

Statistical and Social Inquiry Society of Ireland

The Extent of the Potato Crop in Ireland at at the time of the Famine

By P. M. AUSTIN BOURKE
(Read before the Society on October 30th, 1959)

INTRODUCTION

Purpose of the Paper

Any attempt at a quantitative analysis of the failure of the potato in Ireland in 1845-6 requires a knowledge of the extent to which the crop was grown in those years.

The collection and publication of official returns of crop acreages and yields in Ireland did not begin until 1847. The figures for the extent of the potato crop in that year, after two seasons of blight had reduced the country to starvation, are quite unrepresentative of pre-Famine conditions.

The primary purpose of this paper is to present and analyse the results of a survey of the potato crop in Ireland in the years 1844-6, based on returns discovered in the Public Records Office, Dublin.

PART I—THE DATA

First Reference to Pre-1847 Returns of Acreage Under Potatoes

Occasional references, confused and at times inaccurate, are to be found to a survey of land under potatoes which predates the first official Irish crop returns of 1847.

In Thom's *Almanac for 1847* (15, pp. 191-2) a table is published giving an "estimate of the quantity and value of the potato crop of Ireland in the year 1846, and of the loss caused by its failure". In the preamble to this table, it is stated to be "compiled from sources of official authenticity" and to be "founded on returns of the extent of land planted with potatoes in 1845 and 1846, some of which give the actual extent which appears to be 842,573 acres in parishes containing 5,627,476 inhabitants; and this proportion of potato land to population may be fairly taken for the whole country".

This guarded and oddly-worded paragraph, and part of the table which accompanies it, appear to be the basis on which all subsequent statements have been founded. Column 13 of the table referred to gives the total extent of land under potatoes in 1846, by provinces and for the entire country, and column 9 gives corresponding figures for the extent of potato land in conacre. No subsequent commentator appears to have noticed that the "acre" referred to in these figures is the Irish acre, although this is clear from the heading of Columns 5-8, which gives figures for the neces-

sary crop "supposing one Irish acre to be capable of affording subsistence to five persons living during the year on potatoes exclusively". These estimates, specified as in Irish acres, are applied directly to the returns quoted in Column 9 and elsewhere as in "acres", thus confirming that the same unit is used throughout.

The relevant figures are quoted below, as they appear in the original table, and also, in brackets, converted into statute acres:

TABLE 1.—CONTEMPORARY ESTIMATE OF THE 1846 POTATO CROP.

	Area under potatoes in Irish acres (and statute acres)		Area in conacre in Irish acres (and statute acres)	
Ulster	352,665	(571,317)	12,331	(19,976)
Munster	460,630	(746,221)	76,772	(124,371)
Leinster	217,854	(352,923)	24,756	(40,105)
Connaught	206,292	(334,193)	18,585	(30,107)
IRELAND	1,237,441	(2,004,654)	132,444	(214,559)

It should be noted that if, as the preamble implies, the *total* area under potatoes was calculated directly from the proportion of potato land to population in the survey sample, the final acreage for Ireland was arrived at, not on the basis of the 1841 Census return, but on a population figure of 8,265,000, possibly an estimate for 1846. The corresponding total figures based on the 1841 population of 8,175,124 would be 1,224,000 Irish acres or 1,983,000 statute acres, i.e. a reduction of about 1%. Alternatively, it may have been that the appropriate proportion, based on the 1841 census returns, was applied to the *provincial* samples, and the figure for Ireland arrived at by simple addition. This seems the more likely, since population figures quoted for another purpose in the same table in the original publication are taken from the 1841 census.

Other References to Extent of Pre-1847 Potato Crop

O'Rourke (6, p. 153) says: "The failure of 1845 did not prevent the people from planting potatoes very largely in 1846, in which year, according to one account, the quantity of land under potatoes in Ireland was 1,237,441 acres, the produce being valued at £15,947,919 sterling (Thom's Almanac, 1847), but according to another account it was very much larger, being, as estimated by the Earl of Rosse, two million one hundred thousand acres, valued at £33,600,000. The great discrepancy between these two accounts arises from there being no authoritative official returns on the subject. The truth, no doubt, lies somewhere between them." In a footnote to the same page he adds that "the Rev. Theobald Mathew said, I do not know on what authority, that two millions of acres of potatoes were irrevocably lost, being worth to those who raised them £20 an acre. This estimate would have made the loss £40,000,000".

The difference in the estimates of the money value of the crop is unimportant; the potato was overwhelmingly a subsistence crop

of which only a small part passed through the markets, and estimates of the financial value of the total produce are quite arbitrary. It is, however, remarkable that O'Rourke, writing as early as 1874, overlooked the fact that the discrepancy between the three versions of extent of land under potatoes was reduced to vanishing point if one recognised that the first was in Irish acres and the other two in statute acres.

Barrington (1, p. 224) reproduces the original data from Thom's Almanac as included in Table 1 above, and obviously, though not explicitly, accepts them as being expressed in statute acres. Salaman (7, pp. 248 & 300) repeats the figures as given by O'Rourke and Barrington, but in the latter case specifically states the unit to have been statute acres. Later (p. 321) he arbitrarily resolves the difficulty found by O'Rourke by assigning the two estimates to different years; "The acreage under potatoes in 1846 was 1,237,441 acres. Prior to that date it has been held to have been in the neighbourhood of 2,000,000 acres. In 1847 it fell to little more than one-eighth of this amount, viz., 284,116 acres; this was but temporary, and due to the fact that there was little or no seed from the 1846 crop in the country. The 1847 crop was dependent on fresh seed from Scotland, much of which was imported by the Friends. . . . In 1859 it reached its new maximum of 1,200,247 acres, a figure only a little below that of 1846, though it served a population that had decreased at least 25%."

The last statement is, of course, quite misleading and leads to the false deduction that "the supremacy of the potato was scarcely shaken" for thirty years after the famine. The real reduction of acreage from 1846 to 1859 was about 40% (and, as we shall see later, the reduction from 1845 to 1859 was over 50%). In addition yields had fallen from a typical pre-Famine figure of over 6 tons per acre (3) to a level where 4 tons per acre was an unusually high national average, so that the potato production per head of the population in 1859 represented a fall to about 40% of the pre-Famine figures. In fact, the return after the Famine towards a potato-based economy never attained to anything like the level of the early 1840s.

An even greater misinterpretation of the upward trend of the potato crop from 1847 to 1859 is made by F. Dudley Stamp (9, p. 38). "The peculiar suitability of the potatoes to the humid soil and atmospheric conditions of Ireland was by no means appreciated a century ago when oats, wheat and barley were the staples. It is not too much to say that the increased cultivation of potatoes rendered possible an increase of population and perhaps actually occasioned the overpopulation of rural districts prior to the terrible famines of the forties of the last century. The statistics given below show quite definitely the rise in acreage given to potatoes in those years." The figures which follow are the official returns of potato acreage commencing in 1847. A glance at Table 5 in the present paper will show that what Stamp assumed to be a belated recognition of the potato was, in fact, merely a partial recovery to a position which was only a pale shadow of its former domination.

Location of Details of 1844-6 Potato Acreage Returns

The discovery in the Public Records Office, Dublin, of summary forms of the pre-1847 returns of potato acreage clarifies much of the earlier confusion and provides material for a much more detailed analysis. These papers were filed away with the constabulary reports on potato blight (13) and do not appear to have previously received attention.

The documents show that the Inspector General of Police, by order dated May 20th, 1846, directed the constabulary to submit returns of the extent of land planted with potatoes, and the proportion thereof which was let in conacre, in each of the years 1844, 1845 and 1846. The papers which have been located consist, not of the original returns, but of two sets of printed forms on which have been entered in manuscript—

- (a) *fair copies of the original returns, in the form in which they were presented.* These are available for each county in Leinster, Munster and Ulster; and in Connaught, for Counties Galway, Mayo and Roscommon.

The forms show that there was a certain ambiguity in the Inspector General's directions, possibly arising from the use of the word "proportion". Some of the enumerators submitted returns, not in acres, but as a fraction of the arable land in the district in question. Others gave the total area under potatoes in acres but the "proportion in conacre" as a fraction; in some cases, the complexity of the fraction demonstrates that it represents a conversion from an enumeration originally made in acres.

- (b) *final copies, with totals of the returns.* These are available, county by county, for each of the provinces except Ulster. The individual entries on these forms are identical with (a), except that the fractions have been converted into numerical values, doubtless by the use of the 1841 figures for arable land. The totals are partial ones, since complete returns were available for no entire county (although full returns are included for a large number of baronies).

Although detailed returns for Ulster are missing from these final copies, the forms for Leinster include also a summary for all four provinces, and for Ireland as a whole.

In both these series of forms, the counties are sub-divided into baronies, and the latter into parishes (or parts of parishes falling within the barony boundaries). In the case of many parishes, sub-totals are given, which probably refer to townlands, although these are not identified by name. There is thus an enormous amount of detailed information available in these forms, and it is a lucky chance that the missing forms in each series do not overlap, so that returns covering the whole of Ireland are available.

As an indication of the size of the samples available for each county, it may be mentioned that, out of a possible total of 214 returns for Tipperary, 182 were expressed in acres, 14 wholly or partially in fractions and 18 are missing. For Limerick, out of a

maximum of 166, 107 were returned in acres, 20 include fractions and 39 are missing. As will be seen from Columns 1 and 2 of Tables 2, 3 and 4, samples of the order of 80% or better are available for each county outside Ulster.

In addition to the crop returns, the constabulary were required to comment on the use to which land was being put consequent on the fall in acreage under potatoes which followed the partial failure due to blight in 1845, i.e. to state "the crops sown in 1846 in the land which would, under ordinary circumstances, have been planted with potatoes". Returns under this heading are summarised in the remarks column of forms (a), and indicate that where the land in question was not allowed to lie fallow or to revert to waste or grass, it was sown mainly with oats.

It is clear that the purpose of the survey was to determine the probable food situation during the Winter of 1846-7, and, in particular, the effect of the reduced acreage under potatoes in 1846 compared with the immediately preceding years. Before the entire collection and calculation of the data had been completed, the disastrous blight attack of the first days of August 1846 virtually wiped out the crop and converted the question of its extent, for contemporary purposes, into an academic one. No doubt for this reason the computations were never completed, re-checked or published.

Incidentally, the reason for the peculiar wording of the statement in Thom's Directory for 1847, quoted in paragraph 2 above, becomes clear when the circumstances of the survey are known.

Reliability of the Returns

The main factors to be considered in a broad assessment of the reliability of the survey are the possibility of confusion as to units and the conscientiousness of the enumerators.

The risk of confusion between Irish, Cunningham and statute acres is a very real one. In the first half of the nineteenth century in Ireland, the use of the unqualified word "acre", other than by a Scottish or English agent or other person with similar connections, normally referred, outside parts of Ulster, to the Irish acre. The uncertainty thus introduced extends even to official statistics and forms a subtle trap for the unwary (See Appendix to the present paper).

The tabulated returns in the Public Records Office are ambiguously classified as "acres"; only the evidence provided in Thom's Almanac for 1847 and the incidental support of contemporary calculations (3), shows that they are expressed in Irish acres. A few of the Ulster entries in forms (a) are specifically labelled as being in Cunningham acres; these have been converted before inclusion in the total. The inclusion of any uncorrected returns in statute or Cunningham acres in the 1844-6 survey would lead, of course, to an overestimation in the final returns. To the extent that this occurred, it may have been offset by the omission of inaccessible mountain and bog tracts under potatoes and, in the year 1846, of any plantings made after the survey in late May.

(The crop was normally sown later than it is nowadays, and in 1846 some deferred planting in order to see if blight attacked the earlier crops.)

The returns were made by the Constabulary, who, following their reorganisation in 1836 and the enlightened policy pursued by Drummond and his superiors, probably came closer to winning the confidence of the people, and even to gaining some measure of popularity, in the following ten years than at any other time under British rule. Over the country as a whole, there was one policeman to an average of rather less than 4 square miles, so that the survey did not suffer from a scarcity of observers. The constabulary were in a particularly favourable position to report on the potato crop, for since September 1845, they had been making continuous surveys of the crop from the point of view of potato blight, and reporting frequently and at length to the Inspector General. The care and attention to detail in these reports (13) is impressive.

Presumably the retrospective data as to the 1845 and, particularly, the 1844 crops are less accurate than those for 1846. But the degree of error is unlikely to be large, for the police had direct personal knowledge of the 1845 sowing; further, because the primary purpose of the 1845 blight reports was to assess the probable food situation compared with previous years, several of them made qualitative references to the upward trend from 1844 to 1845 which are consistent with the later numerical returns.

Probably the major factor favouring accuracy was that the enumerators knew the serious and immediate purpose for which the figures were intended, and had not yet lapsed into the inertia of routine returns. Certainly, the internal consistency of the figures and their agreement with other evidence suggest that they may be accepted with some confidence.

Calculation of County Acreages from the Partial Returns

In Tables 2, 3 and 4, the "districts" enumerated in Column 1 are the county totals of parishes and parts of parishes within the boundaries of baronies, i.e. the number of returns required to give a complete account of each county's acreage under potatoes. Column 2 shows the actual number of returns on record. The calculated total area under potatoes in Irish acres (Column 4) is obtained by increasing the partial total in the sample (Column 3) in the proportion of total of districts to actual returns (Column 1 divided by Column 2). By a similar operation, the conacre crop in Irish acres (Column 7) is derived from the partial totals given to Column 6. Columns 5 and 8 give the final figures for total acreage and for conacre as expressed in statute acres.

The figures of partial totals given in the Tables (Columns 3 & 6) for Connaught, Munster, and all of Leinster except Co. Laois, are identical with those given in the Public Records Office papers, which have been checked for accuracy. In the case of Co. Laois, the returns for the barony of Maryborough West were omitted in error from the original totals; the corrected figures for partial acreage under potatoes in County Laois have accordingly been increased in 1844 by 1,580 Irish acres, in 1845 by 1,604 and in

TABLE 2.—AREA UNDER POTATOES IN 1844.

1844	Total of Districts	Number of Returns	Partial area under potatoes (Irish acres)	Calculated total area under potatoes (Irish acres)	Calculated total area under potatoes (Statute acres)	Partial area under conacre (Irish acres)	Calculated total area under conacre (Irish acres)	Calculated total area under conacre (Statute acres)	Percentage of potato land held in conacre
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CONNAUGHT									
Galway ...	171	137	70,000	87,372	141,543	6,662	8,315	13,470	9·5%
Leitrim ...	24	22	15,050	16,418	26,597	1,453	1,585	2,568	9·7%
Mayo ...	79	72	77,955	85,534	138,565	5,653	6,203	10,049	7·3%
Roscommon ...	63	59	34,809	37,169	60,214	6,542	6,986	11,317	18·8%
Sligo ...	42	41	28,490	29,185	47,280	5,187	5,314	8,609	18·2%
Total ...	379	331	226,304	255,678	414,199	25,497	28,403	46,013	11%
LEINSTER									
Carlow ...	61	53	14,974	17,234	27,919	1,839	2,117	3,430	12·3%
Dublin ...	96	71	10,506	14,205	23,012	1,332	1,801	2,918	12·7%
Kildare ...	131	118	15,347	17,038	27,602	1,255	1,393	2,257	8·2%
Kilkenny ...	168	152	39,635	43,807	70,967	6,010	6,643	10,762	15·2%
Laos ...	72	65	26,858	29,750	48,195	3,507	3,885	6,294	13·1%
Longford ...	40	32	15,084	18,855	30,545	2,893	3,616	5,858	19·2%
Louth ...	69	65	16,868	17,906	29,008	4,758	5,051	8,133	28·2%
Meath ...	162	149	25,571	27,802	45,039	8,426	9,161	14,841	33·0%
Offaly ...	60	55	24,542	26,773	43,372	2,094	2,284	3,700	8·5%
Westmeath ...	69	64	18,681	20,140	32,627	3,945	4,253	6,890	21·1%
Wexford ...	155	139	42,569	47,469	76,900	2,897	3,230	5,233	6·8%
Wicklow ...	70	66	16,325	17,314	28,049	1,143	1,212	1,963	7·0%
Total ...	1,153	1,029	266,960	298,293	483,235	40,099	44,646	72,329	15%
MUNSTER									
Clare ...	81	76	37,641	40,117	64,990	6,179	6,586	10,669	16·4%
Cork ...	337	243	164,396	227,990	369,344	36,097	50,060	81,097	22·0%
Kerry ...	99	88	38,875	43,734	70,849	5,405	6,081	9,851	13·9%
Limerick ...	166	127	48,619	63,549	102,949	9,879	12,913	20,919	20·3%
Tipperary ...	214	196	87,853	95,921	155,392	13,945	15,226	24,666	15·9%
Waterford ...	91	74	45,538	55,999	90,718	8,940	10,994	17,810	19·6%
Total ...	988	804	422,922	527,310	854,242	80,445	101,860	165,012	19%
ULSTER									
Antrim ...	96	42	21,523	49,195	79,696	122	279	452	0·6%
Armagh ...	46	7	4,364	28,678	46,458	447	2,937	4,758	10·2%
Cavan ...	48	24	19,467	38,934	63,073	2,496	4,992	8,087	12·8%
Derry ...	46	38	33,978	41,131	66,632	1,056	1,278	2,070	3·1%
Donegal ...	55	40	36,482	50,163	81,264	1,365	1,877	3,041	3·7%
Down ...	88	28	25,630	80,551	130,493	788	2,477	4,013	3·1%
Fermanagh ...	37	27	18,679	25,597	41,467	1,493	2,046	3,315	8·0%
Monaghan ...	27	18	18,938	27,507	44,561	2,350	3,525	5,711	12·8%
Tyrone ...	47	34	32,431	44,831	72,626	512	708	1,147	1·6%
Total ...	490	258	210,892	386,587	626,270	10,629	20,119	32,594	5%
IRELAND ...	3,010	2,422	1,127,078	1,467,868	2,377,946	156,670	195,028	315,948	14%

TABLE 3.—AREA UNDER POTATOES IN 1845.

1845	Total of Districts	Number of Returns	Partial area under potatoes (Irish acres)	Calculated total area under potatoes (Irish acres)	Calculated total area under potatoes (Statute acres)	Partial area under conacre (Irish acres)	Calculated total area under conacre (Irish acres)	Calculated total area under conacre (Statute acres)	Percentage of potato land held in conacre
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CONNAUGHT									
Galway ...	171	137	74,611	93,123	150,867	8,118	10,133	16,415	10.0%
Lettrim ...	24	22	15,402	16,802	27,219	1,457	1,589	2,574	9.5%
Mayo ...	79	72	81,393	89,306	144,676	6,475	7,105	11,510	8.0%
Roscommon ...	63	59	36,213	38,668	62,642	8,024	8,568	13,880	22.2%
Sligo ...	42	41	30,370	31,111	50,400	5,616	5,753	9,320	18.5%
Total ...	379	331	237,989	269,015	435,804	29,690	33,148	53,699	12%
LEINSTER									
Carlow ...	61	53	15,580	17,932	29,050	1,961	2,257	3,656	12.6%
Dublin ...	96	71	11,709	15,832	25,648	1,914	2,588	4,193	16.3%
Kildare ...	131	118	16,022	17,787	28,815	1,472	1,634	2,647	9.2%
Kilkenny ...	168	152	42,288	46,739	75,717	6,613	7,309	11,841	15.6%
Laos ...	72	65	28,062	31,084	50,356	3,746	4,149	6,721	13.3%
Longford ...	40	32	15,205	19,006	30,790	2,894	3,618	5,861	19.0%
Louth ...	69	65	18,197	19,317	31,294	5,183	5,502	8,913	28.5%
Meath ...	162	149	27,469	29,866	48,383	9,222	10,027	16,244	33.6%
Offaly ...	60	55	25,392	27,700	44,874	2,465	2,689	4,356	9.7%
Westmeath ...	69	64	19,666	21,202	34,347	4,262	4,595	7,444	21.7%
Wexford ...	155	139	44,444	49,560	80,287	3,116	3,475	5,630	7.0%
Wicklow ...	70	66	16,871	17,893	28,987	1,228	1,302	2,109	7.3%
Total ...	1,153	1,029	280,905	313,913	508,548	44,076	49,145	79,615	16%
MUNSTER									
Clare ...	81	76	41,601	44,434	71,983	7,385	7,871	12,751	17.7%
Cork ...	337	243	175,387	243,232	394,036	39,162	54,311	87,984	22.3%
Kerry ...	99	88	42,078	47,338	76,688	5,796	6,521	10,564	13.8%
Limerick ...	166	127	51,097	66,788	108,197	10,682	13,962	22,618	20.9%
Tipperary ...	214	196	93,297	101,865	165,021	15,529	16,955	27,467	16.6%
Waterford ...	91	74	44,859	55,164	89,366	9,810	12,064	19,544	21.9%
Total ...	988	804	448,409	558,821	905,291	88,364	111,684	180,928	20%
ULSTER									
Antrim ...	96	42	23,377	53,433	86,561	127	290	470	0.5%
Armagh ...	46	7	4,468	29,361	47,565	499	3,279	5,312	11.2%
Cavan ...	48	24	20,429	40,858	66,190	2,617	5,234	8,479	12.8%
Derry ...	46	38	35,373	42,820	69,368	1,056	1,278	2,070	3.0%
Donegal ...	55	40	38,846	53,413	86,529	1,379	1,896	3,072	3.6%
Down ...	88	28	27,773	87,287	141,405	839	2,637	4,272	3.0%
Fermanagh ...	37	27	20,183	27,658	44,806	1,815	2,487	4,029	9.0%
Monaghan ...	27	18	19,894	29,841	48,342	2,409	3,614	5,855	12.1%
Tyrone ...	47	34	33,673	46,548	75,408	465	643	1,042	1.4%
Total ...	490	258	224,016	411,219	666,174	11,206	21,358	34,601	5%
IRELAND ...	3,010	2,422	1,191,319	1,552,973	2,515,817	173,336	215,335	348,843	14%

TABLE 4.—AREA UNDER POTATOES IN 1846.

1846	Total of Districts	Number of Returns	Partial area under potatoes (Irish acres)	Calculated total area under potatoes (Irish acres)	Calculated total area under potatoes (Statute acres)	Partial area under conacre (Irish acres)	Calculated total area under conacre (Irish acres)	Calculated total area under conacre (Statute acres)	Percentage of potato land held in conacre
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CONNAUGHT									
Galway	171	137	55,015	68,668	111,242	3,927	4,902	7,941	7.1%
Leitrim	24	22	12,562	13,704	22,200	1,003	1,094	1,772	8.0%
Mayo	79	72	69,141	75,863	122,898	3,219	3,532	5,722	4.7%
Roscommon	63	59	29,950	31,340	50,771	5,307	5,667	9,181	18.1%
Sligo	42	41	24,683	25,285	40,962	3,770	3,862	6,256	15.3%
Total	379	331	190,751	214,860	348,073	17,226	19,057	30,872	9%
LEINSTER									
Carlow	61	53	13,591	15,642	25,340	1,468	1,690	2,738	10.8%
Dublin	96	71	7,919	10,707	17,345	422	571	925	5.3%
Kildare	131	118	13,267	14,729	23,861	905	1,005	1,628	6.8%
Kilkenny	168	152	28,899	31,941	51,744	3,323	3,673	5,950	11.5%
Laos	72	65	20,633	22,855	37,025	2,096	2,322	3,762	10.2%
Longford	40	32	12,942	16,178	26,208	2,127	2,659	4,308	16.4%
Louth	69	65	12,670	13,450	21,789	3,227	3,426	5,550	25.5%
Meath	162	149	17,827	19,382	31,399	4,768	5,184	8,398	26.7%
Offaly	60	55	20,713	22,596	36,606	1,022	1,115	1,806	4.9%
Westmeath	69	64	14,876	16,038	25,982	2,182	2,352	3,810	14.7%
Wexford	155	139	38,236	42,637	69,072	2,038	2,273	3,682	5.3%
Wicklow	70	66	14,861	15,762	25,534	919	975	1,580	6.2%
Total	1,153	1,029	216,434	241,917	391,905	24,497	27,245	44,137	11%
MUNSTER									
Clare	81	76	29,622	31,571	51,145	2,676	2,852	4,620	9.0%
Cork	337	243	142,994	198,309	321,261	28,912	40,096	64,956	20.2%
Kerry	99	88	37,837	42,567	68,959	4,814	5,416	8,774	12.7%
Limerick	166	127	40,431	52,847	85,612	6,298	8,232	13,336	15.6%
Tipperary	214	195	63,322	69,492	112,577	8,722	9,572	15,507	13.8%
Waterford	91	74	36,742	45,183	73,196	7,062	8,684	14,068	19.2%
Total	988	803	350,948	439,969	712,750	58,484	74,852	121,261	17%
ULSTER									
Antrim	96	42	18,030	41,211	66,762	126	238	467	0.7%
Armagh	46	7	3,829	25,162	40,762	261	1,715	2,778	6.8%
Cavan	48	24	15,862	31,724	51,393	1,056	2,112	3,421	6.7%
Derry	46	38	29,015	35,123	56,899	508	615	996	1.8%
Donegal	55	40	36,480	50,160	81,259	1,260	1,733	2,807	3.5%
Down	88	28	20,387	64,073	103,798	374	1,175	1,904	1.8%
Fermanagh	37	27	16,890	23,146	37,497	648	888	1,439	3.8%
Monaghan	27	18	14,689	22,034	35,695	1,334	2,001	3,242	9.1%
Tyrone	47	34	32,274	44,614	72,275	478	661	1,071	1.5%
Total	490	258	187,456	337,247	546,340	6,045	11,188	18,125	3%
IRELAND	3,010	2,421	945,589	1,233,993	1,999,063	106,252	132,342	214,395	11%

1846 by 1,291. The corresponding increases in calculated total acreage in statute acres are, respectively, 2,835; 2,878 and 2,317. For the province of Ulster for which forms (a) only are available, it was necessary to ignore the returns given partially or wholly in fractions, and to work only from the smaller sample of completely numerical returns.

As a matter of interest, it may be mentioned that the entire partial sample for which returns are available, including the Ulster returns given as fractions and the Maryborough West figures, amounted—

in 1844, to 1,959,181 statute acres

in 1845, to 2,065,246 statute acres

in 1846, to 1,639,088 statute acres

These are the totals for which concrete evidence is available *before* extrapolation to the entire population from a sample of the order of 80%.

The method adopted for extrapolation is conceded to be somewhat crude, for it ignores, *inter alia*, variations in the size of parishes and parts of parishes and, in particular, differences in the extent of arable land. It would no doubt be more satisfactory, using the detailed 1841 Census returns, to use a proportion based on population figures, although it is not easy to see how allowance should be made for the effect of large towns. In any case, such an approach would involve a considerable amount of work and require facilities not available to a private individual. It would, I think, be useful if the Central Statistics Office were in a position to acquire the crop records at present in the Public Records Office, and to edit, calculate and publish them for general use; the detailed parish information would be of value to local historians, especially as a supplement to any earlier figures in Tithe Books or elsewhere.

Meanwhile, it will be noted that, outside of County Armagh, the size of the observation sample is so large as to preclude any gross errors, even with the method adopted for extrapolation. The figure found for total Irish acreage in 1846 (1,999,000 acres) is in remarkable agreement with the contemporary estimate (2,005,000) calculated on a population basis (Table 1). For the pre-blight sowings, the two totals of 2,378,000 (1844) and 2,516,000 (1845) are consistent with Dowdall's estimate of two and a half million acres (3), based on population and consumption.

Comparison of the provincial totals for 1846 in Tables 4 and 1 shows rather larger differences, but this does not necessarily reflect on the accuracy of the present calculations. Examining the earlier figures, it is difficult to accept without further evidence that the 10% missing reports for Leinster would have contributed no more than about 1% to the total Leinster acreage, while less than 20% missing reports in Munster added over 31%.

As regards the percentage of land in conacre, the figures are, of course, unaffected by the proportion in which the two corresponding *county* returns are increased; and, indeed, the figures given in Column 9 of Table 4 for each of four provinces and for Ireland agree with those calculated from Table 1.

PART II—COMMENT

Total Area Under Potatoes

The calculated figures of total acreage under potatoes for the years 1844-6, combined with official returns for selected subsequent years, are presented in the second column of Table 5.

TABLE 5.—EXTENT OF POTATO CROP IN IRELAND IN SELECTED YEARS.

Year	Acreage (in thousands of statute acres)	Yield (in tons per acre)	Estimated Produce (in thousands of tons)
1844	2,378	(6.25)	(14,862)
1845	2,516	(4.0)	(10,063)
1846	1,999	(1.5)	(2,999)
1847	284	7.2	2,046
1848	810	3.8	3,077
1849	719	5.6	4,024
1855	982	6.4	6,287
1856	1,105	4.0	4,419
1859	1,200	3.6	4,321
1872	992	1.8	1,785
1879	843	1.3	1,095
1897	677	2.2	1,490
1951	466	8.5	3,963

- NOTES : 1. The 1848 figures are based on extrapolation from incomplete returns.
2. The yields given for the years 1844-6 are personal estimates ; that for 1846, in particular, is highly speculative.
3. Although the late nineteenth century generally was a period of poor potato yields, those of the three years 1872, 1879 and 1897 were particularly low, and should not be taken as representative. During this period mean yields of 3 to 4 tons per acre were the rule.

The 6% rise in acreage from 1844 to 1845 was one of the reasons for official optimism regarding the food situation in the early Autumn of 1845, and, without doubt, it helped a little to mitigate the partial failure of the crop which came to light in September of that year. The 1845 figure, large as it was, may not represent the maximum extent of potatoes ever planted in Ireland. Comparison of the acreage under potatoes in certain Co. Tipperary parishes in 1845 (13) with that in 1834 (8) shows a reduction from the earlier year. Other indirect evidence suggests that the potato crop in Ireland reached its maximum extent between 1830 and 1835, and that it contracted in the following decade in face of expanding pasture. Thus the increase from 1844 to 1845 may be interpreted as a desperate reaction from a gradual fall which had brought the crop to a critically low level in 1844.

The total of two and one half million acres under potatoes in 1845 much exceeds the amount of land ploughed for all crops in the whole of Ireland today. Made up primarily of inferior

varieties, bred to exhaustion point for yield, it represented a vast congested potato slum, wide open to epidemic plant disease.

Under the impact of the first blight attack in 1845, the extent of the crop in the following year fell sharply by over 20%. Even had disease spared the potato in 1846, the reduction in land under the crop would have led to distress little below that of the previous winter. Hence the decision to hold a constabulary census of potato sowing in May, 1846.

In actual fact, blight struck in 1846 even earlier and more severely than before, and ushered in the Famine proper. Few had seed to plant in 1847, and those who had, feared that it would immediately be torn from the ground by the starving people. Jonathan Pim, writing in April 1847, estimated that "from one-tenth to one-third of the usual planting" had been carried out, according to the locality (16, p. 276). The official returns confirmed that the sowing had been exceptionally small, and quoted as an example the union of Castlebar with only 803 acres of potatoes, "where under ordinary circumstances there would not have been less than 6,000 acres of potatoes". (14, part 1, p. v.)

The figures show that the 1847 acreage was, in fact, almost exactly one-seventh of that in the preceding year, and less than one-eighth of that in the immediate pre-Famine years, 1844-5. The abnormal figure of 284,116 acres is easily the minimum value for potatoes in the official series of crop returns, and very possibly represents the lowest area under the crop in Ireland during the last two hundred years or more.

Although blight was noticeable here and there in the 1847 crop, the season did not favour its development and the yield was good. The immediate effect was the enormous increase in the 1848 sowing, which was not achieved without great sacrifice. A Quaker report from Roscarberry in late April of 1848 is typical—"An extraordinary effort is being made in these two parishes to plant the potato. I know of a great many instances of the poor people fasting for eight and forty hours, trying to save the little remnant of their potatoes for seed." (16, p. 456.)

The result was almost a tripling of the area under potatoes between 1847 and 1848. Although blight struck again in that year, leading to a temporary fall in acreage in 1849, the extent of the crop continued its general upward trend at a slower pace to the plateau of over a million acres which lasted from 1856 to 1871. The post-Famine maximum of 1,200,347 acres was reached in 1859. After that the crop extent went into a slow but steady decline which has continued, apart from partial wartime recoveries, to the present day.

Yields and Total Production of Potatoes

Thoughtful observers viewed with mixed feelings the recovery of the potato crop immediately after 1847. "I do not know" wrote Jacob Harvey from New York to the Society of Friends Committee in Dublin a few days before his death in April 1848 (16, p. 327) "whether to rejoice or not at the improved prospect of the potato crop; if they should prove as prolific as formerly, what is to pre-

vent the labourers and small farmers from falling back upon them as their only food? This is the great danger to my mind and I confess I am anxious as to the result".

The rise in acreage, considered by itself, was however to prove no true guide to the come-back of the potato, for, after the first few years, it was accompanied by a marked fall in yield per acre. The maximum produce in any post-Famine season (about six and a quarter million tons) fell short of half the pre-Famine requirements, and this record production occurred only in an exceptional year (1855), when high acreage and high yield happened to coincide. Over the following sixteen years (1856-71), when the potato covered over a million acres, the total crop averaged three and a half million tons per year, i.e. a quarter of pre-Famine production and roughly the same amount as is nowadays obtained from less than half the acreage. From 1870 to the turn of the century, potato production reached its lowest level on the average, with a minimum of just over one million tons in the disastrous season of 1879.

As an example of how unreliable a criterion acreages alone can be, it is interesting to note that the total potato crop in the year 1847, when its extent was far below that of any other season, was, because of a good yield, in excess of that in no fewer than eight later years (1861, 1872, 1877, 1879, 1890, 1894, 1897 and 1900).

It is an indication of the extent to which the importance of the potato in the diet of the people had fallen, that the failure of the crop in 1879, coming immediately after the poor crops of 1877-8 and comparable in degree to that of 1846, should have caused so little starvation, although distress was widespread and severe.

It would be interesting to evaluate the position of the potato as human food at various stages in post-Famine Ireland, in comparison with its earlier dominance. For this purpose it would be necessary to have, in addition to potato production and population figures, some information on changes in the relative use of the vegetable for human and animal food. Dowdall's calculations (3) show that before the Famine roughly twice the quantity of potatoes were eaten by people as by livestock, after allowance had been made for seed, wastage and exports. Nowadays the proportion is almost exactly reversed. It is possible that the proportion of the potato crop which was eaten as human food increased at first after the Famine. Turnips, virtually neglected previously, were grown in 1847 as emergency human food and later continued on a high level (3 to 400,000 acres) as fodder for livestock. The importation of maize and other animal feeding material also relieved pressure on the declining potato production in the nineteenth century.

If the population of Ireland in 1901 ate potatoes at the present-day average rate, they would have consumed roughly one million tons per annum. When allowance is made for seed, waste and even limited animal consumption, there are many years about this time (e.g. 1894, 1897, 1900, 1903, 1904, 1906, 1907) when it is extremely doubtful that the production of potatoes could have met such a demand. Thus the implication in a small-scale Guinness investigation (5) that the consumption of potatoes as human food

in Dublin at the turn of the century was below the present level may well be true.

A similar rough analysis applied to the 1856-71 period, during which the total annual crop averaged three and a half million tons, suggests that human consumption, on the average, can scarcely have reached twice the present day level.

An English observer who had been familiar with pre-Famine Ireland, wrote of conditions in 1869 (10, p. 10):—"A great improvement has taken place in the labourers' diet; those in regular employment, especially in the towns, being large consumers of wheaten bread, an article of diet which, a quarter of a century ago, was completely out of the reach of any working man. Even the ordinary farm labourers are not limited, as formerly, to the potato; Indian meal being largely used by them, especially when potatoes are dear, or when they begin to lose their goodness, in the later months of Spring."

All of which tends to indicate that, ignoring regional variations, the use of the potato as human food in Ireland dropped abruptly at the time of the Famine to about one third of its previous per caput value, then fell more slowly to a minimum value about 1900, and may have risen somewhat in later years.

Distribution of the Crop by Counties in 1845

The distribution of the 1845 potato crop by counties is illustrated in Maps 1 and 5. Map 1 shows the number of acres under potatoes per thousand acres under crops and pasture, using the 1851 Census figures for the latter. Map 5 gives the number of persons (1841 Census) per hundred acres of potatoes in each county. The ten counties of highest potato density are shaded in each case.

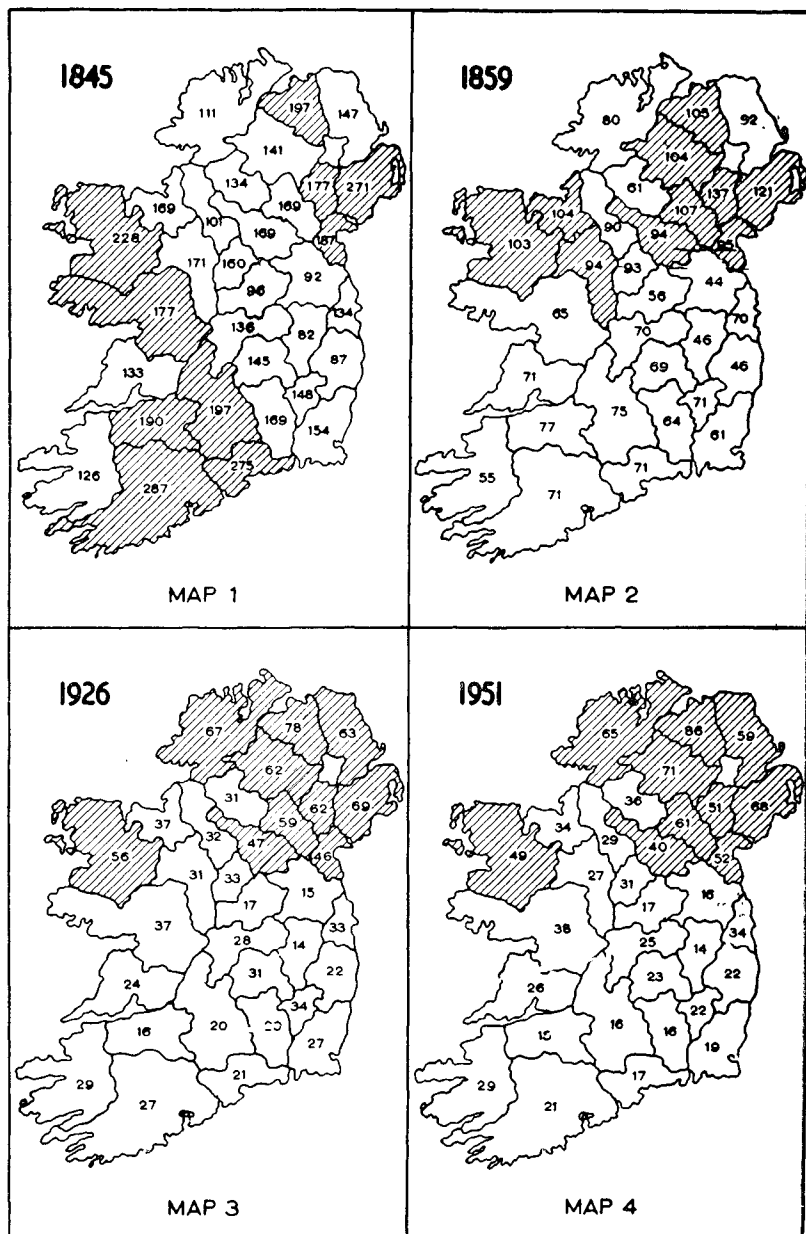
The feature in both diagrams, particularly in Map 5, is the southern wedge of high potato density, stretching mainly to the northwest from a maximum in Cork-Waterford. No doubt there are historical reasons for this specialisation, since growth of the crop from early times in the Youghal district has been established, irrespective of the truth or otherwise of the Raleigh tradition (2, p. 290). It is worthy of remark that the acreage under potatoes in Co. Cork alone in 1845 (394,036) exceeded the crop in the whole 32 counties in 1957 (366,450).

There was also an early seventeenth century nucleus of the crop in Co. Down (2, p. 290), which may have originated the region of high density in the Northeast. Map 1 suggests the possibility of a third focus in Mayo-Galway, perhaps of Spanish origin.

Potatoes, in pre-Famine days, were exported from both North and South, mainly to Scotland and England, respectively. There was also a considerable internal trade of potatoes, mainly to Dublin where (Map 5) there were 1,453 people per hundred acres of potatoes in that county, as against the national average of 325. Townsend (11, pp. 230-232) gives an interesting account of this trade, as plied from Cork to Dublin:—

"The mode of sending potatoes to Dublin is thus managed. Two, three, or more farmers jointly freight a vessel, and, if their

POTATOES PER 1000 ACRES OF CROPS AND PASTURE

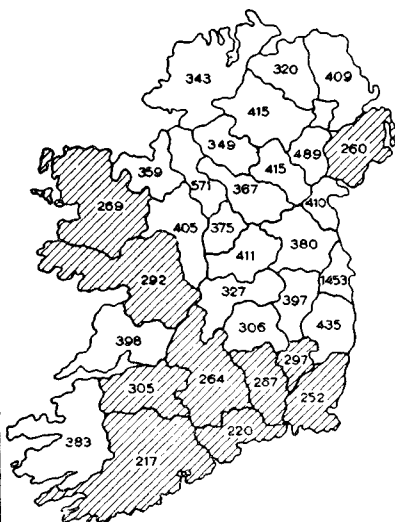


own stock of potatoes be insufficient, collect from their neighbours enough to make up the loading. One of the party, or some person in whom they confide, goes as supercargo, sells the potatoes, and on his return divides the profits among the several contributors, being allowed a certain commission for his trouble. It is supposed, and, I believe not without cause, that the supercargo does not always make fair returns. As there is no check upon his accounts, their only security is his honesty, which, it may be easily conceived, is not always proof against so tempting an opportunity of enriching himself at the expense of his employers. Trusts of more importance, though in the hands of his betters, are not always managed more faithfully.

Sometimes a rich farmer hires a vessel on his own account, and either superintends the sale himself, or deposes one of his sons. The freight varies according to circumstances, generally from thirty to forty guineas for a sloop of fifty or sixty tons. Larger vessels are procured on cheaper terms, but the delay, that frequently attends the sale of a large cargo, seems to render the smaller conveyance more eligible. The master's profit in these voyages is so considerable, that farmers are never at a loss to procure a vessel. The demand for the commodity in Dublin is, however, very fluctuating and uncertain. As the supply, in consequence of the variable weather in this climate, must necessarily be irregular, the market frequently experiences the extremes of want and abundance. The profits of the farmer, therefore, are always precarious. Sometimes he is fortunate enough to return with full pockets, and sometimes he has been known to desert the vessel, and leave the cargo to pay the freight. This uncertainty, however, is not found to destroy his hopes or diminish his ardour. It is a sort of lottery, in which, like other adventurers, each man hopes to be the favourite of fortune, and never calculates the chances against his success. Four shillings per hundred weight, in Dublin, afford a fair profit; his good or bad fortune depends upon their exceeding or falling short of this standard".

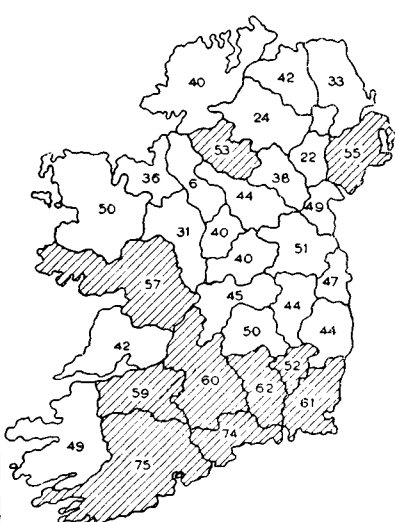
One puzzling feature of the 1845 county distribution (Maps 1 and 5) is the low density of the potato crop in Co. Leitrim, which is about two-thirds only of that in neighbouring counties. It seems unlikely that the figures are at fault since almost complete returns are available. It is difficult to suggest an explanation, for contemporary works rarely discuss Leitrim and never at any length; then, as now, it appears to have been the forgotten county. It may be significant that in pre-Famine and even Famine days, it does not seem to have acquired its modern reputation as one of Ireland's poorest counties. It may be relevant, too, that in 1841 it shared with Kerry the distinction of having the highest density of cattle, ahead of Meath and, for instance, more than 25% above Westmeath. In the subsequent century it lost much of its pre-eminence in cattle raising, for three counties—Wicklow, Donegal and Leitrim—show the lowest increase in cattle population amongst the 32 counties over the period 1841 to 1951. Whether the Famine marked for Leitrim a deterioration of economic status even more

FPOPULATION PER 100 ACRES
OF POTATOES, 1845



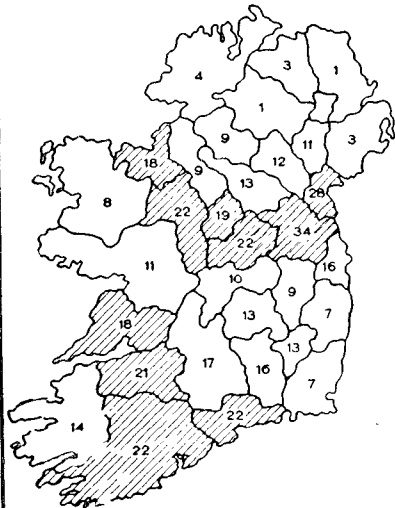
MAP 5

PERCENTAGE DROP IN LAND UNDER POTATOES
FROM 1845 TO 1859



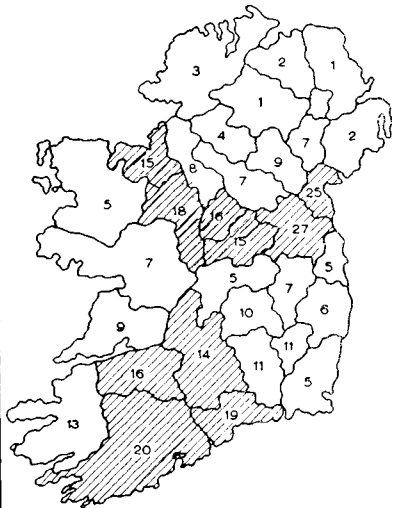
MAP 6

PERCENTAGE OF POTATO LAND
IN CONACRE, 1845



MAP 7

PERCENTAGE OF POTATO LAND
IN CONACRE, 1846



MAP 8

pronounced than elsewhere is an interesting point; certainly, unless the figures are erroneous, the county came much closer in 1859 to its pre-Famine potato acreage than did any other (Map 6).

Subsequent Changes in the Distribution of the Crop

Maps 1 to 4 permit a quick review of the changing density of the potato crop over the period 1845-1951. Map 6 shows the percentage drop in acreage for each county in the period from 1845 to its post-Famine maximum in 1859.

The feature in the first period (Map 1 to 2, and Map 6) is the speed with which Cork and Waterford, ignoring tradition, abandoned the potato, never to return to it again on an intensive scale. This example was followed, to a somewhat lesser degree, by most of the South. Apart from Leitrim, the least falls in acreage occurred in Armagh and Tyrone—a sign of things to come. The crop in Down fell by over half, as did that of Fermanagh, but even with the residue, Down remained one of the counties of highest density in 1859.

The Northward retreat of the potato continued between 1859 and 1926, with falls in density of crop everywhere but much lesser decreases in the North than in the South. Sligo and Roscommon had dropped from the leading potato producers in 1926, and been replaced by Donegal and Antrim. It will be observed that Donegal emerged comparatively late as a potato specialising county.

An intensification of this Northward trend took place between 1926 and 1951, for, although a slow drop continued over most of the country outside Ulster, a sharp *rise* in potato density took place in Derry and Tyrone, and even Fermanagh, last outpost against the potato in the province, showed a similar trend.

The following list of counties of densest potato crop in each of the four years underlines the general trend:—

1845	1 Cork	2 Waterford	3 Down	4 Mayo	5 Derry, Tipperary
1859	1 Armagh	2 Down	3 Monaghan	4 Derry	5 Tyrone, Sligo
1926	1 Derry	2 Down	3 Donegal	4 Antrim	5 Tyrone, Armagh
1951	1 Derry	2 Tyrone	3 Down	4 Donegal	5 Monaghan

One aftermath of the Famine has been that the centre of gravity of potato growing (and of pig rearing) has moved from one end of the country to the other, to come to rest solidly in the North.

Distribution of Conacre in 1845-6

Much evidence on conacre, mainly qualitative, was tendered before the Devon Commission. The following were among the conclusions drawn:—

“The practice of letting land in con-acre appears to be much more prevalent in Munster and Connaught than in Leister and Ulster. In the latter province it seems that con-acre is little known except as potato-land, or land let under a con-acre contract for a single crop of potatoes; but in the southern and

western counties con-acre seems to be frequently taken for the purpose of raising crops of oats, hay and flax, as well as potatoes, though the latter was always the crop for which con-acre was chiefly sought". (4, p. 519.)

The distribution of potato land in con-acre in 1845-6, as illustrated in Maps 7 and 8, shows considerable differences from the picture drawn by the report of the Devon Commission and generally accepted by subsequent commentators. The highest percentages occurred neither in Munster nor Connaught, but in the Leinster counties of Meath and Louth. Outside of Counties Roscommon and Sligo, the percentage of potato land in con-acre in Connaught was below the national average.

It is outside the scope of the present paper to discuss the reasons for the distribution of con-acre; the data and maps have been included since they represent, it is believed, the first published numerical analysis of this important aspect of the pre-Famine agricultural economy.

ACKNOWLEDGMENTS

Thanks are due to the administrators of the Scientific Activities Fund of the Royal Meteorological Society (London) for a grant towards an investigation on weather and potato blight in Ireland in 1845-7, to which the present paper is incidental.

The help of Mrs. R. Keenan in checking calculations is gratefully acknowledged.

References.

- ¹(Barrington, T.) The yields of Irish tillage food crops since the year 1847. *Journal of the Department of Agriculture, Dublin*, xxi, 2 (1921), pp. 205-229; xxi, 3 (1921), pp. 289-305. (Note:—This article was published anonymously; it is attributed to Barrington in (12) (p. xxxvii).)
- ²Davidson, W. D. The history of the potato and its progress in Ireland. *Journal of the Department of Agriculture, Dublin*, xxxiv, 2 (1937), pp. 286-307.
- ³(Dowdall, F.) Series of anonymous articles on agricultural statistics, in *Dublin Evening Herald*, commencing on November 5th, 1846. Summarised, and attributed to Dowdall in (15), 1848, pp. 165-167.
- ⁴Kennedy, J. Pitt. Digest of evidence taken before Her Majesty's commissioners of enquiry into the state of the law and practice in respect to the occupation of land in Ireland. Part I. Dublin (1847).
- ⁵Lumsden, J. An investigation into the income and expenditure of seventeen Brewery families, and a study of their diet. Dublin (1905).
- ⁶O'Rourke, J. The history of the great Irish famine of 1847, with notices of earlier Irish famines. Dublin (1875).
- ⁷Salaman, R. N. The history and social influence of the potato. Cambridge (1949).
- ⁸Simington, R. C. Tithe applotment books of 1834. *Journal of the Department of Agriculture, Dublin*, xxxviii, 2 (1941), pp. 239-343.
- ⁹Stamp, F. Dudley. An agricultural atlas of Ireland. London (1931).
- ¹⁰Thompson, H. S. Ireland in 1839 and 1869. London (1870).
- ¹¹Townsend, H. Statistical survey of the County of Cork. Dublin (1810).
- ¹²Agricultural statistics, 1847-1926. Department of Industry and Commerce. Dublin (1928).
- ¹³Relief commission papers: constables' reports. Public Records Office, Dublin. IA. 50. 73.
- ¹⁴Returns of agricultural produce in Ireland, in the year 1847. H.C. 1847, lvii.
- ¹⁵*Thom's Irish Almanac and Official Directory for 1847*, 1848.
- ¹⁶Transactions of the Central Relief Committee of the Society of Friends during the famine in Ireland in 1846 and 1847. Dublin (1852).

Appendix

UNCERTAINTIES IN THE STATISTICS OF FARM SIZE IN IRELAND, 1841-1851

The first attempt to assess the distribution of farm sizes in Ireland (1, pp. 454-7) is based on information collected during the 1841 Census. Data on farm sizes as such were not required in the census forms (1, p. xcii) which, however, provided for returns, in respect of farms, of the number of "acres" under the three headings—"arable", "pasture" and "waste", as well as of the number of horses, cattle, pigs, etc.

This first official collection of agricultural statistics was obviously regarded as a minor and incidental project compared with the population returns, and the "Instructions to Enumerators" (1, p. xc) gave no guidance in respect of them. Instructions on the form itself contained no directions as to the kind of acres in which the returns should be expressed; the only detailed specifications in the agricultural section of the form were that pasture was to be considered as that portion of the farm fit for grazing which was not under tillage, and that returns of cattle should not include calves of the current year (which, incidentally, means that the 1841 cattle returns are not completely comparable with later figures).

A summary based on the returns, as published in the census report (1), gives the following structure of farm sizes:—

CENSUS OF 1841.

Number of farms not exceeding 1 acre	..	Not given
above 1-5 acres	..	310 436
" 5-15 "	...	252,799
" 15-30 "	...	79,342
" 30 "	...	48,625
Total	691,202

Prima facie, it is to be assumed, in the absence of directions to the contrary to the enumerators, that the bulk of the returns upon which this table was based was expressed in the unit in common use in most of the country, i.e., the Irish acre (1.62 statute acres). There is no mention of any check having been made on the acreage returns, e.g. as against total townland area, such as was carried out from 1847 onward.

Nevertheless, in the 1841 Census report the figures are presented simply as "acres", leaving it to be assumed that they may be taken as expressed in official or statute acres.

In considering farm sizes, the Devon Commission had before it in 1845, not only the 1841 Census results as given in paragraph 1 above, but also a separate summary of pre-famine conditions pre-

pared by the Land Commission Office from returns provided by the Poor Law Commissioners (2, pp. 393-6). The form of the "Poor Law Returns" differed from the census data in including a figure for "the number of persons holding land whose holdings do not exceed one statute acre", and also in the categories into which farms above 5 acres were divided; but it was only too clear that they gave a radically different picture from the 1841 Census summary:—

POOR LAW RETURNS (1845)

Not exceeding 1 statute acre ...	135,314 (including 42,705 "gardens")
Above 1 to 5 acres ...	181,950
Above 5 to 10 acres ...	187,909
Above 10 to 20 acres ...	187,582
Above 20 to 50 acres ...	141,819
Above 50 acres ...	70,441
Unclassified, mainly due to joint tenancy ...	30,433
Total ...	935,448

Kennedy remarks (2, p. 396) that the Poor Law Returns "having been taken with a view to taxation, and being subject to periodical revision for this purpose, are probably nearest to the truth". He arrives at this conclusion in the full knowledge that the Poor Law Returns are subject to some ambiguity arising out of land held in joint tenancy. He does not remark that a large measure of the discrepancy between the two summaries disappears if one treats the 1841 Census returns as expressed in Irish acres.

In the 1847 and subsequent collections of agricultural statistics, great care was taken to ensure that the returns of extent were expressed in statute acres. The size of farms was asked for, in *statute* acres, in the forms for both "tillage return" and "return of live stock"; a table was provided "for converting the Irish and Cunningham acre into the statute acre"; and where farm totals checked against townland areas in statute acres differed by more than 5%, further enquiries were made. (3, Part 1, pp. iv, xiii, xiv). The post-famine returns may therefore be accepted as substantially free of error in this respect.

Apart from these effective measures to avoid further confusion of units, the reaction of Thomas A. Larcum to the criticism of the 1841 returns of farm size, and to the suggestion that the Poor Law Returns were more accurate, is contained in his remarks on the 1847 agricultural returns (3, part 2, p. iii):—

"Among the first comparisons which they (the 1847 figures) should afford is, the number of holdings of each size now, and at any former period; but in all such comparisons the first difficulty which presents itself is, the uncertainty introduced by the difference between the Irish and the Statute acre. In these returns peculiar care was taken to avoid this source of error, not only by pointing the attention of the enumerators to it, but

by printing with the instructions, tables for converting the one into the other, so that the subject was always kept prominently forward. In the Census of 1841 the danger was not overlooked, but the enumeration of the people was then the more essential object; and it is believed that the present returns are more correct in regard to holdings. The Census, however, offers probably the best standard of comparison, so far as comparison can be instituted, which is as follows:—

	Census of 1841	Returns of 1847	Increase	Decrease
Number of farms from 1 to 5 acres ...	310,375	139,041	—	171,334
„ above 5 to 15 „ ...	252,778	269,534	16,756	—
„ „ 15 to 30 „ ...	79,338	164,337	84,999	—
„ „ 30 „ ...	48,623	157,097	108,474	—
Total ...	691,114	730,009	210,229	171,334

Here we have not only a great diminution in the smaller holdings, and an increase in each of the larger classes, but an increase in the total number. This is at once explained, if we assume that some of the holdings of 1841 were in Irish acres, as all those which approached to the upper limit of each class would now rise into the class above it, and many would come into the lowest class which before were under one acre—a class extremely anomalous from the town holdings, houses and gardens which it includes. . . . The comparison however is not without interest, and however uncertain in the extent to which the change has gone in any class, there can be little doubt that the number of larger holdings is on the whole increasing. . . . The precise amount of change in the quantity of live stock in the possession of each class of farmer, cannot indeed be ascertained, from the causes already stated ”.

It is difficult to avoid the impression that Larcom is here being evasive and attempting to put the best face on a poor case. That the danger of confusion between different measures of area in the 1841 Census was not overlooked may be true, but it is irrelevant; Larcom does not claim, nor is there alternative evidence in the Census report, that any steps were taken to avoid the danger. Again the main discrepancy between the 1841 and 1847 Census figures is not in the total of the holdings, but the fact that a computation of the total area, based on any reasonable assumptions for average size in each class of farm, shows an excess in 1847 far greater than can be explained by any assimilation of holdings of less than one acre. It would appear that it is not only doctors who attempt to bury their mistakes!

The admissions specifically made, however, are not unimportant. The 1841 figures are probably less accurate than the 1847 series, it may be assumed that some (sic!) of the 1841 holdings were in Irish acres, and the extent to which the two series of figures may be compared is doubtful. Indeed, the only confident deduction

that Larcom draws from them, that the number of larger holdings was on the whole increasing, was common knowledge.

Larcom's reference to the alternative figures presented before the Devon Commission (paragraph 2 above) is oblique (3, part 2, p. iv):— "It was intended also to make a comparison of holdings, with a valuable return of the same class made to the House of Lords in 1845; but, though apparently similar, they differ materially, that return being 'the number of persons holding land', instead of the number of holdings'; thus including tenancies in common, sometimes as two holdings, sometimes as one, entered as A and B, and partners".

Here again, Larcom is less than candid. Notes to the Poor Law Returns drew attention to the difficulty of joint holdings and attempted to define its effect, which at maximum would have been far less than that arising from any substantial inclusion of returns in Irish acres in the 1841 Census figures. Again, it is not at all clear what steps, if any, were taken to solve the problem of joint holdings when collecting and processing the 1841 farm figures, which, it would seem, may contain an equal ambiguity from this source.

It will be noted that in discussing the 1847 returns (paragraph 4 above), Larcom quotes 1841 Census figures of farm size which differ slightly from those given in the Census volume itself (paragraph 1 above), no doubt as a result of a re-check of the original returns.

In the following year (4, p. iv) he in turn presents a revised form of the 1847 returns, explaining that "in 1847 the number of farms was compiled from the Live Stock Returns, and those have been found in many instances to be less perfect so far as regarded the size of farms, than the Tilage Returns; a careful examination has therefore been made of the Returns of 1847".

Unfortunately only sufficient of the revised 1847 figures are given to permit a comparison with 1848, in which year, due to the disturbed state of the country, agricultural statistics were not collected in the Counties of Tipperary and Waterford, or in the Metropolitan part of Dublin. Accordingly the revised 1847 figures for Munster and Leinster are not complete. Those for the provinces of Connaught and Ulster are given below, with the original figures, as published the previous year, in brackets:—

REVISED RETURNS OF 1847 (original figures in brackets)

	Connaught	Ulster
Number of farms not exceeding 1 acre ...	10,917 (10,890)	13,925 (13,935)
„ above 1 to 5 acres ...	35,634 (35,597)	39,845 (39,785)
„ „ 5 to 15 „ ...	76,707 (76,535)	101,071 (101,030)
„ „ 15 to 30 „ ...	33,740 (33,744)	57,273 (57,587)
„ „ 30 „ ...	22,593 (24,035)	37,376 (39,499)

The revised figures for holdings above 30 acres show a fairly substantial reduction; otherwise the amendments are trifling.

To add further complexity to the subject, there is some uncertainty as to how the size of a farm was defined. In discussing the extent to which the 1841 Census figures of size of holdings and the corresponding 1847 returns were comparable, Larcom interjects the following comment (3, Part II, p. iii):—

“The untilled land is excluded from both. The principle was adopted on consideration, as likely on the whole to give a more correct picture of the condition of the farms in Ireland, from the tendency of the farmers to diminish in the returns the extent of the arable, and increase the extent of their waste land; as well as the indefinite manner in which, as regards extent, many tracts of mountain or waste are rented or held, sometimes indeed without reference to extent at all, a farmer being allowed to graze a number of cattle in proportion to his rent, called a ‘summ’ or a ‘half summ’, etc., a summ being grazing for three cows or an equivalent number of sheep.”

It is difficult to extract any certain meaning from this. That farm sizes should be based on tilled land only, excluding pasture as well as waste, is contrary to common sense; and indeed a calculation of the *minimum* area represented by the *lower* set of 1847 returns, assigning to each the lower limit of size in its class, gives a figure far in excess of the total area under crops. Again (paragraph 6 above), Larcom was later to say that the original 1847 figures, to which the present comment refers, were compiled from the live stock returns; now these (3, part I, p. xiv) contained no information regarding tilled or untilled land, but only a single combined figure for “area of farm” as entered by the enumerator, who had, apparently, no instructions as to how it was defined.

An uncharitable mind might suspect, in the context in which the curious definition of farm size occurs, that it could represent an attempt to confuse the issue by suggesting that, in some vague way, the size of farms in the 1841 Census and 1847 agricultural returns was arrived at in a different, and better, way than in the Poor Law Returns, and thereby to discourage any further comparisons with the latter.

In fairness to Larcom, it should be stressed that the farm statistics form only a tiny proportion of the data collected in the 1841 Census, and that the doubts raised concerning them do not reflect on the accuracy of the main work of that monumental undertaking. Indeed, little attention would have been attracted to this minor sideline of the Census had the Devon Commission not required data on farm sizes, and had the coming of the Famine, before the next census was taken, not given to these returns an importance which could not have been foreseen at the time when they were rather casually collected.

For the first time in the official series of agricultural statistics, the 1851 Census (5, p.v) gives a break-down of the farms above 30 acres, which then numbered 149,090, in startling contrast to the 1841 Census figure of 48,623 (as revised).

Now the Poor Law Returns presented before the Devon Commission also give a break-down of the larger pre-famine farms, and

these particular figures are presumably not subject to any great extent to joint tenancy ambiguities. The classes in which they are arranged correspond to those used in the 1851 Census returns from 50 statute acres upwards; the comparison between them, given below, shows what is surely a closer approximation to the true picture:—

	Poor Law Returns, 1845	Census 1851
Holdings from above 50 to 100 acres ...	45,394	49,940
" " " 100 " 200 " ...	17,121	19,753
" " " 200 " 500 " ...	6,393	7,847
" above 500 acres ...	1,533	1,457
Total	70,441	78,997

An authoritative removal of the major ambiguities from the series of farm size statistics for the years 1841-51 must await detailed examination of all the available data by an expert statistician. Meanwhile the purpose of the present note is to point out some of the pitfalls, to suggest that the 1841 Census figures of holding sizes are predominantly based on returns in Irish acres and are therefore to be interpreted with great caution, and to draw attention to the corresponding Poor Law Returns presented to the Devon Commission which, for all their defects, are considered to form a more valid basis for comparison with post-famine statistics.

As regards the concept of farm size, a guess (and no more than that is possible with the information available in the official publications) may be based on rough calculations of the total area from the various returns of frequencies of holdings of different sizes. This suggests that in the 1841 Census calculations, farm size was arrived at by adding 'arable' to 'pasture' and neglecting 'waste'; while in 1847 and later, farm size included all land, including waste, within the farm proper, but excluded rough grazing, often expressed in terms other than area, outside the actual farm boundaries.

This matter of the comparability of early Irish agricultural statistics is of some importance since, in the course of time, even the reluctant qualifications which Larcom agreed should be applied to the 1841 figures have apparently come to be overlooked. An uncritical acceptance of the 1841 Census data for farm size is apt to lead to untenable conclusions. This is of less importance when the figures are used to show the proportion of farms of different size in different parts of the country in 1841 (7, p. 54-6), although the probability, for instance, that returns in part of Ulster were expressed in Cunningham acres involves a risk of some distortion of the true distribution picture. Much more serious is the interpretation of direct comparisons of the 1841 Census figures with the 1847 and with the 1851 Census returns of farm size as an accurate reflection of the effect of the famine on agricultural

economy, when in fact what is being presented is predominantly the difference between the Irish and the statute acre. (6, p. 123, 127).

References.

¹Report of the Commissioners appointed to take the census of Ireland for the year 1841. H.C. 1843, xxiv.

²Kennedy, J. Pitt. Digest of evidence taken before Her Majesty's Commissioners of inquiry into the state of the law and practice in respect to the occupation of land in Ireland. Part I. Dublin, 1847.

³Returns of agricultural produce in Ireland, in the year 1847. Part I (Tillage) H.C. 1847, lvii; Part II (live stock) H.C. 1847-8, lviii.

⁴Returns of agricultural produce in Ireland, in the year 1848. H.C. 1849, xlix.

⁵The census of Ireland for the year 1851, Part 2; returns of agricultural produce in 1851. H.C. 1852-3, xciii.

⁶Edwards, R. D. and Williams, T. D. (editors). The great famine: studies in Irish history 1845-52. Dublin, 1956.

⁷Freeman, T. W. Pre-famine Ireland: a study in historical geography. Manchester, 1957.

DISCUSSION

Mr. Thomas P. O'Neill, in proposing the vote of thanks, said: Mr. Bourke's statistics may be a great help to us in solving a number of problems. For example, Co. Donegal has always been somewhat of an anomaly to me as has to a lesser degree been Kerry. Donegal suffered a very small decline in population in the decade 1841 to 1851 compared with the rest of the country. It was not a major distress area unlike the rest of the western seaboard. The maps show that the extent of dependence on the potato was much less in that county in 1845 than in other western counties. These maps give an overall picture of distribution which may be valuable. However, they are based on the assumption that, apart from those specified as Cunningham acres, that all the Returns are in Irish acres. This assumption depends largely on whether *Thom's Directory* of 1847 were correct or not in reaching the same conclusion and it does adequately explain the discrepancy between the various estimates of the potato crop at this period. If, however, some of the Returns were in statute acres then Father O'Rourke was right when he said of the estimates that "the truth, no doubt, lies somewhere between them". By broadening his research Mr. Bourke could possibly have checked the figures for some areas against other contemporary evidence. For example, statistics of all crops in Bailieborough Union were prepared for the Board of Trade in 1845 and also Kilrush Union figures for the potato crop in 1846 have been published in official documents.

Allied to Mr. Bourke's main paper is his appendix on the 1841 Census. There are many historical and mathematical difficulties regarding the figures given in that Census for farm sizes and Mr. Bourke suggests "that the 1841 Census figures of holding sizes are predominantly based on returns in Irish acres". That assumption is, of course, if proved, a point in favour of Mr. Bourke's earlier assumption that the 1846 potato returns are predominantly in Irish acres. There is no doubt that the 1841 figures present problems.

For example, according to the Census there were 691,114 farms of over one acre while in 1847 there were 730,009 such farms. This increase is completely at variance with other evidence regarding the effect of the famine. It is a pity that Mr. Bourke does not set out clearly the mathematical problems involved in these figures. He says that "the main discrepancy between the 1841 and 1847 Census figures is that a computation of the total area, based on any reasonable assumptions for average size in each class of farm, shows an excess in 1847 far greater than can be explained by any assimilation of holdings of less than one acre". No attempt is made to examine this in any detail. It would be most valuable to set out the difficulties fully and see, by careful research, what may be the explanation for them.

In suggesting that the Poor Law returns of 1845 "form a more valid basis for comparison" Mr. Bourke states that a large measure of the discrepancy between them and the Census figures disappear if the Census returns are taken to be in Irish acres. This is undoubtedly true but the discrepancy is still so great in some particulars that it casts doubts on the possible value of either set of figures. For example the 1841 Census gives the number of farms over 30 acres as 48,625 while the 1845 figures return the number of farms over 50 acres as 70,441. No appeal to variant measures can eliminate a substantial discrepancy. The 1845 figures themselves contain a number of mathematical problems. They add 42,705 gardens and 39,290 other holdings under one acre to give a total of 135,314. At another place they give a return of farms under one acre as 64,839.

From an historical point of view it is interesting to compare the various sets of figures for farms of one to five acres:

1841	1845	1847
310,375	181,950	139,041

Mr. Bourke suggests that a drop of 42,000 in this type of farm is more realistic than the drop of 171,000 which arises from acceptance of the 1841 returns. In fact he went so far as to say that such a fall as 171,000 was impossible. The drop of 42,000 could be explained by a population change of about 250,000 while the greater fall could be accounted for by a catastrophe far greater. Such a catastrophe is, however, far from beyond the bounds of possibility. In 1846 and 1847 nearly 350,000 persons emigrated to North America while about 200,000 went to Great Britain. A quarter of a million died while 100,000 went into the workhouses and a further 50,000 went into fever hospitals. Many who could not emigrate moved into the larger towns. The gaols, themselves, received an increased number of prisoners and, of course, many sank from the rank of farmer to that of labourer. It was to these latter that Fintan Lalor referred in May 1847:

"Numbers of the small occupiers have surrendered their holdings. The landlords are assisting the natural operation of the famine instead of arresting it—putting the tenant out of his foothold of land instead of aiding him to retain and cultivate it. In every district the tenantry are being evicted in hundreds by legal process, by compelled surrenders, by forced sales for trifling

sums—the price being very frequently paid by a receipt for fictitious or forgotten arrears. These men are being converted into “independent labourers”; and the number already evicted will form a very considerable addition to a class too numerous even now for the demands or resources of the country.”

This suggests a catastrophe as great as a comparison of the 1841 and 1847 figures show and much greater than signified by a drop of 42,000 in the number of farms.

To treat this whole question in a few pages is as impossible as to solve the problems involved on the basis of a limited range of research. The paper does not set out the mathematical difficulties which the various returns present. There are many not alone in the 1841 Census but also in the 1845 returns which require elucidation. When the problems are set out it will be possible to look at the figures more critically, but it is doubtful if the mathematical difficulties which they present will be solved by a simple appeal to differences between Irish and statute measure. More research is needed and should be possible. The Poor Law returns could be checked, for a number of unions at any rate, against rate books. The correspondence regarding the 1841 Census in the Chief Secretary's Office papers should be helpful as also the Board of Trade papers in London, because Larcom was in correspondence with officials of that office regarding his statistics. The surviving scraps of the 1841 Census may be of assistance while surely Larcom's manuscript records of the Census, which are the property of the Statistical and Social Inquiry Society, should be examined before any final conclusions are reached.

Mr. Kevin B. Nowlan, in seconding the vote of thanks, said: In stressing the uncertainty surrounding the use of the term “acres” in the statistical material surviving from the early eighteen-forties, Mr. Bourke has rendered a most useful service to the social and economic historian. I am not so sure, however, that Mr. Bourke has resolved in an altogether satisfactory manner the problems associated with the Irish potato acreage in the years 1844 to 1846.

In formulating his case, Mr. Bourke rightly lays stress on the constabulary reports covering 1846 and the previous years now in the Public Record Office, Dublin. I examined this material some years ago and I was, therefore, surprised to discover that Mr. Bourke does not quote, in the course of his paper, the total of the returns (partial) for the province of Ulster as given in the Constabulary reports.

I realise that the method of computing the Ulster figures may be difficult to control, but in a survey such as Mr. Bourke has presented, it is surely essential that the evidence should be given to the student in as complete a form as possible. The constabulary reports for the year 1846, in the Public Record Office, give a total of 253,650 acres as being under potatoes in the Ulster areas for which returns are available. Mr. Bourke does not use this total figure in his calculations but takes instead a significantly smaller sample of 187,456 acres which he calculates himself.

It is desirable that his extrapolation test, with the necessary safeguards, should be applied to the figure of 253,650 acres, which

is after all a contemporary total arrived at by the compilers of the summarised returns.

I must add that a similar discrepancy exists between the samples used by Mr. Bourke for 1844 and 1845 and the partial totals to be found in the constabulary returns for Ulster.

Not being a statistician, I hesitate to question at any length the methods employed by Mr. Bourke to calculate the total area under potatoes in Ireland in 1846. He seems to make, however, a rather challenging assumption in taking all "parishes and parts of parishes within the boundaries of baronies" as being of equal area for his basic calculations. I cannot say how great may be the margin of error involved in this method, but that such a margin exists is self-evident. Could not some more satisfactory method be evolved to avoid this source of error?

Mr. Bourke did well to draw attention to the interesting pattern he has found in the distribution of conacre land throughout the country. Without, however, a full examination of the complex problem of the uses to which conacre was put, especially the relationship between conacre and grazing, it would be unwise to draw any firm conclusions about the distribution pattern.

It is to be hoped that Mr. Bourke will go further with his arduous task of making as complete a survey of the Irish potato crop as possible.

Professor R. Dudley Edwards said: All historians should be pleased to come across new statistical information on the situation in Ireland just before the Famine. Mr. Bourke, however, challenges the acceptance as statutory measure, of acreage figures in the census of 1841, but he does not substantiate this in any convincing way. He is not entitled to assume that all the statistical material on acres of potatoes, cited in *Thom's Almanac* for 1847, pp. 191-2, are Irish acres. The reference under columns 5-8 gives a convenient equation enabling the computer to relate the size of families to the potato acreage in measurements locally understandable. Even in this instance, it cannot be assumed that acres are not statutory unless Mr. Bourke is able to establish this by independently checking the figures. Historically it must be assumed, as the law only recognised statute measure, that all official returns are given in that measure unless the contrary can be established. It is of course entirely proper to raise the question of which measure is employed having regard to the reference to the equation of Irish acres to the number of persons capable of existing exclusively upon potatoes.

In casting doubt upon the qualifications of Thomas A. Larcom in the conduct of the census, Mr. Bourke overlooks Larcom's substantial knowledge of the country through his many years' work upon the Ordnance Survey which made him both very fully conversant with the economic state of the country and gave him a wide knowledge of the square and linear measurements in use at that time. Larcom acquired this knowledge through his work of reducing all distances to statutory rather than Irish, plantation or Cunningham measure. Mr. Bourke admits he did not know of the published *Ordnance Survey memoir for county Londonderry*

which Larcom edited in 1837 under the supervision of Colonel Thomas Colby. This work gives particulars in detail about agricultural crops and has detailed tables regarding commerce and population. Mr. Bourke is therefore not entitled to assume that queries in the census regarding the extent of farms were merely included to "fill up the form". On the basis of the work collected for all the O.S. memoirs, published and unpublished, much of which is available in the Royal Irish Academy, Larcom, at the time of the census would have been concerned to extend the statistical enquiries commenced before the ordnance survey work had been restricted in 1840.

From a historian's standpoint, regarding the assessment of evidence, Mr. Bourke's method is inadequate. It challenges the figures in the census and, instead of proving they are incorrect, denies that Larcom, the official in charge, was correct when he specifically states that the agricultural data was compiled on a basis of statute acres and not Irish acres. It is, however, quite clear that Larcom was aware of this problem in 1841.

From a historian's standpoint more information collected by statisticians should always be treated with respect where the statistician is clear as to the basis upon which the figures he uses have been assembled. In the present case there is a danger that what the author establishes to his own satisfaction may mistakenly be taken for fact. We are not entitled to assume as factually established that the census of 1841 acreage figures relate to Irish acres and not to statute acres. Accordingly the argument in the first part of Mr. Bourke's paper, entitled "The data", particularly in the last three paragraphs, should either be given in the 1841 figures or removed to the second part of the author's paper entitled "Comment".

Two points may be added in regard to the author's comments. When Mr. Bourke queries the figures quoted by E. R. R. Green in his section of *The Great Famine* as regards the sudden change in the number of small holdings in 1847, he overlooks much evidence regarding the sudden effect of the famine on the decline of the local population through eviction, death and emigration. There is no case to be made regarding a lesser degree of dependence upon the potato, exclusively for subsistence in the generation after the famine, if the author is depending upon the opinion that in 1879 despite the potato failure there was no comparable catastrophe to that of 1847. In 1879 the Duchess of Marlborough's fund, the Mansion house fund and the Land League fund collected in America by Charles Stewart Parnell, prevented a recurrence of the catastrophe. The Land League's policy in 1880 was to employ trade union methods to prevent wholesale evictions. These historical facts have all to be considered before drawing any conclusion based upon an attempt to interpret the statistics regarding the changes in the people's habits as to food, in the first generation after the famine.

In regard to what the author says about county Leitrim in the generation before the famine, a series of documents in *Irish Historical Studies* (vol. ix, p. 300) make it clear that this county depended largely on the poteen industry to eke out an existence

because of the unusually poor quality of the land. When the revenue commissioners stamped out the poteen manufacture, local land agents found it impossible to collect rents. The author may find this fact makes less of an exception of county Leitrim.

Historians would agree with the author that the statistics preserved in the Irish Public Record Office, in the Constabulary Papers, as to the amount of land under potatoes in 1845-6 should be published. In fact, a competently edited reproduction of this material should, more properly, precede any attempt such as the present to expound them, Mr. Bourke might agree that scholars would be more able to understand his argument if the material upon which it was based were to be published in its full details, in the first instance. I make this statement in all awareness that it is only too easy to appear to be defending an existing viewpoint which could block the further pursuit of knowledge. But I am convinced that Mr. Bourke has not gone about this question in the best way.

Dr. M. D. McCarthy, in associating himself with the vote of thanks to Mr. Bourke, welcomed this example of the use of statistics in historical research and suggested that, as these methods had been widely applied in recent years in other countries in studies of what is called Economic Growth, there was a large field open for exploitation in Ireland, particularly in the nineteenth century for which there was much basic material readily available. The quantitative examination of historical problems, where the data were available, could be most illuminating and the decline in potato acreage from 2½ million acres in 1845 to 284,000 in 1847 with the drop in the estimated produce gave the speaker a better picture of what the Famine meant than any other single fact.

While the figures for holdings classified by acreage in the 1841 Census returns clearly required examination it had to be remembered that they constituted only a very small ancillary inquiry in a large Census, the great bulk of which was a model of how such investigations should be made and which measured up not only to the standards of the time, but compared very favourably with most modern Censuses of Population. In fact the acreage inquiry was even more subsidiary than one might gather from Mr. Bourke's paper. The information in question was got not from the ordinary Household Schedule (Form A) but on what was in effect a Control Form (Form B). To get the information on Form A the enumerator had to distribute the Forms to the households, to check and, if necessary, complete the forms himself and was empowered to ask the necessary questions at this end. In the case of the Farm data on the Form B, however, the instructions specifically said "These columns, the Enumerator must fill according to his own observation, and the best information he can procure".

It is quite clear that by inserting any reasonable averages for the areas of farms in the various size groups in the returns of the 1841 Census they do not check with the total area of the country. And this remains true even if the acres are Irish acres. It may be true, and probably is as Mr. Bourke suggests, that the farms were

predominantly returned in Irish acres. It does, however, seem that in addition to this there are other difficulties.

In the Form B of the 1841 Census there were the three columns, under the general heading "No of Acres", with titles "Arable", "Pasture" and "Waste". There was no column for "Total Acreage" and it is difficult to see how the total acreage could have been used as an index of classification unless special computations were made and the acreages inserted on the forms. This may have been done, but it is also possible that either the entry in the "Arable" column alone or the total of the "Arable" and "Pasture" columns was used for the purposes of the classification. Either of these would mean that the acreage was understated and equally, even if the total of the entries on the Form B were used, an understatement might have occurred by the omission of "Waste" land from the original return. This latter is not unlikely to have happened in many cases. A check by computing the estimated total area from the published table for different regions might indicate whether or not this factor was operative since it would lead to a greater understatement in the more "mountainy" regions than in others.

Mr. Bourke (partly communicated) :—

I thank many of the speakers for their kind remarks on the paper, and for their useful contributions to the subject. An encouraging and significant fact is that reaction against the paper has come from the historians, and not from the objective statisticians.

It is understandable that some historians should be slow to abandon the interpretation of the 1841 Census figures for farm size as being in statute acres, an interpretation on which so much of their analysis of the effect of the Great Famine on agricultural life had been based. However, some more solid argument than the confused and at times arbitrary statements of Professor Edwards is necessary if these figures are to be re-established as even an approximation to the true position in 1841.

Candidly, I do not understand his point with reference to the calculation in *Thom's Almanac* for 1847. The argument that, if one Irish acre will support 5 persons, X acres will support 5X people is unsound unless X is expressed in Irish acres. It is as simple as that.

The bald claim that the law of the time recognised only statute acres is historically untrue. See, for instance, Appendix 104 to the Devon Report, which lists in detail the units of area used in ejection cases before the Irish Courts in the period 1839-43. (Incidentally, it is possible from this Appendix to deduce the approximate extent of the use of the different "acres" in Ireland as a whole during this period as follows :—Irish, 80% ; statute, 16% ; Cunningham, 4%. With these proportions, treating a "mixed" acreage return as purely in Irish acres will give an overestimate of 8% ; treating it as entirely in statute acres will give an underestimate of nearly 35%. So that while the "truth may lie between the two estimates", it lies far closer to one than to the other).

I do not cast doubt on Larcom's undeniable qualifications: I merely reject the interpretation of the farm size returns in the 1841 Census as being in statute acres. I have quoted in full Larcom's official comments on these figures. Nowhere, in commenting on the 1841 Census data, does he (in Professor Edward's words) "specifically state that the agricultural data was compiled on the basis of statute acres".

I knew of the Londonderry (1837) Ordnance memoir but had not consulted it prior to presenting my paper. I have since examined it and found nothing counter to the content of the paper.

The argument in the section "Part 1—The Data" of the paper makes no use of the 1841 Census farm-size figures; Professor William's criticism on this point is therefore irrelevant.

Many of the points made by the speakers are, in fact, dealt with in the paper. I would ask the historians to reread the text without preconceived prejudices and taking into account, not subtle statistical concepts, but only the inexorable requirements of simple arithmetic. They will then be convinced, I am sure, that the traditional comparison of farmsizes, as expressed in the table given in paragraph 4 of the Appendix to the paper, raises difficult and, in some cases, insuperable problems, e.g. :—

- (1) The fall of 171,334 in the number of smaller farms, representing the elimination of more than half the families in this group in a relatively short period of full famine conditions, is inconsistent with the fall of less than 51,000 in the same group in the four years 1847-1851, during which distress continued at a very high level.
- (2) In view of the general similarity of life of all small holders, there is a further inconsistency in the fact that the wiping out of the smallest farms is shown as being accompanied by an *increase* in the next larger group, and a doubling of the number in the 15-30 acre category.
- (3) Consolidation of holdings, already going on before the Famine, was speeded up by that catastrophe. Yet the figures show an increase, not a decrease, in the total numbers of holdings above one acre.
- (4) The elimination of holdings up to 5 acres released a certain amount of land, which, at the most generous estimation, must fall short of a million acres. However, the creation of extra holdings of above 30 acres to the extent shown would require a minimum of three million acres. The 1847 figures represent a far greater total area of farmland than the 1841 Census returns, interpreted as statute measurements. This is the decisive factor which condemns the earlier figures.

Unfortunately, the fact that the 1841 Census figures are predominantly in Irish acres is, as explained in paragraphs 7 and 9 of the Appendix, not the whole story of the deficiencies of these data. It is uncertain what definition of farm size was used in working up the 1841 returns, but it seems very likely that farm size was arrived at by adding "arable" to "pasture" and ignoring

“waste”. This tended, of course, to reduce the apparent extent of holdings, especially in the case of large estates, and explains why, as mentioned by Mr. O’Neill, the number of farms above 30 Irish acres (49 statute acres) in the 1841 returns was given as only 48,623 as against 70,441 holdings above 50 statute acres in the Poor Law Returns.

Both the use of Irish acres and the neglect of “waste” within the farm tends to exaggerate the fragmentation of holdings in the 1841 Census figures. The accepted numerical picture of the structure of pre-famine land tenure collapses with the 1841 farm-size data, and requires to be reconstructed on a sounder basis. The appendix to the present paper does not purport to give the complete answer, which must await a deeper and more comprehensive statistical and historical survey. Should any of the University people present consider assigning the subject for postgraduate investigation, I should be happy to make available far more material than it was possible to incorporate in the Appendix to the paper.

Mr. O’Neill’s problem regarding holdings of less than one acre in the Poor Law returns is based on a misunderstanding. As reference to the detailed table in Appendix No. 94 of the Devon Report will show, in many places no attempt was made to break down the “total” of such holdings into the sub-heading of “Gardens, where separately returned” and “For general tillage”; hence the over-all total for the country is not equal to the sum of the two sub-totals. However, there are obvious difficulties in enumerating such small patches of land, and, in fact, no attempt was made subsequently to collect returns of holdings less than one acre in extent.

Dr. Nowlan had asked why the partial totals of land under potatoes in Ulster, as given in Column 3 of Tables 2, 3 and 4, differ from those given in the provincial summary in the papers in the Public Records Office. The reason, as given in paragraph 6 of the main paper, is the absence of forms (b) for Ulster. The conversion into acres of the returns given in the form of fractions would be a considerable task. Accordingly, in the case of Ulster, use has been made only of the returns in numerical form, with a corresponding reduction in the number of usable returns and of the partial total.

Because of the size of the sample available for almost every county, it was considered that even the relatively crude method of extrapolation gave reasonably accurate results. A more refined method could be based either on population or area, but it was doubtful if the work involved would be justified by the increased accuracy of the results.

The suggestion that quantitative information on the pre-Famine potato crop added nothing to our existing knowledge of the dependence of the people on the potato as a foodstuff was surprising, coming from a historian. Surely the very fact that pre-Famine Ireland lived in a potato-based economy made it desirable to obtain as detailed and accurate a picture as possible of that crop. It seemed very possible that better knowledge of the variations in the

extent of land under potatoes in the years 1800-1845 might throw much light on problems of economic history in that period.

Several interesting contributions on the subject of conacre had been made in the discussion. Modern conacre conditions (as described, for instance, by V. Bruce Proudfoot in *Irish Geography*, Vol. III (1956), pp. 162-7), are radically different from those of conacre taken to grow a subsistence crop of potatoes before the Famine (see E. Carroll's "Observations on the conacre system," *Irish Farmer's and Gardener's Magazine*, Vol. II (1835), pp. 9-12).