312,083	1 7 0½	0 5 4¾
Kent	1,041,479	865,231	0 16 7½	1,327,491	1 5 5¾	0 8 10¾
Lancaster	1,219,221	1,316,865	1 1 7½	1,636,416	1 6 10	0 5 2½
Leicester	514,164	726,802	1 8 3½	899,063	1 14 6¾	0 6 3½
Lincoln	1,776,738	1,678,577	0 18 10¾	2,340,625	1 6 4	0 7 5¼
						Dec.
Middlesex	180,168	465,902	2 11 8¼	387,861	2 3 0¼	0 8 8¼
						Inc.
Monmouth	368,399	208,002	0 11 3½	290,334	0 15 9	0 4 5½
Norfolk	1,354,301	992,117	0 14 7¾	1,644,994	1 4 3½	0 9 7¾
Northampton	630,358	761,555	1 3 5¾	973,144	1 10 10½	0 7 4¾
						Dec.
Northumberland	1,249,229	899,956	0 14 6½	835,856	0 13 4¼	0 1 2
						Inc.
Nottingham	526,076	543,798	1 0 8¼	707,756	1 6 1¾	0 5 5¼
Oxford	472,887	530,635	1 2 5¼	602,396	1 5 5½	0 3 0¼
Rutland	45,805	110,966	1 3 2	130,935	1 7 4	0 4 2
Salop	826,055	741,461	0 17 11¼	1,050,132	1 5 5	0 7 5½
Somerset	1,047,220	1,342,561	1 5 7¾	1,715,497	1 12 9	0 7 1¾
Southampton	1,070,216	636,414	0 11 10¾	777,636	0 14 6¾	0 2 7¾
Stafford	728,488	776,676	1 1 4	1,104,151	1 10 3¾	0 8 11¾
Suffolk	947,681	743,605	0 15 8¾	1,147,536	1 4 2½	0 8 6¾
Surrey	478,792	394,162	0 16 5¾	438,505	0 18 1¾	0 1 7¾
Sussex	934,851	577,563	0 12 4¾	855,373	0 18 3½	0 5 11¾
Warwick	563,946	755,094	1 6 9¼	905,869	1 12 1½	0 5 4
Westmoreland	485,432	234,851	0 9 8	269,418	0 11 1	0 1 5
Wilts	865,092	868,150	1 0 0¾	1,021,706	1 3 7¾	0 3 6¾
Worcester	472,165	548,771	1 3 2¾	716,498	1 10 4	0 7 1¾
York	3,829,286	3,207,582	0 16 9	3,989,937	1 0 10	0 4 1
Totals for England	32,590,429	29,252,542	. .	37,795,905	. .	. .
Average Rent per Statute Acre of England	. .	. .	0 17 8	. .	1 3 2¼	0 5 6¼
Totals for Wales	4,752,000	1,644,874	. .	2,371,184	. .	. .
Average Rent per Statute Acre of Wales	. .	. .	0 6 11¼	. .	0 10 0	Inc. 0 3 0¾
Add for England, as before	32,243,200	29,252,542	. .	37,795,905	. .	. .
Totals for England and Wales	36,995,200	30,897,416	. .	40,167,989	. .	. .

III. *Account showing the Area of the different Counties, &c.*—continued.

Counties.	Acres.	Gross Rental for 1814-15 (under Deduction of 10 per Cent.)	Rent per Acre in 1814-15.	Gross Rental for 1842-43.	Rent per Acre in 1842-43.	Inc. or Dec. of Rent per Acre in 1842-43 over Rent per Acre in 1814-15.
		£.	£. s. d.	£.	£. s. d.	£. s. d.
Average Rent per Statute Acre of England and Wales .	. .	. .	0 16 6¼	. .	1 1 6¼	. .
Excess of Total Rent and of Rent per Acre in 1842-43 over ditto in 1814-15 .	. .	. .	. .	9,269,673	. .	Inc. 5 0

IV. *Account showing the Area of the different Counties of England and of Wales; the Gross Rentals of each in* 1842-43 *and in* 1851-52, *as determined by the Assessments under the Property and Income Tax Acts, with the Rent per Acre of each in* 1842-43 *and in* 1851-52, *&c.*

Counties.	Acres.	Gross Rental for 1842-43.	Rent per Acre in 1842-43.	Gross Rental for 1851-52.	Rent per Acre in 1851-52.	Increase or Decrease of Rent per Acre in 1851-52, over Rent per Acre in 1842-43.
		£	£. s. d.	£.	£. s. d.	s. d.
Bedford	295 582	377,995	1 5 6¼	398,243	1 6 11¼	Inc. 1 4½
Berks	451,040	594,903	1 6 4½	586,917	1 6 0¼	Dec. 0 4¼
Bucks	466,932	597,736	1 5 7½	635,745	1 7 2¾	Inc. 1 7¼
Cambridge	523,861	774,658	1 8 5	864,788	1 13 0	,, 4 7
Chester	707,078	962,857	1 7 2¾	992,672	1 8 0¼	,, 0 9½
Cornwall	873,600	774,692	0 17 8¾	728,287	0 16 8	Dec. 1 0¾
Cumberland	1,001,273	603'725	0 12 0¼	634,946	0 12 8	Inc. 0 7¾
Derby	658,803	845,681	1 5 7¾	826,146	1 5 0¾	Dec. 0 7
Devon	1,657,180	1,556,181	0 18 9¼	1,553,120	0 18 8¾	,, 0 0½
Dorset	632,025	613,507	0 19 4¾	656,834	1 0 9¼	Inc. 1 4½
Durham	622,476	537,781	0 17 3½	573,184	0 18 4¾	,, 1 1½
Essex	1,060,549	1,289,645	1 4 3¾	1,358,397	1 5 7¼	,, 1 3½
Gloucester	805,102	1,121,125	1 7 1	1,164,752	1 8 9¼	,, 1 8½
Hampshire	1,070,216	777,636	0 14 6½	895,410	0 16 8¼	,, 2 2½
Hereford	534,823	629,981	1 3 6¾	650,238	1 4 3¾	,, 0 9½
Herts	391,141	438,226	1 2 4¾	528,645	1 7 0¼	,, 4 7½
Huntingdon	230,865	312,083	1 7 0¼	305,397	1 6 5¼	Dec. 0 7
Kent	1,041,479	1,327,491	1 5 5½	1,410,259	1 7 1	Inc. 1 7½
Lancaster	1,219,221	1,636,416	1 6 10	1,593,614	1 6 1¼	Dec. 0 8½
Leicester	514,165	899,063	1 14 6¾	920,599	1 15 9½	Inc. 1 2½
Lincoln	1,776,738	2,340,625	1 6 4	2,424,696	1 7 3¼	,, 0 11½
Middlesex	180,168	337,861	2 3 0¼	345,701	1 18 4¼	Dec. 4 8
Monmouth	368,399	290,334	0 15 9	285,021	0 15 5¼	,, 0 3½
Norfolk	1,354,301	1,644,994	1 4 3½	1,759,928	1 5 1¾	Inc. 0 9¾
Northampton	630,358	973,144	1 10 10¼	969,742	1 10 9	Dec. 0 1½
Northumberland	1,249,299	835,856	0 13 4¼	874,699	0 14 0	Inc. 0 7¾
Nottingham	526,076	707,756	1 6 1¾	717,135	1 7 3	,, 1 1½
Oxford	472,887	602,396	1 5 5½	627,980	1 6 6¼	,, 1 1
Rutland	95,805	130,935	1 7 4	131,294	1 7 4¾	,, 0 0¾
Salop	826,055	1,050,132	1 5 5	1,027,076	1 4 1¾	Dec. 1 3¾
Somerset	1,047,220	1,715,497	1 12 9	1,657,478	1 11 7¾	,, 1 1½
Stafford	728,468	1,104,151	1 10 3½	1,073,817	1 9 5¾	,, 0 10
Suffolk	947,681	1,147,536	1 4 2¼	1,207,411	1 5 5¾	Inc. 1 3½
Surrey	478,792	433,505	0 18 1¾	451,973	0 18 10¼	,, 0 9½
Sussex	934,851	855,373	0 18 3½	897,900	0 19 2¾	,, 0 11
Warwick	563,946	905,869	1 12 1¾	897,174	1 11 9¾	Dec. 0 3½
Westmoreland	485,432	269,418	0 11 1	256,600	0 10 6¾	,, 0 6½
Wilts	865,092	1,021,706	1 3 7¼	1,068,131	1 4 8¼	Inc. 1 1
Worcester	472,165	716,498	1 10 4	758,321	1 12 1¾	,, 1 9½
York	3,829,286	3,989,937	1 0 10	3,919,776	1 0 5¼	Dec. 0 4½
Totals and Average Rent, England	32,590,429	37,795,905	1 3 2½	38,622,046	1 3 8¼	Inc. 0 6
Ditto, ditto, Wales	4,734,486	2,371,184	0 10 0	2,496,283	0 10 6¼	,, 0 6¼
Ditto, ditto, England and Wales	37,324,915	40,167,089	1 1 6¼	41,118,329	1 2 0½	Inc. 0 6

V. *Account showing the Average Prices of Wheat in England and Wales per Imperial Quarter, from 1776, as ascertained by the Receiver of Corn Returns, with Quinquennial Averages of the same; the Depreciation of the Currency from 1801 to 1820, both inclusive; the Average Prices corrected for such Depreciation, with Averages, &c.*

Years.	Price of Wheat according to Receiver of Corn Returns.	Averages in Periods of Five Years.	Depreciation of Currency per Cent.	Prices, according to Receiver of Corn Returns, Corrected for Depreciation.	Averages of Corrected Returns, in Periods of Five Years.	Years.	Price of Wheat, according to Receiver of Corn Returns.	Averages in Periods of Five Years.	Depreciation of Currency per Cent.	Prices, according to Receiver of Corn Returns, Corrected for Depreciation.	Averages of Corrected Returns, in Periods of Five Years.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.		£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
1776	1 19 4		. .	1 19 4		1816	3 18 6		16 14 3	3 4 8	
1777	2 6 11		. .	2 6 11		1817	4 16 11		2 13 2	4 14 4	
1778	2 3 3	2 0 2	. .	2 3 3	2 0 2	1818	4 6 3	4 0 10	2 13 2	4 3 11	3 15 10
1779	1 14 8		. .	1 14 8		1819	3 14 6		4 9 0	3 10 3	
1780	1 16 9		. .	1 16 9		1820	3 7 10		2 12 0	3 6 1	
1781	2 6 0		. .	2 6 0		1821	2 16 1		. .	2 16 1	
1782	2 9 3		. .	2 9 3		1822	2 4 7		. .	2 4 7	
1783	2 14 3	2 8 7	. .	2 14 3	2 8 7	1823	2 13 4	2 17 3	. .	2 13 4	2 17 3
1784	2 10 4		. .	2 10 4		1824	3 3 11		. .	3 3 11	
1785	2 3 1		. .	2 3 1		1825	3 8 6		. .	3 8 6	
1786	2 0 0		. .	2 0 0		1826	2 18 8		. .	2 18 8	
1787	2 2 5		. .	2 2 5		1827	2 18 6		. .	2 18 6	
1788	2 6 4	2 7 3	. .	2 6 4	2 7 3	1828	3 0 5	3 1 7	. .	3 0 5	3 1 7
1789	2 12 9		. .	2 12 9		1829	3 6 3		. .	3 6 3	
1790	2 14 9		. .	2 14 9		1830	3 4 3		. .	3 4 3	
1791	2 8 7		. .	2 8 7		1831	3 6 4		. .	3 6 4	
1792	2 3 0		. .	2 3 0		1832	2 18 8		. .	2 18 8	
1793	2 9 3	2 13 8	. .	2 9 3	2 13 8	1833	2 12 11	2 12 8	. .	2 12 11	2 12 8
1794	2 12 3		. .	2 12 3		1834	2 6 2		. .	2 6 2	
1795	3 15 2		. .	3 15 2		1835	1 19 4		. .	1 19 4	
1796	3 18 7		. .	3 18 7		1836	2 8 6		. .	2 8 6	
1797	2 13 9		. .	2 13 9		1837	2 15 10		. .	2 15 10	
1798	2 11 10	3 13 5	. .	2 11 10	2 13 5	1838	3 4 7	3 1 2	. .	3 4 7	3 1 2
1799	3 9 0		. .	3 9 0		1839	3 10 8		. .	3 10 8	
1800	5 13 10		. .	5 13 10		1840	3 6 4		. .	3 6 4	
1801	5 19 6		8 7 8	5 9 6		1841	3 4 4		. .	3 4 4	
1802	3 9 10		7 5 10	3 4 11		1842	2 17 3		. .	2 17 3	
1803	2 18 10	4 0 0	2 13 2	2 17 3	3 15 11	1843	2 10 1	2 14 9	. .	2 10 1	2 14 9
1804	3 2 3		2 13 2	3 0 7		1844	2 11 3		. .	2 11 3	
1805	4 9 9		2 13 2	4 7 4		1845	2 10 10		. .	2 10 10	
1806	3 19 1		2 13 2	3 17 0		1846	2 14 8		. .	2 14 8	
1807	3 15 4		2 13 2	3 13 4		1847	3 9 9		. .	3 9 9	
1808	4 1 4	4 11 11	2 13 2	3 19 2	4 3 3	1848	2 10 6	2 11 10	. .	2 10 6	2 11 11
1809	4 17 4		2 13 2	4 14 9		1849	2 4 3		. .	2 4 3	
1810	5 6 5		13 9 6	4 11 11		1850	2 0 3		. .	2 0 3	
1811	4 15 3		7 16 10	4 7 9		1851	1 18 6	. .	. .	1 18 6	
1812	6 6 6		20 14 9	5 0 3		1852	2 0 9	. .	. .	2 0 9	
1813	5 9 9	4 14 3	22 18 0	4 6 6	3 16 11						
1814	3 14 4		25 2 6	2 15 8							
1815	3 5 7		16 14 3	2 14 7							

Results of Tables.—Rentals of 1814-15 *and of* 1851-52.—It appears from Table No. II., that the rental of England and Wales in 1842–3 was 5,836,627*l.* greater than in 1814–15, being an average rise of 3*s.* 1¾*d.* per acre; and it appears from Table No. IV., that a farther increase of 6*d.* per acre had taken place in the same rental between 1842–43 and 1851–52, making a total increase of 3*s.* 7¾*d.* on the rent per acre of England and Wales between 1842–43 and 1851–52. It also appears from Table No. V., that the price of wheat during the five years ending with 1815 amounted to 94*s.* 3*d.* per quarter, whereas it only amounted during the five years ending with 1850 to 51*s.* 11*d.*, that the increase of 3*s.* 7¾*d.* an acre in the rental of the kingdom had taken place concurrently with a fall of 42*s.* 4*d.* a quarter in the price of wheat.

But, as already stated, the currency was depreciated to the extent of about 18 per cent. during the five years ending with 1815, so that it is indispensable, if we would make a fair comparison of the rental of 1814–15 with that of 1842–3, to make a suitable deduction from the former: this is done in Table No. III.; and it appears, from this corrected Table, that the gross rental of the land of England and Wales amounted in 1814–15, in undepreciated currency, to 30,897,416*l.*; but it amounted in 1851–52 to 41,118,329*l.*, being an increase in the interval of 10,220,913*l.*, or of 5*s.* 6*d.* an acre.

In Table No. V., showing the prices of wheat from 1776 to 1852, &c., we have allowed for the nett amount of the depreciation in each year of its existence, or from 1801 to 1820, both inclusive. And it will be seen that the average price of wheat in undepreciated currency, during the five years ending with 1815, amounted to 76*s.* 11*d.* a quarter; but in the five years ending with 1850, the price of wheat amounted to only 51*s.* 10*d.* a quarter, showing, all the estimates being made in undepreciated money, that the above increase in the rental of the kingdom of 10,220,913*l.* in the whole, or of 5*s.* 6*d.* an acre, had taken place, despite a real fall of 25*s.* per quarter in the price of wheat.

There is a very considerable difference in the rents of equally fertile land in different counties; occasioned partly by differences of situation, and partly by the different degrees of skill and economy with which they are farmed. Rents of corn farms are highest in Northumberland, Durham, Essex, Kent, Hampshire, &c. A great deal of arable land, even of moderately-good quality, lets at from 10*s.* to 18*s.* an acre, and where highest, its rent, exclusive of tithes, poor rates, and other public burdens, seldom exceeds 35*s.* an acre. Good pasture land generally lets higher than corn land. It may vary from 16*s.* to 3*l.* When it is of limited extent, and contiguous to a considerable town, it sometimes fetches 5*l.* and 6*l.* per acre, and even more.

Rise of Rents in England.—Arthur Young, in his *Northern Tour* (vol. iv. p. 366) estimated the rental of England and Wales, in 1771, at 16,000,000*l.*; and in Dr. Beeke's celebrated pamphlet on the *Income Tax*, published in 1800, it is estimated at 20,000,000*l.* But, as the rental was ascertained by the returns under the old Property Tax Act to have amounted in 1806 to 25,908,207*l.*, there can be no doubt that Dr. Beeke's estimate was below the mark, and that the rental in 1800 could hardly have been under 22 or 22½ millions: and, supposing this estimate to be nearly correct, its progress will have

been, overlooking the variations in the value of the currency, as follows, viz. :—

Years.	Rent. £.	Years.	Rent. £.
1800	22,500,000	1815	34,230,462
1806	25,908,207	1843	40,167,089
1810	29,503,074	1852	41,118,329

Moderate Rent of Land in England.—Considering the advantages which the English farmer enjoys in fertility of soil, climate, and ready access to the best markets in the world, the rent which he pays seems to be unusually low. This, no doubt, is owing partly to the pressure of the public burdens falling on the tenant; partly (at least in the south) to vicious customs with respect to the succession of tenants, and the waste of labour in ploughing; and partly to the want of leases and the consequent insecurity of the occupiers. A good deal is, however, to be ascribed to a disinclination on the part of many landlords to raise rents, and a wish not to remove tenants, and to keep their estates always underrented. But though the disadvantages resulting from the overrenting of land be great and signal, the opposite practice, or its underrenting, is by no means the best that may be devised. Supposing that a tenant has a lease of a farm, or that he is otherwise secured in its possession, it might be imagined that the circumstance of its being underrented would have no influence in diminishing his industry or activity, seeing that he would reap all the advantage of superior skill, enterprise, and economy; but experience shows that such is not by any means the case. To make farmers leave those routine practices to which they are strongly attached, and avail themselves of improved systems and modes of management, they must not only have the means of meliorating their condition, but their rents must be such as to impress them with the conviction that, if they do not exert themselves, their ruin will assuredly follow. Estates that are underrented are, uniformly almost, farmed in an inferior style to those that are let at their fair value: and the tenants are comparatively poor. An increase of rent, provided it be not pushed too far, is, of all others, the most efficient means of improvement. "I have not," says Arthur Young, "seen an instance of rent being low, and husbandry, at the same time, being good. Innumerable are the instances of farmers living miserably, and even breaking on farms at very low rents, being succeeded by others, on the same land, at very high rents, who make fortunes. Throughout my journey I have universally observed that such farms as were the most wretchedly managed were very much underlet."*

A striking illustration of the same principle is given by Davis, in the *Survey of South Wales*:—"A gentleman noted for his liberality to his tenants, during the last 17 years of his life laid out upwards of 20,000*l.* in improving the farms of his tenants at will, without charging them a penny in advance of rent. He died; and his successor, of a different cast, leaving off improvements, tried what *doubling of rents* would do; and it is painful to relate, for it borders on a libel on

* *Young's Tour in the North of England*, vol. iv., p. 376. See also *Analysis of the Statistical Account of Scotland*, part i., p. 258, &c.

human nature, that this advance of rent, considered exceedingly grievous at the time it was imposed, had a greater effect in improving the agriculture of the estate than all the benevolence and forbearance of his predecessor. The tenants were now compelled to do for themselves what another did for them before."—(Vol. i. p. 165.)

Proportion of Rent of Land to the Produce.—It is sufficiently obvious that, in estimating this proportion, it is not possible to do more than arrive at a rough average, which will very rarely apply in particular instances. The cultivation of inferior being quite as expensive as that of superior land, and, in most cases, a good deal more so, it follows that, while the whole, or the greater part of the produce of bad land may be required to indemnify the cultivator, so that little or nothing may remain for the landlord, a comparatively small portion of the produce of superior land may suffice to repay the cultivator for his outlay and trouble, leaving a large surplus to the landlord. Rents do not, however, depend entirely on the differences in the natural fertility of the soils under cultivation, but are materially influenced by the degree in which they have been improved; the nature and duration of the leases under which they are held; the public burdens affecting them, &c. With respect, indeed, to the influence of the latter on rent, it is difficult to form any precise conclusions, without previously knowing the mode in which they are assessed, and their effect on prices. In general, however, there can be no doubt that the imposition of taxes on the land, or on its produce, tends to lower rent, and that their repeal tends to raise it. But the extent to which tillage has been carried, and the different degrees of improvement, are the principal circumstances that affect rent. A farm of naturally bad land, if it be furnished with commodious buildings, and be otherwise highly improved and fertilised by an expenditure of capital and labour, may yield a pretty considerable amount of rent; while a farm of really good land, but furnished with indifferent buildings, and but little improved, may probably not let for so much as the other. Agricultural science has, also, a very considerable influence over rent. The greater the economy with which the business of agriculture is carried on, that is, the smaller the outlay for which the different farming operations may be completed in the best manner, the greater will be the amount of surplus produce after the claims of the farmer are satisfied. It is in this respect, in the greater skill and economy with which agricultural operations are carried on, more than in the absence of tithes and poor rates,—though these have, of course, a considerable influence,—that the superiority of Scotch over English agriculture mainly consists, and that, at an average, the Scotch landlords receive a considerably greater proportion of the produce of the soil than the English.

These statements show how very difficult it must be to form any tolerably accurate estimate of the share of the agricultural produce of an extensive country that goes to the landlord; and they also show how inapplicable such an average proportion would be, even if accurately determined, to the vast majority of particular farms, and even to very many districts of considerable extent. It is pretty evident, too, that though the proportion which the produce of a country going

to the landlords as rent at any particular period were ascertained, it might be materially different at another period. It is, as has been seen, materially influenced, not only by the skill with which agricultural operations are carried on, and by the magnitude and nature of the public burdens laid on the land, but by the extent to which the cultivation of bad land is carried, and by a variety of other circumstances, that, like those now mentioned, are liable to perpetual change, and operate in different directions.

Towards the middle of last century it seems to have been the common opinion, that the rent of land of medium fertility was about equivalent to a third part or more of its gross produce. During the present century, however, those best able to judge believe that this proportion is too high, and that the medium rent of land seldom amounts to more than a fourth part of its produce. We suspect, indeed, that the former estimate must have been at all times a good deal above the mark. For any but the finest land a third part of the produce would be a heavy rent; and for lands of inferior fertility it would be quite oppressive. Those who set aside from a fourth to a third part of the produce of Great Britain as rent, seem to us to make an allowance sufficiently near the mark.

The following Table has been given, as representing the average rent of cultivated land in Scotland; but its accuracy has been disputed, and at best it can be considered as nothing better than a rude outline:—

	£. s.			£. s.	
Land producing	10 18	per acre,	⅓ part, or	3 11	per acre.
,,	6 12	,,	¼ ,,	1 13	,,
,,	4 5	,,	⅛ ,,	0 17	,,

Proportion of the gross to the real Rent of Land.—By the gross rent of land is meant, as every one knows, the entire sum paid by the occupier to the owner, including, of course, an allowance for the houses on the farm subservient to agricultural purposes, and for the fences, roads, drains, and improvements of all sorts that have been made upon the land. The *real* rent is much more limited: it means that portion of the gross rent which may be supposed to be paid by the occupier to the landlord for the use of *the natural and inherent powers of the soil*, or the rent the farm would fetch supposing it were in a state of nature, and destitute of houses, fences, and of every sort of artificial melioration. It is impossible, however, to distinguish between these portions. Most improvements, when once effected, become so intimately blended with the soil, that they cannot be separately considered; nor, supposing they were requested to make the attempt, would any two agriculturists, however skilful, form the same estimate of the real rent of an improved farm. But it is, notwithstanding, obvious that a very large portion of the rent of Great Britain consists, in fact, of a compensation, or return, for the vast amount of capital expended on agricultural buildings and improvements. It is to be regretted that we have no means of estimating, with any pretensions to accuracy, what the portion of rent accruing to the landlords on account of improvements may really amount to. We believe, however, that it

is decidedly greater than the other; but, estimating the whole rental of Great Britain at *forty-five* millions, if we set apart *twenty* millions as real rent, and regard the remaining *twenty-five* millions as interest on account of buildings, fences, drains, roads, and other improvements of the soil, we shall certainly be within the mark.

Distribution of Rent in England.—Landed property in England is not so unequally distributed as many suppose. The highest rental may amount to about 100,000*l.* a-year; but there are comparatively few estates worth more than 10,000*l.* or 12,000*l.*, and the great majority are under 1,000*l.* We regret, however, that there are no means either of classifying the incomes derived from land, or of estimating the total number of proprietors amongst whom it is divided. Dr. Beeke says, that the latter amount to at least 200,000,—(*Observations on the Income Tax*, 2nd edit., p. 21,) which would give, at an average, 200*l.* a-year to each. In the agricultural counties, the smaller proprietors are understood to have become less numerous during the present century; but in the manufacturing districts the reverse is true, and large estates have become comparatively rare.

Agricultural Capital.—Great Britain.—The capital employed in farming has been very differently estimated. It was supposed by Arthur Young, in his *Northern Tour*, to amount to about 4*l.* an acre, which, taking the cultivated land of England and Wales at 32,000,000 acres, would give an aggregate sum of 128,000,000*l.* It is generally believed that this estimate was at the time pretty accurate; but, owing to the general rise of prices, and to the great improvements that have been made in the stock and implements employed on most farms, the amount of capital engaged in agriculture must be much greater at present than in 1770; and cannot, we are assured, be estimated at less, at an average, than 6*l.* or 7*l.* per acre; giving a total sum of from 192,000,000*l.* to 224,000,000*l.*, or 208,000,000*l.* at a medium. The capital required for farming the 5,500,000 arable acres in Scotland may be estimated at from 5*l.* to 6*l.* an acre.

Insufficiency of Agricultural Capital.—It is a remark, as old as the days of Columella, that a farmer's capital should be above rather than below his farm. But it may notwithstanding be affirmed that, speaking generally, farms in all parts of Britain are decidedly understocked. This is a point as to which, more than any other, farmers are apt to miscalculate. Those who should only take a farm of 100*l.* or 150*l.* a-year, not unfrequently take one of 200*l.* or 300*l.* They are led to do this by the greater consequence attached to the occupancy of a considerable farm by associating in their minds the idea that *much land will bring them much profit;* and by an over sanguine expectation that they will be able, by superior address, or by the assistance of friends, to make the capital answer the demands upon it. But such conduct is, for the most part, very short-sighted. A deficiency of capital disables farmers from procuring the best sort of implements; from performing the different operations in the best and most expeditious manner; from executing improvements that are, perhaps, indispensable; and most commonly ends by involving them in debt and difficulties, from which it may not afterwards be in their power to escape. "There is not, in the whole range of rural economy,

a more important object than the country being richly stocked. The best land is of no avail without a sufficient sum of money to render its fertility of use: neither skill nor industry will make any amends for the want of an ample stock. One of the most common and yet most fatal errors, to which the conduct of a farmer is open, is that of under-stocking."—(*Young's Northern Tour*, vol. iv., p. 272.)

Profit of Farmers.—Under the old Income Tax Act, the profits of the tenants of land in England were estimated at three-fourths and in Scotland at half the rent; but under the present Act the profits of the English farmers are taken at a half and those of the Scotch at a third of the rent. And we incline to think that this estimate is not, on the whole, far from, though probably a little under, the mark. Supposing it to be nearly correct, it would give about 20,000,000*l.* for the profits of the occupiers of England and Wales; which would give about 9½ per cent. on the capital of 208,000,000*l.* engaged in cultivation; and we are assured, that if they be supposed to amount to 10 per cent. or to 20,800,000*l.* in the gross, no sensible error will be committed.

But it is to be observed, that this gross profit of 10 per cent. includes, besides the return to the capital possessed by the agriculturists, *all that they receive as wages*, or on account of their labour in superintending and working on their lands. When a fair allowance is made on this account, it will be seen that the *nett* profit realized by the occupiers is but of very limited amount. In this respect, indeed, farmers seem to be less favourably situated than most other classes. Even with the greatest care and attention, few amongst them attain to opulence. The great majority merely manage to live respectably, and to bring up a family. "The few," says Mr. Loudon, "who do more than this will be found to have had leases at low rents, indulgent landlords, to have profited by the accidental rises in the market or depreciation of currency, or to have become dealers in corn or cattle; and rarely indeed to have realised aught by the mere good culture of a farm."—(*Ency. of Agriculture*, p. 719.) The opinion of Mr. Burke, who, in the estimation of those most capable of judging, stood high both as a scientific and practical farmer, is to the same effect. "In most parts of England," says he, "which have fallen within my observation, I have rarely known a farmer (I speak of those who occupy from 150 to 300 or 400 acres) who to his own trade has not added some other employment or traffic, that, after a course of the most unremitting parsimony and labour (such for the most part is theirs), and persevering in his business for a long course of years, died worth more than paid his debts, leaving his posterity to continue in nearly the same equal conflict between industry and want, in which the last predecessor, and a long line of predecessors before him, lived and died."—(*Thoughts and Details on Scarcity*, p. 21.)

II. SCOTLAND.

Cultivated and Uncultivated Land.—Estimates are given in the *General Report of Scotland*, (vol. i., pp. 37, 58, &c.,) of the extent of the cultivated and uncultivated land, exclusive of lakes, in each

county. There may have been errors in these estimates when they were drawn up; and there can be no doubt, that a great deal of waste land has been brought into cultivation in the interval. But, such as they are, they are the only estimates of the kind that have hitherto been put forth, and, for most practical purposes, they may be regarded as tolerably correct. We, therefore, have adopted them in the following table: and have added to it a column showing the extent of cultivated land in each county, supposing 1,000 to represent the total extent of such land in Scotland. (See Table, next page.)

Distribution of Land. — Quantity and Value of Agricultural Produce.—This is a subject as to which the real information at our command is as limited in respect of Scotland as of the other divisions of the empire. According to the statistical tables in the *General Report of Scotland*, published in 1814, (III. Append., p. 5,) the arable land is estimated at 5,043,450 English acres. Of these the proportion in grass is estimated at 2,489,725, leaving 2,553,725 in tillage, which is supposed to be distributed as follows:—

	Acres.		Acres.
Wheat	140,095	Potatoes	80,000
Barley	280,193	Turnips	407,535
Oats	1,260,352	Flax	16,500
Rye	500	Gardens	32,500
Beans and Peas	118,000	Fallow	218,050

But a large extent of waste land, certainly not less than a million of acres, has been brought under cultivation during the last 30 years; and it is all but certain, also, from the greatly increased consumption of wheaten bread in Scotland, and other circumstances, that the quantity of land assigned to the growth of wheat has increased both absolutely and relatively. In our view of the matter, the quantity and the distribution of the land in tillage may be estimated as follows:—

	Acres.		Acres.
Wheat	350,000	Clover	450,000
Barley	450,000	Flax	5,000
Oats	1,300,000	Gardens	35,000
Beans and Peas	50,000	Fallow	100,000
Potatoes	200,000		
Turnips	450,000	Total	3,390,000

Assuming this distribution to be correct, the quantity and value of the crops will be as follows:—

Account of the Extent of Land in Scotland under the principal Descriptions of Crops; the average Produce per Acre; the total Produce; the Amount of Seed; the Produce under deduction of Seed; and the total Value of such Produce.

Crops.	Acres in Crop.	Produce per Acre.	Total Produce.	Seed (1-7th of Produce)	Produce under Deduction of Seed.	Price per Quarter.	Total Value.
		Quarters.	Quarters.	Quarters.	Quarters		£. s. d.
Wheat	350,000	8½	1,225,000	175,000	1,050,000	48s.	2,520,000 0 0
Barley	450,000	4	1,800,000	257,143	1,542,857	28s.	2,159,999 16 0
Oats	1,300,000	5	6,500,000	929,571	5,571,429	20s.	5,571,429 0 0
Beans and Peas	50,000	3	150,000	21,428	128,572	30s.	192,858 0 0
Fallow	100,000						
Potatoes	200,000						
Turnips	450,000	7l. per Acre					7,700,000 0 0
Clover	450,000						
Flax	5,000	15l. per Acre					75,000 0 0
Gardens	35,000	15l. per Acre					525,000 0 0
Totals	3,390,000		9,675,000		8,292,858		18,744,286 16 0

Table of the Extent of Land (exclusive of Lakes) in the several Counties of Scotland, in Imperial Statute Acres, and in Scotch Acres, distinguishing the Number of Cultivated, and the Number of Uncultivated Acres in each, according to General Report of Scotland; and showing the Proportion of Cultivated Land in each County, assuming 1,000 *to represent the total Extent of Cultivated Land in Scotland.*

Counties.	Imperial Statute Acres.			Scotch Acres.			Proportion of cultivated Land in each County, assuming 1,000 to be the Total cultivated Land in Scotland.
	Cultivated.	Not Cultivated.	Totals.	Cultivated.	Not Cultivated.	Totals.	
Mainland.							
Aberdeen	451,564	802,816	1,254,400	356,027	636,493	994,520	89·536,709
Argyle	163,970	1,244,030	1,408,000	130,000	986,298	1,116,298	32·511,475
Ayr	325,830	339,130	664,960	258,328	268,871	527,197	64·604,586
Banff	123,240	288,960	412,200	98,183	229,095	327,278	24·554,920
Berwick	137,197	145,683	282,880	108,773	115,502	224,274	27·223,006
Caithness	92,333	347,347	439,680	73,204	275,386	348,590	18·307,508
Clackmannan	23,040	7,680	30,720	18,267	6,089	24,356	4·568,801
Cromarty	20,480	143,360	163,840	16,237	113,659	129,896	4·060,712
Dumbarton	53,990	91,930	145,920	42,805	72,884	115,689	10·704,274
Dumfries	232,557	569,363	801,920	184,377	451,405	635,782	46·110,698
Edinburgh	144,999	81,561	226,560	114,959	64,664	179,623	28·749,963
Elgin	121,088	181,632	302,720	96,008	144,002	240,004	24·008,962
Fife	209,216	89,664	298,880	165,872	71,088	236,960	41·492,715
Forfar (Angus)	369,408	196,912	566,320	292,876	157,702	450,578	73·245,100
Haddington	139,264	34,816	174,080	110,412	27,603	138,015	27 612,844
Inverness	148,685	1,709,875	1,858,560	117,881	1,355,632	1,473,513	29·480,812
Kincardine	92,416	150,784	243,200	73,270	119,545	192,815	18·323,965
Kinross	27,648	18,432	46,080	21,920	14,613	36,533	5·481,992
Kirkcudbright	168,243	357,517	525,760	133,387	283,448	416,835	33·358,718
Lanark	271,296	331,584	602,880	215,090	262,888	477,978	53·791,750
Linlithgow	57,600	19,200	76,800	45,667	15,222	60,889	11·430,754
Nairn	37,440	87,360	124,800	29,683	69,261	98,944	7·423,460
Peebles	24,500	179,660	204,160	19,424	142,439	161,863	4·857,786
Perth	530,022	1,126,298	1,656,320	420,215	892,957	1,313,172	105·091,156
Renfrew	72,000	72,000	144,000	57,083	57,083	114,166	14·275,942
Ross	120,373	1,203,782	1,324,160	95,439	954,388	1,049,827	40·829,194
Roxburgh	205,920	251,680	457,600	163,256	199,539	362,797	23·368,185
Selkirk	10,100	186,220	196,320	8,008	125,440	133,448	2·002,597
Stirling	195,800	117,360	313,160	155,076	93,046	248,122	38·762,976
Sutherland	63,045	1,059,515	1,122,560	49,984	840,009	889,993	12·500,879
Wigtown	101,186	187,824	288,960	80,183	148,912	229,095	20·052,940
Total of Mainland	4,734,625	11,577,975	16,332,600	3,753,887	9,195,163	12,949,050	938·906,769
Islands:							
Bute and its Isles	29,440	73,600	103,040	23,341	58,352	81,693	5·837,274
Hebrides, viz.:—							
Argyle Isles	107,020	487,540	594,560	84,848	386,534	471,382	21·819,602
Inverness Isles	95,680	640,320	736,000	75,857	507,662	583,519	18·971,141
Ross and Cromarty	30,117	328,283	358,400	23,877	260,271	284,148	5 971,508
Orkney Isles	24,480	247,520	272,000	19,409	196,248	215,651	4·853,620
Shetland Isles	21,888	525,312	547,200	17,358	416,485	433,836	4·339,666
Totals	5,043,450	13,900,550	18,944,000	3,998,572	11,020,709	15,019,281	1,000·000,000

Taking the extent of pasture land and wood land in Scotland, exclusive of heaths, wastes, &c., at 2,500,000 acres, and estimating its produce to be worth, at an average, 3*l.* per acre, its total value will be 7,500,000*l.*; but to this has to be added the value of about 13,000,000 acres of mountain pastures, heaths, and waste land, which has been estimated, apparently with great moderation, at about 1,500,000*l.* Hence the total annual value of the land produce of Scotland will be—

	£.
Value of Crops and Gardens	18,744,286
Value of Pasture and Wood Land	7,500,000
Value of Uncultivated Land and Waste	1,500,000
Total	27,744,286

Rental of Scotland.—We have found it more difficult to obtain accurate information as to the former rental of Scotland than of England. Mr. Wood could only supply us with an account of its

aggregate rental from the Property Tax Returns. There is in the *General Report of Scotland* (vol. i. p. 123) an account of the rental of each county, exclusive of houses, but inclusive of mines, fisheries, quarries, &c., for 1810, deduced from these returns. Unluckily, however, this table contains some very gross errors:* these we have endeavoured to correct; and the rental for 1810-11 in the following table differs very little in the result from the correct return, and is, we believe, nearly accurate. (See Table, next page.)

It appears from this table, and that on page 567, that the rental of Scotland has not increased since the peace, nearly so fast as that of England. Various opinions have been entertained with respect to the causes of this discrepancy, which is not very easily accounted for. A good many commons and wastes have been enclosed and taken into cultivation in England during the last thirty years; but though comparatively few have been enclosed during the same period in Scotland, cultivation has there also been considerably extended. Perhaps it may be safely assumed that the greater part of the different progress of rent in the two countries may be ascribed to the fact, that the system of farming having been more improved in 1814, in Scotland, than in England, the former had less progress to make; and that the rent of land in Scotland was then, also, more nearly proportioned to its value, than it has since become in England. It should further be borne in mind, that a much larger proportion of most Scottish counties consists of mountain and unimprovable land than of English counties; and that consequently the field for improvement is comparatively limited. It must not, however, be supposed, because there has been little rise of rent in Scotland since 1815, that improvements have been at a stand. On the contrary, they have been prosecuted with equal skill, vigour, and success in most parts of the country.

In 1815 the total rental of Scotland, exclusive of houses, amounted to 5,278,685*l.*, being 307,843*l.* less than in 1842-3.

It is difficult to decide as to the share of the entire rental to be set apart as the rent of the 13,000,000 of uncultivated acres; but there are good grounds for thinking that it does not exceed 1,000,000*l.*, leaving 4,586,528*l.* as the nett rental of the arable portion, being at the rate of about 15*s.* 6*d.* an acre. Though there are considerable exceptions, there can be no doubt that, speaking generally, the arable land of England is superior in respect of quality to that of Scotland; but, in consequence of the greater skill and economy of the farmers in the latter, and of the advantage they enjoy in the possession of leases, and the absence of tithes and poor rates, they are able to pay higher rents for lands of equal fertility. The rent of corn land in Scotland varies from 7*s.* to 3*l.* an acre, and occasionally even amounts to 5*l.* and 6*l.* The best pasture land rarely fetches more than 3*l.* per acre; and that which is of a medium quality may vary from 14*s.* to 25*s.*

Rise of Rent in Scotland.—Down to 1815, rent increased more rapidly in Scotland than in England. This was ascribable partly to the

* In the table in question, the gross rental of the stewartry of Kirkcudbright, in 1810, is stated to have been 22,752*l*, whereas it really amounted to 192,047*l.*! The gross rental of Kinross-shire is, in the same table, set down at 83,488*l.*, being above 60,000*l.* too much! These blunders have been copied into some dozen publications.

Table showing the Extent in Statute Acres of the different Counties of Scotland, exclusive of Lakes; the Total Rental of the Land (including Mines, Fisheries, &c.), according to the Returns under the Property Tax Act, for the Year ending 5th of April, 1811; with the Annual Rent per Acre of the Land, &c. in each County; and the Gross Valued Rent of each County.*

Counties.	Statute Acres.	Ascertained Rental for 1810–11.	Rent per Acre in 1810–11.			Valued Rent in Scotch Money.†		
		£.	£.	s.	d.	£.	s.	d.
Aberdeen	1,260,625	233,827	0	3	8¼	235,665	8	11
Argyle and Isles	2,058,126	192,074	0	1	10¼	149,595	10	0
Ayr	650,156	336,472	0	10	4	191,605	0	7
Banff	439,219	79,396	0	3	7¼	79,200	0	0
Berwick	309,375	231,973	0	14	11¾	178,366	8	6 7/24
Bute	109,375	18,591	0	3	4¾	15,042	13	10
Caithness	455,708	30,926	0	1	4¼	37,256	2	10
Clackmannan	29,744	32,048	1	1	6¾	26,482	10	10
Dumbarton	174,532	56,973	0	6	6¼	33,327	19	0
Dumfries	722,813	246,002	2	6	9½	158,502	10	0
Edinburgh	254,300	277,828	1	1	10	191,054	2	9
Elgin	340,000	62,312	0	3	7¾	65,603	0	5
Fife	322,031	335,291	1	0	9¾	363,192	3	7 2/12
Forfar (Angus)	568,750	260,197	0	9	2	171,239	16	8
Haddington	185,937	180,654	0	19	5	168,873	10	8
Inverness and Isles	2,668,658	145,844	0	1	1	73,188	9	0
Kincardine	252,250	159,896	0	12	8	74,921	1	4
Kinross	45,531	22,753	0	9	11¾	20,250	4	3¾
Kirkcudbright	610,735	192,047	0	6	3¼	114,537	2	3 393/561
Lanark	631,719	298,019	0	9	5	162,181	14	6
Linlithgow	64,375	82,947	1	5	9	75,018	10	6½
Nairn	137,500	11,726	0	1	8¼	15,162	10	11
Orkney and Shetland	591,726	16,236	0	0	6¼	57,786	0	4 47/100
Peebles	226,488	57,382	0	5	0¾	51,937	13	10
Perth	1,788,438	460,739	0	5	1¾	339,892	6	9
Renfrew	150,000	127,069	0	16	11¼	69,172	1	0
Ross and Cromarty	1,993,875	101,950	0	1	0¼	87,940	12	10 8/12
Roxburgh	460,938	230,663	0	10	0	314,663	6	4
Selkirk	170,313	39,776	0	4	8	80,307	15	6
Stirling	286,188	177,499	0	12	4¾	108,509	3	3 1/12
Sutherland	1,207,188	28,457	0	0	5½	26,093	9	9
Wigtown	326,736	123,837	0	7	6¾	67,641	17	0
Total	19,500,348	4,851,404		..		3,804,221	0	0
The Average Rent per Statute Acre in Scotland, in 1810, on the data here given, was			0	4	11½			

* These only amounted to about 140,000*l.*, and have, therefore, no sensible effect on the averages.

† By *valued rent* is meant the rental as ascertained by valuations made previously to 1667, or by the Commissioners appointed to carry the Act of that year into execution. The Land Tax, and most other public burthens falling on the land, have ever since been assessed according to the valued rent.—(See *Erskine's Principles of the Law of Scotland*, p. 170, ed. 1827.)

extremely backward and depressed state of Scotch agriculture till after the peace of Paris in 1763, and partly to the extraordinary advance it made after the close of the American war. The entire rental of the kingdom is not supposed to have exceeded 1,000,000*l.*, or 1,200,000*l.*, in 1770. In 1795 it is believed to have rather exceeded 2,000,000*l.*;

and between that epoch and 1815, it increased two and a-half millions more! So rapid an increase of rent is probably unmatched in any old settled country, and indicates an astonishing degree of improvement.

Account showing the Area of the different Counties of Scotland, the Rent per Acre of each in 1842-43, *and Gross Rental and Rent per Acre of each in* 1851-52, *as determined by the Assessments under the Property and Income Tax Acts; showing the Increase or Diminution of the Rent per Acre in* 1851-52, *as compared with that for* 1842-43.

Counties.	Imperial Acres.	Rent per Acre in 1810-11.	Gross Rental in 1842-43.	Rent per Acre in 1842-43.	Gross Rental in 1851-52.	Rent per Acre in 1851-52	Inc or Dec. of Rent per Acre in 1851-52, as compared with 1810-11.
		£. s. d.	£.	£. s. d.	£.	£. s. d.	£. s. d.
Aberdeen	1,260,625	0 3 8¼	423,389	0 6 8¼	444,867	0 7 0½	Inc. 3 4
Argyle	2,058,126	0 1 10¼	232,441	0 2 3	232,508	0 2 3	„ 0 4¾
Ayr	659,156	0 10 4	390,278	0 12 0	391,119	0 12 0¾	„ 1 8¼
Banff	439,219	0 3 7¼	110,608	0 5 0¼	114,473	0 5 2¼	„ 1 7
Berwick	309,375	0 14 11⅜	237,042	0 15 3¾	205,946	0 15 10½	„ 1 11
Bute	109,375	0 3 4¼	20,597	0 3 9·	22,640	0 4 10¼	„ 1 5¼
Caithness	455,708	0 1 4¼	57,982	0 2 6¼	60,539	0 2 7¼	„ 1 3¼
Clackmannan	29,744	1 1 6¼	35,240	1 3 8¼	26,106	0 17 6¼	Dec. 4 0
Dumbarton	174,532	0 6 6¼	72,041	0 8 3	69,097	0 7 11	„ 1 4¾
Dumfries	722,813	0 6 9¼	266,547	0 7 4¼	275,372	0 7 7¼	Inc. 0 10
Edinburgh	254,399	1 1 10	239,189	0 18 9¼	233,322	0 18 4	Dec. 3 6
Elgin	340,000	0 3 7¾	84,082	0 4 11¼	99,886	0 5 9¾	Inc. 2 2
Fife	322,031	1 0 9¾	381,672	1 3 8¼	368,799	1 2 10¾	„ 2 1
Forfar (Angus)	568,750	0 9 2	312,201	0 10 11¼	277,607	0 9 8	„ 0 6
Haddington	185,937	0 19 5	221,714	1 3 10	176,304	0 18 11¼	Dec. 0 5¼
Inverness	2,668,658	0 1 1	161,499	0 1 2¾	159,545	0 1 2¼	Inc. 0 1¼
Kincardine	252,259	0 12 8	128,469	0 10 2	123,200	0 9 9	Dec. 2 11
Kinross	45,431	0 9 11¾	38,892	0 17 1	41,407	0 18 2¼	Inc. 8 2¼
Kirkcudbright	610,734	0 6 3¼	182,926	0 5 11¾	190,330	0 6 2¼	Dec. 0 0¼
Lanark	631,719	0 9 5	341,122	0 10 9¼	324,208	0 10 3	Inc. 0 10
Linlithgow	64,135	1 5 9	82,842	1 5 8¼	76,297	1 3 8¼	Dec. 2 0¼
Nairn	137,500	0 1 8¼	15,202	0 2 2¼	17,306	0 2 6	Inc. 0 9¾
Orkney and Shetland	598,726	0 0 6¼	38,888	0 1 3¼	36,643	0 1 2¼	„ 0 8
Peebles	226,488	0 5 0¾	67,675	0 5 11¼	68,416	0 6 0¼	„ 0 11¼
Perth	1,788,438	0 5 1¾	551,078	0 6 2	512,077	0 5 8½	„ 0 6¾
Renfrew	150,000	0 16 11¼	152,924	1 0 4¼	133,043	0 17 8	„ 0 8¾
Ross and Cromarty	1,993,875	0 1 0¾	120,824	0 1 2¼	133,446	0 1 4	„ 0 3¾
Roxburgh	460,038	0 10 0	235,041	0 10 2	241,511	0 10 5¼	„ 0 5¼
Selkirk	170,313	0 4 8	38,714	0 4 6¼	37,228	0 4 4¼	Dec. 0 3¾
Stirling	236,188	0 12 4¾	181,147	0 12 7¾	180.189	0 12 7	Inc. 0 2¼
Sutherland	1,207,188	0 0 5½	33,689	0 0 6	36,108	0· 0 7	„ 0 1½
Wigtown	326,736	0 7 6¼	124,807	0 7 7½	133,995	0 8 2¼	„ 0 7¼
Totals	19,500,348	. .	5,586,528	. .	5,487,585	. .	. .
Average Rent, per Imperial Acre, in Scotland	. .	0 4 11¼	. .	0 5 8¾	. .	0 5 7½	Inc. 0 8

Distribution of Rent in Scotland.—Landed property in Scotland is less divided than in England; and owing to the system of strict entail,

now so general in that part of the empire, it is daily accumulating in larger masses. The total number of proprietors in Scotland has been estimated at about 7,800, of whom more than 6,000 are the owners of properties worth 600*l.* a year and under.—(*General Report of Scotland*, vol. iii. Appendix, p. 4.)

Owing to the greater economy with which most sorts of farm labour, particularly ploughing, is performed in Scotland, the capital on Scotch farms is, we believe, a good deal less than on English farms of the same value. We should not be inclined to reckon it at more than 35,000,000*l.* on the 5,500,000 arable acres in Scotland. The profits of the farmers may be reckoned at 4,000,000*l.*

Number of Farmers and Size of Farms.—We have already given some details with respect to these points (*ante*, p. 456), in so far as respects England. In Scotland the proportion of land occupied by tenants, is a good deal larger than in England; so much so, that we should not be disposed to estimate the entire annual value of the lands of that kingdom occupied by owners at more than 300,000*l.* a year. If this supposition be well founded, there will remain land worth 5,200,000*l.* a year occupied by tenants; the number of which, according to the census of 1841, being 54,873, it follows that each pays, at an average, about 95*l.* a year.

III. Ireland.

Cultivated and Uncultivated Land—Rent, &c.—Until recently there were no means of forming any tolerably accurate estimates in regard to any of these points. The property tax did not extend to Ireland; and all that we had to trust to in determining its rental were estimates deduced from the rental of particular estates, or from valuations made for the assessment of the local burdens, and for the adjustment of the composition on account of tithe. The first, unless made with unusual care, is rarely much to be depended on, and leads almost always to exaggerated conclusions. In 1727, Mr. Brown computed the gross rental of Ireland, inclusive of quit rents, tithes, &c., at 2,824,000*l.*; and in 1778, Mr. Young estimated it at 6,000,000*l.*—(*Newenham's View of Ireland*, p. 232.) Mr. Wakefield, from minutes collected in his tour, estimated the average rental of Ireland at 27*s.* the Irish acre, or at 16*s* 6½*d.* the imperial acre (vol. i., p. 305.); and, notwithstanding the imperfect data on which it was founded, this estimate, though rather in excess, came pretty near the mark.

In 1832, an elaborate estimate by Mr. Griffith, was published in the *Second Report of the Lords' Committee on Tithe*, which made the average rental of Ireland 12*s.* 5½*d.* an acre. But the area assigned to the different counties, and to the kingdom in general, from which Mr. Griffith deduced the rent, included the lakes extending over 630,825 acres (see *ante*), which should certainly have been excluded; and the estimated rental was also believed to have been rather below the fair letting value of the land at the time.

Since that epoch, two valuations have been undertaken, one by Mr. Griffith under the Act 6 and 7 Will. IV., c. 84, and one by the authorities under the New Poor Law. The former, however, has only been completed in 20 counties; and having been made under certain assump-

tions, it is admitted by Mr. Griffith himself, to be generally about a third part, or 33⅓ per cent., under what the lands would let for. The valuation for the Poor Law assessment has been completed; but it is about 20 per cent. below the real value of the land; it also includes the value of houses, while as the unions by which the valuations are made frequently run into different counties, it is not easy to discriminate the exact valuation, or gross rental of the latter.

Under these circumstances there is no possibility of making an exact estimate of the rental of the different counties of Ireland; though we incline to think that that which follows is sufficiently accurate for all ordinary purposes. In compiling it, we have taken Mr. Griffith's new valuations, as far as they have been completed, increasing them by a third, to make them equivalent to the true present (1846) value of the land. For the counties not yet valued by Mr. Griffith, we have taken (with the exception of Dublin and Cork), the valuations under the New Poor Law, adding to them one-fifth part for deficiencies. In the case of Dublin and Cork, we have adopted Mr. Griffith's old valuations, which we have been assured are nearly accurate, though, perhaps, a little too low.

There are a great many statements in regard to the rent of land in Ireland, in the Reports of the Land Occupation Commission. But it is difficult to draw from them any general conclusions. They are more often guesses, or estimates, than anything else; they uniformly refer to particular farms, estates, or districts; and it is sometimes impossible to say whether they apply to the Irish or to the imperial acre. One thing, only, they make clear, viz., that rent is, all things considered, excessively high.

Table of the Extent of the several Counties and Provinces of Ireland, exclusive of Lakes, distinguishing the Cultivated Land from the Unimproved Mountain and Bog; showing also the Proportion of Cultivated Land in each County, assuming 1,000 *to represent the Total Extent of Cultivated Land in Ireland; with the estimated Gross Rental of the Land in the several Counties and Provinces, and the Average Rent per Statute Acre.*

Provinces and Counties.	Cultivated Acres, including Towns and Plantations	Unimproved Mountain and Bog.	Total Extent of Acres, exclusive of Lakes.	Proportion of Cultivated Acres, assuming 1,000 as the whole Cultivated Land of Ireland.	Gross Annual Value of Land.	Average Rent per Acre.
Leinster.	Acres.	Acres.	Acres.	Acres.	£.	£. s. d.
Carlow	189,588	31,249	220,837	13·657	222,319	1 0 1¼
Dublin	207,102	19,312	226,414	14·919	250,201	1 2 1
Kildare. . . .	365,565	51,854	417,419	26·334	387,401	0 18 7
Kilkenny . . .	485,550	21,126	506,676	34·978	393,280	0 15 6
King's	346,416	145,836	492,252	24·955	354,131	0 14 5
Longford . . .	196,797	58,937	255,734	14·177	201,061	0 15 8¼
Louth	185,490	15,603	201,093	13·362	280,650	1 7 11
Meath	560,622	16,033	576,655	40·386	703,458	1 14 5
Queen's . . .	355,169	69,289	424,458	25·585	202,500	0 11 11
Westmeath . .	374,649	56,392	431,041	26·989	387,597	0 18 0
Wexford . . .	527,419	45,501	572,920	37·994	531,916	0 18 7
Wicklow . . .	298,334	200,754	499,088	21·491	310,305	0 12 5
	4,092,701	731,886	4,824,587	294·827	4,224,819	..
Average rent per statute acre in Leinster. . .	..	..	..	..	..	0 17 6

Table of the Extent of the several Counties and Provinces, &c.—continued.

Provinces and Counties.	Cultivated Acres, including Towns and Plantations.	Unimproved Mountain and Bog.	Total Extent of Acres, exclusive of Lakes.	Proportion of Cultivated Acres, assuming 1,000 as the whole Cultivated Land of Ireland.	Gross Annual Value of Land.	Average Rent per Acre.
Munster.	Acres.	Acres.	Acres.	Acres.	£.	£. s. d.
Clare	464,041	296,033	760,074	33·428	351,582	0 9 3
Cork	1,367,577	465,889	1,833,466	98·517	1,203,936	0 13 1
Kerry	426,590	726,775	1,153,365	30·731	421,759	0 7 2¼
Limerick	541,210	121,101	662,311	38·987	777,386	1 3 5½
Tipperary	870,025	178,183	1,048,208	62·674	1,041,214	0 19 10½
Waterford	350,278	105,496	455,774	25·233	346,949	0 15 2½
	4,019,721	1,893,477	5,913,198	289·570	4,142,826	..
Average rent per statute acre in Munster	..	..	..	..	..	0 14 0
Ulster.						
Antrim	528,166	180,423	708,589	38·048	650,509	0 18 4¼
Armagh	275,017	35,117	310,134	19·812	322,673	1 0 9½
Cavan	383,300	71,918	455,218	27·611	334,699	0 14 8¼
Donegal	400,749	769,587	1,170,336	28·869	300,065	0 5 1¼
Down	530,746	78,317	609,063	38·233	607,619	0 19 11¼
Fermanagh	295,593	114,847	410,440	21·294	228,195	0 11 1¼
Londonderry	327,559	180,709	508,268	23·596	293,907	0 11 6¼
Monaghan	292,005	21,585	313,590	21·035	271,147	0 17 3¼
Tyrone	462,977	311,867	774,844	33 352	370,075	0 9 6¼
	3,496,112	1,764,370	5,260,482	251·850	3,378,889	..
Average rent per statute acre in Ulster	..	..	..	..	..	0 12 10
Connaught.						
Galway	768,324	708,000	1,476,324	55·348	614,208	0 8 3¼
Leitrim	252,746	115,869	368,615	18·207	161,338	0 8 9
Mayo	506,795	800,111	1,306,906	36·508	400,412	0 6 1¼
Roscommon	448,022	130,299	578,321	32·274	385,818	0 13 4
Sligo	297,290	151,723	449,013	21·416	254,336	0 11 4
	2,273,177	1,906,002	4,179,179	163·753	1,816,112	..
Average rent per statute acre in Connaught	..	..	..	..	..	0 8 8¼
Grand Total	13,881,711	6,295,735	20,177,446	1,000·000	13,562,646	..
Average rent per statute acre in the whole Kingdom	..	..	..	..	..	0 13 5½

ABSTRACT.

Leinster	4,092,701	731,886	4,824,587	294·827	4,224,819	0 17 6
Munster	4,019,721	1,893,477	5,913,198	289·570	4,142,826	0 14 0
Ulster	3,496,112	1,764,370	5,260,482	251·850	3,378,889	0 12 10
Connaught	2,273,177	1,906,002	4,179,179	163·753	1,816,112	0 8 8¼
	13,881,711	6,295,735	20,177,446	1,000·000	13,562,646	0 13 5½

The annual rent of the unimproved mountains, bogs, and plantations, has been variously estimated at from 500,000*l.* to 600,000*l.* If we suppose the latter to be the more correct sum, it will leave for the gross rental of the cultivated land of Ireland, amounting, under deduc-

tion of the area occupied by towns and plantations (417,411 acres), to 13,464,300 acres, a sum of 12,962,646*l.*, equivalent to a rental of 19*s.* 3*d.* an acre.

It has been said, that this is by no means a high rent, and that it goes far to weaken the credit to be attached to the statements respecting the excessive competition for land in Ireland: such, however, is not the case. Considering the wretchedly defective system of agriculture that prevails in Ireland, and the fact that the land has to support more than three times the number of individuals that can be advantageously employed upon it, 19*s.* 3*d.* per statute acre is a very high rent. This, however, is not the only payment in the shape of rent that has to be made by the occupiers. We have already seen, that what is called the "Tenants' right" exists in most parts of Ireland; and that it is a very heavy burden on entrants to farms.—(See *ante*, p. 520.)

Distribution of Land.— Quantity and Value of Agricultural Produce.—There are no means by which to form any accurate estimate of the extent of land under different crops in Ireland. But, after much inquiry and consideration, we are disposed to believe that the following estimates may be regarded as nearly correct.

Account of the Extent of Land in Ireland under the principal Descriptions of Crops; the average Rate of Produce per Acre; the Total Produce; the Amount of Seed; the Produce under deduction of Seed; and the Total Value of such Produce.

Crops.	Acres in Crop.	Produce per Acre.	Total Produce.	Seed (1-6th of Produce)	Produce under Deduction of Seed.	Price per Quarter.	Total Value.
		Quarters.	Quarters.	Quarters.	Quarters.		£. s. d.
Wheat	450,000	3	1,350,000	225,000	1,125,000	46*s.*	2,587,500 0 0
Barley	400,000	3½	1,400,000	233,333	1,166,667	26*s.*	1,516,667 2 0
Oats	2,500,000	5	12,500,000	2,083,333	10,416,667	20*s.*	10,416,667 0 0
Potatoes	2,000,000	6*l.* per acre.	. .	. .	. .	..	12,000,000 0 0
Fallow	800,000	. .	. .	. .	. .	..	. .
Flax	100,000	15*l.* per acre	. .	. .	. .	..	1,500,000 0 0
Gardens	15,000	12*l.* per acre.	. .	. .	. .	..	180,000 0 0
Totals	5,765,000	. .	15,250,000	. .	12,708,334	..	28,200,834 2 0

Now, supposing this estimate to be nearly correct, there will remain about 7,600,000 acres of pasture land, exclusive of unimproved bog and mountain, and exclusive also of plantations. The annual produce of this pasture land may, perhaps, be taken at about 50*s.* an acre, making a gross sum of 19,000,000*l.*; and to this may be added the further sum of 1,000,000*l.* for the annual produce of waste land and woodland. Hence, on this hypothesis, the total annual value of the land produce of Ireland will be—

	£.
Value of Crops and Gardens	28,200,834
,, of Pasture Land	19,000,000
,, of Uncultivated Land, &c.	1,000,000
Total annual Value	48,200,834

Deductions from the Rent.—Landed property in Ireland is placed under what would be considered in England very advantageous circumstances. There is no land tax, and till lately, there was no poor's rate to pay: the landlord, as has been seen, rarely lays out a sixpence on

farm buildings or repairs: even the agent, instead of receiving a salary, is frequently allowed to indemnify himself by extorting fees from the tenants; so that the rent-roll, and the free income, have been nearly identical. But, with the exception of the relief from the land-tax, it may well be doubted whether these apparent advantages should not be considered very serious disadvantages. The poor's rate that has recently been established, will contribute to stop the vagrancy that is so prevalent in Ireland; and it will be beneficial to the landlords, by obliging them, from a regard to their own interest, to take effectual measures for preventing the subdivision of the land, and the increase of cottages. The want of proper farm buildings is, in the end, quite as injurious to the owner of an estate as to the occupiers; and nothing can be imagined so hostile to the interests of all parties, as the payment of agents by fees collected from the tenants: it opens a wide door for oppression and jobbing of all sorts, and puts an end to that confidence which should always exist between the tenants and the agent, and the latter and the landlord.

The Price of Land depends on the condition of the district in which it is situated. In some places it is hardly possible, except at the most imminent risk of personal danger, to eject a tenant from an estate, or to consolidate the small patches into which it may be divided. In such cases, land fetches, of course, a comparatively small price, perhaps not more than 17 or 18 years' purchase; but where good order prevails, and the law is respected, land fetches 28 or 30 years' purchase. Undoubtedly, however, a feeling of insecurity attaches to all investments in Ireland; and this circumstance contributes to keep down the price of land in it, and hinders English capitalists from making loans on the usual terms on most Irish estates. Were the security of property and the empire of the law as well established in Ireland as in Britain, land would certainly sell higher in the former than in the latter. Most Irish estates are, comparatively, in a state of nature; and afford capacities for the profitable outlay of capital that are all but unknown in England.

Importation of Corn from Ireland into Great Britain.—This is exhibited in the following table.

Account of the Quantities of Grain, including Flour and Meal, of the Growth of Ireland, Imported into Great Britain from Ireland in different Years, from 1800 *to* 1845 *inclusive, stated in quarters.*

Years.	Wheat and Wheat Flour.	Barley, including Bear or Bigg.	Oats and Oatmeal.	Rye.	Peas.	Beans.	Malt.	Total.
	Quarters.	Quarters.	Quarters.	Quarters.	Quarters.	Quarters.	Quarters.	Quarters.
1800	749	78	2,411	..	..	..	..	3,238
1801	150	..	375	..	..	..	..	525
1802	108,751	7,116	341,151	282	113	1,655	2,303	461,371
1805	84,087	15,656	203,302	235	1,634	2,010	..	306,924
1806	102,276	3,237	357,077	330	1,389	2,361	..	466,760
1807	44,900	23,048	389,649	431	1,390	3,777	..	463,195
1808	43,497	30,586	579,974	573	75	2,065	..	656,770
1810	126,388	8,321	492,741	20	216	3,541	..	631,227
1812	158,352	43,138	390,629	178	51	5,008	..	597,356
1813	217,154	63,560	691,498	420	77	4,455	..	977,164
1814	225,478	16,779	564,010	4	460	5,731	..	812,462
1815	189,544	27,108	597 537	207	425	6,371	..	821,192

Account of the Quantities of Grain, &c.—continued.

Years.	Wheat and Wheat Flour.	Barley, including Bear or Bigg.	Oats and Oatmeal.	Rye.	Peas.	Beans.	Malt.	Total.
	Quarters.	Quarters.	Quarters.	Quarters.	Quarters.	Quarters.	Quarters.	Quarters.
1816	121,631	62,254	683,714	43	239	5,984	..	873,865
1817	55,481	26,766	611,117	..	12	2,275	..	695,651
1818	105,179	25,387	1,069,385	4	10	4,768	..	1,204,733
1819	153,850	20,311	789,613	2	..	3,904	..	967,680
1820	403,407	87,095	916,251	134	439	8,396	..	1,415,722
1821	569,700	82,884	1,162,249	550	2,474	4,959	..	1,822,816
1822	463,004	22,532	569,237	353	728	7,235	..	1,063,089
1823	400,068	19,274	1,102,487	198	586	5,540	..	1,528,153
1824	356,384	44,699	1,225,085	112	756	5,791	1,173	1,634,000
1825	396,018	154,256	1,629,856	220	1,431	11,355	10,826	2,203,962
1826	314,851	64,885	1,303,704	77	1,452	7,190	1,203	1,693,392
1827	405,255	67,791	1,343,267	256	1,282	10,037	572	1,828,460
1828	652,584	84,204	2,075,631	1,424	4,826	7,068	853	2,826,590
1829	519,017	97,140	1,673,628	568	4,435	10,445	2,011	2,307,244
1830	529,717	189,745	1,471,252	414	2,520	19,053	2,820	2,215,521
1831	557,498	185,409	1,655,701	515	4,142	15,029	10,888	2,429,182
1832	790,293	123,639	2,051,867	294	1,915	14,530	8,229	2,990,767
1833	844,211	101,767	1,762,520	166	2,646	19,114	7,017	2,737,441
1834	779,505	217,885	1,769,503	983	2,176	18,771	3,865	2,792,658
1835	661,776	156,242	1,822,767	614	3,417	24,235	10,357	2,679,438
1836	598,757	184,156	2,132,138	483	2,920	17,604	22,214	2,958,272
1837	534,465	187,473	2,274,675	1,016	60	25,630	4,174	3,030,293
1838	542,583	156,467	2,742,807	628	5,232	21,584	5,001	3,474,302
1839	258,331	61,676	1,904,933	2,331	1,484	11,535	2,861	2,243,151
1840	174,439	95,954	2,037,835	122	1,403	14,573	3,456	2,327,782
1841	218,708	75,568	2,539,380	172	855	15,907	4,935	2,855,525
1842	201,998	50,297	2,261,435	76	1,555	19,831	3,046	2,538,234
1843	413,466	110,449	2,648,032	371	1,192	24,329	8,643	3,206,482
1844	440,152	90,656	2,242,308	264	1,091	18,580	8,153	2,801,204
1845	779,113	93,095	2,353,985	165	1,644	12,745	11,154	3,251,901

Agricultural Produce of United Kingdom.

It may now be convenient to bring into a single point of view the results of the previous statements, with respect to the annual value of the agricultural produce of the United Kingdom.

	£.	£.
England:—		
Crops and gardens	79,992,857	
Grass and woodland	61,614,000	
		141,606,857
Scotland:—		
Crops and gardens	18,744,286	
Grass and woodland	9,000,000	
		27,744,286
Ireland:—		
Crops and gardens	28,200,834	
Grass and woodland	20,000,000	
		48,200,834
United Kingdom		217,551,977

SECT. 10.—*Slow Progress of Agricultural Improvements.—Notices of the Progress, Present State, and Prospects of English and Scotch Agriculture.*

1. *Slow Progress of Agricultural Improvement—Circumstances which retard it.*—Considering the wonderful facilities of communication that exist in Great Britain, and the universal diffusion of information by means of the press, the slowness with which agricultural improvements make their way is not a little surprising. Mr. Harte

mentions that, when he was a youth, he heard Jethro Tull declare that though he had introduced turnips into the field in King William's reign, with little trouble or expense, and great success, the practice did not travel beyond the hedges of his own estate till after the Peace of Utrecht.—(*Essays*, ii. p. 223.) It might, one should think, be reasonably enough supposed that improved practices would now be much more rapidly diffused; but experience shows that this is not really the case. "What is well known and systematically practised in one country, is frequently unknown, or utterly disregarded, in the adjacent districts; and what is to every unprejudiced observer evidently erroneous and injurious to the land, is, in some quarters, persisted in most pertinaciously, though a journey of not many miles would open to the view the beneficial effects of a contrary practice."* In a large portion of England there is no regular alternation of corn and green crops, and in many counties the drill husbandry has hardly obtained any firm footing. When speaking of the state of agriculture in Worcestershire, Messrs. Kennedy and Grainger observe, "The mode of farming in this county is generally in itself a very bad one, and is carelessly and negligently conducted. There being no restriction as to rotation or manner of cropping, there is no regular system, but the plan usually adopted is, to sow the land that requires the least work, and barley and oat stubbles are frequently dunged over after harvest, and sown with wheat; a system of farming which certainly does not require much labour, but it is a ruinous one to the land. No pains whatever are taken to relieve the ground from water, nor is a water-furrow to be seen scarcely in any part of the county. The ploughing is, in general, very indifferently performed, and the appearance of the land is sufficient to convince any one that neither master nor man have here any system to act upon."—(Vol. i. p. 358.) The agriculture of Somerset, Oxford, Sussex, Middlesex, Surrey, Berks, and several other counties, though more advanced, is still far behind. In Wales, agriculture is more backward than in the most unimproved of the English counties. In Anglesea, a few years ago, it was not uncommon to take *five* corn crops in succession; and throughout the principality the arable land is, with few exceptions, wretchedly managed. In fact it "*does not produce half what it is capable of doing under proper management.*"—(*Kennedy and Grainger*, vol. i. p. 169.)†

Notwithstanding, too, that the best cultivated lands in Northumberland, Norfolk, Lincoln, and the Lothians are all ploughed by 2 horses, nothing is more common, as already stated, than to see in the vicinity of the metropolis, and throughout most parts of the south and west of England, 3, 4, and, still more frequently, 5 horses yoked in a line to a plough, even where the soil is light and sandy! And as a driver is always necessary when there are more than 2 horses, at least double the labour is expended on ploughing where this barbarous practice is followed that is required where it is abandoned.

It is very difficult to account for this rooted disinclination to leave established practices, even after experience has clearly demonstrated the superiority of others. There is no ground for ascribing it to the

* *Kennedy and Grainger on the Tenancy of Land*, vol. i., Introd. p. 8.

† See *ante*, p. 216.

influence of tithes, poor rates, or other public burdens; for these press as heavily in Norfolk, Northumberland, Suffolk, and Hampshire, as in Worcestershire, Somerset, or Sussex. The truth is, that there is a much greater aversion to precipitate changes, and a more resolute adherence to whatever has been long practised, among farmers, than amongst any other class of persons. "Improvements, which effect material changes in established customs, have, under all circumstances and in all countries, ever been slowly and reluctantly admitted. It requires no little effort to quit the common routine of practice, and still more to relinquish long maintained opinions. The general circumstances affecting agriculture are, moreover, little favourable to great and, more especially, sudden alterations. The farmer is not so much within reach of information as the merchant and manufacturer; he has not, like those who reside in towns, the means of ready intercourse, and constant communication, with others engaged in the same occupation. He lives retired; his acquaintance is limited, and but little valued; and, unless in the habit of reading, he is little likely to acquire any other knowledge of his art than what is traditionary, what is transmitted from father to son, and limited in its application to his own immediate neighbourhood."*

The able writer from whom we have borrowed this striking passage thinks that the obstacles to the more rapid diffusion of agricultural improvements will be gradually overcome by the ready access that is now afforded to all sorts of information. We confess, however, that we are by no means sanguine in our expectations on this head; and that we should anticipate ten times more from the efforts of the landlords to enforce a better system, than from any improvement in the knowledge of the farmers. The former have it in their power, by granting leases of a reasonable length, and containing judicious regulations, by assisting in the drainage of wet lands, and by raising their rents to a proper level, speedily to introduce a better system; and by doing so they will at once add largely to their own wealth, and to that of their tenants and of the public. Agricultural clubs, shows, premiums, and essays have done, and can do but little good. The disease is too deeply seated to be eradicated by such gentle means. Let the tenants have security that they will be allowed to reap all the advantages resulting from increased outlays of capital, and from additional skill and economy; and let them, at the same time, be made to feel that their existence depends on their availing themselves of improved processes and machinery; and we venture to predict that agriculture will make a more rapid progress in ten or a dozen years than it will otherwise do in a century.

2. *Notices of the Progress of English Agriculture*.—Agriculture, and all sorts of industrious pursuits, were kept in a peculiarly backward state in England till after the accession of Henry VII. This arose partly from the destructive contests that grew out of the wild efforts of our Norman monarchs to conquer France, and the civil wars by which they were succeeded; and partly from the abuses produced by the feudal system, and the enslaved and depressed state of the cul-

* Rigby's preface to his translation of *Chateauvieux, on the Agriculture of Italy.*

tivators of the soil. In Henry's reign the foundations were laid of an order of things more favourable to the growth of opulence, and the progress of improvement. By his marriage, he united the opposing claims of the rival houses of York and Lancaster; and put an end to those unhappy quarrels that had, for upwards of 40 years, desolated the country. He also succeeded in repressing the turbulence, and in undermining the power, of the feudal aristocracy; and in establishing a system of severe, but generally impartial, justice. Hitherto it had been the practice to let lands to occupiers who paid a portion of their rents in kind, and a portion in services. But Henry having succeeded in obliging the great lords to dismiss their retainers, it became for their interest to convert the service rents into money rents; a change still more beneficial to the occupiers than to the landlords. The increase of cities, the revival of arts, and the introduction of new branches of commerce, and of new tastes and modes of enjoyment, contributed to hasten and complete that revolution in our social system which the policy of Henry had done so much to accelerate. The great lords, unable any longer to vie with each other in the number and boldness of their retainers, turned their competition into more advantageous channels, and began to seek for distinction in the magnificence of their dress and houses, the expensiveness of their tables, and the splendour of their equipages. It ceased to be desirable to have a large dependent population on an estate; the object being to have it occupied so that it might produce the greatest nett revenue. The small occupiers, who were in consequence ejected from the estates of the great lords, being without any settled habits of industry, were at once deprived of the means of subsistence. Hence the extraordinary increase of vagrant poor in the reigns of Henry VII., Henry VIII., and Elizabeth; and hence, also, the origin of the compulsory provision for the support of the poor. The lands previously possessed by the retainers, and small occupiers, were immediately converted into sheep pasture. Wool formed at the accession of Henry VII., and for a long time before and after, the principal article of export from England; with the exception indeed of tin, cheese, and a few other articles of inferior importance, there were no means of paying for foreign articles except by exports of wool. When, therefore, the taste of the nation began to improve, and its wealth to increase, wool became in greater demand than ever, as a means of carrying on the more extensive commerce of the country. In consequence, sheep-farming went on increasing, notwithstanding the efforts of the legislature to arrest its progress, till the increase of manufactures at home furnished other materials to send abroad, and till the growth of population, by augmenting the demand for corn, raised its price in relation to wool, and checked the growth of the latter. This change began to become manifest during the latter years of the reign of Elizabeth.

The first English treatise on agriculture, entitled the *Book of Husbandry*, written by Sir Anthony Fitzherbert, judge of the Common Pleas, was published in the reign of Henry VIII. It contains much useful information; and, in some material branches, has not been improved upon. The culture of hops, and of several species of garden plants, was introduced into England in this reign. In it, too, the

power of making leases was extended to tenants in tail; to tenants in right of their wives; and to parsons in right of their churches.

Turnips, clover, and potatoes were all introduced into England in the seventeenth century. Mr. Stevenson states, that some of the landed proprietors, who accompanied Charles II. in his exile, introduced, after the Restoration, sundry principles, modes of agricultural practice, and crops, they had observed on the Continent, and particularly in Flanders; and that we are indebted to them for the first examples of the culture of turnips and clover, the two grand instruments for improving agriculture. But, though there can be no doubt that these circumstances had a considerable influence in diffusing the knowledge of a better system of cultivation, it is certain that the crops referred to had been introduced into England a good many years previously to the Restoration. Sir Richard Weston, in his *Discourse of Flanders Husbandry*, published in 1645, recommends the sowing of clover and other grass seeds alone, and not with spring corn, contrary to the custom of England and Flanders; adding, "*I found by experience in Herefordshire*, that it (clover) will thrive much better the first year, and turn to more profit alone, than that and a crop of oats sown together will do."—(P. 17.) It is probable that turnips were introduced about the same time. Ray, in 1686, mentions that turnips were cultivated for the sake of their roots, both in fields and gardens, in England and abroad. It appears from Lisle's *Husbandry* (4th ed. p. 233.), that about the year 1700 the field culture of turnips was not uncommon in Norfolk, Leicestershire, Hampshire, &c.; but it is notwithstanding true that it spread only by slow degrees. Lord Townshend, in the reign of George II., was one of the most successful and extensive growers of turnips; but there is no foundation whatever for the common story of their culture being introduced by him.

There is a discrepancy in the accounts of the introduction of potatoes. Most probably they were brought over from Virginia by Sir Walter Raleigh. Houghton, in one of his papers, written in 1699 (No. 386.), mentions that "they are now very numerous in Lancashire, and begin to spread all the kingdom over."

Blythe's *Improver Improved*, published in 1649, is the first systematic work in which there are any traces of the alternate system of husbandry, or of the introduction of clover, turnips, &c., between culmiferous crops. The practice did not, however, make much progress during the 17th century; and though it forms, as it were, the very foundation of good farming, there are extensive districts in which it is still very imperfectly understood, and but little followed.

The famous Jethro Tull was the first, or among the first, who introduced the drill husbandry; and his work on *Horse-hoeing Husbandry*, published in 1731, did a vast deal to recommend the practice; though, from his undervaluing the influence of manure, it was, in other respects, prejudicial.

The relaxation and ultimate abolition of the restraints and duties that had been laid on the exportation of corn gave, undoubtedly, the greatest stimulus to agriculture that it received in the seventeenth century. In England, as in other countries, exportation was for a long time entirely prohibited, from a notion that this was the best means

by which plenty could be maintained at home. When the laws for this purpose were framed, the sound principles of public economy were almost wholly unknown; and no one seems to have been aware that, without the ability to export, a luxuriant crop, by causing an overloading of the market and a heavy fall of price, might be as injurious to the farmer as a scarcity; and that no market can be steadily and liberally supplied, unless the surplus produce of plentiful years meets with a profitable vent. Not only, however, was exportation to foreign countries prevented, but even the internal corn trade was laid under the severest restraints, and the business of a corn dealer was in great measure proscribed. But the constant alternation of excessively high and ruinously low prices, which this system occasioned, at length opened the eyes of the legislature to a sense of its pernicious influence; and, in the reign of Elizabeth, exportation was allowed when the home prices were under certain limits.* During the ascendancy of the house of Stuart, the practice of laying duties on the exportation of corn was introduced; but at the Revolution these were totally abolished, and the contrary policy adopted of granting a bounty on exportation. The laws restricting the freedom of the internal corn trade were almost wholly abolished in the reign of Charles II.; so that our farmers, having ready access not only to the markets of Great Britain, but to those of the Continent, were stimulated to put forth all their energies; and agriculture advanced with a rapidity unknown at any former period. Restrictions on importation were imposed at the Revolution, and had existed previously; but it was not till after the Peace of Paris in 1763, when, in consequence of the rapid growth of manufactures and commerce, population increased so fast that the home supply of corn became inadequate, that these restrictions began to attract attention, and to have a powerful influence.

But, notwithstanding the stimulus to cultivation given by the bounty, and by the rise of prices since 1760, and particularly during the late war, stock-husbandry has been more improved since 1750 than tillage husbandry. As soon as Bakewell's system of breeding began to be known, it was taken up and followed by spirited and judicious farmers in all parts of the country. Of these, Mr. Culley of Northumberland, was one of the most conspicuous. He published his *Observations on Live Stock* in 1786; and in it the just principles for improving the breeds of domestic animals were, for the first time, fully elucidated. This has had, as formerly observed, a wonderful influence in increasing the supply of butchers' meat. Indeed, the principal improvement in arable husbandry—the general introduction and superior management of green crops—may be, in no inconsiderable degree, ascribed to the anxiety of farmers to procure an abundant and suitable supply of food for their stock. The superior attention paid to stock-farming may probably be, to some extent at least, accounted for from the circumstance of tithe pressing with comparative lightness on pasture land, while it fell with its full weight on arable land, and operated powerfully to prevent the outlay of capital upon it.

* Exportation had been previously allowed, but the limit when it was to cease was generally such as to render this license of little practical importance. See article *Corn Laws and Corn Trade* in the new edition of the *Encyc. Britannica*.

But however it may be accounted for, there can be no doubt of the fact, that stock husbandry is now more advanced than tillage husbandry; and that, in all that belongs to the breeding and rearing of cattle, horses, sheep, and pigs, the English are, at present, superior to the Scotch, and to every other people.

But, though surpassed by its kindred branch, the progress of arable husbandry in England since 1760, and of the improvements connected therewith, has notwithstanding been astonishingly great. From the beginning of last century, down to about 1765, we exported large quantities of corn. During each of the 10 years ending with 1750, the exports amounted at an average, to 378,000 quarters of wheat, and 424,000 quarters of other grain. During the next decennial period, the exports were materially reduced; and, subsequently to 1770, the balance began to turn to the side of importation, to which it still continues to incline. This diminution of exports and increase of imports is, however, wholly ascribable to the greater demand for corn, caused by the rapidly increasing population and wealth of the country; and not, as has sometimes been contended, to any change in the corn laws, or to any decay of tillage. Mr. Charles Smith, the well-informed author of the *Tracts on the Corn Trade* (2nd ed. p. 140), estimated the consumption of wheat in 1765, at 3,840,000 quarters. Eight years after, the produce of the wheat crop was estimated at 4,000,000 quarters. In 1796, Lord Hawkesbury (afterwards Lord Liverpool) stated in his place in the House of Commons, that government estimated the consumption of wheat at 6,000,000 quarters, of which only a trifling portion was imported. And we have already seen that in estimating the growth of wheat in England at this moment (1846) at 15,200,000 quarters, we are certainly within the mark.

The number of wastes, commons, and common fields was long, and, though much diminished, still continues to be, in some degree, a reproach to England. The two former are not cultivated: common fields are, however, subjected to the plough; but property in them is so much subdivided and intermixed, that they are altogether unsusceptible of improved cultivation. During the last and present century, much progress has been made in wiping off this stain on the rural economy of the country; and in nothing, indeed, has the progress of improvement been more remarkable than in this particular. The first inclosure act was passed in the reign of Charles II. Since the Revolution, the progress has been as follows:—

Reigns.	Number of Acts passed.	Number of Acres Inclosed.
In Queen Anne's reign .	2	1,439
In George I.	16	17,660
In George II.	226	318,778
In George III., to 1797 .	1,532	2,804,197

According to this statement, which is taken from the *Report of the Committee on Waste Lands*, it appears that each enclosure act passed

during that period of the reign of George III., which terminated with 1797, enclosed, at an average, 1,830 acres. Now it appears, from the official returns, that from 1798 to 1832, both inclusive, 2,103 enclosure acts were passed; and, supposing each to have enclosed, as before, 1,830 acres, the total would amount to 3,848,490 acres; making, when added to the quantity enclosed previously to 1798, an aggregate of no less than 6,652,687 acres, enclosed since the accession of George III. But, as it seems probable that the earlier acts applied to a larger extent of land than the latter ones, we may, perhaps, estimate the total extent of land enclosed and divided by Act of Parliament, from 1760 to 1832, at from 5,500,000 to 5,800,000 acres. And it may be safely affirmed that in consequence of its enclosure, the produce of this immense extent of land has been increased, at least, *five* fold! As might be expected, a decidedly greater number of enclosure acts were passed in 1802, and during the 5 years ending with 1814, when prices were enormously high, than in any other equal period.

Of recent improvements the most important have been the extension of the system of furrow draining, and the introduction of bone-dust and guano as manures. In many places, but particularly in Lincolnshire, the use of bone-dust has occasioned a vast increase of produce, and has enabled many extensive tracts to be brought into a high state of cultivation.

There has been, in fact, almost everywhere throughout the country, but especially in the northern counties, a progressive improvement in agriculture, effected partly by the better drainage of the land, partly by the adoption of better rotations, partly by the enforcement of greater economy in the management of the details, and partly by other causes. No doubt there is still, in many counties, great room for further improvements; but there has been, even in the most backward, very great advances since the peace.

3. *Progress of Agriculture since* 1815.—It was for a while contended that, owing to the fall of prices, agriculture declined materially after 1815, and in particular in the years immediately subsequent to 1820. This view of the matter was strongly supported in the *Report of the Agricultural Committee of* 1833; and it is but too certain that the fall in question involved many persons, landlords as well as farmers, in very great difficulties; and in some districts, particularly in the southern parts of the island, there may have been, for a while, a pretty general decline. On the whole, however, there is incontestible evidence to prove, speaking of Great Britain generally, that the effects of the sudden and heavy fall of prices in 1814 and 1815, though severe at the time, were very soon overcome, and there has been an all but unparalleled improvement in agriculture since 1820. How else could the extraordinary increase of population, that has taken place in the interval, have been provided for? and how else could the rental of England and Wales in 1842–3 have exceeded by 5,836,627*l.* its rental in 1814–15? There was no increase, worth mentioning in a question of this sort, in the quantity of foreign corn retained for home consumption during the 20 years ending with 1840, as compared with the previous 20 years; and yet the population of Great Britain increased during that interval from 14,481,139

to 18,844,434! Now it is impossible, that a result of this sort could have taken place without either a very great increase of agricultural produce or a signal and almost unprecedented falling off in the demand for corn: but the latter supposition is out of the question. Instead of there being any decline in the consumption, there can be no manner of doubt that, speaking generally, the bulk of the population consume, at this moment, more corn, and particularly wheat, than at any former period. In fact, wheaten bread has now almost entirely superseded every other sort of bread. The consumption of rye, barley, and oats in the northern and south-western parts of England, and in Wales, is reduced to a mere trifle. All classes subsist mainly on wheaten bread; and, during the last 20 years, there has been a growing indisposition to use even the inferior sorts of such bread. In Scotland the change has been still more decided than in England; and we believe we are quite within bounds, when we express our conviction that, fully ten times more wheat is consumed in Scotland at present than in 1790.

A part of the extraordinary increase in the supply of corn has been derived from Ireland; this part is, however, much smaller than is generally supposed. The imports of all sorts of grain from Ireland are, at present, from 1,400,000 to 1,500,000 quarters a-year greater than in 1820. But during that period we have added, including the increase since 1841, about 5,603,295 individuals to the population of Great Britain; at the same time that, at an average, the consumption per head has been materially increased; and that there has been a large increase in the number of horses—the great consumers of oats, the principal article of import from Ireland.

On the whole, therefore, it may be safely affirmed, that the soil and agriculture of Great Britain furnish, at present, food sufficient for the comfortable subsistence of at least *five millions* of inhabitants more than in 1820. Little, comparatively, of this wonderful result can be ascribed to the bringing of waste land into cultivation, or to the extension of tillage. It is principally a consequence of improved drainage, improved modes of management, and the adoption of improved processes and implements. In proof of the extraordinary change that has taken place, we may mention that, in the wolds of Lincolnshire, the crops of turnips are said to have become from *five* to *ten* times heavier within the last few years from the application of bone manure to their culture; at the same time that there has been a proportional increase in the productiveness of other crops!—(*Ante*, p. 178.) Similar improvements, and in some instances quite as great, have been made in other parts of the country. It is gratifying, too, to know that the capacities of improvement are far from being anywhere exhausted. But what has been effected shows what may be done, were the productive energies of the more backward districts better developed by the extension of the improved practices of Norfolk, Northumberland, Lincoln, &c., to other counties. The granting of leases of a reasonable length, and the enforcing of proper conditions as to management, would be the most likely means to bring about so desirable a result. It is impossible, indeed, to say to what extent, under such circumstances, improvement might be carried.

4. *Future Prospects of Agriculture.*—It is supposed by many that the change that has recently been effected in the Corn Laws will have a most injurious influence over agriculture: we believe, however, that there is no good foundation for this opinion. In submitting a few remarks on this important question, it is not necessary that we should enter into any details with regard to the history of the Corn Laws, which, indeed, would be out of place in a work like this. It is sufficient to observe, that there is no way in which the new system can injure agriculture unless by reducing the price of agricultural produce. If there be no probability of its doing this to any considerable extent, there can be none of its being injurious to agriculture.

Now, though this be a matter in regard to which there must, necessarily, be a good deal of uncertainty, we are entitled to say, that there are no good grounds whatever for thinking that wheat of the average quality of that of England will be imported, even in abundant years, after the introduction of the new system, at less than from 44*s.* or 45*s.* to 48*s.* a quarter.* The expenses of importing wheat into this country may be taken at from 10*s.* to 12*s.* a quarter; so that, supposing its cost in the great shipping ports to be from 34*s.* to 37*s.* a quarter, it could not be imported and sold under the price specified above. But wheat of the average quality of English wheat is seldom so low as this either at Dantzic or any other corn-shipping port within a reasonable distance†; and it is never so low when there is any considerable exportation. It is, no doubt, impossible to say what changes may take place in prices in the course of a few years. But, looking at the rapid increase of wealth and population † in the countries in the North of Europe, round the Black Sea, and in America, the presumption is, not that prices will fall but that they will rise. But, supposing that, under the new system, they are pretty constant at from 44*s.* or 45*s.* to 48*s.*, it is quite clear its introduction can have no injurious influence over agriculture. The average prices of corn in England and Wales, during the five years ending with 1835, were 52*s.* 8*d.*, and, during the five years ending with 1845, they were 54*s.* 9*d.* a quarter, being only from 6*s.* to 9*s.* a quarter above their future probable average range under a perfectly free system. Prices, indeed, were decidedly lower in 1834, 1835, and 1836—years of great agricultural improvement—than there is much probability of their being after the new system has been carried into full effect.

But, supposing that prices were to fall 10*s.* a quarter, it is the greatest error to suppose that this fall would be productive of any real injury to agriculture. Prices, after allowing for the depreciation of the currency, were, during the five years ending with 1810, no less than 83*s.* 3*d.* a quarter; they have since fallen, so that, during the five years ending with 1845, they were only 54*s.* 9*d.* a quarter, being a fall of no less than 28*s.* 6*d.* a quarter in the interval: and yet we have already seen that there has been, in the teeth of this immense fall, and coincident with it,

* For proofs of this see the article *Corn Laws and Corn Trade* in *Commercial Dictionary.*

† The population of Prussia, which amounted to 10,223,499 in 1816, had increased in 1840 to 14,992,738! The increase of population in the countries round the Black Sea, during the same period, has, we believe, been still greater.

an extraordinary improvement of agriculture, accompanied with a vast increase of production and a very great increase of rent. And such being the case, with a fall of 28*s.* 6*d.* a quarter, it would be contradictory and absurd to suppose that agriculture should sustain any serious, or, indeed, perceptible injury from a further fall of 6*s.* or 7*s.*, or even of 10*s.* a quarter. (See *ante*, pp. 551–557.)

It is, no doubt, true, that a considerable part of the increase of production and of rent that has taken place since 1815 is the consequence of the expenditure of a large amount of capital upon the land. But it is plain that this amount of capital would not have been laid out had not the reduced price of corn been such as to make its outlay profitable. The supply of corn, like that of other things, cannot be increased without the application of additional skill or capital, or both, to its production; and if the application of such additional skill and capital, instead of being checked, appears rather to have been promoted by a fall of 28*s.* 6*d.* in the price of corn, on what principle or pretence can any one suppose that it will be checked by a fall of 7*s.* or 10*s.* a quarter?

At the same time we are ready to admit, that we should have been quite as well or better pleased had this question been settled by imposing a low fixed duty of 5*s.* or 6*s.* a quarter on wheat, and other grain in proportion, accompanied with a corresponding drawback. We make this statement on general grounds, and without any reference to the peculiar burdens that affect the agriculturists, though these should neither be forgotten nor overlooked. It would be easy to show that in scarce years a duty of this amount would fall wholly on the foreigner, without affecting prices, or narrowing importation; while, in years of unusual plenty, the drawback would facilitate exportation, and would, consequently, tend to steady prices, and to prevent them from falling so low as to injure the farmer and obstruct improvement. And in a matter of such immense importance it is the part of a wise government to be cautious how they take any step, of the consequences of which they are not fully assured, or which may expose any great interest to serious vicissitudes. But, even if our limits permitted, it would be to little purpose to insist on these or any similar considerations. The pertinacity with which the agriculturists opposed every approach to a more liberal system roused a spirit which would not be satisfied with anything short of a complete abandonment of all restrictions. The time for compromise and arrangement having been allowed to go by, government had to deal with an unreasoning necessity: *Cum ventre humano tibi negotium est, nec rationem patitur, nec æquitate mitigatur, nec ulla prece flectitur populus.*—(Seneca, de Brev. Vitæ, c. 18.) There can, indeed, be little doubt that, under the circumstances, it was infinitely better to make an end of the matter at once than, by attempting to introduce any intermediate system, however well devised, to prolong, as it would have done, a sense of insecurity, and the pernicious trade of agitation. The agriculturists need not, however, despond: they have, in truth, little or nothing to fear from the downfall of the protective system. There is not, as already seen, any real room or ground for thinking that it will occasion such a fall of *average* prices as will do them any material injury; and should

there be at any time so very abundant a season in this country and in the North of Europe as to threaten such a fall of prices as might give a serious shock to agricultural industry, the crisis may be warded off by some temporary expedient. It is not, however, very probable that it will be at any time necessary to interpose in the way now alluded to. The notions current amongst us, respecting the extreme cheapness of corn in foreign ports, have no very solid foundation. Though sound in principle, there is good reason to think that in its operation, the new measure will disappoint alike the fears and apprehensions of the one party, and the expectations of the other. Indeed, the chances are, that the agriculturists will gain by the change; for it will teach them to depend for success on skill, science, and industry, and to cease to rely on the worthless resource of Custom-house regulations and parliamentary majorities; and it will give them increased security by identifying their interests in opinion, as well as in fact, with those of the public.

5. *Notices of the Progress and present State of Scotch Agriculture.* —Though now highly improved, agriculture, down to a comparatively recent period, was in the most depressed state in Scotland. So late as the beginning of last century, and for a considerable period thereafter, lands, even in the Lothians, were divided into *infield* and *outfield*. The whole manure made on the farm was laid on the former, which was ploughed and cropped without intermission, so long, at least, as it would bear anything. There was little alternation of crops; neither turnips, clover, nor potatoes had been so much as heard of; but corn followed corn in an unbroken series. Leases were but seldom granted, and the cultivators were destitute alike of capital and intelligence. In the *Countryman's Rudiments*, written by Lord Belhaven, and published in 1723, we are informed that the "infield in East Lothian, where wheat is sown, is generally divided by the tenant into four divisions or breaks, as they call them; viz., one of wheat, one of barley, one of peas, and one of oats; so that the wheat is sown after the peas, the barley after the wheat, and the oats after the barley." Here we have a rotation with three consecutive corn crops, and a crop of peas once every four years. The returns were, as might be expected, *about three times the seed!* It is of importance, too, to observe, that this trifling return was obtained at a great comparative expense. At this period, and for about half a century after, there was no instance in Scotland of a plough being drawn by fewer than 4 horses. Most commonly it was wrought either by 6 horses, or by 4 horses and 2 oxen; and in some of the less cultivated districts, a still greater number of animals, sometimes as many as 10 or 12, were yoked to it.* This was ascribable, partly to the awkward and clumsy form of the implement itself, partly to the weakness of the cattle, their diminutive size, and the improper manner in which they were yoked, and partly, and principally perhaps, to the ignorance of the cultivators. On the whole, however, the work was at once very expensive, and very ill performed; the ridges were crooked and twisted, and so much heaped up in the middle, that a great deal of land in the hollows between them was lost to any useful purpose.

* *Robertson's Rural Recollections*, p. 196.

In 1723, a Society of Improvers was established at Edinburgh, which, though it lasted only about 20 years, contributed to diffuse a knowledge of better principles.

Though very ancient in England, in Scotland the practice of fallowing is comparatively recent. It began to be tried in the Lothians about 1720; but it spread slowly, and did not become very general till more than 20 years afterwards.*

Political circumstances have almost always exerted a powerful influence over agriculture; and nowhere, perhaps, has this been more clearly evinced than in Scotland. The Union with England in 1707, though its beneficial operation was not very obvious for a number of years, began at no very distant period to have a sensible influence. Besides opening the markets of England and of her foreign possessions to the products of Scotland, the removal of the seat of the legislature to London obliged an unusually large proportion of the Scottish nobility and gentry to reside partly in England, where they became acquainted with improved habits and modes of management, and acquired sounder ideas as to the relation between landlord and tenant than those that were then prevalent in Scotland.

But of all the political measures by which the agriculture of Scotland has been affected, none had so powerful or beneficial an influence as the Act, passed in 1748, for the abolition of hereditary jurisdictions. In most counties, down to this period, a tenant, who had any dispute with a landlord, could only appeal either to that individual, or to some one else of the same class. The mischievous consequences of such a state of things are too obvious to require to be specified. It was fatal alike to the real interests of both landlords and tenants.

The Act abolishing hereditary jurisdictions effectually obviated this abuse. The sheriff or principal judge in each county has since been a salaried officer appointed by government, and selected from among the most eminent practising barristers. He has had no leanings in favour of one class or another, but has been equally ready to redress the grievances of all. And the fact of their generally holding under well-defined leases of a reasonable length, and having ready access to local judges distinguished for their ability and integrity, have given a feeling of independence, and a consequent energy and enterprise, to the Scotch tenants of our times, that were quite unknown to their ancestors.

About the middle of the century we begin to find symptoms of amendment. In Maxwell's *Practical Husbandry*, published in 1756, an improved system is laid down and inculeated. He pronounces it to be bad husbandry to take *two* consecutive corn crops; and he farther informs us that the best farmers in East Lothian, after fallow, take a crop of wheat; after the wheat, peas; then barley; and after that oats. This is still very bad, though a material improvement on the practice described by Lord Belhaven. It shows, too, that, down to 1757, neither

* The introduction of fallowing is ascribed to Thomas, sixth Earl of Haddington, and to a Mr. Walker, tenant of Beanston. The latter is said to have been led to try the practice by the representations of some Englishmen by whom he had been visited. His neighbours, when they saw what he was about, concluded that he was either insane or in bankrupt circumstances!—(*Somerville's Survey of East Lothian*, p. 29.)

turnips, potatoes, clover, nor cultivated herbage of any sort, formed any part of the system, even of the best farmers in the Lothians. Lord Stair is said to have been the first who introduced the turnip culture into Scotland, having raised turnips on his estate of New Liston, near Edinburgh, about the middle of last century. But William Dawson, tenant of Frogden, in Roxburghshire, has an unquestionable title to be considered as the real father of the improved Scotch husbandry. Being a farmer, and cultivating for profit only, his example had infinitely more influence over his neighbours than it would have had, had he been a landlord. He commenced raising turnips at Frogden in 1759. They were at first sown broadcast; but he set about drilling on a large scale in 1763, and his success stimulated others to adopt the same system. Dawson was also the first who introduced, not long after 1760, the practice of ploughing with 2 horses abreast, without a driver; nor is it easy to exaggerate the obligations which the agriculture of Scotland owes to his sagacity and enterprise. But even in the Lothians the 4-horse plough continued in general use till about 1780, and it was not finally superseded by the 2-horse plough for several years after. In the other parts of the country the former kept its footing even longer than in the Lothians. Nothing contributed more to pave the way for this important revolution in the method of ploughing than the signal improvements made upon the construction of the plough by Small, about 1770, to which we have already alluded.

From the close of the American war, the progress of improvement in Scotland has been rapid beyond all previous example. This has been owing to a variety of causes, but chiefly to the extraordinary progress made in commerce and manufactures since that period. In the distracted state in which Scotland had formerly been placed, these could make no considerable progress. But after the battle of Culloden had extinguished the hopes of the Jacobites, and the abolition of hereditary jurisdictions had paved the way for the introduction of a regular system of government, a spirit of industry and enterprise began to be diffused on all sides. A good many branches of trade and manufacture carried on in England were introduced into Scotland soon after the peace of 1763; and not a few of them were prosecuted with much success. Their progress was checked for a while by the American war; but after the treaty of Paris, in 1783, they acquired more than their former vigour: others were introduced; and all of them have since continued, with few, and those but transient interruptions, to advance with a rapidity that could not previously have been supposed possible.

This unprecedented extension of manufacturing and commercial industry occasioned a corresponding increase of wealth and population, especially in towns and villages. Improved accommodations of all sorts began to be in universal demand; and, besides the greater quantity of the inferior sorts of food required to supply the increasing population, a novel, or, at least, a vastly increased market, was opened for wheat and butchers' meat. These circumstances had an astonishing influence over agriculture. The new and constantly increasing markets, established at their very doors, stimulated the farmers to put forth all

their energies, and to avail themselves of discoveries and practices to which they had hitherto been total strangers. We believe, indeed, that we run little risk in affirming, that agriculture has made a more rapid progress in Scotland since 1760 or 1770, than it has ever made in any nearly equal period in any other civilized country.

But in contrasting the progress of improvement in England and Scotland during the last 60 or 70 years, allowance should be made for the different situation of the two countries when the competition began. England in 1770 was, as compared with Scotland, a highly improved country. When, therefore, the latter began to enter on the career of improvement, she had much greater scope for advancement, at the same time that she could avail herself of the example and experience of England.

There can, however, be no doubt that a good deal of the progress of Scotch agriculture, since the epoch referred to, is ascribable to other causes; among the most prominent of which may be specified the improvements made in the public roads, or in the means of communication among different districts: and it has, also, been partly owing to the absence of tithe and poor's rate; and, in a still greater degree, if not principally, to the habit, that has become universal in all the best cultivated districts of Scotland, of granting leases, with conditions hindering the exhaustion of the soil, and of a sufficient length to induce the tenant to make every possible exertion and every profitable outlay.

The following statement of the comparative weight of the produce annually afforded under the system of farming followed in East Lothian, as described by Lord Belhaven, and that which is now followed, is taken from a paper by the late Mr. Oliver, of Lochend, near Edinburgh, an intelligent and extensive practical farmer:—

"The mode of cropping at the former period (1723) was, first, peas; second, wheat; third, barley; fourth, oats; the produce being about three seeds; but, to prevent all cavil, say four seeds. This, taking the seed for each acre at 1 boll,* over a farm of 100 acres,† is 400 bolls. The quantity of straw for each boll of such a crop could not exceed 15 stones, which on 400 bolls gives 6,000 stones, or 42 tons 15¼ cwts. of straw, to be consumed by the stock and returned to the land in the shape of manure. But upon a farm of 100 acres, cultivated as at present, viz., a fourth turnips; a fourth wheat or barley; a fourth clover or rye-grass, pastured, or made into hay and consumed on the farm; and a fourth oats or wheat; the account would stand thus:— 50 acres of wheat, barley, and oats, at 8 bolls per acre, which, we are convinced, is not above the average crops of the best district of East Lothian (and such only was cultivated when Lord Belhaven wrote): this, allowing, as above, 15 stones of straw for each boll, gives 120 stones per acre; which, over 50 acres, makes in all 6,000 stones of straw, or 42 tons 15¼ cwts.; being equal to the quantity produced by the whole 100 acres under the old system. Now, suppose that the 25 acres of clover and rye-grass are made into hay (which, however, is not

* One East Lothian boll of wheat was equal to nearly 4 bushels; a boll of barley to near 6 bushels.

† The Scotch acre, equal to 1·261 imperial acres, is here referred to.

the mode practised, nor the best mode for obtaining the greatest quantity of manure, and keeping up the fertility of the soil), and that each acre yields 200 stones, the total quantity will be 5,000 stones, or 35 tons $14\frac{1}{10}$ cwts.; and add to this 500 tons turnip, being the produce of 25 acres, at 20 tons per acre, which is by no means above a fair average crop. Upon these data the weight of materials produced annually for manure under the old and new systems will be as follows:—

Old system,	Straw . . .	6,000 stones,	42 tons	$15\frac{1}{2}$ cwt.
New system,	Straw . . .	6,000 ,,	42	$15\frac{1}{2}$,,
	Hay . . .	5,000 ,,	35 ,,	$14\frac{1}{10}$,,
	Turnips . .	70,000 ,,	500 ,,	

"Thus, making the weight of materials to be converted into manure under the new system, in round numbers, 577 tons; while, under the old system, the quantity is only 42 tons, leaving a balance in favour of the new of 533 tons per annum, being *more than twelve times the whole quantity produced under the old!* Nothing more is necessary to show the superiority of the new system, in as far as *keeping up the fertility of the soil* is concerned; and upon this depends the progress of agriculture. And as to the question of comparative profit, it would be easy to show, from unquestionable data, that the new system is as superior to the old in this respect as it is in the supply of manure; but this, we think, must be abundantly obvious to every one who contrasts the almost imperceptible advances made in agriculture, and in the accumulation of agricultural capital, for many centuries, with their extraordinary progress during the last 70 years, or since the new system was introduced."

The farmers having generally obtained leases for 19 years, and frequently for a much longer period, for what the lands were worth when this system was beginning to be introduced, it is easy to see that, with such means of improvement in their hands, combined with the rise of prices, they could not fail of rapidly accumulating wealth; and we believe that the increase of capital in the hands of the farmers of Scotland, in the interval between 1780 and 1815, has never been equalled, in the same period, in any other old settled country. The heavy fall of prices at the end of the war occasioned, in some districts, the loss of a considerable quantity of capital. But that has been since far more than replaced; and at present (1846) the farming capital of Scotland is very decidedly greater than at any former period; while it has, at the same time, gained most materially in efficacy, or in productive power.

The improved thrashing machine, introduced about 1794, an instrument of the utmost importance in agriculture, was the invention of a Scotch mechanic of the name of Meikle.

Most of the commons and wastes that formerly existed in Scotland have been divided, and the greater number, at least in the lowlands, have been enclosed and cultivated. In this respect the practice in Scotland is very superior to that in England. Instead of requiring, as is the case in the latter, a particular Act of Parliament for the enclosure and subdivision of each common, they have all been enclosed and subdivided, in Scotland, under the provisions of an Act of the Scotch

Parliament, passed in 1695. This Act is so very important, and at the same time so brief and comprehensive, that we subjoin it:—

Act concerning the dividing of Commonties, passed in the Parliament of Scotland, 17th July, 1695.

"Our Sovereign Lord, with advice and consent of the Estates of Parliament, for preventing the discords that arise about commonties, and for the more easy and expedite deciding thereof in time coming, statutes and ordains, That all commonties, except the commonties belonging to the King and royal boroughs in burgage, may be divided at the instance of any having interest, by summons raised against all persons concerned before the Lords of Session; who are hereby empowered to discuss the relevancy, and to determine upon the rights and interests of the several parties concerned; and to grant commissions to sheriffs, stewards, bailies of regality and their deputies, or justices of peace, or others, for perambulating and taking all other necessary probation; which commissions shall be reported to the said lords, and the said processes ultimately determined by them: And, where mosses shall happen to be in the said commonties; with power to the said lords to divide these said mosses among the several parties having interest therein, in manner aforesaid: or in case it be instructed to the said lords that the said mosses cannot be conveniently divided, His Majesty, with consent aforesaid, statutes and declares, that the said mosses shall remain common, with free ish and entry thereto, whether divided or not; declaring, also, that the interest of the heritors having right in the said commonties shall be estimate according to the valuation of their respective lands or properties; and which divisions are appointed to be made of that part of the commonty which is next adjacent to each heritor's property."

Had a similar Act been passed in England, at the same period, it would have saved the proprietors of such commons as have been enclosed a great deal of money, and would have led to the cultivation of a much greater extent of waste land.

The introduction of the sheep-farming system into the highlands has effected a radical change in the internal economy of the northern counties, and has been, on the whole, most advantageous. Under the old system, the population was collected in the arable districts in the glens, or valleys between the mountains, and along the banks of the lochs, or arms of the sea. Their habitations were usually clustered together in a sort of villages; the lands susceptible of tillage being sometimes cultivated in common; though they were more usually divided into small patches, or *crofts*, held by the occupiers, generally from year to year, sometimes from the proprietor, but more commonly from a middleman, or *principal tacksman*. Owing to the very limited extent of the low grounds in the glens, particularly on the western coast, and the torrents of rain by which they are frequently deluged, but little corn could be raised, even in the most favourable seasons; and the entire failure of the crops was a calamity of anything but rare occurrence. Hence, the principal dependence of the occupiers was on their cattle, fed on the contiguous mountain pastures: and had they renounced all attempts at tillage, and appropriated their valleys to the production of winter food for their cattle, importing supplies of meal from the lowlands, their condition would have been much improved; but the petty tenants were too poor, too ignorant, too indolent, too firmly attached to old customs and habits, and too much occupied in schemes of illicit distillation, to attempt any innovation of this sort. They uniformly endeavoured to raise on their little patches of low

ground bread for themselves and their families, and fodder for their stock during winter. In this, however, they often failed; and when such was the case, men and beasts were exposed to all the evils of scarcity, and even famine.

Such a system was fitted only to perpetuate and extend the most abject poverty and barbarism. The population, as is always the case where the land is held by cottiers, was decidedly redundant. The rents the occupiers paid were but trifling; but, though they had been themselves the owners of the land, their condition would not have been sensibly ameliorated. They had no capital with which to undertake any improvement; and though, during the greater part of the year, they had little or nothing to do, the smallness of their occupancies obliged them to keep a much greater number of horses than would have been required for larger farms. At length, however, the occurrence of circumstances similar to those that occasioned the extension of sheep-farming in England, in the reigns of Henry VII. and Henry VIII., led to its introduction in the highlands. After hereditary jurisdictions had been abolished, and good order and a regular system of government were introduced into the northern counties, the landlords, finding they could no longer acquire distinction by the number of their vassals, became more than ever desirous to increase the rental of their estates. Under such circumstances, they could not help perceiving that the mode in which they were occupied constituted an effectual barrier to all improvement, and to any material increase of rent. The prejudices in which they had been educated hindered many of those who were the first to perceive the inconveniences of the old system from attempting to modify it; but these gradually lost their efficacy, and, at length, completely disappeared. It is to no purpose, however, to ascribe the overthrow of the cottier system in the highlands to any undue preference of sheep-farming. The introduction of this system determined the mode in which an inevitable change has been accomplished; but it did not bring it about. Though the hills and mountains north of the Forth had continued to be exclusively depastured by black cattle, the obvious advantage of clearing the glens of their petty occupiers, and of appropriating them to the production of winter food for the cattle, would have led to nearly the same results, in so far as the cottier population is concerned, that have resulted from the introduction of sheep. But it must not be supposed that black cattle have been banished from the highlands; they have merely been confined to the pastures less suitable to sheep; while the greater attention paid to the selection and improvement of the breed, and the circumstance of the entire produce of the meadows and low grounds being reserved for their support in winter, make it be generally concluded that the exports of cattle from the highlands are about as great at present as at any former period; and supposing it to be so, it follows, that the vast quantities of wool and sheep annually furnished by the highlands are so much added, through the change in the mode of occupancy, to the free available produce of the country! It would not, therefore, be easy to exaggerate the beneficial results of the sheep-farming system. Immense tracts of mountain land, that were formerly

either wholly useless, or appropriated only to the depasturing of the half-starved oxen of the glens for a few months in summer, have been made, through its agency, considerably productive. The increase of food, and other accommodations thence resulting, have not been confined to any particular class or order. The benefit has been truly national; and has redounded, despite the violence with which the change was, in a few instances, forced upon the poor occupiers, as much to their advantage as to that of the landlords.

It has been repeatedly objected to the new system that it has depopulated the highlands, and forced the inhabitants to seek an asylum in foreign countries; but it is hardly necessary to say, that a system of farming which has added most materially to the supply of produce in a country, cannot, whatever other effects it may have, occasion any diminution of population. Now, no one doubts that this has been a consequence of the introduction of sheep-farming into the highlands; so that the fallacy of the objections alluded to is seen at a glance. Perhaps, however, it may be thought, that though, in consequence of the increase of exportable produce from the highlands, the population of the other parts of the empire may have been increased, the inhabitants of that district may, notwithstanding, have been diminished: but, provided the population of the empire be not injuriously affected, its distribution is of inferior consequence. In point of fact, however, there has been no falling off in the population of the highlands; on the contrary, it has materially increased since the epoch when sheep-farming began to be introduced. This is obvious from the following returns of the population of the principal sheep counties:—

Counties.	Pop., 1755.	Pop., 1801.	Pop, 1831.	Pop., 1841.	Pop., 1851.
Argyll	63,291	71,859	101,425	97,371	89,298
Inverness . . .	64,656	74,292	94,797	97,799	96,500
Ross and Cromarty	47,656	55,343	74,820	78,585	82,707
Sutherland . . .	20,774	23,117	25,518	24,782	25,793
Totals . . .	196,377	224,611	296,560	298,637	294,298

Hence, instead of declining, it appears that the population of the principal highland counties has increased 97,921 since 1755, and 69,687 since 1801! And this, after all, is only what a more unprejudiced inquiry into the circumstances would have led any one to anticipate. The inhabitants, instead of being scattered over the country, have been collected into villages and towns; and, from being lazy half-employed petty farmers and cottiers, numbers have been converted into comparatively industrious artisans, fishermen, &c. The proprietors, in consequence of the immense increase of their rentals, have been enabled and stimulated to undertake the most expensive improvements; and their efforts have been so well seconded by the new class of tenantry, that a totally different appearance has been given to

the entire country. There is, also, a greater demand for labour, and more people employed than at any former period; with a proportional increase in the quantity of work done, and of the products brought to market. The condition of the people has, at the same time, been signally improved; and, instead of those frequently recurring famines that used to spread disease and death over large portions of the country, scarcity is now as little prevalent in most highland districts as in the lowlands.

6. *Present State of Agriculture.*—It was supposed by many, that the extraordinary improvement in the agriculture of Scotland, during the late war, being mainly owing to the high prices that then prevailed, the heavy fall of prices that took place subsequently to the renewed intercourse with the Continent in 1814, would check its further progress. Luckily, however, this anticipation has not been realised. No doubt, the shock occasioned by the fall alluded to, was as severe as it was sudden and unlooked for by most persons; and, in the first instance, was productive of much distress, and the ruin of a few landlords in embarrassed circumstances, and of tenants paying money rents, calculated on the footing that the high prices that had prevailed during the previous half dozen years, would be permanent. This, however, was not the situation of the great body of the agriculturists; and, while the fall was comparatively little felt by them, it was highly advantageous to the manufacturing and commercial classes; no inconsiderable portion of the wonderful progress made in manufactures and commerce since 1815 being clearly ascribable to the fall in the cost of necessaries. It is impossible, too, that agriculture can be long depressed where manufactures and commerce are flourishing; and in a brief period it began to revive, and to flourish more vigorously than ever. The property tax, which pressed severely on the land, was struck off; rents, where necessary, were reduced: and the farmers exerted themselves to meet the new order of things by fresh efforts of industry, and by proscribing every useless expense.

These efforts have been powerfully promoted by the formation of improved means of communication. We have already had occasion to exhibit some of the effects of the opening of new roads (*antè*, p. 301, &c.); and the establishment of steam-packets has been quite as important. They have brought most part of the great markets in the kingdom within reach of the occupiers in some of the remotest districts. The farmers of the east coast of Scotland, as far north as the Moray Frith, are now able to send up *full-fed cattle and sheep* to London at a fourth part of the expense, and in a tenth part of the time, that was formerly required to send them up half fed to the Norfolk fairs; at the same time that a new and boundless market is created for all other sorts of agricultural produce. The same machinery has opened an equally easy access to the great markets of Liverpool and Manchester for the farmers of Dumfriesshire, Galloway, Ayrshire, and generally of all the west of Scotland. The advantages accruing from this have been, both directly and indirectly, of the greatest importance; and, in most places, have more than countervailed the fall of prices.

The introduction of bone manure into Scotland has also been of the

very highest value. Bone mills are now erected in most parts of the country; and large quantities of dust are imported. Its influence, assisted as it has latterly been by that of guano, in increasing the crops of turnips and corn, and, consequently, the supply of butcher's meat and of farm manure, has been quite wonderful. The facility, too, of the carriage of bone dust and guano has permitted many hilly and comparatively inaccessible districts to be improved at a comparatively small cost.

But here, as in England, next to the introduction of these manures, or, perhaps, before it, the extension of drainage, and principally of the new practice of furrow-draining, has been the most important of the recent improvements in Scotch agriculture. Large tracts, that were formerly comparatively unproductive, have been, through its means, rendered capable of bearing heavy crops. Everywhere, indeed, a spirit of improvement is diffused; and the land is not only rendered more suitable for the production of most sorts of produce, but is better cultivated, and subjected to rotations better suited to its capacities. Hence the quantity of corn, butcher's meat, &c., at present raised in Scotland, vastly exceeds the quantity raised in 1815; and there are good grounds for thinking that prices might be considerably reduced, without materially retarding the progress of agriculture.

The only thing that seems at all likely to check the future progress of agriculture in Scotland, is the fact of the Reform Act having conferred the elective franchise on all occupiers of lands worth 50*l.* a-year and upwards. This has been in every respect, economical and political, a pernicious, ill-advised measure. Formerly the landlords rarely inquired respecting the politics of their tenants; and provided they paid them their rents, and managed their lands according to the stipulations in their leases, they might be of any political or religious party they pleased. But now it is altogether different. The landlords, desirous, like other people, of extending their political influence, endeavour to control, or rather command, the suffrages of their tenants, and to multiply the dependent voters on their estates. In furtherance of these objects, they have not scrupled, in many instances, to resort to intimidation, and to adopt vindictive measures against such of their tenants as have voted contrary to their wishes. This, however, though the most prominent at the time, is but the least evil resulting from the new state of things. It has already led in many instances to a change in the mode of letting land; and there is but too much reason to fear that it may, in the end, subvert, to a great extent, that system of giving leases for 19 or 20 years certain, that has been a main cause of the improvement of agriculture. It has also occasioned, in many instances, a subdivision of farms for the mere purpose of creating voters; and there cannot, indeed, be a question that, however well intended, the conferring the elective franchise on the tenants has been one of the heaviest blows ever struck at their independence, and at the prosperity of agriculture.*

* For the influence of this measure, in a political point of view, see the chapter in the 2nd volume of this work on Political Institutions.

NUMBER OF PERSONS EMPLOYED IN AGRICULTURE.

I. *Account of the Number of Farmers and Graziers, Agricultural Labourers, Gardeners, &c., in each County of England and Wales in* 1841, *according to the Census of that Year.*

Counties.	Farmers and Graziers. Males. 20 Years of Age and upwards.	Farmers and Graziers. Males. Under 20 Years of Age.	Farmers and Graziers. Females. 20 Years of Age and upwards.	Farmers and Graziers. Females. Under 20 Years of Age.	Farmers and Graziers. Total.	Agricultural Labourers. Males. 20 Years of Age and upwards.	Agricultural Labourers. Males. Under 20 Years of Age.	Agricultural Labourers. Females. 20 Years of Age and upwards.	Agricultural Labourers. Females. Under 20 Years of Age.	Agricultural Labourers. Total.	Gardeners, Nurserymen, and Florists. Total.	Total Persons engaged in Agriculture.
England.												
Bedford	1,321	31	106	..	1,458	10,977	1,813	59	12	12,861	614	14,933
Berks	1,728	32	116	..	1,876	13,997	3,005	1,329	316	18,649	724	21,249
Bucks	2,256	40	169	..	2,465	15,681	2,702	841	136	18,860	572	21,897
Cambridge	3,136	29	176	..	3,341	15,990	2,068	619	239	18,916	661	22,918
Chester	6,482	53	919	..	7,454	14,795	2,675	542	443	18,455	895	26,804
Cornwall	7,668	128	405	..	8,201	14,279	2,752	795	177	18,003	658	26,862
Cumberland	4,796	26	432	..	5,254	7,574	1,075	1,073	357	10,079	278	15,611
Derby	6,182	58	756	..	6,991	10,019	1,447	188	122	11,776	566	19,333
Devon	11,187	324	521	..	12,032	31,667	7,481	1,178	728	41,054	1,436	54,522
Dorset	2,701	33	120	..	2,854	13,043	2,060	592	181	15,876	462	19,192
Durham	3,274	46	218	..	3,538	7,866	1,203	726	274	10,069	783	14,391
Essex	4,575	120	415	..	5,110	36,272	6,541	1,074	321	44,208	1,798	51,116
Gloucester	4,577	57	319	..	4,953	19,949	2,879	1,578	320	24,725	1,592	31,270
Hereford	3,194	27	292	..	3,513	10,664	1,474	603	90	12,831	272	16,616
Hertford	1,628	22	130	..	1,780	14,110	3,066	227	68	17,541	824	20,145
Huntingdon	1,027	23	72	..	1,121	6,004	866	183	59	7,112	247	8,480
Kent	5,123	57	297	..	5,477	33,504	5,502	521	84	39,611	2,497	47,585
Lancaster	14,740	139	1,767	..	16,646	24,761	5,194	442	188	30,585	2,338	49,569
Leicester	3,358	26	285	..	3,669	11,259	1,858	133	25	13,770	653	17,092
Lincoln	10,579	78	631	..	11,288	36,917	7,712	643	132	45,304	879	57,561
Middlesex	1,118	32	55	..	1,205	9,627	1,437	522	82	11,668	5,291	18,164
Monmouth	2,263	56	278	..	2,597	4,472	1,172	126	33	5,853	235	8,685
Norfolk	6,960	73	414	..	7,447	34,502	5,784	735	184	41,275	1,643	50,365
Northampton	3,069	41	205	..	3,315	18,538	3,045	186	23	21,792	624	25,731
Northumberland	2,817	26	222	..	3,065	10,669	1,817	883	290	13,659	615	17,339
Nottingham	3,444	49	294	..	3,787	12,769	2,923	220	14	15,926	645	20,358
Oxford	2,178	23	164	..	2,365	14,488	2,350	670	206	17,909	515	20,789
Rutland	567	2	47	..	616	2,169	420	89	1	2,629	71	3,316
Salop	4,467	43	494	..	5,024	17,075	4,929	297	60	22,361	618	28,003
Somerset	8,196	84	407	..	8,687	26,949	5,693	1,388	314	34,338	1,442	44,467
Southampton	3,420	47	147	..	3,614	24,898	4,948	514	175	30,535	1,392	35,541
Stafford	5,791	39	685	..	6,515	17,484	3,847	194	43	21,568	1,037	29,120
Suffolk	4,957	44	381	..	5,382	31,700	4,932	507	133	37,331	1,125	43,838
Surrey	1,892	27	111	..	2,030	15,963	3,140	247	79	19,392	4,040	25,358
Sussex	3,805	31	206	..	4,042	24,845	5,264	323	90	30,522	4,144	35,708
Warwick	3,461	45	293	..	3,799	15,914	3,009	328	33	19,284	1,156	24,239
Westmoreland	2,293	12	173	..	2,478	3,083	706	122	60	3,973	113	6,566
Wilts	4,149	133	174	..	4,456	22,065	5,133	2,308	629	31,099	835	36,390
Worcester	2,991	42	323	..	3,356	13,577	2,904	1,820	942	19,243	950	23,549
York:—												
East Riding	4,165	39	271	..	4,475	13,824	4,110	334	120	18,378	653	23,506
City & Ainsty	449	4	42	..	495	1,180	294	49	6	1,519	165	2,179
North Riding	7,295	68	613	..	7,946	13,992	3,984	1,843	443	19,752	479	28,177
West Riding	13,327	164	1,247	..	16,738	34,615	4,941	613	152	30,321	2,288	49,297
Total England	194,596	2,467	15,392	..	212,455	724,625	139,661	26,888	6,460	899,634	45,727	1,157,816
Wales.												
Anglesey	2,069	19	261	..	2,348	3,706	1,223	227	144	5,299	73	7,720
Brecon	1,941	6	160	..	2,107	2,358	949	64	39	3,410	72	5,589
Cardigan	3,073	24	371	..	3,467	3,560	1,687	129	102	5,478	51	8,996
Caermarthen	4,817	26	660	..	5,503	5,787	2,568	864	197	9,936	72	14,511
Caernarvon	3,064	12	420	..	3,496	4,708	1,428	44	15	6,195	122	9,813
Denbigh	3,022	13	32	..	3,467	5,736	1,937	48	24	7,767	207	11,441
Flint	1,499	13	259	..	1,771	2,742	982	18	4	3,586	134	5,491
Glamorgan	2,957	26	208	..	3,191	4,925	1,699	89	30	6,643	252	10,086
Merioneth	2,110	11	246	..	2,367	2,824	856	56	24	3,760	48	5,677
Montgomery	3,143	15	325	..	3,483	4,600	1,928	91	60	6,669	77	10,229
Pembroke	2,632	23	339	..	2,993	5,003	1,800	66	15	6,884	93	9,470
Radnor	1,482	3	99	..	1,584	2,076	759	92	81	3,008	17	4,609
Total Wales	31,807	190	3,767	..	35,777	47,447	17,155	1,900	735	66,687	1,218	103,682
Isles in the British Seas	3,723	44	164	..	3,930	3,247	626	365	88	4,346	227	8,493

II. *Account of the Number of Farmers and Graziers, Agricultural Labourers, Gardeners, &c., in each County of Scotland in* 1841, *according to the Census of that Year.*

Counties.	Farmers and Graziers.					Agricultural Labourers.					Gardeners, Nurserymen, and Florists.	Total Persons engaged in Agriculture.
	Males.		Females.			Males.		Females.				
	20 Years of Age and upwards.	Under 20 Years of Age.	20 Years of Age and upwards	Under 20 Years of Age.	Total.	20 Years of Age and upwards.	Under 20 Years of Age.	20 Years of Age and upwards.	Under 20 Years of Age.	Total.	Total.	
Aberdeen . .	3,052	39	586	..	3,677	9,184	5,896	517	427	15,974	573	25,224
Argyle . . .	3,811	28	707	..	4,546	5,951	2,907	364	110	9,322	119	13,187
Ayr	2,839	28	161	..	3,028	5,665	1,869	234	61	7,829	303	11,160
Banff. . . .	2,301	10	242	..	2,553	2,562	1,824	303	236	4,925	103	7,581
Berwick . .	560	9	10	..	579	3,443	1,117	693	318	5,501	93	6,173
Bute	592	1	19	..	612	442	291	16	15	764	43	1,419
Caithness . .	1,768	3	144	..	1,915	1,610	1,012	397	145	3,164	37	5,116
Clackmannan .	113	6	7	..	126	561	168	12	12	771	55	952
Dumbarton. .	500	2	19	..	521	1,468	367	81	25	1,941	141	2,603
Dumfries . .	1,708	17	133	..	1,858	4,650	1,632	1,736	901	8,919	161	10,938
Edinburgh . .	632	8	17	..	657	4,012	1,102	635	116	5,865	1,234	7,756
Elgin or Moray	1,390	1	92	..	1,483	1,780	1,247	321	83	3,471	126	5,080
Fife	1,137	16	42	..	1,195	6,019	1,730	555	181	8,485	361	10,041
Forfar . . .	1,665	14	92	..	1,771	5,193	2,072	493	137	7,895	402	10,078
Haddington .	308	6	5	..	321	3,610	976	694	434	5,714	123	6,158
Inverness . .	3,495	22	249	..	3,766	7,088	1,411	1,138	163	9,800	180	14,746
Kincardine .	1,234	1	97	..	1,332	2,615	1,345	350	109	4,419	97	5,848
Kinross . . .	157	1	2	..	160	595	209	54	9	857	15	1,032
Kirkcudbright .	1,646	5	72	..	1,723	2,864	709	379	55	4,007	126	5,256
Lanark . . .	2,395	30	127	..	2,552	7,126	2,100	422	372	10,020	588	13,160
Linlithgow . .	354	3	15	..	372	1,423	488	107	89	2,007	77	2,456
Nairn	389	..	7	..	396	577	360	209	37	1,183	15	1,594
Orkney and Shetland .	3,656	14	348	..	4,018	1,119	761	286	63	2,229	9	6,251
Peebles . . .	245	3	4	..	252	225	305	89	65	1,374	43	1,669
Perth	3,690	13	176	..	3,879	7,489	3,534	720	228	11,980	443	16,302
Renfrew. . .	1,054	16	56	..	1,126	3,432	758	167	59	4,416	328	5,866
Ross and Cromarty. .	2,169	18	153	..	2,340	5,822	1,007	858	189	7,826	115	10,281
Roxburgh . .	664	14	20	..	698	3,402	985	807	440	5,634	160	6,530
Selkirk . . .	90	2	1	..	93	601	160	18	6	785	24	902
Stirling . . .	1,184	15	57	..	1,256	3,393	1,549	150	53	4,945	204	6,415
Sutherland . .	399	4	47	..	450	2,115	211	377	11	2,914	16	3,380
Wigtown . .	1,129	1	85	..	1,214	2,954	680	217	46	3,897	56	5,167
Total Scotland	50,738	354	3,787	..	54,873	109,550	39,854	13,528	5,114	168,046	6,418	229,337

GREAT BRITAIN.

England . .	194,596	2,467	15,892	..	212,455	784,625	130,661	26,888	8,460	950,634	45,727	1,157,816
Wales . . .	31,307	100	3,730	..	35,777	47,447	17,155	1,300	735	66,637	1,218	103,632
Scotland . .	50,738	354	3,787	..	54,873	109,550	39,854	13,528	5,114	168,046	6,418	229,337
Isles in the British Seas	3,752	44	164	..	3,960	3,247	626	335	38	4,246	287	8,493
Total . .	280,887	3,055	23,123	..	307,065	884,869	197,296	42,051	14,347	1,138,563	53,650	1,499,278

The foregoing tables comprise all the information embodied in the census of 1841, in regard to the number of persons engaged in agricultural employments. Little reliance can, however, be placed on these returns. The numbers given in them are all very decidedly below the mark. As formerly observed, all those artizans, such as smiths, carpenters, saddlers, machine-makers, &c. engaged in the manufacture of implements for the agriculturists, though essentially agricultural labourers, are reckoned in the manufacturing class; and many also of the menial servants, and others employed by the agriculturists, are enrolled in the official returns in other classes. It is difficult to form any estimate of the numbers that should be added to make up for these deficiencies, to those in the preceding returns, so as to arrive at the total number engaged in what are really agricultural employments; but we incline to think, that in Great Britain only they may be moderately estimated at about 800,000, making in all

about 2,300,000 individuals engaged in agriculture and its immediately subsidiary and dependent employments.

The number of persons engaged in, and dependent upon, agriculture in Ireland is comparatively much larger than in Great Britain. It appears from the census of 1841 that there are in Ireland 1,472,787 families, of which no fewer than 974,188 were employed in agriculture. Hence, as there are very near 5½ individuals to a family (11 individuals to 2 families) in Ireland, it is seen that in that part of the United Kingdom 5,358,034 persons are directly dependent on the culture of the soil, out of a population of 8,175,124, and taking into account its subsidiary employments, the dependence on agriculture will be proportionally greater.

CHAPTER II.—Mines and Minerals.

The mineral riches of Great Britain, if not superior, are at least equal to those of any other country. We cannot, it is true, boast of mines of gold or silver; but we possess what is of still more importance to a manufacturing nation, an all but inexhaustible supply of the most excellent coal. Iron, the most useful of all the metals, is found in the greatest abundance, and of an exceedingly good quality, in most parts of the empire. Our tin mines are the most productive of any in Europe; and we have also very productive and valuable mines of copper, lead, manganese, &c. Our salt springs, and beds of fossil salt, are alone sufficient to supply the whole world for an indefinite period.

The most valuable minerals are situated in the western and northern parts of England; and in the southern and middle parts of Scotland. The English mines are the most important. Were a straight line drawn from the Isle of Portland, in Dorsetshire, to Rugby in Warwickshire, and thence to Hartlepool, on the coast of Durham, the country to the east of it would be found to be destitute of coal, copper, tin, lead, salt, &c. Iron is, indeed, found in various places to the eastward of the line now mentioned; but, owing to the want of coal, it is not wrought. This district may, therefore, as compared with the other parts of the country, be said to be destitute of minerals; and, to a considerable extent, also, of those branches of industry for the successful prosecution of which an abundant supply of minerals is necessary.

We begin our notices of the different minerals with that of coal, by far the most important and valuable of them all.

1. Coal. — It is hardly possible to exaggerate the advantages England derives from her vast beds of coal. In this climate, fuel ranks among the principal necessaries of life; and it is to our coal mines that we owe abundant and cheap supplies of so indispensable an article. Had they not existed, wood must have been used as fuel; and it is not possible that any attention to the growth of timber could have furnished a supply equal to the wants of the present population of Great Britain, even though a large proportion of the cultivated land had been appropriated to the raising of trees. But,

however great and signal, this is not the only advantage we derive from our coal mines: they are the principal source and foundation of our manufacturing and commercial prosperity. Since the invention of the steam-engine, coal has become of the highest importance as a moving power; and no nation, however favourably situated in other respects, not plentifully supplied with this mineral, need hope to rival those that are, in most branches of manufacturing industry. To what is the astonishing increase of Glasgow, Manchester, Birmingham, Leeds, Sheffield, &c., and the comparatively stationary or declining state of Canterbury, Winchester, Salisbury, and other towns in the south of England, to be ascribed? It cannot be pretended, with any show of reason, that the inhabitants of the former are naturally more ingenious, enterprising, or industrious, than those of the latter. The abundance and cheapness of coal in the north, and its scarcity, and consequent high price, in the south, are the real causes of this striking discrepancy. The citizens of Manchester, Glasgow, &c., are able, at a comparatively small expense, to put the most powerful and complicated machinery in motion; and to produce results quite beyond the reach of those who have not the same command over coal, or, as it has been happily defined, "hoarded labour." Our coal mines have been sometimes called the *Black Indies;* and it is certain that they have conferred a thousand times more real advantage on us than we have derived from the conquest of the Mogul empire, or than we should have reaped from the dominion of Mexico and Peru. They have supplied our manufacturers and artisans with a power of unbounded energy and easy of control; and enabled them to overcome difficulties insurmountable by those to whom nature has been less liberal of her choicest gifts.

Consumption of Coal in Great Britain.—It is uncertain when coal first began to be used amongst us as fuel: probably it did not long precede the 13th century. In 1281, however, Newcastle is noticed as having some trade in this article. In the reign of Edward I. its use, in London, was prohibited, because of the supposed injurious influence of its smoke. This prohibition was renewed at several subsequent periods, but to no purpose. Experience showed that the smoke was not deleterious; while the growing scarcity, and consequently increased price, of timber, and the superiority of coal as an article of fuel, secured its ascendancy in despite of every obstacle. Since the reign of Charles I., it has become almost the only description of fuel used in London, and in most other towns and districts throughout the kingdom.

The consumption of coal in Great Britain is immense. It was estimated, about 17 years ago, by Mr. Taylor, an experienced coal owner and engineer, at 15,580,000 tons, exclusive of the exports to foreign countries. We suspect, however, that this estimate was even then (1829) under the mark, and the consumption has increased rapidly in the interval. The yearly importation of water-borne coal into the port of London amounts, at present, to about 3,000,000 tons. The population of the district that derives its principal supply from this source amounts to about 2,600,000, or 2,700,000, giving an annual supply of above a ton to each individual. There are, no doubt, several very extensive gas-works, breweries, brick-works, &c., in London

and its vicinity, in which large quantities of coal are consumed; and the population may be reckoned more opulent, and, consequently, able to consume more fuel than that of most other parts of the kingdom. But, on the other hand, the comparatively high price of coal in the metropolis and its vicinity reduces its consumption by the middle and lower classes considerably below the level of the consumption of the same classes in Lancashire and other coal counties. The researches of Dr. Cleland show that, in 1831, when the population was 202,000, the consumption of coal in Glasgow amounted to 437,000 tons; and we believe we shall make a liberal allowance for the coal consumed in cotton factories, and other public works of a description not carried on in London, if we estimate it at 225,000 tons; which would leave 212,000 tons, or more than a ton for each individual, for the domestic consumption of the city.—(*New Statistical Account of Scotland*, No. 7, p. 162.) On the whole, therefore, we should be disposed to think that, including the consumption of coal in gas-works, breweries, distilleries, brick-works, soap-works, sugar-refineries, bake-houses, and other businesses carried on in the valley of the Thames, the consumption of Great Britain may be estimated at nearly the same rate, or at about a ton of coal for each individual, exclusive of the consumption in iron-works and other great branches of manufacture. This would give about 20,000,000 tons for what may be called the domestic consumption of the island in 1846. The domestic consumption of coal in Scotland, in 1813, was estimated in the *General Report* (vol. i. p. 66), at 2,000,000 tons; the population being, at the time, under 1,900,000. But to this quantity many very large additions have now to be made.

The quantity of iron annually produced in Great Britain may be taken at 1,750,000 tons; and estimating the quantity of coal required, at an average, to produce each ton of pig iron, at 3½ tons, the consumption in this branch will be 6,125,000 tons a year; to which 3,000,000 tons may be added for the conversion of pig iron into bar iron, making the total consumption of coal in the iron manufacture 9,125,000 tons. According to Mr. Kennedy, the quantity of coal consumed in the cotton manufacture, in 1817, was upwards of 500,000 tons; and the manufacture has since more than quadrupled; so that, allowing for greater economy, we may fairly estimate the consumption of coal in the cotton trade at 1,000,000 tons a year. Its consumption in the woollen, linen, and silk trades, may be taken at about the same. The quantity of copper ore annually smelted in Great Britain amounts to about 185,000 tons; and it is supposed that about 2½ tons of coal are required to smelt each ton of ore, making the total consumption in this department equal to 462,500 tons. It is generally believed that the brass and copper manufactures require nearly as much coal as the copper smelting. In the salt-works of Cheshire, Worcestershire, &c., the consumption is probably not under, if it do not exceed, 375,000 tons. The consumption in lime-works may, it is believed, be estimated at 700,000 tons; and that of steam-boats, railway carriages, &c., may perhaps be taken at 1,200,000 tons. It would appear, therefore, that the total annual consumption of coal in Great Britain may be moderately estimated as follows:—

	Tons.
Domestic consumption, and smaller manufactures (1846)	20,000,000
Production of pig and bar Iron	9,125,000
Cotton Manufacture	1,000,000
Woollen, Linen, Silk, &c.	1,000,000
Copper Smelting, Brass Manufactures, &c.	1,000,000
Salt-works	375,000
Lime-works	700,000
Railway Carriages, Steamers, &c.	1,200,000
	34,400,000
Exports to Ireland	1,500,000
Ditto to Colonies and foreign parts (1846)	2,500,000
Total	38,400,000

In this estimate no allowance has been made for the coal consumed in the manufacture of hardware and cutlery at Birmingham, Sheffield, &c.; so that for this, among other reasons, we do not think it can be justly accused of exaggeration.

If we suppose that the above quantity of 38,400,000 tons costs the consumer, at an average, 10*s.* a ton, it will be worth in all 19,200,000*l.* a year!

Supply of Coal in England.—The importance of coal as a necessary of life, and the degree in which our superiority in arts and manufactures depends upon our obtaining supplies of it at a cheap rate, has naturally attracted a good deal of attention to the question, as to the period when the exhaustion of the coal mines may be anticipated. But the investigations hitherto made in regard to the magnitude and thickness of the different coal-beds, and the extent to which they may be wrought, are too vague and unsatisfactory to afford grounds for forming anything like a tolerably near approximation to a solution of this question. But such as they are, they are sufficient to show that many centuries must elapse before posterity can feel any serious difficulties from a diminished supply of coal. According to Mr. Taylor, to whose estimate of the consumption of coal we have already referred, the coal-fields of Durham and Northumberland are adequate to furnish the present annual supply for more than 1340 years. We subjoin Mr. Taylor's estimate:—

Estimate of the Extent and Produce of the Durham and Northumberland Coal-fields

DURHAM.

	Sq. Miles.	
From South Shields southward to Castle Eden, 21 miles; thence westward to West Auckland, 32 miles; north-east from West Auckland to Eltringham, 33 miles; and then to Shields, 22 miles; being an extent or area of	594	

NORTHUMBERLAND.

From Shields northward, 27 miles, by an average breadth of 9 miles	243	
		837
Portion excavated in Durham-on-Tyne, say	39	
,, in Durham-on-Wear, say	40	
		79
,, in Northumberland, say 13 miles by 2	26	
		105
		732

	Tons.
Estimating the workable coal strata at an average thickness of 12 feet, the contents of 1 square mile will be 12,390,000 tons and of 732 square miles	9,069,480,000
Deduct 1-3rd part for loss by small coal, interceptions by dikes, and other interruptions	3,023,160,000
Remainder . . .	6,046,320,000

This remainder is adequate to supply the present vend from Newcastle, Sunderland, and Stockton, of about 4,500,000 tons, for a period of 1,343 years.

It will be understood that this estimate of the quantity of coal in Durham and Northumberland can only be an approximation, especially as the south-eastern coal district of Durham is yet almost wholly unexplored; but it was framed by its author, in the hope of satisfying the public that no apprehension need be entertained of this valuable mineral being exhausted for many future generations.

There is also a considerable extent of coal-field in the northern and south-western districts of Northumberland; but the foregoing comprises that which is continuous and most suitable and available for exportation.—(*Lords' Report*, 1829, p. 124.)

We may add, that Dr. Buckland, in his examination before the Committee of the House of Commons on the Coal Duties, quoted with approbation a passage of Bakewell's Geology, in which it is stated, that the coal-fields in South Wales are alone sufficient to supply the demand of England for coal for 2,000 years.

It is unnecessary to add anything more, to show the futility of the apprehensions of the speedy exhaustion of our coal mines. But, though we were shut out from South Wales, and though the supply in Northumberland and Durham were far more limited than it really is, we should have nothing to fear. In the West Riding of Yorkshire there are many extensive coal-beds, hitherto wholly untouched. In Staffordshire the coal-beds are of immense magnitude, that round Dudley being no less than 30 feet thick! It is true that, in the present slovenly mode of working the mines, more than *two-thirds* of the coal is left in the mine and wasted (*Bakewell's Geology*, 4th ed. p. 183); but it is abundantly certain that, were there anything like a scarcity of coal apprehended, this wasteful practice would be put an end to, and means would be found of totally exhausting the mines. There are also very extensive coal-fields in Flintshire and Denbighshire; so that for all practical purposes, and in relation to such periods of time as may be supposed to come within the scope of the remotest schemes and combinations, our supply of coal may be considered as inexhaustible.

Supply of Coal in Scotland.—The previous statements in regard to the consumption of coal apply to Great Britain; but those in regard to its supply are applicable only to England. We should, however, have a very incorrect notion of the coal-fields of Great Britain, if we omitted to notice those of Scotland; they are of great extent and value; and would of themselves suffice to furnish the whole empire with an adequate supply of coal for a very long series of years. We borrow the following details from the *General Report of Scotland*:—

"Coal is found in several districts of Scotland, as in Dumfriesshire,

and Roxburghshire, in the more southern counties; but the great field of Scotch coal stretches from S. W. to N. E., across the centre of the kingdom; and is to be found in greater or smaller quantities, in the shires of Haddington, Edinburgh, and Linlithgow (commonly called the Lothians), Stirling, Clackmannan, Kinross, Fife, part of Perth, Ayr, Renfrew, Lanark, Dumbarton, and part of Argyll. Its average breadth is 33 miles, and its length on the mainland of Scotland, is 98 miles; consequently, its total area is 3,234 square miles. From this, deducting 360 miles for the space covered by the Frith of Forth, there will be left 2,874 square miles of territory, in most parts of which coal is found at different depths, and of various qualities; and in 600,000 acres of which, it is computed, it may be worked to advantage. The districts through which this great field of coal extends are by far the most populous in the kingdom, containing above two-fifths of the people in less than one-tenth part of the space; and the soil in general is well cultivated. This improved cultivation is, in no small degree, to be attributed to the advantages arising from the extensive distribution, easy conveyance, and moderate price of coal; for wherever fuel is most abundant, there the population is greatest, and manufactures, commerce, and agriculture, mutually aid and stimulate each other.

"The depth of coal varies, but in general it seems to be rather nearer the surface in the western than in the eastern division of the country. There is also a great variety in the number of its seams or strata, and their thickness. The most extraordinary thickness in the island is at Quarrelton, near Paisley, where five contiguous seams are upwards of 50 feet thick. Seams less than 18 inches are not deemed equivalent to the expense of working."—(*General Report of Scotland*, i. p. 64.)

Number of Persons engaged in the British Coal Trade.—Mr. Buddle, of Wallsend, an extremely well informed coal engineer, estimated as follows, the number of persons engaged in the different departments of the coal trade on the Tyne and Wear, in the conveyance of coal to London, and in the London coal-trade in 1829:—"I hold a paper in my hand, stating the number of people employed in the coal trade in each department. I would beg to observe, the returns from the Tyne are official documents; from the Wear I have no returns, but it is by an approximate calculation. The number of persons employed under ground on the Tyne are,—men, 4,937; boys, 3,554; together, 8,491: above ground,—men, 2,745; boys, 718; making 3,463: making the total employed in the mines above and below ground, 11,954, which, in round numbers, I call 12,000, because I am pretty sure there were some omissions in the returns. On the river Wear, I conceive there are 9,000 employed; making 21,000 employed in digging the coal, and delivering it to the ships on the two rivers. From the best calculations I have been able to make, it would appear that, averaging the coasting vessels that carry coals at the size of 220 London chaldrons each vessel, there would be 1,400 vessels employed, which would require 15,000 seamen and boys. I have made a summary. There are seamen 15,000; pitmen and above-ground people employed at the collieries, 21,000; keel-men, coal-boatmen, casters, and trimmers, 2,000; making the total number employed in what I call the northern coal trade, 38,000. In London, whippers, lightermen, and so forth, 5,000; factors, agents,

&c., on the coal exchange, 2,500; 7,500 in all, in London. Making the grand total in the north country and London departments of the trade, 45,500. This does not, of course, include the persons employed at the outposts in discharging the ships there."

But though this estimate came from a well-informed quarter, it was intended to set the importance of the trade in the most striking point of view, and we have been well assured that it was not a little exaggerated. Notwithstanding the great increase of the trade in the interval we doubt, whether it now (1846) employs as many persons as it is said by Mr. Buddle to have done in 1829. But supposing such to be the case, and that the coal trade of the Tyne and Wear, including the home consumption, amounts to one-seventh part of the coal trade of Great Britain, it follows as 21,000 persons are engaged above and below ground on the Tyne and the Wear, and in carrying the coal to the ships, that there will be in Great Britain seven times this number, or 147,000 persons, engaged in the raising of coal and in its land carriage; and adding to these 30,000 for the seamen, wharfingers, and others employed in the trade from the Tyne, the Wear, and the Tees, to the south, and from Whitehaven, Liverpool, Ayr, &c., to Ireland, and the trade by sea with other places, we get 177,000 as the total number of persons directly engaged in the British coal trade. We do not of course put forth this as an accurate estimate: we have stated the grounds on which it is made; and it is merely to be regarded, in the absence of more authentic information, as an approximation to the real state of the case.

Gradation of Workmen in Coal Mines.—"There are trap-door keepers, boys who attend to the doors, to open and shut them to let the workmen pass to and from the working places; these doors are necessary to keep the current of the air to the front of the working places, and thus sweep off the gas which is evolved from the coal. The next class in age and size is the rolley drivers, who are stouter boys, generally about 12 to 14 years of age; those boys are the drivers of the horses which convey the coals from the crane to the bottom of the shaft. There is another class of boys called putters, who are stronger lads, and whose ages vary from 15 to 22 or 23 years; those lads are employed in bringing the corves, filled with coal, from the hewers working at the face of the bords, or the pillars working to the crane, where they are lifted to the trains and put upon the rolleys, which bring them to the bottom of the shaft. The next class is the hewers, who are the producers of the coal. The next gradation in rank is the deputy, who is under the immediate direction of the overman; this man has the management of the pit, and the care of the miners, in the absence of the overman. The next in station is the overman, who gives the daily directions to the miner as to the working of the mine; he takes an account of their daily earnings, and sees that each working place is properly ventilated before the miner is permitted to go to it. Then the underviewer, whose business it is to descend the mine daily, and see that all is right in the ventilation and general management; he consults with the overmen, and gives them such directions as he sees necessary, if nothing occurs of so much moment as to require his previous communication with the viewer, and to take his directions as

to what may be necessary for the management of the mine. The viewer is the chief superintendent."—(*Report of* 1835 *on Accidents in Mines*, p. 87.)

Mode of paying Colliers' Wages, &c.—Colliers are always paid by the piece, and consequently their wages, although at the same rate per chaldron, vary according to the quantity of work they have to do; and it is difficult to form an average, they vary so very considerably; they have varied from 14*s.* a-week to, in some instances, 40*s.* The colliers can earn up to 5*s.*, or even more, per day; but there is not full employment for them; they sometimes do not earn more than half that sum; 2*s.* 6*d.* is the certain wages that they are hired to receive from their employers, whether they are employed or not; that is, consequently, a tax on the coal owner, during the suspension of his colliery from any accident. The men have the option of finding work elsewhere; but if they cannot do this, they may call upon their master to pay them 14*s.* a-week.

Accidents in Coal Mines.—These, we regret to say, are very frequent. They arise principally from explosions of inflammable gas, but partly also from the presence of carbonic acid gas, or choke damp, and partly from other causes. The returns of these casualties are very far from complete; but the committee of the House of Commons appointed to inquire into the subject, in 1835, state that, defective as the returns are, they show that 2,070 persons had lost their lives in coal mines within the previous 25 years. While the committee was sitting, an explosion took place in one of the northern coal mines, by which 101 men and boys were destroyed in an instant, and many similar accidents have since occurred. The report of the committee serves rather to show the dangerous nature of the evil to be contended with than anything else. In many instances, not one of those engaged in mines that have exploded has survived to tell how the accident arose; and the causes of explosions, and the means of obviating them, have not been subjected to the continued or searching investigation of scientific men. It appears that, during the period that has elapsed since the introduction of Sir Humphrey Davy's lamp, decidedly more accidents have taken place in the northern mines than during any equal previous period. This, however, is not to be ascribed to the instrument not realizing the expectations of its illustrious inventor, but to the fact of very dangerous, or, as they are expressively called, "fiery mines," being wrought by its means, that must otherwise have been long ago abandoned. It is, however, clearly established that, under certain circumstances, and especially when exposed to a current of air, the safety lamp is no protection at all. As matters now stand, all the more dangerous mines require in their working a degree of vigilant and continuous attention that can hardly be expected from ordinary workmen, and especially from boys. The smallest inattention, the placing a lamp where it should not be placed, the closing of a door that should not be closed, or the opening of one that should be kept shut, the accidental striking of a spark, or any such occurrence, may occasion an explosion, and the instant death of hundreds.

At present, it would seem to be the opinion of the most experienced miners that *efficient ventilation* is the only thing to be depended on.

But the statements in the report go to show, what we have been otherwise well assured of, that this indispensable security is, in numerous instances, too little attended to.

The question whether the legislature should interfere in such a case is one of much difficulty, and involves various considerations. Certainly, however, it does appear to us that the working of "fiery," or unusually dangerous mines, should not be permitted till they have been so ventilated, or otherwise secured, that the risk of danger may be obviated with ordinary attention. It is useless to trust anything to the disinclination of the pitmen to engage in dangerous mines. By daily exposure to danger they become habituated to and careless about it; and, besides, they are apt to trust implicitly to the reports of "viewers" and others, who are quite as much interested in getting the coal brought cheaply to the pit mouth as in the security of the mine. It has been suggested that it would be good policy, in the view of making the owners and overseers more attentive to the state of their mines, to compel them to make provision for the widows and other dependants of the parties losing their lives in them. And there can be no doubt that a regulation of this sort would be the most effectual of any.

But before resorting to other means, it might be well, in the first place, to see whether the resources of science might not be made to yield greater security. And, on this ground, we think that a commission, consisting partly of eminent scientific men, and partly of the most skilful mining engineers, might be advantageously appointed to inquire into the state of the mines, in the view of preventing accidents, and of increasing the security and comfort of the miners. Some very destructive accidents have taken place, even in the course of this present year (1846).

Profits of Coal Mining.—Instead of the business of coal mining being, generally speaking, an advantageous one, it is distinctly the reverse. Sometimes, no doubt, large fortunes have been made by individuals and associations engaged in this business; but these are rare instances. The opening of a mine is a very expensive and hazardous operation, and of very uncertain result. Collieries are exposed to an infinite number of accidents, against which no caution can guard. Besides explosions, which are every now and then occurring from the carelessness of the workmen, and other contingencies, mines are very liable to be destroyed by *creeps*, or by the sinking of the roof, and by drowning, or the irruption of water from old workings, through fissures which cannot be seen, and, consequently, cannot be guarded against. So great, indeed, is the hazard attending this sort of property, that it has never been possible to effect an insurance on a coal-work against fire, water, or any other accident.

Mr. Buddle, who was intimately acquainted with the state of the coal-trade, informed the Committee of the House of Lords, that "although many collieries, in the hands of fortunate individuals and companies have been, perhaps, making more than might be deemed a reasonable and fair profit, according to their risk, like a prize in a lottery, yet, as a trade, taking the whole capital employed on both rivers, he should say that certainly it has not been so."—(*First Report*, p. 56.) Again, being asked, "What have the coal owners on

the Tyne and Wear, in your opinion, generally made on their capital employed?" he replied, "According to the best of my knowledge, I should think that by no means 10 per cent. has been made at simple interest, without allowing any extra interest for the redemption of capital."—(p 57.)

Irish Coal Mines.—There are mines of coal in Ireland, at Ballycastle, on the north coast of Antrim; at Arigna, in Leitrim; at Castle-Comer, in Kilkenny; and in some other places. The mines now mentioned are all wrought, but not to any considerable extent. The quality of the Irish coal is, in general, bad; and we agree in Mr. Wakefield's opinion, that "there is no vein of coal yet discovered in Ireland which can come into general consumption."—(i. 621.) As already stated, almost all the coal used in Dublin, Belfast, and other towns, is imported from England and Scotland.

Duty on Coal.—A duty on *sea-borne* coal was imposed in the reign of William III., and continued till 1830. A duty of this sort fell, of course, principally on London and the southern and south-eastern counties, and was not at all felt in the coal districts, or in those places to which coal could be conveyed by inland carriage. It is impossible, in fact, to imagine a more partial, unequal, and oppressive impost. At the period of its repeal it amounted to 6*s.* a chaldron, and produced about 900,000*l.* a-year. Duties appropriated for local purposes are still charged on the coal imported into London and some other ports. In 1845 the entire importation of coal into London amounted to 3,461,169 tons; of which only 68,687 tons were brought by internal navigation and land carriage. We subjoin

An Account of the Cargoes and Quantities of Coals brought Coastways and by Inland Navigation into the Port of London in 1841, 1842, 1843 *and* 1844.

Ports whence Shipped.	Cargoes.				Quantities.			
	1841	1842	1843	1844	1841	1842	1843	1844
	No	No	No.	No	Tons.	Tons.	Tons.	Tons.
Newcastle	3,849	3,590	3,595	3,185	1,246,710	1,164,633	1,187,037	1,001,621
Sunderland	2,601	2,446	2,374	2,253	837,770	788,132	696,373	639,726
Stockton	2,099	2,067	1,979	1,946	552,731	542,902	521,920	504,821
Blythe and Seaton Sluice	372	408	421	315	98,591	100,294	98,622	76,351
Leith, Inverkeithing, Kirkcaldy, and other parts of Scotland	229	201	148	354	25,634	19,484	12,108	66,347
Swansea, Llanelly, Milford, and other parts of Wales	244	249	307	318	74,315	73,699	79,924	83,039
Hull, Goole, Gainsborough, and other parts of Yorkshire	673	703	712	945	66,705	69,512	71,034	94,199
Sundry Places, Small Coal, &c.	44	35	57	107	6,898	4,945	9,502	24,794
Quantity which passed the boundary stone on the Grand Junction Canal at Grove Park, Herts, and the River Thames at Staines	5	..	..	..	418	31,519	34,594	72,256
Total	10,816	9,691	9,593	9,466	2,909,562	2,754,719	2,663,114	2,563,166

Exports.—The coal exported in 1845 amounted to 2,531,282 tons. All coal exported to countries having reciprocity treaties with Great Britain, and to colonies, is duty free. France, Holland, Russia, Prussia, Germany, the British North American and West Indian Colonies, the East Indies, Spain, the United States, &c., are the principal foreign markets for British coal.

2. Iron.—We are ignorant of the period when iron began to be

made in England; but there is authentic evidence to show that iron-works were established by the Romans in the Forest of Dean, in Gloucestershire, and in other parts of the kingdom.* They were also established, at an early period, in Kent and Sussex; these counties being well supplied, not only with iron ore, but (which was, at the time, of still more importance) with timber, the only species of fuel that was then used in the furnaces. It is to this latter circumstance that the slow increase in the production of iron in England, during a lengthened period, is to be ascribed. Complaints were very early made of the destruction of timber by the iron works; and in the reign of Elizabeth, when an unusual demand for timber for the navy, and for merchant vessels also took place, the decrease of timber excited a great deal of attention. At length, in 1581, an Act was passed prohibiting the manufacturers of iron from using any but small wood, and from establishing any new works anywhere within 22 miles of the city of London, and 14 miles of the river Thames, and in several parts of Sussex specified in the Act. Soon after this Edward Lord Dudley invented a process for smelting iron ore with pit-coal instead of timber; and it is not possible, perhaps, to point out another invention that has been more advantageous. The patent which his Lordship obtained in 1619 was exempted from the operation of the Act of 1623, (21 James I. c. 23,) setting aside monopolies; but though, in its consequences, it has proved of immense value to the country, the works of the inventor were destroyed by an ignorant rabble, and he was well nigh ruined by his efforts to introduce and perfect his process.† The invention seems, in consequence, to have been for many years almost forgotten. The complaints of the destruction of timber continued; so much so that, in 1637, the exportation of iron without licence was prohibited, and fresh restrictions were laid on the felling of timber. But the evil could not be abated by such means; and, in the early part of last century, complaints of the destruction of timber by the iron-works became more prevalent than ever, and their total suppression began to be contemplated as a lesser evil than the continued decrease of the stock of timber. At this period more than two-thirds of the iron made use of was imported, and the condition of the manufacture was most unprosperous. But the growing scarcity and high price of timber, coupled with the increasing demand for iron, at last succeeded in drawing the attention of some ingenious persons to Lord Dudley's process; and about 1740 iron was made at Colebrook Dale, and one or two other places, by means of pit-coal, of as good a quality as that made with timber. From this period the business steadily increased; at first, however, its progress was comparatively slow, and the furnaces of Kent and Sussex were not wholly relinquished for more than 30 years after iron began to be largely produced by means of pit-coal. The great demand for iron occasioned by the late war, and the obstacles which it threw in the way of supplies from abroad, gave the first extraordinary stimulus to the manufacture, which has since become of vast importance and great value. In 1740 the quantity of pig-iron made in England and Wales amounted to about 17,000 tons, produced by 59 furnaces. Since this epoch, the increase

* *Pennant's Wales*, ed. 1810, vol. i. p. 89.

† *Report of Committee of House of Commons on Patents*, p. 168, &c.

is believed to have been as follows, viz., in 1750, 22,000 tons; in 1788, 68,000 tons, produced by 85 furnaces; in 1796, 125,000 tons, produced by 121 furnaces; in 1806, 250,000 tons, produced by 169 furnaces; and in 1820, about 400,000 tons were produced; but there is no account of the number of furnaces. From extensive inquiries made by government and parties connected with the iron trade, the following statements have been deduced. They exhibit the districts in which iron is made the number of furnaces, and the total quantity produced in 1825, 1830, and 1840:—

Account of the Number of Furnaces, and of the Quantities of Iron produced, in 1825, 1830, *and* 1840.

Districts.	Number of Furnaces.							Tons of Iron produced.			Tons of Coal consumed in Production of Pig Iron
	1825			1830	1840						
	In Blast.	Out	Total	Total.	In Blast	Out.	Total.	1825	1830	1840	1840
South Wales	80	27	107	113	132	31	163	230,412	277,643	505,000	1,436,000
Staffordshire	80	27	107	123	123	24	151	182,156	212,604	427,650	1,605,000
Shropshire	36	13	49	48	24	7	31	89,596	73,416	82,750	408,000
Yorkshire	22	12	34	27	25	7	32	30,104	27,926	56,000	308,500
Derbyshire	14	5	19	18	13	5	18	22,672	17,999	31,000	120,000
North Wales	8	6	14	20	12	3	15	17,756	25,000	26,500	110,000
Forest of Dean	..	5	5		4	..	4	..	..	15,500	60,000
Scotland	17	8	25	27	64	6	70	33,540	37,500	241,000	723,000
Ireland	2	..	2	..	..	..	..	3,000	..	..	..
Various (including Northumberland)	..	..	..	..	5	1	6	..	5,327	11,000	38,500
Totals	259	103	362	376	402	88	490	618,236	677,417	1,396,400	4,827,000

The increase of production, as shown in this table, is to be matched only by the progress of the cotton manufacture, after the inventions of Arkwright and others; and, extraordinary as it may appear, the increase in the course of the five years ending with 1845 will be found to have been little, if at all, inferior. It will be seen from the subjoined table, that the make of iron in Scotland, in 1853, was at the rate of 685,750 tons a-year; and sundry new furnaces being then in the course of erection, the make in 1854, will not be under, if it do not exceed, 700,000 tons a-year! Estimating the make in England at 1,600,000 tons, the total make in the United Kingdom, in 1854, will be 2,300,000 tons!

Account of the Number of Furnaces, for the Production of Iron in Scotland In and Out of Blast, in December 1853, *with the Number of Furnaces then Building, and the Weekly and Annual Produce of Iron.*

Works.	Where situated.	Furnaces in Blast.	Furnaces Out.	Building.	Weekly Produce.	Yearly Produce.
					Tons.	Tons.
Gartsherrie	Lanarkshire	15	1	..	1,800	90,000
Dundyvan	,,	6	3	..	660	33,000
Summerlee	,,	6	..	..	720	36,000
Langloan	,,	6	..	..	720	36,000
Calder	,,	5	3	..	650	32,500
Carnbroe	,,	4	2	..	520	26,000
Monkland	,,	8	1	..	880	44,000

Account of the Number of Furnaces, &c.—continued.

Works.	Where situated.	Furnaces in Blast.	Furnaces Out.	Building.	Weekly Produce.	Yearly Produce.
					Tons.	Tons.
Shotts . . .	Lanarkshire .	3	1	. .	345	17,250
Castlehill . .	,,	3	. .	. .	345	17,250
Coltness . .	,,	6	. .	. .	690	34,500
Omoa . . .	,,	4	. .	. .	460	23,000
Clyde . . .	,,	5	2	. .	450	22,500
Govan . . .	,,	4	2	. .	600	30,000
Garscube . .	Dumbartonshire	. .	2	. .	. .	. .
Carron . . .	Stirlingshire .	2	1	. .	230	11,500
Devon . . .	Fifeshire . .	2	. .	. .	220	11,000
Forth . . .	,,	5	1	. .	575	28,750
Lochgelly . .	,,	2	. .	. .	230	11,500
Lumphinnans .	,,	. .	. .	2	. .	. .
Kinniel . . .	Linlithgow . .	4	. .	. .	460	23,000
Blair . . .	Ayrshire . .	2	3	. .	300	15,000
Glengarnock .	,,	9	. .	. .	1,200	60,000
Eglinton . .	,,	4	1	. .	560	28,000
Muirkirk . .	,,	3	. .	. .	330	16,500
Lugar . . .	,,	. .	4	. .	. .	. .
Portland . .	,,	2	1	. .	250	12,500
Dalmellington .	,,	2	1	. .	300	15,000
New Cumnock .	,,	2	1	. .	220	11,000
Ardeer . . .	,,	. .	. .	4	. .	. .
		114	30	6	13,715	685,750

N.B.—The weekly quantity is multiplied by 50 only, the average stoppages being equal to two weeks per annum.

The whole of the above iron is made by means of heated air.

Bar Iron Works in Scotland in December 1853.

Works.	Where situated.	Weekly Produce.	Works.	Where situated.	Weekly Produce.
		Tons.			Tons.
Monkland . .	Lanarkshire	750	St. Rollox . .	Lanarkshire	65
Govan . . .	,,	330	Coatbridge . .	,,	50
Dundyvan . .	,,	330	East of Scotland	Fifeshire .	50
Mossend . .	,,	160	Muirkirk . .	Ayrshire .	70
Glasgow . .	,,	250			
,, Motherwell	,,	375			2,430

30 cwt. of pig iron to the ton of bars.

The above Malleable Iron Works are all situated near Glasgow, with the exception of the East of Scotland and Muirkirk.

Bar Iron Works erecting in Scotland in December 1853.

Works.	Where situated.	Quantity intended to be Made.
Blochearn, Glasgow .	Lanarkshire .	300 tons per week
Airdrie	,,	80 ,,

The above works erecting will be in operation in the course of two months.

This astonishing increase has been owing to a great variety of causes, among the more prominent of which may be specified the greater cheapness of iron, and its consequent application to a great many purposes, including the construction of various descriptions of agricultural implements, pipes for the conveyance of water, and even the building of ships, for which it was not formerly supposed to be applicable. Unquestionably, however, the unprecedented demand for iron for railways in this country, and in the United States and the continent, has, within the last three or four years, given the most powerful stimulus to the manufacture; and, if a tenth part of the railway projects now (1846) on foot be executed, the production of iron, vast as it at present is, will be quite inadequate to supply the demand.

It will, however, readily occur to the reader that a demand for iron for railways, depending, as the formation of the latter does, on so many varying circumstances, must necessarily be both capricious and fluctuating; and hence it is not really possible to infer from the state of the iron trade at any given period what may be its state a few months after. Even so late as 1842 and 1843 the price of pig-iron had sunk to from 2*l.* to 3*l.* per ton, and the manufacturers in the least favoured districts were involved in the greatest difficulties. But within the last two years the price of iron has doubled or trebled; and larger fortunes have been made in this than in any other department of industry. Similar mutations will, doubtless, take place in future. On the whole, however, the fair presumption seems to be that the manufacture will go on increasing for an indefinite period. The uses to which iron may be applied seem to be all but infinite; and every fall of its price always introduces it into new channels. Most probably, indeed, the works situated in the least favoured districts, or those where iron is produced at the greatest expense, will, in the course of time, have to be abandoned. This, however, is merely a local and accidental grievance, and can in nowise affect the general well-being of the business.

The employment of the hot-blast, or of air heated to a high temperature, instead of common atmospheric air, in the working of furnaces, has been one of the greatest improvements in the manufacture, and has at once reduced the cost of iron and increased its quantity. It was first used in Lanarkshire, in Scotland, and has been one of the principal causes of the extraordinary extension of the trade in that part of the empire, where it is now universally made use of.

Taking the annual produce of pig-iron in the United Kingdom at 2,300,000 tons, and supposing that about 3 tons of coal are required for the production of each ton of iron, the consumption of coal in this branch of the iron trade will, on this hypothesis, amount to 6,900,000 tons a-year; and adding to this quantity 3,000,000 tons for the coal required for the conversion of pig-iron into bar-iron, it follows that a supply of no fewer than 9,900,000 tons of coal will be annually required in this single department of industry! And hence, also, the fact that the consumption of coal in the production of iron is about three times as great as its consumption in the metropolis!

About three-tenths of the total quantity of iron produced is used in the state of pig, or cast-iron, and is consumed principally in Great

Britain and Ireland; the exports of pig-iron amounted, however, in 1853, to 329,511 tons, sent principally to the United States, Holland, and France. The other seven-tenths are converted into wrought-iron, being formed into bars, bolts, rods, &c. The exports of bar-iron amounted, in 1853, to above 653,000 tons, and the exports of all sorts of iron are, probably, at present (1854,) not under 1,250,000 tons; which, at 10*l.* a-ton, would be worth 12,500,000*l.*

Supposing the total quantity of pig-iron produced in Great Britain to amount to 2,300,000 tons a-year, and to be worth, at an average, 6*l.* a-ton, its total value will be 13,800,000*l.*; and the additional labour expended in forming the pig-iron into bar-iron, that is, into bars, bolts, rods, &c., may, probably, add about 4,000,000*l.* more to its value; making it worth in all about 17,800,000*l.*

The increased production of iron has not only led to its exportation in immense quantities, but has reduced our imports of foreign iron for home consumption from about 34,000 tons, which they amounted to at an average of the five years ending with 1805, to from 20,000 to 25,000 tons, consisting principally of Swedish iron, which is subsequently manufactured into steel, for which it is peculiarly well fitted.

Amount of Capital and Number of Hands engaged in the Production of Iron.—It appears from the previous statements, that South Wales, (including Monmouthshire,) Staffordshire, and Shropshire, particularly the first two, are the grand seats of the iron trade. We regret our inability to lay any details before the reader on which much reliance can be placed as to the amount of capital and the number of persons engaged in the business. In 1806 it was proposed to lay a tax on pig-iron; and, among other arguments in opposition to the tax, the producers contended that the capital employed in the establishment and support of the works amounted to 5,000,000*l.*, and that they supported a population of 200,000 persons. Inasmuch, however, as this statement was made by persons engaged in the trade, and anxious, by displaying its importance, not only to avert the threatened tax, but to increase their own consequence in a public point of view, it may fairly be reckoned as a good deal exaggerated. But even admitting the estimate of the capital, &c., then engaged in it to have been correct, it would not be increased, owing to the improvements that have been made in the business, in anything like the proportion in which the latter has increased. Without pretending to give any very positive opinion on the subject, we may, perhaps, be warranted in estimating the total amount of capital at present engaged in the trade at about 30,000,000*l.*, and the number of persons engaged in and dependent on the various departments of the business at from 150,000 to 175,000.

The following table, extracted from the returns obtained under the late census, gives an account of the number and description of persons engaged in iron-mines and iron-works in Great Britain:—

Table showing the Number of Males and the Number of Females above and below 20 Years of Age engaged in Iron Mines and the Iron Manufacture in Great Britain in 1841.

	Iron Mines.					Iron Manufacture.					Total Iron.				
	Males.		Females.			Males.		Females.			Males.		Females.		
	20 Years of Age and upwards.	Under 20 Years of Age.	20 Years of Age and upwards.	Under 20 Years of Age.	Total.	20 Years of Age and upwards.	Under 20 Years of Age.	20 Years of Age and upwards.	Under 20 Years of Age.	Total.	20 Years of Age and upwards	Under 20 Years of Age.	20 Years of Age and upwards	Under 20 Years of Age.	Total.
England, Wales, &c.	5,933	2,174	309	53	8,559	19,980	5,535	271	142	25,878	25,863	7,709	670	195	34,437
Scotland . .	1,840	505	25	20	2,890	2,741	840	80	8	3,619	4,581	1,345	55	28	6,009
Total Great Britain . .	7,773	2,679	424	73	10,949	22,671	6,375	301	150	29,497	30,444	9,054	725	223	40,446

It would seem from this table as if the total number of persons employed in iron-mines and in the production and manufacture of iron did not exceed 40,446. Such, however, is very far from being really the case. The persons employed in raising the coal used in smelting the ores and manufacturing the iron, are obviously as much entitled to be classed among those engaged in the business as those employed in the iron-mines; and the same may be said of those employed as carriers in the conveyance of coal and ore to the works, and of the smiths, carpenters, brickmakers and bricklayers, engineers, and others, employed in the construction of the works and in keeping them in repair. And it is the opinion of those best acquainted with such matters, that when allowance is made for the parties now referred to, and others engaged in the subsidiary departments of the business, the total number of those really engaged in it will be a great deal more than double the number given in the census returns.

We borrow from the treatise on the manufacture of iron, written for the Society for the Diffusion of Useful Knowledge, the following statement of the number and description of persons employed in and about a work with fire furnaces and a forge and mill capable of producing about 200 tons a-week of bar iron. It strikingly illustrates and corroborates the previous statements:—

	Men.	Women.	Boys.
Colliers, including road-men, horse-tenders, and sundry labourers	280	..	27
Miners, including stacking and loading the mine, road-men, horse-tenders, and sundry labourers	395	40	73
Furnaces, &c., including furnace labour, viz., keepers, fillers, refiners, cokers, pig-weighers, engineers, fitters-up, moulders, smiths, carpenters, sawyers, stablemen, brickmakers, masons, machine-men. carriers, &c. &c.	257	39	9
Forge and mill, viz., puddlers, shinglers, rollers, catchers, straighteners, smiths, ballers, engineers, bur-weighers, clerks, &c. &c.	145	5	55
Agents, overlookers, and others, not included in the above .	31	..	..
Totals	1,108	84	191

The iron-works of South Wales and Monmouthshire are comprised in a range of country of about 25 miles from one extremity to the other, stretching in the direction of north-west and south-east. The works at Hirwain in Brecknock, and Aberdare in Glamorgan, form the extreme points to the westward. Then comes Merthyr Tydvil, the focus, as it were, of the manufacture; and from Merthyr there is a continued line of furnaces formed by the works at Dowlais, Romney, Tredegar, Sir Howey, Beaufort, Nant-y-Glo, Blaenafon, Varteg, Abersychan, and Pontypool, which finishes the principal range in that direction.

The progress of the manufacture in South Wales and Monmouthshire has been rapid beyond all precedent. Merthyr Tydvil and the contiguous district, the seat of the immense works of Messrs. Guest and Co., the largest in the empire; of Crawshay and Co., Thomson and Co., &c.; was, about the middle of last century, an insignificant village. In proof of this, it is sufficient to state, that, in 1755, the lands and mines for several miles round the village, the seat of the great works now referred to, were let for 99 years for 200*l.* a year! In 1841, the population of Merthyr Tydvil amounted to 34,977; and the increase at Tredegar, in Monmouthshire, and other seats of the business, has been nearly similar.

The Staffordshire iron-works, including those of Warwickshire, are principally situated in the district stretching from Wolverhampton round by Walsall to Birmingham, and then round by Dudley. Colebrookdale is the principal seat of the iron-works of Shropshire.

The Scottish iron-works, though latterly they have began to be established in various parts of the country, are mostly within no great distance of Glasgow; and the advantages which the country round that city enjoys for the prosecution of the business, in an inexhaustible supply of coal and ironstone, with the command of improved communications by land and water, warrant the presumption that it will preserve its ascendancy as a principal seat of this important branch of industry.

Instead of using, as had hitherto been done, the cool blast, or a blast of common atmospheric air, in working furnaces, the proprietors of the Clyde iron-works began some years since to use the "hot blast," or air heated to a high temperature. This discovery has been of material importance; and has led to a considerable saving of expense in fuel, and consequently, in conducting the manufacture. It is now adopted at many works in England, and even in France, as well as in Scotland.

Iron was formerly made in considerable quantities in various parts of Ireland, its manufacture having contributed in no slight degree to the destruction of the woods in that country. Boate tells us that the iron-works of the great Earl of Cork, in Munster, produced to his lordship a clear profit of 100,000*l.* (*Natural History*, p. 137, edit. 1652); but, owing to the scarcity of timber, the iron-works were subsequently almost entirely abandoned. The attempts that have been made within these few years, to revive them at Arigna and other places, have been very unsuccessful.—(See vol. i. p. 397.)

Account of the Quantities of British Iron (including Unwrought Steel) Exported from the United Kingdom in 1851, *distinguishing the Kinds of Iron, and specifying the Quantities sent to different Countries.*

Countries to which Exported.	Iron, Pig.	Bar Iron.	Bolt and Rod Iron.	Cast Iron.	Iron Wire.	Wrought Iron, viz.				Old Iron for Re-manufacture.	Unwrought Steel.
						Anchors, Grapnels, &c	Hoops.	Nails.	Of all other Sorts (except Ordnance).		
	Tons.	Tons.	Tons	Tons.	Tons.	Tons.	Tons.	Tons.	Tons	Tons.	Tons.
Russia	2,837	2,220	138	1,027	280	190	3	169	604	..	786
Sweden	567	50	6	98	4	194	17	2	66	..	6
Norway	1,688	3,825	117	415	28	340	122	5	563	140	20
Denmark	3,676	2,583	642	79	48	368	941	16	1,073	234	39
Prussia	16,780	4,905	97	19	18	116	44	41	1,887	9,037	169
Mecklenburgh	290	292	79	124	9	59	123	1	87	..	4
Hanover	1,743	5,943	1,036	67	76	111	193	3	742	60	14
Oldenburgh	554	536	78	..	..	10	27	..	69	..	..
Hanseatic Towns	7,736	9,482	1,553	590	607	809	1,593	103	7,120	706	770
Heligoland	..	..	..	3	..	1	..	..	..	..	..
Holland	22,536	8,059	458	937	120	1,099	1,381	97	5,413	99	452
Belgium	..	34	5	16	883	17	1	..	85	..	610
Channel Islands	295	920	106	314	5	200	35	100	277	4	15
France	12,041	554	225	10	20	189	389	2	1,122	..	119
Portugal, Azores, and Madeira	1,168	5,904	2,060	47	27	143	1,673	59	685	..	10
Spain and the Canaries	4,697	1,077	63	933	272	725	2,091	30	1,210	365	87
Gibraltar	20	310	14	6	2	167	33	43	13	70	1
Italy	9,495	23,232	2,970	1,687	200	1,107	2,539	131	2,520	1,596	354
Malta	..	7·5	42	9	6	80	68	17	67	..	..
Ionian Islands	..	250	..	2	..	15	63	6	18	..	..
Greece	..	895	96	2	1	46	79	2	24	..	..
Turkish Dominions, exclusive of Wallachia, Moldavia, Syria, Palestine, and Egypt	417	3,794	2,712	180	35	387	152	70	1,016	..	13
Wallachia and Moldavia	80	1,656	515	2	..	104	560	78	840	..	..
Syria and Palestine	..	109	59	1	1	30	20	3	12	..	..
Egypt	341	1,152	102	84	17	17	102	21	101	..	..
Algeria	260	100	..	..	..	..	..	..	..	..	..
Morocco	..	..	..	..	2	..	..	1	8	25	..
Western Coast of Africa	..	1,705	34	429	..	31	606	28	171	..	1
British Possessions in South Africa	25	1,147	24	224	2	216	200	143	475	..	12
Cape Verde Islands	..	10	..	11	..	14	1	1	3	..	..
St. Helena and Ascension Islands	..	1	..	18	..	..	1	2	4	..	..
Mauritius	10	548	..	174	1	56	42	187	191	..	2
Aden	..	..	..	..	..	..	..	..	1	..	..
British Territories in the East Indies	1,148	30,382	2,084	2,708	27	472	2,092	331	5,308	..	81
Java	60	1,603	174	56	7	247	89	51	171	..	10
Philippine Islands	..	200	43	6	5	114	30	2	25	1	4
China (including Hong Kong)	160	521	3,215	23	61	24	293	26	49	..	..
British Settlements in Australia	1,937	3,117	130	1,457	44	368	832	1,796	1,659	..	86
South Sea Islands	..	58	2	2	..	1	6	2	36	..	..
British North American Colonies	23,117	48,601	298	3,545	200	3,704	2,108	2,089	6,788	1	482
British West Indies & British Guiana	80	1,023	26	1,240	51	86	749	1,098	1,473	2	9
Foreign West Indies	90	3,066	451	2,789	14	56	341	633	1,309	256	25
United States of America	79,783	333,138	1,316	2,353	1,460	5,478	8,685	710	18,328	5,956	7,352
Mexico	10	946	17	37	10	11	12	30	56	..	73
Central America	..	326	1	67	..	56	11	42	55	..	5
New Granada	..	2,130	1	18	..	..	6	36	30	..	14
Venezuela	30	96	2	127	3	1	10	80	38	..	1
Ecuador	10	40	..	8	..	25	..	20	21	..	..
Brazil	1,927	3,793	35	1,121	3	412	235	509	1,042	..	101
Oriental Republic of the Uruguay	..	282	..	50	1	2	66	29	51	..	1
Buenos Ayres	80	969	51	205	18	93	156	84	224	..	6
Chili	315	3,605	..	502	6	632	161	106	447	..	31
Bolivia	..	56	..	..	..	..	..	..	..	..	..
Peru	175	1,259	6	202	4	89	41	32	255	..	18
Falkland Islands	..	..	..	5	..	1	3	1	4	..	..
Total	201,264	517,327	21,084	24,123	4,576	18,714	29,022	9,147	63,845	18,371	11,861

Total quantity exported in 1851—919,479 tons.

3. Tin is exclusively produced in Cornwall and Devonshire, but principally in the former. The tin mines of Cornwall have been wrought from the remotest antiquity; the Phœnicians being supposed by the most judicious critics to have traded thither for tin. In more modern times, the business of mining has been prosecuted with various skill and success. During the reign of Elizabeth, some German miners were brought over, by whom the processes were considerably improved. The produce of the mines has fluctuated a good deal during the last half century. At an average of the 5 years ending with 1845, it may be taken, inclusive of the washings, at about 5,000 tons a year, worth from 65*l.* to 80*l.* a ton.

Duty on British Tin.—All tin produced in Cornwall was subject, from a very remote period down to 1837, to a coinage duty of 4*l.* a ton, payable to the Duke of Cornwall: the tin raised in Devonshire was subject to a similar duty of 1*l.* 13*s.* 4*d.* a ton. This duty produced from 16,000*l.* to 20,000*l.* a year; and was felt to be a serious grievance, not only from its amount, but from the vexatious regulations under which it was collected. Luckily, however, the duty on tin, and all regulations with respect to its coinage, were abolished by 1 and 2 Vict. c. 120. Compensation was made to the Duchy of Cornwall for the loss arising from this abolition, by settling on its possessors a perpetual annuity equal to the nett average amount of the duties during the 10 years ending with 1837.

The price of British tin, at an average, from 1811 to 1815, inclusive, was about 7*l.* a cwt. Its fall from 1815 to 1820, and its comparatively low price since, have been owing to a variety of causes; partly to improvements in the art of working the mines, partly to the increased supply of metal obtained from them, and partly and principally to the competition of the tin of Banca and of the Malay countries. Previously to 1814, we had in some measure a monopoly of the market of the world. But since then the Banca mines have been wrought with unusual spirit; and their produce has been so much increased, as not only fully to supply the market of China, to which we formerly exported from 600 to 1,000 tons, but to meet us in every European market. Malay tin is now very extensively imported, for warehousing, into England, at the same time that large quantities are carried direct to Holland, where there are refining houses; but, notwithstanding these circumstances, our exports of tin have increased considerably of late years.

4. Copper.—This metal is most abundant in Cornwall, where it is produced on a very large scale, and is of much more importance than tin. The ores of copper and tin being frequently intermixed, it is natural to suppose that the former would be wrought to some extent at an early period; but it is only since the beginning of the 18th century that a due sense began to be entertained of their superior importance, and that they were wrought with spirit and success. From 1736 to 1745, they annually furnished about 700 tons of fine copper. From 1756 to 1765, they yielded 1,800 tons. In 1775, the produce increased to 2,650 tons. In 1798, it exceeded 5,000 tons; and at present i amounts to from 10,000 to 12,000 tons. Subjoined is—

An Account of the Quantity of Ore, Pure Copper, &c., obtained from the Cornish Mines in each year, from 1800 *to* 1842, *both inclusive.*

Years.	Quantity of Ore.	Copper.	Value of Ore.	Produce	Standard.	Years.	Quantity of Ore.	Copper.	Value of Ore.	Produce	Standard.
	Tons.	Tons.	£.		£. s.		Tons.	Tons.	£.		£. s.
1800	55,981	5,187	550,925	9·25	138 3	1822	104,528	9,140	663,085	8·75	104 0
1801	56,611	5,267	476,813	9·25	117 5	1823	95,750	7,927	606,033	8·25	109 18
1802	53,927	5,228	445,634	9·625	110 16	1824	99,700	7,823	597,178	7·875	110 0
1803	60,562	5,615	538,910	9·25	128 0	1825	107,454	8,236	726,336	7·625	124 4
1804	64,627	5,374	507,840	8·375	136 5	1826	117,308	9,026	788,971	7·625	128 3
1805	78,452	6,234	663,410	7·875	169 16	1827	126,710	10,811	745,178	8·125	106 1
1806	79,269	6,863	730,845	8·625	138 5	1828	130,366	9,921	756,174	7·625	112 7
1807	71,694	6,716	608,002	9·375	120 0	1829	124,502	9,656	717,334	7·75	109 14
1808	67,867	6,795	495,303	10·	100 7	1830	135,665	10,890	784,000	8·	106 0
1809	76,245	6,821	770,028	8·875	143 12	1831	146,502	12,218	817,740	8·375	99 18
1810	66,048	5,628	570,035	8·5	132 5	1832	139,057	12,099	835,812	8·75	104 14
1811	66,796	6,141	556,723	9·125	120 12	1833	138,300	11,185	858,708	8·	110 0
1812	71,547	6,720	549,625	9·375	111 0	1834	143,206	11,234	867,902	7·75	114 4
1813	74,047	6,918	594,345	9·25	115 7	1835	150,607	13,271	916,401	8·125	106 11
1814	74,322	6,869	627,501	8·5	130 12	1836	140,981	11,639	957,752	8·25	115 12
1815	76,488	6,525	553,813	8·25	117 16	1837	140,753	10,822	908,613	7·625	119 5
1816	77,331	6,627	447,959	8·625	98 13	1838	145,688	11,527	857,779	7·875	109 3
1817	76,701	6,498	494,010	8·5	108 10	1839	159,551	12,451	932,298	7·75	110 2
1818	86,174	6,849	696,005	7·875	134 15	1840	147,266	11,038	792,758	7·5	108 10
1819	88,736	6,804	623,595	7·625	127 10	1841	135,090	9,997	819,949	7·375	119 6
1820	91,473	7,508	602,441	8·125	113 15	1842	154,180	9,896	882,870	7·125	120 16
1821	98,485	8,514	608,968	8·625	103 0						

Exclusive of the copper raised in Cornwall, considerable quantities are raised in Anglesey and other parts of Wales, in Devonshire, Staffordshire, &c. The famous mines in the Parys mountain, near Amlwch in Anglesey, were discovered in 1768. The ore being in the mountain, it was not necessary to work it like the Cornish mines, by shafts and levels, but to dig at once into its sides. The supplies of ore were for a long time abundant beyond all precedent, and formed a vast source of wealth to the adventurers and proprietors. But for many years past the productiveness of the mine has been declining, and it now yields comparatively little. In all, it is supposed to have furnished about 85,000 tons of pure metal, amounting, at 90*l.* a ton, to the enormous sum of 7,650,000*l.*! At present, the entire produce of the mines of Anglesey and other parts of Wales does not exceed 900 tons a year. Previously to 1770, the mine of Ecton, in Staffordshire, was one of the most productive in the kingdom. The following statement, extracted from the Transactions of the Cornwall Geological Society, contains an authentic—

Account of the Produce, in pure Metal, of the Copper Mines of Great Britain and Ireland, during the 5 *years ending with the* 30*th June,* 1827.

Districts.	1823	1824	1825	1826	1827
	Tons.	Tons.	Tons.	Tons.	Tons.
Cornwall	8,070	8,022	8,417	9,140	10,450
Devon	510	451	554	482	424
Other parts of England .	5	23	20	21	89
Anglesey	740	726	726	758	735
Other parts of Wales . .	120	126	131	186	143
Scotland	13	..	..	..	..
Ireland	257	488	512	482	540
Totals . .	9,715	9,836	10,350	11,069	12,381

Owing to the want of coal, the Cornish copper ores are not smelted on the spot, but are shipped from the nearest port to the mine for

Swansea, where the principal smelting companies have their establishments. Formerly there were one or two companies which smelted in Cornwall; but it seems to have been found, by experience, that it is less expensive to carry the ore to the coal than to bring the coal to the ore. The copper produced in Ireland is also carried to Swansea to be smelted; so that by taking an account of the quantity of copper brought from Cornwall, Devon, Anglesey, &c., to Swansea, we get a pretty accurate account of the total produce of the different mines of the empire.

At present (1846) the annual produce of the empire in copper may probably be estimated as follows, viz.:—Cornwall, 11,000 tons; Devon, 500 ditto; other parts of England, 260; Anglesey, 750; other parts of Wales, 150; Ireland, 1,400; making a grand total of 14,060 tons. The price may be estimated at from 90*l.* to 100*l.* a ton, giving a gross sum of from 1,265,000*l.* to 1,406,000*l.* a year. Of this quantity from 8,000 to 9,000 tons are exported, partly wrought and partly manufactured. More than the half of all the copper exported is shipped for the East Indies and China, France and the United States being the next greatest markets. Foreign copper imported is altogether intended for exportation.

Working of the Tin and Copper Mines of Cornwall.—The number of these mines in this county is not accurately known; but 140,753 tons of copper ore, brought to market in 1837, were furnished by 77 mines. Exclusive, however, of these mines, there are many copper mines in which trials for ore are going on, and there is no correct list of the tin mines, but they are comparatively unimportant. Old workings are frequently given up, and new ones opened, while those that were formerly abandoned are again in many instances brought into activity. Within the last few years several new mines have been opened, and a large amount of money expended by companies formed in London, Liverpool, &c. These are generally called, from the way in which shares in them have been issued, *scrip* companies. In all there may be from 200 to 220 mining concerns with works now in progress.

The veins or *lodes* vary in thickness from 3 inches to no less than 30 feet. The mines are sometimes wrought to a very great depth. In the consolidated mines in the parish of Gwennap, between Truro and Redruth, there is a shaft 300 fathoms deep, and the temperature at the bottom varies from 96° to 99°. No fewer than 21 steam-engines are employed in these mines, some of which are of the very largest size. There are many instances in which a single engine, with its apparatus, and the sinking of the shaft, has cost upwards of 12,000*l.*

Mines in Cornwall are generally undertaken by companies of adventurers, the shares being divided into 64th, and sometimes into 128th parts. If the mine be upon a waste, it is the property of the King, as Duke of Cornwall, to whose agents the adventurers apply for a lease. If the mine be private property, its owners are of course applied to. It is usually let for 21 years, or for such part of that time as the workings shall be proceeded in. The payment to the proprietor, or the lordsman, varies, according to circumstances, from 1-10th to 1-15th part of the ores raised, but the deep mines pay only 1-24th part.

The ore, after being brought to the surface, is washed, reduced to a powder, and otherwise prepared, so as to be fit for the smelting-house.

Besides the tin mines, there are *stream-works*, which supply a considerable portion of the finest tin. They occur in valleys, and derive their name from the manner in which they are worked, which consists chiefly in washing the alluvial soil, by directing a stream of water over it, when the earthy particles being washed away, the tin ore remains in a separate form. It is a singular fact that the only traces of gold to be found in Cornwall are in those alluvial depositions, in which it sometimes occurs in small grains, mostly detached, but occasionally adhering to quartz.—(*Guide to Mounts Bay*, p. 197, 2nd edit.)

The miners, whether tin or copper, are sometimes paid by the piece, and sometimes by a certain per centage of the ores they raise. The workmen relieve each other by turns, each set generally continuing in the mine for *eight* hours; but when working at the bottom of very deep shafts, they relieve each other every *six* hours. When it is remembered that the miner always works in a damp atmosphere, frequently with his feet in water, and his clothes perfectly wet, his occupation will seem anything but enviable. But if he make what he calls wages, he is satisfied; and is cheered by the prospect of attaining to the rank of *captain* or overseer.

Tin and copper mining, like that of the precious metals, partakes largely of the nature of a lottery. There is no certainty beyond the present moment. Veins that promise much in their beginning sometimes lose all traces of advantage below, and occasion immense loss to the adventurers, or continue to be wrought for many years under *promising* symptoms, but with little or no profit. And on the contrary, many mines and veins, which, at the outset, promised little or nothing in the estimation of experienced miners, have yielded very large profits. Hence, although great losses often occur, great fortunes are sometimes made, and even to an amount which far outstrips the expectations of the most sanguine.—(*Phillip's Mineralogy and Geology*, pp. 194—211.) Dr. Paris mentions that *Crennis* copper mine returned a clear profit to the adventurers of 84,000*l.* in one year! *Huel Alfred*, during the last period of its working, yielded very nearly 130,000*l.*, after defraying every necessary outlay. The expense attending the working of some of the large mines is very great.

The miners and others engaged in the mines of Cornwall and Devonshire are under the especial jurisdiction of the Stannary courts, held by the lord warden of the Stannaries, or his deputy. These courts were established about 500 years ago; and, after being modified in the reign of Charles II., have been much improved by a late Act. Formerly they were applicable only to the tin miners; but now their jurisdiction is extended to all sorts of miners in the two counties. These local courts are found to be of great advantage; and transact the peculiar business that comes before them cheaply, skilfully, and expeditiously.

The capital employed in connection with the copper and tin mines of Cornwall has been estimated as follows:—

	£.
In the working of the mines.	1,000,000
In the wharfs and trades dependent on them .	120,000
In waggons, carts, horses, &c.	100,000
Smelting works and mills	1,000,000
Collieries	100,000
Shipping	120,000
Total	£2,440,000

The number of persons employed in connection with the mines have been supposed to be as under:—

In and on the mines	60,000*
Carriers	2,500
Sailors	2,500
In the smelting works	6,000†
Total	71,000

5. LEAD.—Mines of this valuable mineral have been wrought in England from the æra of the Romans. It does not, however, appear that it was obtained anywhere except in Derbyshire, till 1289, when it was discovered in Wales: and the fact having transpired that silver was found intermixed with the Welsh ores, gave a new stimulus to the business; but in other respects the discovery of silver was of no use; the quantity obtained being insufficient to defray the cost of its separation from the lead. At present, the most productive lead mines are situated in Flintshire and other parts of North Wales; the western parts of Durham and Yorkshire; Allendale and other parts of Northumberland; Aldstone-moor, &c., in Cumberland; the hundred of High Peak, in Derbyshire; Salop; in Scotland, at Leadhills, on the confines of Dumfriesshire and Lanarkshire; in the Isle of Man; and in Wicklow, and elsewhere in Ireland. We subjoin an account obtained from the highest authority of the produce of the lead mines in 1839.

Produce of the Lead Mines in the different parts of the United Kingdom in 1839.

	Tons.	
England—		
Durham.	7,628	
Northumberland	4,421	
Cumberland	4,241	
Westmoreland	630	
Yorkshire	6,155	
Derbyshire	4,500	
Shropshire	3,350	
Cornwall and Devon . . .	1,750	
		32,675
Wales		13,396
Isle of Man		1,829
Scotland		1,313
Ireland		1,927
Total		51,140

The foreign lead imported is mostly all re-exported; so that the supply obtained from our own mines must be adequate, not only to

* We are assured that this is a very exaggerated estimate; 45,000 would be nearer the mark, but probably above it.

† The same remark applies to this estimate.

furnish an annual export of from 10,000 to 14,000 tons a year, but to supply the home consumption, which is very great. The price of lead declined considerably after 1820, a result principally to be ascribed to the increased supplies of lead from Spain, and to the comparatively cheap rate at which they were furnished; latterly, however, the supplies from the Spanish mines have fallen off, and prices have again risen. A considerable quantity of silver is now obtained from lead; the expense of its extraction having been materially diminished by the invention of improved processes. It is believed that of the lead raised in Great Britain, about 25,000 tons yield 8 ozs. per ton of silver. Supposing this estimate to be correct, the entire produce in silver will be 200,000 ozs.; which, at 5*s.* per oz. will be 50,000*l.* a-year.

That very rare mineral called *black lead*, *plumbago*, or *wad*, is found in Borrowdale, in Cumberland. The mines in this place have been wrought since the days of Queen Elizabeth, and furnish the very best material hitherto discovered for making pencils.

The lead is not found in veins but in detached pieces, or in what are called *sops* or *bellies*, so that the supply is very irregular, the miners being frequently employed for a lengthened period in seeking at random for the lead. Its quality also differs very widely. The best is that which is lightest, and the trace of which on paper is easily and completely removed by the application of India rubber. The mine used only to be opened at intervals, but for a considerable number of years past it has been constantly open. The supply, however, has of late been extremely scanty, and mostly also very inferior. The trade is supplied at sales held on the first Monday of each month, in *Essex Street*, *Strand*, London.

This lead is now almost wholly employed in making pencils: an inferior variety from Spain and Ceylon being used in the manufacture of crucibles, the polishing of cast iron utensils, the diminishing of friction, and other purposes to which genuine black lead was formerly applied. Foreign black lead and antimony are now, also very extensively used in the manufacture of spurious pencils.

6. SALT.—There is no country better supplied than England both with brine springs and beds of fossil or rock salt. The former have been known and wrought at Northwich, Winsford, Middlewich, and other places contiguous to the river Weaver in Cheshire, and at Droitwich in Worcestershire, from a very remote æra. But the beds of rock salt were not discovered till a comparatively recent epoch; the first of them having been met with in 1670, about 34 yards from the surface, in searching for coal in the vicinity of Northwich. Another bed of fossil salt was discovered in 1779, near Lawton, 42 yards below the surface; and others have since been discovered in other parts of the surrounding country. These fossil beds are generally of very great thickness; and it has been found that, upon cutting through the indurated marl at the bottom of the first bed, there was another below it of still greater thickness. In one instance a third bed has been pierced to the depth of 25 yards, without having been cut through. It has been ascertained that there are also beds of fossil salt at Droitwich; but they are not wrought, and comparatively little is known with respect to them.

In the early part of last century, the salt made in England was supposed to be inferior to that of several other countries; and while a good deal of foreign salt was imported, very little native salt was exported. But the manufacture progressively improved; and for these many years past, the production of salt for home consumption has been carried on to a vast extent, and has become an object of great national importance.

Rock salt is not generally, when dug from the mine, of such a degeee of purity as to admit of its being used for most purposes, without being refined; and by far the largest part of the salt produced in Cheshire, with the whole of that produced in Worcestershire, is obtained from the brine springs. In the former, the brine being pumped up by means principally of steam-engines, from very deep wells, is collected in reservoirs, where it is sometimes saturated, or strengthened, by an admixture of crushed rock salt. It is then conveyed into large, broad, shallow pans placed over furnaces, and the water being evaporated, the salt is taken out. Different qualities of salt, such as the *stoved* or *lump salt*, *common salt*, *large-grained flaky salt*, *large grained fishery salt*, &c., are produced according to the mode in which the heat is applied, and the evaporation conducted. Animal jelly, butter, and other foreign substances, are sometimes made use of to assist in clearing the brine, and in the granulation of the salt.

The coal used at the salt works at Northwich, Winsford, and other places, is obtained from the collieries in the southern part of Lancashire, near St. Helen's. The flat-bottomed boats (*flats*) which convey the salt from the different works to Liverpool, after discharging their cargoes, return loaded with coal; so that few channels of communication are more crowded than the Weaver.

During the 10 years ending with 1806, the average quantity of white, or manufactured salt, brought down the Weaver, amounted to 139,317 tons a-year.—(*Holland's Cheshire*, p. 321.) But the business has been since very greatly increased; so much so that, during the three years ending with 1834, the average annual supply of white salt, sent down the Weaver, for home consumption and exportation, amounted to 368,594 tons, exclusive of about 15,000 tons a-year sent by canals into different parts of the interior, and of about 27,000 tons a-year sent down the river to be used at the Gartshore and Dungeon works, on the Lancashire side of the Mersey, and at Frodsham. Of this vast quantity, Northwich furnished about 220,000 and Winsford about 150,000 tons.—(*Private Information.*) The supply has since increased considerably.

During the 10 years ending with 1806, 51,109 tons of rock salt was sent down the Weaver, being destined mostly for Ireland, and for exportation.—(*Holland's Cheshire*, p. 317.) This department of the business has also greatly increased in the interval, though not so much as the other. The supply of rock salt at present brought down the Weaver, varies from about 100,000 to 110,000 tons a-year; but as a part of it is used at the Gartshore and Dungeon works, where fine salt is prepared, it is not possible accurately to estimate the quantity exported and sent coastwise to Ireland, and other parts; but it may probably amount to from 80,000 to 90,000 tons a-year.

In 1805, the manufacturers of white salt, with the proprietors of

the fossil beds, and others interested in the salt trade of Cheshire, presented a memorial to Mr. Pitt, against the duty which it was understood he intended to propose on salt when exported. In it they stated, that the capital vested in salt works, rock pits, and lighters, amounted to 436,000*l.* over and above the capital employed in carrying on the trade; and that 2,950 individuals were engaged in the works, exclusive of those dependent on them.—(*Holland's Cheshire*, p. 316.) In 1838 the trade employed about 300 flats, or lighters, measuring at an average, about 70 tons each, employing in all, inclusive of carpenters and builders, about 1,200 men. Altogether there were about 8,000 individuals directly employed in the salt trade of Cheshire; and the capital then embarked in it, was estimated at from 600,000*l.* to 700,000*l.*—(*Private Information.*)

Salt has been obtained from the brine pits at Droitwich in Worcestershire, for at least, 1000 years. When dug to a proper depth, the brine ascends to the surface of the pit. A canal has been constructed from Droitwich to the Severn, navigable by vessels of 60 tons burthen, which convey the salt to Gloucester, and other ports, and return laden with the coal required in the works. The quantity of white salt made at Droitwich is very inferior, as compared with that produced in Cheshire, and it does not furnish any supplies of rock salt.

Exclusive of the salt produced in Cheshire and Worcestershire, a good deal was formerly obtained by the evaporation of sea water, principally at Lymington, and other places on the Hampshire coast; but also in various other parts. But since the abolition of the duties, these works have been either wholly abandoned, or much reduced. Part of the rock salt shipped at Cheshire is refined at Newcastle and other places.

Consumption of Salt.—The consumption of salt in this country is immense. Necker estimated the consumption in those provinces of France, which had purchased an exemption from the *Gabelle* (*Pays francs redimées*) at about 19½ lbs. (Eng.) for each individual.—(*Administration des Finances*, tom. ii. p. 12.) From all that we have been able to learn on the subject, we believe that the consumption of the people of this country may be estimated a little higher, or at 22 lbs.; the difference in our food and habits, as compared with the French, fully accounting for this increased allowance. On this supposition, and taking the population at 20,000,000, the entire consumption of Great Britain only, exclusive of Ireland, will amount to 440,000,000 lbs, or nearly 200,000 tons.

Exclusive of this immense home consumption, we annually export from 13,000,000 to 14,000,000 bushels, which, at 56 lbs. a bushel, are equivalent to about 337,000 tons. The Americans are the largest consumers of British salt; the exports to the United States, in 1844, having amounted to 4,664,430 bushels. During the same year, we exported to Holland and Belgium 1,823,230 bushels; to the British North American colonies, 1,772,790 ditto; to Russia, 1,823,756 ditto; to Prussia, 1,686,520 ditto, &c.

The cheapness of this important necessary is not less remarkable than its diffusion. Its present cost may be estimated, at a medium, at from 14*s.* to 16*s.* a ton.

Duties on Salt.—In ancient Rome salt was subject to a duty (*Vectigal salinarum*; see *Burman, Dissertatio de Vectigalibus Pop. Rom.* c. 6.); and it has been heavily taxed in most modern states. The *gabelle* or code of salt laws, formerly established in France, was most oppressive. From 4,000 to 5,000 persons are calculated to have been sent annually to prison and the galleys for offences connected with these laws, the severity of which had no inconsiderable share in bringing about the Revolution.—(*Young's Travels in France*, vol. i. p. 598.) In this country duties upon salt were imposed in the reign of William III. In 1798 they amounted to 5*s.* a bushel; but were subsequently increased to 15*s.* a bushel, or about *forty* times the cost of the salt! So exorbitant a duty was productive of the worst effects; and occasioned, by its magnitude, and the regulations for allowing salt, duty free, to the fisheries, a vast deal of smuggling. The opinion of the public, and of the House of Commons, having been strongly pronounced against the tax, it was finally repealed in 1823.—(*Commercial Dictionary*, art. SALT.)

7. MANGANESE, a metal of considerable consequence in the arts, is found principally in Devonshire, the eastern part of Cornwall, and in Warwickshire. The quantity raised is from 3,000 to 4,000 tons a year. Zinc is obtained from the Derbyshire mines; but Flintshire and the Isle of Man furnish ores of the best quality. It is produced, but in very small quantities, in England, the metal being imported in great abundance and at a very cheap rate from Silesia.

8. QUARRIES (STONE).—The quarries of England are not of any great value or importance; and, in consequence, the greater number of buildings in most parts of the country are constructed of brick. The principal quarries are situated in the Isle of Portland, and in the neighbourhood of Bath. The former, which are the most important, have supplied the stone used in the construction of St. Paul's, and most other public buildings in London. The annual produce of the Portland quarries may at present be estimated at about 18,000 tons. The best blocks bring from 18*s.* to 22*s.* a ton, and the inferior from 6*s.* to 8*s.* The quarries are wrought partly by owners and partly by lessees, who pay the proprietors at the rate of 1*s.* 6*d.* a ton on the superior stones, and of 11*d.* on the coarse or inferior. In all, about 300 men and boys are employed in the quarries.—(*Private Information.*)

The quarries of Gateshead Fell, near Newcastle, furnish the grindstones known in all parts of the world by the name of "Newcastle grindstones," from the port of shipment.

There are some very excellent quarries in Scotland. That of Craigleith, near Edinburgh, Cullalo, in Fife, and some others, are amongst the most celebrated. The beauty of the houses in the new town of Edinburgh attest the excellence of the quarry (Craigleith) which furnishes the stone of which they are built. Large quantities of granite are shipped from Aberdeen for London, where it is employed in paving the streets. The docks at Liverpool are partly constructed of granite brought from the stewartry of Kirkcudbright.

Quarries (*Slate*).—The principal slate quarries in Great Britain are in Caernarvonshire. Those belonging to Mr. Pennant (formerly

Lord Penrhyn's), near Bangor, are the most extensive and valuable. They furnish employment for above 1,500 men and boys. The other slate quarries in Caernarvonshire and North Wales generally employ about 2,000 men and boys. There are also extensive quarries in different parts of South Wales, at Ulverstone, in Lancashire, &c.

The principal slate quarries of Scotland are in the island of Easdale and at Balachulish in Argyleshire. Speaking generally, they do not furnish slates of the size and smoothness of those obtained from the Welsh quarries.

9. LIME.—Limestone is very widely diffused over Great Britain and Ireland; and being, when calcined, used largely both in the building of houses and as a manure, its consumption must be immense. There are not, however, any means of accurately estimating its amount.

10. FULLERS' EARTH.—This is a species of clay used in the woollen manufacture, being once deemed of so much importance that its exportation was prohibited under a heavy penalty. At present, however, it is not employed to nearly the same extent as formerly, many of the clothiers using soap in preference to it. Malcolm, in his *Survey of Surrey*, published in 1809, says, that he was at considerable pains in endeavouring to ascertain the consumption of fullers' earth, and that he found it to amount to about 6,300 tons a-year for the whole kingdom, of which about 4,000 tons a-year were furnished by Surrey.

11. BRICKS AND TILES.—These, though manufactured articles, may, perhaps, be more properly noticed here than in any other place. By far the greater number of houses in London, and other English towns, as well as in most country districts, are built of brick, so that the consumption is immense. Tiles, also, though inferior to slates as a roof, are used in large quantities; and they are now, also, largely consumed in draining. Owing to the general use of stone in buildings in Scotland, the consumption of bricks in that part of the empire is comparatively limited.

Both tiles and bricks have been subjected to an excise duty; but that on tiles was repealed in 1833, and that on bricks in 1850. It produced from 350,000*l.* to 450,000*l.* a-year. Sound policy would suggest its repeal; for no duty being laid on stone, the use of bricks was unfairly limited, and an injury done to those engaged in their manufacture. We subjoin an

Account of the Number of Bricks upon which Duty was paid in 1843 *and* 1844 *in England and Scotland; with the Amount of such Duty.*

	1843		1844	
	Number of Bricks.	Amount of Duty.	Number of Bricks.	Amount of Duty.
		£. s. d.		£. s. d.
England . .	1,158,857,167	355,464 8 4½	1,420,730,745	435,735 15 5½
Scotland . .	25,531,499	7,910 13 2	37,129,535	11,491 2 8¢
Total . .	1,184,388,666	363,375 1 6½	1,457,860,280	447,226 18 1¼

We subjoin the following estimate of the aggregate quantity and value of the minerals annually produced in Great Britain.

Estimate of the Quantity and Value of the Mineral Produce of Great Britain, at an Average of Three Years, ending with 1852.

Quantity.	Value. £.	Quantity.	Value. £.
Silver . . 68,166 lbs. Troy	210,000	Coal, 40,000,000 tons . . .	20,000,000
Copper . . 13,000 tons . .	1,300,000	Salt, Alum, and other minor Produce	1,500,000
Tin. . . . 5,500 tons . .	550,000		
Lead . . . 52,000 tons . .	1,000,000		
Iron . . 2,300,000 tons . .	11,500,000	Total value probably exceeds £36,060,000	

Profits of Mines, Iron Works, &c.—Subjoined is an account of the profits of quarries, mines, iron-works, &c., in 1810–11, and 1851–52, as ascertained by the Property Tax Commissioners.

Account of the Profits arising from Quarries, Mines and Iron Works in England, Wales, and Scotland in 1810–11, *and in* 1851–52, *as determined by the Assessments under the Property and Income Tax Acts.*

Counties.	1810–11			1851–52		
	Profits of Quarries.	Profits of Mines.	Profits of Iron Works.	Profits of Quarries.	Profits of Mines.	Profits of Iron Works.
England.	£. s. d.	£. s. d.	£. s. d.	£.	£.	£.
Bedford	. .	. .	59 10 0	. .	. .	. .
Berks	. .	. .	2,668 11 0	40	. .	. .
Bucks	. .	. .	. .	. .	. .	. .
Cambridge	. .	. .	. .	. .	137	. .
Chester	987 0 0	9,568 0 0	8,354 5 0	5,167	36,992	. .
Cornwall	2,147 10 0	106,027 14 2	. .	2,209	142,365	478
Cumberland	951 13 6	22,465 11 10	656 10 0	984	47,696	5,189
Derby	1,959 3 9	18,678 9 3	34,618 1 9	6,775	41,072	10,600
Devon	3,907 5 0	10,830 10 0	13,043 3 2	5,850	49,579	. .
Dorset	261 5 0	. .	1,967 12 0	1,695	. .	. .
Durham	1,668 0 0	51,071 8 11	12,256 17 6	8,329	285,811	36,135
Essex	330 0 0	. .	3,366 18 6	817	. .	. .
Gloucester	319 8 0	7,096 14 9	1,926 10 0	2,312	31,230	8,960
Hereford	15 0 0	. .	. .	751	7	. .
Hertford	. .	. .	2,033 15 0	198	. .	. .
Huntingdon	. .	. .	. .	. .	. .	. .
Kent	15 0 0	. .	893 16 6	5,199	. .	. .
Lancaster	3,248 5 0	30,818 10 0	18,726 3 9	34,888	469,881	316
Leicester	921 0 0	550 0 0	42 0 0	4,082	33,872	. .
Lincoln	. .	. .	5,782 19 6	1,425	. .	. .
Middlesex	. .	. .	3,138 0 0	20	. .	. .
Monmouth	. .	11,980 0 0	2,362 10 0	714	31,150	88,408
Norfolk	. .	. .	. .	586	. .	. .
Northampton	54 0 0	. .	92 0 0	1,742	. .	. .
Northumberland	3,795 17 0	45,012 14 11	17,419 12 2	8,533	134,991	4,580
Nottingham	25 10 0	3,235 0 0	363 0 0	1,131	17,867	. .
Oxford	. .	. .	67 15 0	69	. .	. .
Rutland	. .	. .	. .	673	. .	. .
Salop	1,705 12 0	21,056 1 8	6,438 12 6	4,293	43,443	65,848
Somerset	77 18 0	19,155 14 7	520 0 0	2,295	31,067	76
Southampton	. .	214 5 0	6,742 5 0	1,673	. .	. .
Stafford	332 10 0	21,366 0 0	6,323 0 0	3,516	230,013	185,334
Suffolk	140 0 0	. .	2,600 0 0	78	. .	144
Surrey	340 2 0	. .	1,700 0 0	1,188	. .	351
Sussex	26 0 0	. .	738 7 4	1,119	. .	. .
Warwick	45 5 0	250 0 0	16,714 15 0	1,344	11,082	. .
Westmoreland	324 4 0	1,570 16 8	118 15 0	321	5,739	. .
Wilts	307 7 6	. .	3,369 2 0	943	. .	. .
Worcester	477 0 0	8,225 5 0	1,775 10 0	497	42,638	11,845
York	3,799 15 0	84,306 9 6	7,859 6 0	34,327	186,706	54,518
Wales	798 16 0	49,814 13 5	30,711 18 8	102,354	218,615	156,462
England and Wales	29,180 6 11	488,490 19 8	222,672 16 11	243,029	2,110,225	629,299
Scotland	13,406 4 0	77,741 13 0	45,462 2 1	47,681	261,704	177,408
Great Britain	42,586 10 11	561,232 12 8	268,134 19 0	290,709	2,371,929	806,707

We, however, incline to think that the profits of iron-works in 1851–52 are underrated in the above account. At present (1854) we are well convinced they are not under 1,000,000*l.* a-year.

CHAPTER III.—Fisheries.

The supply of fish in the seas round Britain is most abundant, or rather quite inexhaustible. "The coasts of Great Britain," says Sir John Burroughs, "do yield such a continued sea harvest of gain and benefit to all those that with diligence doe labour in the same, that no time or season of the year passeth away without some apparent means of profitable employment, especially to such as apply themselves to fishing; which from the beginning of the year unto the latter end, continueth upon some part or other upon our coastes; and these, in such infinite shoales and multitudes of fishes, are offered to the takers, as may justly move admiration, not only to strangers, but to those that daily are employed amongst them."—"That this harvest," says Sir John Barrow, "ripe for gathering at all seasons of the year, without the labour of tillage, without the expense of seed or manure, without the payment of rent or taxes, is inexhaustible, the extraordinary fecundity of the most valuable kinds of fish would alone afford abundant proof. To enumerate the thousands and even millions of eggs which are impregnated in the herring, the cod, the ling, and, indeed, in almost the whole of the esculent fishes, would give but an inadequate idea of the prodigious multitudes in which they flock to our shores: the shoals themselves must be seen, in order to convey to the mind any just idea of their aggregate mass."—(*Ency. Britannica*, vol. ix. p. 590. new ed.)

This abundance of fish, coupled with the predilection of a large portion of the population for a maritime life, would naturally make one anticipate that the fisheries would be prosecuted on a very large scale, and be in a very flourishing state. But hitherto, except in London, and a few seaport towns, the consumption of fish has not been great; and it has been found to be, on the whole, rather more expensive than most other sorts of food. And hence, notwithstanding the efforts that have been made, by bounties and otherwise, to stimulate different departments of the fishery, none of them had till lately, attained to any very great magnitude.

Latterly, however, the consumption of fish has been materially increased. The difficulty and expense of conveying fish fresh, and in good order, into the interior of the country, was till very recently the principal obstacle to its consumption. But the opening of railways from the coast to all the great internal towns has gone far to remove this obstacle; and has, in consequence, increased the consumption of fish in the great manufacturing and other towns, at a distance from the sea, in a degree not easy to be imagined. In proof of this, we beg to lay before the reader the following extract from a letter in the Morning Chronicle, by the Birmingham Correspondent of that Journal.

"In the year 1829, there were only ten fish merchants in Birmingham, but since the opening of the various railways which now centre in or communicate with the town, the number has increased to forty, exclusive of several dealers of smaller note who reside in the suburbs. The quantity of fish consumed by the community has increased in the same ratio, and in round numbers is estimated thus:—

	Tons.	Population.
1829	400	150,000
1835	1,000	160,000
1840	2,500	180,000
1845	3,910	200,000

"This amazing increase has not been occasioned by the tariff of 1842, notwithstanding it opened our markets to foreign salmon, smelts, and herrings; for the increase in the consumption of salmon, though considerable, has not been such as was expected, the price of that fish still continuing above the reach of the working man. Smelts were formerly prohibited; now they come in free, but very few of them have yet found their way to the centre of England. Cured herrings are now more in demand than formerly, but with the exception of plump soft reds, no material increase has taken place in the quantity imported. The great increase has been in the consumption of what are termed fresh fish: that is, of all kinds of white and shell fish, as they come out of the water. This is entirely owing to the facilities of speedy conveyance afforded by railway transit. Although Birmingham stands in the very centre of England, and is distant from the nearest sea-port a hundred miles, fish caught in the morning on the east or west coast, may now be found in excellent order on the bench of the fish merchant here in the evening. As cod, herrings, mackarel, and shell-fish, have each and all particular seasons, in which they can be caught in abundance and good condition; and as these seasons differ widely according to the coast on which the fish are caught, the herring for example, being abundant in July and August on the east coast, and in winter on the west coast of Ireland, so we are now in circumstances from our communications with both sides of the island, to have a fresh supply of fish of some kind or other all the year round! Nothing like this could be obtained before the railways were made. A fresh cod was then only to be seen on the table of the merchant or manufacturer who could afford to pay 1*s.* to 1*s.* 6*d.* a pound for it, sometimes 30*s.* was paid for one good round full-sized cod. Now any quantity can be had as low as 2*d.* to 4*d.* a pound, and in much better condition than when the conveyance was from London by mail or stage-coach, even though packed in ice. The same may be said of herrings, mackarel, salmon, and shell-fish, the current price of fresh herrings now being twelve to fifteen a shilling, mackarel 2*d.* to 4*d.* each, and crabs, which formerly cost from 1*s.* to 3*s.* 6*d.*, may now be had for from 1*d.* to 2*d.*, 4*d.*, and 6*d.*, the very largest and finest not exceeding 1*s.* to 1*s.* 3*d.* each. As many as twenty tons of crabs have been brought to town in a morning, and on several occasions no fewer than 300 barrels of fresh herrings have been delivered amongst our various fish merchants, one of whom now thinks nothing of having 40*l.* to pay for carriage of fresh fish delivered in the course of one day."

The principal fish-market in the British dominions is that of Billingsgate, in the city of London. A notion has been pretty current, that the dealers in this market contrived to exercise a sort of monopoly, and that they had succeeded in restricting the supply of fish, and in forcing up its price to an unnatural elevation. But there does not appear to be any foundation whatever for this notion. On the contrary, there are but few markets in which competition is so keen as at Billingsgate; and none, perhaps, in which the supply and price of the articles sold are so very fluctuating. The smacks that catch the fish are allowed to be eight days at Gravesend; but, except in winter they seldom lie so long. The fish is transhipped from the smacks to hatch-boats, that bring it to town; and, owing to the liability of the fish to spoil, and other circumstances, it is always a great object with the fishermen to bring their boats as early to market as possible. It is said, that if, during the mackarel season, a vessel come to the wharf at 5 o'clock in the morning, when the market opens, the fish may sell from 48*s.* to 50*s.* a hundred; whereas, if the same vessel came at 10 o'clock, the mackarel would not be worth more than 36*s.* a hundred;

and if she came in the afternoon, they would not fetch more than 24*s.* or 28*s.*!—(*Report of* 1833 *on Channel Fisheries*, p. 89.) A good deal of the mackarel and other fish taken on the Kentish and Sussex coasts used, for the sake of dispatch, to be sent to London in vans with four horses; and, to hasten their arrival, they not unfrequently had six horses; but these are now abandoned, the fish being conveyed much more cheaply and expeditiously by railway. There is now, also, owing to the command of steam tugs, comparatively little difficulty in getting fish up by water in adverse winds; and the market is in consequence more regularly supplied. But the fishery is in itself extremely uncertain; and instances occur every season, of the price of the same description of fish varying cent. per cent., and sometimes more, from one day to another. On the whole, however, there has been a great decline in the prices of most sorts of fish at Billingsgate, within the last 12 or 20 years; though, as the price of butcher's meat has declined in a nearly equal ratio, it is not supposed that the consumption of fish in London has been materially increased.

In Billingsgate, fish, other than salmon and eels, are sold either by tale or by measure; but it has been supposed that, taking all the fish that comes to market, its price, as sold by the fishers, would, at a rough average, be about 2½*d.* per lb.—(*Report*, p. 95.) The extreme difference between the wholesale price at Billingsgate, and the retail price at the west end of the town, is owing to various causes; but principally, perhaps, to the perishable nature of the article, which, if not speedily disposed of, cannot be sold at all, except at a heavy reduction. The notion, that fish is thrown into the river or destroyed, to enhance or keep up the price of the remainder, is quite unfounded. The only difficulty is to prevent bad and unwholesome fish from being sold; and to effect this, is the duty of a clerk of the market, or inspector, appointed by the city.

The fishery is carried on partly in the rivers, and in the bays and along the coasts, of Great Britain and Ireland; and partly in the seas at a less or greater distance from our shores. Of the first, the salmon, herring, pilchard, and oyster—and of the second, the cod, turbot, and whale—fisheries, are the most important.

1. *Salmon Fishery.*—Salmon being rarely caught, except in æstuaries or rivers, is, in most instances, private property: the fisheries frequently producing a large revenue to their owners. It is found in most English rivers; but seldom in such abundance as to make the fishing an object of much attention. London derives the principal part of its supply from Scotland; and Liverpool, Manchester, &c., from Ireland. The fishery in the Tweed is important and valuable. About 20 years ago it produced a rental of from 15,000*l.* to 18,000*l.* a-year. But in the interval the decline has been such, that at present it does not yield above 4,000*l.* or 5,000*l.* a-year to its proprietors. This extraordinary decline is principally owing to a nearly corresponding falling off in the catch of salmon, the exports from Berwick having sunk from about 9,000 or 10,000 boxes a-year to 3,000 or 4,000.—(*Kerr's Berwickshire*, p. 460; *Penny Cyclopædia*, art. BERWICK.)

Exclusive of the Tweed, there are valuable salmon fisheries in the Tay, Forth, Dee, Don, Findhorn, Spey, Ness, Conon, and other Scotch

rivers. But they are mostly all in about the same condition as those of the Tweed. There are everywhere complaints of a growing scarcity of fish; and the fact that the exports and the rentals of all the principal rivers have decreased very much during the last 20 years, shows that these complaints are but too well founded. Subjoined is an account of the

Produce of the Salmon Fishery on the River and Æstuary of Tay, and the River Earne, annually from 1830 *to* 1835.

	1830		1831		1832	
	Salmon.	Grilses.	Salmon.	Grilses.	Salmon.	Grilses.
River Tay	22,896	43,102	14,224	30,180	20,838	43,248
Æstuary of Tay . . .	4,762	10,147	5,603	8,574	5,054	9,836
River Earne	902	2,655	583	1,765	766	2,638
Total . . .	28,560	55,904	20,410	40,519	26,658	55,722

	1833		1834		1835	
	Salmon.	Grilses.	Salmon.	Grilses.	Salmon.	Grilses.
River Tay	14,114	34,787	21,733	37,592	25,614	51,315
Æstuary of Tay . . .	6,432	16,206	6,407	10,018	7,271	9,721
River Earne	773	2,240	733	1,685	1,084	3,193
Total . . .	21,319	53,233	28,873	49,295	33,969	64,229

Most persons seem to think that the declining state of the salmon fisheries is mainly owing to the prevalence of poaching, or to the destruction of the breeding fish and fry in the upper parts of the rivers, during *close time;* and the extent to which this pernicious practice has been carried of late years has, no doubt, been highly injurious, though we doubt whether it has been so in the degree that is commonly supposed. On the whole, we rather incline to think that fully as much injury is done to the fishery in most rivers by the *weirs*, or salmon traps, and other obstructions placed in the way of the fish when ascending the rivers to spawn, as by anything else. These obstructions are not, indeed, always equally prevalent, and, in some instances, they have been partially demolished; but there is hardly a river in which they do not still exist to a greater or less extent, and are generally believed to be very destructive. The fishery has also, perhaps, been injured by the temptation to overfish, caused by the high price of salmon; and in a still greater degree by the too limited duration of the *close time.* The last-mentioned cause of decline is thought, by many good judges, to be the most powerful of the whole; and it is justly objected to the acts for the regulation of the Scotch fisheries, that they prolong the period for fishing too far into the spawning season. A police has been established for the protection of the fisheries on the Tweed, under the provisions of a local act passed in 1830; and it has been, in part at least, effectual to the end in view. The fisheries in the north of Ireland are said to have been seriously injured by the steeping of flax in waters communicating with the rivers in which salmon are taken.

The fisheries in the Bann, near Coleraine; the Foyle; the Billick, near Ballyshannon; the Boyne, above Drogheda; and in various other

Irish rivers, are very productive. Their produce is principally shipped for Liverpool; and it is mainly owing to the increased supplies derived from this source, and more recently from Holland, and the facility with which they are brought to market by steam-packets, that, despite the falling off in the produce of the Scotch, and English rivers, the price of salmon in England has been materially diminished. It has been stated that the Irish salmon brought to Billingsgate market is generally in superior condition to the Scotch; a circumstance for which, if it be really true, it is rather difficult to account.—(*Report on Channel Fisheries*, p. 96.)

The salmon fisheries in the Foyle belong, with a trifling exception, to the Irish Society, a branch of the Corporation of the City of London. Contrary to what has happened in most other places, these fisheries have very considerably increased of late years. From 1827 to 1845 inclusive, the yearly produce has been as follows:—

Years.	No. of Salmon.	Years.	No. of Salmon.	Years.	No. of Salmon.
1827	46,001	1833	50,337	1839	43,181
1828	50,606	1834	53,748	1840	59,305
1829	32,770	1835	55,906	1841	52,582
1830	66,053	1836	No Returns.	1842	83,106
1831	62,560	1837		1843	62,348
1832	64,447	1838		1844	49,387

Formerly, the greater part of the salmon caught in the Tweed and other Scotch rivers was pickled or kitted, after being boiled, and sent to London, under the name of Newcastle salmon, a little only being brought up fresh during the early spring months. But, about 1790, the plan, suggested by Mr. Dempster of Dunnichen, of packing salmon in boxes with coarsely pounded ice, began to be introduced; and, by this ingenious contrivance, it is now brought quite fresh to London in the summer months from the most distant parts of Scotland and Ireland. This discovery immediately raised the price of salmon in the remoter parts of the country, where it had previously been a drug, almost to the London level, and restricted its consumption within the narrowest limits. "Within memory, salted salmon formed a material article of economy in all the farm-houses of the Vale of the Tweed, as a considerable portion of their winter stores for family use, inasmuch that in-door servants often bargained that they should not be obliged to take more than two weekly meals of salmon! It could then be bought, fresh caught, in summer, at 2*s.* the fish stone, of nearly 19 pounds weight. But, from the introduction of ice, enabling the whole to be sent fresh to London at all times, the price hardly falls now below 12*s.* a stone, and is often 30*s.*, and sometimes 42*s.*"—(*Kerr's Berwickshire*, p. 461.)

It is enacted by the 9 Geo. IV., c. 39, that the Scotch rivers are to be shut from the 14th of September to the 1st of February. Every person catching, or attempting to catch, fish in that period, is to forfeit not less than 1*l.*, nor more than 10*l.*, for every offence, besides the

nets, boats, or other implements he may have employed. Pecuniary penalties are also imposed on poachers and trespassers; and provision is made for the watching of the rivers. As previously remarked, it is believed that the commencement of the *close-time*, as fixed by this Act, is too late; and that it should begin by the 25th of August, or, at all events, not later than the 1st of September.

We have been fortunate enough to obtain from a source, on which every reliance may be placed, the following

Account of the Quantity of Salmon packed in Ice imported into London, from Scotland, during each of the Eight Years ending with the 14th of October, 1841, and of the Wholesale Price of the same.

Years ending Oct. 14.	Weight of Fish.	Average Price, about.	Total Value.
	lbs.	*d.*	£.
1834	3,432,800	9½ per lb.	135,900
1835	4,740,960	9 „	177,800
1836	2,751,840	10½ „	120,400
1837	3,617,600	10 „	150,750
1838	2,396,800	10½ „	104,160
1839	1,830,080	11 „	83,880
1840	1,697,920	11 „	77,850
1841	3,192,672	8¾ „	116,400

This, it will be observed, is independent of the pickled salmon brought from Scotland, the quantity and value of which varies as much as that of the fresh salmon; but we are well assured that, at an average of the last eight years, its value has not exceeded 12,000*l.* a-year. At an average, the retail price of salmon in London may be taken at from 50 to 75 per cent. above the wholesale price.

We may remark by the way that, as by far the largest portion of the salmon made use of in London comes from Scotland, the above statement shows that its consumption in the metropolis is not nearly so great as is generally supposed. In fact it is little used, except by the more opulent classes; and nothing that is not generally used by the middle classes, or by them and the lower, is ever of much importance.

2. *Herring Fishery.*—This department of the fishery business has been prosecuted, at different parts, on the coast of Great Britain from a very early period. Yarmouth used to be its principal station; and the herring fair, held in that town, was deemed of so much importance in the 14th century, that different statutes were passed for its regulation.—(Stat. Edw. III., an. 31, 35.) But, notwithstanding this early commencement, the fishery made, for a very long period, little or no progress; and, till a comparatively recent epoch, by far the greatest part of the fish taken on our shores was captured by the Dutch. "*Veniam enim piscandi,*" says Camden, "*semper concesserunt Angli, honore sibi reservato, utilitate vero exteris, quasi per desidiam resignata.*"—(*Brit.*, p. 586.) But, notwithstanding this sarcastic remark, and the circulation of the most exaggerated accounts of the advantages derived by the Dutch from the fishery, they were allowed, with but little interruption, to monopolise it until towards the middle of last

century. At length, however, a vigorous effort was made to induce the public to set about exploring and cultivating this new and, as it was supposed it would turn out to be, most productive field of industry. In 1749, in pursuance of a recommendation in his Majesty's speech at the opening of parliament, and of a report of a committee of the House of Commons, 500,000*l.* was subscribed for carrying on the fisheries, under a corporation, called "The Society of the Free British Fishery." The Prince of Wales was chosen governor of the society, which was patronised by men of the first rank and fortune in the state. But this society did not trust entirely to its own efforts for success. The duties were remitted upon the salt used in the fisheries; and, besides this reasonable encouragement, a high tonnage bounty was granted upon every buss fitted out for the deep-sea fishery. In consequence, many vessels were sent out, as Adam Smith has truly stated, not to catch herrings, but to *catch the bounty;* and to such an extent was this abuse carried, that, in 1759, when the tonnage bounty was 50*s.*, the almost incredible sum of 159*l.* 7*s.* 6*d.* was paid as bounty upon *every barrel of merchantable herrings that was produced!*—(*Wealth of Nations*, p. 231.) It is hardly necessary to add, such being the waste and mismanagement of the company's affairs, that it was speedily destroyed. Dr. Smith says that, in 1784, hardly a vestige remained of its having ever been in existence.

But, notwithstanding this ill success, a new company was formed, for nearly the same objects, in 1786, of which George III. was patron. It had nearly the same fate. "For a season or two busses were fitted out by the society; but if every herring caught had carried a ducat in its mouth, the expense of its capture would scarcely have been repaid. The bubble ended by the society for fishing in the deep sea becoming a kind of building society, for purchasing ground in situations where curers and fishermen find it convenient to settle; and selling it or letting it in small lots to them, at such advance of price as yields something better than fishing profits."—(See an able article on the *Herring Fishery*, in the 11th Number of the *Quarterly Journal of Agriculture.*)

In 1808, a fresh attempt was made for the improvement and extension of the fishery. The act 48 Geo. III. established a distinct set of commissioners for the superintendence of all matters connected with the fishery, and authorised them to appoint a sufficient number of fishery officers, to be stationed at the different ports, whose duty it was to see that the various regulations, with respect to the gutting, packing, &c., of the herrings, and the branding of the barrels, were duly carried into effect. In 1809, a bounty of 3*l.* per ton was granted on all vessels employed in the deep-sea herring fishery of above 60 tons burthen, but payable only on 100 tons; and, in 1820, a bounty of 20*s.* per ton, which, under certain specified circumstances, might be increased to 50*s.*, was granted on all vessels of from 15 to 60 tons, fitted out for the shore herring fishery; and, exclusively of the bounties on the tonnage, a bounty of 2*s.* a barrel was allowed on all herrings cured gutted, during the six years ending the 5th of April, 1815, and a bounty of 2*s.* 8*d.* a barrel on their exportation, whether cured gutted or ungutted. During the 11 years ending the 5th of April, 1826, the bounty on herrings cured gutted, was 4*s.* a barrel.

It is stated, in the article previously referred to, that the cost of a barrel of cured herrings is about 16*s.*; half going to the fisherman for the green fish, the other half to the curer for barrel, salt, and labour. The bounty of 4*s.* a barrel was, therefore, equal to *half* the value of the herrings as sold by the fisherman, and to *one-fourth* of their value as sold by the curer! In consequence of this forced system, the fishery was rapidly increased. The subjoined account, extracted from the *Report of the Commissioners of the Fishery Board* for 1844, shows the progress it has made since 1811.

Abstract of the Total Quantity of White Herrings Cured, Branded for Bounty, and Exported, in so far as the same have been brought under the Cognizance of the Officers of the Fishery, from the 5th of April, 1810, *distinguishing each Year, and the Herrings Cured Gutted from those Cured Ungutted.*—(Parl. Paper, No. 47, Sess. 1846.)

Years ending April 5.	Total Quantity of Herrings Cured.			Total Quantity of Herrings Branded.	Total Quantity of Herrings Exported.		
	Gutted.	Ungutted.	Total.		Gutted.	Ungutted.	Total.
	Barrels.	Barrels.	Barrels.	Barrels.	Barrels.	Barrels.	Barrels.
1811	65,430	26,397½	91,827½	55,662½	18,880	19,253	38,313
1812	72,515½	39,004	111,519½	58,430½	27,564	35,256	62,820
1813	89,900½	63,587½	153,488½	70,027½	40,100½	69,625	109,725½
1814	52,931½	57,611	110,542½	38,184	34,929	83,474½	118,403½
1815	105,372½	54,767	160,139½	83,376	68,938	72,367½	141,305½
1816	135,981	26,670½	162,651½	416,436	81,544½	26,143½	107,688
1817	155,776	36,567½	192,343½	140,018½	115,480½	23,148	138,628½
1818	204,270½	23,420½	227,691	183,089½	148,147½	14,192	162,389½
1819	303,777½	37,116½	340,894	270,022½	212,301½	14,860½	227,162
1820	347,190½	35,301	382,491½	309,700½	244,096	9,420	253,516
1821	413,308	28,887½	442,195½	363,872	289,445½	5,360	294,805½
1822	291,626½	24,897½	316,542½	263,205½	212,890½	2,065½	214,956
1823	225,037	23,832	248,869	203,110	169,459½	985½	170,445
1824	335,450	56,740½	392.190½	299,631	238,505½	1,125	239,630½
1825	303,397	44,268½	347,665½	270,844½	201,882½	134	202,016½
1826	340,118	39,115½	379,233½	294,422½	217,053½	20	217,073½
1827	259,171½	29,324	288,495½	223,606	165,741	695	166,406
1828	339,360	60,418	399,778	279,317½	210,766	893	211,659
1829	300,242½	55,737	355,979½	234,827	202,813½	3,062	205,875½
1830	280,933½	48,623½	329,557	218,418½	177,776	3,878½	181,654½
1831	371,096	68,274	439,370	237,085	260,976	3,927	264,903
1832	313,113½	49,547	362,660½	157,839½	214,820½	2,679½	217,490½
1833	353,684½	63,279½	416,964½	168,259½	218,422½	2,255	220,684½
1834	382,677½	68,853½	451,531½	178,000½	269,133½	2,960	272,093½
1835	217,242½	60,074½	277,317	85,079½	156,229½	2,580	158,805½
1836	399,334	98,280½	497,614½	192,317	270,846½	2,547	273,393½
1837	290,169	107,660½	397,829½	114,192	187,238½	2,027	189,265½
1838	382,400	125,374½	507,774½	141.552	229,160½	5,997	235,158
1839	302,229	173,330½	555,559½	153,659½	233,690½	6,040	239,739½
1840	405,379½	138,565½	543,945	152,231	250,554	1,968	252,522
1841	431,157	126,105½	557,262½	154,189	246,851	3,286	250,137
1842	489,620½	177,624½	667,245½	190,922½	283,530	1,206	284,736
1843	442,290	181,129½	623,419½	162,713	287,043½	4,757	291,800½
1844	473,556½	191,803	665,359½	182,988	311,167½	2,349	313,516½

Note.—In the six years ending 5th of April, 1815, the bounty on herrings cured gutted was 2*s.* per barrel, while there was a bounty at the same time of 2*s.* 8*d.* per barrel, payable by the excise, on the exportation of herrings, whether cured gutted or ungutted, but which ceased on the 1st of June, 1815. In the eleven years ending 5th of April, 1826, the bounty on herrings cured gutted was 4*s.* per barrel; in the four succeeding years the bounty was reduced 1*s.* per barrel each year, till the 5th of April, 1830, when it ceased altogether, and has not since been renewed.

On looking at this table, it is seen that the fishery made no progress under the new system till 1815, when the bounty was raised to 4*s.* This is a sufficient proof of the factitious and unnatural state of the business. Its extension, under the circumstances in question, instead of affording any proof of its being in a really flourishing condition,

was distinctly the reverse. Individuals, without capital, but who obtained loans sufficient to enable them to acquire boats, barrels, salt, &c., on the credit of the bounty, entered in vast numbers into the trade. The market was most commonly glutted with fish; and yet, the temptation held out by the bounty caused it to be still further overloaded. Great injury was consequently done to those fish-curers who possessed capital, and even the *fishermen* were injured by the system. "Most of the boats employed in the fishery never touch the water but during six weeks from the middle or end of July to the middle of September. They are owned and sailed, not by regular fishermen following that vocation only, but by tradesmen, small farmers, farm-servants, and other landsmen, who may have sufficient skill to manage a boat at that season, but who do not follow the sea, except for the six weeks of the herring fishery, when they go upon a kind of gambling speculation of earning a twelvemonths' income by six weeks' work."—(*Quarterly Journal*, No. 11, p. 653.)

It has been often said, in vindication of the bounty system, that, by extending the fishery, it extended an important nursery for seamen; but the preceding statement shows that such was not the case. On the contrary, it tended to depress the condition of the genuine fisherman, by bringing a host of interlopers into the field; and it was also prejudicial to the little farmers and tradesmen by withdrawing their attention from their peculiar business, and tempting them to embark in what has been little better than a sort of lottery adventure.

These consequences, and the increasing amount of the sum paid for bounties, at length induced the government to adopt a different system. By an Act passed in 1825, the bounty of 2*s.* 8*d.* on exported herrings was made to cease in 1826, and 1*s.* was annually deducted from the bounty of 4*s.* a barrel paid on gutted herrings till it ceased in 1830. And the above table shows conclusively that those who contended that the best way to promote the fishery was to let it alone, were in the right; the quantity of herrings cured and the quantity exported having been both nearly doubled since the cessation of the bounties. The fishery is now, for the first time these hundred years, placed on a secure foundation; the supply is proportioned to the real demand, while the genuine fishermen, and those curers who have capital of their own, are no longer injured by the competition of landsmen and others allured to the business by factitious encouragement and trading on capital furnished by government.

The repeal of the salt laws and of the duty on salt, which preceded the repeal of the bounty, was of signal service to the fishery. It is true, that the salt used in the fisheries was exempted from the duty; but, in order to prevent the revenue from being defrauded, so many regulations were enacted, and the difficulties and penalties to which the fishermen were in consequence subjected were so very great, that some of them chose rather to pay the duty upon the salt they made use of than to undertake compliance with the regulations.

The greater part, by far, of the British herring fishery has been long carried on from different places, principally on the east coast of Scotland, of which Wick, in Caithness, is the principal.—(See p. 305.) Of the 665,359 barrels of herrings, reported by the Fishery Commis-

sioners to have been cured in the year ended 5th of April, 1844, 108,089 were cured at Wick; 96,031 at Peterhead; 68,131 at Fraserburgh; 37,960 at Helmsdale, &c. We subjoin—

An Account of the total Number of Barrels of White Herrings which have been Cured on Board Vessels cleared out for the Fishery, or Cured on Shore, in the Year ended 5th April, 1844; distinguishing the Stations where Landed or Cured, and distinguishing also the Herrings Cured Gutted from those Cured Ungutted.

Stations.	Herrings Cured Gutted.		Herrings Cured Ungutted.		Total Herrings Cured.
	Gutted and Packed within 24 Hours after being Caught.	Gutted and Packed not within 24 Hours after being Caught.	Barrels.	Barrels of Bulk.	
	Barrels.	Barrels.			Barrels.
Campbeltown and Islay	2,785	..	..	951	3,736
Dumfries and Stranraer	2,084	..	..	..	2,084
Glasgow	18,266	..	2,330	..	20,596
Greenock and Ayr, &c.	22,591½	18	213	62	22,884½
Inverary and Loch Gilphead	8,882	..	..	..	8,882
Loch Broom	1,693	..	..	639	2,332
Loch Carron and Dunvegan	1,767	..	..	..	1,767
Loch Shildag	1,157	1,118	..	48	2,323
Rothsay	11,969	..	..	18	11,987
Stornoway and Barra	9,202½	110	92	423	9,827½
Isle of Man	..	..	4,043½	45,175	49,218½
Whitehaven	1,291¾	..	937	4,580	6,808¾
Anstruther	16,976	141	14,081	650	31,848
Banff	27,001	..	1,961	..	28,962
Burntisland	576	..	813	..	1,389
Cromarty	14,173	50	2,052	..	16,275
Eyemouth	6,825	50	6,345	684½	13,904½
Findhorn	15,109½	159	1,662	..	16,930½
Fraserburgh	45,308	..	22,079	744	68,131
Helmsdale	37,137	..	823	..	37,960
Leith	586	..	..	33	619
Lybster	32,328	34	202	..	32,564
Orkney, North Isles	7,762	..	..	..	7,762
Orkney, South Isles	15,178½	..	..	..	15,178½
Peterhead	58,368½	..	37,467	196	96,031½
Port Gordon	2,668	..	114	..	2,782
Shetland, Lerwick	2,776	..	..	..	2,776
Shetland, Unst	48	..	..	..	48
Shetland, Walls	89	..	..	..	89
Stonehaven	906	..	5,238	130	6,274
Thurso	1,230	..	48	..	1,278
Tongue	1,765	..	..	..	1,765
Wick	97,454½	30	8,744½	1,860½	108,089½
North Sunderland	5,732	161	25,037½	1,227½	32,158
Whitby	..	..	99	..	99
Total	471,685¾	1,871	134,381½	57,421½	665,359¾

The Yarmouth fishery, though much fallen off, is still prosecuted to a considerable extent. About 100 sail of fishing vessels, averaging from 40 to 50 tons each, belong to the port, exclusive of about 50 or

60 vessels that arrive annually from Yorkshire during the herring season. The capital employed is estimated at about 250,000*l*. Lowestoff, 9 miles from Yarmouth, employs about 70 fishing boats, of 40 tons each. The greater number of the herrings taken at Yarmouth are smoked, and are known in London by the name of "Yarmouth bloaters."—(*Report of* 1833, *on Channel Fisheries*, p. 17.)

An Account of the Number of Boats, whether Decked or Undecked, that have been Employed in the Year ended 5th April, 1844, *in the Shore-Curing Herring and Cod and Ling Fisheries; distinguishing each Station; showing also the Number of Fishermen and Boys by whom the said Boats were manned; the Number of Coopers employed; the Number of Persons employed in Gutting, Packing, Re-Packing, Cleaning, or Drying the Fish; the Number of Labourers; and the Total Number of all such Persons; together with the Number of Fish-Curers in each District.*

Stations	Number of Boats, whether Decked or Undecked.	Number of Fishermen and Boys by whom the said Boats were Manned.	Number of Coopers Employed.	Number of Persons employed in Gutting, Packing, Re-packing, Cleaning, or Drying the Fish.	Number of Labourers Employed.	Total Number of Persons Employed.	Number of Fish Curers.
Campbeltown and Islay	462	1,687	20	813	..	2,520	81
Dumfries and Stranraer	191	620	14	213	30	877	4
Glasgow	..	..	46	50	60	156	7
Greenock and Ayr, &c.	518	1,280	121	370	584	2,355	46
Inverary and Loch Gilphead, &c.	1,080	3,076	43	1,550	..	4,669	35
Loch Broom	441	1,783	11	45	..	1,839	10
Loch Carron and Dunvegan	582	2,244	8	3,346	4	5,602	20
Loch Shildag	201	814	6	10	20	850	5
Rothsay	278	875	21	120	..	1,016	41
Stornoway and Barra	578	3,369	66	514	184	4,133	25
Isle of Man	655	4,686	21	295	114	5,116	135
Bristol	184	476	8	18	20	522	3
Liverpool	334	1,669	43	75	31	1,818	8
St. Ives	784	2,697	23	1,143	.	3,863	191
Whitehaven	137	444	14	32	12	502	8
Anstruther	267	1,335	99	1,236	534	3,204	40
Banff	61	276	63	616	82	1,037	29
Burntisland	158	516	50	172	9	747	14
Cromarty	325	1,368	131	1,863	2,329	5,691	34
Eyemouth	159	795	55	298	46	1,194	24
Findhorn	214	729	57	493	15	1,294	19
Fraserburgh	192	917	107	1,299	158	2,481	54
Helmsdale	264	1,320	119	828	102	2,369	29
Leith	376	1,072	93	173	29	1,367	14
Lybster	280	1,400	88	890	91	2,469	33
Orkney, North Isles	258	1,160	11	721	8	1,900	11
Orkney, South Isles	490	2,205	49	1,116	15	3,385	57
Peterhead	226	809	189	1,853	136	2,987	54
Port Gordon	356	1,800	14	876	14	2,704	14
Shetland, Lerwick	510	1,684	36	549	45	2,314	36
Shetland, Unst	139	726	4	129	..	859	20
Shetland, Walls	251	1,431	6	328	76	1,841	25
Stonehaven	192	1,032	64	467	30	1,593	28
Thurso	117	525	16	240	119	900	14
Tongue	150	750	20	358	323	1,451	9
Wick	525	2,610	283	2,089	204	5,186	69
London, including Dover, Portsmouth, Gravesend, and Yarmouth, from which resident officers have now been withdrawn	1,426	8,249	211	2,188	1,013	11,661	325
North Sunderland	443	1,082	54	508	78	1,722	27
Whitby	263	946	22	293	669	1,930	16
Total	14,067	60,457	2,306	28,177	7,184	98,124	1,614

The herring fishery of Ireland has never been of any material importance. It is only, indeed, in a few places that we meet with any

regular fishermen in that country; the minute division of the land, and the dependence so generally placed on it, are very formidable obstacles to the success of the fisheries. Subjoined is—

A Statement of the Number of Boats and Men engaged on the Coast Fisheries of Ireland in 1836, *enumerated by the Officers of the Coast Guard.*

Counties.	Decked Vessels.			Half-decked Vessels.			Open Sail Boats.		Row Boats.		Number of Fishermen.
	No	Tons.	Men.	No	Tons.	Men	No.	Men.	No	Men.	
Dublin, North of the Bay	85	3,321	645	23	232	128	60	261	41	153	1,207
—— South of the Bay	36	1,330	144	4	33	22	6	26	24	96	218
Wicklow	30	4,174	156	153	1,425	858	57	246	14	33	1,378
Wexford	1	20	6	77	668	403	209	1,129	229	1,228	2,656
Waterford	..	..	..	101	1,668	595	52	301	266	1,260	2,156
Cork	13	302	82	233	3,815	1,816	346	1,696	2,039	10,833	13,748
Kerry	1	22	7	44	408	234	421	2,612	610	3,458	6,311
Clare	..	..	..	7	88	35	30	141	334	1,236	1,462
Galway	1	18	4	116	1,125	525	479	2,260	1,376	5,750	8,539
Mayo	..	..	..	4	42	12	12	42	677	3,548	3,708
Sligo	..	..	..	..	..	..	10	29	172	995	1,294
Donegal	8	130	28	11	61	42	64	280	1,169	6,254	6,613
Antrim (including also the coast to Lough Foyle)	5	60	15	3	25	9	13	38	242	746	816
Down	13	288	67	33	372	363	23	92	358	1,608	2,305
Louth	13	454	80	11	225	52	1	5	313	1,106	1,878
Total	215	7,099	1,234	870	10,292	4,684	1,812	9,179	7,864	37,229	54,119

In 1842, a Board of Commissioners was appointed for the improvement and regulation of the fisheries of Ireland; and under its direction the coast of the island has been divided into 28 districts, each of which is placed under a superintendent officer, whose duty it is to see the laws regulating the fishery carried into effect, to register the fishermen, &c. It appears, from the Fourth Report of this Board, that, in 1845, there were employed in the various coast fisheries of Ireland, 19,883 vessels and boats of all descriptions, and that 93,073 men and boys were wholly and partially engaged in the fishery. This shows a rapid increase as compared with the return for 1836, if we may depend (which is doubtful) on the accuracy of the latter.

3. *Pilchard Fishery.*—This is exclusively carried on along the coasts of Cornwall and Devon, particularly the former, its principal seats being St. Ives, Mountsbay, and Mevagissey. The fishery has been said to be in rather a declining state for some years past; but it seems doubtful whether this be really the case. Dr. Borlase mentions that, at an average of the 10 years ending with 1756, the annual export of pilchards amounted to 29,795 hogsheads. At an average of the 10 years ending with 1842, the annual export was 16,694 hogsheads; but in 1842, it amounted to 20,714 hogsheads. And when it is considered that the trade at the former period, and for long after, was forced by means of a bounty, which, previously to its repeal a few years ago, was as high as 8*s.* 6*d.* a hogshead, there would seem to be but slender grounds for thinking that the fishery has really declined. Pilchards are not used in England, except in the counties in which they are taken, where about 3,000 hogsheads are retained for home consumption. They are mostly exported to Italy; and the imposition of a heavy duty on pilchards in Naples did more injury to the fishery than the repeal of the bounty; we are glad, however, to have to state that last year (1845) this duty was reduced a half. Pilchards are all cured on shore, principally by women. The total capital employed in

this department of industry, in boats, nets, &c., has been estimated at from 200,000*l.* to 250,000*l.*—(*Commercial Dictionary*, art. PILCHARDS.)

4. *Oyster Fishery.*—Oysters of excellent quality are found in many parts along the British shores, but principally in the rivers and creeks of Essex and Kent; in Poole harbour, and elsewhere on the coast of Hants and Dorset; at Porth-Einion, in Glamorgan, &c. They are also very abundant on the Mersey shores. Those found at Carlingford, in Ireland, are said to be of a peculiarly delicate flavour. The breeding and fattening of oysters for the London market forms a considerable branch of business. It is principally carried on in Essex and Kent; the rivers Crouch, Blackwater, and Colne being the chief breeding-places in the former, and the channel of the Swale, contiguous to Milton, in the latter. The oysters found in them are not, however, brought immediately to town; but are deposited for a while in *beds* or *layings* in the adjoining creeks, where they are fed and fattened for the market. Exclusive of the oysters bred in Essex and Kent, vast numbers, brought from Jersey, Poole, and other places along the coast, are fattened in the beds. The export of oysters from Jersey is very considerable, having amounted, at an average of the four years ending with 1832, to 208,023 bushels a year, of which a large portion comes to London. The Jersey fishery employs, during the season, about 1,500 men, 1,000 women and children, and 250 boats.—(*Inglis's Channel Islands*, 2nd ed. p. 142.)

Lobsters, of which the consumption in London is immense, are brought from the Shetland Isles, the Yorkshire coast, &c.; but the largest supply comes from Norway.

5. *Cod Fishery.*—This fishery, including under the term not only the fishery of common cod, but of haddock, ling, hake, torsk, &c., is next in importance to that of herring. It is carried on in a great variety of places contiguous to the shores of the British islands; but the most productive and valuable of the adjacent fisheries are those in the neighbourhood of the Shetland and Orkney Islands, and off the shores of Essex, Suffolk, Norfolk, Lincoln, &c. Formerly the principal part of the cod brought to London was taken round the edges of the Dogger bank, or rather in the hollows between it and the Well-bank; and the finest fish is still brought from thence. But, within the last few years, the London market has been principally supplied with cod taken between Yarmouth and the Nore; and, in consequence of its being procured so much nearer home, the average price of cod has fallen from 30 to 50 per cent. under what it was twenty years ago.—(*Report of* 1833, *on the Channel Fisheries*, p. 85.) This change has occasioned a great increase in the number of fishing smacks belonging to Barking, Gravesend, and other ports on the Thames; while those belonging to Harwich, and some of the more distant ports, have been materially reduced. The cod taken by the fishermen of Shetland and the Western Isles is mostly cured dried, but it is partially, also, cured green or in pickle; and it is sometimes, though much seldomer now than formerly, conveyed alive in welled vessels to London. The haddocks taken on the Aberdeenshire coast, and cured at the village of Finnan, near Aberdeen, are held in the highest estimation all over the kingdom.

The great bank of Newfoundland is the principal station of the distant cod fishery; the fish found on it being not only of excellent quality, but in the greatest abundance. The bank began to be resorted to by fishers early in the sixteenth century. In 1578, France had on the bank of Newfoundland 150 vessels, Spain 120 or 130, Portugal 50, and England from 30 to 50. During the first half of last century, the fishery was principally carried on by the English (including the Anglo-Americans) and the French; but the capture of Cape Breton, and of their other possessions in America, gave a severe blow to the fishery of the latter. The American war divided the British fishery; that portion of it which had previously been carried on from New England being thereafter merged in that of the United States. Still, however, we contrived to preserve the largest share. At an average of the three years ending with 1789, we are said to have had 402 ships, 1,911 boats, and 16,856 men engaged in the American fisheries. During the last war, the French being excluded from the fisheries, those of England attained to an extraordinary degree of prosperity; the total value of the produce of the Newfoundland fishery, in 1814, having exceeded 2,800,000*l.* But since the peace, the British fishery on the Newfoundland banks has rapidly declined, and can hardly, indeed, be said, at this moment, to exist. It is now carried on almost entirely by the French and the Americans; the facilities enjoyed by the latter for its prosecution being greater than those of any other people, and the former being tempted to engage in it by the extraordinary encouragement afforded by government. At present the British fishery carried on by the inhabitants of Newfoundland is confined entirely to the shore or boat fishery. But this, though probably not so good a nursery of sailors as the bank fishery, is admitted to be "the most productive of merchantable fish and oil."—(*M'Gregor's British America*, 2nd ed. vol. i. p. 206.) The average annual produce of the fisheries of all sorts, including seal, salmon, &c., exported from Newfoundland during the three years ended with 1832, is stated by Mr. M'Gregor at 516,417*l.*—(vol. i. p. 161.) A considerable fishery is also carried on from the ports and harbours of Nova Scotia and Cape Breton, New Brunswick, &c. But, next to that of Newfoundland, the principal British fishery is carried on along the coast of Labrador,—its produce being estimated at from 300,000*l.* to 350,000*l.* a year.

The Exportation of Fish from Newfoundland in each of the Years, 1832, 1833, *and* 1834, *was as follows:—*

	1832	1833	1834
Cod, Dry . . . . . Cwt.	619,179	883,536	763,187
Cod, Wet . . . . . Barrels	658	3,633	2½
Herrings . . . . . Boxes	86	..	..
Herrings . . . . . Barrels	1,728	2,039	1,623½
Mackarel . . . . . ,,	477	326	202
Salmon . . . . . ,,	2,690	3,256	3,363
Value of Fish exported . . £	319,265	455,672	443,577

The total produce of the British fisheries, in the various seas and rivers of America, including seal oil and skins, is estimated by Mr. M'Gregor, at an average of the 5 years ending with 1832, at 857,210*l.* a-year.—(Vol. ii. p. 596.)

Abstract of the Total Quantity of Cod, Ling, or Hake, Cured, Punched, or Branded, and Exported, in so far as the same have been brought under the cognizance of the Officers of the Fishery, during the 19 *Years ended 5th April,* 1844.

Periods.	Total Quantity of Cod, Ling, or Hake Cured.			Total Quantity of Cod, Ling, or Hake Punched or Branded.		Total Quantity of Cod, Ling, or Hake Exported.	
	Cured dried.	Cured in Pickle.		Cured dried.	Cured in Pickle.	Cured dried.	Cured in Pickle.
Year ended 5th April,	Cwt.	Cwt.	Barrels.	Cwt.	Barrels.	Cwt. qrs lbs.	Barrels.
1826	69,136¾	5,634¾	5,621	66,315¾	5,337	7,281 1 14	..
1827	95,161¼	9,273	9,025	82,185¾	8,008¼	14,051 2 27	..
1828	82,515¾	6,726¼	6,142¼	74,103¾	6,609¼	13,208 2 0	
1829	81,321¼	5,786	6,819	73,500¼	6,204	20,587 3 4	..
1830	101,014	5,652¼	8,836¼	92,314¼	8,464	16,369 3 15	..
1831	37,647	. .	2,950¼	34,337¼	2,459¼	11,920 1 1	..
1832	50,293	. .	3 779¼	13,879¾	3,230	20,168 3 16	47
1833	58,461¼	. .	6,467¼	13,581¼	4,393¾	14,754 1 26	67
1834	52,710¾	. .	5,522¼	14,255¼	3,829	16,298 3 0	24
1835	44,152	. .	3,767	9,492	2,235	10,632 0 0	..
1836	38,040	. .	6,276	6,766	3,018	10,992 0 0	..
1837	66,976	. .	7,273	9,589	3,206	10,195 0 0	1¼
1838	84,996¾	. .	10,303	9,259¼	4,373	22,166 2 12	36
1839	85,279¾	. .	10,051¼	23,936¼	5,093	26,701 3 0	150¼
1840	93,560¼	. .	6,053	21,695¼	3,205	29,656 1 0	24
1841	91,494¼	. .	9,480	21,029¼	3,891	30,550 1 0	44
1842	76,849	. .	7,038¼	13,283¾	2,164	25,293 1 0	..
1843	77,207¼	. .	6,431	10,030¼	1,342	23,737 3 0	70
1844	92,813	. .	5,123	20,810¼	2,226¼	35,476 0 0	4

N.B.—The books of this department do not exhibit the total quantity of cod, ling, or hake cured till the year commencing 5th April, 1825. The bounty from the commencement of this abstract to the 5th April, 1830, was near 4*s.* per cwt. for fish cured dried, and 2*s.* 6*d.* per barrel for fish cured in pickle, taken by the crews of vessels or boats not on the tonnage bounty; while the bounty vessels licensed for cod, ling, or hake fishery, on the tonnage bounty, was 50*s.* per ton for tonnage and cargo to the 5th July, 1826; 45*s.* from thence to the 5th July, 1827; 40*s.* to the 5th July, 1828; and 35*s.* to the 5th of April, 1830; when the bounties ceased altogether, and have not since been renewed.

We subjoin the following particulars with respect to the fisheries of Cod, Ling, and Herrings, during the year ended 5th of April, 1844.

Cod:—			
Vessels		105	Number
Men		883	Men
Tonnage		3,466¼	Tons
Number of Fish taken or bought		382,954	Number
Quantities cured dried		12,203½	Cwts.
Number of Fish taken, or purchased by Crews of open Boats		2,697,841	Number
Quantity cured dried		80,610½	Cwts.
Quantity cured pickled		5,119	Barrels
Herring:—			
Boats employed in Herring and Cod Fishery		14,067	Number
Fishermen and Boys	60,457		
Coopers	2,306		
Persons employed gutting, packing, re-packing, cleaning, and drying the Fish	28,177		
Labourers employed	7,184		
Total number employed		98,124	Men

Number of Fish-curers		1,614	
Quantity of Herrings:—			
Cured gutted	473,556¾	Barrels	
Cured ungutted	191,803	Barrels	
Total		665,359¾	Barrels
Cured Branded		182,988	Barrels
Cured, exported gutted	311,167½	Barrels	
Cured, exported ungutted	2,349	Barrels	
Total		313,516½	Barrels
Quantity of Cod, &c. cured dried		92,813½	Cwts.
——— &c. cured pickled		5,123	Barrels
——— &c. exported dried		35,476	Cwts.
——— &c. exported pickled		4	Barrels.

6. *Turbot Fishery.*—Turbot is rather scarce in the Channel and on the English coasts. By far the largest portion of turbot brought to the London market is taken on the Dutch coast, principally, too, by Dutch fishermen, who sometimes import the fish direct, but who more frequently sell it to English fishermen. The greater part of the eels used in London, and even at Hampton and Richmond, is also brought from Holland.

Immense numbers of sprats and other small fish are annually captured, to be used as manure, on the coasts of Kent, Norfolk, and Essex, but especially the first.

Mackarel are found, in the proper season, in many parts along the coast. The London market is principally supplied with those taken off the shores of Kent and Sussex.

7. *Whale Fishery.*—The English engaged in the Greenland whale-fishery towards the commencement of the seventeenth century, but it was not prosecuted continuously, or on a considerable scale, till so recently as 1750. At that period, however, in consequence of a bounty of 40*s.* a ton being allowed on the vessels fitted out for the fishery, a good number were despatched, as much certainly in the view of catching the bounty as of catching whales. Deceived by the prosperous appearance of the fishery, parliament imagined that it was firmly established; and in 1777 the bounty was reduced to 30*s.* The effects of this reduction showed the factitious nature of the trade, the vessels engaged in it having fallen off in the course of the next 5 years from 105 to 39! To arrest this alarming decline, the bounty was raised to its old level in 1781; and of course the trade was soon restored to its previous state of apparent prosperity. The hostilities occasioned by the American war reduced the Dutch fishery to less than half its previous amount, and gave a proportional extension to that of England. The bounty which had, in consequence, become very heavy, was reduced in 1787 to 30*s.* a ton; in 1792 it was further reduced to 25*s.*; and, in 1795, it was reduced to 20*s.*; at which sum it continued till 1824, when it ceased.

Altogether there have been about 2,500,000*l.* expended in bounties

for the encouragement of the whale fishery; and it is doubtful whether even this enormous outlay, had it been unaccompanied by extrinsic and accidental circumstances, would have established it on the very moderate scale at which it now stands. But the late war totally destroyed the Dutch fishery; and, in addition to this, many of those engaged in the business emigrated to England, bringing with them their capital, industry, and skill. In consequence of this encouragement, the fishery carried on from England became more extensive and valuable than at any former period; so much so, that in 1815 we employed in it 134 ships of the burthen of 43,320 tons. But since then the fishery has greatly declined; partly, no doubt, in consequence of the competition of the Americans, who have peculiar advantages for carrying it on, but more in consequence of the increasing scarcity of fish, and of the greater difficulty and danger of the voyage.

A remarkable change has taken place in the localities of the fishery. When it began, the whales were found in vast numbers in the seas round Spitzbergen; but being gradually exterminated, and driven from thence, the whale ships followed them to the icy barrier that bounds the Greenland sea on the north. In 1719 the Dutch commenced fishing in Davis's Straits; but they were not resorted to till a comparatively late period by English ships. In 1820 by far the larger portion of our ships went to the Greenland seas; but from 1826 to 1837 they were nearly abandoned.

The same thing, however, has happened in Davis's Straits that had formerly happened in the seas round Spitzbergen. The whales having become much less numerous in the lower part of the Straits, it was necessary to pursue them into Baffin's Bay, Lancaster's Sound, and the recently discovered inlets to the west of the Straits, where the risk of loss is considerably greater. In consequence the ships sent out since 1836 have gone mostly to the Greenland seas.

For several years past the whale fishery has been so very hazardous as to have partaken more of the character of a gambling adventure than of a regular industrious pursuit. Sometimes the ships have come home with only half a cargo, sometimes they have arrived *clean*, or without any fish, and sometimes they have been wholly lost. In 1830, of 91 ships that sailed for Davis's Straits, 19 were totally lost, 24 returned clean, or without a single fish; and of the remainder not one had a full cargo, only one or two being *half fished*. The year 1835 was also very unfavourable, several of the ships having been detained, locked in the ice. The business may now, in fact, be considered as all but abandoned, in as far as the capture of whales is concerned, the produce of the fishery having consisted of late years almost wholly of seals.

There has been a singular change in the ports from which, as well as the places at which, the northern fishery is carried on. London had, for a lengthened period, by far the greater number of ships in the business; but within the last dozen years she has almost entirely withdrawn from it, having, in 1834, only sent out three ships, and latterly not one. Hull is now the only seat of the fishery in England, and Peterhead the principal in Scotland.

Abstract Account of the Northern Whale Fishery for the 28 *Years ending with* 1842.

Number of Ships to Greenland and Davis's Straits.			Total Ships.	Tonnage.	Ships Lost.	Number of Whales.	Tuns of Oil.	Tons of Bone.
Years.	G.	D. S.						
1815	98	48	146	47,148	1	733	10,682	528
1816	101	45	146	46,868	1	1,330	13.590	632
1817	97	53	150	48,084	5	828	10,871	539
1818	94	63	157	50,362	2	1,208	14,482	666
1819	96	63	159	51,082	12	988	11,401	517
1820	102	57	159	50,546	3	1,155	18,745	946
1821	80	79	159	50,709	14	1,405	16,853	923
1822	61	60	121	38,144	8	630	8,663	422
1823	55	62	117	36,759	3	2,018	17,074	921
1824	32	79	111	35,013	1	761	9,871	534
1825	21	89	110	34,751	5	500	..	350
1826	5	90	95	30,414	5	512	7,200	400
1827	16	72	88	28,273	1	1,162	13,186	733
1828	14	79	93	28,665	3	1,197	13,966	802
1829	1	88	89	28,812	4	871	10,672	608
1830	..	91	91	29,396	19	161	2,199	119
1831	8	80	82	28,608	3	451	5,104	273
1832	19	62	81	26,393	5	1,563	12,610	676
1833	3	74	77	25,294	1	1,695	14,508	802
1834	7	69	76	24,955	3	872	8,214	442
1835	1	70	71	..	6	167	2,623	..
1836	3	58	61	..	2	70	707	..
1837	15	37	52	..	2	122	1,356	65
1838	31	8	39	..	1	466	4,345	236
1839	29	12	41	..	..	115	1,441	79
1840	11	20	31	..	2	22	412	14
1841	11	8	19	..	..	52	647	22
1842	14	4	18	..	..	54	668	..

8. *Southern Whale Fishery.*—This department of the whale fishery began to be prosecuted about the beginning of the American War; and was, for many years, carried on to a considerable extent. The ships engaged in it principally apply themselves to the catch of the *Physeter Macrocephalus*, or spermaceti whale; but large quantities of oil are also obtained from the common whale of the southern seas, and from the sea elephant, a species of marine animal, intermediate between the walrus of the northern seas and the seal. This fishery has, however, of late decreased very rapidly. During last year (1845) not a single vessel cleared out for it.

This decline is a consequence, partly of the growing scarcity of the whales in their old haunts, and of the greater difficulty experienced in their capture, but more of the competition of the Americans, and of the colonists in New South Wales and Van Diemen's Land. The situation of the latter gives them peculiar advantages for the prosecution of the fishery, which they now carry on to a great extent, and with much spirit and success.

9. *Value of British Fisheries.*—There are no means by which to form any accurate estimate of the total annual value of the different

fisheries belonging to Great Britain. It must, however, amount to a very large sum, though less, perhaps, than is commonly supposed. Sir John Barrow, in an article on the fisheries, in the new edition of the *Encyclopædia Britannica*, estimates their total value, including foreign as well as domestic, at 8,300,000*l.* a year; but there can be little doubt that this is a very great exaggeration. We are convinced that those who estimate the entire value of the fisheries at 4,000,000*l.* or 4,500,000*l.* a year, will not be within, but beyond the mark.

CHAPTER IV.—MANUFACTURES.

SECT. 1.—*Circumstances favourable to the Progress of Manufactures and Industry.*

THESE are partly of a moral and political, and partly of a physical description. Of the former class, the most important seem to be the security and free disposal of property; the absence of monopolies, and the non-interference of government in industrious undertakings the diffusion of knowledge amongst the people; the cordial reception of foreigners; and the emulation and energy inspired by inequality of fortune, and by the gradual increase of taxation: among the more prominent of the physical circumstances conducive to their progress are, supplies of the raw material used in manufactures, with the command of power, that is, of coals, waterfalls, &c. A good deal, also, of the progress of manufactures seems to depend on the advantageous situation of a country for commerce, and on the nature of its climate. We shall briefly notice some of the more prominent of these circumstances.

Moral Circumstances contributing to the Progress of Manufactures.

1. It would be unnecessary to take up the reader's time by enlarging on the necessity of security, and of the free disposal of property to success in manufacturing industry, or, indeed, in any laborious undertaking. Without security there cannot, in fact, be either industry or invention. No man will engage in any undertaking, or exert either his bodily or mental powers, unless he be well convinced that he will be allowed to reap all the advantages accruing from the exertion of his labour, skill, or genius. Any doubt as to this is sure to paralyse all his exertions. And if, owing to the weakness or ignorance of government, the prevalence of a revolutionary spirit, or any other cause, the security of property were materially impaired, all sorts of industrious undertakings, that did not promise an immediate return, would be forthwith abandoned, and every person possessed of property would endeavour to convey it out of the country. The want of security is, therefore, by far the greatest of all public calamities. Wherever it does not exist, we find nothing but the most abject poverty and barbarism; and, supposing other things to be equal, the wealth and civilization of nations will be pretty nearly proportioned to the degree of security they respectively enjoy. Every other circumstance con-

ducive to the advancement of industry may exist in a country; but without security these cannot be of any material service. A high degree of security will compensate for many deficiencies; whereas nothing can make up for its want: it is a *sine quâ non* of national prosperity.

2. The absence of monopolies, and the non-interference of the government in industrious undertakings, undoubtedly conduce in no ordinary degree to the progress of industry. Every man is always exerting himself to find out how he may best extend his command over the necessaries and conveniences of life; and sound policy requires that he should, so long as he does not interfere with the rights and privileges of others, be allowed to pursue his own interest in his own way. Human reason is, no doubt, limited and fallible; we are often swayed by prejudices, and are apt to be deceived by appearances: still, however, it is certain that the desire to promote our own purposes contributes far more than anything else to render us clear-sighted and sagacious.—"*Nul sentiment dans l' homme ne tient son intelligence éveillée autant que l' intérêt personnel. Il donne de l' esprit aux plus simples.*" The principle that individuals are, generally speaking, the best judges of what is most beneficial for themselves, is now universally admitted to be the only one that can be safely relied on. No writer of authority has, latterly, ventured to maintain the exploded and untenable doctrine, that governments may advantageously interfere to regulate the pursuits of their subjects. It is their duty to preserve order; to prevent one from injuring another; to maintain, in short, the equal rights and privileges of all. But it is not possible for them to go one step further, without receding from the principle of non-interference, and laying themselves open to the charge of acting partially by some, and unjustly by others.

The most comprehensive experience corroborates the truth of these remarks. The natural order of things has been less interfered with in Great Britain than in most other countries. Since the passing of the Act of James I., in 1624, for the abolition of monopolies, full scope has been given to the competition of the home producers; and, though the various resources of talent and genius have not been so fully, perhaps, or at least so early, developed as they would have been had there been no restrictions on our intercourse with foreigners, they have been stimulated in a degree unknown in most other countries. France, previously to the Revolution, was divided into provinces, having each peculiar privileges, and separate codes of revenue laws; and in consequence the intercourse between them was subjected to the most oppressive restrictions. In Germany and Spain the same miserable system prevailed; so that they were not only deprived of the freedom of foreign, but even of internal, commerce. The inhabitants of each province being in a great measure isolated from the rest, there was comparatively little competition; and instead of invention and active exertion, there was nothing but routine and sluggish indifference. Holland and the United States have been almost the only countries that have enjoyed the same degree of internal freedom as Great Britain; and the former, notwithstanding the unfavourable physical circumstances under which she is placed, has long been, and still is, the

richest country in Europe; while the latter, whose condition is in other respects more favourable, is advancing with giant steps in the career of improvement.

It is sometimes said, that restrictions on industry and commerce cannot be so injurious as has been represented, seeing the progress we have made notwithstanding they have always existed amongst us. The previous details show the weight to be attached to this allegation. The restrictions referred to have been confined to some branches of foreign trade; and, luckily, the freedom allowed to all sorts of industry at home would have insured our advance though the fetters laid on foreign trade had been a good deal more oppressive than they actually have been. But to imagine, as many have done, that these restrictions contributed to accelerate our progress, is the climax of absurdity. Their influence has, in every case, been distinctly and completely the reverse; but, though considerable, it has been insufficient to countervail the advantages resulting from the freedom we otherwise enjoyed.

3. The ability to read, and the diffusion of instruction among all ranks and orders of the people, by the general circulation of books and journals, the establishment of mechanics' institutes, &c., have had a material influence on the advancement of arts and industry. The circumstances in question have had the double advantage of multiplying the means and chances of improvement, and of preventing any invention or discovery, when made, from being engrossed by a few. An uninstructed people, though surrounded by all the means and capacities for the production and accumulation of wealth, being unable to apply them to any useful purpose, are necessarily poor and destitute; whereas an intelligent people, though placed in a comparatively unfavourable situation, never fail, by availing themselves of the powers and energies of nature, and making them subservient to their purposes, to become rich and prosperous. That "knowledge is power," is true in a physical as well as in a moral sense. The more familiar our acquaintance with, and the more complete our command over, natural agents, the greater, of course, must be our command over the necessaries and conveniences of life. In tracing the causes of our progress, it is not possible to appropriate to each the portion belonging to it of a result which is the joint effect of the whole united; but if this could be done, it would be found that no inconsiderable share is fairly ascribable to the extraordinary diffusion of scientific information amongst us.

4. For a lengthened period, the reception given to foreigners in England was anything but cordial. In most countries, indeed, not in an advanced state of civilization, strangers are uniformly the objects of popular dislike; and this feeling seems to have prevailed quite as much in England as anywhere else. But, notwithstanding the various legal disabilities laid on foreigners, and the ill-treatment they often experienced, their settlement here has been productive of the most advantageous results. The Flemings, invited over and protected by Edward III., gave the first great impulse to the woollen manufacture; and the immigrations from the Low Countries during the persecutions of the Duke of Alva, and from France subsequently to the revocation of

the Edict of Nantes, materially forwarded our commerce and manufactures. During the last century the prejudice against aliens lost much of its force; and several of the disabilities under which they formerly laboured have been removed. But, in all that respects the treatment of foreigners, our policy has been less liberal and enlightened than that of the Dutch. In Holland they have always been received with open arms; and a short residence in the country, and a small payment to the state, entitled them to all the privileges enjoyed by natives. The highest authorities agree, that this was one of the main causes of the extraordinary progress made by the republic in commerce and wealth. "It has always been our constant policy to make Holland a perpetual, safe, and secure asylum for all persecuted and oppressed strangers: no alliance, no treaty, no regard for, nor any solicitation of any potentate whatever has at any time been able to weaken or destroy, or make the state recede from protecting those who have fled to it for their own security and self-preservation. Throughout the whole course of all the persecutions and oppressions that have occurred in other countries, the steady adherence of the republic to this fundamental law has been the cause that many people have not only fled hither for refuge, with their whole stock in ready cash, and their most valuable effects, but have also settled and established many trades, fabrics, manufactures, arts, and sciences, in this country; notwithstanding the first materials for the said fabrics and manufactures were almost wholly wanting in it, and not to be procured but at a great expense from foreign parts." *

5. We incline to think that the great inequality of fortune that has always prevailed in this country has powerfully contributed to excite a spirit of invention and industry among the less opulent classes. It is not always because a man is absolutely poor that he is perseveringly industrious and economical; he may have already amassed considerable wealth; but he continues with unabated energy to avail himself of every means by which he may hope to add to his fortune, that he may place himself on a level with the great landed proprietors, and those who give the tone to society in all that regards expense. No successful manufacturer or merchant ever considers that he has enough till he be able to live in something like the same style as the most opulent persons. Those immediately below the highest become, as it were, a standard to which the class next to them endeavour to elevate themselves; the impulse extending, in this way, to the very lowest classes, individuals belonging to which are always raising themselves by industry, address, and good fortune, to the highest places in society. Had there been less inequality of fortune amongst us, there would have been less emulation, and industry would not have been so successfully prosecuted. It is true, that the desire to emulate the great and the affluent, by embarking in a lavish course of expenditure, is often prematurely indulged in, and carried to a culpable excess; but the evils thence arising make but a trifling deduction from the beneficial influence of that powerful stimulus which it gives to the inventive faculties, and to that desire to improve our condition, and to mount in the scale of society, which is

* *Proposals for amending the Trade of Holland*, printed by authority in 1756; Eng. ed. p. 12.

the source of all that is great and elevated. Hence we should disapprove of any system which, like the law of equal inheritance established in France, had any tendency artificially to equalize fortunes. To the absence of any such law, and the prevalence of customs of a totally different character, we are inclined to attribute a considerable portion of our superior wealth and industry.

6. We are also disposed to believe, how paradoxical soever such a notion may appear, that the taxation to which we have been subjected has, hitherto at least, been favourable to the progress of industry. It is not enough that a man has the means of rising in the world within his command; he must be placed in such a situation, that, unless he avail himself of them, and put forth all his energies, he will be cast down to a lower station. Now, this is what our taxation has effected: to the desire of rising in the world, implanted in the breast of every man, it superadded the fear of being thrown down to a lower place in society; and the two principles combined produced results that could not have been produced by either separately. Had taxation been carried beyond due bounds, it would not have had this effect. But, though considerable, its increase was not such as to make the contributors despair of being able to meet the sacrifices it imposed by increased skill and economy; and the efforts they made in this view were far more than sufficient for their object; and, consequently, occasioned a large addition to the public industry and wealth, that would not otherwise have existed.

II. *Physical Circumstances contributing to the Progress of Manufactures.*

1. Supplies of the raw material may be classed among the more prominent of this description of circumstances; and those who reflect on the nature, value, and importance of our manufactures of wool; of the useful metals, such as iron, tin, lead, copper, &c.; of leather, flax, and so on, will readily admit that our success in them has been materially facilitated by our possessing abundant supplies of the raw material. It is of less consequence, when the material of a manufacture possesses considerable value in small bulk, whether it be furnished from native resources, or be imported from abroad; though, even in that case, the advantage of having an internal supply, of which we cannot be deprived by the jealousy or hostility of others, is far from immaterial. But no nation can make any considerable progress in the manufacture of bulky and heavy articles, the conveyance of which to a distance necessarily occasions a large expense, unless she have supplies of the raw material within herself. Had we been destitute of iron ore, lead, and tin, we could never have distinguished ourselves by the magnitude and value of our manufactures of these articles. But any one who reflects on the signal advantage resulting to every branch of manufacturing industry from being able to procure abundant supplies of iron at the cheapest rate, will be convinced that we are under anything but slight obligations to our exhaustless stores of this mineral.

2. But of all the physical circumstances that have contributed to our extraordinary progress in manufactures and industry, none have had so

much influence as our possession of the most valuable coal mines. They have conferred advantages on us not enjoyed in an equal degree by any other country. Our extraordinary success in the manufacture of iron, copper, &c., is not owing so much to our possessing the ores, as to our possessing the coal, by the aid of which they have been smelted and refined. But the paramount importance of coal as a manufacturing agent has been principally manifested since the invention of the steam-engine. Without a cheap and abundant supply of fuel, the engine, as now constructed, would be of comparatively little use. It is, as it were, the hands; but coal is the muscles by which they are set in motion, and without which their dexterity cannot be called into action, and they are of no use. Our coal mines may be regarded as vast magazines of *hoarded* or *warehoused power*; and, unless some such radical change should be made on the steam-engine as should very decidedly lessen the quantity of fuel required to keep it in motion, or some equally serviceable machine, but moved by different means, be introduced, it is not at all likely that any nation should come into successful competition with us in those departments in which steam-engines, or machinery moved by steam, may be advantageously employed.

Since the introduction of the steam-engine, waterfalls have lost much of their value; and unless they be very favourably situated, and of a superior description, we no longer reckon them of any considerable importance.

3. The advantageous situation of the country for commerce, and the nature of its climate, have also powerfully contributed to the perfection of manufacturing industry. Owing to the facilities afforded by our insular situation for maintaining an intercourse with all parts of the world, our manufacturers have been able to obtain supplies of foreign raw materials on the easiest terms, and to forward their own products wherever there was a demand for them. Had we occupied a central internal situation in any quarter of the world, our facilities for dealing with foreigners being so much the less, our progress would have been comparatively slow. But being surrounded on all sides by the sea, that is, by the great highway of nations, we have been able to deal with the most distant as well as with the nearest people, and to profit by all the peculiar capacities of production enjoyed by each. With such advantages on our side, it would have been singular had we not shot ahead of most of our competitors in the race of improvement.

Our climate is peculiarly favourable for all sorts of exertion and enterprise; without being too severe, it is sufficiently so to render comfortable clothing and lodging indispensable; and, consequently, gives rise to wants that are either unknown, or less sensibly felt, in more genial regions. Its inequality, too, by requiring incessant care and attention on the part of the husbandmen, makes them vigilant and active, as well as industrious; and the qualities that are thus naturally impressed on this great class are, through their example, universally diffused.

Mr. Stevenson, in his valuable article on English statistics in the *Edinburgh Encyclopædia*, when enumerating the causes of our extraordinary success in manufactures, lays the greatest stress on the superiority of our machinery, the vast magnitude of our capital, and the

extent to which the division of labour is carried amongst us. But this is to mistake effects for causes. These are, in fact, the means by which and the modes in which manufacturing industry is carried on; and the real inquiry is, What are the circumstances that have rendered us so abundantly supplied with the former, and have enabled us to use them so efficiently?—We have endeavoured briefly to answer this inquiry, by stating what we believe to have been the most prominent causes of that extraordinary accumulation of capital, and of that employment of improved and powerful machinery, and subdivided labour, which mark our eminence as a manufacturing people. Still, however, we are inclined to think that a good deal must in these matters be ascribed to chance, or to some lucky accident. Had Hargreaves, Arkwright, Watt, or Wedgwood not existed, or been born abroad, it is impossible to say how much it might have affected the state of industry here: but there seem to be sufficient grounds for thinking that it would have been, at this moment, materially different from what it actually is. A good deal, too, depends on priority. A country, town, or district, that has already established and made a considerable progress in a manufacture, acquires, in consequence, an advantage that may enable it successfully to contend with competitors placed under what are naturally more favourable circumstances: its merchants are already in possession of the markets; its inhabitants, being trained to the business, have acquired that peculiar sleight of hand that is necessary to form expert workmen; and they are in this way frequently able to preserve their ascendancy for a lengthened period, and sometimes even to drive those from the field who have a preponderance of natural advantages on their side.

It seems to be the peculiar good fortune of England that, as respects all the great branches of manufacture, she has at once the advantages of priority and of acquired skill and dexterity on her side, as well as the natural advantages already noticed of abundant supplies of the raw material, of inexhaustible beds of coal, and of situation. Cotton is not an exception; for, though the raw material be the product of other countries, the freight upon it is not very considerable, and is but a trifling deduction from the other circumstances that seem to insure our superiority in this department.

To excel in machine making, is to excel in what is certainly the most important branch of manufacturing industry. Superiority in any single branch, except this, may exist simultaneously with great inferiority in many others; but eminence in the manufacture of machinery is almost sure to lead to eminence in every other department.

Mr. Stevenson has laid considerable, though not, as it appears to us, too much, stress on the practice generally adopted in Great Britain, of paying workmen, wherever it is practicable, by the piece, or by the work done, and not by the day. This system gives the workmen an interest in being industrious; and makes them exert themselves to execute the greatest quantity of work in the least space of time. And, in consequence of its prevalence, this practice materially influences even the day labourers; who, to avoid invidious comparisons, make exertions unknown in other countries. Hence, a given number of hands in Great Britain perform much more work than is executed by the same number of hands almost any where else: in fact, if we regard wages in

their proper light, that is, if we look upon them as a compensation for the quantity of work done, and not for the time spent in doing it, they will, we believe, be found to be cheaper in Great Britain than in most other countries.

Sect. 2.—*Woollen Manufacture.*

Rise and Progress of the Manufacture.—It has been pretty commonly supposed that the woollen manufacture was, for the first time, established in England in the reign of Edward III.; but, though the policy of that able prince contributed powerfully to its advancement, it certainly existed amongst us from the time of the Romans. There are notices in the statute book of "broad cloths 2 yards within the lists," more than 100 years before the date of the measures adopted by Edward III. for its improvement.

Owing to the suitableness of the soil and climate of England for the growth of sheep, the excellence of our wool, the demand for warm clothing, and the ingenuity of our people, it might be fairly presumed that we were, at an early period, distinguished by our proficiency in this manufacture. But, for several centuries after the Conquest, our ancestors were, in this respect, very far behind the Flemings; and, though there can be no doubt that a greater or less supply of coarser articles was always produced at home, it was customary, down to the 16th century, to carry large quantities of English wool to Flanders; whence were brought back in return, not only the finer descriptions of woollen cloths, but most part of the foreign products required for our consumption.

Though without any claim to be entitled its founder, Edward III. certainly did much for the improvement of the manufacture. He had a clear perception of the advantages resulting from the immigration of foreigners, as well by communicating a knowledge of the arts practised abroad, as in exciting a spirit of emulation and invention amongst the native population. Acting on this principle, Edward availed himself, in 1331, of some discontents existing among the Flemish manufacturers to invite them over to England. This invitation was accepted by a number of weavers, dyers, fullers, &c., who settled in different parts of the country, being protected by the vigorous policy of the king from the assaults of the rabble. From this early period down to the present day, the manufacture has always been regarded as of primary importance. In 1337, an Act was passed prohibiting the wear of any cloths made beyond seas; and it is supposed that the exportation of English wool was then also interdicted: but the words of the Act do not bear this interpretation; the exportation being prohibited only "*till it be otherwise ordered;*" that is, till measures were matured for subjecting it to a duty. In these unsettled and turbulent times prohibitory Acts were but little attended to, and the one now referred to was soon after repealed.—(*Smith's Memoirs of Wool*, vol. i. p. 32, and p. 39.) During the reign of Edward III., and for long after, the duties on exported wool formed a large branch of revenue; and, though the manufacturers were exceedingly anxious to have its exportation prohibited, and this was then believed to be good policy, they did not succeed in their object

till 1660; when, owing to the increase of industry and commerce, means were found for raising a sufficient revenue independently of the wool duties.

It may, however, be doubted, whether the benefit derived by the manufacturers from prohibiting the export of wool was not more apparent than real: it occasioned a material diminution of the growth of the article; and it is well known, that large quantities were at all times clandestinely exported. Mr. Smith, who has carefully investigated the early history of the manufacture, states, that it made a far more rapid progress during the reign of Elizabeth, when wool might be carried out of the kingdom, than it ever did during any equal period subsequent to the restriction on exportation. Foreign wool began to be imported in small quantities in the 13th century.

At first, the manufacture seems to have been pretty equally distributed over the country. In an insurrection that took place in 1525, more than 4,000 weavers and other tradesmen are said to have assembled out of Lancham, Sudbury, and other towns in Suffolk. The manufacture had been previously introduced into Yorkshire. In 1533, an Act was passed (34 and 35 Hen. VIII., c. 10), reciting, that "the city of York, afore this time, had been upholden principally by making and weaving of coverlets, and the poor thereof daily set on work in spinning, carding, dyeing, weaving, &c.;" that the manufacture, having spread into other parts, was "thereby debased and discredited;" and enacting as a remedy for this evil, that henceforth "none shall make coverlets in Yorkshire but inhabitants of the city of York!" This seems, indeed, to have been, at the time, a favourite principle of commercial legislation: for it was enacted, nearly at the same period, that the manufacture should be restricted, in Worcestershire, to Worcester and four other towns. Worsted goods, so called from Worsted, now an inconsiderable village in Norfolk, where the manufacture was first set on foot, were produced in the reign of Edward II., or perhaps earlier: but Norwich soon after became the principal seat of this branch of the manufacture: and continued to preserve its superiority, till it has been surpassed, within these few years, by Bradford and the contiguous district, in the West Riding of Yorkshire. In an Act of Henry VIII. (33 Hen. VIII., c. 16), worsted yarn is described as "the private commodity of the city of Norwich."

But, however objectionable, these statutes may be regarded, if compared with others enacted about the same period, as formed on tolerably sound principles. In proof of this, we may mention that the statute 5 and 6 Edward VI., c. 22, was framed for the express purpose of putting down machinery; while the statute 2 and 3 Philip and Mary, cap. 11, prohibits any *clothier* out of a borough, market town, or corporate town, from having more than *one* loom, and any *weaver* dwelling out of a city from having more than *two* looms; and it also prohibits any white woollen cloths being made, except where they had been made during the 10 preceding years. It further interdicts any one from setting up the trade of a weaver unless he have served a seven years' apprenticeship to the same; and no weaver dwelling out of a city is to have more than two apprentices at a time.

In 1614 an improvement took place in the woollen manufacture of the west of England, by the invention of what is called medley or

mixed cloth, for which Gloucestershire is still celebrated. But, in despite of this, there were, during the reign of Charles II., many, though probably exaggerated, complaints of the decay of the manufacture; and, by way of encouraging it, an Act was passed (30 Car. II., st. 1, c. 3), ordering that all dead bodies should be buried in woollen shrouds! This Act, the provisions of which were subsequently enforced, preserved its place in the statute book for more than 130 years!

Much has been said about the encouragement formerly afforded by the English legislature to the establishment of manufactures, but those who inquire into the matter will, we apprehend, agree with us in thinking that their chance of success would have been decidedly greater had they been left to shift for themselves, without any interference. The Acts specified above, and others of a similar description, confining the manufacture within certain limits, were early repealed; but those prohibiting the employment of machinery, and regulating the number of looms, kept their place on the statute book to a recent period, and opposed the most formidable obstacle to the progress and improvement of the manufacture. They were not, as may perhaps be supposed, allowed speedily to fall into disuse; on the contrary, their provisions were every now and then put in execution. So late as 1802 there were serious disturbances in Somersetshire and Wiltshire on account of the manufacturers setting up gig-mills, or machines for raising the nap on cloths, it being contended that they were proscribed by the Act of Edward VI.! Nor was the public rendered fully aware of the real nature and powerful influence of the Acts in question till the publication of the *Report on the Woollen Manufacture* by the Commons' Committee in 1806. Hence, notwithstanding all the circumstances favourable to the manufacture in England, and which, had it been let alone, would have insured its rapid advancement, it was long in a very backward and depressed state. The Dutch and Flemings retained a decided superiority over the English till the end of the 17th century. It was not, indeed, till 1668, when some immigrants from Flanders settled in England, that we succeeded in producing any of the finest cloths, or those made entirely of Spanish wool, without the admixture of any wool of an inferior quality.—(*Memoirs of Wool*, vol. i., p. 229, &c.)

The statute of Edward VI., for the discouragement of machinery, seems, combined no doubt with other circumstances, to have been as completely successful as any one of its promoters could have desired. "From the most remote period of the woollen manufacture, until the latter end of the last century, or about the year 1780, very few, if any, mechanical improvements had been introduced into it. During the whole time the various processes were carried on nearly in the same manner, but with greater or less skill, and were employed upon materials more or less valuable. The carding and spinning of wool, and the weaving and finishing of cloth, in the early part of the reign of George III., were effected by the same machines as in the reign of Edward III., which, probably, were similar to those of the ancient Romans, but more rude in their construction. In an art which had seen so many centuries roll on without any change, it did not appear possible to the manufacturer that any improvement could be effected;

and had not the genius of Hargreaves and Arkwright changed entirely the modes of carding and spinning cotton, the woollen manufacture would probably have remained at this day what it was in the earliest ages of civilized society."—(*Rees's Cyclopædia*, article "Woollen Manufacture.")

But the astonishing improvements made in the cotton trade roused, at length, the dormant energies of the woollen manufacturers, and stimulated them to make something like corresponding efforts. In consequence, machinery began, in the interval between 1785 and 1800, to be everywhere employed in the carding and spinning of wool, until the performance of these processes by hand-cards and spinning-wheels was wholly abandoned. The repeal of the Acts of Edward VI. and of Philip and Mary, in 1807, paved the way for the general introduction of gig-mills, shearing-mills, brushing-mills, &c.

The power-loom is, as yet, but little introduced into the cloth trade, and is employed only in weaving the finer description of goods. This is supposed to be owing to the loose way in which the yarn is spun, which, while it facilitates the process of felting, makes it unsuitable for the power-loom.—(*Report on Yorkshire*, Factory Commission, c. i., p. 168.)

Towards the end of the 17th century, Mr. Gregory King and Dr. Davenant (*Davenant's Works*, Whitworth's ed., vol. ii., p. 233) estimated the value of the wool shorn in England at 2,000,000*l.* a-year; and they supposed that the value of the wool (including that imported from abroad) was quadrupled in the manufacture; making the entire value of the woollen articles annually produced in England and Wales 8,000,000*l.*, of which about 2,000,000*l.* was exported. In 1700 and 1701, the official value of the woollens exported amounted to about 3,000,000*l.* a-year. Owing to the vast increase in the wealth and population of the country, the manufacture must have been very greatly extended during the last century; but the increase in the amount of exports was comparatively inconsiderable. At an average of the 6 years ending with 1789, the annual official value of exports was 3,544,160*l.* a-year, being an increase of only about 540,000*l.* on the amount exported in 1700. The extraordinary increase of the cotton manufacture soon after 1780, and the extent to which cotton articles then began to be substituted for those of wool, though unaccompanied by any absolute decline of the woollen manufacture, no doubt contributed to check its progress. In 1802 the official value of the exports rose to 7,321,012*l.*, being the largest amount they ever reached till 1833, when they amounted to 7,788,842*l.* In consequence of the revulsion in the trade with the United States, the exports of woollens declined considerably in 1837 and 1838. But a depression arising from such a cause could be temporary only; and the declared value of the exports during the three years ending with 1845 has exceeded that of the exports of any previous period of equal duration. The declared or real values of the woollen manufactures exported from the United Kingdom since 1818 are shown in one of the annexed returns.

The subjoined account shows the quantity and value of the British woollen manufactures exported in 1844, and their distribution. It sets the importance of the market of the United States in a very striking point of view:—

Account of the Quantities and Values of the different Descriptions of British Wool, Woollen and Worsted Yarn, and Woollen Manufactures Exported from the United Kingdom in 1844, specifying the Quantities and Values of those sent to different Countries.

Countries to which Exported.	Wool, Sheep's and Lambs'.		Woollen and Worsted Yarn.		Woollen Manufactures.						Total Value.
					Entered by the Piece.		Entered by the Yard.		Hosiery and Small Wares		
	Quantity.	Declared Value.	Quantity.	Declared Value.	Quantity.	Declared Value.	Quantity.	Declared Value	Declared Value.		
	lbs.	£.	lbs.	£.	Pieces.	£	Yards.	£.	£.		£.
Russia	..	..	731,091	105,046	26,822	40,624	98,228	7,130	681		152,431
Sweden	..	..	15,978	1,551	15,948	19,467	13,780	972	344		22,334
Norway	..	..	2,163	301	6,880	17,096	79,081	3,906	1,444		22,839
Denmark	..	..	1,404	151	621	1,290	6,610	332	166		1,929
Prussia	..	..	6,055	821	996	1,923	2,145	267	9		2,997
Germany	13,927	933	4,614,745	516,786	591,780	821,579	3,536,697	190,124	19,870		1,549,292
Holland	240,750	13,263	1,652,890	165,890	223,307	363,199	391,320	36,564	3,998		567,854
Belgium	6,962,572	439,267	494,672	54,476	97,966	160,895	500,763	56,479	3,987		695,304
France	1,685,899	99,102	365,685	77,403	54,501	104,771	1,331,187	79,433	3,686		364,455
Portugal, Propr.	500	75	5,479	574	51,474	161,448	84,832	7,015	2,532		171,589
Spain and the Balearic Islands	336	25	20,591	2,413	31,226	70,794	63,281	7,283	769		81,489
Gibraltar	..	..	14,332	1,256	60,708	102,582	387,530	14,316	2,025		120,179
Italy, and the Italian Islands	..	..	78,202	8,264	160,765	232,216	1,468,570	91,057	8,733		340,260
Malta	..	..	48	5	6,525	17,565	21,649	1,599	1,435		20,604
Turkey	1,549	190	61	12	33,962	73,183	179,230	10,734	1,379		85,522
Egypt	..	..	..	.	1,703	4,250	1,791	233	117		4,600
Western Coast of Africa	..	..	552	120	3,254	5,474	2,457	184	1,461		7,245
Cape of Good Hope	..	..	..	.	17,478	35,347	167,916	9,401	2,585		47,333
St. Helena and Ascension Islands	..	..	20	2	152	634	614	80	29		745
Mauritius	..	..	..	..	4,939	10,622	124,650	3,779	256		14,457
East India Company's Territories and Ceylon	200	16	872	134	128,184	365,772	501,176	41,012	11,859		418,793
China	..	..	..	..	209,985	558,567	68,786	6,102	669		565,423
British Australian Colonies	..	..	96	50	12,807	35,134	354,651	23,379	7,009		65,572
—— North American Colonies	108	6	34,855	2,531	183,773	376,546	2,066,628	118,512	39,339		538,934
—— West Indies	..	..	112	5	24,433	52,360	346,425	18,902	7,428		78,695
Cuba and other Foreign West Indian Colonies	..	..	224	27	20,635	55,734	244,684	14,811	3,250		73,822
United States of America	140,317	1,222	152,367	17,959	621,240	1,401,471	11,976,772	917,507	125,811		2,463,970
Mexico	..	..	..	..	20,952	67,304	437,004	24,464	666		92,524
New Granada, Venezuela, and Equador	..	..	..	..	7,406	25,703	29,698	2,583	411		28,697
Brazil	..	..	118	16	79,029	230,141	481,703	35,394	3,389		268,940
States of Rio de la Plata	..	..	..	..	42,136	155,748	268,522	22,479	6,730		184,957
Chili	..	..	..	..	47,999	175,013	337,549	23,462	2,866		206,341
Peru and Bolivia	..	..	..	..	43,733	230,291	307,533	29,907	3,050		263,248
The Channel Islands	1,400	85	23,411	2,355	9,601	34,648	229,172	14,631	2,060		53,749
All other Places	..	..	333	56	18,150	44,723	98,698	6,266	1,229		52,279
Total	8,947,619	585,134	8,271,906	958,217	2,864,787	6,104,696	26,940,170	1,624,308	275,332		9,598,187

Imports of Foreign Wool.—We have already seen (*ante*, p. 505) that the entire produce of British and Irish wool may be estimated at about 540,000 packs of 240 lbs. each. But, exclusive of this, we use large supplies of foreign wool, English wool not being suitable, at least without an intermixture of foreign, for various departments of the manufacture. Formerly the principal part of our imports came from Spain; but the late King of Saxony, when elector, introduced the breed of Merino sheep into his dominions, and exerted himself to promote their growth. His praiseworthy efforts were crowned with the most signal success. The Merino sheep seem to succeed better in Saxony, and other German States, than in Spain; and, since the peace of 1815, the imports from the latter have been inconsiderable, compared with those from the former. The Australian colonies, also,

An Account of the Quantities and Declared Value of British Woollen Manufactures Exported from the United Kingdom in the Year 1851, *specifying the Countries to which they were sent.*

Countries to which Exported	Cloths of all Sorts	Napped Coatings, Duffels, &c	Kersey-mere.	Baizes of all Sorts	Stuffs, Woollen or Worsted	Flannel	Blankets and Blanketing	Carpets and Carpeting.	Woollens, mixed with Cotton	Hosiery, viz. Stockings, Woollen or Worsted.	Sundries; consisting of Rags, Coverlids, Tapes, Small Wares, &c.	Total Declared Value of Exports.
	Pieces	Pieces	Pieces.	Pieces.	Pieces.	Yards	Yards.	Yards	Yards	Dozen Pairs.	£.	£.
Russia	338	..	77	3	7,243	2,680	8,471	20,568	70,575	259	2,854	34,910
Sweden	197	..	47	2	29,271	1,092	2,796	11,027	11,079	32	1,467	41,889
Norway	1,230	..	46	55	13,404	14,427	1,292	1,456	44,344	205	2,722	32,414
Denmark	1,537	29	27	110	7,565	5,166	4,056	5,550	122,341	27	798	23,745
Hanseatic Towns	14,057	80	447	446	456,505	441,571	40,884	188,174	3,793,673	524	21,497	915,705
Holland	4,754	63	322	2,108	185,202	96,521	726	115,244	1,645,485	2,736	6,867	403,157
Belgium	839	16	517	4	66,967	19,014	798	35,960	700,634	991	2,781	155,318
Channel Islands	3,447	..	312	101	2,643	92,243	23,693	29,632	81,153	1,499	2,215	54,563
France	2,564	25	321	118	32,147	12,115	745	46,697	738,809	342	3,077	122,409
Portugal, Azores, and Madeira	14,190	12	381	1,080	21,752	25,679	2,956	6,221	354,772	565	954	143,357
Spain and the Canaries	1,256	4	176	211	20,715	7,576	4,341	56,916	95,525	33	985	64,474
Gibraltar	1,712	..	78	9	12,893	11,878	520	8,343	65,099	696	1,440	29,051
Italy	16,097	47	356	98	131,950	36,458	15,191	100,926	5,164,512	18,660	5,498	469,322
Malta	1,456	..	9	..	3,377	4,305	3,979	5,696	98,651	945	530	20,155
Ionian Islands	657	..	..	2	2,272	9,916	946	709	66,055	994	258	9,296
Turkey, Syria, Palestine, and Egypt	2,248	1	18	79	25,877	11,359	5,008	30,065	598,880	4,146	2,594	75,766
Wallachia and Moldavia	544	..	..	2	1,546	..	..	3,702	123,079	300	161	7,166
Syria and Palestine	655	..	..	..	6,264	890	60	1,870	27,376	45	676	9,302
Egypt	379	..	12	..	5,975	5,140	150	7,115	80,159	281	482	14,894
British Possessions in South Africa	4,302	204	728	443	14,688	114,684	105,009	8,555	90,425	514	4,170	65,462
Mauritius	359	2	2	..	2,037	19,176	1,880	1,682	44,777	42	287	9,575
British Territories in the East Indies	50,227	290	351	132	30,840	232,681	23,564	10,606	526,892	2,952	13,264	315,902
Java	949	..	17	..	6,675	7,760	5,600	148	77,960	..	227	12,056
Philippine Islands	1,071	..	..	..	5,289	5,870	2,050	135	15,000	30	94	10,406
China	44,103	..	77	22	103,376	9,066	7,880	3,038	29,577	355	962	374,648
British Settlements in Australia	9,307	175	704	399	46,844	336,603	609,354	93,475	778,311	21,268	14,921	258,097
British North American Colonies	52,654	85	1,220	891	136,497	1,457,862	428,105	304,263	5,639,154	20,820	22,650	747,021
British West Indies	4,827	21	189	188	20,056	102,597	79,532	5,084	393,847	2,565	3,707	78,573
Foreign West Indies	4,329	..	6	20	21,599	11,624	136,991	11,460	283,062	2,348	2,243	70,549
United States of America	146,292	352	1,329	3,561	419,880	220,171	3,104,678	472,121	32,155,231	83,512	51,175	2,437,061
Mexico	10,094	..	8	..	11,913	8,255	..	4,065	263,710	252	1,182	60,727
Central America	1,627	..	15	..	3,755	..	3,840	320	321,664	462	152	23,282
New Granada	3,484	..	160	..	3,680	434	1,944	1,845	17,710	125	174	20,271
Venezuela	3,412	..	..	..	2,723	3,578	22,946	255	36,703	348	140	24,714
Brazil	63,555	60	540	3,288	60,508	11,569	206,919	34,276	1,101,484	1,564	5,143	446,049
Uruguay	9,150	..	93	..	7,027	800	3,566	16,730	195,453	100	1,258	69,672
Buenos Ayres	17,641	..	3	..	12,487	..	4,499	17,611	210,331	1,305	3,148	141,644
Chili	24,034	..	2,707	1,075	26,593	16,244	12,845	98,964	928,563	7,136	1,137	244,816
Peru	26,262	..	632	120	28,616	1,988	2,440	51,752	635,836	1,037	1,403	285,086
All other places	3,894	6	26	194	6,787	10,529	22,615	6,523	41,550	2,151	3,156	38,952
Total	562,181	1,472	11,953	20,864	2,034,930	3,361,584	5,706,965	1,814,284	58,318,528	192,176	188,371	8,377,188

have risen, with an all but unprecedented rapidity, to the highest importance as wool-growing countries. We subjoin an

Account of the Quantities of Sheep and Lambs' Wool, Foreign and Colonial, Imported into the United Kingdom, in the Year 1851, *distinguishing the Countries from which they came, and the Quantities brought from each.*

Imports.	Sheep and Lambs' Wool, Foreign and Colonial.	Imports.	Sheep and Lambs' Wool, Foreign and Colonial.
From	lbs.	From	lbs.
Russia, Northern Ports	584,067	Morocco	967,040
,, Ports within the Black Sea	5,312,139	British Possessions in South Africa	5,816,591
Denmark, including Iceland	1,657,910	British Territories in India	4,549,520
Prussia	42,211	China	69,546
Hanseatic Towns	8,216,020	West Australia	368,595
Holland	142,082	South Australia	3,392,603
Belgium	496,783	New South Wales	14,772,132
France	908,314	Victoria	17,269,521
Portugal Proper	2,356,622	Van Diemen's Land	5,198,083
Spain	383,150	New Zealand	809,203
Gibraltar	448,120	United States of America	594,017
Italy, viz., Sardinian Territories	14,956	Brazil	179,946
,, Tuscany	408,157	Buenos Ayres or Argentine Republic	853,194
,, Papal Territories	158,534	Chili	129,221
,, Naples and Sicily	220,436	Peru	1,675,644
,, Austrian Territories	495,804	All other places	45,135
Malta	181,255		
Turkish Dominions, including Wallachia and Moldavia	831,240	Total	81,298,793
Egypt, Syria, and Palestine	1,748,602		

Re-Exports.	All Sorts.	Re-Exports.	All Sorts.
To	lbs.	To	lbs.
Russia	28,402	France	1,496,811
Sweden	285,533	Italy	190,317
Norway	14,000	United States of America	2,029,968
Hanseatic Towns	800,632	Other places	47,170
Holland	1,100,483		
Belgium	7,718,407	Total	13,711,723

In 1852 the imports and re-exports of the different varieties of wool and woollen manufactures were as follows:—

		Imports.	Re-Exports.
Wool, Beaver	lbs.	56	12
,, cut and combed	,,	42	. .
,, Coney	,,	6,507	50
,, Hares	,,	12	. .
Wool or Hair, Goats'	,,	2,564,330	71,734
Wool, Sheep and Lambs'	,,	91,692,864	11,266,939
,, Alpaca and the Llama Tribe	,,	2,068,594	49,994
Woollen Manufactures, not otherwise described	value	£655,049 10s.	£35,659

Return of the Rates of Duty chargeable on Foreign and Colonial Wool, the Quantities thereof Imported, the Prices of Southdown and Kent Long Wool, and the Declared Value of British Woollen Manufactures Exported in each Year, from 1818 *to* 1845.—(Parl. Paper, No. 109, Sess. 1846, amended.)

Years.	Rates of Duty.	Foreign Wool Imported.	Colonial Wool Imported.	Total Wool Imported.	Price of South-down.	Price of Kent Long.	Declared Value of Exports.		
							Woollen and Worsted Yarn.	Woollen Manufactures	Total.
		lbs.	lbs.	lbs.	per lb. s. d.	per lb s. d	£.	£.	£.
1818	¾d. per lb.	24,720,139	. .	. .	2 6	2 0	. .	8,145,337	. .
1819	6d. per lb.	16,044,499	. .	. .	1 7	1 3	. .	5,989,623	. .
1820	. .	9,653,366	122,237	9,775,605	1 3	1 4	. .	5,586,138	. .
1821	. .	16,416,906	205,761	16,622,567	1 3	1 1	. .	6,402,866	. .
1822	. .	18,859,365	198,815	19,058,080	1 3	0 11	. .	6,488,167	. .
1823	. .	18,963,686	502,839	19,366,725	1 3½	1 0	. .	5,636,586	. .
1824	Dec 1824: 1d. per lb of 1s. value . . ½d. per lb under 1s value .	22,147,540	416,945	22,564,485	1 2	1 1	. .	6,043,051	.
1825	Colonial free	43,465,282	351,684	43,816,966	1 4	1 4	. .	6,165,648	. .
1826	. .	14,747,103	1,242,009	15,989,112	0 10	0 11	. .	4,966,979	. .
1827	. .	28, 52,742	562,5 2	29,115,341	0 9	0 10½	. .	5,245,649	. .
1828	. .	29,628,121	1,607,938	30,236,059	0 8	1 0	. .	5,068,741	. .
1829	. .	19,639,620	1,877,020	21,516,649	0 6	0 9	. .	4,587,603	. .
1830	. .	30,304,173	2,002,141	32,305,314	0 10	0 10½	. .	4,728,666	. .
1831	. .	29,110,073	2,541,536	31,652,029	1 1	0 10½	156,111	3,211,013	3,389,124
1832	. .	25,691,2 8	2,461,191	28,142,489	1 0	1 0½	235,307	5,244,479	5,479,786
1833	. .	34,461,427	3,614,986	38,076,413	1 5	0 10½	246,204	6,294,522	6,540,726
1834	. .	42,644,932	3,770,300	46,455,232	1 7	1 7½	238,544	5,736,871	5,975,415
1835	. .	37,472,032	4,702,500	42,174,532	1 6	1 6	300,091	6,840,511	7,140,602
1836	. .	57,814,771	6,425,206	64,239,977	1 8	1 8½	358,690	7,639,354	7,998,044
1837	. .	38,945,575	9,434,153	48,379,728	1 3	1 3	383,098	4,655,977	4,989,075
1838	. .	42,430,102	10,164,253	52,594 355	1 4	1 5	384,535	5,795,061	6,179,604
1839	. .	44,504,811	12,973,112	57,479, 23	1 4	1 5½	422,420	6,271,645	6,694,065
1840	. .	36,491,168	12,956,116	49,456,284	1 3	1 2½	452,957	5,327,953	5,780,910
1841	. .	39,672,153	16,498,921	56,170, 74	1 0	0 11	552,148	5,748,673	6,300,821
1842	. .	27,394,920	18,486,719	45,881,639	0 11½	0 10	637,805	5,185,045	5,822,350
1843	. .	26,633,913	21,151,148	47,785,061	0 11½	0 11	742,888	6,790,232	7,538,120
1844	From June 6, free .	42,473,228	22,606,296	65,079,524	1 2	1 2	956,217	8,204,336	9,163,053
1845	. .	44,970,798	31,843,062	76,813,855	1 4	1 3	1,066,925	7,693,118	8,760,043

The imports of all sorts of wool amounted in 1847 to 62,592,598 lbs., in 1848 to 70,864,847 lbs., in 1849 to 76,768,647 lbs., and in 1850 to 72,674,483 lbs.

Prices of Southdown Fleeces in the Month of July, in each Year, from 1846 *to* 1853, *both inclusive, per Pack of* 240 *lbs.*

Years.	Average Quality, such as the Growths of Surrey, Essex, Hertfordshire, &c.					
	Ewe and Wether.			Teg Fleeces.		
	£. s. d.			£. s. d.		
1846	11 10 0	per pack.		13 10 0	per pack.	
1847	11 10 0	,,		12 10 0	,,	
1848	9 0 0	,,		10 0 0	,,	
1849	10 0 0	,,		11 0 0	,,	
1850	11 0 0	,,		12 0 0	,,	
1851	10 10 0	,,		12 0 0	,,	
1852	12 10 0	,,		14 0 0	,,	
1853	16 0 0	,,		17 0 0	,,	

Years.	Superior Quality, such as the Growths of Sussex, Wiltshire, part of Kent, &c.					
	Ewe and Wether.			Teg Fleeces.		
	£. s. d.			£. s. d.		
1846	12 10 0	per pack.		14 10 0	per pack.	
1847	12 10 0	,,		13 10 0	,,	
1848	10 0 0	,,		11 0 0	,,	
1849	11 0 0	,,		12 0 0	,,	
1850	12 0 0	,,		13 0 0	,,	
1851	11 10 0	,,		13 0 0	,,	
1852	13 10 0	,,		15 0 0	,,	
1853	17 0 0	,,		18 0 0	,,	

Value of the Manufacture.—Number of Persons employed.—The most discordant estimates have been given as to both these points. For the most part, however, they have been grossly exaggerated. In a tract published in 1739, entitled *Considerations on the Running* (*Smuggling*) *of Wool*, the number of persons engaged in the manufacture is stated at 1,500,000, and their wages at 11,737,500*l.* a-year. Dr. Campbell, in his *Political Survey of Great Britain*, published in 1774, observes, "Many computations have been made upon this important subject, and, amongst others, one about 30 years since, which, at that time, was thought to be pretty near the truth. According to the best information that can be obtained, there may be from 10,000,000 to 12,000,000 sheep in England, some think more. The value of their wool may, one year with another, amount to 3,000,000*l.*; the expense of manufacturing this may probably be 9,000,000*l.*, and the total value 12,000,000*l.* We may export annually to the value of 3,000,000*l.*, though one year we exported more than 4,000,000*l.* In reference to the number of persons who are maintained by this manufacture, they are probably upwards of 1,000,000. Sanguine men will judge these computations too low, and few will believe them too high."—(Vol. ii., p. 158.) But the moderation displayed in this estimate was very soon lost sight of. In 1800 the woollen manufacturers objected strenuously to some of the provisions in the treaty of union between Great Britain and Ireland, and were allowed to urge their objections at the bar of the House of Lords, and to produce evidence in their support. Mr. Law (afterwards Lord Ellenborough), the counsel employed by the manufacturers on this occasion, stated, in his address to their lordships, on information communicated to him by his clients, that 600,000 packs of wool were annually produced in England and Wales, worth, at 11*l.* a pack, 6,600,000*l.*; that the value of the manufactured goods was three times as great, or 19,800,000*l.*; that not less than 1,500,000 persons were immediately engaged in the operative branches of the manufacture; and that the trade collaterally employed about the same number of hands.—(*Account of the Proceedings of the Merchants, Manufacturers, &c.*, p. 34.)

It is astonishing that reasonable men, conversant with the manufacture, should have put forth such ludicrously absurd statements. We have already seen that the quantity of wool produced in England and Wales in 1800 did not really amount to 400,000 packs; and the notion that *three* out of the *nine* millions of people then in the country were directly and indirectly employed in the manufacture is too ridiculous to deserve notice, though it was generally acquiesced in at the time.—(See *Middleton's Survey of Middlesex*, 2nd ed., p. 644; *Adolphus's Political State of the British Empire*, vol. iii., p. 236.)

Mr. Stevenson, who is one of the very few writers on British statistics to whose statements much deference is due, has given the following estimate of the value of the woollen manufactured goods annually produced in England and Wales, and of the interest, &c., of the capital, the wages, and the number of persons employed in the manufacture:—

Total value of manufactured articles		£18,000,000
Value of raw material	£6,000,000	
Interest on capital, sum to replace its wear and tear, and manufacturers' profits . . .	2,400,000	
Wages of workmen	9,600,000	
		£18,000,000

Number of people employed, 480,000, or, perhaps, 500,000.

But even this estimate requires to be materially modified. Taking Scotland into account, and allowing for the increase of population and of exportation since Mr. Stevenson's estimate was made, the total value of the various descriptions of woollens annually produced in Great Britain may, at present, be moderately estimated at from 25,000,000*l.* to 27,000,000*l.*, or 26,000,000*l.* at a medium. We have further been assured by high practical authorities, that Mr. Stevenson's distribution of the items is essentially erroneous; and that assuming the value of the manufacture to be 26,000,000*l.*, is made up nearly as follows:—

Total value of manufactured articles		£26,000,000
Raw material, 110,000,000 lbs. British wool, at 1*s.* 3*d.* per lb., and 60,000,000 do. Foreign, at 2*s.*	£12,875,000	
Wages	7,725,000	
Oil, dye stuffs, soap, &c.	1,200,000	
Profits, sum to replace wear and tear of capital, &c.	4,200,000	
		£26,000,000

At present, the average wages of the people employed may be taken at about 24*l.* a-year, making the total number employed 322,000. And, however small this may look as compared with former estimates, we believe it is fully up to the mark, if not rather beyond it.

Most of the innumerable statutes formerly passed for the regulation of the different processes of the manufacture have been repealed within these few years, and the sooner every vestige of the remainder disappears from the statute book the better.

Notwithstanding the carding engine, the spinning frame, the gig or raising machine, the shearing machine, brushing machine, &c., have been mostly introduced since 1790, it is the opinion of some well-informed manufacturers that as many hands are at present required to produce the same quantity of cloth as at the last-mentioned epoch. This result, so different from what might be expected, is accounted for by the fact that a great deal more work is now expended upon the cloth, the appearance of which has been vastly improved.

In 1793, cloth of a *medium quality*, worth at the time about 13*s.* a yard, was made of the best English wool. In 1815, middling cloth was made of Spanish wool, and cost 16*s.* or 17*s.* a yard; while in 1832 similar cloth made of German, and cost about 12*s.* a yard; but, owing to the improvement of the manufacture, cloth produced in 1832, though not actually finer than that produced in 1793, had a great deal better appearance, so much so that we have been assured by undoubted judges that cloth worth only 10*s.* a yard in the former year looked quite as well as cloth worth 13*s.* in the latter. The deterioration in the quality of English wool, occasioned by the farmers having laboured

to increase the carcass, though at the expense of the fleece, is the reason that it is now seldom used, unless mixed with foreign wool in the manufacture of the finer cloths.—(*Private Information.*)

Distribution of the Manufacture.—Factory and Domestic Systems, &c.—The principal seats of that branch of the manufacture which is especially denominated *woollen* are the West Riding of Yorkshire, and the counties of Gloucester, Wilts, and Somerset. *Worsteds* used to be principally manufactured in Norfolk, but they are now produced at Bradford, Halifax, and Leeds, but especially the first, to a far greater extent than in Norfolk. *Stockings* are mostly made in Leicestershire.

The manufacturing district of the West Riding of Yorkshire, which, with the exception of that of Lancashire, is by far the most important of any in the kingdom, extends from north to south about 40 miles, its mean width being about 20 ditto, including an area of nearly 800 square miles; but this space comprises the hardware manufacturing district contiguous to Sheffield, as well as the clothing district. The latter commences below Craven, and extends over a tract of which Leeds, Bradford, Halifax, Huddersfield, and Wakefield, are the principal centres. Cloth is the chief article manufactured in this district, the greater part being made in the neighbourhood of Leeds, Wakefield, Huddersfield, and Saddleworth. Leeds, in particular, is the grand mart for coloured and white broad cloths. The former, which are usually called *mixed cloths*, are made wholly of dyed wool. The mixed cloth manufacturers reside partly in the villages belonging to the parish of Leeds, but chiefly at Morley, Gildersome, Adwalton, Driglington, Pudsey, Farsley, Calverley, Eccleshill, Idle, Baildon, Yeadon, Guiseley, Rawdon, and Horsforth, in or bordering upon the vale of the Aire, principally to the west of Leeds; and at Batley, Dewsbury, Osset, Horbury, and Kirkburton, west of Wakefield, in or near the valley of the Calder. Few mixed cloth manufacturers are to be found to the east and north of Leeds, and there are but few in the town itself. White cloth is principally manufactured at Alverthorpe, Osset, Kirkheaton, Dewsbury, Batley, Birstal, Hopton, Mirfield, Eccleshill, Cleckheaton, Bowling, and Shipley, a tract of country forming an oblique belt across the hills that separate the vale of the Calder from the vale of the Aire, beginning about a mile west of Wakefield, leaving Huddersfield and Bradford a little to the left, terminating at Shipley on the Aire, and not coming within less than 6 miles of Leeds on the right. The districts of the mixed and white cloth are in general distinct and separate, but in some places, particularly at their south-east and south-west extremities, they run into each other. Flannels and baizes are the principal woollen articles manufactured in and near Halifax; but cloth is also largely made. The blanket and flushing line lies between Leeds and Huddersfield. Worsted spinning is carried on upon a very large scale, and to the exclusion of almost everything else, at Bradford; stuffs being made in its vicinity, and in Halifax and Leeds. Narrow cloths are made in and near Huddersfield. Saddleworth furnishes broad cloths of nearly equal fineness to those of the west of England, with kerseymeres, &c. White cloths are made at Wakefield; but it is principally distinguished by its wool-market, and the superior

skill of its cloth-dyers. Dewsbury is at the head of what is called the *shoddy* trade. Refuse woollen rags, brought from all quarters of the kingdom and from foreign countries, are collected here, and, having been subjected to various processes, torn to pieces, and reduced to their original state of wool, by the aid of powerful machinery, they are re-spun, and again made into cloth. Formerly, shoddy cloth was used only for padding and such like purposes; but now flushings, druggets, carpets, and table covers, cloth for pilot and Petersham great coats, &c., are either wholly or partly made of shoddy. The clothing of the army and the greater part of that of the navy, consists principally of the same material, which, in fact, is occasionally worn by everybody. Large quantities of shoddy cloth are exported. Great improvements have recently been effected, not only in the fabric of the cloth, but also in the dyes; this is especially seen in the cloth for soldiers' uniforms, which is no longer of a brick-dust colour, but makes a much nearer approach to scarlet. The beautiful woollen table cloths are made wholly of shoddy, being printed by *aquafortis*, from designs drawn in London and Manchester, and cut on holly and other blocks on the spot. The whole trade, in fact, is one of the greatest triumphs of art and civilization: it is of comparatively recent origin, and is rapidly extending itself. It is most active in summer, and is comparatively dead in winter. Between 2,000 and 3,000 men, women, and boys are engaged in the trade in Dewsbury and its vicinity. No power-looms are employed in the manufacture.

Rochdale, in Lancashire, may be almost considered as forming a part of the woollen district of the West Riding, to which it is contiguous; being, in fact, within the parish of Saddleworth. Its manufactures consist principally of baizes, flannels, kerseys, and broad cloths. They are very extensive, and employ a great number of hands.

It is impossible accurately to ascertain the proportion which the woollen manufacture of Yorkshire bears to that of the rest of the kingdom; but we have been assured, by those well qualified to give an opinion on such a point, that it is from a half to two-thirds of the whole; and this statement seems to be completely borne out by the returns obtained from the factory inspectors. From these it appears that, of 1,179 woollen (ex-worsted) factories, employing 48,500 work-people, at work in England in 1839, 543 factories and 26,180 individuals belonged to the West Riding.

Halls have been established for the sale of cloth at Leeds, Halifax, Bradford, Huddersfield, &c., which are attended, on the public market-days, by thousands of the smaller class of manufacturers. These halls are divided into long walks or galleries, consisting of two rows of stands, each of which is marked with the name of the individual to whom it belongs, or by whom it is occupied. On these the cloth is exposed for sale; and, when the market opens, the manufacturers take their stations at the stands behind their goods; the merchants, or buyers, passing to make their purchases through the avenues between the rows. The time during which the halls are open is limited usually to an hour or an hour and a half; and, during that brief period, purchases to a very large extent are often completed. At Leeds there

are two large halls: that for mixed cloth was erected in 1758, and has about 1,800 stands: the white cloth hall is of later construction, having been built in 1775; it has 1,200 stands. These halls are appropriated exclusively to the use of those who have served regular apprenticeships to the business of cloth-making. The halls at Bradford, Halifax, &c., though large and commodious, are inferior, in point of magnitude, to those of Leeds. All of them are managed by trustees; and most of the stands are said to be the freehold property of those by whom they are occupied.

A good deal of cloth is, however, produced and sold, in the districts referred to, without passing through the halls. This is effected by the merchants giving out samples to the manufacturers, and getting the cloth sent direct to their warehouses.

All the cloth sold in the halls is rough or undressed. Those by or for whom it is bought have what are called *finishing shops*, where the cloth is shorn, dressed, and fitted for the consumer. This is a distinct branch of the business, and it is one in which no female children, and but few boys, are employed; the machinery being, for the most part, attended to, and the work performed, by men.

In some of the Yorkshire factories every part of the work is performed, from the spinning of the yarn to the dressing and finishing of the cloth: in some, again, the yarn is sold; and in some it is given out to hand-weavers, who bring it back as cloth. But we understand that the greater number confine themselves to some one department, of which the dressing and finishing is the most extensive.

For a lengthened period various Acts of Parliament existed, some of them being applicable only to certain districts, called the *Stamping Acts*. These were intended to obviate frauds in the measurement of cloth; but, at length, their impolicy became obvious to every one, and they were finally repealed in 1818. From 1725 down to that period returns were annually made to the Justices at Pontefract sessions, from officers at the different fulling-mills, of the quantity of cloth manufactured in the West Riding. Kerseymeres and various other articles, were not, however, included. We subjoin a copy of these returns. (See p. 663.)

This table shows the great increase of the manufacture in the West Riding during the period to which it refers; and the extraordinary increase in the number of factories erected since 1813, and in the imports of foreign wool, show that the manufacture has continued to increase, since the last-mentioned epoch, even more rapidly than before.

The woollen manufacture is carried on to a greater extent in Gloucester than in any other of the western counties. Broad cloths of various sorts are made in it, but chiefly superfine, of Saxon, Australian, and Spanish wool; and fine narrow fancy goods are, also, extensively produced. The manufacture is carried on in the district called the *Bottoms*, including parts of the several parishes of Avening, Painswick, Pitchcomb, Randwick, Minchinhampton, Stroud, Biesly, Rodborough, Stonehouse, King's Stanley, Leonard Stanley, Wood Chester, Horsley, and Eastington. Extensive works are also carried on at Dursley, Cam, Uley, Alderley, Wickwar, and Wooton-under-Edge. Stroud may be considered as the centre of the manufacture in

this part of the country; all the surrounding valleys exhibiting ranges of houses or villages occupied by persons engaged in this business; and the banks of the Frome being thickly set with fulling-mills. In 1839, there were, in Gloucestershire, 125 woollen factories, employing 5,416 work-people, being the next greatest district to the West Riding of Yorkshire and Lancashire.

Account of the Number of Broad Cloths Milled at the several Fulling mills in the West Riding of the County of York from the 12th March, 1726, and thence Annually, distinguishing each Year; and of the Narrow Cloths from the 20th January, 1738, and thence Annually, distinguishing each Year; exhibiting also the Number of Yards made each Year, from Easter Sessions, 1768.

Years.	Broads.	Narrows.	Years.	Broad Pieces.	Yards.	Narrow Pieces.	Yards.
1726	26,671	..	1769	92,522	2,771,667½	87,762	2,144,019
1727	28,990	..	1770	93,075	2,717,105	85,376	2,255,625
1728	25,223½	..	1771	92,782	2,966,224½	89,920	2,235,625
1729	29,643	..	1772	112,370	3,223,913½	95,539	2,377,517½
1730	31,579½	..	1773	120,245	3,635,612½	89,874½	2,306,235
1731	35,563	..	1774	87,201	2,587,364½	88,323	2,133,583
1732	35,548½	..	1775	95,878	2,841,213	96,794	2,441,007
1733	34,620	..	1776	99,733	2,975,389	99,586	2,488,140½
1734	31,123	..	1777	107,750	3,153,891	95,786	2,601,583
1735	31,744½	..	1778	132,506	3,795,990	101,629	2,746,712
1736	38,899	..	1779	116,942	3,427,150	93,143	2,659,659
1737	42,256	..	1780	94,625	2,802,671	87,309	2,571,324
1738	42,404	14,495	1781	102,018	3,099,127	98,721	2,671,397
1739	43,086½	58,848	1782	112,470	4,458,405	96,743	2,598,751
1740	41,441	58,620	1783	131,092	4,563,376	108,641	3,292,002
1741	46,364	61,196	1784	138,023	4,094,335	115,500	3,356,648
1742	44,954	62,804	1785	157,275	4,844,855	116,036	3,409,278
1743	45,178½	63,545	1786	158,792	4,934,975	123,025	3,536,889
1744	54,627½	63,065	1787	155,748	4,850,832	128,740	4,058,157
1745	50,453	63,423	1788	139,406	4,244,322	132,143	4,208,303
1746	56,637	68,775	1789	154,134	4,716,460	145,495	4,409,673
1747	62,480	68,374	1790	172,588	5,151,677	140,407	4,582,122
1748	60,765	68,080	1791	187,569	4,815,079	154,373	4,797,594
1749	60,705½	68,889	1792	214,851	6,760,728	190,468	5,531,698
1750	60,447½	78,115	1793	190,332	6,054,946	150,666	4,783,722
1751	60,964	74,022	1794	190,988	6,067,208	130,403	4,634,258
1752	60,724	72,442	1795	250,993	7,759,907	155,087	5,172,511
1753	55,358	71,618	1796	246,775	7,830,536	151,594	5,245,704
1754	56,070½	72,394	1797	229,292	7,245,038	156,709	5,503,648
1755	57,125	76,295	1798	224,159	7,134,114	148,566	5,180,313
1756	33,590½	79,318	1799	272,755	8,806,688	180,168	6,377,277
1757	55,777½	77,097	1800	285,851	9,263,966	169,262	6,014,420
1758	60,396	66,396	1801	264,082	8,699,242	137,231	4,833,534
1759	51,877½	65,513	1802	265,660	8,686,046	137,016	5,023,754
1760	49,362½	69,573	1803	266,785	8,942,798	139,575	5,023,996
1761	48,944	75,468	1804	298,178	9,987,255	150,010	5,440,179
1762	48,621	72,946	1805	300,237	10,079,256	165,847	6,193,317
1763	48,038½	72,096	1806	290,269	9,561,178	175,334	6,430,101
1764	54,916	79,458	1807	280,056	9,111,006	162,120	6,180,981
1765	54,660	77,419	1808	279,859	9,050,970	144,624	5,309,007
1766	72,575½	78,893	1809	311,239	9,826,048	151,911	5,951,762
1767	102,428	78,819	1810	273,664	8,671,042	158,252	6,180,811
1768	90,036	74,480	1811	269,892	8,535,559	141,809	5,715,534
			1812	318,431	9,949,419	136,863	5,117,209
			1813	369,890	11,702,837	142,863	5,515,755

Bradford, in Wiltshire, is the centre of what is, perhaps, the greatest fabric of superfine cloth in England; the district including the surrounding towns of Trowbridge, Westbury, Melksham, and Chippenham. Woollen cloth, of a thin texture, is made at Wilton; and cloths of various qualities, but all fine, are made at Warminster, Heytesbury, and Calne. In 1839 there were, in Wilts, 55 woollen factories, employing 3,228 work-people.

In Somersetshire the manufacture is carried on at Taunton, where the goods produced are principally of a coarse fabric, and at Frome and Tiverton (near Bath). Shepton Mallet has entirely lost its woollen trade. Taunton is famed for its manufacture of second cloth; Frome for superfine, of which it produces a large supply. West of England cloths are commonly divided into five classes, according to their thickness: the thickest are double milled superfine; the finest and thinnest cloths are for the Turkey trade; ladies' cloths are rather thicker than these; cloths manufactured for the East and West Indies a degree thicker; the superfine being, in point of thickness, next to the double-milled superfine already mentioned. The Western woollen manufacture also extends into parts of Dorsetshire; Sturminster Newton, in that county, producing white baize and flannels.

The county of Norfolk was long the principal seat of the stuff or worsted manufacture. The name worsted is said, as previously mentioned, to be derived from Worsted, a parish in this county, where woollen twist and stuffs were first made. But the manufacture was early transferred to Norwich, whence it extended to other towns. A number of refugees, who sought an asylum at Norwich from the persecutions of the Duke of Alva, introduced the manufacture of bombasins, for which this city was afterwards distinguished. It has been, also, celebrated for its manufacture of crapes and camlets; and, more recently, for that of shawls. On the whole, however, the manufactures of Norwich appear to have declined considerably during the present century; and those in the other towns of the county are at present of trifling importance. The falling off is principally, we believe, ascribable to the want of coal, and to the consequent disadvantage under which most businesses are carried on here, as compared with those established in the districts where this mineral abounds: in fact, the greater part of the yarn now made use of in the Norwich fabrics is made at Bradford, in Yorkshire; and, as already stated, the worsted manufacture of the West Riding is become of vastly greater extent and value than that of Norfolk. Worsted yarn is also largely produced in Leicestershire and Lancashire; and, to some extent, in Warwick and other places.

Exclusive of the leading fabrics already adverted to, an immense variety of woollen goods, the mere recapitulation of the names of which would be a tedious task, are manufactured in various places. Druggets, long-ells, &c., are made in Devonshire and the contiguous parts of Cornwall, and in some parts of Somerset. They are sold, as they come from the loom, to the merchants of Exeter, by whom they are milled, dyed, finished, and afterwards exported. The East India Company were the principal buyers of long-ells; but, as they are but little used at home, and the exports have declined, the manufacture is no longer in a flourishing state. The manufacture of plush, at Modbury, in Devonshire, deserves notice; but, notwithstanding the ingenious machinery that was employed, it is much decayed.

Baize was formerly largely produced in the towns and neighbourhood of Colchester, Bocking, Braintree, and Coggleshall, in the county of Essex; but the manufacture has almost entirely passed to other places, especially to Rochdale, in Lancashire. Baize and flannels are also

manufactured at Bury, in Lancashire; and the former article, with coarse cloth and blankets, at Chichester, in Sussex. Salisbury is noted for its flannels. Blankets are made at Dewsbury, Witney, Dulverton, &c. But with respect to Witney it may be observed, that, since the introduction of machinery, the chief part of the blankets sold at its markets (though they still retain their former name) has been made in Glamorganshire. Carpets, of every variety of quality and pattern, and of a very great value, are manufactured at Kidderminster, Wilton, Cirencester, Worcester, Axminster, &c. The best of those made at Wilton and Axminster are deemed but little, if at all, inferior to those imported from Turkey and Persia.

Coarse woollens, druggets, &c., are made in considerable quantities at Kendal, Ambleside, and Keswick. Druggets, shalloons, serges, and a variety of worsted articles, at Andover, Basingstoke, and Alton, in Hampshire. Worsted shags at Banbury and Coventry; rugs, at Burford; and fleecy hosiery at Godalming, in Surrey. Light stuff, bunting, crape, &c., are made at Sudbury, Bury St. Edmund's, Needham Market, and Lavenham. Woollen yarn is likewise made at Mottram, in Cheshire, and in various parts of Lancashire, &c.

Leicestershire is the grand seat of the manufacture of woollen and worsted stockings. In 1844, Mr. Felkin, of Nottingham, who has given much attention to this subject, estimated that 11,457 frames were then employed in the county in the manufacture of woollen stockings, gloves, drawers, &c., principally in the borough of Leicester and its vicinity, but partly, also, at Loughborough (celebrated for the manufacture of patent fleecy hosiery), Hinckley, and other places. The yarn used in the manufacture is partly prepared in the county, and partly brought from a distance.

Mr. Felkin, at the same time, estimated the total number of frames employed in the United Kingdom, in the manufacture of woollen and worsted stockings, gloves, &c., at 14,083; of which England had 11,703, Scotland 2,380, and Ireland only 15. Mr. Felkin further estimated the entire value of the wool and worsted hosiery at 1,223,750*l.* But in this estimate no allowance is made for the value of the stockings produced by wires; which, though very much fallen off, is still too considerable to be altogether neglected.—(*Paper on the Hosiery Trade*, by Mr. Felkin, 8vo. London, 1845.)

Woollen Manufacture of Wales.—This is principally situated in North Wales, in the counties of Montgomery, Merioneth, and Denbigh. Its products consist of webs, flannels, stockings, socks, wigs, and gloves. The webs manufactured in North Wales are distinguished into two sorts; *strong*, or *high country cloth;* and *small*, or *low country ditto.* The first kind is made in Merioneth, principally on the domestic system; though, in some parts, there are factories.—(See *post.*) Almost every little farmer makes webs, and few cottages are without a loom. In some cases, the manufacturing farmers employ wool of their own growth; but it is principally bought from the woolstaplers and skinners. All kinds are used indiscriminately. The qualities of the manufactured article are very various. There is a market for strong cloth at Shrewsbury; but it is customary for the drapers of that town to travel into the country, and buy goods wherever

they find them. It is usual, also, for the principal drapers to keep servants, the greater part of the year, among the manufacturers, who get acquainted with them, assist those who are poor with loans to purchase wool, and superintend the making and dressing of the goods. A good deal of the strong cloth is exported to Europe and America; but a very considerable quantity is retained at home for workmen's jackets, ironing cloths, blankets, &c.

The small cloth is manufactured in Denbighshire, in that tract of country which includes Llangollen and Corwen. The factory system has not yet been applied to this article. The raw material is procured from the neighbourhood of Oswestry, and is sorted into two kinds; the finer part being manufactured into a sort of flannel, called Oswestry flannel, while the coarser part is made into small cloth. Most of this is sent abroad.

Flannels form the most important and valuable article of the Welsh manufactures. They are principally made in Montgomeryshire; but not entirely so, for they are also made in various places within a circle of about 20 miles round Welshpool. The manufacture used to be principally conducted upon the domestic system; but there are now many factories in which it is carried on. In Shropshire, too, into which the manufacture has spread itself, machinery is pretty generally employed. A market for flannels is held at Welshpool every alternate week. Formerly the manufacturers used to bring hither their goods; but now a set of middle-men go about the country, and buy all the flannels they can lay their hands on. At this market nothing is sold on credit, every piece being paid for as soon as measured; and a similar system prevails at the other woollen markets throughout the principality. Stockings, socks, wigs, and gloves are made principally in the town and neighbourhood of Bala.

The goods produced in the west of England and in Norfolk are not sold, like those of the West Riding of Yorkshire, in halls, but at public fairs or markets, or to the agents sent round by the drapers.

The woollen manufacture of the south of England has, speaking generally, fallen very much off within the last 30 years; a circumstance ascribable, no doubt, to the greater advantages enjoyed, through the possession of coal and otherwise, by the northern manufacturers. The manufacture in the western counties has stood its ground better. It is pretty certain, however, that, down to a recent period, it was gradually, though slowly, declining; but latterly it has revived. Within these few years various improvements have been made in different departments; and, besides the extension of those branches of which it had retained possession, it is now recovering some of those which it was supposed were wholly transferred to the north.

Woollen Manufacture of Scotland.—As compared with that of England, the woollen manufacture of Scotland is inconsiderable. Formerly it was usual for the occupiers of land to spin, in their own houses, the greater part of their wool, and to send the yarn to a weaver in a contiguous village, to get it woven into a species of coarse cloth, called *plaiding*; but this sort of manufacture could exist only in a rude and backward state of society, and is now entirely abandoned. Factories for the making of fine cloth have since been set on foot in

various parts of Aberdeenshire, and in some other counties; but coarse cloth still continues to form the staple article of Scotch manufacture. Some of the woollen spinning-mills and factories, established at Aberdeen and its vicinity, are upon a very large scale. Narrow cloths, of various kinds, known by the name of *Tweeds*, with tartans, shawls, plaids, flannels, &c., are extensively produced at Galashiels and Jedburgh, but especially at the former. They used, also, to be produced in considerable quantities at Hawick; but the attention of the manufacturers of the latter is now principally directed to the production of woollen hose, of which they annually furnish above 1,000,000 pairs, exclusive of blankets and flannels. Tartans are principally produced in the counties of Stirling (especially in that town), Argyle, and Inverness. Bonnets, which were, at one time, almost universally worn by the middle and lower classes in all parts of Scotland, are now everywhere throughout the Lowlands superseded by hats; and they are, also, rapidly disappearing in the Highlands. At Kilmarnock, which is one of the most flourishing manufacturing towns in Scotland, above 1,000 weavers are employed in the carpet manufacture, which is also carried on at Stirling, and some other places. Kilmarnock is further supposed to furnish an annual supply of about 1,500,000 worsted shawls, besides large numbers of bonnets and foraging caps for the army. The manufacture of woollen stockings is also pretty extensively carried on at Dumfries and Selkirk, especially the former. Altogether, there were in Scotland, in 1839, 117 woollen factories, employing 5,076 work-people.

Woollen Manufacture of Ireland.—Owing to the unsettled, turbulent state of the country, and the dependence uniformly placed by the great mass of the inhabitants on agricultural pursuits, manufactures, with, perhaps, the single exception of linen, have always been in a depressed state in Ireland. The woollen manufacture is said to have made some considerable progress in the interval between 1640 and 1687; though, considering the convulsed state of the country during that period, and the wars and proscriptions of which it was the theatre, it is difficult to believe that it could be very perceptible; but, such as it was, it alarmed the English manufacturers, who prevailed on parliament to address William III. to take measures for *discouraging the woollen manufacture in Ireland!* and, in consequence, the exportation of Irish wool and woollens to foreign countries was prohibited, and oppressive duties laid on the importation of Irish woollens into England. The gross injustice and impolicy of such measures are too obvious to need being pointed out. We do not, however, believe that they had any considerable practical influence, or that the woollen manufacture of Ireland would have been in a much more advanced state than it really is had the measures referred to never been heard of. The facilities enjoyed by England for the successful prosecution of the manufacture are so very great, that it seems quite visionary to suppose she should, under any circumstances, have anything to fear from the competition of Ireland.

In 1779 the prohibition of the export of Irish woollens to foreign countries was repealed. The Act of Union also gave fresh facilities to the Irish manufacture, notwithstanding the unreasonable opposition

of the British manufacturers, and of a considerable party in parliament. And at length, in 1823, all duties and restrictions on the woollen trade between the two divisions of the empire were put an end to, and the Irish manufacturer placed, in all political respects, on the same footing as the British. This, however, has not hitherto been of much advantage to Ireland. The continued prevalence of agitation has deterred capitalists from making investments in that country; and, though this cause had not existed, the want of abundant and cheap supplies of good coal, and of expert and careful workmen, would have opposed all but insuperable obstacles to the progress of the manufacture, which, instead of advancing, has declined. Several of the factories, that were bolstered up by the protecting duties, abolished in 1823, have been since abandoned. At present, the only broad-cloth factories in Ireland are in the vicinity of Dublin, and at Glenmire, near Cork; but these, with the factories in every other part of the country, do not employ more than from 1,200 to 1,500 hands. Flannels are made in Wicklow, though to no great extent; and the blanket manufacture exists, on a small scale, in Kilkenny.

Modes in which the Woollen Manufacture is carried on.—The woollen manufacture of the West Riding of Yorkshire, and of Gloucester, Wilts, Somerset, and North Wales, is carried on in three different modes: 1st, on the system of the master clothier of the West of England; 2nd, on the factory system; and 3rd, on the domestic system. We shall briefly notice the peculiar features of each.

1. Through the whole of the west, as well as in the north, of England there are factories; but the practice is for the master clothier of the west of England to buy his wool, if it be foreign, from the importer, mostly assorted, but partly in the fleece, or from the woolstapler, if it be of domestic growth; employing, in the different processes through which it passes in the course of its manufacture, distinct classes of persons, who sometimes work at their own houses, and sometimes in the factories of their masters. Each workman confines himself exclusively to a peculiar branch of the manufacture; and the greater skill and dexterity resulting from this more perfect division of employments was believed, by the committee of 1806, to be the principal cause of the acknowledged excellence of the west of England cloths. The committee state that, previously to the introduction of machinery, it was common (and the practice is not yet entirely relinquished) for the north-countryman to come into the west of England to purchase wool; and, having worked it up in Yorkshire, to carry it back in a manufactured state, and sell it in its native county. This is supposed to proceed from the system followed in the north, giving the clothier more liberty to work himself, and employ his family and others, in any way that his interest or fancy suggested: but the practice is now nearly fallen into disuse.

2. In the factory system, the master manufacturers, who sometimes possess a large amount of capital, employ a greater or smaller number of workmen, in one or more buildings or factories, under their own inspection, or that of their superintendents. This system admits, of course, like that of the master clothier of the west of England, of much variation; but in neither has the workman any property in the

goods he is employed to produce: and this, as the committee justly state, forms the essential distinction between them and the domestic system.

3. The latter was the original system; and was, indeed, the only one heard of till the accumulation of capital, and the introduction of improved and expensive machinery, paved the way for the others. It is now principally confined to the vicinity of Leeds, Huddersfield, and North Wales; at least they are the only places where it is at present carried on to such an extent as to deserve any particular notice. Under this system, the manufacture is conducted by a number of small masters, generally possessed of but very limited capital, who, besides their business as manufacturers, mostly occupy farms of a few acres, partly for the support of their families, and partly for the convenience of their manufacture. The domestic clothiers have, in these houses, sometimes only 1 loom, sometimes 2 or 3, and but seldom as many as 4: at these they employ themselves, their wives and children, and from 2 or 3 to 6 or 7 journeymen. During harvest, their wives, children, and servants are sent out to work. Formerly the domestic manufacturers used to carry the wool through all the stages of its manufacture, till it was brought to the state of undressed cloth; but for several years past they have availed themselves, in the performance of various processes, of the *public mills* established in or near all the manufacturing villages in the district which is the seat of the domestic system. These mills have been, in various instances, erected on a joint-stock principle, by shares of 50*l.* or 100*l.* each, principally subscribed by the domestic clothiers, to whom they have been of the greatest service. They have, in fact, enabled them to maintain a successful competition with the large manufacturers in the production of inferior cloth; that is, of cloth worth 8*s.* a yard and under. A good many of the smaller manufacturers have also become partners in factories.

The extension of the factory system, consequent on the improvements that were made in machinery subsequently to 1790, excited the fears and jealousy of the domestic clothiers, and even led to outrages. At last, in order effectually to arrest the progress of what they naturally enough considered a very serious evil, they petitioned parliament to enforce the statute 5 and 6 Edward VI., which they contended applied to gig-mills, and the statute 2 and 3 Philip and Mary, limiting the number of looms in one building. These petitions were referred to a committee; and in their report, to which we have already referred, the most satisfactory reasons are assigned, not only for refusing to accede to the request of the domestic clothiers, but for recommending the repeal of both statutes.

We extract from the report the following statements, which set some of the peculiar advantages belonging to both the domestic and factory systems in a very clear point of view, at the same time that they explain the grounds on which the committee concluded that the fears entertained by the domestic clothiers, of being swallowed up by the factory system, were, in a great degree, visionary and ill-founded.

"Your committee cannot wonder that the domestic clothiers of Yorkshire are warmly attached to their accustomed mode of carrying on the manufacture: it is

not merely that they are accustomed to it—it obviously possesses many eminent advantages seldom found in a great manufacture.

"It is one peculiar recommendation of the domestic system of manufacture, that, as it has been expressly stated to your committee, a young man of good character can always obtain credit for as much wool as will enable him to set up as a little master manufacturer; and the public mills which are now established in all parts of the clothing district, and which work for hire at an easy rate, enable him to command the use of very expensive and complicated machines, the construction and necessary repairs of which would require a considerable capital. Thus, instances not unfrequently occur, wherein men rise from low beginnings, if not to excessive wealth, yet to a situation of comfort and independence. It is another advantage of the domestic system of manufacture, and an advantage which is obviously not confined to the individuals who are engaged in it, but which, as well as other parts of this system, extends its benefits to the landholder, that any sudden stoppage of a foreign market, any failure of a great house, or any other of those adverse shocks to which our foreign trade, especially, is liable in its present extended state, has not the effect of throwing a great number of workmen out of employ, as, in the domestic system, the loss is spread over a large superficies: it affects the whole body of manufacturers; and though each little master be a sufferer, yet few, if any, feel the blow so severely as to be altogether ruined. Moreover, it appears in evidence that, in such cases as these, they seldom turn off any of their standing set of journeymen, but keep them at work, in hopes of better times.

"On the whole, your committee feel no little satisfaction in bearing their testimony to the merits of the domestic system of manufacture; to the facilities it affords to men of steadiness and industry to establish themselves as little master manufacturers, and maintain their families in comfort by their own industry and frugality: and to the encouragement which it thus holds out to domestic habits and virtues. Neither can they omit to notice its favourable tendencies on the health and morals of a large and important class of the community.

"But while your committee thus freely recognize the merits and value of the domestic system, they at the same time feel it their duty to declare it as their decided opinion, that the apprehensions entertained of its being rooted out by the factory system, are, at present at least, wholly without foundation.

"For, happily, the merchant, no less than the domestic manufacturer, finds his interest and convenience promoted by the domestic system. While it continues, he is able to carry on his trade with far less capital than if he were to be the manufacturer of his own cloth. Large sums must then be irrecoverably invested in extensive buildings and costly machinery; and, which, perhaps, is a consideration of even still more force, he must submit to the constant trouble and solicitude of watching over a numerous body of workmen. He might then often incur the expense of manufacturing articles which, from some disappointment in the market, must either be kept on hand, or be sold to a loss. As it is, he can agree with his customer at home or abroad for any quantity of goods; and, whether on a long expected or a sudden demand, he can repair at once to the market, and most probably, purchase to the precise extent of his known wants; or, if the market happen not to furnish what he wishes to purchase, he can give out his sample, and have his order executed immediately. While these, and various other considerations which might be stated, interest the merchant, as well as the manufacturer, in the continuance of the domestic system, and when it is remembered that this mode of conducting the trade greatly multiplies the merchants, by enabling men to carry on business with a comparatively small capital, your committee cannot participate in the apprehensions which are entertained by the domestic clothiers. In fact, there are many merchants, of very large capitals, and of the highest credit, who for several generations, have gone on purchasing in the halls; and some of this very description of persons state to your committee, that they not only had no thoughts of setting up factories themselves but that they believed many of those who had established them were not greatly attached to that system, but only persisted in it because their buildings and machinery must otherwise lie a dead weight upon their hands. Under these circumstances, the lively fears of the decline of the domestic, and the general establishment of the factory system, may reasonably excite surprise. It may have been in part occasioned by the decrease of the master manufacturers in the immediate neighbourhood of the large towns, especially in two or three populous hamlets ad-

joining to Leeds, whence they have migrated to a greater distance in the country, where they might enjoy a little land, and other conveniences and comforts. It may have strengthened the impression that, as your committee have already stated, three or four factories have, within no very long period of time, been established in Leeds or its vicinity.

"The right of every man to employ the capital he inherits or has acquired according to his own discretion, without molestation or obstruction, so long as he does not infringe on the rights or property of others, is one of those privileges which the free and happy constitution of this country has long accustomed every Briton to consider as his birthright; and it cannot, therefore, be necessary for your committee to enlarge on its value, or to illustrate its effects. These would be indubitably confirmed by an appeal to our own commercial prosperity, no less than by the history of other trading nations, in which it has been ever found that commerce and manufactures have flourished in free, and declined in despotic countries. But, without recurring to principles of which, even under different circumstances, your committee would be compelled to admit the force, your committee have the satisfaction of seeing that the apprehensions entertained of factories are not only vicious in principle, but that they are practically erroneous to such a degree, that even the very opposite dispositions might be reasonably entertained; nor would it be difficult to prove that the factories, to a certain extent, at least, and in the present day, seem absolutely necessary to the well-being of the domestic system; supplying those very particulars wherein the domestic system must be acknowledged to be inherently defective: for it is obvious that the little master manufacturers cannot afford, like the man who possesses considerable capital, to try the experiments which are requisite, and incur the risks, and even losses, which almost always occur, in inventing and perfecting new articles of manufacture, or in carrying to a state of greater perfection articles already established. He cannot learn by personal inspection the wants and habits, the arts, manufactures, and improvements, of foreign countries: diligence, economy, and prudence are the requisites of his character, not invention, taste, and enterprise; nor would he be warranted in hazarding the loss of any part of his small capital. He walks in a sure road as long as he treads in the beaten track; but he must not deviate into the paths of speculation. The owner of a factory, on the contrary being commonly possessed of a large capital, and having all his workmen employed under his own immediate superintendence, may make experiments, hazard speculation, invent shorter or better modes of performing old processes, may introduce new articles, and improve and perfect old ones; thus giving the range to his taste and fancy, and thereby alone enabling our manufacturers to stand the competition with their commercial rivals in other countries. Meanwhile, as is well worthy of remark (and experience abundantly warrants the assertion), many of these new fabrics and inventions, when their success is once established, become general among the whole body of manufacturers; the domestic manufacturers themselves thus benefiting, in the end, from those very factories which had been, at first, the objects of their jealousy. The history of almost all our other manufactures, in which great improvements have been made of late years, in some cases at an immense expense, and after numbers of unsuccessful experiments, strikingly illustrates and enforces the above remarks. It is, besides, an acknowledged fact, that the owners of factories are often among the most extensive purchasers at the halls, where they buy from the domestic clothier the established articles of manufactures, or are able at once to answer a great and sudden order; while at home, and under their own superintendence, they make their fancy goods, and any articles of a newer, more costly, or more delicate quality, to which they are enabled, by the domestic system, to apply a much larger proportion of their capital. Thus the two systems, instead of rivalling, are mutual aids to each other; each supplying the other's defects, and promoting the other's prosperity."

Experience has proved the correctness of these conclusions. The number of small manufacturers, and the quantity of cloth produced by them, have both increased since 1806; but, as the number of factories, and the quantity of cloth made in them, have increased still more rapidly, the former constitute, at present, a less proportion of the trade.

Comparative moral Influence of the Factory and Domestic Systems.—The committee have made no remarks on this head; and it comes, indeed, more within the sphere of the politician and moralist than of the statist. Though the question be not free from difficulty, we are, on the whole, disposed to agree with those who think that the domestic system is, in a moral point of view, decidedly preferable to the other. In it the manufacturer works at home, surrounded by his family, on goods which are his own property. In this case, therefore, the young are not corrupted by the contaminating influence of the unworthy companions they may meet with in factories; and, being under their father's eye, they are restrained from indulging in vicious habits; while the industry of the family is stimulated by the consciousness that they are working for themselves, and that they will reap all the advantage of superior perseverance and skill. It is really, however, quite unfair to contrast the condition of those employed in factories with that of the small country clothiers. Factories are, for the most part, established in considerable towns: and the individuals engaged in them are not often taken from the class of small manufacturers, but from a very inferior class, who have few or none of the advantages enjoyed by the clothiers. To such persons, and particularly to their children, well-conducted factories are really schools of improvement; and both their morals and their health are improved by being in them. Those familiar with the cold and comfortless habitations of the poor in many of the large towns, and the little attention paid to the children, will have no difficulty in assenting to what is now stated. Provided the children be not sent too early to factories, nor wrought too hard, they acquire habits of industry, and of regular, orderly conduct, that are of the highest importance; and the influence of which is materially assisted by the education they receive at the Sunday and other schools.

Health of the People employed in Woollen Factories.—There is, as might be expected, a great deal of contradictory assertion on this point, and but little evidence that can be entirely depended upon. It is evident, indeed, that much of the influence of a factory depends on its construction, the branches carried on in it, and the way in which it is managed; so that what may be true of some may be quite false, if affirmed of others. On the whole, however, we are inclined to think that, speaking generally, woollen factories may be said to be decidedly healthy. Children are no longer admitted into them under 9 years of age: the proportion of females, at least in the English factories, is less than in most other manufactures: the hours of working have, also, been materially reduced, and greater attention paid to ventilation, cleanliness, and comfort, within the last dozen years. The late Mr. Thackrah, an intelligent surgeon of Leeds, states that slubbers and spinners are "strong, robust, and healthy."* Some of the other departments are, no doubt, less favourable; but, taking the whole manufacture together, there is nothing in it, now that the hours of labour are of a reasonable length, to occasion any injury to health.

The numbers and the ages of males and females employed in the woollen and worsted mills or factories in the different parts of the

* *On the Effect of Trades, Professions, &c., on Health and Longevity*, 2d ed. p. 33.

United Kingdom, are exhibited in the tables attached to the account of the SILK MANUFACTURE in this volume (see *post*). We regret we are unable to lay before the reader any statements with regard to the rate of wages in these and other departments of the manufacture, on which much reliance could be placed. They are in a constant state of fluctuation, being influenced not merely by the prosperous or backward state of the manufacture at the time, but also by the cost of provisions, lodgings, &c.; by the good or defective state of the machinery employed, and a variety of other considerations which it is very difficult to appreciate. It may, however, be safely said that, speaking generally, wages in most departments of the trade are good, and adequate in years of moderate abundance to maintain the workpeople in a state of considerable comfort. The stocking branch is, perhaps, the least prosperous of any.

SECT. 3. *Cotton Manufacture.*

The precise period when the cotton manufacture was introduced into England is not known; but it is most probable that it was some time towards the end of the 16th, or in the early part of the 17th century. The first authentic mention is made of it by Lewis Roberts, in his *Treasure of Traffic*, published in 1641, where it is stated, "The town of Manchester, in Lancashire, must be also herein remembered, and worthily, for their encouragement, commended, who buy the yarne of the Irish in great quantity, and, weaving it, return the same again into Ireland to sell. Neither doth their industry rest here; for they buy cotton-wool in London, that comes first from Cyprus and Smyrna, and at home worke the same, and perfect it into fustians, vermilions, dimities, and other such stuffes, and then retu.n it to London, where the same is vented and sold, and not seldom sent into forrain parts, who have meanes, at far easier terms, to provide themselves of the said first materials."—(Orig. ed. p. 32.) It is true, indeed, that mention is frequently made by previous writers, and in acts of the legislature, passed at a much earlier period,* of "Manchester cottons," "cotton velvets," "fustians," &c.; but these articles were *wholly composed of wool*, and had, most probably, been denominated cotton from their having been prepared in imitation of some of the cotton fabrics imported from India and Italy.

From the first introduction of the cotton manufacture into Great Britain, down to the comparatively late period of 1773, the weft, or transverse threads of the web, only were of cotton; the warp, or longitudinal threads, consisting wholly of linen yarn, principally imported from Germany and Ireland. In the first stage of the manufacture, the weavers, dispersed in cottages throughout the country, furnished themselves, as well as they could, with the warp and weft for their webs, and carried them to market when they were finished; but about 1760 a new system was introduced. The Manchester merchants began, about that time, to send agents into the country, who employed

* In an act of 5 & 6 Edw. VI. (1552), entitled, "For the true making of *woollen* cloth," it is ordered, "*That all cottons called Manchester, Lancashire, and Cheshire cottons*, full wrought for sale, shall be in length," &c. This proves, incontestably, that what were then called cottons were made wholly of wool.

weavers, whom they supplied with foreign or Irish linen yarn for warp, and with raw cotton; which, being carded and spun, by means of a common spindle or distaff, in the weaver's own family, was then used for weft. A system of domestic manufacture was thus established: the junior branches of the family being employed in the carding and spinning of the cotton, while its head was employed in weaving, or in converting the linen and cotton yarn into cloth. This system, by relieving the weaver from the necessity of providing himself with linen yarn for warp, and raw cotton for weft, and of seeking customers for his cloth when finished, and enabling him to prosecute his employment with greater regularity, was an obvious improvement on the system that had been previously followed; but it is at the same time clear, that the impossibility of making any considerable division among the different branches of a manufacture so conducted, or of prosecuting them on a large scale, added to the interruption given to the proper business of the weavers, by the necessity of attending to the cultivation of the patches of ground which they generally occupied, opposed invincible obstacles to its progress, so long as it was conducted in this mode.

The custom-house returns of the imports of raw cotton, and of the export of cotton goods, during the first half of last century, are very imperfect. The following account, furnished by authority to Mr. Baines, contains all the information that can be rendered by the customs' officers on this subject.

Years.	Raw Cotton imported.	Official Value of British Cotton Goods exported.	Years.	Raw Cotton imported.	Official Value of British Cotton Goods exported.
	lbs.	£.		lbs.	£.
1697	1,976,359	5,915	1730	1,545,472	13,524
1701	1,985,868	23,253	1741	1,645,031	20,709
1710	715,008	5,698	1751	2,976,610	45,986
1720	1,972,805	16,200	1764	3,870,392	200,354

The following more detailed account of the import and export of cotton wool, during the seven years ending with 1749, is taken from a paper laid before a committee of the House of Commons, on the linen manufacture, and printed in *Postlethwayte's Commercial Dictionary*, art. LINEN.

Years.	Cotton imported.	Cotton exported.	Cotton retained for Home Use.
	lbs.	lbs.	lbs.
1743	1,132,288	40,870	1,091,418
1744	1,882,873	182,765	1,700,108
1745	1,469,523	73,172	1,369,351
1746	2,264,868	73,279	2,191,529
1747	2,224,869	29,438	2,195,431
1748	4,855,966	291,717	4,561,249
1749	1,658,365	330,998	1,327,357

Postlethwayte's Dictionary was published in 1766; and the author estimated the then value of the different species of cotton goods produced in England at about 600,000*l.* a-year. This, however, includes, besides the cotton, the value of the linen yarn used in the manufacture; and, when a reasonable deduction is made on account of the latter, the inconsiderable amount of the cotton trade, even at this late period, is sufficiently obvious.

Such was the depressed state of this manufacture at the commencement of that wonderful career of invention and discovery which has carried it to its present unexampled pitch of greatness and prosperity. The first, and perhaps, also, the most important step in this career was made by James Hargreaves, an illiterate but most ingenious mechanic, who invented the *spinning-jenny*, in 1767. At first, this admirable machine enabled *eight* threads to be spun with the same facility as one; and it was subsequently brought to such perfection, that a young girl was able to work no fewer than from *eighty* to *one hundred and twenty* spindles!

The jenny was applicable only to the spinning of cotton for weft, being unable to give to the yarn that degree of firmness that is required in the longitudinal threads or warp; but this deficiency was soon after supplied by the introduction of the *spinning-frame*, that wonderful piece of machinery, which spins a vast number of threads of the strength and hardness suitable to warps, leaving to man merely to feed the machine with cotton, and to join the threads when they happen to break. It is not difficult to understand the principle on which this machine is constructed, and the mode of its formation. "In every mode of spinning, the ends to be accomplished are, to draw out the loose fibres of cotton wool in a regular and continuous line; and, after reducing the fleecy roll to the requisite tenuity, to twist it into a thread. Previous to the operation of spinning, the cotton must have undergone the process of carding, the effect of which is to comb out, straighten, and lay parallel to each other, its entangled fibres. The cotton was formerly stripped of the cards in loose rolls, called cardings, or *slivers;* and the only difference between the slivers produced by the old hand-cards, and those produced by the present carding-engine, is, that the former were in lengths of a few inches, and the latter are of the length of some hundred yards. Let it be remarked, that the sliver, or carding, requires to be drawn out to a considerably greater fineness before it is of the proper thickness to be twisted into a thread. The way in which this is now accomplished is by two more pairs of small rollers, placed horizontally, the upper and lower roller of each pair revolving in contact. The sliver of cotton, being put between the first pair of rollers, is, by their revolution, drawn through and compressed, whilst, still passing through these rollers, it is caught by another pair of rollers, placed immediately in front, which revolve with three, four, or five times the velocity of the first pair, and which, therefore, draw out the sliver to three, four, or five times its former length and degree of fineness. After passing through the second pair of rollers, the reduced sliver is attached to a spindle and fly, the rapid revolutions of which twist it into a thread, and, at the same time, wind it upon a

bobbin. That the rollers may take hold of the cotton, the lower roller is fluted longitudinally, and the upper is covered with leather.

"Such is the beautiful and admirable contrivance by which a machine is made to do what was formerly, in all countries and ages, effected by the fingers of the spinner. It is obvious that, by lengthening or multiplying the rollers, and increasing the number of spindles, all of which may be turned by the same power, many threads may be spun at once, and the process may be carried on with much greater quickness and steadiness than hand-spinning. There is, also, the important advantage, that the thread produced will be of more regular thickness, and more evenly twisted."—(*Baines's History of the Cotton Manufacture*, p. 120.)

The invention of this wonderful piece of mechanism has been usually ascribed to Sir Richard Arkwright, who took out a patent for *spinning by rollers* in 1769. But Mr. Baines has shown that the merit of being the original discoverer of this great invention is incontestably due to Mr. John Wyatt, who took out, in the name of Mr. Lewis Paul, a foreigner, a patent, wherein the process of spinning by rollers is distinctly described, as early as 1738, or 31 years before Arkwright's patent. And it further appears that, in 1741 or 1742, Wyatt erected a mill at Birmingham, which was turned by two asses, and attended by 10 girls. Some of the yarn spun by this mill is still in existence. Owing, however, to the imperfection of the machinery, the want of skill, capital, or some other cause, this undertaking was speedily abandoned. The invention was soon after tried, on a larger scale at Northampton, but with no better success.* It appears, from the special reference made to them in the case printed by Sir Richard Arkwright in 1786, that he was fully aware of these attempts to spin by machinery; but it is not known whether he was aware of the principle on which they proceeded, or had seen the patent referred to. Undoubtedly, however, the presumption is that he had seen it; and if so, he cannot be regarded as the inventor of the spinning-frame. But, notwithstanding this deduction from his extraordinary merits, enough will still remain to justify the claims of Arkwright to the respect and gratitude of mankind. The machine he constructed, though in principle the same, differed materially in its form and make from that of Wyatt. In the hands of the latter, the invention, how ingenious soever, was of no practical utility; and all traces of it seem to have been lost. If Arkwright did not invent it a second time, he did what was equally important, he made it available in practice, and showed how it might be rendered the most prolific source of individual and public wealth.

Sir Richard Arkwright's patent was set aside in 1785, and since then the progress made in every department of the manufacture has been most rapid. The improvements made on the steam-engine by the genius of Watt relieved the spinners from the necessity, under which they would, of course, have been placed, of building factories in inconvenient situations, merely for the sake of waterfalls, and enabled them

* Letter by Mr. Charles Wyatt, son of the inventor, in *Baines's Cotton Manufacture*, p 134.

to raise them in the centre of an industrious population, where all the processes necessary in the manufacture might be brought together, and carried on, as it were, almost in the same workshop. The *mule jenny*, so called from its being a compound of the jenny and the spinning-frame, was invented by Mr. Samuel Crompton, of Bolton, in 1775; but it did not come into general use till after the dissolution of Arkwright's patent. The yarn produced by the spinning-frame, though well fitted for warp, was of too firm and hard a texture to render it available for weft, which was, in consequence, mostly spun upon Hargreaves' jenny. But the introduction of the mule almost entirely superseded the latter, and forms an important æra in the history of the cotton manufacture. All sorts of wefts, from the lowest to the highest numbers, are now spun by means of this machine; and, as evincing the perfection to which spinning by it has been carried, we may mention that in 1792 no fewer than 278 hanks of yarn, forming a thread of 233,520 yards, or upwards of 132 miles in length, were spun on the mule, from a single pound of raw cotton: and since then Mr. Houldsworth, of Manchester, has obtained as many as 500 hanks, forming a continuous thread of nearly 240 miles in length, from a single pound of cotton!

Mr. Crompton did not take out any patent for his invention, which, indeed, he only perfected by slow degrees. In 1812 he was advised to apply to parliament for a reward. His claim being entertained, a committee of the House of Commons was appointed to investigate the matter, before which evidence was brought to prove that upwards of *four millions* of spindles were then employed on Mr. Crompton's principle; that two-thirds of the steam-engines for spinning cotton turned mules; and that the value of the buildings, machinery, &c., employed on the same principle, amounted to from 3,000,000*l.* to 4,000,000*l.* It is painful to have to add that, notwithstanding this conclusive evidence of the great utility and importance of his invention, the House of Commons voted Mr. Crompton the paltry sum of 5,000*l.*; a pittance hardly adequate to defray the expenses of the application!

At first the mule carried only 144 spindles; but, by successive improvements, it was rendered capable, about a dozen years ago, of working 300 or 400 spindles. Its maximum capability was far, however, from being yet attained; and several mules are now at work in Manchester, and other places, carrying the extraordinary number of from 700 to 800 spindles, and a few as many as 1,100 spindles.

Various attempts have been made, at different periods, by Mr. Kelly and others, to work the mule solely by machinery, without the aid of manual labour. But none of the contrivances for that purpose were altogether successful till the *self-acting mule* of Messrs. Sharpe and Roberts, of Manchester, came into the field. The machinery is so constructed as to roll the spindle-carriage out and in at the proper speed, without a hand touching it; the only manual labour employed in these machines being that of the children who join the broken threads. The machine seems to have come very near perfection, producing a considerably greater quantity of yarn, of a more uniform twist, and less liable to break, than mules wrought by the hand; at the same time that it has the important advantage of rendering the mill-owners, to a

great extent, independent of the combinations and strikes of the working spinners.

It was at one time supposed that the mule would wholly supersede the water or spinning frame; but the improvements made on the latter have enabled it to keep its ground. The improved machine is called a *throstle;* and of late years the proportion of throstle-spindles has been increasing.

Besides these leading inventions, there have been many of inferior, indeed, but still of very great importance. In consequence of the combined influence of the whole, and of the gradually increasing skill and dexterity of the workman, the art of spinning has been carried to a degree of perfection that, in 1760, could not have been believed attainable even by the most sanguine and visionary of projectors.

But, to complete the manufacture, it was necessary to improve and perfect the art of weaving as well as of spinning; and this, also, has been done. The *power-loom*, invented by the Rev. Dr. Cartwright, a clergyman of Kent, has done for weaving what the invention of Arkwright did for spinning. Dr. Cartwright states, in an interesting letter addressed to Mr. Bannatyne, of Glasgow, that the idea of constructing a power-loom was excited in his mind by being in company with some Manchester gentlemen at Matlock, in 1784, who remarked that so many cotton-mills would be erected, and so much yarn spun, that it would be impossible to procure hands to weave it. Dr. Cartwright replied that, in that case, Mr. Arkwright must set his wits to work to invent a weaving-mill. The Manchester gentlemen all declared that that was impracticable; but Dr. Cartwright denied that there could be any greater difficulty in inventing a machine to weave cotton than to spin it; and, meditating afterwards on the subject of this conversation, he succeeded in constructing a loom, all the movements of which were performed by means of machinery! Dr. Cartwright took out a patent for his invention in 1787, and, subsequently, received 10,000*l.* as a reward from government.

The progress of power-loom weaving was not, at first, so rapid as might have been expected. This arose partly from the imperfections that attached originally to the machine, but chiefly from the circumstance of its being necessary to dress the webs, from time to time, after they were put into the looms, which made it impossible for one person to do more than attend to one loom. But a beautiful machine, invented by Mr. Thomas Johnson, of Bradbury, for warping and dressing the yarn used as warps, completely obviated this difficulty; and, at this moment, a boy or girl, of from 12 to 14 years of age, can with ease attend to two power-looms, and can, by their means, produce three and a half or four times as much cloth as could be produced by the best hand-loom weaver.

"The best hand-weavers seldom produce a piece of uniform evenness; indeed it is next to impossible for them to do so, because a weaker or stronger blow with the lathe immediately alters the thickness of the cloth, and, after an interruption of some hours, the most experienced weaver finds it difficult to recommence with a blow of precisely the same force as the one with which he left off. In power-looms the lathe

gives a steady certain blow, and, when once regulated by the engineer, moves with the greatest precision from the beginning to the end of the piece. Cloth made by these looms, when seen by the manufacturers who employ hand-weavers, at once excites admiration, and a consciousness that their own workmen cannot equal it."—(*Baines's Cotton Manufacture*, p. 240.)

Arkwright's spinning-frame is not confined to the spinning of cotton, but is now employed, with nearly equal success, in the woollen, the worsted, and the flax manufacture. It is the same with the power-loom. It is principally employed in the manufacture of cotton goods, particularly of calicos and fustians; but it is well adapted for weaving all sorts of plain silk, linen, woollen, and worsted goods, and is now largely introduced into most of these departments. In 1835, when the last official return was made out, there were, in the United Kingdom, 116,712 power-looms. But it appears from the Report of Mr. Horner, Inspector of Factories, dated 26th November, 1845, that there were in his district, (which includes Lancashire, part of the West Riding of Yorkshire, the North Riding of ditto, and the four northern counties of England,) in 1835, 63,861 power-looms, whereas they amounted, at the above date, to 142,949. Now, if we suppose that the increase in the number of power-looms in the other parts of the kingdom has been about equal to their increase in Mr. Horner's district, the total number at the end of last year (1845) would be 261,252. Inasmuch, however, as Mr. Horner's district includes the principal seat of the cotton manufacture, in which power-looms are employed to the greatest extent, the probability is that their increase will have been less rapid in other parts of the country; and on the whole they may, perhaps, be fairly estimated to amount at present (1846) to from 240,000 to 250,000. Of these nearly 18,000 belong to Glasgow and its neighbourhood.—(See *post.*)

Such is a hasty, and, necessarily, very imperfect, sketch of the leading steps in the astonishing progress of the British cotton manufacture. At present, it is by far the most wonderful triumph of mechanical genius and invention that the world has ever seen. "The operations," says Mr. Baines, "are numerous, and every one of them is performed by machinery, without the help of human hands, except merely in transferring the material from one machine to another. It is by iron fingers, teeth, and wheels, moving with exhaustless energy and devouring speed, that the cotton is opened, cleaned, spread, carded, drawn, roved, spun, wound, warped, dressed, and woven. The various machines are proportioned to each other in regard to the capability of their work, and they are so placed in the mill as to allow the material to be carried from stage to stage with the least possible loss of time. All are moving at once, the operations chasing each other, and all derive their motion from the mighty engine, which, firmly seated in the lower part of the building, and constantly fed with water and fuel, toils through the day with the strength of, perhaps, a hundred horses. Men, in the meanwhile, have merely to attend on this wonderful series of mechanism, to supply it with work, to oil its joints, and to check its slight and infrequent irregularities; each workman performing, or rather superintending, as much work as could have been done by 200 or 300 men 60

years ago.* At the approach of darkness the building is illuminated by jets of flame, whose brilliance mimics the light of day—the produce of an invisible vapour, generated on the spot. When it is remembered that all these inventions have been made within the last 70 years, it must be acknowledged that the cotton-mill presents the most striking example of the dominion obtained by human science over the powers of nature of which modern times can boast. That this vast aggregate of important discoveries and inventions should, with scarcely an exception, have proceeded from English genius, must be a reflection highly satisfactory to every Englishman."—(*Cotton Manufacture*, p. 243.)

The following tables, exhibiting the imports, exports, &c., of cotton wool since 1697, set the progress of the manufacture in a clear point of view.

Account of the Imports and Exports of Cotton Wool, into and from Great Britain, since 1697.

Years.	Imports.	Exports.	Years.	Imports.	Exports.
	lbs.	lbs.		lbs.	lbs.
1697	1,976,359	..	1794	24,358,567	1,349,950
1701	1,985,868	..	1795	26,401,340	1,193,737
1700 to 1705 (Average)	1,170,881	..	1796	32,126,357	694,962
1710	715,008	..	1797	23,354,371	609,058
1720	1,972,805	..	1798	31,880,641	601,139
1730	1,545,472	..	1799	43,379,278	844,671
1741	1,645,031	..	1800	56,010,732	4,416,610
1751	2,976,610	..	1801	56,004,305	1,860,872
1764	3,870,392	..	1802	60,345,600	3,730,180
1771 to 1775 (Average.)	4,764,589	..	1803	53,812,284	1,561,053
1776 to 1785 (Average.)	6,766 613	..	1804	61,867,329	503,171
1781	5,198,778	96,788	1805	59,682,406	804,243
1782	11,828,039	421,229	1806	58,176,283	651,867
1783	9,735,663	177,626	1807	74,925,306	2,176,283
1784	11,482,083	201,845	1808	43,605,982	1,644,867
1785	18,400,384	407,496	1809	92,812,282	4,351,105
1786	19,475,020	323,153	1810	132,488,935	8,787,109
1787	23,250,268	1,073,381	1811	91,576,535	1,266,867
1788	20,467,436	853,146	1812	63,025,936	1,440,912
1789	32,576,023	297,837	1813	50,966,000	..
1790	31,447,605	844,154	1814	60,060,239	6,282,437
1791	28,706,675	365,442	1815	99,306,343	6,780,392
1792	34,907,497	1,485,465	1816	93,920,055	7,105,034
1793	19,040,929	1,171,566	1817	124,912,968	8,155,442
			1818	177,282,158	15,159,453
			1819	149,739,820	16,622,969

* Mr. Kennedy stated, in 1815, since which time many improvements have been made, that the united effects of the spinning-machines amounted to this: that the labour of one person, aided by them, can now produce as much yarn, in a given time, as 200 could have produced 50 years ago.—(*Rise and Progress of the Cotton Trade.*) Mr. Farey, in his *Treatise on the Steam Engine*, says, "An extensive cotton-mill is a striking instance of the application of the greatest powers to perform a prodigious quantity of light and easy work. A steam-engine of 100 horse power, which has the strength of 880 men, gives a rapid motion to 50,000 spindles, for spinning fine cotton-thread: each spindle forms a separate thread; and the whole number work together, in an immense building erected on purpose, and so adapted to receive the machines that no room is lost. Seven hundred and fifty people are sufficient to attend all the operations of such a cotton-mill; and, by the

Cotton Wool Imported, Exported, and Entered for Consumption, from 1820 *to* 1845.

Years.	Quantity imported.	Quantity exported.	Quantity entered for Consumption.	Years.	Quantity imported.	Quantity exported.	Quantity entered for Consumption.
	lbs.	lbs.	lbs.		lbs.	lbs.	lbs.
1820	151,672,655	6,024,038	152,829,633	1833	303,656 337	17,363,882	293,682,976
1821	132,536,620	14,589,497	157,401,549	1834	326,875,425	24,461,963	302,935,657
1822	142,837,628	18,267,776	143,428,127	1835	363,702,963	32,779,734	326,407,692
1823	191,402,503	9,318,402	186,311,070	1836	406,959,057	31,739,763	363,684,232
1824	149,380,122	13,299,505	141,038,743	1837	407,286,783	39,722,031	368,445,035
1825	228,005,291	18,004,953	202,546,869	1838	507,850,577	30,644,469	455,036,755
1826	177,607,401	24,474,920	162,889,012	1839	389,396,559	38,738,238	352,000,277
1827	272,448,909	18,134,170	249,804,396	1840	592,488,010	38,673,229	528,142,743
1828	227,760,642	17,396,776	208,987,744	1841	487,992,355	37,673,585	437,093,631
1829	222,767,411	30,289,115	204,097,037	1842	531,750,086	45,251,302	473,976,400
1830	264,961,452	8,534,976	269,616,640	1843	673,193,116	39,619,979	581,303,105
1831	288,674,853	22,308,555	273,249,653	1844	646,111,304	47,222,541	554,196,602
1832	286,832,525	18,027,940	259,421,463	1845	721,523,712	42,916,384	

Sources whence the Supplies of Cotton Wool are derived.—Previously to 1795, our supplies of raw cotton were principally brought from the West Indies, South America, India, and the Levant. The United States, which, for many years past, has been the grand cotton mart, producing more for exportation than all the other countries of the world taken together, was then only beginning to come into the field. A little cotton had, indeed, been raised for domestic use, in the Southern States, previously to the revolutionary war; but its produce was quite inconsiderable. In 1791 it began, for the first time, to be exported; the trifling quantity of 189,316 lbs. having been shipped in the course of that year, and 138,328 lbs. in 1792. Such was the late and feeble beginning of the American cotton trade! And we are warranted in saying that there is nothing in the history of industry to compare with its subsequent progress and extension, unless it be the growth of the manufacture in this country.

American cotton, the produce of the *Gossypium herbaceum*, is of two kinds, generally known by the names of *Sea Island* and *Upland*. The former grows along the low sandy shores of Carolina, Georgia, &c. It is long in the staple, has an even silky texture, a yellowish tinge, is easily separated from the seed, and is decidedly superior to every other description of cotton hitherto brought to market. Unluckily, however, it can be raised only in certain situations, so that its quantity is limited, and has not, in fact, been increased since 1805. At present, 97 or 98 per cent. of the cotton produced in the United States consists of what is denominated upland, from its being grown on the comparatively high ground at a distance from the coast. Though of varying qualities, it is all short-stapled, and its separation from the seed and pod, if attempted by the hand, is so very difficult, that the cotton is hardly worth the trouble and expense. This, however, was the only way in which it could be made available for home use or ex-

assistance of the steam-engine, they will be enabled to spin as much thread as 200,000 persons could do without machinery, or one person can supply it with fuel. Each spindle in a mill will produce between two and a half and three hanks (of 840 yards each) per day, which is upwards of a mile and a quarter of thread in 12 hours; so that the 50,000 spindles will produce 62,500 miles of thread every day of 12 hours, which is more than a sufficient length to go two and a half times round the globe."

portation in 1791; and, had any one then ventured to predict that 10,000,000 lbs. of upland cotton would ever be exported, he would have been looked upon as a visionary dreamer. But the genius and talent of Mr. Eli Whitney did for the cotton-planters of the United States what Arkwright did for the manufacturers of England. He invented a machine by which the cotton wool is separated from the pod, and cleaned, with the greatest ease and expedition; and, in this way, doubled the wealth and industry of his countrymen.—(*Pitkin's Statistics of the United States*, p. 109, ed. 1835.) Mr. Whitney's invention came into operation in 1793; and, in 1794, 1,601,760 lbs., and, in 1795, 5,276,300 lbs. of cotton were exported! The effect of the machine was, like that of Arkwright, all but miraculous. The exports of cotton from America, during the year ending 30th of September, 1840, amounted to the enormous sum of 743,941,061 lbs.; worth, when shipped, 63,870,307 dollars. And it is not going too far to say that, had not Whitney's or some equivalent machine been invented, there is no reason to think that the exports during the above year would have exceeded 45,000,000 lbs., if so much; so that the existence of the other 700,000,000 lbs., with the greater part of that retained for home consumption, may be ascribed to Mr. Whitney's machine, as to its real source and origin!*

Whitney, Arkwright, and Watt, were all necessary to each other. Without an adequate supply of cotton, Arkwright's inventions would have been comparatively unimportant; without the demand for the raw material, which they occasioned, Whitney's machine would have been but little employed; and, without the invention of Watt, neither that of Arkwright nor of Whitney could have been brought into full play. So true it is that *omnes artes quæ ad humanitatem pertinent, habent quoddam commune vinculum, et quasi cognatione quadam inter se continentur*. It would be curious to investigate how many persons in the Old and New Worlds, at present, directly depend for subsistence on the inventions of these three individuals. They certainly amount to several millions; at the same time that they have made immense additions to the comforts and enjoyments of almost every one else.

Notwithstanding the vastly increased demand for cotton-wool during the last 20 years, the supply, contrary to what some had anticipated, has increased in a more than equal proportion; and there has, in consequence, been a material reduction of price.

* Like too many inventors, Mr. Whitney enriched others without materially enriching himself. South Carolina gave him 50,000 dollars for liberty to use the machine, and he received smaller sums from North Carolina and Tennessee. But Georgia, which was signally benefited by the invention, piratically invaded his patent; and, before he succeeded in establishing his rights in the Supreme Court of the United States, 13 years of his patent had expired, and he had expended a large portion of the sums paid him by the other states. In 1812, after the vast importance of his invention had been recognised in all parts of the Union and of the world, Mr. Whitney petitioned Congress for a renewal of his patent, or for some indemnity for the losses he had sustained by its invasion. But, notwithstanding a Committee of Congress made a strong report in his favour, the thing fell to the ground; and Mr. Whitney died, without having gained anything by an invention by which his countrymen have already realised a clear profit of 200,000,000*l.* sterling. —(*Pitkin's Statistics*, p. 110.)

The subjoined table, taken from the carefully compiled and comprehensive annual statement of Messrs. George Holt and Co., eminent cotton brokers of Liverpool, dated 31st of December, 1852, shows in a very striking manner the progress of the manufacture in this country, and the fall in the price of cotton wool. The manufacture declined in 1847, but that was wholly owing to the decrease in the supplies of raw cotton from the United States in 1846-47, and the consequent rise in its price.

Statement of the Imports into, the Exports from, and the Consumption, Prices, &c. of Cotton Wool in, Great Britain, in different Years, from 1816 *to* 1852, *both inclusive.*

Average Weekly Consumption.	1816	1820	1825	1830	1835	1840	1845	1850	1851	1852
Upland	..	2,918	3,713	5,452	5,896	5,846	7,243	4,450	5,908	5,750
Orleans & Alabama	990	1,192	2,442	4,756	7,623	13,654	17,169	15,796	18,448	21,093
Sea Island . . .	..	409	360	460	354	392	392	529	579	450
Total United States	4,036	4,519	6,515	10,668	14,073	19,592	24,804	20,767	24,325	28,148
Brazil	1,509	2,408	2,502	3,602	2,230	1,444	2,192	3,330	2,421	2,411
Egypt.	..	811	508	446	540	1,062	1,542	1,436	1,685	
East India . . .	207	1,518	1,096	940	1,089	2,227	1,888	3,895	3,686	3,163
Demerara, West India, &c. . .	656	534	527	294	421	260	331	121	99	133
Total . .	6,488	8,979	11,531	16,002	18,319	24,063	30,277	29,125	31,988	35,750
Packages annually consumed . .	337,400	466,900	599,600	832,100	954,100	1,251,300	1,574,400	1,514,500	1,663,400	1,861,100
Average weight of packages consumed, in lbs. .	263	258	278	298	333	367	365	380	396	397
Weekly consumption in packages, average 397 lbs	5,738	8,003	10,292	14,015	15,752	22,243	29,363	28,465	31,907	35,770
Average weight of packages imported, in lbs. . .	256	249	270	300	331	365	386	372	399	372
Packages exported .	29,300	23,400	72,800	83,400	102,800	119,700	122,800	271,800	268,500	292,800
Lbs. weight annually imported, in millions & tenths	93·9	143·1	222·4	261·2	361·7	584·4	716·3	685·6	760·1	925·2
Lbs. weight consumed, ditto .	88·7	120·3	166·8	247·6	316·1	458·9	606·6	568·2	658·9	739·6
Lbs weight in ports, 31st. Dec., ditto	19·2	110·5	107·0	91·4	73·3	162·9	400·8	194·1	196·4	247·2
Lbs. weight in Great Britain, ditto .	..	127·0	115·5	116·8	89·6	207·0	458·3	231·6	225·9	300·9
Average price per lb of Uplands in Liverpool . .	10½*d*	11½*d.*	11·6*d.*	6·9*d.*	10½*d.*	6*d.*	4·375*d.*	7¼*d*	5¾*d*	5¼*d.*
Ditto, ditto, Pernams	26*d*	15½*d*	15·1*d.*	8½*d.*	14·1*d*	9½*d*	6·375*d.*	7¾*d.*	7½*d*	7*d.*
Ditto, ditto, Surats .	15½*d*	8½*d.*	8·9*d.*	5*d.*	7½*d.*	4·025*d.*	3*d.*	5⅛*d.*	4*d*	3½*d.*

N.B.—Messrs. Holt and Co estimate the average weight of packages imported in 1852 at 390 lbs per bag Upland; 440 lbs Orleans and Alabama; 339 lbs. Sea Island; 180 lbs. Brazil; 250 lbs. Egyptian, 385 lbs. East Indian, and 210 West Indian.

We borrow from the elaborate and valuable statements of Messrs. Dufay and Co, of Manchester, the following details respecting the cotton trade of this country, as compared with that of others:—

Comparative Estimate of the Quantity of Raw Cotton Consumed in the Chief Manufacturing Countries for Ten Years, from 1836 *to* 1845, *in Millions of Pounds.*

Countries.	1836	1837	1838	1839	1840	1841	1842	1843	1844	1845
Great Britain	350	369	435	362	473	422	462	531	543	587
France, including adjacent Countries.	118	121	133	110	157	154	163	152	146	158
Holland, Belgium, Germany, and North of Europe	57	58	61	48	72	65	78	82	86	95
Countries bordering on the Adriatic	28	32	26	26	28	29	38	44	26	38
United States of North America	79	75	83	94	105	108	99	122	130	147
Total	632	655	738	640	835	778	840	931	931	1,036

" *Comparative Estimate of the Quantity of Raw Cotton, &c.*—continued.

Countries.	Total last Five Years, 1841–5.	Total previous Five Years, 1836–40.	Increase per Cent.
Great Britain	2,555	1,989	28·4
France, including adjacent Countries .	773	639	
Holland, Belgium, Germany, and North of Europe	407	296	27 8
Countries bordering on the Adriatic .	175	140	
United States of North America . . .	606	436	38·9
Total	4,506 or Great Britain 56·5 per cent. of the whole.	3,500 or Great Britain 56·8 per cent. of the whole.	

" Our statement embraces a period of 10 years, and shows the total consumption of this important staple in the chief manufacturing countries to have amounted for the five years from 1836 to 1840, to 3,500 millions of lbs. weight, and in the five years from 1841 to 1845, 4,506 millions of lbs.—Total consumption from 1836 to 1845, 8,006 millions of lbs. weight. Of this quantity, Great Britain has consumed, in the five years from 1836 to 1840, 1,989 millions of lbs. weight, and in the five years from 1841 to 1845, 2,555 millions of lbs. weight, showing that England has steadily maintained her proportion of about 56 per cent. of the total consumption of cotton from 1836 to 1845; and in going back for a further period of 10 years, we find very nearly the same result, as will be seen from the following statement. The total average consumption of cotton per annum has been, (in round numbers,) in the chief manufacturing countries—

	Millions of pounds a-year.
5 years from 1826 to 1830 an average of about	365
5 years from 1831 to 1835 „ „	500
5 years from 1836 to 1840 „ „	700
5 years from 1841 to 1845 „ „	900

" Of which the proportion consumed in Great Britain, (in round numbers,) averages as follows;—

	Millions of pounds a-year.	Per Cent. of the whole.
5 years from 1826 to 1830 an average of about . .	210 . .	or 57·5
5 years from 1831 to 1835 „ „ . .	289 . .	or 57·8
5 years from 1836 to 1840 „ „ . .	398 . .	or 56·8
5 years from 1841 to 1845 „ „ . .	510 . .	or 56·6

which shows that there has been for some time an increase in the total consumption of raw cotton, equal to about 200 millions of pounds weight per annum in the average annual consumption of every succeeding five years, or of about 1,000 millions of pounds weight of total increase in five years; and that, notwithstanding this immense increase, Great Britain has continued to consume the same proportion of about 56 to 57 per cent. of the total quantity.

" Of all the cotton-consuming countries, France has made the least progress in this branch of industry, considering the advantages which an advanced state of science and mechanics afford. Not only in her cotton trade, but also in the increase of her population, France keeps behind other nations; it is well known, also, that the population of that country has been stationary, compared with that of other European states.

" For some time past, we have taken pains to ascertain the number of spindles at work here and elsewhere, and have great pleasure in submitting the result to our friends. The returns were procured from the trade, as regards Great Britain, and have been carefully collated and revised. The information of the productive power of foreign states has been derived from the best authorities, and well-informed quarters. The estimate of the number of spindles at work in the principal foreign cotton manufacturing countries is, according to the latest accounts received from abroad, as follows, viz:—

" In the States comprised in the German Customs League, viz.—

Saxony	500,000		
Prussia	130,000		
Baden	95,000	together	815,000 spindles.
Wurtemburg	30,000		
Other States	60,000		
In Austria and Italy			1,500,000 ,,
In France			3,500,000 ,,
In Belgium			420,000 ,,
In Switzerland and all other parts of Europe			1,350,000 ,,
In United States of America			2,500,000 ,,
		Together	10,085,000

" The numbers of yarns, spun in Austria and the Customs Union, rule between Nos. 30 and 60, while France produces finer numbers. Austria imports only about 12 per cent. of the yarns consumed in that country. The States comprised in the Customs Union, on the other hand, import 67 per cent.

" The average number of mule yarns produced in Great Britain, is generally assumed to be No. 38, and of throstles or water twist No. 18.

" Mr. John Kennedy estimated the number of mule spindles at work in 1819 at 7 millions; the estimate for 1832, was 9 millions; and the quantity of cotton consumed in the latter year amounted to about 276,900,000 lbs.

" The quantity of cotton consumed in 1845, is estimated, in round numbers, at 600 millions of lbs.; and it appears that this quantity (after deducting the usual per centage for loss, and cotton used in the raw state, for waddings and other purposes,) has been reduced into yarns by 13 millions of mule spindles, and 4½ millions of throstle spindles, in all 17½ millions. Of these—

	Mule Spindles.	Throstles.
Ireland possesses	159,333	56,170
Scotland	1,476,083	253,795
England and Wales	11,364,584	4,190,035
Spindles	13,000,000	4,500,000

" The spinning process is carried to a high degree of perfection in this country. There is very little loss of material in reducing cotton into yarns; the waste of the finer numbers is re-spun into a second quality, and this process is going on, down to the lowest material. The speed in spinning has been much increased of late years, which accounts for the comparatively small number of spindles required to reduce the large quantity of cotton into yarn. In 1834 about 10,904,000 spindles were requisite to reduce 300 millions lbs. of cotton into yarn, at present we require only 17½ millions of spindles to work up double the quantity of cotton. The coarser numbers which are produced now, account partly for this, but only in a very small degree."

Fall in the Price of Cotton Goods.—In consequence, partly, of the reduction in the cost of the raw material, but in an incomparably greater degree of the wonderful improvements in the manufacture, the price of cotton goods has undergone an extraordinary fall since 1780, and even since 1820. They are now, indeed, so extremely cheap, that there is hardly an individual so very poor as to be unable to supply himself abundantly with cottons. This has improved the dress and appearance, and added to the comfort, of the great bulk of the female part of the population, not merely of this, but also of other countries, in a degree and to an extent not easy to be imagined.

Increase in the Proportion of Coarse to Fine Goods.—During the last twenty years the cotton manufacture has undergone a singular and not easily explained change in respect of the average fineness of its products. As successive improvements have been made in the construction and management of machinery, and in the experience and

manual skill of the workpeople, the proportion of fine to coarse yarns and fabrics might have been expected to make a corresponding increase, whereas it has, on the contrary, been very greatly diminished. During the last twenty-five years, the consumption of cotton has increased *four-fold;* but the quantity of fine yarn produced (*i. e.*, of yarn of above sixty hanks to the pound), instead of keeping pace with the increased consumption of cotton, has really undergone a positive and by no means inconsiderable reduction. For a number of years past no new establishments for the production of fine yarns have been formed; but in Manchester only about twenty mills, formerly employed chiefly or entirely in fine spinning, have been given up, or devoted to the production of coarser yarns. To some extent, no doubt, the diminution of produce arising from this cause has been countervailed by the increased speed of the machinery still at work; but after making every reasonable allowance on that score, there can be no doubt that the total produce of fine yarn has materially decreased. This conclusion is strengthened by the falling off which has taken place in the imports of Sea Island cotton, which is used almost exclusively in the production of fine yarn.

This change in the average fineness of cotton goods cannot be ascribed to foreign competition, for fine spinning is precisely that branch of the trade in which English cotton-spinners most excel their rivals abroad; and the tariffs of most foreign countries are framed in the view of excluding coarse rather than fine fabrics. It has been sometimes attributed to one of those capricious changes of taste and fashion which frequently operate disadvantageously on particular manufacturing pursuits; but it has been too long in operation, and has proceeded too gradually and uniformly, to be so accounted for: and it is abundantly certain that powerful natural causes must be in operation, otherwise so extensive an alteration could not have been brought about, and maintained for so long a period. These causes are by no means obvious; but we incline to think that the reduction which has taken place in the price of silk, and still more the prodigious improvements which have been made in various descriptions of worsted goods, have had no inconsiderable influence in lessening the demand for fine cottons. The main cause, however, will probably be found in the continued reduction which has taken place in the price of raw cotton, and the consequent greater comparative cheapness of stout and serviceable fabrics. It is found that an advance of a penny per pound in the price of the material speedily and invariably causes an increase of two or three hanks in the average produce and fineness of the yarn per pound. And it is not, therefore, surprising that the great decline which has taken place in the price of the raw cotton of the United States and Brazil should have occasioned a corresponding increase of demand for heavier fabrics, and a corresponding diminution in the average fineness of yarn.

Export of Cotton Goods.—Down to 1750, the exports of cotton goods, or rather, of goods consisting partially of cotton, were so very inconsiderable that they hardly attracted the least attention from any of our commercial writers. But, after the inventions of Arkwright began to come into general operation, the exports increased with unprecedented rapidity. At the commencement of the present century

they were nearly as large as the export of woollens, the produce of the old and staple manufacture of the country. But though the export of woollen goods has increased considerably since 1800, that of cotton goods and yarn has increased so much more that it is now about *three* times the amount of the other; and *constitutes, indeed, about a half of the total exports of the empire!*

Account of the Official Value of the Cotton Manufactures exported from Great Britain from 1697 *to* 1797.

Years.	Official Value of Exports.	Years.	Official Value of Exports.	Years.	Official Value of Exports.
	£.		£.		£
1697	5,915	1765	248,348	1790	1,662,369
1701	23,253	1766	220,759	1791	1,875,046
1710	5,698	1780	355,060	1792	2,024,368
1720	16,200	1785	864,710	1793	1,733,807
1730	13,524	1786	915,046	1794	2,376,077
1741	20,709	1787	1,101,457	1795	2,433,331
1751	45,986	1788	1,252,240	1796	3,214,020
1764	200,354	1789	1,231,537	1797	2,580,568

Account of the Total Quantities and Declared Values of British Cotton Manufactured Goods, Twist and Yarn, Exported from the United Kingdom in each Year, from 1814 *to* 1845, *both inclusive.*

Years.	Cotton Manufactures.			Cotton Twist and Yarn.		Total Declared Value of Cotton Manufactures, Twist, and Yarn Exported.
	Entered by the Yard.		Hosiery, Lace, and Small Wares.	Quantities.	Declared Value.	
	Quantities.	Declared Value.	Declared Value.			
	Yards.	£.	£.	lbs.	£.	£.
1814	192,340,825	16,480,750	798,826	12,782,354	2,791,246	20,070,824
1815	252,884,029	18,158,172	880,034	9,241,548	1,674,021	20,712,227
1816	189,263,731	12,309,079	746,634	15,740,675	2,628,448	15,684,161
1817	236,987,669	13,475,534	571,515	12,717,382	2,014,181	16,061,230
1818	255,331,695	15,708,183	692,136	14,743,675	2,395,304	18,795,623
1819	202,514,682	11,714,507	474,968	18,085,410	2,519,783	14,709,258
1820	250,956,541	13,209,000	498,111	23,032,325	2,826,643	16,533,754
1821	266,495,901	13,192,904	623,803	21,526,369	2,305,830	16,122,537
1822	304,479,691	13,853,954	727,712	26,595,468	2,697,590	17,279,256
1823	301,816,254	12,980,644	718,124	27,378,986	2,625,947	16,324,715
1824	344,651,133	14,448,255	866,886	33,605,510	3,135,396	18,450,537
1825	336,466,698	14,233,010	920,260	32,641,604	3,206,729	18,359,999
1826	267,060,534	9,866,623	735,791	42,179,661	3,491,338	14,093,752
1827	365,492,804	12,948,035	1,146,988	44,878,774	3,545,578	17,640,601
1828	363,328,431	12,483,249	1,165,763	50,505,751	3,595,405	17,244,417
1829	402,517,196	12,516,247	1,041,885	61,441,251	3,976,874	17,535,006
1830	444,578,498	14,119,770	1,175,153	64,645,342	4,133,741	19,428,664
1831	421,385,303	12,163,513	1,118,672	63,821,440	3,975,019	17,257,204
1832	461,045,503	11,500,630	1,175,003	75,667,150	4,722,759	17,398,392
1833	496,352,096	12,451,060	1,331,317	70,626,161	4,704,024	18,486,401
1834	555,705,809	14,127,352	1,175,219	76,478,468	5,211,015	20,513,586
1835	557,515,701	15,181,431	1,240,284	83,214,198	5,706,589	22,128,304
1836	637,667,627	17,183,167	1,328,525	88,191,046	6,120,366	24,632,058
1837	531,373,663	12,727,989	912,192	103,455,138	6,955,942	20,596,123
1838	690,077,622	15,554,733	1,161,124	114,596,602	7,431,869	24,147,726
1839	731,450,123	16,378,445	1,313,737	105,686,442	6,858,193	24,550,375
1840	790,631,997	16,302,220	1,265,090	118,470,223	7,101,308	24,668,618
1841	751,125,624	14,985,810	1,246,700	123,226,519	7,266,968	23,499,478
1842	734,098,809	12,687,220	1,020,664	137,466,892	7,771,464	21,679,348
1843	918,640,205	15,168,464	1,085,536	140,321,176	7,193,971	23,447,971
1844	1,046,670,823	17,612,146	1,204,618	138,540,079	6,988,584	25,805,348
1845	1,091,686,069	18,029,808	1,126,288	135,144,865	6,963,235	26,119,331

Present Value of the British Cotton Manufacture.—Amount of Capital and Number of Persons employed in it.—It would be very desirable to have some accurate information with respect to these particulars. But the data on which all estimates of this sort are founded being necessarily very imperfect, it is impossible to arrive at anything like precision. Probably, however, the following statements may not be very wide of the mark.

Mr. Huskisson stated, in his place in the House of Commons, in March, 1824, that he believed the total value of the cotton goods, then annually manufactured in Great Britain, amounted to the sum of *thirty-three and a half millions.* But there can be no manner of doubt that this estimate was excessively overrated; and we do not think we should be warranted in estimating the total value of the cotton goods and yarn now (1846) annually produced in the United Kingdom, at above 36 millions. If, indeed, we took the increase in the imports of the raw material, since 1824, as a test of the increase in the value of the manufacture, we should estimate it a good deal higher. But the improvements that have been made in the different processes, and the fall in the price of raw cotton, have had so powerful an influence in reducing the price of the goods brought to market, that notwithstanding the increase of the quantity, their total value must have remained comparatively constant.

The average annual quantity of cotton wool imported, after deducting the exports, may be taken at about 550,000,000 lbs. weight. It is supposed that of this quantity about 50,000,000 lbs. are used in a raw or half-manufactured state, leaving a balance of 500,000,000 lbs. for the purposes of manufacturing, the cost of which may be taken, at an average at nearly 5*d.* per lb. Deducting, therefore, from the total value of the manufactured goods, or 36,000,000*l.*, the value of the raw material, amounting to nearly 10,000,000*l.*, (10,413,000*l.*, at 5*d.* per lb.) there remains 26,000,000*l.*, which, of course, forms the fund whence the wages of the persons employed in the various departments of the manufacture, the profits of the capitalists, the sums required to repair the wear and tear of buildings, machinery, &c., the expense of flour for dressing, coals, &c., must all be derived. If, then, we had any means of ascertaining how this fund is distributed, we should be able, by taking the average of wages and profits, to form a pretty accurate estimate of the number of labourers, and the quantity of capital employed. But here, unfortunately, we have only probabilities and analogies to guide us. It may, however, be confidently assumed, in the first place, that in consequence of the extensive employment of highly valuable machinery in all departments of the cotton manufacture, the proportion which the profits of capital, and the sum to be set aside to replace its wear and tear, bears to the whole value of the manufacture, must be much larger than in almost any other department of industry. We have heard this proportion variously estimated, at from a third to two-thirds of the total value of the manufactured goods, exclusive of the raw material; and as the weight of authority seems to be pretty much divided on the subject, we shall take an intermediate proportion. Assuming, therefore, that the profits of the capital employed in the cotton manufacture, the wages of superintendence, &c., the sum required to replace the wear and tear of machinery and buildings, and

to furnish flour, coals, &c., amount together to half the value of the manufactured goods, exclusive of the raw material, or to 13,000,000*l.*, a sum of 13,000,000*l.* will remain as the wages of the spinners, weavers, bleachers, &c., engaged in the manufacture; and taking, inasmuch as a considerable number of children under 16 years of age are employed, the average rate of wages at only 24*l.* a year, we shall have (dividing 13,000,000 by 24), nearly 542,000 as the total number of persons directly employed in the different departments of the manufacture.

An Account of the Quantities and Declared Value of British Cotton Manufactured Goods and Yarn Exported from the United Kingdom, distinguishing the Description of Goods, and the various Countries whereto the same were Exported, in the Year 1852.

Countries to which Exported.	Cottons, Plain and Dyed, entered by the Yard		Hosiery, Lace, and Small Wares.	Cotton Twist and Yarn		Total Declared Value
	Yards	Declared Value.	Declared Value.	Lbs	Declared Value.	
		£.	£.		£.	£
Russia	2,307,794	45,571	15,170	2,592,125	133,407	194,150
Sweden	344,993	6,529	2,437	1,065,529	36,259	45,225
Norway	1,095,454	20,804	1,664	368,920	15,458	37,926
Denmark	2,735,853	37,903	2,054	1,768,586	60,754	100,711
Prussia	6,044	52	89	497,926	18,700	18,841
Mecklenburgh Schwerin	..	..	..	1,000	37	37
Hanover	329,468	6,119	110	2,930,451	139,646	145,875
O'denburgh	..	..	..	10,800	370	370
Hanseatic Towns	41,539,214	709,612	204,791	39,651,461	1,950,703	2,874,10
Holland	27,776,866	479,189	76,106	25,948,240	1,486,893	2,042,188
Belgium	1,572,860	39,824	44,245	1,151,605	67,787	151,856
Channel Islands	998,240	27,313	3,423	5,334	356	31,092
France	3,808,149	85,139	41,686	141,668	55,391	186,216
Portugal, Azores, and Madeira	51,203,872	645,488	12,759	980,276	37,474	695,721
Spain and the Balearic Islands	3,761,454	99,636	6,627	269,775	9,421	115,684
Spain and the Canary Islands	1,557,920	21,899	973	3,722	151	23,023
Gibraltar	23,913,836	326,360	16,215	268,198	13,320	355,895
Italy, with the adjacent Coast of the Adriatic and Islands	69,017,064	990,008	76,976	19,832,632	717,507	1,783,491
Malta	9,000,118	103,731	3,070	653,528	22,078	128,879
Ionian Islands	6,401,371	79,754	849	690,166	27,755	108,358
Kingdom of Greece	6,704,945	109,891	843	729,190	17,716	127,949
Turkey	110,876,925	1,570,619	9,406	5,251,256	199,668	1,779,693
Wallachia and Moldavia	7,974,247	110,538	845	3,343,382	117,756	229,139
Syria and Palestine	32,098,272	427,242	85	2,525,370	57,937	485,264
Egypt, Ports on the Mediterranean	33,470,200	428,864	9,246	960,995	33,217	471,327
Tripoli, Algeria, and Morocco	6,595,707	87,148	446	38,512	1,286	88,880
Western Coast of Africa	14,212,547	217,604	637	1,575	243	218,474
British Possessions in South Africa	15,569,740	263,087	10,541	6,126	349	273,977
Eastern Coast of Africa	169,071	2,044	..	..	..	2,044
Cape Verde Islands	192,407	2,480	..	..	..	2,480
Ascension and St Helena	45,791	1,362	72	..	..	1,434
Mauritius	5,584,370	82,313	1,923	..	..	84,236
Aden	131,677	1,883	..	49,500	1,643	3,526
British Territories in the East Indies	352,637,240	4,242,272	46,102	24,802,091	1,070,068	5,358,442
Sumatra, Java, and Islands of Indian Seas	31,201,407	465,399	4,713	1,175,205	41,456	511,568
Philippine Islands	6,161,239	85,597	1,840	98,680	2,110	89,547
China	140,922,065	1,649,188	2,631	6,638,552	253,507	1,905,321
British Settlements in Australia	12,548,172	259,591	70,893	197,408	7,476	337,960
South Sea Islands	485,485	16,670	67	..	..	16,737
British North American Colonies	25,119,492	405,152	41,612	573,605	22,890	469,654
British West Indies	23,337,640	440,388	30,632	19,896	1,503	472,517
Foreign West Indies	44,727,215	660,664	70,675	17,990	1,328	732,667
United States of America	110,994,734	1,121,957	552,185	171,629	7,488	2,681,025
Mexico	8,315,008	160,201	10,713	2,540	154	177,068
Uruguay and Buenos Ayres	44,652,020	680,141	46,214	43,027	1,983	737,338
Brazil	124,177,765	1,831,163	60,211	3,652	191	1,891,565
Central America, New Granada, Venezuela and Ecuador	40,637,731	595,424	27,383	146,919	10,156	632,963
Chili	38,098,531	532,734	26,504	50,000	2,073	571,310
Peru	29,953,154	443,861	29,568	72	4	473,433
Falkland Islands	6,708	161	44	..	..	205
Total	1,564,256,914	21,648,458	1,574,974	145,478,302	6,654,653	29,878,087

We should mistake, however, if we suppose that this number, great as it certainly is, comprised the whole number of persons to whom the cotton manufacture furnishes subsistence, exclusive of the capitalists. Of the sum of 13,000,000*l.* set apart as the profit of the capitalists, and the sum required to furnish coal and to defray the wear and tear of machinery, &c., a large portion is annually laid out in paying the wages of engineers, machine-makers, iron-founders, smiths, joiners, masons, bricklayers, &c. It is not easy to say what this proportion may amount to; but taking it at 4,000,000*l.*, and supposing the rate of wages of each individual to average 50*l.* a year, the total number employed in the various capacities alluded to will be (4,000,000 divided by 50) 80,000; and a sum of 9,000,000*l.* will remain to cover the profits of the capital employed in the various branches of the manufacture, to repair the machinery and buildings as they wear out, and to buy coal, flour, &c. The account will, therefore, stand as under:—

	£	£
Total value of every description of cotton goods annually manufactured in Great Britain		36,000,000
Raw material, 500,000,000 lbs. at 5*d.* per lb.	£10,000,000	
Wages of 542,000 weavers, spinners, bleachers, &c. at 24*l.* a year each	13,000,000	
Wages of 80,000 engineers, machine-makers, smiths, masons, joiners, &c., at 50*l.* a year each	4,000,000	
Profits of the manufacturers, wages of superintendence, sums to purchase the materials of machinery, coals, &c.	9,000,000	
		36,000,000

It has been said by some that this estimate of the total value of the manufacture is under, and by others that it is overrated; but we believe it will be found to be nearly correct. Misled by the authority of Mr. Huskisson, we, no doubt, estimated, in the former edition of this work, the value of the cotton stuffs and yarn produced in the United Kingdom in 1836 at 34,000,000*l.*; but farther inquiry has convinced us that this estimate was too high; and it is to be borne in mind, that, though the consumption of raw cotton has greatly increased since 1836, there has been in the interval a very considerable fall in the value of the raw material, and in the prices of the manufactured articles. The declared value of the exports of cotton goods and yarn, in 1845, amounted to 26,119,331*l.*; and estimating the value of those consumed at home at two-fifths of the value of those exported, we shall have 36,567,083*l.* for the total value of the manufacture. Perhaps it may be thought that in this estimate we have underrated the home consumption of cottons; but we are not sure that we have not inclined to the opposite side. In Burns' *Glance*, a publication of authority, exhibiting the state of the cotton trade in 1845, the total weight of cotton spun in England (after deducting for loss in spinning) is estimated at 467,029,465 lbs., of which the exports in wove fabrics and yarn amounted to no less than 368,520,560 lbs., leaving (including the quantity sent to Scotland) only 98,508,905 lbs. for the home consumption. Hence, if we took this account for a standard, the value of the goods retained at home would be very decidedly under two-fifths of the value of those exported. But we doubt whether this would be

a fair standard, both because it is doubtful whether the weight of the yarn left for home consumption be not underrated in the publication referred to, and because the great bulk of the cotton goods retained at home are of a superior fabric, and more costly than those sent abroad. On the whole, therefore, we are disposed to believe that in estimating the present value of the products of the British cotton manufacture at 36,000,000*l.* a-year, we shall not be very wide of the mark; and moderate as this estimate may appear as compared with others put forth on the same subject, it strikingly evinces the great value and importance of the manufacture.

The capital employed may be estimated as follows:—

Capital employed in the purchase of raw material . . .	£4,000,000
Capital employed in the payment of wages	8,000,000
Capital vested in spinning mills, power and hand-looms, workshops, warehouses, stocks on hand, &c.	35,000,000
	£47,000,000

Now this sum of 47,000,000*l.*, supposing the interest of capital, inclusive of the wages of superintendence, &c., to amount to 10 per cent., will yield a sum of 4,700,000*l.*; which, being deducted from the 9,000,000*l.* profits, &c., leaves 4,300,000*l.* to defray the waste of capital, the flour required for dressing, the coals necessary in the employment of the steam-engines, to effect insurances, and to meet all other outgoings.

The aggregate amount of wages, according to the statement on p. 690, is 17,000,000*l.*; but there are not many departments of the business in which wages have to be advanced more than six months before the article is sold. We, therefore, incline to think that 8,000,000*l.* is a sufficient (perhaps too great) allowance for the capital employed in the payment of wages.

If we are nearly right in these estimates, it will follow—allowance being made for old and infirm persons, children, &c., dependent on those actually employed in the various departments of the cotton manufacture, and in the construction, repair, &c., of the machinery and buildings required to carry it on—that it must furnish, on the most moderate computation, subsistence for from 1,000,000 to 1,200,000 persons! And for this new and most prolific source of wealth we are indebted partly, and principally, as already shown, to the extraordinary genius and talent of a few individuals; but, in a great degree, also, to that security of property and freedom of industry which give confidence and energy to all who embark in industrious undertakings, and to that universal diffusion of intelligence which enables those who carry on any work to press every power of nature into their service, and to avail themselves of productive capacities of which a less instructed people would be wholly ignorant.

Distribution of the Manufacture.—Lancashire was the earliest, and it still continues to be the principal, seat of the cotton manufacture; Manchester being, as it were, the head quarters of this great department of industry. Of 1,594 cotton mills, employing 118,920 individuals, reported to be at work in England in 1839, no fewer than

1,125 mills, employing 82,234 individuals, were situated in Lancashire; 163 mills, employing 34,039 hands, being within the single parish of Manchester! And so rapid has been the increase of the manufacture in the interval, that there were in Mr. Horner's district (see *ante*, p. 679) in November, 1844, no fewer than 1,724 cotton mills, employing 197,460 hands. The greatest seats of the manufacture in Lancashire, after Manchester, are Oldham, Rochdale, Bolton, Bury, Preston, Wigan, Stayley Bridge, Heap, &c. Cheshire is, next to Lancashire, the principal manufacturing district: it had, in 1839, 154 mills at work, which employed 18,676 hands. The Cheshire manufacture is principally carried on at Hyde, Stockport, Bollington, and Mottram. The manufacture is also carried on to a considerable extent in Derbyshire, principally in the hundred of High Peak, in Cumberland, Stafford, and in the West Riding of Yorkshire, principally in the parish of Halifax. In Wales it is principally confined to Flintshire.

Nottinghamshire is the principal seat of two rather peculiar, but important, branches of the cotton manufacture—that of lace and of cotton stockings. The application of the stocking frame to the lace manufacture was first attempted by a watchmaker of the name of Hammond, in 1768; but the difficulties in the way of the attempt were not completely overcome till Mr. Heathcoat made some important alterations and improvements in the machinery, for which he took out a patent in 1809. The lace, or, as it is usually called, bobbin net, produced on Mr. Heathcoat's frames, having seriously affected the manufacture of pillow lace, or lace wrought by the hand, his machines became the object of attack by the workmen; who, under the name of Luddites, maintained, for a lengthened period, a formidable combination against them. But this conspiracy being suppressed, and Mr. Heathcoat's patent having expired in 1823, and various improvements having been effected in the manufacture, it rapidly increased. The beauty and cheapness of the fabric are such, that it has not only destroyed the old manufacture of pillow lace in this country, but in Belgium and France; and instead of smuggling French lace into England, English lace was very largely smuggled into France. Latterly, however, the French have made considerable progress in the manufacture of bobbin-net, and have even begun to export it to Germany and elsewhere. The aggregate value of the bobbin net, including silk as well as cotton lace, annually produced, was estimated, in 1842, at 2,740,000*l.*, and the hands engaged in the business at 70,000; but it was not then, nor is it now, in a flourishing condition.

The cotton stocking manufacture is principally carried on in Nottinghamshire, and partly also in Leicestershire, Derbyshire, and to a small extent in some other places. The total number of frames employed in 1844, including 384 in Scotland and Ireland, was estimated, by Mr. Felkin, at 24,823; the stockings made at 2,872,000 dozen pairs, and their value at 998,700*l.*

Lanarkshire, and the contiguous county of Renfrew, have always been the principal seat of the Scotch cotton manufacture. Some of the fabrics made at Glasgow and Paisley are of almost unrivalled beauty and fineness. The first steam-engine for the spinning of cotton,

erected in Scotland, was constructed so late as 1792. Mr. Leonard Horner, one of the Factory Inspectors, reported, in 1833, that "In Scotland there are 134 cotton mills; that, with the exception of some large establishments at Aberdeen, and one at Stanley, near Perth, the cotton manufacture is almost confined to Glasgow and the country immediately adjoining, to a distance of about 25 miles radius; and all these country mills, even including the great work at Stanley, are connected with Glasgow houses, or in the Glasgow trade. In Lanarkshire, in which Glasgow is situated, there are 74 cotton factories; in Renfrewshire, 41; in Dunbartonshire, 4; in Bute, 2; in Argyle, 2; and in Perth, 1, &c."

But the following statements, on the accuracy of which every reliance may be placed, obligingly furnished to us by Dr. Watt of Glasgow, give by far the best account hitherto published, of the recent progress and present extent of the cotton manufacture in Scotland.

Statement of the Quantity of Cotton Wool Consumed in Scotland from 1820 *to* 1844 *inclusive.*

Year.	Bales.	Average Weight per Bale.	Total Weight.	Average Consumption, in periods of Five Years.	
		lbs.	lbs.	Bales.	lbs.
1820	52,103	258	13,442,574		
1821	52,908	258	13,650,264		
1822	55,447	267	14,804,349	54,010	14,385,172
1823	54,891	275	15,095,025		
1824	54,702	273	14,933,646		
1825	56,995	278	15,844,610		
1826	56,117	294	16,498,398		
1827	72,655	297	21,578,535	68,009	19,900,336
1828	74,037	297	21,988,989		
1829	80,242	294	23,591,148		
1830	79,801	298	23,780,698		
1831	85,929	306	26,294,274		
1832	88,162	311	27,418,382	87,292	27,478,522
1833	86,964	326	28,350,264		
1834	95,603	330	31,548,990		
1835	89,415	333	29,775,195		
1836	100,904	343	34,610,072		
1837	101,857	346	35,242,522	100,665	34,478,152
1838	112,726	346	39,003,196		
1839	98,425	343	33,759,775		
1840	122,946	367	45,121,182		
1841	98,469	367	36,138,123		
1842	97,998	375	36,749,250	110,117	41,169,437
1843	118,950	379	45,082,052		
1844	112,222	381	42,756,582		

Note.—The number of spindles in Glasgow and Lanarkshire is 908,020
Renfrewshire 445,840
Other parts of Scotland . 374,768
Total spindles 1,728,628

the proportional consumption of cotton should be

	Per Cent.
	52·5
	25·8
	21·7
	100·0

Statement of the Cotton Spinning in Glasgow and Neighbourhood, June, 1845.

Number of Spindles.	Estimated Value of Factories.	Estimated Number of Workers Employed.	Estimated Average Weekly Wages per Worker.	Estimated Total Weekly Wages.
784,756	784,756*l.*	7,847	8*s.* to 9*s.*	3,138*l.* 16*s.* to 3,531*l.* 3*s.*

Statement of Power-Looms in Glasgow and Neighbourhood, June, 1845.

Number of Looms.	Estimated Value of Factories.	Estimated Number of Workers Employed.	Estimated Average Weekly Wages per Worker.	Estimated Total Weekly Wages.
17,620	264,300*l.*	11,200	8*s.* to 9*s.*	4,480*l.* to 5,040*l.*

Note A.—The engines employed in working the above machinery are nominally of 3,705 horse power, but their real working power may be reckoned at from 30 to 50 per cent. additional.

Note B.—The number of spindles in Glasgow and Lanarkshire is . 52·5 per cent.
Renfrewshire . . . . . 25·8 „
Other parts of Scotland . . . 21 7 „
100·0 „

The number of power-looms in Glasgow and Lanarkshire is 79·0 „
Renfrewshire . . . . . 8·0 „
Other parts of Scotland . . 13·0 „
100·0 „

The cotton manufacture of Ireland is of very inferior importance, not merely to that of England, but even to that of Scotland. It is principally situated in Belfast and its vicinity, or in the counties of Antrim, Down, and Armagh; but there are factories in the county of Dublin, and in other places. Contrary to the anticipations of most of those engaged in it, the manufacture has increased considerably since the repeal of what were falsely called protecting duties, laid on English cottons when imported into Ireland; the real effect of which was to make the manufacturers depend for success rather on custom-house regulations than on their own skill and enterprise. The scarcity and bad quality of Irish coal, is, however, an all but insuperable obstacle to the extension of the manufacture in Ireland. Most part of the coal used in Belfast is, in fact, imported from Britain. In 1839 there were in Ireland 24 cotton factories, employing 4,622 hands.

CONDITION OF LABOURERS EMPLOYED IN COTTON FACTORIES.

Wages.—The wages of the adults engaged in factories are in general high, many of them earning from 3*s.* 6*d.* to 7*s.* 6*d.* a day, and some more. Employment in factories is also remarkably steady, not depending, like work carried on out of doors, on the state of the weather, or other uncertain contingencies, but is prosecuted almost without interruption. Hence the superior condition of the factory work-people. Such of them as are provident are in decidedly comfortable circumstances. The money wages of some classes have somewhat

declined since the peace, but they have not declined to any thing like the extent that the prices of bread, beef, clothes, and almost every necessary and useful article, have done; so that the manufacturing part of the population possess, at this moment, a greater command over the necessaries and conveniences of life, and are in better circumstances, than at any former period. We subjoin—

I. *An Account (obtained from the very best sources) of the Wages paid to the Labourers in Cotton Factories, and other descriptions of Work-people, in Manchester, in* 1832 *and* 1846.

		1832		1846	
		s. *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
Spinners, Men	per week.	20 0 to	25 0	50 0 to	60 0*
				By hand.	
„ Women	„	10 0 —	15 0	17 0 —	19 0
				Self-actors.	
Stretchers	„	25 0 —	26 0	.	.
Piecers (Boys and Girls)	„	4 7 —	7 0	5 0 —	10 0
Scavengers	„	1 6 —	2 8	2 6 —	3 6
In the Card Room.					
Men	„	14 6 —	17 0	10 0 —	21 0
Young Women	„	9 0 —	9 6	8 0 —	10 0
Children	„	6 0 —	7 0	2 0 —	6 0†
Throstle-spinners	„	5 0 —	9 6	10 0	
Reelers	„	7 0 —	9 0	8 0 —	9 0
Weavers by Power.					
Men	„	13 0 —	16 10	10 0 —	16 0
Women	„	8 0 —	12 0		
Dressers' Men	„	28 0 —	30 0	40 0	
Winders and Warpers	„	8 0 —	11 0	9 0 —	11 0
Mechanics	„	24 0 —	26 0	27 0 —	32 0
Weaving by Hand.					
QUALITY. WOVEN BY.					
Nankeens, Fancy, Men	„	9 0 —	15 0	8 0 —	15 0
„ Common, Children & Women	„	6 0 —	8 0	5 0 —	7 0
„ Best . Men	„	10 0 —	13 0		
Checks . Fancy, Men	„	7 0 —	7 6	7 0 —	10 0
„ Common, Children	„	6 0 —	7 0	5 0 —	7 0
Cambrics . . . All ages	„	6 0 —	6 6	6 0 —	8 0
Quiltings . . . Men and Women	„	9 0 —	12 0	12 0	
Fustian Cutters . All ages	„	10 0 —	12 0	8 0 —	9 0
Machine Makers . Men	„	26 0 —	30 0	26 0 —	30 0
Iron Founders‡ . Men	„	28 0 —	30 0	28 0 —	36 0
Dyers and Dressers, Men	„	15 0 —	20 0	20 0 average.	
Dyers and Dressers, Young Men	„	12 0 —	14 0		
Dyers and Dressers, Boys	„	5 0 —	10 0	6 0	
Tailors . . . . Men	„	18 0		18 0 —	27 0
Porters	„	14 0 —	15 0	14 0 —	30 0
Packers	„	20 0		20 0 —	33 0
Shoemakers	„	15 0 —	16 0	12 0 —	13 0
Whitesmiths	„	22 0 —	24 0	14 0 —	35 0
Sawyers	„	24 0 —	28 0	7 6 per day.	
Carpenters	„	24 0		24 0 —	30 0
Stonemasons	„	18 0 —	22 0	30 0	
Bricklayers	„	17 0 —	20 0	27 0 —	30 0
Bricklayers' Labourers	„	12 0		18 0 —	20 0
Painters	„	18 0		18 0 —	27 0
Slaters	„	3 8 per day.		4 6 per day.	
Plasterers	„	19 0 —	21 0	20 0 —	26 0
Spademen	„	10 0 —	15 0	15 0 —	18 0

* In 1832 the spinning was done chiefly by hand; it is now chiefly done by self-acting machines.

† Hours of infant labour now restricted.

‡ The increase of railways since 1832 has given rise to a species of iron work, at which skilled operatives may earn as much as 7*l.* 10*s.* per week.

II. *Table of Wages paid to Artizans and Labourers in the following Trades at Manchester in the first week of April in the undermentioned Years.*—(From Returns prepared by the Manchester Chamber of Commerce)

Trades.	1840	1841	1842	1843	1844	1845
	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.
Spinners, Mule	25 0 to 27 0	24 0 to 27 0	22 6 to 27 0	20 9 to 29 0	22 0 to 30 6	23 6 to 32 7
Self acting, Males	13 0 — 19 0	13 0 — 20 0	13 0 — 20 0	13 0 — 16 0	14 0 — 16 0	16 2 — 20 2
Throstles, Young Women	8 6 — 11 0	8 0 — 10 0	8 6 — 10 0	8 6 — 10 0	8 6 — 10 0	9 0 — 10 6
Piecers	6 0 — 10 0	6 0 — 10 0	6 0 — 10 0	6 0 — 10 0	7 0 — 10 0	7 6 — 10 0½
Scavengers	2 6 — 5 2	2 6 — 5 4	2 6 — 5 2	3 0 — 5 2	3 0 — 5 8	3 6 — 5 8
Card Room, Men	12 0 — 16 0	12 0 — 18 0	12 0 — 18 6	13 0 — 16 0	14 0 — 16 0	14 0 — 16 6
Young Women	7 6 — 12 0	7 6 — 11 8	7 6 — 10 0	7 6 — 10 0	8 0 — 10 0	8 0 — 11 0
Children	3 0 — 6 0	3 0 — 6 0	3 0 — 6 6	3 0 — 7 0	4 0 — 7 0	4 6 — 7 0
Power-loom Weavers	11 1 — 14 2	10 2 — 14 2	9 10½ — 14 2	9 3 — 14 2	9 4 — 14 2	11 3 — 14 2
Reelers	6 0 — 9 0	7 5 — 9 0	7 7 — 9 0	6 8 — 9 0	5 10 — 9 0	7 6 — 9 0
Mill Mechanics	25 6 — 33 9	25 6 — 33 9	24 0 — 33 9	26 0 — 30 0	26 0 — 30 0	27 7 — 31 6
Warpers	23 4½	24 2	24 3	24 5	24 0	24 1
Labourers	13 6 — 17 0	13 6 — 17 0	13 6 — 17 0	13 6 — 17 0	13 6 — 17 0	13 6 — 17 0
Machine Makers, Mechanics	24 0 — 32 0	25 0 — 32 0	24 0 — 32 0	26 0 — 31 0	26 0 — 31 0	30 0 — 33 0
,, Blacksmiths	24 0 — 32 0	24 0 — 32 0	23 0 — 32 0	24 0 — 31 0	25 0 — 31 0	26 0 — 34 0
,, Millwrights	33 0	33 0	33 0	33 0	31 6	34 0
,, Joiners	30 0	30 0	30 0	29 0	29 0	30 0
Boiler Makers	22 0 — 25 0	22 0 — 25 0	22 0 — 25 0	22 0 — 25 0	22 0 — 25 0	24 0 — 26 0
Ditto Assistants	20 0	20 0	20 0	20 0	20 0	21 0
Ditto Strikers	18 0	18 0	18 0	16 0	16 0	19 0
Moulders, Ironfounders	32 0 — 34 0	32 0 — 34 0	34 0	32 0	30 0 — 32 0	34 0 — 36 0
Skein Dyers	15 0 — 21 0	15 0 — 21 0	15 0 — 21 0	15 0 — 21 0	15 0 — 21 0	15 0 — 21 0
Builders, Joiners	26 0 — 28 0	26 0 — 28 0	26 0 — 28 0	24 0 — 28 0	24 0 — 28 0	26 0 — 28 0
Sawyers	28 6	29 6	29 6	28 6	28 6	28 0
Labourers	18 0	18 0	18 0	18 0	18 0	18 0
Spademen	16 0 — 18 0	16 0 — 18 0	16 0 — 18 0	16 0 — 18 0	16 0 — 18 0	16 0 — 18 0
Cabinet Makers	25 0 — 27 0	25 0 — 27 0	25 0 — 27 0	25 0 — 27 0	25 0 — 27 0	25 0 — 28 0
Ditto Joiners	27 0	27 0	27 0	27 0	27 0	27 0
Upholsterers	24 0 — 28 0	24 0 — 28 0	24 0 — 28 0	24 0 — 28 0	24 0 — 28 0	24 0 — 28 0
Ditto Females	10 0	10 0	10 0	10 0	10 0	10 0
Ditto Carvers	26 0 — 30 0	26 0 — 30 0	26 0 — 30 0	26 0 — 30 0	26 0 — 30 0	28 0 — 30 0
Stonemasons	27 0	27 0	27 0	27 0	27 0	27 0
Tailors	19 1½ — 25 3	18 0 — 24 3½	21 2½ — 23 7½	21 6 — 25 1½	23 3½ — 24 10½	25 10½ — 26 6
Boot and Shoe Makers	22 8	18 3	17 5	19 10	21 6	22 4
Ditto for Ladies	15 11	17 2	16 9	17 1	17 5	18 0
Painters	26 0 — 30 0	26 0 — 30 0	26 0 — 30 0	26 0 — 30 0	26 0 — 30 0	26 0 — 30 0
Plasterers	26 0 — 30 0	26 0 — 30 0	26 0 — 30 0	26 0 — 30 0	26 0 — 30 0	26 0 — 30 0
Ditto Labourers	17 0 — 18 0	17 0 — 18 0	17 0 — 18 0	17 0 — 18 0	17 0 — 18 0	17 0 — 18 0
Machine Calico Printers	30 0 — 40 0	30 0 — 40 0	30 0 — 40 0	30 0 — 40 0	30 0 — 40 0	30 0 — 40 0
Ditto Engravers	40 0 — 50 0	40 0 — 50 0	40 0 — 50 0	40 0 — 50 0	40 0 — 50 0	40 0 — 50 0
Sawyers by hand	24 0 — 30 0	24 0 — 30 0	24 0 — 30 0	24 0 — 30 0	24 0 — 30 0	24 0 — 30 0
Ditto by Steam	24 0	24 0	24 0	24 0	24 0	24 0
Chest Makers	24 0	24 0	24 0	24 0	24 0	24 0
Whitesmiths	24 0 — 30 0	24 0 — 30 0	24 0 — 30 0	24 0 — 30 0	24 0 — 30 0	24 0 — 30 0
Saddlers	25 0	25 0	25 0	25 0	25 0	25 0

Spinners are paid according to a fixed scale of prices, depending on the work done, and which decreases when the quantity of yarn they produce, in equal space of time, is increased. But the ratio of the decrease of price is less than that of the increase of work; so that when a workman is able, by the assistance of improved machinery, to produce, in a given time, a third or a half more yarn than previously, his wages do not fall a third or a half, but in some less proportion, so that he, as well as his master, reaps a direct and immediate advantage from the improvement of machinery; while, owing to the fall that takes place in the price of the manufactured article, the demand for it is extended, and the manufacture kept on the increase.

Hand-loom Weavers.—The condition of this class of work-people has, we regret to say, long been one of great misery and destitution. We are satisfied, however, that a great deal of misconception exists with respect to it. We doubt much, notwithstanding the currency of the opposite opinion, whether the hand-loom weavers have been materially injured by the introduction of the power-looms. Had the weavers been in a prosperous state before they were exposed to this new competition, there would have been plausible grounds, at least, for concluding that it had been

mainly instrumental in sinking them into their present hopeless situation. But, in point of fact, the condition of the weavers, when power-looms were only beginning to be talked of, was very little, if anything, better than at present. So far back as 1808, Mr. William Radcliffe, one of the inventors of the dressing-machine, and intimately acquainted with the manufacture, was examined by the Committee of the House of Commons appointed to inquire into the claims of the Rev. Dr. Cartwright, the inventor of the power-loom, to a public reward; when he made the following statement:—"To that part of your question, whether I think the general adoption of the loom by power will operate to the prejudice of the weavers in the old way, I answer, no. In the first place, their situation, for the last twelve or eighteen months, has been such, that it cannot be made worse; as, during that time, generally speaking, they have neither been able to pay rents nor buy themselves clothes; *all their earnings have barely been sufficient to keep them alive;* and men who have families to support are obliged to work from sixteen to eighteen hours in the day to do this." Nor was this distress temporary merely. From 1808, when this striking evidence was given, down to 1818, when there were not more than 2,000 power-looms in Lancashire, the weavers were exposed to similar privations. Their wages have fluctuated since, according to the greater or less prosperity of the trade; but, a few short intervals excepted, they have always been so ruinously low, as to be altogether inadequate to support them in anything approaching to comfort.

But it will probably be said that, how much soever the condition of the hand-loom weavers may have been depressed in 1808 or 1818, the subsequent extension of the manufacture would have insured its being very materially improved, but for the introduction of the power-looms. This, however, is a very questionable proposition. A very considerable part of the extraordinary progress of the manufacture of late years is certainly ascribable to the employment of power-looms; but, supposing Dr. Cartwright's invention had not come into the field, and that the progress of the manufacture had, notwithstanding, been equally great, still we doubt whether the situation of the weavers would have been materially different from what it now is. The truth is, that their low wages are not occasioned by the competition of the power-looms, but *by the easy nature of their employment.* The following remarks of Mr. Baines seem to be quite decisive as to this point:—"The labour of the cotton-loom requires little strength, and still less skill; it may be performed by a boy or girl of 12 years old, and may be quickly learned by men who have been brought up to any other employment. It is obvious, that that which is only a child's labour, can be remunerated only by a child's wages. In point of fact, women and children are continually put to the loom: weavers, who have not an opportunity of sending their children to mills, teach them to weave as soon as they are able to throw the shuttle. Thus this department of labour is greatly overstocked, and the price necessarily falls. The evil is aggravated by the multitudes of Irish who have flocked into Lancashire, some of whom, having been linen weavers, naturally resort to the loom, and others learn to weave as the easiest employment they can adopt. Accustomed to a wretched mode of living in their own country,

they are contented with wages that would starve an English labourer. They have, in fact, so lowered the *rate* of wages, as to drive many of the English out of the employment, and to drag down those who remain in it to their own level. It is manifest that these are reasons amply sufficient to account for the long continued and extreme depression of the hand-loom weavers: and, as they are incapable of remedy so long as the employment itself exists, the introduction of the power-loom, which must put an end to it, is to be hailed as a national blessing."

The greatest improvement that could possibly take place, at present, in the manufacturing districts, would be the general transfer of the hand-loom weavers to the factories in the progress of being built. A transfer of this sort has occurred to some extent; but it is checked, partly by the improvement that has taken place in the wages of hand-loom weavers within the last two or three years; partly by expectations of relief founded on legislative interference; and partly by the unwillingness of the weavers to enter factories, and to submit to the strict discipline that is necessarily kept up in them. But there can be no doubt that, sooner or later, they will be driven from their business. The increased wages they are now receiving, act as a premium upon the erection of power-looms, which not only do their work cheaper, but better. The only resource, in fact, for the weaver, is to bring up his children to other employments; and to embrace the first favourable opportunity of leaving the business himself. All attempts to interfere with the natural rate of wages, by the formation of what have been called Boards of Trade, or otherwise, are mere quackery and delusion. They might, if it were seriously attempted to carry them into practice, do much injury to the manufacture; but it is a contradiction and an absurdity to suppose that they should do any good to the weavers. *Their* only resource is to abandon their business.

Health of the Labourers employed in Cotton Factories.—This is a subject as to which there has been a great deal of misrepresentation. Children, that is, young persons between the ages of 9 and 16 years, as well as adults, are largely employed in factories; and, while the health and morals of the latter are said to suffer severely, the former have been described as being stunted in their growth, and rendered decrepid and miserable for life, by the prolonged confinement, drudgery, and ill-treatment to which they are exposed. These representations of the injurious effects of what has been called *white slavery*, were embodied in a Report of a Committee of the House of Commons in 1832. We believe, however, that we run little risk in affirming that this report contains more false statements and exaggerated representations than any other document of the kind ever laid before the legislature. It made a great sensation; and the discussions to which it, or rather the proposal that grew out of it, for limiting factory labour to 10 hours a day, gave rise, induced government to appoint a commission to inquire, on the spot, into the actual condition of the labourers, and especially of the children, employed in factories. This commission collected a great deal of authentic information; and much light has since been thrown on the question of factory labour by the reports of the Factory Inspectors. It were absurd to pretend, as some

have done, that the statements and representations in regard to its pernicious influence, were proved to be *wholly* destitute of foundation; but they were shown to be much exaggerated. Great inattention to cleanliness, and some very revolting abuses, certainly existed in some factories, particularly in those of the smaller class, at the time (1832) when the above Report was published; but the factories in question bore but a small proportion to the total number, and the abuses by which they were disgraced, are now wholly rooted out.

It appears from the tables previously given (*antè*, p. 416), that the mortality in Lancashire and Cheshire, the two great seats of the cotton manufacture, especially in the former, is decidedly greater than in any other part of the kingdom. But, though the great extent to which factory labour is carried on in these counties, be partly a cause of this greater mortality, it is certainly not the only cause. The crowds of Irish immigrants, and of other poor persons, attracted to the great manufacturing towns, and the dirty and badly-ventilated houses and cellars in which many of the work-people live, and their improvident habits, are powerful causes of increased mortality. The appointment of Factory Inspectors has been productive of the greatest advantage, not merely by making the regulations, in regard to the employment of children and young people in mills and factories, be particularly attended to, but by obliging masters to attend to their security, cleanliness, ventilation, &c. And were police regulations enforced in the manufacturing towns, providing that the houses built for the accommodation of the labouring classes should be liberally supplied with water, and properly drained and ventilated, it can hardly be doubted that the existing rate of mortality would be materially reduced.

We do not, however, know that we should object to the total exclusion of children, under 10 or 12 years of age, from factories, provided we had any reasonable security that they would be moderately well attended to and instructed at home. But no such security is to be looked for. The parents of such children frequently want the ability, oftener the opportunity, and sometimes the wish, to keep them at home in anything like a decent condition; to provide them with instruction, or to impress on them the importance of habits of cleanliness, sobriety, and industry. Were they turned out of the factories, few would either go to the country or to school. Four-fifths of them would be thrown loose upon the streets, to acquire a taste for idleness, and to be early initiated in the vicious practices prevalent amongst the dregs of the populace in Manchester, Glasgow, Leeds, and other great towns. Whatever may be the state of society in these towns, we hesitate not to say, that it would be much worse but for the factories. They have been their best and most important academies. Besides taking the children out of harm's way, they have imbued them with regular, orderly, and industrious habits. Their earnings are considerable, and are a material assistance to their parents; at the same time that they make them perform their tasks with a zeal and alacrity that is rarely manifested by apprentices serving without pay, merely that they may learn some art, trade, or mystery. Many factories have day-schools, or Sunday schools, or both, attached to them, and all children under 13 years of age, must attend school five days every week for certain

specified periods. But, independently of this, the training they undergo in factories is of inestimable value, and is not more conducive to their own interests than to those of the public.

We subjoin some conclusive extracts as to the state of the adult and non-adult work-people employed in factories, from the valuable report of Mr. Tufnell, one of the commissioners who travelled in Lancashire :—

"Of all the common prejudices that exist with respect to factory labour, there is none more unfounded than that which ascribes to it excessive tedium and irksomeness above other occupations, owing to its being carried on in conjunction with the 'unceasing motion of the steam-engine.' In an establishment for spinning or weaving cotton, all the hard work is performed by the steam-engine, which leaves for the attendant no manual labour at all, and, literally, nothing to do in general, but at intervals to perform some delicate operation, such as joining the threads that break, taking the cops off the spindles, &c. And it is so far from being true that the labour in a factory is incessant, because the motion of the steam-engine is incessant, that the fact is, that the labour is not incessant on that very account, because it is performed in conjunction with the steam-engine. Of all manufacturing employments, those are by far the most irksome and incessant in which steam-engines are not employed; and the way to prevent any employment being incessant, is to introduce a steam-engine into it. And these remarks, strange as it may appear, apply peculiarly to the labour of children in cotton factories. Three-fourths of the children so employed are engaged in piecing at the mules, which, when they have receded a foot and a half or two feet from the frame, leave nothing to be done,—not even attention is required from spinner or piecer, but both stand idle for a time, which, if the spinning is fine, lasts in general three-fourths of a minute or more. Consequently, in these establishments, if a child remains during twelve hours a day, for nine hours he performs no actual labour. A spinner told me that during these intervals he had read through several books. The scavengers, who have been said to be 'constantly in a state of grief, always in terror, and every moment they have to spare stretched all their length upon the floor in a state of perspiration,' I have seen idle for four minutes at a time, and certainly could not find that they ever displayed any symptoms of the condition described in this extract from the Report of the Factory Committee.

"The objections urged against the factory system, from its collecting a large number of persons together under one roof, are equally unfounded. In truth, so completely erroneous is this notion, that the complaint ought to be just the reverse,—that there are not enough large factories, and too many small ones. I invariably found that the large factories were those in which the health, general comfort, and convenience of the workmen were most attended to, and where they were the best off in every respect. And it would be an extraordinary circumstance if it were not so. When a large body of workmen are collected together under one employer, he is enabled to allow them many indulgences, at a comparatively small expense, but which would cause a serious outlay to the proprietor of a small establishment. It is the

interest of a master manufacturer to do all that is in his power to accommodate his men, as he thereby is enabled to attract the best workmen into his employ, owing to the good repute which his factory will bear among them; therefore, a large establishment is certain to be best regulated, as it can be most cheaply, well regulated. Accordingly, the greatest mills I always found to be the cleanest, the machinery most securely fenced off, and the hands of the neatest and most respectable appearance. In Messrs. Birley and Kirk's mill, the largest in Manchester, the workmen are allowed as much hot water as they please at tea-time, without charge, and persons are employed to take it to them. In Messrs. Strutt's mill, at Belper, each hand is allowed a pint of good tea or coffee, with sugar and milk, for one halfpenny, and medical assistance gratis: a dancing room is also found for them in this establishment. It could never answer to put up a copper to heat water for 20 or 30 persons, nor could tea or coffee be sold at this price, unless a large number were supplied with it. Mr. Ashton can afford to pay for all the surgical assistance that is yearly required by his 1,173 workmen, as he can contract for it at six guineas a-year: did he employ only a twelfth part of that number, he assuredly could not get a surgeon to take the contract at a twelfth part of six guineas. Mr. Bott undertakes to attend to all the ailments of the operatives in Messrs. Lichfield's mills, on payment of a halfpenny each, weekly: he certainly would refuse to attend 20 persons for eighteenpence a week."

The statements in respect to the vicious morals and profligacy of the persons employed in factories, have also been shown to be much beyond the mark. The rectors of St. John's and St. Paul's, Manchester, the chaplain of the Manchester gaol, and various dissenting clergymen, intimately acquainted with the factory population, were closely examined as to this point, and their evidence went to show that the morals of the persons engaged in mills are about as good as those of any other class of people, and that they have been materially improved—by means of Sunday schools and otherwise—during the last 15 or 20 years. But, notwithstanding what has now been stated, we incline to think that the Legislature did right in prohibiting altogether the employment of children in mills under eight years of age. The limitation of the hours of work in factories is, however, a matter of great nicety and difficulty; and interference has already, we think, been carried in this respect quite as far as it can be carried with safety. A false step in a matter of this sort would be alike irretrievable and ruinous. The less, generally speaking, the cotton trade is tampered with the better. It has not been indebted for any part of its rise to legislative encouragement or protection, and we hope no one may ever be able truly to affirm that, when the Legislature did interfere, its progress was retarded.

"It is worthy of remark," says Mr. Rickards, late inspector of factories, "that most of the wonderful discoveries which have raised these manufactures to their present unrivalled superiority, such as roller-spinning, the jenny, the carding-machine, the mule, &c., owe their existence to the natural genius of uneducated men, moving only in the class of common workmen or labourers;—this is their proud boast. The improvements through which they have attained their present perfection are all ascribable to the same class; whilst, I

A Return showing the Number, Age, and Sex of the Workpeople employed in 412 Cotton Mills in Manchester and the surrounding Districts, in April. 1844; compiled from Returns prepared by the Proprietors and Occupiers.

District.	No. of Firms	Operatives under 13.		Operatives 13 and under 18.		Operatives 18 and under 21.		Operatives 21 and under 40.		No. of Operatives 40 and upwards.		Married.		Employment of the Husbands of Females working in Factory.			Total No. of Males.	Total No. of Females.	Total No. of Operatives.	No. of Operatives able to Read.	No. of Horse-power.	Assessment to Poors' Rate of 814 Mill-owners making the Return, out of 412.	Aggregate Number of Years engaged in Business.
		Male.	Fem.	Male.	Fem.	Male.	Fem.	Male.	Fem.	Male.	Fem.	Male.	Fem.	No. employed in Factory.	Other Trades.	No. who have no regular Employment.						£.	
Hyde, Glossop, and Mottram	14	43	31	685	760	279	480	1,011	1,067	418	71	951	447	233	180	53	2,436	2,429	4,865	4,072	1,006	7,049	196
Burnley	6	7	3	191	368	102	210	181	293	77	16	176	87	87	45	5	558	810	1,448	1,231	295	960	122
Wigan	3	1	..	198	366	121	218	222	294	51	8	50	30	8	19	3	593	886	1,479	1,056	301	2,097	26
Preston	14	147	14	839	1,033	385	667	916	1,072	258	52	825	400	210	155	27	2,545	2,843	5,388	4,025	921	9,686	230½
Lancaster	5	47	32	197	364	107	257	300	412	105	24	273	157	82	90	12	786	1,069	1,845	1,473	341	1,984	97
Glossop	4	..	1	112	67	46	48	134	71	31	6	106	22	9	13	..	323	193	516	493	139	1,143	116
Dukinfield and Stalybridge	8	51	17	273	340	197	366	661	884	172	60	495	868	179	72	50	1,354	1,667	3,021	2,661	659	5,329	129
Stockport	16	68	28	1,106	1,124	587	882	1,356	1,620	391	142	1,183	863	531	260	64	3,510	3,796	7,306	6,189	1,691	10,889	300
Heywood	9	60	30	232	273	148	161	465	477	115	24	420	227	153	56	11	1,020	965	1,985	1,704	419	3,608	149
Blackburn	12	188	135	1,019	928	681	657	1,175	928	285	38	8 4	435	244	132	16	3,236	2,686	5,984	5,156	968	10,803	112½
Bolton	8	22	9	203	308	123	223	242	302	54	13	153	78	57	33	3	648	855	1,503	1,338	335	2,137	93
Rochdale	16	128	63	434	552	231	568	402	583	90	17	250	130	43	71	4	1,325	1,733	3,058	1,735	241	5,242	209½
Oldham	36	229	104	750	793	324	367	1,255	1,113	464	93	1,126	589	296	153	29	3,257	2,695	5,952	4,539	1,291	10,338	745
Newchurch	18	70	46	349	429	208	275	502	343	156	11	430	108	75	25	2	1,285	1,159	2,444	2,401	493	2,166	203
Todmorden	6	17	10	64	74	42	48	115	80	31	6	102	16	2	1	..	269	218	487	456	113	498	78
Ashton-under-Lyne	12	29	19	351	421	204	311	590	729	151	31	332	335	173	123	30	1,333	1,591	2,924	2,454	602	4,977	157
Manchester	43	269	253	1,915	2,649	1,120	2,258	2,592	4,082	850	347	2,342	1,831	710	620	229	6,704	9,589	16,293	12,770	3,862	33,221	790
Bury	14	22	48	353	522	174	376	523	644	205	60	405	223	86	102	4	1,335	1,650	2,985	2,662	702	2,693	209
Various Towns	168	1,123	553	6,107	7,342	3,443	5,597	8,889	9,907	2,972	765	7,978	4,375	2,230	1,570	279	22,684	24,164	46,788	39,167	9,371	64,970	2,682½
Total	412	2,615	1,396	15,382	18,723	8,727	14,269	21,593	24,926	6,860	1,784	18,720	10,721	5,314	3,927	821	55,183	61,098	116,281	95,642	24,570	£179,767	6,622

PROPORTIONS PER CENTUM OF THE DIFFERENT CLASSES EMPLOYED IN THE ABOVE 412 MILLS.

	Per Cent.		
Under 13 years	3 9/20	Males	2¼
		Females	1⅕
13 and under 18	29 7/20	Males	13¼
		Females	16 1/10
18 and under 21	19⅛	Males	7⅛
		Females	12⅕
21 and under 40	40	Males	15⅗
		Females	21⅖
40 and upwards	7⅗	Males	5 9/10
		Females	1 7/10
Married	25⅔	Males	16⅛
		Females	9⅙

Out of the 412 mill-owners, 167 have reported the following accidents occurring within an average period of 20½ years, viz —72 occasioning death; 168 loss of limb; and 13 not specified;—196 have reported that no accidents involving loss of life or limb have occurred in their factories, in an average period of 13½ years The proportion of accidents therefore appears to be about 1 death per annum in 104 mills, and 1 loss of limb in 41 mills. From 49 of the mills no returns have been made with respect to accidents.

From the Return of Accidents (by Coroners, &c) sent with this Return, it appears that out of upwards of 856 accidents occasioning loss of life, only 29 (or 3 2-5ths per cent.) have been occasioned by factory machinery, while 79 have been caused by carts, &c, and 85 by coal-pits.

The above Return shows that no less than 82 per cent. of the whole number of factory operatives can read, while it appears from the registrars' returns for England that about one-half of the population do not know how to write their names.

Some of the mill-owners have neglected to make a return of the amount of wages paid by them, but returns have been made by mill-owners employing 112,796 operatives, and the total amount of nett weekly wages paid by them is £57,821 18s. 1d., or the average weekly wages to each operative of 10s. 3⅛d. nett, being a reduction of 2d. per week in the average wages of each operative since 1833, as shown by a similar statement then published, of 131 mills employing 48,645 persons.

believe, it may be safely added, that every one of the great fortunes and immense establishments existing in the manufacturing districts may be traced to the minute savings of common operatives, who, from the smallest of small beginnings, nave, by prudence, skill, and unremitting perseverance and industry, raised themselves, with unexampled rapidity, to a pinnacle of wealth and importance which, but for its existence, could scarcely be believed. This, then, is a state of society, with its magnificent institutions, essentially popular in its origin; its progress and present results owing little to science,—nothing to patronage,—but all to the unaided efforts of natural genius and practical experience; often obstructed, but never encouraged, by legislative enactments; and, consequently, exhibiting a striking example of the benefits of non-interference in matters where nothing is wanting but equal protection and security to insure splendid success."

We subjoin an important statement, drawn up and subscribed by some of the principal mill-owners of Manchester and its vicinity (see page 702).

Sect. 4.—*Linen Manufacture.*

The linen manufacture has been prosecuted in England for a very long period, but until of late years its progress has been inconsiderable, compared, at least, with the progress made in other branches of manufacture. This seems to be partly owing to the attempts to bolster up and encourage the manufacture in Ireland, partly to the absurd restrictions that were for a lengthened period laid on the importation of foreign flax and hemp, and partly to the rapid growth of the cotton manufacture; fabrics of cotton having, to a considerable extent, superseded those of linen.

Mills for the spinning of flax were first constructed at Darlington. Previously to their introduction, about 50 years ago, the manufacture was in a very depressed state, the German and Belgian spinners being so superior to ours, that we derived the greater part of our linens from Flanders and the north of Europe; but the introduction of spinning by machinery, and the improvements that have been made in it, and in bleaching, &c., have raised us to the same level as the foreigner, and in some departments given us an advantage over him; so that, besides supplying our own markets with linen, we now export large quantities.

The manufacture is at present principally carried on in the West Riding of Yorkshire; its chief seat being in Leeds and its immediate vicinity, and in Lancashire, Dorset, Durham, and Salop. Of 16,573 individuals employed in flax mills within England and Wales, in 1839, 9,654 were in the West Riding, and of these about a half belong to Leeds and the adjacent township of Holbeck. One of the largest mills in the empire, that of Messrs. Marshall, is in the latter. The principal flax-mills out of Leeds are situated on the Nidd and its tributary streams, in the neighbourhood of Knaresborough, Ripley, and Pateley.

Lancashire, which, after the West Riding, is the next greatest seat of the English linen manufacture, had, in 1839, 2881 individuals employed in flax-mills. Formerly, about half the sail-cloth required for the use of the navy was manufactured at Warrington; but the

manufacture has declined since the peace, though it is still carried on to a considerable extent. There is also a large manufactory of canvass at Freckleton, near Garstang. The manufacture in the other English counties is but inconsiderable.

Scotch Linen Manufacture.—The linen manufacture was long reckoned the staple branch of industry carried on in Scotland. But such were the narrow limits within which it was confined, that at the Union, in 1707, its total product is not supposed to have exceeded 1,500,000 yards a-year. In 1727 a board of trustees was established for the superintendence and improvement of the manufacture. It is not easy to suppose that the institution of this board could, of itself, be of any material service; but considerable bounties and premiums being, at the same time, given on the production and exportation of linen, the manufacture went on increasing; the quantity stamped for sale in 1750 having amounted to 7,572,000 yards; and, at the end of last century, to about 20,000,000 yards. Still, however, the manufacture did not increase so fast as cotton and some others, which have not received any adventitious support, until machinery began to be extensively employed in spinning, &c.; so that it is very doubtful whether the influence of the bounty has been so great as it would, at first sight, appear to have been. The regulations as to the inspection and stamping of the linen intended for exportation, after having been long objected to by those concerned, were abolished in 1822; and the bounties ceased in 1830. We subjoin—

An Account of the Quantity and Value of the Linen Cloth manufactured and stamped for Sale in Scotland, during the Ten Years ending with 1822; being the latest Period to which it can be made up.

Years.	Yards.	Value.			Average Price per Yard	Years.	Yards.	Value.			Average Price per Yard
		£.	s.	d.	d.			£.	s.	d.	d.
1813	19,799,146½	977,382	1	7½	11·8	1818	31,283,100½	1,253,528	8	10½	9·6
1814	26,126,620½	1,253,574	16	10½	11·5	1819	29,334,428	1,137,923	4	11	9·4
1815	32,056,015½	1,403,766	15	2	10·5	1820	26,259,001½	1,038,708	18	5½	9·4
1816	26,112,045½	1,026,674	1	1½	9·4	1821	30,473,461½	1,232,038	15	4½	9·7
1817	28,784,967½	1,092,689	2	8½	9·1	1822	36,268,530½	1,396,295	19	11½	9·2

This account, which extends as far back as 1728, is not, however, of any use, as affording any certain test of the progress or total value of the manufacture. The stamp was only affixed to linen on which a bounty was paid; that is, on *linen intended for exportation.* Linen manufactured for home use, or intended for private sale, was not stamped. Since 1822 all the branches of the manufacture have made an astonishing progress.

Dundee is the chief seat of the Scotch, and, indeed, of the British, linen manufacture. The business seems to have been introduced into it early last century; but for a lengthened time it was quite inconsiderable. In 1745 only 74 tons of flax were imported. From that period to 1791 the progress of the manufacture was more rapid: in the latter year 2,444 tons of flax and 299 tons of hemp being imported, and about 8,000,000 yards of linen, sail-cloth, &c., exported. Previously to this period all the yarn used in the manufacture was spun

upon the common hand-wheel, partly in the town and partly in the adjacent country; but the spinning of yarn by machinery began soon after to be introduced; and the increased facility of production, consequent to the erection of flax-mills, has been such, that the cost of the yarn, including, of course, the raw material, is now less than the mere expense of spinning amounted to 40 years ago! The result has been the total cessation of hand-spinning in all parts of Scotland, and a wonderful increase in the quantity of yarn produced, and of the manufacture. In 1811 four spinning-mills had been constructed in Dundee. In 1831 the number was increased to 31, and now (1846) they amount to about 50, and are all in full work! We subjoin—

An Account of the Imports of Flax, Hemp, &c., into Dundee, and of the Exports of Linen, Sail-Cloth, &c., from the same, during 1831, 1835, 1844, *and* 1845.

IMPORTS.

Articles.	1831	1835	1844	1845
	Tons.	Tons.	Tons.	Tons.
Flax	14,607	12,141	20,724	19,865
,, Codilla	3,907	6,497	8,077	9,198
Hemp	2,179	5,397	950	1,127
,, Codilla	1,566	1,124	389	72
Jute	..	..	6,814	9,298
Totals	22,259	25,159	36,954	39,560

EXPORTS.

Linens.	1831	1835	1844	1845
	Pieces.	Pieces.	Pieces.	Pieces.
Osnaburgs	96,957	139,450	78,816	77,629
Sheetings	131,660	165,959	268,345	281,904
Cotton Bagging	65,592	80,158	10,524	952
Sundries	7,395	12,511	16,009	28,886
Sail-cloth	72,268	103,010	118,264	160,861
Sacking	45,893	57,177	174,759	132,317
Dowlas	40,915	46,733	82,987	73,131
Sundries	11,550	13,709	24,887	29,230
Totals	474,230	618,707	774,591	784,910

The entire value of the linen goods annually manufactured in Dundee may be estimated at from 1,500,000*l.* to 1,600,000*l.*

A part of the flax which is imported at Dundee, is sold to spinners in the neighbourhood, but at least 30,000 tons are spun annually by the mills in the town. The yarns produced from this large quantity of raw material, are manufactured partly in the town, and partly in the neighbouring towns and villages. A part also is exported to France and other foreign countries; but the exportation of yarns has been decreasing for a year or two past, from the circumstance of the French and other foreigners, having greatly extended the use of spinning machinery in their own countries. The manufacture of the yarns into linen is carried on partly by the proprietors of the spinning-mills, and partly by a class of persons called "manufacturers." The latter give out the yarns in small quantities ready for the loom, to weavers, who perform the work for the most part in their own houses, or in small weaving

shops containing four or six looms, for which the weavers pay a small rent. There are, also, large weaving shops in which sail canvas is chiefly manufactured. These contain from 20 to 100 looms of a stronger construction than those on which other sorts of linen are woven. In the larger factories, men are chiefly employed, but in the smaller shops, and in private houses, a great many women are employed in weaving. There are three "power-loom" weaving factories in Dundee, of considerable extent. These have been at work for several years, and perform the work very well, but from the circumstance of no power-loom factories having been erected for the last seven years, it may be inferred that hand-loom weaving is fully as profitable for the manufacturer. The wages of hand-loom weavers are in general very low, seldom exceeding from 5*s.* to 8*s.* a-week. More than half the linens shipped at Dundee are exported to foreign countries, the remainder being sent to London and other large towns for home consumption. The linens which are exported to foreign countries, are for the most part sent to Liverpool, Glasgow, and London, to be shipped there, as it is found more advantageous to send them as parts of general cargoes of goods, than to send whole cargoes of them direct from Dundee. Some of the manufacturers are the exporters of their own linens; others sell to exporting merchants in Dundee, who employ their capitals in that branch of the trade. The linens are in general sent on consignment to agents in foreign countries for sale, and they are sold by them to the retailers in these countries on credit of six to twelve months. The foreign countries to which Dundee linens are sent, are the United States, Canada, Mexico, the West Indian Islands, Brazil, Peru, Chili; and some, also, are sent to Spain and Portugal, and the countries bordering on the Mediterranean*

The machinery used at Dundee is all moved by steam power, and there is a considerable deficiency of water. Several projects are now on foot for diverting some of the adjacent streams into or near the town; and there is but little doubt that this will, at no distant period be effected.

It is stated, in the returns as to Forfarshire, under the last census, that there are engaged in the linen manufacture, at Dundee, 5,614 males, and 4,543 females, making in all 10,157 individuals. The number of individuals employed in the county at the same time (1841), in the same business, appears, from the same return, to have been 23,072.

Besides the district of which Dundee is the emporium, embracing the counties of Angus and Perth, with the northern part of Fifeshire and the southern part of Kincardineshire, the manufacture is carried on to a considerable extent in other parts of the country. At Aberdeen are some of the largest flax-mills in the empire; and these, with the business of bleaching, weaving, &c., dependent upon them, are supposed to afford employment to nearly 4,000 persons.

* We are indebted for the greater part of our information with respect to Dundee to a communication from Mr. Brown, the worthy and intelligent provost of the town. The progress of Dundee has been quite astonishing. In 1814-15 the harbour dues amounted to 4,411*l.* a-year; but at present (1846) they amount to above 25,000*l.*

Dunfermline is the principal seat of the manufacture of fine table linen, fine and common shirting, &c.

Previously to the beginning of the present century, all the yarn used in the Dunfermline manufactures was spun by the hand-wheel; but at that time machinery was introduced, and has now entirely superseded the former clumsy and expensive system. The manufacturers obtain the finer sorts of yarn chiefly from Yorkshire and Ireland, and the other sorts from the neighbourhood, Dundee and elsewhere; but in 1836 there were seven spinning-mills in the burgh and parish, which employed 160 men, and 533 girls, the wages of the former being 15*s.* a-week, and those of the latter 5*s.* The quantity of flax purchased by these mills is about 1,000 or 1,100 tons annually. The mills do not spin exclusively for the local market, but prepare such articles as linen thread, shoe thread, twist, &c., for the general market. The power-loom is not thought applicable to the Dunfermline manufacture, but the jacquard loom, introduced in 1824, and now universally used, has occasioned a great saving of time, as well as comfort in working. The fineness, too, and general fabric of the goods, have been vastly improved, and the manufacture proportionally extended. The following table shows the progress of the manufacture within the burgh and parish, and in the neighbouring villages of Torryburn, Crossford, and Cairneyhill, also in Leslie, Strathmiglo, Auchtermuchty, Falkland, and Dunshelt, in the middle district of the county, and in the small town of Culross, in which places the work is carried on for the Dunfermline manufactures:—

Date.	Number of Looms within the Burgh and Parish.	Number of Looms out of the Burgh and Parish.	Total.	Value of Produce.
				£.
1749	400	..	400	..
1788	..	..	900	..
1818	1,500	150	1,650	120,000
1836	2,794	723	3,517	351,700
1844	2,978	1,200	4,178	400,000
1845	3,050	1,240	4,290	400,000

The following table shows the number of persons, and amount of capital occupied in all the branches of the manufacture, (damask and diaper, both single and double, table-covers, ditto with worsted warps, linen full harness, bed-quilts, floor-covers or crumb-cloths, cloutings, &c.) prepared by a committee of manufacturers in 1836:—

	£.
3,517 looms producing annually finished goods to the amount of (calculating it at 100*l.* each loom)	351,700
Value of looms, shops, and workhouses	156,000
Floating capital (calculated at 60*l.* for each loom)	211,020
Total amount of capital invested in 1836 . . .	718,720

The following table shows the aggregate of all the persons employed in the different departments of the manufacture, exclusive of the spinners, with their wages, at the above period:—

Trades.	Number of Persons Employed.	Average Wages Weekly.
		s. d.
Weavers (Men and Boys)	3,517	10 0
Winders and Pirn-fillers (Women and Girls) .	1,100	4 0
Warpers, Warehousemen, and Lappers (Men)	150	15 0
Yarn-boilers (chiefly Women)	29	7 0
Bleachers of Yarn (chiefly Women) . . .	135	7 0
Bleachers of Cloth (Men and Women) . .	150	8 6
Lappers (chiefly Men)	29	9 6
Pattern-cutters (Men and Women) . . .	12	10 0
Dyers (Men)	10	18 0
Total number of Persons	5,032	

The goods produced in Dunfermline, and its vicinity, were, until within these few years, mostly woven in the houses of the weavers; almost every master of a house being owner of his own loom, at least, if it were of the more common description, and sometimes of two or three more, which he let to journeymen and apprentices. Latterly, however, the factory system has been introduced into this department; sundry manufacturers having fitted up extensive shops with looms, partly from a belief that their yarns would be safer in such establishments, partly, because on the old plan, they were sometimes obliged to furnish, at a considerable risk, weavers with peculiarly expensive looms, and partly from a belief that the business might be carried on in this way better, and more economically than when it was distributed over swarms of cottages. Very different opinions are entertained in regard to the influence of the new system. It, however, is admitted on all hands, to have had the effect of materially shortening the hours of labour. Formerly the weavers were frequently tempted to prolong their working hours to 9, 10, and 11 P.M., whereas the factories are never open later than 8 o'clock. Some of them have schools attached; and they are all clean, and well ventilated.

The patterns were till lately conceived in a wretched taste, were ill-drawn, and in every respect inferior to foreign specimens. They consisted chiefly of the British flag, the national Scotch arms, gentlemen's coats of arms; sometimes flowers, birds, &c.; all very unnatural and extravagant. But now the patterns display equal ingenuity and taste in design and execution: they are rich and varied, and considered equal if not superior to the German; besides, the damask loom is capable of producing any figure, however complicated. There are now several individuals wholly devoted to design painting.

It is believed that the first articles of the Scotch linen manufacture that made their way to foreign countries were produced in Paisley; but, after attaining, in some departments, to great excellence, the linen trade in that town began gradually to decline, and has been nearly superseded by that of cotton and silk.

According to the statements furnished by the Factory Inspectors, there were in Scotland, in 1839, 251 flax-mills in full operation, employing, in all, 17,897 hands.

Irish Linen Manufacture.—We have previously noticed the unjustifiable proceedings of the English Parliament in 1698, when the two

houses addressed William III., stating that it would be for the public advantage were the woollen manufacture of Ireland discouraged, and the linen manufacture established in its stead!—(*Ante*, p. 667.) This recommendation was carried into full effect. The woollen trade, in which the Irish had made some progress, was entirely crushed. But, though it be impossible either to palliate or excuse conduct so illiberal and unjust, it is but fair to say that the Parliament of England has always discovered the greatest readiness to encourage the linen manufacture of Ireland, and zealously co-operated with the Irish Parliament in that view. All the expensive and cumbrous machinery of premiums, regulations, bounties, and so forth, was put in motion; and, had it been possible to establish a manufacture on a solid foundation by such means, they might have been expected to succeed in this instance. In 1711 a board of trustees was appointed to watch over the progress of the manufacture; to distribute the large sum annually given by Parliament for premiums; and to provide for the prevention of frauds in the manufacture, and for other purposes. Under the superintendence of this board, halls were erected in Dublin, Belfast, and Newry, for the accommodation of the linen factors and others engaged in the trade; regulations were established in regard to the manufacture and sale of linen; and officers were appointed in different districts to see that these regulations were complied with. A more solid encouragement was given by the granting of bounties on the exportation of Irish linen in 1743. Efforts were also made to encourage the growth of flax-seed; and, in imitation of the English policy of making dead bodies be buried in woollen shrouds, the use of linen scarfs and hatbands at funerals was introduced!

In consequence of this extraordinary encouragement, the linen manufacture was gradually extended, particularly in the northern part of the island. But it may be questioned whether its extension has been advantageous. Mr. Young and Mr. Wakefield, two very high authorities as to all that respects Ireland, contend that it has been prejudicial rather than otherwise; and we are inclined to think that they are right. It certainly contributed to that morbid increase of population, and that minute division of the land, which are the bane of Ireland, and which are carried to the greatest extent where the manufacture is, and was most diffused. The manufacturers, too, being not only spinners and weavers, but also little farmers, had their attention diverted from their proper business, and were neither sufficiently industrious nor inventive. As might be expected, their earnings were generally very low, and but few amongst them were ever able to emerge to a more elevated sphere.

The introduction of mill-spinning has already gone far to effect a total change in the old mode of conducting the manufacture. The low wages of spinners in Ireland, and the system on which the manufacture had been long conducted, hindered the erection of flax-mills in that country, for many years after they had been extensively introduced into England and Scotland. But the rapid progress of the manufacture in the latter, subsequent to the erection of these mills, made it evident that, unless similar machinery were set in motion in Ireland, the linen manufacture in it would be entirely annihilated. At length,

notwithstanding the obstacles in the way, mills were introduced, and, in consequence, spinning by the hand is now nearly unknown; and the manufacture has disappeared from several parts of the country, where it had been largely introduced, leaving those who were partially dependent on it for subsistence, in a very depressed state. On the whole, however, there can be no doubt that the introduction of the factory system will be, in the end, most advantageous. Belfast is the principal seat of the new, as it was of the old, system. In 1841, there were in the town and its immediate vicinity, 25 steam mills for spinning linen yarn, one of which employed 800 hands. In 1835, the exports of linen goods from Belfast amounted to 53,881,000 yards, of the value of 2,694,000*l*. According to the official returns, there were in Ireland, in 1838, 40 flax-mills, employing in all, 9,017 hands.

The regulations relating to the stamping of linen, its sale in the public markets, and most of those that had reference to the details of the manufacture, have been repealed, with advantage to all parties.

Imports of Flax.—Exclusive of the flax raised in Ireland, and other parts of the United Kingdom, we import immense quantities from foreign countries. Of these, Russia supplies us with by far the largest share.

Account of the Quantities of Flax and Tow, or Codilla of Hemp and Flax, dressed or undressed, Imported into and Exported from the United Kingdom, in 1843, 1844, *and* 1845.

Countries.	1843	1844	1845
	Cwts.	Cwts.	Cwts.
Russia	1,089,386	1,112,024	859,627
Denmark	8,851	7,674	15,193
Prussia	173,259	249,404	185,019
The Hanseatic Towns	13,911	17,463	18,312
Holland	66,008	106,658	107,592
Belgium	44,186	44,967	80,168
France	9,472	7,575	11,145
Italy	249	2,557	8,271
Malta	55	. .	4,086
Egypt	29,546	30,266	124,144
Other parts	2,227	4,906	4,766
Total quantities Imported	1,437,150	1,583,494	1,418,323
Ditto Re-exported	11,657	4,732	17,924
Ditto entered for Home Consumption (deducting quantities re-exported after payment of Duty)	1,422,992	1,583,328	Duty repealed 19th March, 1845.

Account of the Quantities of Hemp, rough or undressed, or other substance of the nature of Hemp, Imported into and Exported from the United Kingdom, in 1843, 1844, *and* 1845.

Countries.	1843	1844	1845
	Cwts.	Cwts.	Cwts.
Russia	463,061	655,954	603,886
Italy	21,981	19,369	17,708
British Territories in the East Indies	227,812	211,392	273,963
Philippine Islands	19,354	14,122	4,056
United States of America	1,072	7,592	31,470
Other parts	2,463	4,804	1,367
Total quantities Imported	735,743	913,233	931,850
Ditto Re-exported	10,404	11,635	12,593
Ditto entered for Home Consumption (deducting quantities re-exported after payment of Duty)	689,741	881,351	Duty repealed 19th March, 1845.

Exports of Linen from Ireland, &c.—The following table, which we regret the parliamentary accounts do not furnish the means of continuing to the present day, gives an account of the quantity of linens exported from Ireland, from 1800 to 1829, both inclusive; and of the bounty paid on linen exported to foreign parts from Ireland:—

Years.	Exported to Great Britain.	Exported to Foreign Parts.	Total.	Amount of Bounty Paid in Ireland on Linen Exported to Foreign Parts.
	Yards.	Yards.	Yards.	£. s. d.
1800	31,978,039	2,585,829	34,563,868	. .
1802	33,246,943	2,368,911	35,615,854	. .
1804	39,837,101	3,303,528	43,140,629	10,545 2 2
1806	35,245,280	3,880,961	39,126,241	15,668 4 6
1808	41,956,719	2,033,367	43,992,086	6,740 16 0
1810	32,584,545	4,313,725	36,898,270	16,448 19 9
1812	33,320,767	2,524,686	35,845,453	11,548 3 4
1814	39,539,443	3,463,783	43,003,226	17,231 14 11
1815	37,986,359	5,496,206	43,482,565	17,430 17 3
1816	42,330,118	3,399,511	45,729,629	12,082 6 4
1817	50,288,842	5,941,733	56,230,575	21,524 15 4½
1818	44,746,354	6,178,954	50,925,308	28,848 6 2
1819	34,957,396	2,683,855	37,641,251	16,177 8 3½
1820	40,318,270	3,294,948	43,613,218	14,928 9 11
1821	45,519,509	4,011,630	49,531,139	18,218 19 2½
1822	43,226,710	3,374,993	46,601,703	17,112 9 2
1823	48,066,591	3,169,006	51,235,597	17,765 5 10
1824	46,466,950	3,026,427	49,493,377	17,114 13 10½
1825	52,559,678	2,559,587	55,113,265	12,015 9 6½
1826	The exportation to Great Britain cannot be ascertained for these years, the cross-channel trade having been assimilated by law to a coasting traffic.	2,726,297	. .	10,249 17 9
1827		4,284,566	. .	12,114 0 8
1828		3,214,911	. .	9,494 7 5
1829		2,386,223	. .	6,886 1 11

Of these exports, more than twelve-thirteenths have been to Great Britain. The total average export, during the three years ending with 1825, was 51,947,413 yards, of which 49,031,073 came to this country: the exports to all other parts being only 2,916,340. Since 1825, the trade between Ireland and Great Britain has been placed on the footing of a coasting-trade, so that linens are exported and imported without any specific entry at the custom-house.

Bounties. — Besides premiums and encouragements of various kinds, bounties were granted on the exportation of linen, for a very long period, down to 1830, when they ceased. It is not easy to imagine a worse policy. Bounties of this sort, instead of promoting the manufacture, render those engaged in it comparatively indifferent to improvements; and, though it had been otherwise, what is to be thought of the policy of persisting for above a century in supplying the foreigner with linens for less than they cost? We have not the least doubt that were the various sums, expended in well-meant but useless attempts to force this manufacture, added together, with their accumulations at simple interest merely, they would be found sufficient to yield an annual revenue little, if at all, inferior to the entire value of the linens exported from Ireland to foreign parts. And, after all, the business never began to do any real good or to take firm root, till the manufacture ceased to be a domestic one, and was carried on principally in mills, and by the aid of machinery, a change which the old forcing system tended to counteract. The only real and effectual legislative encouragement the manufacture has ever met with has been the reduc-

tion and repeal of the duties on flax and hemp, and the relinquishing of the absurd attempts to force their growth at home.

Account showing the Quantities and Values of Linen Manufactures and Linen Yarn Exported from the United Kingdom in 1844, *specifying the Countries to which they were sent, and the Quantities and Values of those sent to each.*

Countries to which Exported.	Linen Manufactures.			Linen Yarn.		Total Value
	Entered by the Yard.		Thread, Tapes, and Small Wares.			
	Quantity.	Declared Value.	Declared Value.	Quantity.	Declared Value.	
	Yards.	£.	£.	lbs.	£.	£.
Germany	3,662,058	116,850	91,049	4,537,108	239,888	441,087
Holland	643,097	29,756	10,716	4,298,651	126,731	161,203
Belgium	82,968	5,256	5,301	908,537	42,280	52,837
France	4,976,718	173,455	1,202	13,546,757	501,241	675,898
Portugal, Proper	871,241	20,088	..	541	25	20,063
Spain and the Balearic Islands	3,991,153	111,215	1,980	1,458,860	60,666	193,811
Gibraltar	1,652,475	50,134	467	407,338	25,194	75,815
Italy and the Italian Islands	2,069,917	104,715	1,250	648,966	28,520	134,485
Turkey	254,608	10,046	14	8,054	385	10,616
Cape of Good Hope	465,828	14,897	1,459	..	..	16,346
St. Helena and Ascension Islands	17,576	757	26	..	..	783
Mauritius	210,900	7,817	380	..	..	8,197
East India Company's Territories and Ceylon	1,223,854	50,823	2,814	..	..	53,642
Sumatra, Java, and other Islands of the Indian Seas	127,825	4,927	164	..	..	5,091
Philippine Islands	66,490	3,178	40	..	..	3,218
China	175,703	7,567	315	..	..	7,882
British Australian Colonies	976,375	29,186	794	2,228	130	30,110
,, North American Colonies	3,750,448	112,514	22,823	10,332	827	135,664
,, West Indies	9,472,485	214,950	2,383	1,997	39	217,072
Hayti	2,749,846	47,153	287	..	..	47,490
Cuba and other Foreign West Indian Colonies	8,553,263	270,265	5,549	..	..	275,814
United States of America	27,811,411	872,414	64,786	34,407	1,192	938,392
Mexico	3,562,896	140,234	469	61,707	1,890	142,593
New Grenada, Venezuela, and Equador	2,629,063	56,532	124	..	..	56,706
Brazil	6,106,838	167,849	2,913	800	34	170,296
States of the Rio de la Plata	991,594	31,114	583	..	..	31,697
Chili	1,902,030	68,996	437	2,866	64	69,499
Peru and Bolivia	955,453	36,770	497	..	..	37,267
The Channel Islands	482,960	22,575	209	1,245	120	22,904
All other places	842,841	32,879	4,109	39,113	2,150	39,138
Total	91,2-3,754	2,801,609	223,191	25,070,569	1,050,676	4,075,476

Value of the Manufacture.—Number of Persons employed.—There are no means by which to form an accurate estimate of the entire value of the linen manufacture of Great Britain and Ireland. Dr. Colquhoun estimated it at 15,000,000*l.**; but there cannot be the shadow of a doubt that this was an absurd exaggeration. In the first edition of the *Commercial Dictionary*, published in 1832, we expressed our conviction that it could not be valued at more than 10,000,000*l.*; and though, probably this estimate was then beyond the mark, farther inquiries have satisfied us that it may, at present, be looked upon as nearly accurate. Now, if we set aside 3,400,000*l.*, or nearly a third part of this sum for the value of the raw material, and another equal part for profits, wages of superintendence, wear and tear of capital, coal, &c., we shall have 3,200,000*l.* to be divided as wages among those employed in the manufacture. And, supposing each individual to earn, at an average, 24*l.* a-year, the total number employed in the different departments of the business would be about 133,000. It may be thought, perhaps, that 24*l.* is too low an estimate for wages; and such, no doubt, would be the case, were not Ireland taken into the average. But as a great

* Sir F. M. Eden estimated the entire value of the linen produced in Great Britain in 1800 at 2,000,000*l.* *Treatise on Insurance* p. 76.

many persons are there employed in the manufacture at very low wages, we believe that 24*l.* is not very far from the mean rate. We subjoin—

An Account of the Number of Persons, distinguishing between Males and Females, engaged in the different Departments of the Flax and Linen Manufacture in Great Britain, according to the Returns under the Census of 1841.

	Males.		Females.		Total.
	20 Years of Age and upwards.	Under 20 Years of Age.	20 Years of Age and upwards.	Under 20 Years of Age.	
England and Wales, and Isles in the British Seas	8,819	2,817	3,504	4,008	19,148
Scotland	21,395	6,211	13,203	7,791	48,600
Total	30,214	9,028	16,707	11,799	67,748
Add Proportion of Fabric not specified	9,224	1,880	4,114	2,247	17,465
Total Great Britain	39,438	10,908	20,821	14,046	85,213

Health of the People employed in Flax Mills.—It appears to be the concurrent opinion of Messrs. Stuart, Drinkwater, and Power, Factory Commissioners, that employment in flax-mills is, speaking generally, more injurious to the health than in any other class of factories. The heckling department, in which children are largely employed, requires constant attention on their part, and also pretty considerable exertion. A great deal of dust is, at the same time, always flying about, which cannot fail to be very prejudicial to the health. In the spinning department, the roving, out of which the thread is formed, is made to pass through either hot or cold water; and there is in consequence, a continual spray from the yarn and the machinery, which is not long in wetting the clothes to the skin. Perhaps the best way to avoid the serious injury arising from this cause would be the use of waterproof aprons. These have, indeed, been already introduced into one or two mills, and found to answer exceedingly well.

Sect. 5.—*Silk Manufacture.*

The silk manufacture seems to have been introduced into England so early as the 14th century. The throwsters of the metropolis were formed into a fellowship in 1562, but they were not incorporated till 1629. It is stated in the preamble to a statute passed in 1666 (13 & 14 Charles II. c. 15), that there were then no fewer than 40,000 individuals engaged in the trade. No doubt, however, there is a vast deal of exaggeration in this statement, and we refer to it only as showing that the manufacture was then firmly established, and of considerable importance. It received a powerful stimulus by the immigration of Protestants from France, subsequently to the revocation of the Edict of Nantes, in 1685. Unluckily, however, an end was soon after put to the importation of foreign silks, which had previously been carried on to a considerable extent. This prohibition had the effect that might have been anticipated; the manufacturers trusted in future rather to custom-house regulations than to their own skill and ingenuity for the disposal of their goods; routine usurped the place of

invention; and from this distant period down to the adoption of the new system in 1825, but few improvements were made in the processes.

Our largest supplies of the material are derived from China and India, where the culture of silk is greatly on the increase; but the higher qualities are imported from Italy and France. Various attempts have been made to introduce the rearing of the silk-worm in England. The signal success which attended its introduction into the south of France, and the encouragement held out for the cultivation of the mulberry-tree for that object, by Henry IV., excited the efforts of James I. of England, to introduce the culture of silk into this country; but, after repeated trials, the pursuit was abandoned as hopeless. Latterly, however, the attempts to produce silk in this country have been revived; and samples of native produce have been raised in Cornwall, remarkable for their beauty and richness; but we doubt whether this branch of industry can ever be rendered of any material importance.

In 1719, the first mill for throwing silk was erected at Derby, by the famous Sir Thomas Lombe, who had made himself acquainted with the mechanism in Italy, and who, at the expiration of his patent, received a parliamentary reward of 14,000*l.* in consideration of his great public services. But it is more than doubtful whether the construction of this mill was of any advantage to the manufacture, inasmuch as exorbitant duties were imposed on foreign thrown silk, in order to bolster up the new business at home.

For more than a century prior to 1825, the history of the silk manufacture presents little else than a continuous series of complaints, on the part of the manufacturers, of the decay of their trade, arising from the clandestine importation of foreign silks, and of impotent efforts on the part of Government to effect their exclusion. In consequence of this system, the energies of the manufacturer were paralysed; and, notwithstanding our astonishing progress in other manufactures, and our superiority in the machinery employed in them, such is the deadening influence of monopoly, that the machinery we employed in the silk trade, in 1825, was decidedly inferior to that of either France or Germany, which, indeed, were superior to us, not in one only, but in every department of the trade.

Mr. Huskisson had sagacity to perceive the cause of this inferiority, and courage to undertake the introduction of a new system. This was accomplished in 1825, by reducing the duties on raw silk to a nearly nominal amount, and materially diminishing those on thrown or Organzine silk, while, at the same time, the prohibition against importing foreign silk goods was repealed, and they were allowed to be freely imported on paying an *ad valorem* duty of 30 per cent. This change of system was violently opposed, and many predicted that it would occasion the ruin of the manufacture. But these sinister auguries have proved wholly fallacious. The measure, in fact, has been signally successful. The manufacturers feeling they could no longer depend on the wretched resource of custom-house regulations, put forth all their energies, and having called the various resources of science and of ingenuity to their aid, the manufacture has been more improved

and extended during the last twenty years than it had been during the previous century. In the fancy departments, the French have the pre-eminence, which they owe to the great attention they devote to the beauty of designs, and the harmony of colours, assisted by a climate more favourable for dyeing the material. But the British manufacturers have not allowed this pre-eminence to remain undisputed, and during the last few years, have closely approached, in broad silks and ribbons, that standard of excellence which their neighbours had already attained. Where the value of an article does not depend so much on the *quantity of material* of which it is composed as on the taste displayed in its production, our manufacturers have also emulated, though as yet they have not reached, that superiority which the French display in their designs and in the beauty of some of their fabrics. This emulation has been promoted by the establishment of schools of design, under the auspices, or with the encouragement of Government, in London and the manufacturing districts.

The great increase which has taken place in the manufacture, may be seen by comparing the quantities of raw and thrown silk entered for home consumption since 1814, comprising the ten years immediately preceding the opening of the trade (1825) and the twenty years which have since elapsed :—

Account showing the Quantities of Raw, Waste, and Thrown Silk entered for Consumption in the United Kingdom, from 1814 *to* 1844, *both inclusive.*

Years.	Raw, Waste, and Thrown Silk entered for Consumption.			
	Raw	Waste, Knubs, and Husks.	Thrown.	All Sorts.
	lbs	lbs.	lbs.	lbs.
1814	1,504,235	29,234	586,505	2,119,974
1815	1,069,596	27,971	377,822	1,475,389
1816	873,414	4,162	210,758	1,088,334
1817	1,343,051	49,055	294,553	1,686,659
1818	1,444,881	86,940	391,186	1,922,907
1819	1,446,097	71,331	431,125	1,948,553
1820	1,622,799	94,883	309,953	2,027,635
1821	1,864,518	105,047	360,248	2,329,808
1822	1,993,764	64,921	382,878	2,441,563
1823	2,051,895	52,362	363,864	2,468,121
1824	3,414,520	133,257	463,271	4,011,048
1825	2,848,506	105,910	559,642	3,604,058
1826	1,064,188	included	249,325	2,253,513
1827	3,759,138	with raw in	454,015	4,213,153
1828	4,162,550	these	385,262	4,547,812
1829	2,719,962	years.	172,239	2,892,201
1830	3,771,969	485,013	436,535	4,693,517
1831	3,035,832	762,258	514,240	4,312,330
1832	3,401,445	660,696	329,932	4,392,073
1833	3,638,795	654,381	268,367	4,761,543
1834	3,346,750	1,009,982	165,669	4,522,351
1835	4,151,008	1,382,872	254,578	5,788,453
1836	4,372,501	1,536,721	224,933	6,266,160
1837	3,730,427	975,791	213,368	4,819,576
1838	3,683,739	990,147	243,570	4,897,456
1839	3,483,363	1,042,655	229,940	4,755,958
1840	3,860,980	745,243	288,981	4,895,204
1841	3,209,895	1,379,814	267,838	4,856,532
1842	3,936,714	1,434,693	363,977	5,735,384
1843	3,649,747	1,495,457	334,825	5,480,039
1844	4,021,808	1,775,855	410,358	6,208,021
Aggregate Quantities entered for Consumption.	Abstract in Decennial Periods.			
In the 10 Years, 1814–1823	15,214,245	565,901	3,608,872	19,409,023
Ditto 1824–1833	32,016,905	2,891,515	3,672,823	39,581,243
Ditto 1834–1843	37,425,114	11,924,815	2,657,189	52,007,118
Average Annual Consumption.				
In the 10 Years, 1814–1823	1,521,424	56,591	360,887	1,940,902
Ditto 1824–1833	3,201,690	289,151	367,282	3,958,124
Ditto 1834–1843	3,742,511	1,192,481	265,719	5,200,711
Consumption of the single year 1844	4,021,808	1,775,855	410,358	6,208,021

Previously to 1824, the silk goods produced were comparatively heavy and rich, and their consumption was proportionally limited, being mostly confined to the wealthier classes. But the competition to which the producers were subsequently exposed, led to a greater variety of styles, and to a reduction of qualities and prices. In consequence, silks have gradually fallen in value, until at length they have become articles of general consumption. Though our manufacturers have with difficulty withstood the competition of our neighbours in patterns, they have had a largely increased demand for silk goods of medium and lower qualities. It is only in *fancy* silks of a high quality that the English producers have anything to fear from foreign competition; and even in these they are gaining ground; while British plain fabrics (satins excepted) are largely exported to our colonies, the United States, and the Continent, including France itself. The preference given to French satins is a consequence of the manufacturers paying more attention to the '*dressing*' and '*finish*,' by which they impart a richness, and a brilliancy to their plain satins, which English satins, though really heavier, do not possess in the same degree; but as regards gros de Naples, and satinettes, the great staple articles of consumption, our manufacturers have the superiority.

Account of the Declared Value of British Silk Goods Exported from the United Kingdom in each Year, from 1826 *to* 1845, *both inclusive; showing the Countries to which they were principally Exported, and the Values of those Exported to each.*

Years.	British Silk Goods Exported from the United Kingdom.						
	France.	Other Countries in Europe.	United States of America.	Mexico, South America, and Foreign West Indies.	British Possessions in America, and the West Indies	Africa, Asia, and Australia.	Total.
	£.	£.	£.	£.	£.	£.	£.
1826 .	1,498	49,477	27,265	56,548	19,523	14,490	168,801
1827 .	4,661	59,406	67,111	61,057	25,852	18,757	236,344
1828 .	11,009	61,825	46,567	80,346	24,966	31,138	255,871
1829 .	32,047	70,064	56,663	50,743	36,069	20,324	267,930
1830 .	34,806	75,196	125,257	69,015	100,342	25,692	521,010
1831 .	43,462	75,226	227,965	67,916	120,591	44,738	579,874
1832 .	75,187	105,114	92,245	67,591	113,561	46,004	329,691
1833 .	76,525	119,306	251,278	106,450	122,816	54,527	747,404
1834 .	90,346	113,894	240,306	106,191	102,487	53,974	637,198
1835 .	45,612	157,762	537,040	67,962	116,421	48,989	973,786
1836 .	48,160	82,850	524,301	75,026	122,990	64,495	917,822
1837 .	43,144	84,097	109,629	73,326	113,514	79,963	503,673
1838 .	56,398	81,214	348,506	65,675	111,109	114,178	777,280
1839 .	44,622	66,463	410,093	96,681	175,217	75,038	868,118
1840 .	48,607	63,476	274,130	140,974	162,110	98,122	792,848
1841 .	117,333	73,344	306,737	107,601	113,317	68,532	788,894
1842 .	181,924	75,779	81,243	96,986	96,395	53,862	570,189
1843 .	148,222	106,876	164,238	120,026	62,509	66,086	667,958
1844 .	159,660	110,425	189,696	117,594	109,191	49,867	736,455
1845 .	139,772	. .	218,977	. .	. .	. .	766,405

It may be interesting, not only for present, but for future comparison, to refer to the actual values of both British and foreign silk goods in plain fabrics, as they are manufactured and imported at the present period. With this view the following statements have been carefully prepared, and the results may be relied upon:—

Particulars of 100 *lbs. weight of English Plain Broad Silks.*

Description.	Where Manufactured.	Manufacturers' Price per Yard.	Cost per lb.	Number of Yards per 100 lbs.	Value per 100 lbs.
		s. d.	*s. d.*		*£. s. d.*
Black Gros de Naples*	Manchester	1 6	26 1½	1,740	130 10 10
	Spitalfields	2 0	31 6	1,583	158 7 0
	Manchester	2 2	32 0½	1,509	163 8 1
	Ditto.	2 9	34 1½	1,376	175 11 6
	Spitalfields	3 0	42 0½	1,402	210 6 11
Coloured Gros de Naples*	Manchester	3 6	36 7½	1,047	183 4 8
	Spitalfields	2 0	32 0	1,600	160 0 0
	Ditto	2 6	38 9	1,553	193 6 8
	Ditto	3 5	40 7½	1,189	203 3 0
Black Satinets*	Manchester	2 3½	27 9½	1,212	138 19 4
	Spitalfields	3 0	33 7	1,120	168 0 0
	Ditto	3 5	37 1	1,015	185 9 6
	Ditto	4 5	40 2½	910	201 2 4
Coloured Satinets*	Ditto	3 0	35 3½	1,177	176 9 5
	Ditto	3 5	41 10½	1,225	209 6 6
	Ditto	4 5	47 1	1,065	235 8 9
	Ditto	1 8	37 11½	2,279	189 16 0
Black Satins	Ditto	2 10	44 10	1,363	224 5 1
	Ditto	7 6	50 3½	670	251 7 3
Coloured Satins	Ditto	3 1	54 1	2,593	270 9 4
	Ditto	6 0	60 2½	1,003	301 0 4
	Ditto	3 9	31 2	831	155 17 9
Black (Dress) Velvets	Ditto	6 9	56 0½	831	280 4 2
	Ditto	11 6	80 6	700	402 17 2
Coloured (Dress) Velvets	Ditto	4 6	35 8	794	178 7 6
	Ditto	7 0	58 1½	845	290 14 7
	Ditto	11 6	80 0	697	400 13 4

* These are the chief articles of consumption in England, and are not interfered with by foreign consumption.

[N.B.—The widths of Spitalfields gros de Naples are from 19 to 19½ inches; low satins, under 3*s* 4*d*. per yard, 17 inches; dress satins, 19½, satinets, 19 inches, and dress velvets, 19½ inches. Manchester gros, low qualities, from 17½ to 18½; higher qualities, from 18½ to 19½, satinets, all qualities, from 18½ to 19 inches.]

Particulars of 100 *lbs. weight of Foreign Manufactured Silks.*

		Price per Yard.	Cost per lb.	Value per 100 lbs.	Yards per 100 lbs.
		s. d.	*s. d.*	*£. s. d.*	
French Exchange, 25·42½ :—					
Plain Black Satins	Manufacturers' price	2 1½	32 11½	164 14 10	1589
	Ditto, with duty, &c, added	2 7	40 3	201 7 5	
Ditto coloured ditto	Manufacturers' price	3 6½	43 11½	219 14 7	1250
	Ditto, duty added	4 9	59 4½	296 17 6	
German Exchange, 25·60 :—					
Velvets	Manufacturers' price	3 1½	23 8½	141 8 9	992
	Ditto, duty, &c., added	4 2½	37 6	187 15 9	
	Manufacturers' price	6 5½	56 2½	281 4 0	875
	Ditto, duty, &c., added	7 7	67 3	336 8 6	
	Manufacturers' price	9 1	60 5	302 7 3	664
	Ditto, duty, &c., added	10 6½	70 2	350 16 1	

[N.B.—The widths are about the same as in English goods; but the lower qualities of velvets, at same prices, are decidedly inferior, being shorter in the pile, and having a greater admixture of cotton.]

The broad silk manufacture, though exposed to much fluctuation from the caprices of fashion, has certainly increased since 1836, when an estimate of its extent appeared in the first edition of this work. In that year, which was one of unexampled activity in our textile fabrics generally, it was supposed that nearly half the silk imported was consumed in the manufacture of broad silks, the gross value of the trade being estimated thus, viz., Spitalfields, 1,800,000*l*.; Manchester, 1,500,000*l*., and all other places, 500,000*l*.; and that in all, upwards of 55,000 persons were employed in the trade in the United Kingdom. The preponderance of the manufacture is now considered to be in favour of Manchester, a circumstance which was in the first instance promoted by a local Act of Parliament, called the Spitalfields Act, passed in 1773, empowering the weavers in Middlesex to demand a fixed rate of wages to be settled before a magistrate. This Act was repealed in 1824, but not until it had driven the manufacture to other

quarters, and particularly to Manchester, where it was independent of the influence of so impolitic a statute.

In the *ribbon trade* (the next great branch of the silk manufacture), the estimate formed for 1836 may be taken, so far as the numbers of persons employed, and the value of the entire manufacture are concerned, as a fair estimate for 1845. During the interval of ten years, no important changes have taken place in the machinery, with the exception of the engine-loom, which has been considerably extended, and rendered applicable to the production, at the same time, of several pieces, in plaid or checked ribbons, which were formerly woven in one piece by the single hand-loom. In Coventry, there are only two factories, in which ribbons are woven by power, and the frequent change of pattern, promoted by competition, and the ever-varying taste of the public, offer little inducement to the application of steam power for the manufacture of *fancy* ribbons, where variety of pattern, rather than quantity of a particular style, is a chief *desideratum* in the production. The competition with the French, which is more felt and feared in this than in any other branch of the trade, has been productive of the best results in the progressive improvement, both in the design and execution, of ribbons. The English ribbon manufacturer is already, almost, if not quite, independent of foreign competition in *plain* fabrics; and if we may judge by his progress during the last ten years, he will speedily arrive at that eminence in the higher classes of the manufacture, which the French have hitherto exclusively occupied. In 1836, or shortly before that time, English ribbons were scarcely made at a price above 30*s.* per piece of 36 yards, whereas they are now made as high as 60*s.* per piece; and such is the improvement in bonnet ribbons, the leading branch of the trade, that a higher class of goods is now in demand than at any previous period of the English manufacture.

During the last ten years a vast increase has taken place in the consumption of silk for the manufacture of shawls, arising from the change which has taken place in the fashion. The manufacture of damask shawls of entire silk has been greatly extended in Manchester and its neighbourhood, employing, it is supposed, nearly 4,000 hands, and consuming a great weight of material, a considerable portion being Italian silk. This has materially interfered with the woollen and mixed shawl manufacture of Paisley. Latterly, however, this branch has been again set on foot in that town, with a reasonable prospect of its succeeding.

In other branches of the silk manufacture, no material changes have taken place during the last ten years: so that the following estimate of the total value of the manufacture for 1836 has undergone but little modification in its results. Silk enters into so many articles, either in whole, or as a component part; and is so widely spread over the United Kingdom, that any estimate formed of the entire value of the manufacture must at best be only a rude approximation. To distribute the material among the different branches of the trade, to apportion the value of the manufacture under the heads of *labour, wear and tear, interest of capital*, &c., and manufacturers' profit, and to estimate the number of persons employed, would be a task presenting all but insuperable difficulties. The following table was, notwith-

standing, submitted to the reader in the former edition of this work, as some approximation to the truth. It was drawn up with great care from the statements of intelligent practical men in all parts of the country, conversant with the trade, and well able to form an opinion upon it. And as the circumstances have changed but little in the interval, we believe it is as nearly correct as it can well be rendered :—

Estimate of the Total Value of the Silk Manufacture of Great Britain (entire and mixed) for 1836, *showing the different Items of which the same is made up, the Number of Persons employed, &c.*

Branches.	Estimated Weight of Raw Silk consumed.	Cost to Manufacturer, including Throwing and Waste.	Cost of Dyeing.	Estimated Amount paid for Winding, Warping, Weaving, Printing, Finishing, &c.	Estimated Number of Persons employed.	Interest on Capital, Wear and Tear of Machinery, Risk, Incidental Charges, and Manufacturer's Profit.	Estimated Total Value.
	lbs.	£.	£	£.	No	£.	£
Broad silks	1,800,000	1,845,000	135,000	1,156,500	55,603	627,300	3,763,800
Ribbons	750,000	768,750	56,250	577,500	27,765	290,500	1,693,000
Handkerchiefs	350,000	262,500	26,250	202,125	9,718	98,175	589,050
Crapes	160,000	140,833	12,000	76,417	7,350	80,238	309,488
Silk hose and gloves	180,000	162,000	16,000	139,000	6,683	47,550	364,550
Sewing silks	200,000	152,000	15,000	41,000	1,970	41,600	249,600
Mixed goods	800,000	600,000	60,000	900,000	49,452	936,000	2,496,000
Miscellaneous	100,000	93,958	7,500	304,874	16,726	243,500	649,332
	4,340,000	4,025,041	328,000				
Deduct from dyeing one-third for labour at 10s per week, and one-third for profit, &c.	..	..	218,666	109,333	4,205	109,333	
			109,334	3,506,249	179,472	2,464,196	10,104,820
From the Government Returns, just published, there appear to be employed in silk factories 10,186 males and 20,494 females, from which deduct for crapes 1,350 persons, and sewings 1,500 persons, engaged in throwing	..	..	..	..	27,332	..	
Producing, at 2s. per week average wages	..	..	..	217,090	..	161,385	978,425
Total amount paid for wages	..	..	..	3,723,339			
Total number employed	..	..	..	..	207,304		
Interest on capital, wear and tear, profit, &c.	..	..	..	..	..	2,625,581	
Estimated total value	..	..	..	..	..	..	10,468,245
Estimated silk consumed		4,340,000					
Deduct Italian thrown		195,750					
Total value of throwing, at 2s. per lb.		4,144,250 lbs. 414,425*l.*					

The principles on which this estimate was formed were explained in the former edition of this work, I. pp. 682-690; and it would seem to be unnecessary to repeat them in this place.

Under Mr. Huskisson's Act, which came into operation on 5th July, 1826, foreign silks ceased to be prohibited, and were admitted to consumption, on payment of a duty of 30 per cent. *ad valorem*. In consequence of the remonstrances of the manufacturers of Spitalfields and Coventry, the *ad valorem* duty was modified to a duty, *by weight*, of various rates, applicable to different descriptions of the manufacture. It was intended that this modification should approximate to the average duty of 30 per cent. *ad valorem*, but in practice it has been found that the duties payable, particularly on the fancy branches of the manufacture, have ranged from 30 to 50 per cent. These duties, however, have been again modified; the Act 9 and 10 Vict., c. 23, having fixed the duties on foreign manufactured silks at 15 per cent. *ad*

valorem, or at an assumed equivalent sum charged by weight. The duty upon raw silk was totally repealed in 1845.

An Account of the Quantities of Foreign Silk Manufactures, entered by Weight, retained for Home Consumption in the United Kingdom since the Removal of the Prohibition (5th July, 1826).

Years.	Quantities retained for Home Consumption.	Years.	Quantities retained for Home Consumption.	Years.	Quantities retained for Home Consumption.
	lbs.		lbs.		lbs.
1826 (from 5th July)	48,301	1833 (from 5th July)	142,267	1840 (from 5th July)	248,248
1827 ,,	115,278	1834 ,,	166,261	1841 ,,	248,902
1828 ,,	169,489	1835 ,,	160,540	1842 ,,	237,460
1829 ,,	121,585	1836 ,,	180,078	1843 ,,	267,073
1830 ,,	126,314	1837 ,,	172,860	1844 ,,	295,125
1831 ,,	143,479	1838 ,,	247,067	1845 ,,	310,154
1832 ,,	144,956	1839 ,,	256,851		

Factories and People employed therein.—Mr. Saunders, one of the Factory Inspectors, gives the following statement of the hands employed in the silk mills in Derby, viz. :—

Year.	Adults.	Young Persons.	Children.	Total.
1843	1,552	759	698	3,009
1844	2,196	1,079	1,064	4,339
1845	2,946	1,220	753	4,219

The whole numbers employed in his district, termed the "London and Leeds District," (but comprising the silk factories in Berkshire, Bucks, Derby, Essex, Herts, Kent, Lancashire, Middlesex, Nottingham, Norfolk, Oxford, Stafford, Suffolk, Surrey, Yorkshire), Mr. Saunders returns as under, viz :—

	Adults, above 18.		Young Persons, 13 to 18.		Children, under 13.		Total Employed.		
	Males.	Fem.	Males	Fem.	Males.	Fem.	Males.	Fem.	M. & F.
October, 1838	1,073	3,540	702	2,850	970	1,357	2,744	7,747	10,491
January, 1843	1,819	4,150	689	2,102	716	1,335	2,724	7,587	10,311
January, 1845	1,695	5,116	878	2,626	742	1,491	3,315	9,233	12,548

And the number of occupiers of factories, and power employed, as under :—

	Number of Occupiers.	Available Power.		
		Steam.	Water.	Steam and Water.
October, 1838	69	667	281	948
January, 1845	63*	853	126*	1,023

* The reduction in the number of occupiers, and in the amount of water power, is said to have been principally caused by some country mills, in which the machinery was wholly propelled by water, having been closed or converted into flour-mills.

It appears from Mr. Horner's Report (26th November, 1845), that there were in his district 32 silk mills, employing—

	Males.	Females.	Total.
Children, 8 to 13 . .	331	683	1,014
,, 13 to 18 . .	494	1,613	2,107
Adults, 18 and above .	1,045	2,279	3,324
	1,870	4,575	6,445

At the same date there were 995 looms engaged in the manufacture. The inspectors in other districts do not distinguish the silk mills in their localities, or the numbers employed; but it is supposed that at present (1846), in the United Kingdom, there cannot be less than 150 mills, employing about 35,000 persons of all ages.*

Account of the Cotton, Woollen, Flax, and Silk Factories in Lancashire, the North and part of the West Ridings of Yorkshire, and the Four Northern Counties of England (Mr. Horner's District), specifying the Moving Power, and the Number and Classes of Work People employed in them in November, 1845.

	Number of Mills.	Moving Power.				Persons Employed.								Power Looms.
		Steam.		Water.		Children. 8 to 13.		Young Persons. 13 to 18		Adults. 18 and above.		Total.		
		Engines.	Horse Power.	Wheels	Horse Power.	M.	F.	M.	F.	M.	F.	M.	F.	
Cotton . .	1,794	1,398	41,168	285	3,069	7,373	3,674	24,646	33,462	53,297	70,008	90,316	107,144	138,717
Woollen and Worsted .	241	105	1,778	185	1,727	1,049	845	1,564	1,978	3,340	2,645	6,473	5,468	3,327
Flax . .	71	30	924	40	552	264	222	650	1,119	1,060	2,276	1,974	3,617	..
Silk. . .	32	24	448	5	45	331	683	494	1,613	1,045	2,279	1,875	4,575	995
Total .	2,068	1,552	44,333	515	5,413	9,017	5,424	27,374	38,172	54,242	77,208	100,638	120,804	142,949
						14,441		65,546		141,450		221,437		

We subjoin the following—

Statutory Regulations in regard to the Employment of Children in Factories.

No statutory restrictions respecting the employment of children in the mills and factories of the United Kingdom existed until 1802, when the 42 Geo. III. was passed for the preservation of the health and morals of apprentices and others employed in cotton and other factories, and directing the local magistrates to report whether the factories were conducted according to law, and to adopt such sanitary regulations as they might think fit. This Act was followed, in 1816, by the Act generally called Sir Robert Peel's Act, imposing various regulations on the employment of children in cotton-mills.

Both of these Acts were repealed in 1831, by the 1 & 2 Will. IV. c. 39, commonly called Sir John Hobhouse's Act, which provided, that in cotton factories, to which it alone related, no child could legally be employed till it had attained the age of 9 years; and that no person under 18 years, should be permitted to remain in the factories more than 12 hours in one day; and that on Saturdays they should only be employed in the factories for 9 hours.

Sir John Hobhouse's Act was repealed in 1833, by the 3 and 4 Will. IV. c. 103; and this last-mentioned statute, and the 7 Vict. c. 15, enact the following provisions relative to persons employed in all processes incident to the manufacture of cotton, wool, hair, silk, flax, hemp jute or tow, separately or mixed together, or mixed with any other material, or any fabric made thereof, with the exception of factories used solely for the manufacture of lace, hats, or paper, or solely for bleaching, dyeing, printing, or calendering.

1. That no person under 18 years of age shall be allowed to work in the night, *i. e.* from half-past 8 in the evening to half-past 5 in the morning, nor on Saturday for any purpose after half-past 4 in the afternoon, the hours to be regulated by a public clock, as stated in the notice put up in each factory.

2. That no child under 8 years of age shall be employed, and that no child between 8 and 13 years old shall be employed more than 6 hours and 30 minutes in any one day, unless the dinner-time of the young persons from 13 to 18 years old in the factory shall begin at 1 o'clock; in which case, the children beginning to work in the morning may work for 7 hours; but any child above 11 years of age employed solely in the winding and throwing of silk may work for 10 hours a day.

* This article has been principally drawn up from materials furnished by our friend Mr. Robert Slater, of Fore Street, to whom, on many occasions, we have been largely indebted.

And any occupier of a factory restricting the labour of young persons between 13 and 18 years old to 10 hours a day, may on certain conditions employ any child 10 hours on 3 alternate days of every week, provided that such child shall not be employed in any manner in the same or any other factory on 2 successive days.

3. That no child under 13 years of age shall work in the night for any purpose.

4. That every child under 13 years of age must have a surgical certificate of age, and must attend some school, on 5 days of every week for certain specified periods, and obtain a weekly certificate of attendance from the schoolmaster, which may be annulled by the inspector on account of the unfitness of the schoolmaster.

5. That no young person of the age of 13, and under the age of 18, shall be allowed to work for more than 12 hours in any one day, nor more than 69 hours in any one week.

6. That every young person under 16 years of age must have a surgical certificate of his age.

7. That no female above the age of 18 years shall be employed in any factory save for the same time and in the same manner as young persons in factories, certificates of age not, however, being necessary for females above 18 years of age.

8. That in factories, in which any part of the machinery is moved by water, and time lost by stoppages from want of water or too much water, children or young persons may, under certain conditions, be employed one hour additional, except on Saturday; and that when from the same causes any part of the manufacturing machinery driven by the water-wheel has been during any part of a day stopped, the young persons who would have been employed at such machinery, may, under certain conditions, recover such lost time during the night following the said day, unless the said day be Saturday.

9. That the inspector of the district, one of the four inspectors appointed under the Acts, shall have power to appoint a sufficient number of certifying surgeons to examine the children and young persons, and to give certificates of age to children and young persons under 16 years of age, according to certain forms and directions, but which certificate may be annulled by the inspectors or sub-inspectors appointed under the Acts, provided they believe the real age of the persons mentioned in the certificates to be less than that mentioned in them, or provided the certifying surgeon of the district deems such persons to be of deficient health or strength at the time when the certificates are annulled.

10. That not less than 1½ hour shall be allowed every day for meals to every young person, to be taken between half-past 7 A.M. and half-past 7 P.M., and 1 hour at least before 3 P.M.: and that no child or young person shall be employed more than 5 hours before 1 P.M., without an interval for meal-time of at least 30 minutes, and that all the young persons shall have the meal-times at the same period of the day.

11. That all children and young persons shall have not fewer than eight half-holidays in the year, four of such half-holidays between 15th March and 1st of October, and that no child or young person shall be allowed to work in any factory on Christmas Day or Good Friday, in England or Ireland, and in Scotland on any day the whole of which is set apart by the church of Scotland for the observance of the sacramental fast in the parish in which the factory is situated.

The Acts embody other regulations respecting the appointment of inspectors to carry out these provisions, &c.; but these, though of importance to the parties interested, by whom they must be carefully attended to, being of little public importance, need not be inserted in this place.

SECT. 6. *Manufacture of Hardware, Watches, Jewellery, &c.*

Hardware.—We have given in a previous chapter an account of the extraordinary increase in the production of iron since 1780. But, as was to be anticipated, the articles of utility, convenience, and ornament, formed out of it, have increased in an equal degree. In no country in the world are iron, copper, and brass, converted to so many purposes, as in Britain; and, though some countries may vie with us in the production of a few articles of hardware and cutlery, yet, taking the whole range of the manufacture into view, our superiority in it seems to be as decided as in that of cotton; and in

nothing, perhaps, is the triumph of art, science, and industry more conspicuous than in the astonishing variety, convenience, beauty, and cheapness of our hardware articles. The manufacture includes every sort of iron-work, from the massive castings of an iron bridge, and the anchors of a first rate man-of-war, down to the minute and delicate furniture of a lady's work-box. The heavy and coarser articles are principally prepared at the great iron foundries in South Wales, Staffordshire, Colebrook Dale, and other places it is unnecessary to specify. The production of the finer articles, which comes nearer to what is called a factory business, is principally carried on in Birmingham and Sheffield,—the two grand seats of the hardware manufactory, —and in their vicinity.

We have little, or, rather, no satisfactory information respecting the origin and early progress of the manufacture at Birmingham. Hutton, the historian of the town, supposes that iron was made in the parish by the Britons or Romans; and appeals, in proof of this hypothesis, to the huge mountain of calx, or cinder, at Aston furnace, on the border of the parish.—(*History of Birmingham*, 4th edit. p. 23.) But whatever weight may be attached to this, it is, at all events, certain that our information as to the early modern history of the town is very scanty. It had, however, attained to considerable eminence, as a seat of the hardware trade, previously to the middle of the sixteenth century; for Leland, who visited it about 1540, describes it in his *Itinerary* as "a good market town;" adding, "There be many smithes in the town that use to make knives and all manner of cutting tools, and many lorimers that make bittes, and a great many naylers; so that a great part of the town is maintained by smithes, who have their iron and sea-coal out of Staffordshire."—(*Hutton*, p. 19.) From this distant epoch, the manufacture, though it has sustained some severe checks, has gone on increasing, with more or less rapidity, till it has arrived at its present unexampled height of greatness and prosperity.

Its proximity to coal and iron, both of which are found in an but inexhaustible quantities in its immediate vicinity, was, no doubt, the primary cause of the establishment of the hardware manufacture at Birmingham; and, notwithstanding the competition they have had to sustain, the enterprise, skill, and good fortune of the citizens have enabled them to keep the start they had once gained. It is situated almost in the centre of the kingdom, and is not intersected by any great navigable river. But the obstacles thence arising to the easy transport of articles to and from the town were obviated in the course of last century by the construction of canals, by which it has a water communication with the ports of London, Liverpool, Hull, and Bristol; and more recently it has become the centre of a system of railways, which brings it into all but immediate communication with the metropolis, and the other great towns of the empire.

Mr. Stevenson, in his article on British statistics, in the Edinburgh Encyclopædia, has enumerated about 200 distinct articles made at Birmingham! and the list is, notwithstanding, far from complete.* The manufacture of each article is, in most instances, a separate trade; and the extreme subdivision of employments thence arising, accounts, in

* It is given in the last edition of this work, i. p. 695.

some measure, for the superior skill of the workmen, and the excellence of the manufacture.

Of the articles made in Birmingham, fire-arms are among the most important. Their manufacture has been carried on since the reign of William III., under whose auspices it was introduced. During last war more than two-thirds of the fire-arms required by the Board of Ordnance were produced by the Birmingham workshops; and it appears from the official returns that, in the interval between 1804 and 1818, nearly 5,000,000 fire-arms were furnished on account of Government and of the private trade. At the conclusion of hostilities, the cessation of the greater part of this extraordinary demand was productive of much distress and embarrassment. But in no long time industry began to revive; and the workmen, who had been thus suddenly thrown out of employment, were gradually taken into those businesses that have either grown wholly up, or been greatly extended, since 1815. The manufacture of fire-arms is still, however, of very great importance. There is a proof-house at Birmingham; and all arms manufactured in the town and its vicinity are required, under a heavy penalty, to be subjected to the test required by the Board of Ordnance: if they stand this they are marked by a stamp, to counterfeit which is felony.

The manufacture of swords may also be regarded as one of the staple trades of Birmingham.

The manufactory of steam-engines, originally established at Soho, in the immediate vicinity of Birmingham, by Messrs. Boulton and Watt, (the latter the great improver of the steam-engine,) is of a very extensive description. The engines made at present in this factory maintain their former celebrity; and the works employ a great number of hands. The establishment is not, however, restricted to the manufacture of steam-engines. It produces vases, candelabras, and other descriptions of goods in bronze and *or moulu*, of the most beautiful workmanship. Plate is also largely produced in this establishment; and here a great part of the copper coinage of the country used to be executed.

Most sorts of cast-iron articles are made at Birmingham; and the beauty of the patterns, the goodness of the workmanship, and, what may seem not very consistent with these qualities, their cheapness, have been wonderfully increased within these few years. There has, in consequence, been a greatly extended demand for them, and a proportional increase of the quantity produced.

Little is known of the early history of the brass manufacture in Birmingham, except that it was introduced about 1748. It has been very greatly improved and extended within the present century. It embraces a vast variety of articles of utility and ornament. Lamps, chandeliers, candlesticks, vases, fenders, fire-screens, handles for locks, door-knockers, &c., are among the most prominent articles.

Exclusive of solid gold and silver plate, of which the quantity produced is comparatively inconsiderable, large quantities of silver and gold, but especially the former, are used at Birmingham in the plating and gilding of spoons, knives and forks, teapots, plates, sugar-basins, buttons, chains, thimbles, and an infinite variety of other articles. The consumption of silver in the various departments here may be estimated at about 200,000 oz. a year. The plating business has, however, been

checked, by the substitution for plated goods of articles made of the metallic compound called *albata*. These do not look so well as plated goods, when the latter are well finished; but they are said to be comparatively durable. All articles that were formerly made of pewter, and most of those that are now made of silver, or which are plated, have their counterpart in Britannia metal. This is a compound of tin, the regulus of antimony, copper, and brass. The articles made of it are extremely cheap, and have a good deal of beauty; and, when care is taken to buy those that are sufficiently massive, they are also very durable. But, though articles of Britannia metal and German silver be made in Birmingham, Sheffield is the principal seat of their manufacture.

Japanned articles of every form, variety, and price, are very extensively manufactured at Birmingham. The best trays, and other articles of that description, are made of *papier mâché;* the designs on some of them being of great beauty and elegance.

Birmingham was said by Mr. Burke to be the "toy-shop of Europe." It is still entitled to this distinction; though, as the manufacture of other and more important articles has increased, during the present century, more rapidly than that of toys, the latter does not bear the same proportion to the entire trade of the town that it formerly did.

The button is placed by Hutton at the head of the toys, though it seems to be entitled to no mean place among articles of utility. The fashion of buttons, as of most other things, has varied exceedingly. Hutton says that, in 1818, the art of gilding was carried to such perfection that three penny-worth of gold was made to cover a gross of buttons!—(p. 106.) The demand for buttons for home consumption is immense; and, notwithstanding the loss of some branches of the trade, large quantities are exported. Some idea of the magnitude of this business may be formed from the fact, that a single manufacturer had in his workshop, in 1834, as many as 10,000 double sets of cut steel dies for livery buttons only!—(*Manufactures in Metal.—Lardner's Cyclopædia*, vol. iii. p. 393.)

Buckles long ranked as one of the staple articles of Birmingham manufacture; and the rise, mutations, and extinction of the trade would furnish materials for an interesting work. Large square buckles, plated with silver, were the fashion in 1781; but soon after that period shoe-strings began to be introduced; and, the taste for them having rapidly extended, the demand for buckles declined in an equal degree. In 1791, his late majesty, George IV., then prince of Wales, endeavoured, at the solicitation of a deputation from Birmingham, Walsall, and other places, to revive the taste for buckles. But the tide of fashion set too strongly in the opposite direction to be controlled even by the example of royalty: the use of the buckle was entirely given up. The manufacture ceased to exist; and the thousands who depended on it for support were reluctantly compelled to seek for subsistence by resorting to other businesses.

The quantity of fancy seals, brooches, clasps, and other trinkets, made of what is called *Birmingham gold* and polished steel, is only less wonderful than their beauty and cheapness. Few, indeed, unless they have seen some of the warehouses filled with these articles, can

form any just idea of the extent to which they are produced, and of their variety. The toy and trinket trade, in its various ramifications, is quite immense. Mr. Osler, a manufacturer of Birmingham, stated, before a committee of the House of Commons, in 1824, that he had received a single order for 500*l.* worth of dolls' eyes!—(*Report on Artisans and Machinery*, p. 314.)

Any article, how trivial soever, may, if it get into extensive demand, become the subject of a very large business. The steel pen is an example of this. We are not aware of the exact period when pens made of steel began to be substituted for quills; but down to 1818 the manufacture was confined within very narrow limits. Since then, however, the quality of the pens has been vastly improved, and their price very greatly reduced; and the demand has, in consequence, been extended in a degree not easily to be imagined. At present (1846) it is believed by the best informed parties that above 300,000,000 pens, requiring from 150 to 160 tons of fine sheet steel for their production, are annually manufactured. Of these very large quantities are exported. More than nine-tenths of the pens are made in Birmingham; and the trade may in all furnish employment for about 1,000 hands.

There are but few large capitals employed in the manufactures of Birmingham. Exclusive of the great establishment at Soho, and a few others, most of the works carried on in the town and neighbourhood are on a comparatively small scale. The greater number of the manufacturers have only very limited capitals; some not possessing more than from 500*l.* to 800*l.*; and many not more than from 2,000*l.* to 5,000*l.*, employing from 5 to 30 hands. The work is partly carried on in workshops; but a large portion of it is paid by the piece, and is carried on in the houses of the work-people to whom it is given out to be executed. There is also a class of middlemen, or of workmen called *undertakers*, from their receiving the rude material from the manufacturer, and undertaking to get it wrought up. Women are extensively employed in polishing the goods, in the glass toy branch, and in the manufacture of braces. Boys are chiefly employed by the outworkers and undertakers as apprentices, receiving the first year about 1*s.* a week, and the last from 6*s.* to 12*s.*, exclusive of their clothing; but they get their food at home; and in most instances indeed, work in the houses of their parents. The wages of the men vary according to the departments in which they are engaged, their skill and dexterity, and the state of trade at the time. In some branches, where superior skill and attention are required, wages are very good; being little, if at all, inferior to those earned by the best workmen in the metropolis. Some of the small manufacturers have accumulated large fortunes; and the condition of the work-people is, on the whole, very favourable.—(*First Report of Factory Commissioners*, B. 1, p. 2.)

No means exist of forming any estimate of the value of the articles produced in Birmingham and its immediate vicinity. It must, however, be very great; and, probably, (including gold and silver plate,) does not fall short, if it do not exceed, 4,000,000*l.* The value of the raw material, or of the iron, copper, or brass, bears, in most descriptions of Birmingham goods, a very small proportion to that of the labour expended upon them; and, in some of the lighter and finer

finished goods, becomes almost inappreciable. The manufacture of watch-springs, in which the value of the iron does not amount to nearly the *two thousandth part* of the value of the finished article, is an instance of this.

The town of Birmingham, with the parishes of Aston and Edgbaston, had, in 1841, a population of 182,922. But Soho, though a suburb of Birmingham, being in Staffordshire, is not included in the above. The country for several miles round is exceedingly populous; and the population is almost entirely dependent on the working of metals.

The Census Commissioners make the following statements in regard to the hardware trade of Warwickshire, which is mostly centred in Birmingham:—

"The principal manufacture of this county consists of articles denominated hardware, which employs 5,188 persons, of whom 1,148 are under 20 years of age. Of this number 1,093 are employed in the manufacture of tools of various descriptions, 730 in that of needles, 120 in that of pins, 516 in that of nails, 438 in that of screws, and the remainder, 2,291, in making bridle-bits, spurs, stirrups, curb chains, currycombs, and other articles of saddlers' ironmongery, bolts, hinges, castors, door and other springs, clasps, rivets, brass ferules, buckles, steel chains, brass, iron, and other candlesticks, lamps, jacks, and pans of various descriptions, coffee, malt, and other mills, corkscrews, cruet frames, fenders, fire-irons, scuttles, snuffers, spoons, stair-rods, tea and coffee-pots, urns, scales and steelyards, brace and other bits, hooks and eyes, bodkins, steel tags, thimbles, shoe and other tips, mouse and steel traps and gins, dog collars, steel and metal combs, spectacles, fish-hooks, rings, steel purses, handcuffs, and swords and other articles of cutlery.

"The brass manufacture employs 3,388 persons, of whom 852 are under 20 years of age; and the iron employs 542 persons, of whom 114 are under 20 years of age. In addition to which, 517 persons are returned as founders, 93 as moulders, and 40 as rollers.

"The manufacture of guns and pistols employs 2,126 persons, of whom 406 are under 20 years of age; and that of percussion caps employs 30 persons, of whom 9 are under 20 years of age.

"The button manufacture employs 2,913 persons, of whom 891 are under 20 years of age; the engine and machine (boiler makers included) 242 persons, of whom 30 are under 20 years of age; the Britannia, German silver, and other metals, 249 persons, of whom 59 are under 20 years of age; the toy, 938 persons, of whom 166 are under 20 years of age; and the tray, 114 persons, of whom 8 are under 20 years of age. The manufacture of plated ware employs 55 persons, of whom 12 are under 20 years of age; that of wire 381 persons, of whom 84 are under 20 years of age; and that of steel and other metallic pens 379 persons, of whom 177 are under 20 years of age. In addition to the above, 902 persons are returned as silver and other platers, and 700 as burnishers, chasers, polishers, and refiners. The glass manufacture employs 1,000 persons, of whom 284 are under 20 years of age."

The situation of Birmingham is dry and salubrious. In a few departments the processes carried on are reckoned very unhealthy; but this is not generally the case; and, notwithstanding the immense number of furnaces, and the volumes of smoke which they emit, the town is not unhealthy.

The manufacturing district, of which Birmingham is the metropolis, includes a considerable tract to the north-west of the town, embracing the southern part of Staffordshire, with the extreme northern border of Worcestershire, and a detached part of Salop. Within this district are the populous towns of Dudley, Wolverhampton, Bilston, Walsall, Wednesbury, Stourbridge, &c. Exclusive of the production of iron, in which most of them are very largely engaged, different branches of the hardware manufacture are carried on in all these towns. The nail trade, which is, perhaps, the most important, is principally prosecuted in and round Dudley, Stourbridge, and Walsall. Many efforts have been made to supersede the labour of the hand in making nails, by constructing them wholly by means of machinery; and vast numbers are now made in this way that answer sufficiently well for various purposes. But the best of those made by machinery are still very inferior to those made at the common forge; which, in consequence, is still very extensively employed.

The art of making nails by the hand continues at present nearly in the state described by Hutton. "We cannot," says he, "consider it a trade *in* so much as *of* Birmingham; for we have but few nail-makers left in the town. Our nailers are chiefly masters, and rather opulent. The manufacturers are so scattered round the country that we cannot travel far, in any direction, out of the sound of the nail-hammer. When I first approached Birmingham from Walsall, in 1741, I was surprised at the prodigious number of blacksmiths' shops upon the road; and could not conceive how a country, though populous, could support so many people of the same occupation. In some of these shops I observed one or more females, stripped of their upper garment, and not overcharged with their lower, wielding the hammer with all the grace of the sex. The beauties of their face were rather eclipsed by the smut of the anvil. Struck with the novelty, I inquired 'whether the ladies in this country shoed horses?' but was answered, with a smile, 'They are nailers.'"—(P. 117.)

This employment is as poor as it is slavish and degrading. The wages obtained in it are very low, most probably from the circumstance of women and children being largely employed.

The manufacture of japanned-ware is prosecuted on a large scale at Bilston and Wolverhampton. The latter has been long celebrated for the excellence of her locks; the general trade in which she almost exclusively enjoyed till a comparatively late period. At present, the more costly and best locks are made in the metropolis; and the lock trade is also carried on in Birmingham. But Wolverhampton still engrosses the largest share of the manufacture; and she has, also, large manufactures of brass and copper articles.

Saddlers' ironmongers are a class of manufacturers some of whom are found in Birmingham, but who chiefly reside in Walsall, Wolver-

hampton, and Wednesbury. They plate and prepare bridles and stirrups, with ornaments for coaches and coach-harness, &c. For cheapness in the common, and perfection in the best, of these articles, the district in question is unrivalled.

The following statements of the Census Commissioners show the number of persons employed in the hardware business in Dudley and its vicinity, and in Staffordshire:—

"The principal manufacture of Worcestershire is that of articles denominated hardware, (principally carried on at Dudley,) which employs 8,212 persons, of whom 2,186 are under 20 years of age. Of this number, 6,226 are employed in the manufacture of nails, 1,162 in that of needles, 160 in that of fish-hooks, 398 in that of tools of various descriptions, and the remainder (266) in that of fenders, fire-irons, shovels, scuttles, salt, frying, and other pans, hinges, screws, rivets, malt mills, swords, and other articles of cutlery, Jews'-harps, and steel toys.

"The iron and steel manufacture employs 1,171 persons, of whom 274 are under 20 years of age; and the chain 349 persons, of whom 81 are under 20 years of age."

"The iron manufacture of Staffordshire, including Bilston, Wolverhampton, Walsall, and other towns, employs 6,359 persons, of whom 1,627 are under 20 years of age; the brass employs 693, of whom 145 are under 20 years of age; the tin employs 612, of whom 172 are under 20 years of age; the chain employs 397 persons, of whom 107 are under 20 years of age; the engine and machine employs 781 persons (boiler makers included), of whom 110 are under 20 years of age; the gun and pistol employs 729 persons, of whom 115 are under 20 years of age.

"The manufacture of articles denominated hardware employs 12,080 persons, of whom 2,561 are under 20 years of age; of this number 4,268 are employed in the manufacture of locks and keys, 3,992 in that of nails, 821 in that of tools of various descriptions, and the remainder 2,989 are returned under the following heads; viz., bridle-bits, curb-chains, curry-combs, saddletrees, spurs, stirrups, and other articles of saddlers' ironmongery; bolts, hinges, screws, springs, ferules, pulleys, spindles, and swivels; buckles, buttons, pins, tags and tips, candlesticks, coffee mills, corkscrews, covers, fenders, fire-irons, frying-pans, gridirons, scales, steelyards, snuffers, spectacles, spoons, urns, gilt and tin toys, steel and other traps and trays."

Sheffield, in the district of Hallamshire, in the West Riding of Yorkshire, is the next grand seat of the hardware manufacture. Nothing is known of its early history, or of the origin of that business for which it is now so famous; but it had attained to eminence in the making of knives so early as the 13th century; for Chaucer, who was contemporary with Edward III., mentions, in his "Reeve's Tale," the Sheffield "thwytel," or whittle, in such a way as shows it was then in common use. It does not appear ever to have lost the reputation for cutlery it had thus early acquired. In 1575, the Earl of Shrewsbury, lord of the manor of Sheffield, sent to his friend Lord Burleigh "a case of Hallamshire whittels, beinge such fruites as his pore cuntrey affordeth

with fame throughout the realme."—Manufactures in Metal, Lardner's Cyclopædia, vol. ii., p. 5.) In 1624 a corporation was formed for the "good order and government of the makers of knives, scissors, shears, sickles, and other cutlery-wares in Hallamshire;" the government being vested in a master, two wardens, six searchers, and 24 assistants, consisting of freemen only. The principal object in the formation of this corporation seems to have been the regulation of the marks or other devices which every individual was to strike or impress on the goods he made for sale. But these regulations can hardly be said to be any longer in existence.*

The corporation continued on the footing fixed in 1624 till 1814, when an Act was passed permitting all persons indiscriminately, without their being freemen, or having served an apprenticeship, or obtained a mark from the corporation for their goods, to carry on business anywhere within the district of Hallamshire. This liberal and judicious measure has been of great service to the town, by inducing men of talent and enterprise, from all parts of the country, to settle in it, where their competition and industry have had the best effects.

For several centuries the manufactures of Sheffield were confined almost entirely to the making of sheath-knives, scissors, sickles, and scythes. About the beginning of the 17th century, a common tobacco-box and the Jew's-harp were added to the list of manufactured articles; but it was not till about forty years after that the manufacture of clasp-knives, razors, and files, for which it is now so famous, was introduced. It has been remarked that, for about a century after this period, the manufacturers of Sheffield discovered more of industry and perseverance than of enterprise or ingenuity in the conduct of their business. But about 1750 they began, for the first time, to carry on a direct trade with the Continent. The manufacture of plated goods was soon after commenced; and, from that period down to the present time, Sheffield has made an astonishing progress in the career of industry; and in many branches of the hardware manufacture has no superior, and in some no rival.

Like Birmingham, Sheffield was, most probably, indebted to her situation for her early application to the hardware business. Coal and iron are found in her immediate vicinity. The Don, on which Sheffield is built, supplies her with power to work mills for forging, cutting, and preparing the iron and steel used in her manufactures;

* We may take this opportunity to observe that a considerable difference of opinion exists as to whether it would be expedient to enforce any general regulations with respect to marks; and the subject is involved in a good deal of difficulty. No one, indeed, can doubt for a moment the impolicy of attempting to interfere, in any manner of way, with the description of articles a person may choose to manufacture; but it would, at the same time, be very desirable could some means be devised that would make the public readily aware of the sort of articles they are buying. At all events, the practice of putting false marks on articles cannot be too much condemned. We do not object to knives being made of hammered iron, cast iron, &c.; but we do object to the practice of impressing such articles with the words "steel," "sheer steel," &c. This is practising a fraud upon the public, and inflicting an injury on such manufacturers as make similar articles of steel.

and in this respect she has an advantage over Birmingham. The river was made navigable to within about three miles of the town so early as 1751; and a lateral canal has since prolonged the navigation to the town.

Cutlery, as it was the earliest, so it is still the largest and most important, branch of industry carried on in Sheffield. The principal articles are table-knives and forks, pen and pocket knives of every variety and description, scissors, razors, surgical, mathematical, and optical instruments, scythes, sickles, saws, with all sorts of carpenters' tools, and so forth. The most beautiful and highly-finished articles of cutlery exhibited in the shops of the metropolis, though stamped with the vendor's name, are mostly all made here; and Sheffield cutlery is deservedly held in the highest estimation in all parts of the world.

With the exception of plated saddlery ware, almost all the other descriptions of plated goods made at Sheffield are reckoned superior to those made at Birmingham, or anywhere else. Some of the best plated articles have silver edges; and, when used with ordinary care, last for a very long time, and can with difficulty be distinguished from silver. We have already noticed the extensive manufacture of articles of Britannia metal and German silver carried on here.

Mr. Jacob says that, in as far as he was able to ascertain by inquiries of the platers, the owners of flatting mills, and of the manufacturers of plated goods, he was disposed to estimate the silver used for plating in Birmingham and Sheffield, including with it that used at Walsall and other places, by saddlers' ironmongers, at about 750,000 ozs. a year.—(Vol. ii., p. 298.) And deducting from this the 150,000 ozs. (he supposed) used at Birmingham, and 100,000 ozs. for that used at Walsall and other minor towns, there will remain 550,000 ozs. for the consumption of Sheffield. But the quantity has since been largely increased.

Few articles of copper and brass, and no toys, are made in Sheffield; but, in lieu of these, it has some peculiar and important businesses. The conversion of iron into steel is carried on to a greater extent in it than in any other part of the empire; and most of the steel used in Birmingham and other places is prepared in Sheffield. The works of the Messrs. Sanderson, Jessop and Sons, and others, for the converting and preparing of steel by tilting, rolling, &c., are most extensive.

The manufacture of files is one of the staple trades of Sheffield. Files are used in immense quantities at home, and are largely exported. Any one who has ever seen the process of file-cutting would be likely to conclude that it was an operation that might be successfully performed by machinery; and a great variety of contrivances have been set on foot in that view. Hitherto, however, none of them have completely succeeded; so that all the best files continue now, as heretofore, to be cut by the hand. Within these few years the manufacture of springs for railway carriages has been largely carried on.

The town of Sheffield had, in 1841, a population of 68,186. The manufacture is not, however, confined to it, but is diffused over the

whole parish, representing, though not quite identical with, the old Saxon manor of Hallam, or Hallamshire. The parish, which includes an area of 22,830 acres, lies mostly to the west of the town, and had, in 1841, a population of 111,091. The principal part, not only of the male, but also of the female part of the population, is engaged in the hardware trade.

"The manufactures of cutlery and hardware, carried on at Sheffield and in the surrounding districts, employ 14,603 persons, of whom 8,654 are employed in making various articles of cutlery, whereof 1,759 are under 20 years of age; 729 in making hafts and scales in connexion with cutlery, whereof 108 are under 20 years of age; 2,854 in making files, of whom 740 are under 20 years of age; 1,595 in making other tools of various descriptions, of whom 303 are under 20 years of age; and the remainder (771) are variously employed in the manufacture of fenders, fire-irons, shovels, spoons, tea-pots, and tea-pot handles, candlesticks, snuffers, corkscrews, spirals, covers, frying-pans, and skewers; brace, bridle, and other bits, buckles, hooks, clasps, busks, and tips; pins, needles, steel pens, spectacles, steel toys, and magnets; bolts, screws, ferules, metal caps, rings, and rivets; powder-flasks, skates, springs, scale-beams, and spears.

"The iron manufacture employs 2,143 persons, of whom 535 are under 20 years of age; the nail 1.262 persons, of whom 269 are under 20 years of age; the Britannia, German silver, white and other metals, 917 persons, of whom 199 are under 20 years of age; the wire, 482 persons, of whom 49 are under 20 years of age; the steel, 312 persons, of whom 42 are under 20 years of age; the brass, 258 persons, of whom 50 are under 20 years of age; the engine and machine, 1,391 persons, (boiler-makers included,) of whom 323 are under 20 years of age; in addition to which, 116 persons are returned as founders, and 742 as moulders, the manufacture in which they are engaged not being specified."—(*Report, Census* 1841.)

Wages in Sheffield vary from about 15*s.* to 35*s.* and 40*s.* a-week. The labour in some departments is very severe; and in others great skill is required. Grinders, particularly those who do not use water in the operation, inhale the finer particles of stone and steel, and are generally short-lived. A good many attempts have been made to obviate this, as well as to lessen the risk of accident in the grinding-mills; but the employment continues to be more than ordinarily unhealthy and dangerous;* and, as much skill is required in the grinding of the finer descriptions of knives and razors, wages, being influenced by both circumstances, are generally high.

Combinations have been very prevalent in Sheffield. Different opinions are entertained as to their influence on wages; but it seems pretty clear that, though they have kept up their nominal rate, they have effected this by lessening the hours of work, and keeping a considerable number of individuals out of employment; so that there is but little room for doubt that here, as everywhere else, they have been, on the whole, injurious to the workmen.

But few, comparatively, of the Sheffield manufacturers have large

* *Manufactures in Metal.—Lardner's Cyclopædia*, vol. i. pp. 289–296.

capitals; and the business is not so generally carried on in workshops or factories as in Birmingham. A person worth a few shillings may commence business on his own account as a cutler; and, in this class, individuals are not unfrequently journeymen one year and masters another, and conversely.

Exclusive of these two grand seats of the hardware manufacture, and of the districts subordinate to and connected with them, the business is carried on to a greater or less extent in many other places. Most part of the machinery used in the cotton and other factories is made at Manchester and other great centres of the trade. The wonderful progress of the manufacture has been mainly owing to the excellence and continued improvement of the machinery made use of; the preparation and repair of which employs a great number of hands, and a large amount of capital. The reputation of what are called "Lancashire tools" is very widely diffused. Under this designation are comprised files of the best quality, chisels, gravers' tools, watch and clock makers' tools, hand vices, pincers, metal and wire gauzes, and an infinite variety of such like articles. Warrington is the centre of this trade; and in some of its factories may be seen collections of unrivalled excellence of the articles in question. The best watch-tools are, however, made at Prescott.

Besides tools, pins are largely manufactured in Warrington, and in Birmingham, Gloucester, Bristol, and Stroudwater; a good many being also made in Dublin and Dundalk. A company for the manufacture of pins by machinery is established at Deptford. The business is supposed to employ in all from 2,500 to 3,000 hands, of whom about a sixth part are men, the remainder being women and children. The wages of the former amount, at an average, to about 21*s*., and those of the latter to about 5*s*. a-week. Exclusive of those consumed at home, large quantities are exported to the Continent and the United States. The patent pins are made by machinery; the entire pin, head included, being formed out of one piece of wire. Most descriptions of fire-arms, including the finest fowling-pieces and pistols, are made in the metropolis. A great deal of cutlery business is transacted in London; but, as already stated, by far the greater number of the articles sold in it, though bearing the names of the vendors, are really made in Sheffield.

Long Crendon, in Bucks, is supposed to have been the earliest seat of the needle manufacture, and it still furnishes a few fancy needles for knitting, netting, sailmaking, &c. But what may be called the "needle district," with which the manufacture of fish-hooks is now combined, is situated about 13 miles from Birmingham, on the Cheltenham road. It comprises the villages of Redditch, Studley, Alcester, Feckenham, &c., and their neighbourhoods. A very large proportion of the population is engaged in, and nearly the whole is dependent on, the business; the wages of those employed in it being good, and employment remarkably constant, they have been little subject to periods of depression. The scale on which the business is carried on is vastly greater than might be at first supposed; the principal houses not unfrequently receiving orders for from 4,000,000 or 5,000,000 to 10,000,000 of one variety of needles for exportation! They are sent in immense quantities

to all parts of the world; and being easily smuggled, their sale is but little affected by foreign tariffs. It is, however, a good deal affected by the frauds of the foreign makers, the greater number of whom vend their inferior articles under the forged names and labels of the best English makers. The fish-hook trade is supposed to amount to about a sixth part of that of needles. As farther illustrating the importance of what many suppose to be an insignificant trade, we may, perhaps, be excused for mentioning that the present opulent and respectable High Sheriff of Worcestershire is a needle manufacturer, having succeeded to the business carried on by his father.

Cast-iron goods are produced at different places in Scotland; but the best known and most celebrated works are at Carron, in Stirlingshire. They were established in 1760; but have since been greatly enlarged. All kinds of cast-iron goods, whether for the purposes of war or peace, are made at Carron. Among the former may be included cannons of all sorts, mortars, bombs, &c., with shot and shells. The peculiar variety of cannon called a carronade derived its name from its being originally produced here. The domestic articles are too numerous to admit of enumeration; but stoves, grates, fenders, &c., constitute, perhaps, the largest item. There are many foundries in other parts of the country, particularly in Lanarkshire. Glasgow, like Manchester, Newcastle, and other towns, has very large factories for the production of steam-engines, railway carriages, and other sorts of machinery.

The hardware manufacture can hardly be said to exist in Ireland.

Value of the Manufacture.—We regret that no materials exist, or are likely to be procured, for forming an accurate estimate of the total value of the hardware and cutlery annually produced in Great Britain. Mr. Stevenson estimated the annual value of all the articles made of iron in England and Wales, in 1814, at 10,000,000*l.*; those of brass and copper at 3,000,000*l.*; and the steel, plated, and hardware articles, including toys, at 4,000,000*l.*; making the total value of the goods 17,000,000*l.*, and the total persons employed 320,000.

We incline to think that this estimate was very decidedly beyond the mark. There has, however, during the last 30 years, been an extraordinary increase in the production of iron; and the rapid increase of Birmingham and Sheffield, as well as of the smaller seats of the hardware manufacture, shows that it has increased in at least a corresponding proportion. But, on the other hand, there has been, during the same period, a very heavy fall in the prices of most articles; the reduction in several descriptions of goods having been from 50 to 60, 70, and even 80 per cent., and in few less than from 20 to 30 per cent. It is, therefore, doubtful whether, notwithstanding the great increase of the manufacture, its value at present materially exceeds its value in 1814. On the whole, if we might venture a conjecture on such a subject, we should say that the annual value of all sorts of wrought brass and iron, and of hardware and cutlery articles, produced in Great Britain, may be taken at about 17,000,000*l.* a-year, and the persons employed at from 250,000 to 300,000.

Account showing the Quantities and Values of the Brass and Copper Manufactures Hardware, and Cutlery, and of the Iron and Steel, wrought and unwrought, exported from the United Kingdom in 1844, *specifying the Countries to which they were sent, and the Quantities and Values of those sent to each.*

Countries to which Exported.	Brass and Copper Manufactures.		Hardwares and Cutlery.		Iron and Steel, Wrought and Unwrought.		Total Value.
	Quantity.	Declared Value.	Quantity	Declared Value.	Quantity.	Declared Value.	
	Cwts.	£.	Cwts.	£.	Tons.	£.	£.
Russia	306	1,840	7,313	40,453	14,586	107,413	149,706
Sweden	453	1,995	6 0	3,454	96	1,279	6,728
Norway	79	396	1,771	9,276	446	5,814	15,426
Denmark	388	1,777	1,067	4,227	19,434	111,396	117,390
Prussia	714	2,991	2,520	8,549	34,433	202,241	214,821
Germany	16,211	76,434	25,261	156,706	39,456	285,214	518,354
Holland	7,470	34,415	7,676	49,454	69,035	386,112	469,881
Belgium	13,041	56,189	6,288	36,671	1,149	27,403	122,413
France	103,214	453,405	21,256	121,555	21,352	100,982	675,942
Portugal, Proper	2,905	14,674	3,059	20,490	4,638	29,600	64,754
Spain and the Balearic Islands	1,240	6,008	4,404	24,841	5,756	34,670	66,519
Gibraltar	644	3,031	4,410	29,897	1,270	9,816	42,744
Italy and the Italian Islands	16,777	74,555	9,993	54,676	27,728	171,203	296,434
Malta	783	4,314	723	5,081	775	5,726	15,121
Ionian Islands	46	217	183	904	373	3,054	4,175
Morea and Greek Islands	..	..	188	757	754	7,259	8,016
Turkey	258	1,332	1,958	12,214	7,542	48,914	62,500
Egypt	641	3,358	750	3,210	470	5,449	12,017
Western Coast of Africa	4,415	22,352	6,417	24,356	2,053	19,713	66,423
Cape of Good Hope	647	3,038	3,275	17,668	1,687	22,672	43,378
Mauritius	2,449	12,769	1,617	7,240	1,030	18,614	38,623
East India Company's Territories and Ceylon	141,237	611,100	23,645	115,911	35,377	265,698	992,718
Sumatra, Java, and other Islands of Indian Seas	2,008	9,183	2,081	10,572	1,233	7,512	27,267
Philippine Islands	358	1,610	36	377	410	2,738	4,725
China	647	3,109	2,294	16,291	4,361	29,104	48,404
British Australian Colonies	1,333	6,282	5,349	24,231	2,373	28,676	59,189
British North American Colonies	3,192	15,723	36,657	167,876	27,835	236,958	420,557
British West Indies	4,717	25,694	19,773	77,525	6,570	114,151	217,370
Cuba, and other Foreign West Indian Colonies	3,995	18,280	16.526	56,291	4,811	56,748	133,319
United States of America	43,811	197,289	106,524	827,064	107,379	696,937	1,721,310
Mexico	345	2,236	1,548	9,928	2,070	16,200	29,364
New Grenada, Venezuela, and Equador	542	3,321	2,803	12,446	294	3,719	19,486
Brazil	2,544	44,281	23,919	79,068	4,759	61,196	184,545
States of the Rio de la Plata	119	577	16,400	48,492	1,999	18,884	67,953
Chili	1,373	7,018	10 365	41,053	1,235	13,721	61,792
Peru and Bolivia	381	1,955	6,825	31,883	1,381	13,321	47,159
The Channel Islands	1,964	9,475	3,925	18,545	1,176	13,745	40,665
All other Places	617	2,493	1,612	6,847	1,119	10,316	19,656
Total	388,882	1,736,545	451,043	2,179,087	458,745	3,193,368	7,109,000

Watches, Plate, Jewellery, &c.—Exclusive of the hardware and plated goods, referred to above, the manufacture of watches, and of solid gold and silver articles, is of much importance. Instead of a watch being the distinguishing appendage to a man of wealth and fashion, it has become the useful companion of all but the poorest and idlest of the community. Among even the middle ranks it has grown into use, not merely for the heads of the family, but few of the junior members, or even of the domestic servants, are without them. The increased number of watches, especially since it has been permitted to form the cases of gold and silver of a lower degree of fineness than our standard, has been such that they must be counted by millions.*

The separate parts of the mechanism of watches are now generally constructed by different sets of artists, mostly in Lancashire, on the principle of the division of labour; the delicate task of putting them together, and regulating their movements, being left to the watchmakers. The watchmaking business is principally carried on in London, especially in the parish of Clerkenwell, and to a lesser extent in Coventry, Liverpool, Edinburgh, and other places. At an average

* *Inquiry into the Production and Consumption of the Precious Metals*, by William Jacob, Esq., vol. ii. p. 209.

of the three years ending with 1829, there were annually assayed, at the Goldsmiths' Hall, London, 13,893 gold and 84,810 silver watches. —(*Jacob*, vol. ii., p. 413.) The metal in the gold watches is 18 carats fine, worth 3*l.* 5*s.* an ounce; and the weight of metal in each watch is about 2 ounces. At a medium, the gold watches may, it is believed, be worth about 15*l.* each, or 208,395*l.* in all: and, estimating the value of the silver watches at 6*l.* each, the value of those produced in the metropolis, during the same three years, will be 508,860*l.* a-year; making, when added to the value of the gold watches, a total of 717,255*l.*, exclusive of plated and gilt watches, &c. But the business has been very considerably extended in the metropolis in the interval. The average number of gold watches assayed at Birmingham (but chiefly made at Coventry), Chester, and elsewhere, may be from 900 to 1,000 a-year, worth 13*l.* each; and the silver watches made at Coventry, Liverpool, Edinburgh, and all other places, exclusive of London, varies from 135,000 to 145,000 a-year (*Jacob*, vol. ii., p. 292, and p. 296), worth, probably, 5*l.* each. On the whole, including the gilt and plated watches, &c., the value of those annually manufactured in Great Britain may be moderately estimated at from 1,500,000*l.*, to 1,800,000*l.* a-year.

The different pieces of the mechanism of clocks, like those of watches, are made by different sets of workmen; and are put together by others, who, though mostly distinct from, are usually confounded with, watchmakers. It appears, from the population returns, that there were, in 1841, 12,464 males, of 20 years and upwards, employed as clock and watch makers in Great Britain, of whom 11,094 belonged to England, 339 to Wales, and 965 to Scotland. Of those belonging to England the metropolis had above 3,000.

Exclusive of the gold used in gilding and in watchmaking, large quantities are annually wrought up into plate, trinkets, snuff-boxes, &c. The amount so disposed of has been estimated by Mr. Jacob at 58,000 ounces fine gold, worth 4*l.* 7*s.* 6*d.* an ounce, and 232,000 ounces standard gold, worth 3*l.* 17*s.* 10½*d.* an ounce, making together 290,000 ounces, worth in all, 1,156,020*l.*—(Vol. ii. p. 292.) In the same work, Mr. Jacob estimates the annual consumption of silver in the arts at 3,282,046 ounces, from which, deducting 900,000 ounces used in plating, and 506,740 used in watch-cases, there remain 1,875,306 ounces, worth 5*s.* an ounce, or 468,826*l.*, for all other purposes.—(Vol. ii. p. 299.) We suspect, however, that both these estimates, particularly the first, are exaggerated. It should also be observed that a considerable quantity of the new plate, annually manufactured, is made out of old plate; and that the absolute consumption of the precious metals is, consequently, not nearly so great as these estimates would seem to infer.

London is the principal seat of the jewellery business. Next to it, but at a great distance, are Birmingham, Derby, Liverpool, and Chester. There are, also, manufacturers of gold and silver articles and jewellery in Newcastle, York, and Exeter, and in Edinburgh and Dublin. In 1830, of 6,441 ounces of gold plate produced in the empire, 5,458 paid duty in London, 827 in the rest of England, 68 in Scotland, and 88 in Ireland. During the same year there were manu-

factured 1,271,322 ounces of silver plate, of which 965,364 were made in London, 132,900 in the rest of England, 59,498 in Scotland, and 113,560 in Ireland. The jewellery business is believed to be distributed nearly in the same proportions.—(*Jacob*, vol. ii. p. 408.)

According to the population returns, there were in Great Britain, in 1841, 8,727 males, and 380 females, in the jewellery business; of the former, England had 8,036, Wales 46, and Scotland, 629. More than half the jewellers of England belong to the metropolis.

In London, the most costly articles of jewellery, contrary to what might, perhaps, have been anticipated, are devised and completely finished by the same persons; and, exclusive of the precious stones, which, in some of the ornamental products, are the chief cost, the greatest expenditure on them is the gold. That metal is rarely used in a pure state; though, in some of the more delicate parts, such as the filigree work, it is mixed with but a very small proportion of alloy. That commonly used, at least by the first-rate jewellers, is usually 16 carats fine, or with a third part of alloy. The finer gold is supplied by the refiners; and amounts to about a fourth part of the other. The trade of a gold-beater used to be restricted to London, where it continues to be principally carried on; but it is now prosecuted on a smaller scale at Birmingham, Dublin, Glasgow, Edinburgh, Liverpool, and some other places.

The declared or real value of the plate, plated goods, jewellery, and watches, exported in 1845, amounted to 294,128*l*. The United States are the best market for this description of goods, and, next to them, India.

Sect. 7.—*Leather Manufacture.*

The leather manufacture ranks either third or fourth among those carried on in the country, being inferior only, in point of value and extent, to those of cotton, wool, and iron, if it be not superior to the latter. Sir F. M. Eden, in his *Treatise on Insurance*, estimated the value of the different articles manufactured of leather, in 1808, at 12,000,000*l*.; and there is reason to think that this statement was not very wide of the mark. Besides the hides and skins produced at home, vast quantities are imported. At an average of the three years ending with 1845, no fewer than 647,712 cwt., or 72,543,744 lbs., of foreign cow, ox, and buffalo hides were entered for home consumption, exclusive of vast quantities of lamb-skins, goat-skins, &c. The total quantity of all sorts of leather, tawed, tanned, dressed, and curried in Great Britain, may at present be estimated at about 75,000,000 lbs.; which, at 1*s*. 6*d*. per lb., gives 5,625,000*l*. as the value of the leather only. Now supposing, as is sometimes done, the value of the leather to amount to one-third the value of the finished articles produced from it, that would show the value of the manufacture to be 16,875,000*l*. We incline, however, to think that the value of manufactured leather articles does not amount, at an average, to three times the value of the raw material; and therefore we may, perhaps, estimate the entire value of the manufacture at about 16,000,000*l*. Now, to get the number of

persons employed, we have first to deduct from this sum of 16,000,000*l.* 5,625,000*l.* for the raw material, which leaves 10,375,000*l.* as the aggregate amount of profits, wages, &c.; and, setting aside 25 per cent. as profits, rent of workshops, capital invested, &c., we have a sum of 7,281,250*l.* remaining as wages. And, supposing those employed as shoemakers, saddlers, glovers, &c., to make, one with another, 30*l.* a year, the total number of such persons will be 259,375.

This, however, does not give the total number of persons employed in the leather trade, inasmuch as it excludes the tanners, curriers, &c. employed in dressing and preparing the leather. But if, from the value of the prepared leather, 5,625,000*l.*, we deduct 2,000,000*l.* for the value of the hides and skins, and 2,500,000*l.* for tanners' and curriers' profits, including the expense of bark, lime, pits, &c., we have 1,125,000*l.* left as wages. Now as the wages of curriers, tanners, leather-dressers, &c., may, we believe, be taken at 40*l.* a-year at an average, we shall have 28,100 as the number employed in these departments; and, adding these to the persons employed in manufacturing the leather, we have a grand total of 287,475 employed in the various departments of the business.

Those who may be inclined to suspect these estimates of exaggeration, would do well to reflect on the value of the shoes annually manufactured. It is sometimes supposed that the expenditure upon shoes may be taken, at an average of the whole population, at 10*s.* a-year for each individual, young and old; which, taking the population at 20,000,000, would give 10,000,000*l.* for the value of shoes alone; but, taking the value of the shoes at 8*s.* only, it gives 8,000,000*l.* for the amount. Mr. Stevenson supposes (art. ENGLAND, *Edinburgh Encyclopædia*) that the value of saddlery, harness, gloves, &c., is at least equal to that of shoes; but we believe this to be too high, and such would plainly be the case, were shoes estimated to cost 10*s.* or 9*s.* per individual. On the whole, in estimating the entire value of the manufacture at 16,000,000*l.*, we incline to think that we are as near the mark as it is easy to come in such investigations.

Distribution of the Manufacture.— Tanneries. — The business of tanning is very widely diffused. As was to be expected, the largest tanneries in the empire are in the vicinity of London, particularly at Bermondsey, in the Borough. The manufacture of what is called morocco leather, principally used by bookbinders, coachmakers, &c., is almost entirely confined to it. There are, also, extensive tanneries in the vicinity of most large towns, and at different places throughout the country. The capital required to carry on the business is very considerable; since, besides what is laid out on pits and buildings, &c., there must be sufficient to wait the returns, which are usually very slow. At present, however, hides can be prepared for sale in half the time that was formerly required; and this, as is said, not only without any injury to, but with an actual improvement of, the leather. Many experiments have been tried with different kinds of bark; but oak still continues, all things considered, to maintain its ancient pre-eminence: very large quantities of it are annually made use of; valonia, divi-divi, and other articles are, also, very extensively employed.

Shoemaking.—London is the principal seat of this business, no fewer than 23,775 persons, of whom 18,867 were males of more than 20 years of age, having been employed in it, in 1841, in Middlesex only. Exclusive of the shoes made in London, large quantities are brought to its markets from Northamptonshire and Staffordshire, counties in which the manufacture of shoes, over and above what is required for their own supply, is carried on to a very considerable extent. In Northampton, Wellington, Irthlingborough, Kettering, and other places in Northamptonshire, about 5,000 males, of 20 years and upwards, exclusive of women and children, are employed in the manufacture of shoes for export to other parts of the country, and to foreign countries.—(*Population Returns.*) In the town of Stafford the manufacture employed, in 1841, 1,135 males, and 143 females. It is, also, extensively carried on, especially of late years, in Norwich. It was formerly carried on to a considerable extent in Congleton and Sandbach, in Cheshire; but it has been superseded in the first by the manufacture of cotton, and in the latter by that of silk. Leather slippers are largely produced at Bicester, in Oxfordshire.

Saddlery and Harness are made in every considerable town, and even village, in all parts of the empire; but the largest proportion, as well as the finest and best articles, are made in London. Of 12,962 males, of 20 years and upwards, employed in the manufacture of saddlery and harness in Great Britain, in 1841, 1,745 belonged to Middlesex. The annual value of the exports of leather, wrought and unwrought (exclusive of saddlery), amounts to above 350,000*l.* The exports of saddlery exceed 100,000*l.* a-year. The West Indies and the British North American colonies are the principal markets for these articles.

Gloves.—The leather used in the manufacture of gloves is not, properly speaking, tanned, but prepared by a peculiar process that renders it soft and pliable. Some sorts of leather gloves admit of being washed, and others not. Woodstock and Worcester, but particularly the former, are celebrated for the manufacture of leather gloves of a superior quality, in which a great number of women and girls, as well as men, are employed. The produce of the Worcester manufacture has been estimated at about 42,000 dozen pairs of oil leather, or beaver gloves, and 470,000 dozen pairs of kid and lamb-skin gloves; the value of the whole, when finished, being about 375,000*l.* Besides Worcester and Woodstock, Yeovil, London, Ludlow, and Leominster are the principal seats of the leather glove manufacture. Of these Yeovil is the most important. "The quantity of all sorts of gloves annually produced there may be estimated at about 300,000 dozen pairs; and the number of men, women, and children employed in the place, and the adjoining districts (spreading over 20 miles), amounts, perhaps, to 20,000. They are principally employed in making men and women's fine gloves, or those that pass in the shops under the denomination of kid-gloves, but which are really made from lamb-skins, imported from Italy, Spain, and Germany, and dressed at Yeovil."—(*Hull on the Glove Trade*, p. 69.) Gloves are sometimes sewed by machinery; but this is done only to improve the work, by rendering the stitches more correctly equidistant, as it is not cheaper than manual labour. Large quantities of cotton gloves are made at Nottingham and Leicester. We subjoin an—

Account of the Number of Persons above and below 20 Years of Age employed in the making of Boots and Shoes, Saddlery, and Leather Gloves, in the different Divisions of Great Britain in 1841, as returned by the Census Commissioners.

	Above 20 Years of Age.		Under 20 Years of Age.		Total.
	Males.	Females.	Males.	Females.	
Boot and Shoe Making —					
England	146,169	8,666	21,675	1,970	178,480
Scotland	21,601	749	4,344	143	26,837
Wales	7,999	134	1,301	29	9,463
Great Britain	175,769	9,549	27,320	2,142	214,730
Saddlery —					
England	11,223	274	1,902	84	13,435
Scotland	1,195	27	404	6	1,632
Wales	544	8	104	..	656
Great Britain	12,962	309	2,410	42	15,723
Leather Glove Making —					
England	2,592	4,250	306	1,600	8,750
Scotland	33	27	5	7	72
Wales	32	18	4	1	85
Great Britain	2,687	4,295	317	1,608	8,907
Grand Total	191,418	14,153	30,047	3,792	230,410

Influence of Repeal of Prohibition of Importation.—The importation of leather gloves and mitts was formerly prohibited, under the severest penalties. This prohibition, by preventing all competition and emulation with the foreigner, checked improvement, and rendered British gloves at once inferior in quality and high in price. This system was, however, permitted to continue till 1825, when the prohibition was repealed, and gloves allowed to be imported on payment of duties which, though high, are not prohibitory. This measure was vehemently opposed, and many predictions were made of the total ruin of the manufacture; but in this, as in every similar instance, experience has shown that the trade had not been really benefited, but that, on the contrary, it had been injured, by the prohibition. The wholesome competition to which the manufacturers now felt themselves, for the first time exposed, made them exert all their energies; and it is admitted on all hands, that there has been a more rapid improvement in the manufacture during the last 10 years than in the previous half century. There is still, no doubt, a great deal of complaining of a decay of trade among the leather glove manufacturers; but we are assured that, if there be any real foundation for their complaints, it is ascribable more to the growing use of home-made cotton and silk gloves than to the increased importation of foreign leather gloves; and, had it not been for the improved fabric and greater cheapness of British leather gloves that has grown out of the new system, it is abundantly certain that cotton gloves would have gained still more rapidly on them. In point of fact, however, it does not appear that there has been any falling off in the leather glove trade; on the contrary, the fair inference seems to be that it has increased: at all events, there has been a very considerable increase in the number of skins brought from abroad to be used in the manufacture, and, consequently, in the number of pairs of gloves produced from such skins; and there is no reason for thinking that it is at all different with the other departments.—(*Commercial Dictionary*, art. GLOVES.)

Sect. 8.—*Manufactures of Earthenware and Glass.*

1. *Earthenware.*—The manufacture of earthenware, or, as it is frequently called, stoneware, is of considerable value and importance. It is carried on in several parts of the country; but its principal seat is in the district called, by way of distinction, "The Potteries," in the north-west part of Staffordshire, having the town of Burslem in its centre. It is doubtful when the manufacture was originally established here; but it has certainly been prosecuted at Burslem for at least two centuries. The district has great natural capabilities for the successful prosecution of the business. The upper strata present, in almost every part, a great variety of clays, covering vast beds of excellent coal, which, being situated near the surface, are, in general, easily wrought. But notwithstanding these capabilities, the manufacture was long in a very backward state. Dr. Plot, whose *Natural History of Staffordshire* was published in 1686, gives what is believed to have been a very accurate account of the manufacture at that time. The wares were then of the coarsest and commonest sort, and consisted principally of pots for the preservation of butter, whence Burslem is, in several old maps, marked by the name of "Butter Pottery!" Plot says that the wares were "chiefly sold to the poor crate-men, who carried them at their backs all over the country."—(*Nat. Hist. of Staffordshire*, cap. 3, § 29.) About the year 1690 some improvements were introduced into the manufacture by two foreigners of the name of Ellers. Superior clays were also brought from Dorset and Devonshire; and the fabric of the ware was improved by the addition of pounded flints, &c. Still, however, British earthenware was very inferior in beauty to that of France, which was, consequently, imported in considerable quantities, and was almost the only thing made use of by the more opulent class of customers.

It was not till about the year 1760, or 1762, that the grand æra of improvement commenced in the Potteries. We are indebted for it to the exertions and example of Mr. Josiah Wedgwood, who did for the manufacture of earthenware what Arkwright did for that of cotton. This eminent individual was the youngest son of a potter, was very indifferently educated, and received but little property from his father. But these untoward circumstances, far from repressing, served rather to stimulate, the native vigour of his mind. His original and inventive genius enabled him to make many important discoveries, while his practical acquaintance with the business gave him the means of successfully introducing them into practice. Besides improving the composition, the glaze, and the colours of the old wares, he invented several that were altogether new; and (which was least to be expected from a person in his situation) he made vast improvements upon the figure of the articles manufactured, displaying in their formation a degree of classical elegance, and purity of design, which materially improved the national taste, and has never been surpassed. In addition to this, Mr. Wedgwood successfully exerted himself to improve the communications with the Potteries; and was mainly instrumental in carrying the Act for the Trent and Mersey Canal through parliament, and in accomplishing that grand undertaking. The village of Etruria, where

his works were situated, was built by him. Since his death, which took place in 1795, they have been carried on by his descendants.*

The inventions and discoveries of Mr. Wedgwood were soon universally introduced; and the manufacture has since continued gradually to extend and to improve. Its progress, we are assured, has been such, that a workman at the present day can, in a given time, produce about *four* times the quantity of manufactured articles he could have done in 1790!

Exclusive of earthenware, chinaware is also extensively manufactured in the pottery district.

Certain descriptions of earthenware are produced, in a considerable quantity, and of excellent quality, at Lambeth, and the same and other descriptions in other parts of the country. Chinaware is made at Worcester, Derby, Colebrook Dale, Rotherham, &c. It is estimated that the value of the various sorts of earthenware produced at the Potteries may amount to about 1,700,000*l.* or 1,800,000*l.* a-year; and that the earthenware produced at Worcester, Derby, and other parts of the country may amount to about 850,000*l.* more; making the whole value of the manufacture 2,550,000*l.* or 2,650,000*l.* a-year. The consumption of gold for gilding, &c., at the Potteries, is about 700*l.* a-week, and of coal about 9,500 tons a-week.

The finer sorts of clay used in the Potteries are principally brought from the Isle of Purbeck, in Dorsetshire, and from Devonshire; steatites or soapstone is brought from Cornwall; large quantities of flints from Kent, and some from Wales, Ireland, &c. The railways and canals by which Staffordshire is intersected, and which unite the Potteries with all the principal ports of the kingdom, afford the greatest facilities for the conveyance of the raw materials used in the manufacture, and for the easy distribution of the wares to the great markets at home and abroad.

The population of the pottery district, which is naturally poor and barren, is exceedingly dense. It comprises from 70,000 to 80,000 inhabitants. The principal places are Burslem, Shelton, Longton, Stoke-upon-Trent, Henley, Tunstall, Lane-End, Etruria, &c. But several of these are now joined together; and, to a stranger, the entire district has the appearance of a large straggling town. A very large proportion of the population is employed in, and a still greater is dependent for support on, the manufacture. With the exception of gold, most of the materials made use of are worth very little; so that the value of the finished articles, as well as their exquisite beauty, and aptitude to every purpose of utility and ornament, is mainly ascribable to the skill and labour expended upon them. The wives and children of the workmen are usually employed; and, though they work together in factories, yet, as they reside in separate cottages, the manufacture partakes largely of the domestic character. The wages of a whole family amount to a very considerable sum. "The noxious process of glazing, so injurious to the health of those employed, has been rendered nearly free from its deleterious effects by the substitution of boracic acid for lead, which was formerly used in the proportion of 100 per

* See *Aikin's Description of the Country round Manchester*, p. 528; and the *Supplement* to his *Biographical Dictionary*, art. "Wedgwood."

cent., but now only of 8 per cent. The people employed in that branch were, formerly, not admissible into clubs, and were considered as degraded objects, from the insalubrity of their employment; but they are now gladly received into their benefit societies.—(1st *Factory Report*, B. 2, p. 78.) On the whole, the work-people have a healthy, comfortable appearance. The new parliamentary borough of Stoke, comprising the principal places in the Potteries, had, in 1841, a population of 67,798.

Owing to its extreme cheapness, excellent cream and blue-coloured stoneware is now found in every cottage; and it has everywhere superseded, not only the old, ill-glazed, clumsy Delft-ware, but also pewter-plates, and the greater part of the wooden dishes that were formerly used in the kitchen and the dairy. It is not easy to over-rate the influence of this change in diffusing a taste for cleanliness, and for increased comforts and conveniences. Nor have its advantages been confined to this country. It is now widely spread over all parts of the world; the annual value of the exported articles, during each of the three years ending with 1845, having been, 1843, 628,783*l.*; 1844, 766,764*l.*; and 1845, 828,084*l.* Formerly, as we have seen, we imported large quantities of stoneware from France, and, at a previous period, from the Dutch potteries at Delft; but the produce of our own potteries is now everywhere held in the highest estimation. An intelligent foreigner, M. Faujas de St. Fond, when noticing the English earthenware, observes, "Its excellent workmanship, its solidity, the advantage which it possesses of sustaining the action of fire, its fine glaze, impenetrable to acids, the beauty and convenience of its form, and the cheapness of its price, have given rise to a commerce so active and universal, that, in travelling from Paris to Petersburg, from Amsterdam to the extremity of the South of France, one is served at every inn upon English ware. Spain, Portugal, and Italy are supplied with it; and vessels are loaded with it for the East Indies, the West Indies, and the continent of America."—(*Travels in Engand*, Eng. trans., vol. i., p. 97.)

2. *Glass.*—The manufacture of glass is alike interesting and important,—interesting from the worthlessness of the materials out of which so beautiful an article is made, and important from the extreme utility of glass as ministering, in the highest degree, to our comfort, and to the promotion of scientific investigations. The art is said to have been early introduced into this country; but, if so, it was for a long time but little practised. In the latter part of the 16th century, glazed windows were luxuries all but unknown, even in the castles of the principal nobility of England; * and in Scotland, in the early part of the last century, glass was but seldom seen in the windows of country-houses.† The second Duke of Buckingham materially improved the manufacture of British glass by bringing workmen from Venice, which had long taken the lead in this beautiful art. The manufacture was still further improved by the arrival of the French refugees, subse-

* *Northumberland Household Book*, xvii.

† Ray, in his *Itinerary* (p. 187), mentions that, in Scotland, in 1661, glass was only used in the upper parts even of the windows of the king's palaces.

quently to the revocation of the edict of Nantes; and we began soon after to export considerable quantities of glass bottles.

The year 1773 is an æra of some importance in the history of the British glass manufacture, inasmuch as a company for the production of plate-glass was then incorporated by Act of Parliament. This company erected extensive works at Ravenhead, near St. Helen's, Lancashire. The manufacture was at first conducted by workmen brought from France, whence we had previously imported our plate-glass. The first company, being unsuccessful, was succeeded by another in 1794. And, for these many years past, glass plates have been produced at these works that will bear a comparison with any made in any other country. About 26 years ago, another company for the manufacture of plate-glass was established at Newcastle; and these are the only establishments for its manufacture in the empire. The competition of the latter company would appear to have been not a little advantageous to the public; the price of plate-glass having been reduced, since its formation, very far below its previous level.

Next to bottle or green glass, crown and broad glass, being that which is commonly used in the glazing of windows, is produced in the greatest quantity. Flint or crystal glass is the purest and most brilliant of all. It is the material out of which drinking-glasses, decanters, chandeliers, and most domestic articles, whether for use or ornament, are usually manufactured. Plate-glass is principally employed in the making of mirrors, in coach and shop windows, the glazing of prints, &c.

Distribution of the Manufacture.—Newcastle and South Shields are, beyond all comparison, the principal seats of the manufacture of crown and bottle glass. The largest manufactory of crown glass is that of Messrs. Chance and Hartley, near Birmingham: and there are considerable manufactories of flint and other descriptions of glass there, and at Dudley, Stourbridge, &c., situated, some in the Lichfield, and some in the Stourbridge collection. The manufacture is also carried on to a very considerable extent in Liverpool,* Bristol, and Warrington; and, to a less extent, in Leeds, Manchester, and London. In Scotland the manufacture is principally carried on at Dunbarton, Glasgow, and Leith. The Irish manufacture is but of trifling importance. Its principal seats are Dublin, Cork, Lisburn, and Waterford.

We gave, in the former editions of this work, statements illustrative of the injury to the manufacture inflicted by the duties on glass. But as these were repealed in 1845, it is unnecessary again to repeat the statements in question. It is sufficient to observe, that the anticipations of those who contended that the manufacture would rapidly increase were the duties abolished, seem to be in a fair way of being realised. In 1844 there were, in the United Kingdom, 13 establishments which wrought 20 furnaces for the manufacture of *crown* or *window* glass. These firms employed about 2,000 work-people, at wages varying from 15*s.* to 3*l.* per week, the average being about 22*s.*, making the

* The works at Ravenhead and St. Helen's are included in the Liverpool collection.

annual sum paid for labour in this branch of the manufacture about 110,000*l.* per annum; and the value of the glass being (exclusive of duty) nearly double that of the labour, it was worth about 220,000*l.* Since the duty has been repealed the previously existing establishments have increased the number of their furnaces to 24; and six new establishments have constructed seven furnaces, making at present (July, 1846) a grand total of 31 furnaces. At an average each furnace employs 100 work-people, whose wages (taking men and boys at a medium) amount to about 1*l.* per week, making the present expenditure for labour in the manufacture of crown glass 161,000*l.*, and its total value 322,000*l.* a-year. The price has been reduced from 8*l.* 10*s.* per crate to 3*l.* 10*s.*, and in squares from 1*s.* per foot to 4*d.*, being something more than the duty. It is difficult, however, to foretell what will be the ultimate result of the repeal of the latter on the manufacture of crown glass, the probability being that its consumption will be interfered with by the increased demand for sheet glass, which is a better article, and was, also, more interfered with by the Excise laws than crown glass.

Sheet Glass is formed out of cylinders split longitudinally, and then spread or flattened into squares. Its manufacture was introduced into this country in 1832, when the Excise laws were rendered less stringent. The skilled labour connected with this branch of the manufacture is at present (1846) mostly performed by Belgians and Frenchmen, who earn from 4*l.* to 8*l.* per week! Ultimately, however, they will be superseded by Englishmen, and when the supply equals the demand, the wages of skilled labour will, no doubt, be reduced to the ordinary rate of about 40*s.* a-week. Previously to the repeal of the duty, the following establishments existed for the production of sheet glass:—

Chance and Co. . .	Birmingham . .	2	furnaces.
Hartley and Co. . .	Sunderland . . .	1	,,
Cookson and Co. . .	Newcastle . . .	1	,,
Pilkington and Co. .	St. Helen's . . .	1	,,
		5	

The wages paid previously to the repeal of the duty were about 25,000*l.* per annum, and the annual value, minus the duty, 50,000*l.* Since the repeal of the duty the preceding establishments have increased their furnaces from 5 to 11, and the following new establishments have come into the field; viz.—

Birmingham Glass Company .	Birmingham . . .	1	furnace.
Silvester and Co.	,, . . .	1	,,
Sir M. W. Ridley and Co.. .	Newcastle	1	,,
Shortridge and Co.. . . .	South Shields . . .	1	,,
Liverpool Company . . .	Liverpool	1	,,
Coathupe and Co.	Bristol	1	,,
		6	

Raising the present number of sheet glass furnaces to 17, paying for labour 85,000*l.* per annum, the annual value of the glass being 170,000*l.*

The high-priced skilled labour only applies to 8 or 10 men out of every 100, and makes but little difference in the general average.

At present (July, 1846) the sheet glass manufacture is in a transition state. Its ultimate success will depend upon whether we can successfully withstand the competition of the Belgians. Some parties think this doubtful; but others, quite as competent to judge, hold a contrary opinion; and when we are supplied with native skilled labour, which will be the case at no very distant period, there does not seem to be any good reason why we should not be as successful in this as in other departments of manufacturing industry.

The following statements with respect to the manufacture of plate glass in England, in 1827 and 1846, were compiled by Mr. Henry Howard, of Fenchurch-street:—

Plate Glass-making in England in 1846, *contrasted with what it was in* 1827.

In 1827			In 1846		
1827	Coals, in London, were about 31s. 6d. per chaldron in the Pool, which, with lighterage, wharfage, and cartage to the works, rendered them about 40s. per chaldron, or . .	30s. per ton.	1846	Coals are landed at works near London at about	13s. per ton.
1827	An annealing kiln contained . .	200 ft.	1846	An annealing kiln contains . . .	400 ft.
1827	A casting furnace produced, say .	1,200 ft. per week.	1846	A casting furnace produces . . .	4,000 ft. per week.
1827	Hooded or covered pots were used for melting the glass, containing about	12 cwt. each.	1846	Open pots are used, requiring less fuel, and containing about . . .	20 cwt. each.
1827	Pearlashes were at a high price, and a heavy duty, on alkali made therefrom.				
1836	Pearlashes were	42l. per ton.	1846	Pearlashes are about	23l. per ton.
1827	The casting-table was heated on the top by charcoal, at an expense of.	5 0l. per annum.	1846	The casting-table is heated underneath by cinders	at scarcely any expense
1827	An engine of 32-horse power ground and polished (12 hours to the day) from	800 to 1000 ft. per week	1846	An engine of 60-horse power will grind and polish at least . . .	3,000 ft. per week.
1827	A grinding-bench ground	200 to 250 ft. per week.	1846	A grinding-bench at —— Works grinds about	500 ft. per week.
			1846	A grinding-bench may be constructed to grind	600 ft. per week.
1827	A polishing-bench polished . . .	200 to 250 ft per week.	1846	A polishing-bench at —— Works polishes about	500 ft. per week.
			1846	A polishing-bench can be constructed to polish, better and cheaper.	nearly 1,000 ft. per week.
1827	A plate-glasswork in London manufactured about.	60,000 ft. per ann.	1846	A company near London is making 8,000 feet per week, or more than And that is insufficient, but they can make no more, having no room to extend.	400,000 ft, per annum.
1827	The price of rough and moulded plate varied from	5s. to 6s. per foot	1846	The price of rough plate ($\frac{1}{4}$ and $\frac{3}{8}$ of an inch thick) is . . . . . And one company has an order for 48,000 feet	1s. 6d. to 2s. per foot (cost 10d. to 1s. per foot).
1827	Wages were comparatively low.		1846	Wages are high, but they do not amount to so much per foot as in 1827.	
1827	Large plates were made with great difficulty, and the cost, on the average, is estimated at about. . .	10s. per foot.	1836	The largest plates are made, with perfect facility, at less than . . And this amount may be still further reduced to about 2s. 6d per foot	3s. per foot.
1827	The manufacturers kept a very large stock on hand.		1846	None of the houses can keep stock, but can only supply their customers from hand to mouth, and that very inadequately	

SUMMARY.

Average,
In 1827 Plate Glass sold for about 12s. per foot, to the extent of about 5,000 feet per week.
In 1836 Plate Glass sold for from 8s. to 9s. per foot, to the extent of about 7,000 feet per week.
In 1844 Plate Glass sold for from 6s. to 7s. per foot, to the extent of about 23,000 feet per week.
In 1846 Plate Glass sells for from 5s. to 6s. per foot, to the extent of about 40,000 feet per week.
May 30.—Now nearly 45,000 feet per week.
(Exclusive of Foreign Glass.)

Looking at the extraordinary increase that has taken place, notwithstanding the severity of Excise restrictions, and seeing that the demand now progresses more rapidly than ever, even at 5s. to 6s. per foot,—if the price were reduced to 4s. or 3s. 6d. per foot (which, free as the trade now is from Excise interference, would afford ample profit), what must then be the demand?

The flint or crystal glass made in England is purer and more brilliant than any made anywhere on the continent. But in all that relates to the colouring or staining of glass the Bohemians are at present superior to every other people. We, however, are gaining

upon them in this department. The following table gives a correct view of the gross extent of the British glass manufacture in 1840, 1841, and 1842; and will serve as a standard by which to measure its future progress:—

Account exhibiting the Quantities of the different descriptions of Glass Manufactured during each of the three Years ending with 1842, *with the Quantities Exported, the Rates and Produce of the Duties, &c.*

Description of Glass.		Quantity Manufactured.	Quantity Exported.	Rate of Duty.	Gross Amount of Duty.	Drawback on Glass Exported.	Nett Amount of Duty (Excise), after deducting Drawbacks and other Legal Allowances.
		Cwts.	Cwts.		£.	£.	£.
Flint Glass .	1840	104,889	19,913	To 15th May, 1840, 18s. 8d per cwt., since, 18s. 8d per cwt. and 5 per cent.	101,029	21,199	79,830
,, . .	1841	97,524	20,516		95,565	22,605	72,960
,, . .	1842	83,653	13,696		81,973	15,098	66,875
		Sq. feet,					
Plate Glass .	1840	33,623	52,879	To 15th May, 1840, 3l. per cwt., since, 3l. per cwt. and 5 per cent.	104,117	7,412	96,705
,, . .	1841	27,639	121,113		87,061	17,483	69,578
,, . .	1842	21,528	68,318		67,812	9,866	57,946
		Cwts.					
Crown Glass .	1840	129,978	15,318	To 15th May, 1840, 3l. 13s. 6d. per cwt., since, 3l. 13s. 6d. per cwt. and 5 per cent.	492,982	78,330	417,497
,, . . .	1841	116,845	19,118		451,064	92,070	357,337
,, . . .	1842	97,495	12,369		376,205	60,891	314,324
German Sheet Glass . .	1840	16,859	8,219	To 15th May, 1840, 3l. 13s. 6d. per cwt., since, 3l. 13s. 6d. per cwt. and 5 per cent.	63,986	33,604	30,382
,, . .	1841	20,955	8,781		80,473	36,876	43,597
,, . .	1842	25,500	7,701		98,897	32,349	66,049
Broad Sheet Glass . .	1840	9,651	14	To 15th May, 1840, 1l. 10s. per cwt.	19,015	2	13,913
,, . .	1841	..	..	To 15th Aug., 1840, 1l. 10s. per cwt. and 5 Per cent., since, 3l. 13s. 6d. per cwt. and 5 per cent.			
,, . .	1842	..	..				
Common Bottle Glass .	1840	525,574	292,687	To 15th May, 1840, 7s. per cwt., since 7s. per cwt. and 5 per cent.	189,883	103,926	85,957
,, . .	1841	501,177	310,937		184,174	114,109	70,065
,, . .	1842	390,482	225,633		143,496	82,915	60,581
Total Nett Revenue collected during the three years ending with 1842							1,902,595
Annual Average Nett Revenue of the three years ending with 1842							634,198

Sect. 9.—*Paper Manufacture, Books, Newspapers, &c.*

Paper.—The application of paper to the purposes of writing and printing, and the fact of its being indispensable to the prosecution of the latter, render its manufacture of the highest utility and importance. But, even in a commercial point of view, its value is very considerable. France, Holland, and Genoa had, for a lengthened period, a decided superiority in this department. The finest and best paper being made of linen rags, its quality may be supposed to depend, in a considerable degree, on the sort of linen usually worn in the country where it is manufactured; and this circumstance is said to account for the greater whiteness of the Dutch and Belgian papers as compared with those of the French and Italians, and still more of the Germans. The rags used in the manufacture of writing-paper in Great Britain are collected at home; but those used in the manufacture of the best printing-paper are imported principally from Italy, Hamburgh, and the Austrian States, by way of Trieste.

We believe, however, that it was owing rather to the want of skill than, as has sometimes been supposed, to the inferior quality of the linen of this country, that the manufacture of paper was not carried on with much success in England till a comparatively recent period. During the 17th century most part of our supply was imported from the continent, especially from France. The manufacture is said to

have been considerably improved by the French refugees who fled to this country in 1685. But it is stated in the *British Merchant* (vol. ii., p. 266), that hardly any sort of paper, except brown, was made here previously to the Revolution. In 1690, however, the manufacture of white paper was attempted; and, within a few years, most branches were much improved. In 1721 it is supposed that there were about 300,000 reams of paper annually produced in Great Britain, which was equal to about two-thirds of the whole consumption. In 1783 the value of the paper annually manufactured was estimated at 780,000*l.* At present, besides making a sufficient quantity of most sorts of paper for our own use, and for exportation, we annually export about 100,000*l.* worth of books. The importation of foreign paper for British consumption has now nearly ceased. A small quantity of French paper was used in this country for copperplate printing till within these few years; but, in this respect, we now surpass the French, and there is no artist of either country who does not consider English paper, manufactured according to the latest improvements, best adapted for prints. The French have, however, always excelled in the manufacture of very thin letter paper; and a small portion of this article, and some paper hangings, are now the only articles of import.

In 1813, Dr. Colquhoun estimated the value of paper annually produced in Great Britain at 2,000,000*l.*; but Mr. Stevenson, an incomparably better authority upon such subjects, estimated it at only half this sum. From information obtained from those engaged in the trade, we incline to think that the total annual value of the paper manufactured in the United Kingdom, exclusive of the duty, may at present amount to about 1,800,000*l.* or 2,000,000*l.* There are about 700 paper-mills in England, and from 70 to 80 in Scotland. The number in Ireland is comparatively inconsiderable. Of these mills, we believe very few have lately been unemployed. About 30,000 individuals are supposed to be directly engaged in the trade; and, besides the workmen employed in the mills, the paper manufacture creates a considerable demand for the labour of millwrights, machinists, smiths, carpenters, iron and brass founders, wire-workers, woollen manufacturers, and others, in the machinery and apparatus of the mills. Some parts of these are very powerful, and subject to severe strain; and other parts are complicated and delicate, and require continual renovation. Owing to this, the manufacture is of much greater importance, as a source of employment, than might at first be supposed, or than it would seem to have been formerly considered by Government, who loaded it, down to a very recent period, with an oppressive excise duty.

During the present century this manufacture has been signally promoted by the combined influence of science, ingenuity, and mechanical skill. These have been successfully exerted in the preparation of the pulp; the conversion of the pulp into paper; and the provision of materials: and in none has their influence been more remarkable than in the last. This is evident from the fact, that while the manufacture has been more than doubled since 1820, the demand for continental rags and other foreign materials has actually been reduced within that time, in consequence of the immense home supply we derive from sub-

stances previously regarded as worthless, and treated as refuse. The sweepings of cotton and flax mills, owing to the grease and dirt with which they are mixed up, were, until within these few years, of no value whatever, except as manure. But means having been discovered of rendering them clean and white, they are now made into very good paper; and the neighbourhood of Manchester has, in consequence, become a principal seat of the manufacture. The chemical and mechanical processes by which these materials are purified, whitened, and made available for the production of paper, without their strength being impaired, are not only exceedingly interesting in themselves, but are of great national importance; and, by reducing the cost of paper, have done ten times more to lower the price of books, and diffuse literature, than all the efforts of all the societies that ever existed.

The first idea of a machine for converting pulp into paper, originated in France, the inventor being an ingenious workman of the name of Louis Robert. A model of this machine was brought to England by M. Leger Didot; and though at first it was far from giving an assurance of success, it sufficed to induce English capitalists and engineers, particularly Mr. Donkin, to follow up the scheme; and in the course of a few years they brought it to a high degree of perfection. Mr. Dickinson, of Hertfordshire, one of the most intelligent mechanists and extensive paper manufacturers in England, has invented a machine of a different construction for the same purpose, and has also introduced various subsidiary improvements into the manufacture. One of these consists in the application of air-pumps to the process, by the action of which, he produces a partial vacuum under a portion of the wire on which the pulp is in the act of settling, and thus very much accelerates its consolidation; in fact, prepares it almost instantaneously for the first mechanical pressure. The result is all but miraculous. By the agency of a great deal of complicated machinery, so admirably contrived as to produce the intended effect with unerring precision and in the very best manner, a process, which in the old system of paper-making occupied about three weeks, is performed in as many minutes! A continuous stream of fluid pulp is, within this brief space of time, and the short distance of 30 feet, not only made into paper, but actually dried, polished, and every separate sheet cut round the edges, and rendered completely ready for use! The paper manufactured by this wonderful combination of intelligence and power is, at once, moderate in price, and, for most purposes, superior in quality to what was formerly made by hand. The same gentleman some time since made an important improvement in the paper manufacture, on the principle of veneering in cabinet work. He makes two webs of paper, each by a separate process; and by laying them together while in an early stage, they are rendered inseparable by the pressure to which they are subjected. This paper is used in copperplate printing; and by adopting a peculiar method of preparing the pulp, and selecting a finer rag for the web which forms the face of the paper, it is much better calculated for taking a fine impression. Its introduction has put a total stop to the importation of that species of French paper, which was formerly used in considerable quantities by copperplate printers. Probably, however, the most ingenious of the modern inventions in the manufacture is that

by which Mr. Dickinson has contrived, without increasing the thickness of paper, to embody parallel coloured threads in its fabric. This novel description of paper is now used in the printing of exchequer bills and postage envelopes, for which it is admirably fitted, inasmuch as it cannot be counterfeited, except by employing similar machinery, which it would cost a great deal to construct, and be all but impossible to conceal.

Duty on Paper.—Previously to 1836, all writing, coloured, or wrapping papers, cardboards, and pasteboards, were denominated first class paper, and paid 3*d.* per lb. duty (28*s.* a cwt.); unless *manufactured wholly of tarred ropes, without the tar being previously extracted*, in which case the paper was denominated second class, and paid 1½*d.* per lb. (14*s.* a cwt.) Millboards and scaleboards, made of the same materials as second class paper, paid 2¼*d.* per lb. (21*s.* a cwt.) duty.

This duty varied on the different descriptions of first class paper from about 25 or 30 per cent. on the finest, to about 200 per cent. on the coarsest! A duty so oppressive seriously obstructed the progress of literature and the diffusion of knowledge, and led to the commission of frauds, which all the vigilance of the officers, and the endless multiplication of checks and penalties, were unable to prevent. But, laying out of view for a moment the oppressiveness of the duty, could anything be more absurd than to interdict the manufacturer of third class wrapping paper (for it is to him that the regulation applied) from using any other material than *tarred ropes?* After the peace, and the very general introduction of iron cables, tarred ropes advanced considerably in price; but as the use of *any other material* would have occasioned an increase of 14*s.* a cwt. of duty, advantage could not be taken of this circumstance; so that the excise regulation, without putting one sixpence into the pockets of Government, obliged the public to pay an increased price for an inferior article.

But though the exigencies of the public service have not permitted the total repeal of the duties on paper, they have been most materially lowered. In 1836, the duty on first-class papers was reduced to the same level as that on papers of the second class, or from 3*d.* per lb. to 1½*d.* per lb.; the manufacturers of the coarser descriptions of paper being at the same time relieved from the restraints under which they had previously laboured, and allowed to use any material in the manufacture which they may judge best. The oppressive duty of 1¾*d.* per square yard laid on paper when printed or stained, over and above the ordinary duty on paper, was then also repealed, and the various acts relating to paper were combined into a single statute. At present, therefore, the same rate of duty is laid on all descriptions of paper, so that there is no longer any room for cheating the revenue by the substitution of superior for inferior paper, and, consequently, no necessity for exercising so great a degree of vexatious surveillance over the manufacture as formerly prevailed.

The influence of this wise and judicious measure in reducing the price of paper used in printing and writing, has since been decidedly manifested. The abolition of the discriminating duty on stained or printed paper has, also, been of material importance. The reduction of price it occasioned, enabled a much larger class of persons to get their apartments papered; and has been in this way productive, not only of

a great additional demand for paper and labour, but of a great increase of comfort and cleanliness.

This measure, also, in part obviated the injustice done to authors and publishers, by compelling them to pay a duty on the paper used in printing books previously to their publication; and consequently, before it can be known whether the books will sell. When they do not sell, the tax has obviously to be paid out of the capital of the authors or publishers, and the loss arising from an unsuccessful publishing speculation is increased by its amount. It is true that every duty on paper, how limited soever, operates in this way, and is, therefore, objectionable on principle; but the hardship inflicted on an unsuccessful author by the existing paper duty being only half its former amount, is not nearly so much felt, and is, perhaps, a useful restraint on the *cacoethes scribendi*.

As respects revenue, too, the measure has been successful. In 1835, the nett produce of the duties on paper, in the United Kingdom, amounted to 796,305*l.*, and notwithstanding they were reduced a half in the following year, they amounted, in 1845, to 758,982*l.*, showing that in the interval the manufacture had nearly doubled! In truth and reality, however, it has done more than this; for, owing to the premium (for so it may be called) which the present postage regulations give to the use of thin and light paper, the increase in its production has been much greater than we might infer from the increase of weight. Indeed the probability is that, but for the change in the postage system, the revenue from paper would have been greater now (1846) than before the reduction of the duties.

Books.—It would be inconsistent alike with the objects and limits of this work to enter upon any investigations with respect to the influence of literature, or of the diffusion of books and periodical publications. But, apart from their importance in other respects, the production of such works is an important branch of industry; and furnishes employment, directly and indirectly, to a great number of persons.

London is the great centre of the British book trade; the number of new publications that issue from its presses being far greater than all that appear in the rest of the empire. Within the course of the last 40 years, however, many very important works have been published in Edinburgh; but the latter, as well as those that appear in Oxford, Cambridge, Glasgow, &c., are principally disposed of by the London trade. With the exception of the school-books published by the Commissioners of Education, very few new works appear in Ireland, and it is comparatively destitute of booksellers and of circulating libraries. The booksellers of Edinburgh, and of all the provincial towns, have agents in London, to whom they consign copies of every work they publish; and to whom, also, they address their orders for copies of such new or old works as they have occasion for. The London booksellers, who act as agents for those in the country, are in the habit of regularly despatching parcels to their correspondents on the last day of each month, with the magazines and other monthly publications; but if any new work of interest appears in the interim, or orders be received from the country that cannot be conveniently deferred to the end of the month, a parcel is immediately forwarded by railway. The booksellers of Edinburgh and Dublin act as

agents for those of London, and supply the Scotch and Irish country trade with the metropolitan publications.

The price of new works is fixed by the publishers, who grant a deduction to the retail dealers of from 20 to 25 per cent. on the price of *quartos*, and from 25 to 30 per cent. on that of *octavos*, and those of smaller size. The credit given by the publishers to the retailers varies from seven to twelve months; a discount being allowed for prompt payment at the rate of 5 per cent. per annum.

From inquiries we have made with much care and labour, we find that at an average of the four years ending with 1842, 2,149 volumes of new works, and 755 volumes of new editions and reprints (exclusive of pamphlets and periodical publications), were annually published in Great Britain; and we have farther ascertained that the publication price of the former was 8*s.* 9½*d.*, and of the latter 8*s.* 2*d.* a volume. Hence, if we suppose the average impression of each work to have been 750 copies, it will be seen that the total value of the new works annually produced, if they were sold at their publication price, would be 708,498*l.* 8*s.* 9*d.*, and that of the new editions and reprints, 231,218*l.* 15*s.* We believe, however, that if we estimate the price at which the entire impressions of both descriptions of works actually sell at 4*s.* a volume, we shall not be far from the mark; and if so, the real value of the books annually produced will be 435,600*l.* a-year. Subjoined is a summary of these results.

Years.	New Works.		Reprints and New Editions	
	No. of Vols.	Value at Publication Price.	No. of Vols.	Value at Publication Price.
		£. s. d.		£. s. d.
1839 . . .	2,302	966 11 2	773	296 7 8
1840 . . .	2,091	943 3 5	821	327 16 10
1841 . . .	2,011	902 5 9	741	314 12 7
1842 . . .	2,193	968 2 6	684	295 9 6
Totals . . .	8,597	3,780 2 10	3,019	1,234 6 7
Average of the four years	2,149	945 0 8¼	755	308 11 7¾
Average price of each vol.	. .	0 8 9¼	. .	0 8 2

	s. d.	£. s. d.
750 copies of 2,149 vols. at	8 9¼	708,498 8 9
of 755 ,,	8 2	231,218 15 0
of 2,904 ,,	4 0	435,600 0 0

We regret that no estimate can be formed of the number or price of the pamphlets that annually make their appearance.

Periodical Publications.—In a mercantile point of view periodical literature (excluding newspapers and books published in parts) is of more importance than most persons would probably be at first disposed to admit. We have inquired with some care into the subject, and we are inclined to think that the following estimate of its extent and value in 1846 may be relied on with pretty considerable confidence.

Monthly Magazines.—These, in the united kingdom, amount, including all descriptions, to about 200: and taking their average price

at 1*s.* 2*d.*, and their average sale at 1,500 copies, their produce will be 17,500*l.* a-month, and 210,000*l.* a-year.

Quarterly Journals.—There are about 30 of these; and taking the average price of each at 5*s.*, and their average sale at 2,000 copies, they will produce 15,000*l.* a-quarter, and 60,000*l.* a-year. Hence, supposing these estimates to be nearly accurate, the annual produce of the sale of periodical publications (exclusive of what they yield by advertisements) will amount to about 270,000*l.*

Newspapers.—In modern times the distinguishing feature of our literature is, undoubtedly, the newspaper, and especially the daily, press. To such perfection has the method of conducting the daily journals been carried, that debates that occur in either house of parliament are accurately and very fully reported in the morning papers of the ensuing day, and sometimes in the evening papers of the same day. These, indeed, are not unfrequently published within two or three hours of the termination of the debate; and being carried to the country by the railway coaches, and other speedy conveyances, the report of a debate ending in the House of Lords or Commons at 4 o'clock in the morning, may be perused at Birmingham or Bristol, above 100 miles off, by 12 o'clock of the same day! The other departments of the daily journals; such as communications from foreign parts; criticisms in various branches of science and literature; and the comments of the editors on the events of the day, are, for the most part, written with great ability; and though strongly tinctured with party prejudices, and but little to be depended on when party interests are concerned, they discover a grasp of mind, an extent and accuracy of information, and a correctness of style, that are really astonishing, considering the haste with which they have to be composed, and the little time given for revision. Generally speaking, the periodical press of Great Britain is decidedly superior to that of every other country, and displays much practical good sense, and, with some few exceptions, the most praiseworthy respect for the decencies of private life, and for the great principles that form the foundations of society.

Down to a comparatively recent period the Scotch newspaper press was alike inefficient and degraded. This was not a consequence of any indifference on the part of the public to newspaper discussions, but was wholly ascribable to the corrupt state of the court of justiciary. (See *ante*, p. 226.) Full scope was given to the panegyrists of the government of the day, how worthless soever it might be; but any one who happened to question its merits, or who ventured to espouse or recommend any doctrine or theory not approved by the Lord Advocate for the time being, was, in fact, at the mercy of the latter, and might be banished almost at pleasure. The servility of the judges, and the facility of packing juries, afforded the agents of Government a ready means of crushing any obnoxious writer; and, in fact, it may be said that Scotland had no newspaper press, or none worthy of the name, till after the close of last war.

Exclusive of their vast influence over public opinion newspapers have become an important commercial article. In 1845 the gross produce of the stamp duty levied on newspapers in the United Kingdom

was 327,682*l.*: the gross produce of the sale may be estimated at 4½ times this sum; so that on this hypothesis the newspapers produced in that year must have cost the public about 1,474,570*l* sterling, exclusive of the sums paid for advertisements.

Newspapers, in London, are sold by the publishers to newsmen or newsvenders, by whom they are distributed to the purchasers in town and country. The newsmen, who are the retailers, receive, for their business of distribution, a regulated allowance. The papers sold to the public at 5*d.*, which form the great mass of London newspapers, are sold to the newsmen in what are technically called quires. Each quire consists of 27 papers, and is sold to the newsmen for 8*s.* 9*d.*; so that the newsman's gross profit on 27 papers is 2*s.* 6*d.* In some instances, where newspapers are sent by the post, ½*d.* additional on each paper is charged by the newsmen to their country customers. Some of the clerks of the Post-office, called clerks of the roads, used to be considerable news-agents; but this, we believe, is no longer the case. Previously to 1836 the stamp duty on a newspaper was rather under 3½*d.* (4*d.* — 20 per cent.); but it was then reduced to 1*d.* nett. A single paper being sold to the newsmen at 4*d.*, the sum which is received by the newspaper proprietors for paper, printing, and the expenses of their establishments, is 3*d.* for each copy.

The subjoined statement shows how papers are disposed of at present to the different classes of dealers.

Papers at	Wholesale Newsmen, per 27 Papers.		Retail Newsmen, per 27 Papers.		Retail Newsmen, per single Copy.	
	Cost.	Profit on Sale.	Cost.	Profit on Sale.	Cost.	Profit on Sale.
d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*d.*	*d.*
5	8 9	2 6	9 0	2 3	4	1

Advertisements form a considerable source of profit to newspapers; and without this source, some of those that are most widely circulated could not support their great expenditure. Each advertisement is charged, without distinction of length, with a duty of 1*s.* 6*d.*, and in 1845 this duty produced 146,363*l.* nett in Great Britain, and 10,911*l.* in Ireland. We have no means of ascertaining exactly the portion of this sum derived from newspapers, as distinguished from other publications, but we believe we should under-estimate it by taking it at four-fifths of the whole. The charges of newspapers for advertisements are proportioned to their length, and to the character of the newspaper itself. The sum received for them may be taken, inclusive of the duty, at above 340,000*l.*

Newspaper stamps are obtained at the Stamp Office, where the paper is sent by the stationers to be stamped. The stamps are paid for before the paper is returned. The duty on advertisements, which is also under the management of the Commissioners of Stamps, is paid monthly; and, for securing these payments, the printer and two sureties become bound in moderate sums.

A Return specifying the Aggregate Number of Stamps issued for Newspapers in England, Scotland, Wales, and Ireland, in 1842, 1843, *and* 1844.

Years.	England.		Scotland.		Wales.		Ireland.	
	Stamps at 1*d.*	Stamps at ½*d.*	Stamps at 1*d.*	Stamps at ½*d.*	Stamps at 1*d.*	Stamps at ½*d.*	Stamps at 1*d.*	Stamps at ½*d.*
1842	50,145,912	1,473,664	4,977,344	443,550	440,200	10,830	6,063,906	35,750
1843	51,282,900	1,893,682	5,293,726	243,150	456,925	2,000	6,452,072	142,580
1844	53,933,848	3,738,128	5,727,585	317,620	479,700	7,000	6,769,067	249,550

The Stamps at ½*d.* are for Supplements.

SECT. 10. *Malt, Breweries, and Distilleries.*

THE establishments connected with the conversion of grain into fermented and distilled liquors are of much greater magnitude in Great Britain than in any other country. Owing to the want of wine as a native product, and to the heavy duties that have always been laid upon it when imported, the common beverage of the great bulk of the people has always consisted of fermented or distilled liquors, obtained either from malted or from raw grain. The manufacture of malt, beer, and spirits is important, not only from the amount of capital employed in the business, and the value of the products, but also because the duties on them constitute an important item of the public revenue.

Malt.—The process followed in the manufacture of malt is very simple; and has been carried on for a very long period nearly in the same manner in which it is conducted at present. It is succinctly described in the Report of the Commissioners of Excise Inquiry on Malt.

Description of the Process of Malting.—"Barley is the grain generally used, but oats and other grain, and pulse, viz., beans and peas, are sometimes used for the purpose; and the process commences with wetting or steeping the same in an oblong or square vessel called a cistern. Sometimes the grain is first put into the cistern and then covered with water, at other times the water is first put in and the grain added afterwards.

"Very soon after the grain has been covered with water, it begins to swell and increase in bulk, and continues to do so pretty regularly until it reaches its maximum. The amount of the swell depends not only upon the length of time the grain remains in the steep covered with water (which by law can in no case be less than forty hours), but also upon its quality, and state of dryness before put in steep, and must of course be expected to vary; but the law presumes that the swell will amount to 17½ bushels for every 82½ bushels before steeped.

"The grain, after being steeped, and the water drawn off, is thrown out of the cistern into a square or oblong utensil called a couch-frame, in which it is required by law to remain for the space of 26 hours at the least. Immediately after the expiration of 26 or 30 hours, as the case may be, the grain in operation is said to be on the floor; and

during the time it remains on the floor it undergoes a variety of changes.

"1st. The grain at a certain period (which varies according to circumstances) becomes moist, and emits a rather agreeable smell, and soon after this period the roots begin to make their appearance.

"2d. The acrospire or future stem begins to swell, and gradually advances under the husk from the same end where the roots are observed to spring, till it nearly reaches the other extremity of the grain.

"3d. The kernel, as the acrospire advances through it, becomes friable, and sweet-tasted, and the whole art of malting depends upon the proper regulation of these changes. In a day or two after the grain has been thrown out of the cistern, the roots begin to appear at the end of each kernel in the shape of a small white protuberance, which soon divides itself into distinct fibres or rootlets. The grain about this time appears moist on the outside, which is called *sweating*, and which usually goes off in a day or two.

"In about a day, generally, after the spreading of the roots, the rudiments of the future stem may, by splitting the grain, be seen to lengthen. It rises from the same extremity with the root, and, advancing with the husk, would at last issue from the opposite end of the grain, and assume the form of a green blade of grass; but the process of malting is brought to a conclusion some time before the stem has made such progress as to burst the husk.

"As the germination proceeds, the grain is gradually spread thinner on the floor; and when the moisture has been in some degree evaporated, and the germination has thereby been checked, it is again gradually laid thinner to wither. Maltsters differ much in their manner of working, which is affected also by the state of the weather.

"The grain, having thus germinated to the extent required, is put upon the kiln, and heat applied by means of a fire, which is regulated according to circumstances; and when the malt has attained the requisite state of dryness, it is thrown off the kiln, the process being then finished."

The first of the following Tables shows the quantity of malt annually made in England and Wales, in different years, since 1702, with the rates of duty charged upon it, and the produce of the duties. There are similar accounts for Scotland and Ireland; the one commencing with 1793, and the other with 1790.

The manufacture of malt has been carried on in England to a great extent from a very early period; but it is singular that, notwithstanding the products obtained from it have always formed the principal beverage of the great bulk of the people, the consumption of malt varied very little from the beginning of the last century till within the last half dozen years! This extraordinary result, so different from what would have been *à priori* anticipated, is ascribable partly to the increase of the duties laid on malt, but still more to the greater increase of those laid on beer, its principal product. No doubt, however, it has been partly, also, occasioned by the change that has taken place in the mode of living, by the introduction and universal use of tea, coffee, and other articles, substituted in the place of beer. But the

increase that has taken place in the consumption of malt since the reduction of the duty on it in 1822, and the repeal of the beer duty in 1830, seems to prove that the duties were, at least, quite as instrumental in checking the consumption as the introduction of the articles alluded to.

Breweries.—The establishments in Great Britain for the manufacture of beer, particularly those in the metropolis, are, many of them, of great magnitude, and employ a large amount of capital. The latter principally produce *porter*, the favourite beverage of the Londoners. This is a peculiar species of beer, of a bitterish taste, and a dark colour, both of which it derives from its being prepared from malt dried at a high temperature, and in some degree charred. Ale is produced from pale malt, or malt dried at a very low temperature. Edinburgh, Burton-on-Trent, and several other districts of England, are celebrated for the superiority of their ale.

Account of the Quantities of Malt charged with Duty in England and Wales, of the Revenue received thereon, and of the Rates of Duty, in different Years, from 1702 *to* 1852, *both inclusive.*

Years	Number of Bushels of Malt	Amount of Duty. £.	s.	d.	Rate of Duty per Bushel.
1702	12,166,778	313,907	5	0	$6\frac{16}{21}d.$
1705	27,120,982	702,957	11	1	—
1710	19,671,021	511,954	10	6	—
1715	24,472,610	635,330	18	6	—
1720	25,625,844	665,527	1	9	—
1725	27,265,172	707,467	12	3	—
1730	28,410,421	736,815	8	0	—
1735	25,494,686	661,259	17	3	—
1740	22,074,874	573,059	9	7	—
1745	24,917,869	645,998	13	5	—
1750	29,284,786	758,396	18	1	—
1755	27,916,402	722,732	2	5	—
1760	27,810,971	999,818	11	11	$6\frac{16}{21}d$ $9\frac{1}{4}\frac{2}{21}d$
1761	28,928,960	1,123,040	17	2	$9\frac{1}{4}\frac{2}{21}d$
1765	25,631,086	996,756	19	8	—
1770	24,452,960	950,827	12	6	—
1771	21,961,057	854,344	11	6	$9\frac{1}{4}\frac{2}{21}d$
1775	24,967,360	971,085	8	2	—
1776	23,836,298	1,024,336	2	5	—
1777	25,814,436	1,004,050	9	3	—
1778	26,318,736	1,022,950	9	1	—
1779	26,273,405	1,028,088	1	6	$9\frac{1}{4}\frac{2}{21}d.$ $9\frac{1}{4}\frac{4}{5}d$
1780	30,805,100	1,534,454	14	5	$9\frac{1}{4}\frac{4}{5}d.$ 1s $4\frac{1}{4}d.$
1781	26,718,048	1,817,556	7	4	1s $4\frac{1}{4}d.$
1782	27,159,104	1,846,108	11	10	—
1783	16,712,114	1,138,782	16	0	—
1784	25,796,105	1,745,953	19	8	—
1785	26,269,439	1,777,917	15	2	—
1786	22,074,834	1,493,548	2	8	—
1787	26,489,578	1,789,780	3	9	—
1788	26,048,072	1,763,277	17	8	—
1789	23,509,592	1,591,468	15	6	—
1790	21,976,959	1,487,775	6	0	—
1791	27,070,863	2,092,191	15	10	1s. $4\frac{1}{4}d.$ 1s. $7\frac{1}{4}d.$
	Stock in hand	46,716	18	3	
1792	27,789,166	2,142,950	12	10	1s. $7\frac{1}{4}d.$ 1s. $4\frac{1}{4}d$
1793	23,706,765	1,604,717	9	9	1s. $4\frac{1}{4}d.$
1794	24,818,341	1,679,222	8	6	—
1795	23,960,828	1,620,515	7	6	—
1796	27,282,973	1,846,819	5	9	—
1797	29,979,110	2,029,349	7	11	—
1798	26,148,482	1,769,476	13	11	—
1799	30,805,622	2,083,701	14	0	—
1800	14,049,749	950,296	18	5	—
1801	18,005,786	1,218,455	16	7	—
1802	29,482,584	2,175,406	18	4	1s. $4\frac{1}{4}d.$ 2s 5d.
	Stock in hand	436,633	8	7	

Years	Number of Bushels of Malt	Amount of Duty. £	s	d	Rate of Duty per Bushel.
1803	29,562,038	3,555,906	18	0	2s. 5d. 4s $5\frac{3}{4}d.$
1804	21,854,111	4,858,056	9	4	4s. $5\frac{3}{4}d.$
	Stock in hand	914,356	0	0	
1805	21,665,204	4,841,066	15	0	—
1806	26,652,425	5,955,716	0	0	—
1807	24,158,843	5,397,635	6	4	—
1808	21,726,415	4,854,698	2	4	—
1809	22,120,984	4,942,771	7	8	—
1810	23,546,346	5,261,362	12	0	—
1811	25,982,749	5,806,251	15	0	—
1812	18,092,965	4,042,716	16	4	—
1813	21,701,356	4,849,419	5	0	—
1814	25,320,615	5,657,228	8	4	—
1815	26,246,795	5,865,606	18	8	—
1816	21,158,348	4,217,259	13	1	4s $5\frac{3}{4}d$ 2s. 5d.
1817	20,855,566	2,509,817	18	4	2s 5d.
1818	24,029,838	2,964,024	12	10	—
1819	22,612,290	3,268,881	3	2	2s. 5d. 3s $7\frac{1}{4}d.$
	Stock in hand	420,263	8	8	—
1820	23,884,242	4,311,446	5	1	3s $7\frac{1}{4}d$
1821	26,188,437	4,718,360	10	0	—
1822	26,668,512	3,624,242	8	0	3s. $7\frac{1}{4}d.$ 2s 7d.
1823	24,845,152	3,203,502	17	6	2s 7d.
1824	27,615,383	3,560,693	0	0	—
1825	29,572,741	3,813,072	7	6	—
1826	27,433,971	3,530,895	18	8	—
1827	25,096,337	3,241,610	3	11	—
1828	30,517,819	3,941,884	19	1	—
1829	23,428,185	3,026,133	19	6	—
1830	26,900,902	3,474,699	16	10	—
1831	32,963,470	4,257,781	10	10	—
1832	31,669,771	4,090,678	15	1	—
1833	33,789,010	4,364,418	15	10	—
1834	34,449,646	4,449,745	0	0	—
1835	36,078,855	4,660,185	0	0	—
1836	37,196,098	4,804,612	0	0	—
1837	33,602,356	4,351,929	8	3	—
1838	33,823,985	4,368,931	8	8	—
1839	33,826,016	4,369,193	14	8	—
1840	36,653,442	4,841,229	18	0	2s. 7d. 2s. 7d. & 5 per cent
1841	30,956,394	4,198,460	18	4	2s. 7d. & 5 per ct.
1842	30,796,262	4,176,742	19	0	—
1843	30,891,000	4,189,592	0	9	—
1844	31,856,563	4,320,546	8	3	—
1845	30,508,840	4,737,774	5	4	—
1846	35,723,774	4,845,050	11	10	—
1847	30,269,965	4,105,364	0	0	—
1848	31,848,456	4,319,446	14	0	—
1849	33,161,128	4,498,152	9	9	—
1850	34,423,489	4,668,685	9	3	—
1851	34,638,214	4,697,807	10	1	—
1852	35,483,623	4,812,466	2	0	—

Account of the Quantities of Malt charged with Duty in Scotland, of the Revenue received thereon, and of the Rates of Duty, in different Years, from 1793 *to* 1852.

Years.	Number of Bushels of Malt.	Amount of Duty.	Rate of Duty per Bushel.		Years	Number of Bushels of Malt.	Amount of Duty.	Rate of Duty per Bushel.	
		£.					£.	Barley.	Bigg.
1793	1,715,381	58,164	$\frac{1}{8}\frac{1}{3}$d.		1825	3,925,847	468,144	2s. 7d.	2s.
1794	1,692,946	57,419	—		1826	2,788,555	335,574	—	—
1795	1,692,946	57,419	—		1827	2,714,073	335,489	—	—
1800	876,598	29,070	—		1828	3,867,159	478,503	—	—
1802	1,716,278	70,527	$\frac{1}{8}\frac{1}{3}$d.	11s. 8$\frac{1}{2}$d.	1829	3,712,568	457,588	—	—
	In hand	20,580	—		1830	4,101,946	505,651	—	—
1803	1,594,284	187,878	11s. 8$\frac{1}{2}$d.		1831	4,186,955	515,579	—	—
		Barley.	Bigg.		1832	3,714,834	458,096	—	—
1804	1,091,377	197,567	3s. 9$\frac{1}{2}$d.	3s. 1$\frac{1}{2}$d.	1833	4,302,096	530,358	—	—
	In hand	94,806	—	—	1834	4,491,292	553,567	—	—
1805	1,186,112	206,935	—	—	1835	4,459,558	551,096	—	—
1810	820,294	149,206	—	—	1836	4,503,187	611,910	—	—
1811	1,012,236	184,882	—	—	1837	4,568,045	578,515	—	—
1812	934,452	169,970	—	—	1838	4,419,141	557,913	—	—
1813	685,244	123,705	—	—	1839	4,360,363	552,107	—	—
1814	1,266,552	231,776	—	—	1840	4,307,304	572,544	2s. 7d. & 5 per cent.	2s. 2d. & 5 per cent.
1815	1,227,777	236,339	3s. 9$\frac{1}{2}$d.	3s. 1$\frac{1}{2}$d.	1841	4,056,249	530,572	2s.7d.& 5 per ct.	2s. & 5 per cent.
1816	1,162,024	164,743	1s 8$\frac{1}{2}$d.	1s. 8$\frac{1}{2}$d.	1842	3,786,476	368,899	—	—
			1s. 1$\frac{1}{2}$d.	1s. 0$\frac{1}{2}$d.	1843	3,618,606	481,911	—	—
1817	1,093,678	94,599	1s. 1$\frac{1}{2}$d.	1s. 0$\frac{1}{2}$d.	1844	3,889,442	516,052	—	—
1818	1,390,515	120,274	—	—	1845	4,353,938	577,498	—	—
1819	1,454,320	179,226	1s. 6$\frac{1}{2}$d. 3s. 7$\frac{1}{2}$d.	1s. 5$\frac{1}{2}$d. 2s. 7$\frac{1}{2}$d	1846	4,584,667	609,155	—	—
	In hand	17,739	—	—	1847	3,650,445	485,541	—	—
1820	1,182,208	212,282	3s. 7$\frac{1}{2}$d.	3s. 7$\frac{1}{2}$d. 3s 1d.	1848	4,026,987	534,543	—	—
1821	1,305,659	231,606	—	3s. 1d. 2s. 10d.	1849	4,197,929	558,457	—	—
				2s. 10d.	1850	4,639,159	618,647	—	—
1822	1,403,177	183,042	3s. 7$\frac{1}{2}$d. 2s. 7d.	1s. 9$\frac{1}{2}$d 2s.	1851	4,102,245	546,723	—	—
1823	1,616,590	198,696	2s. 7d.	2s.	1852	3,931,790	524,789	—	—
1824	2,789,606	383,505	—	—					

Account of the Quantities of Malt charged with Duty in Ireland, of the Revenue received thereon, and of the Rates of Duty, in different Years, from 1790 *to* 1852.

Years.	Number of Bushels of Malt.	Amount of Duty.	Rate of Duty per Bushel	Years.	Number of Bushels of Malt	Amount of Duty.	Rate of Duty per Bushel.	
		£.				£.		
1790	4,607,653	135,406	7d.	1822	1,756,301	275,614	3s 6$\frac{1}{2}$d. 2s 7d.	
1793	5,049,899	148,197	—	1823	1,702,895	217,302	2s. 7d.	
1794	4,673,984	186,315	9$\frac{1}{2}$d.	1824	2,107,752	276,255	—	
	Stock in hand	17,678	—	1825	2,706,992	356,108	—	
1795	4,697,153	210,051	1s. 3d.	1826	2,405,253	310,808	—	
	Stock in hand	86,761	—	1827	1,803,091	232,899	—	
1796	4,956,584	306,070	—	1828	2,409,228	311,192	—	
1798	4,413,817	313,661	1s 5d.	1829	2,012,079	253,894	—	
	Stock in hand	19,768	—				Barley.	Bigg.
1799	3,811,463	233,170	1s. 6$\frac{1}{2}$d.	1830	1,959,606	251,646	2s. 7d.	2s.
	Stock in hand	12,236	—	1831	2,101,844	263,308	—	—
1800	681,340	52,090	—	1832	2,006,350	250,278	—	—
1802	3,611,379	276,115	—	1833	1,984,849	245,987	—	—
1803	3,558,729	238,594	1s. 6$\frac{1}{2}$d. 1s. 9$\frac{1}{2}$d.	1834	2,204,658	273,201	—	—
	Stock in hand	91,162	—	1835	2,353,645	293,602	—	—
1804	2,807,585	270,086	1s. 9$\frac{1}{2}$d. 2s 3$\frac{1}{2}$d.	1836	2,287,635	283,357	—	—
	Stock in hand	28,689	—	1837	2,275,347	286,470	—	—
1805	2,766,867	317,299	2s. 3$\frac{1}{2}$d.	1838	2,293,440	284,954	—	—
1806	2,814,418	334,105	2s. 3$\frac{1}{2}$d. 2s. 6$\frac{1}{2}$d.	1839	1,744,550	218,503	—	—
	Stock in hand	22,696	—				2s. 7d.	2s. 2d.
1807	2,372,228	302,221	2s. 6$\frac{1}{2}$d.	1840	1,406,116	178,703	2s. 7d. & 5 per cent.	and 5 per cent.
1810	2,532,543	321,425	—				2s. 7d. & 5 per cent.	2s. and 5 per cent.
1811	2,681,842	341,793	—	1841	1,149,692	151,210		
1812	2,206,206	281,117	2s. 6$\frac{1}{2}$d.					
1813	2,967,608	428,830	2s. 6$\frac{1}{2}$d. 3s. 3$\frac{1}{2}$d	1842	1,268,656	168,009	—	—
	Stock in hand	63,406	—	1843	1,184,278	157,046	—	—
1814	2,156,175	592,813	3s 3$\frac{1}{2}$d.	1844	1,441,173	190,462	—	—
1815	2,664,486	462,685	3s. 3$\frac{1}{2}$d. 4s. 5d.	1845	1,684,112	222,761	—	—
	Stock in hand	122,233	—	1846	1,783,644	237,057	—	—
1816	1,879,721	350,609	4s 5d. 2s. 4$\frac{1}{2}$d.	1847	1,367,405	194,727	—	—
1817	1,385,466	164,571	2s. 4$\frac{1}{2}$d.	1848	1,670,519	222,349	—	—
1818	1,783,636	211,930	—	1849	1,576,403	210,180	—	—
1819	1,742,444	207,036	—	1850	1,682,108	224,108	—	—
1820	1,798,671	310,684	3s. 6$\frac{1}{2}$d.	1851	1,596,956	213,737	—	—
	Stock in hand	48,974	—	1852	1,657,073	221,303	—	—
1821	1,949,315	347,484	—					

A duty was imposed on the beer produced at public breweries so early as 1660, and was continued down to 1830, when it was repealed. We subjoin an

Account showing the Quantity of the different Sorts of Beer made respectively in England and Scotland, in each Year, from 1820 *to* 1830, *with the Rates of Duty on each, and the Annual Produce of the Duties.*

Years.	England.				Scotland.			
	Strong Beer.	Table Beer.	Intermediate Beer.	Amount of Duty.	Strong Beer.	Table Beer.	Intermediate Beer.	Amount of Duty.
	Barrels.	Barrels.	Barrels.	£. s. d.	Barrels.	Barrels	Barrels.	£. s. d.
1820	5,866,917	1,518,950	..	2,836,149 1 1	123,114	207,988	Nil.	80,972 6 0
1821	5,969,891	1,528,575	..	2,987,366 8 6	128,939	219,546	—	85,060 4 0
1822	6,306,981	1,570,043	..	3,153,861 5 7	128,107	227,478	—	85,117 12 0
1823	6,395,835	1,483,045	7,016	3,190,'08 12 8	119,292	226,832	—	80,592 8 0
1824	6,660,969	1,544,049	15,660	3,326,277 14 2	118,813	230,956	—	81,894 10 0
1825	7,014,395	1,606,999	6,190	3,495,597 9 1	122,'04	264,935	—	91,731 2 2
1826	6,977,183	1,608,653	7,707	3,268,655 9 9	122,156	271,385	—	79,940 0 1
1827	6,404,302	1,532,308	17,154	3,131,662 6 0	112,067	241,293	—	72,877 0 10
1828	6,570,310	1,530,419	62,817	3,222,807 2 11	118,943	247,442	—	76,984 16 8
1829	5,961,048	1,380,469	55,493	2,923,118 1 5	111,071	229,384	—	71,786 19 5
1830	3,570,332	1,066,262	41,834	..	75,262	178,011	—	..

The Rates of Duty were, throughout this whole period, on Strong Beer, 9*s.* 10*d.*; on Table ditto, 1*s.* 11½*d.*, and on Intermediate ditto, 4*s.* 11*d.* per Barrel. The Beer Duty did not extend to Ireland.

The beer duties having ceased in 1830, there are no means of determining the quantities that have been brewed in the interval. There can, however, be no doubt of their having been materially augmented. The increased consumption of malt, more than three-fourths of which is used by brewers and victuallers, proves that such is the fact. About 2,000,000 barrels of beer are annually produced by the great porter breweries of London. The largest of these establishments belongs to Messrs. Barclay, Perkins, and Co., being, in all respects, framed on the most gigantic scale. It formerly belonged to Mr. Thrale, the friend of Dr. Johnson; but, since his death, it has been greatly enlarged.

The beer brewed in private families for their own use has been always exempted from all charges on account of duty, except that on malt. But, instead of being an advantage, this exemption was one of the most objectionable parts of the beer duty. Persons in the middle and lower ranks of life, particularly those resident in towns, have no facilities for private brewing; so that, in point of fact, the exemption redounded to the advantage of few except the rich and the great, who evaded the duty, while it fell with its full weight on most others. It is astonishing that an unjust monopoly of this sort should have been tolerated for so long a period.

Account of the Number of Brewers and Retailers of Beer in England, Scotland, and Ireland respectively, in 1843 *and* 1844.

	England.		Scotland.		Ireland.	
	1843	1844	1843	1844	1843	1844
Brewers of Strong Beer not exceeding 20 barrels	9,106	7,820	64	67	12	4
Ditto above 20 and not above 50	6,724	8,401	21	23	1	1
,, 50 ,, 100	9,697	9,404	29	29	6	4
,, 100 ,, 1,000	15,607	16,129	155	147	33	30
,, 1,000	1,488	1,502	82	83	66	70
Brewers of Table Beer	253	217	47	31	4	5
Retail Brewers under 5 Geo. IV. c. 54	11	12	27	31	1	1
Sellers of Strong Beer only, not being Brewers	1,041	1,021	17	12	116	131
Beer Retailers whose premises are rated under 20*l.* per annum	39,614	39,672	14,396	14,691	11,906	12,304
Ditto 20*l.* and upwards	18,248	18,423	1,117	1,159	1,212	1,210
Retailers of Beer, Cider, or Perry, under the 4 Will. IV. c. 64, and 4 & 5 Will. IV. c. 85	31,212	31,745	—	—	—	—

The beer duty did not extend to Ireland; but it would seem, from the account of the quantity of malt used in that country by brewers, that the quantity of beer produced in it must have been about double that produced in Scotland. Dublin porter enjoys a pretty high reputation.

The brewers of beer being subject to licence duties, varying according to the quantity they produce, their number is exactly known. This, also, is the case with the retailers of beer.

Distilleries.—The distilleries of Great Britain and Ireland are not less, if they be not more, important than the breweries. Malt liquor has always been the favourite drink of the bulk of the people of England; but they also consume, particularly in the metropolis and other great towns, large quantities of gin. Whiskey has been, for a lengthened period, the favourite or national beverage of Scotland and Ireland. It were well, perhaps, for the public, that the consumption of ardent spirits were diminished; and repeated attempts have been made, by the imposition of heavy duties, and otherwise, to bring this about. But these attempts have not, in any instance, been successful. Whenever the duty is carried beyond reasonable limits, it gives rise to smuggling; and, without in any degree lessening the evil of drunkenness, it brings the law into contempt, and enables those who despise its enactments to undersell the fair trader. The truth of these statements has been proved by the most comprehensive experience, and is now, indeed, almost universally admitted. The existing duties on spirits—in so far, at least, as Scotland and Ireland are concerned—seem to be on a very reasonable footing.

I. *Account of the Number of Distillers, Rectifiers, and of the Dealers in, and Retailers of, Spirits, in England, Scotland, and Ireland respectively, in* 1843 *and* 1844.

	England.		Scotland.		Ireland.	
	1843	1844	1843	1844	1843	1844
Distillers and Rectifiers	95	95	186	176	90	94
Dealers in Spirits, not being Retailers	2,724	2,735	425	423	307	317
Retailers of Spirits whose premises are rated under 10*l.* per annum	15,250	15,125	9,973	10,150	8,618	9,002
Ditto at 10*l.* and under 20*l.*	19,723	19,873	4,038	4,126	2,625	2,668
,, 20*l.* ,, 25*l.*	3,390	3,408	329	344	268	276
,, 25*l.* ,, 30*l.*	2,378	2,304	184	196	157	167
,, 30*l.* ,, 40*l.*	3,736	3,754	209	213	251	237
,, 40*l.* ,, 50*l.*	2,322	2,354	96	94	140	134
,, 50*l.* and upwards	6,221	6,332	263	276	229	213

II. *Account of the Number of Gallons of Native Proof Spirits on which Duty was paid for Home Consumption in the different portions of the United Kingdom, with the Rate per Gallon, and Amount of Duty, in the Years* 1843, 1844, *and* 1845.

	England.			Scotland.			Ireland.			The United Kingdom.	
	Total Gallons.	Rate per Gall.	Amount of Duty.	Total Gallons.	Rate per Gall.	Amount of Duty.	Total Gallons.	Rate per Gall.	Amount of Duty.	Total Gallons.	Amount of Duty.
		s. d.	*£. s. d.*		*s. d.*	*£. s. d.*		*s. d.*	*£. s. d.*		*£. s. d.*
1843	7,784,051	7 10	3,025,233 6 2	5,393,796	3 8	1,025,529 12 8	5,546,483	3 8 and 2 8	892,418 11 4	18,864,328	4,903,201 10 2
1844	8,234,449	7 10	3,225,155 18 4	5,922,948	3 8	1,065,973 16 0	6,451,127	2 8	860,151 12 0	20,608,525	5,171,181 1 4
1845	9,976,891	7 10	3,854,915 17 10	6,441,011	3 8	1,160,852 0 4	7,605,196	2 8	1,014,026 2 8	23,123,598	5,749,794 0 10

III. *An Account of the Number of Proof Gallons of Rum, distinguishing West India, East India, and Foreign; and of Brandy, Geneva, and other Foreign, Colonial, or Jersey Spirits Imported in* 1852; *of the Quantities upon which Duty has been Paid for Home Consumption, the Quantities Exported, and the Quantities Shipped as Stores, and used by the Navy, during the same Year; with the Quantities of each Sort remaining in Bond on the 5th day of January,* 1853.

United Kingdom.	Quantities Imported.	Quantities Retained for Home Consumption.	Quantities Exported as Merchandise.	Quantities shipped as Stores.	Quantities delivered for the use of the Navy.	Quantities remaining in Bond, in the United Kingdom, 5th January, 1853.
Rum:	Proof Galls.	Proof Galls.	Proof Galls.	Proof Galls.	Proof Galls.	Proof Galls.
Of British Possessions, viz.—						
West India and Mauritius	5,077,683	2,795,506	1,600,625	99,831	132,013	4,869,868
East India	307,403	46,468	164,787	25,068	39,618	150,193
	..	57,612	188,886	79,923	..	68,686
Foreign	105,138	96	245,699	419	..	44,678
All sorts	5,490,224	2,899,684	2,199,997	205,246	191,631	5,133,370
Brandy	3,959,452	1,924,395	1,225,074	104,863	1,286	3,199,592
Geneva	185,856	26,232	119,150	14,600	..	66,033
Other Foreign and Colonial Spirits	30,582	11,957	19,819	93	..	52,251
Spirits mixed in Bond	..	..	48,728	76	..	17,450
Spirits of Heligoland	2,991	3,991	..	..	..	..
Spirits of the Channel Islands (Imported previously to 8 & 9 Vict. cap 65, which places these Spirits under the Excise)	..	5,859	..	..	..	3,968
Total	9,669,605	4,872,118	3,612,268	324,888	192,867	8,474,674

IV. *An Account of the Number of Gallons of Foreign Wine Imported, specifying the varieties thereof; of the Quantities upon which Duty has been Paid for Home Consumption, and the Quantities Exported; the Quantities retained for Home Consumption, after deducting the Amount Exported subsequently to the Payment of Duty, during the same Year; with the Quantities of each Sort remaining in Bond on the 5th day of January,* 1852.

United Kingdom.	Quantities Imported.	Quantities upon which Duty has been Paid.	Quantities Exported as Merchandise.	Quantities retained for Home Consumption after deducting the Amount Exported subsequently to the Payment of Duty.	Quantities remaining in Warehouse under Bond, in the United Kingdom, on 5th January, 1853.		
					At London.	At other Places.	Total.
Wines, viz.:—	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
Cape	407,162	234,795	3,023	234,672	285,663	210,676	496,339
French	764,935	468,488	142,064	447,556	345,664	231,677	577,341
Portugal	3,101,031	2,614,378	312,175	2,594,775	2,921,188	1,554,830	4,476,018
Spanish	3,904,978	2,689,525	866,147	2,533,384	2,804,921	1,611,681	4,416,602
Madeira	186,122	88,218	108,325	71,023	112,880	39,295	152,135
Rhenish	76,353	60,322	10,164	56,257	26,015	9,195	35,210
Canary	139,398	16,490	109,618	15,928	29,013	14,351	43,364
Fayal	37	131	..	131	1,222	2,673	3,895
Sicilian and other sorts	428,517	406,889	84,714	394,225	122,483	317,943	440,326
Mixed, in Bond	..	..	24,172	..	424	4,296	4,720
Total	9,008,422	6,554,426	1,661,402	6,290,658	6,719,423	3,926,717	10,646,140

SECT. II.—*Manufactures of Hats, Soap, &c.*

HATS being universally worn by almost all the male population of the British empire, the manufacture for home consumption is very great, and considerable quantities are exported. The quality of hats differs very widely. The best, or those called *stuff hats*, are made in the highest perfection in London. Since the introduction of "waterproofing," it is found unnecessary to use so valuable a material as beaver in the foundation or framework of the best hats. Instead of it, fine seasoned backs of English coney wool, red Vigonia wool, Dutch carroted coney wool, and a small quantity of fine Saxony lambs' wool, are employed with equal advantage.

The covering, *i. e.*, the "napping," of the best qualities is a mixture of *cheek* beaver, with white and brown stage beaver, or seasoned beaver, commonly called "*wooms*." Inferior stuffs are napped with mixtures of stage beaver, nutria, hares' wool, and musquash.

Of late years hats have been much reduced in weight. This is principally owing to the new method of "waterproofing," which is effected in the bodies of the hats prior to their being napped. The elastic properties of the gums employed for this purpose, when dissolved in pure spirits of wine, give a body to the stuffs which allows a good deal of their weight to be dispensed with.

Not 25 years ago, 96 ounces of stuff were worked up into one dozen ordinary sized hats for gentlemen; at present, from 33 to 34 ounces only are required to complete the same quantity.

The manufacture of the best hats employs in London nearly 1,000 makers and finishers, besides giving employment to nearly 3,000 men in Gloucestershire and Derbyshire, in body-making and ruffing.

Next to fine hats are those designated "plated," so called from the *plate*, or napping, being of a distinct and superior nature to the foundation or body. The latter is generally formed of Kent, Spanish, or Shropshire wool; while the former consists of a mixture of fine beaver, hares' wool, musquash, nutria, and English back wool. From the cheapness of coal and the purity of the water in Lancashire, Cheshire, and Staffordshire, the whole of the plating trade is engrossed by them. The men employed in the three counties, including apprentices, do not exceed 3,000.

Felt Hats and *Cordies* are the coarsest species, being made wholly of Kent, Shropshire, and Italian wools. Cordies are distinguished by a fine covering of camel or goat hair. A very large trade was at one time carried on in these articles; but since the introduction of caps, and the manufacture of inferior plates, the returns have sunk from 1,000,000*l.* to scarcely 150,000*l.* Atherstone, Rudgeley, Bristol, and Newcastle-under-Line are the principal places where they are manufactured.

At present *silk hats* of a low quality are more extensively worn; and recently public taste set strongly in favour of a new and showy kind of silk hat, made on the French plan, and of a material imported from France at a duty of 30 per cent. This change, which reduced the consumption of both *stuff* and *plated* hats, probably arose, so far as regards the lower sorts of silk hats, from motives of economy, induced by the state of the country, in 1841 and 1842, and in the higher qualities, chiefly from the influence of fashion.

Machinery is extensively used in the preparation of the materials for the manufacture, but it has hitherto been found inapplicable to the manufacture itself, which, in some processes, requires a certain amount of mental discretion. Particular districts are celebrated for particular branches of the trade, chiefly from special reasons respecting fuel, water, or lowness of wages; but the increased competition has of late had a tendency to concentrate the trade in a few localities rather than to disperse it, although it is still rather widely distributed. Hitherto the trade has not been exposed to foreign competition in the home

market, but it has been of late years seriously affected in the Brazilian and West Indian markets.

Few beaver or ruffed hats meet the English manufacturer in the markets referred to; but chiefly hats of silk or felted hares' wool, of styles not adapted to our taste, though suited to that of the Continent and of South America. This competition originated most probably in the high duties paid by our manufacturers on the ingredients or materials used, especially on spirits of wine and silk; but the latter are now greatly reduced.

English hats, though to a limited extent, and in an unfinished state, have been exported to the continent. The hats chiefly exported to our colonies are silk, plated, and stuff hats, generally of a light description. Wool felts, which before the Emancipation Act were largely exported, have now materially decreased, the article termed "negro felts" being almost extinct.

The trade employs a great amount of labour, being supposed to furnish, at present, employment to not less than 28,000 or 30,000 persons. In the Lancashire district, the first and second manufacturing processes are chiefly carried on in the houses of the workmen. The labour of women and children is very largely employed in the trade generally, but less in the actual manufacture than in the preparation of the material; the proportions may be, in both departments, men 50 per cent., women 25 per cent., and children 25 per cent.; and their earnings, on a yearly average, are, men 25*s.*, women 7*s.*, and boys 5*s.* per week. The depression in the finer branches of the manufacture has, doubtless, affected the earnings of the workmen engaged in them, as a less amount of skill and labour is required in the production of low silk hats than beavers, and the increased quantity produced in the lower descriptions has not furnished an amount of employment equivalent to the decrease in the higher branch. Combinations on the part of the workmen have occasionally arisen, sometimes from questions affecting wages and disputes arising out of the existence of trades' unions, but not to any considerable extent, from attempts to introduce machinery.

No data exist on which to form any certain estimate of the value of the different branches of the manufacture or of its aggregate amount. But it is estimated, on good grounds, that on *plated* goods, the cost of the raw material varies from 25 to 40 per cent., the labour and manufacturing expenses from 75 to 60 per cent.; on stuff hats, materials 40 to 50 per cent., labour, &c., 60 to 50 per cent.; silk hats, materials 50 per cent., labour, &c., 50 per cent. The proportions in value are estimated as under:—

	£.
Plated hats	1,200,000
Stuff ditto	800,000
Silk ditto	900,000
Wool felts	100,000
Estimated yearly value	3,000,000

The duty on hats, which was formerly 10*s.* 6*d.* each, has been reduced to 2*s.*

Soap and Candles.—The use of soap as a detergent is known to every one, and it should, in fact, be considered more in the light of a

necessary of life, than as the most indispensable of luxuries. Its consumption in this country is immense; and, being subjected, in Great Britain at least, to an Excise duty, the magnitude of the manufacture and its distribution are pretty accurately known.

Liverpool, London, Bristol, Runcorn, Newcastle, Glasgow, Brentford, Dudley, Hull, &c., are the principal seats of the manufacture. Thus of 170,210,561 lbs. of hard soap made in Great Britain in 1845, Liverpool furnished 47,656,940 lbs.; London, 40,837,075 lbs.; Bristol, 7,876,103 lbs.; Runcorn, 11,878,610 lbs.; Newcastle, with Gateshead and South Shields, 7,765,610 lbs.; Glasgow, 7,265,520 lbs.; Brentford, 3,996,460 lbs.; Hull, 3,740,224 lbs., &c. Of 16,880,370 lbs. of soft soap made during the same year, Liverpool supplied nearly a half, the remainder being supplied by Glasgow, London, Paisley, &c. There is no duty on the soap made in Ireland, so that the quantity prepared in that part of the empire is not known; but it is quite inconsiderable, compared with that made in England.

Duty on Soap.—This article has been long subject to an Excise duty, formerly of 3*d.* per lb. on hard, and 1½*d.* per lb. on soft; but in 1833 these duties were reduced, the former to 1½*d.* and the latter to 1*d.* per lb. But even this reduction is hardly sufficient to prevent smuggling, and the better plan would be to reduce the duties on hard soap to 1*d.* per lb., and on soft to ½*d.* per lb.; and to extend them to Ireland. The duty would then be so light, that its pressure would be but little felt even by the poorest classes; the temptation to direct smuggling would be greatly lessened, while all that indirect smuggling that takes place in the traffic between Great Britain and Ireland would be completely obviated. The total repeal of the soap duty would be a popular measure; but, as a large amount of revenue must be raised, we are not of the number of those who think it should be abandoned. The real objections to the tax have been, not that soap is an improper subject for taxation, but that the duty has been pushed beyond its proper limits, and that it has been imposed on a part only, whereas it should have been imposed on the whole United Kingdom.

The *candle manufacture* may be considered in connexion with that of soap, with which it is closely allied. The consumption of candles is immense, though it has been greatly interfered with by the use of lamps. In 1829, when they were subject to an Excise duty, there were produced in Great Britain, and brought to charge, 115,156,806 lbs. tallow candles, 746,052 lbs. wax ditto, and 303,683 lbs. spermaceti ditto. But, from the facility with which candles are made at home, many, no doubt, were clandestinely manufactured. The Excise duty on candles was repealed in 1831; and the consumption, influenced partly by this cause, and partly by the increase of wealth and population, may at this moment be safely estimated at 150,000,000 lbs. Taking their price, inclusive of wax candles, at a rough average, at 6*d.* per lb., their total value will be 3,750,000*l.*

Considerable quantities of soap and candles are exported, especially to the West Indies and the British colonies in North America and Brazil. The declared value of the exports of both articles, in 1845, amounted to 242,756*l.*

Refining of Sugar.—Of late years the refining of British colonial

sugar for exportation has almost ceased; but the refining of colonial sugar for home consumption is carried on to a great extent, and has increased considerably since the late reduction of the duty. There were in January, 1846, about 24 establishments, with an aggregate capital of about 850,000*l.*, for refining sugar for the home market, which used about 80,000 tons of raw sugar, yielding from 60,000 to 65,000 tons of refined sugar, exclusive of bastards and treacle. The consumption of refined sugar amounts, in consequence of its comparative cheapness, to about one-third part of the whole. The refining of foreign sugar in bond is also carried on to some extent; but the business is narrowed here by the artificial encouragement given to it in foreign countries.

Coaches. — Owing to the vast number of public and private coaches, and other descriptions of carriages, used in Great Britain, and the severe wear and tear to which many of them are exposed, their manufacture affords employment to a very considerable number of individuals. Formerly all carriages made for sale paid a certain duty; and in 1812, when it existed, it was paid upon 1,531 four-wheeled carriages, 1,701 two-wheeled ditto, and 407 taxed carts. But besides the repeal of this duty, the annual duties charged on four-wheeled and two-wheeled carriages, particularly the latter, have been very materially reduced; and the number of them in use has, partly in consequence of this reduction, and partly of the increase of wealth and population, been very greatly increased since 1812. In 1845 duty was charged on 26,478 four-wheeled carriages belonging to private parties; on 36,069 ditto let to hire; and on 36,364 two-wheeled carriages.

Coaches and all sorts of carriages are made at most of the considerable towns in the country; but by far the greatest number, as well as those of the best workmanship and most fashionable shapes, are made in London. The trade of a coach currier is hardly carried on anywhere except in the metropolis. Of 10,665 males, of 20 years of age and upwards, employed in the coach-making business in Great Britain, in 1841, 9,953 belonged to England, 78 to Wales, and 602 to Scotland: of those belonging to England, nearly a third, or 3,336 were in Middlesex. The number of coach and cab owners, drivers, &c., of 20 years of age and upwards in Great Britain, during the same year, was 15,351; of which England had 13,930; Wales, 285; and Scotland, 1,083.—(*Population Returns.*)

Cabinet-Makers' Goods. — The manufacture of cabinet-makers' goods is largely carried on in every part of the country; but especially in the metropolis, where the best and most beautiful articles of furniture are made. There are no means of forming any estimate of the value of the goods annually produced by cabinet-makers; but it is abundantly certain that it must be very great. According to the official returns, of 3,877 males, of 20 years of age and upwards, employed as cabinet-makers in Great Britain, in 1841, 19,752 belonged to England, 516 to Wales, and 3,350 to Scotland.

Exclusive of the above, there is a vast number of manufactures, such as those of gunpowder, starch, dyeing and bleaching stuffs, colours, vinegar, furs, &c., &c., which it is unnecessary to particularise.

Such is a short sketch of the more important statistical details connected with the principal manufactures carried on in the United Kingdom. We are sensible that it is in many respects defective; but we believe that it will, notwithstanding, be found to afford a more complete and accurate view of the progress and present state of these manufactures than is to be met with in any other publication.

It is to be regretted that there are no means of forming any estimate of the real value of the manufactured articles annually produced in Great Britain and Ireland. But the previous statements show that it must be very great. There are, in fact, but few departments in which we are able to obtain a tolerably close approximation to the gross value of the articles produced; and even though we could do this in them all, the results would not be of so much value as is commonly supposed; and might, indeed, unless subjected to farther examination and analysis, lead to the most erroneous conclusions. It is supposed by many that whatever may be the annual value of our manufactured goods, we shall, by adding it to the annual value of our agricultural products, get the total value of the new commodities annually produced in the empire. But this is an error. The value of the British wool, for example, employed in the woollen manufacture, may amount to from 5,000,000*l.* to 5,500,000*l.* a year; and forms an item of this amount in estimating the value of the manufacture. It is plain, however, that if we include this wool in any estimate of the agricultural produce of the country, we must exclude it from that of its manufactured produce; for if we do not, it will be reckoned twice over. The same thing happens in a vast variety of cases. Four-fifths of the value of malt, for instance, consists of the value of the grain out of which it is made; so that in forming any estimate of the new products annually brought to market, we must either reckon the value of malt under deduction of the value of the raw grain, or else exclude the latter from the estimate of agricultural products. Again; very many manufactured articles, such as beer, spirits, coaches, &c., consist principally of other manufactured articles, the value of which must necessarily be deducted to learn the new or additional value which the peculiar manufacture adds to the wealth of the country. Hence the extreme difficulty of forming any fair estimate of the real value of many species of manufactures. It is always a difficult matter to learn their gross value. That, however, is really but the smallest part of the difficulty to be overcome. It is farther necessary, in order to specify the nett addition made by any manufacture to the mass of valuable products, to detach from it the value of the raw produce, and of other manufactured articles embodied in it. But in many, perhaps most, cases this would be all but impossible; and nothing would be gained by laying before the reader conjectural estimates that might be as often erroneous as the reverse, and from which, consequently, he could derive no real instruction.

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