

The Development of Market Gardening in Bedfordshire 1799-1939¹

By F. BEAVINGTON

THE early history of commercial vegetable production in Bedfordshire antedates parliamentary enclosure by at least two centuries. Its nature, gardeners, and location in the cottage closes and on specific unenclosed land of one parish, Sandy, are reconstructed from a variety of documentary sources and discussed in an earlier paper in another journal.² Several references testify to the antiquity of the industry. A Sandy glebe terrier of 1708 describes "a piece of ground lying on the South side of the great barne commonly called the Redish ground and always in the occupation of a Gardiner."³ The industry was already established a century earlier when, in 1610, "William Spring, gardener of Sandy, bought one acre between the croft late Walt. Swetman's and the spinney called Shillonde, abutting north on Lincoln cross."⁴ This paper traces the evolution of market gardening in Bedfordshire during 140 years of economic and technological change from enclosure to the emergence of the present system of extensive production of vegetables. The growth is considered in three periods: 1799 to 1850, the pre-railway period; the mid-century to 1918, the period of railway transport and of great development of traditional market gardening; and 1919 to 1939, during which the foundations of the present system of vegetable production were laid.⁵

GARDENING AT ENCLOSURE

The site of Sandy village lies between the small northward-flowing River Ivel and the south-east facing slopes of the Lower Greensand plateau that rises 100 feet or so above the river, whilst the parish of Sandy extends over the broad Ivel valley and on to the Greensand plateau. Fig. 1 shows the location of Sandy and twenty-nine other parishes which, by the 1930's, broadly contained the market-gardening district. They are situated on the terraces of the Ivel and Ouse valleys and on the Lower Greensand east and west of Sandy, designated Eastern Greensand and Western Greensand respectively. The Ivel and Ouse terraces are built characteristically of layers of gravels and sandy materials that form a total thickness of 6 to 10 feet and contain a fluctuating water table. The surface soils are sandy, though with a clay content of 10 to 20 per cent, and many pieces of gravel. The soils of the

¹ My thanks are due to Professor H. C. K. Henderson who, some years ago, stimulated my interest in this work.

² F. Beavington, 'Early Market Gardening in Bedfordshire', *Trans. Inst. Brit. Geog.*, 1965, xxxvii, pp. 91-100.

³ Beds. C.R.O. ABE/2: account of the Rights of the Rectory and Church of Sandy.

⁴ Beds. C.R.O., PM 263.

⁵ This article is based on F. Beavington, 'Market Gardening in eastern and central Bedfordshire', unpublished Ph.D. thesis, University of London, 1961, ch. II, but also embodies a good deal of evidence collected over the past two years on a number of aspects outside the scope of that work.

Greensand are deep sands and loamy sands with 6 per cent clay and low natural fertility. They drain freely to a deep water table.¹ Large areas of the Eastern Greensand, for example, the eastern part of Sandy parish, were mainly under heath vegetation until the later nineteenth century;² such land is especially poor. Two fields are more clayey, and corroborated evidence shows the land was marled in the 1880's; there was probably little or no previous marling on the Greensand here, however.³ The soils of the Ivel and Ouse terraces are now classified as gleyed brown earths of the Biggleswade and Milton Associations, and those of the Greensand as brown earths of the Cottenham Association.⁴ On this range of sandy soils market-gardening cultivation in Bedfordshire spread during the nineteenth century.

The Act of enclosure for Sandy was passed in 1798 and the Award signed in 1804. The significance of the industry at enclosure and in the following decade was witnessed by the authors of five topographies.⁵ They testify to the unusual spectacle of this island of intensive gardening. Cooke, for example, writes in 1810,

Sandy ... is much noted for its gardens; ... it is a curious ... sight to behold crops of onions, potatoes, French beans, and even whole fields of cucumbers intermixed with crops of wheat, barley and turnips.⁶

Batchelor says that Sandy cottagers commonly sowed onions with drills;⁷ even so the little freeholds were cultivated largely by spade and hoe;

Carrots they sow about Ladyday on ground dug one spit deep, they hoe them very carefully about three times; ... and get on a medium a crop of two hundred bushels upon an acre. Of onions they sow vast quantities ... they always manure them with great care ... the average crop is about 200 bushels.⁸

The range of marketing clearly included London, being said to extend "in all directions up to 60 miles and sometimes still further," and "from Hertford to the metropolis."⁹ Hired labour was common, and for the three hoeings of carrots, "the work by the day comes to nearly two pounds per acre." The rents the gardeners paid were high, "two to three pounds per acre," whilst a field at Biggleswade, manured

¹ F. Beavington, 'Particle size distribution of the surface soil on the Lower Greensand in eastern Bedfordshire', *East Midland Geographer*, xxxviii, 1972, pp. 315-16.

² T. G. Bonney, *Geology of Cambridgeshire*, Cambridge, 1875, pp. 22-3.

³ Beavington, thesis, pp. 216-18. Soil analysis showed twice the normal clay content at the present day. See J. D. Chambers and G. E. Mingay, *The Agricultural Revolution 1750-1880*, 1966, pp. 62-3, for further reference to marling.

⁴ D. W. King, *Soils of the Luton and Bedford district*, Soil Survey of Great Britain, Harpenden, 1969, pp. 15-20.

⁵ C. Bruyn Andrews (ed.), *The Torrington Diaries, 1781-1794, containing the tours through England and Wales of the Hon. J. Byng*, II, 1938, p. 280; J. Britton and E. W. Brayley, *The Beauties of England and Wales*, 1801, p. 78; A. Young, *Annals of Agriculture*, 42, 1804, p. 28; T. Batchelor, *General View of the Agriculture of the county of Bedford*, 1808, pp. 456-7; G. A. Cooke, *Topographical and Statistical Description of the county of Bedford*, c. 1810, pp. 18-19. A summary of the gardening industry in Bedfordshire at the time of enclosure, drawn from these and other sources is given by Beavington, 'Early Market Gardening ...', *loc. cit.*, pp. 91-100.

⁶ Cooke, *op. cit.*, pp. 18-19. ⁷ Batchelor, *op. cit.*, p. 457.

⁸ Cooke, *op. cit.*, pp. 18-19. This yield of about 4½ tons per acre of onions is very poor in terms of production of the present day when 15 tons per acre is regarded as a good average yield.—Priv. comm., Mr J. Davies, Ministry of Agriculture, Huntingdon.

⁹ Cooke, *op. cit.*, p. 19.

and cleaned, was let for growing potatoes and onions at £5-£6 an acre.¹ The vegetable crops were grown in cottage gardens, old enclosures within the village, and on the former unenclosed land, Chester Field.² Reference to gardening in other parishes of the present market-gardening area are few at this time, and none exists for many parishes.³ Batchelor (1808) refers to "good garden ground where sandy soil prevails" at "Biggleswade, Clophill and Maulden."⁴ The paucity of references of all kinds shows that gardening in these parishes at the beginning of the nineteenth century was in a secondary position. Sandy was the outstanding centre and was to remain so for the next fifty years at least.

GROWTH TO 1850

Although the northern part of the parish of Sandy extends on to the Oxford Clay lowland, there are several hundred acres of well-drained sandy land on both the Lower Greensand and the Ivel gravel terraces (fig. 1). The enclosure map shows that most of this sandy land, which subsequently became devoted to market gardening, had been held in the common field system.⁵ Much of this area, however, was not cultivated until the last quarter of the nineteenth century.

Arthur Young refers to sixty-three small proprietors at Sandy at the time of parliamentary enclosure. Fundamental changes had been forced on the little gardening enterprises: "These men kept cows on the boggy common, and cut fern for litter on the Warren, by which means they were enabled to raise manure for their gardens, besides fuel in plenty; the small allotment of an acre and half, however good the land, has been no compensation for what they were deprived of. They complain heavily and know not how they will manage to raise manure."⁶

There is little evidence of the immediate effects of enclosure on the number of these small proprietorships. According to Sandy's enclosure map they were between 2 and 5 acres and were distributed continuously along the Greensand slopes of the former Chester Field. Some were on the Ivel terrace along the Great North Road though most of this land was in large allotments. It is not possible to confirm from the enclosure map whether the small holdings are gardens. However, the lists of Sandy Jurors⁷ make it possible to identify two proprietors, John Underwood and William Sutton, as gardeners. Their land is shown on the enclosure map as three pieces of 1½ acres, 5½ acres, and 1½ acres (old enclosure) for Underwood, and three pieces of 7 acres (including 4 acres bought at enclosure), 2 acres, and 3 acres (old enclosure) for Sutton. Underwood's land was on the Greensand slopes and Sutton's was on the river terraces where his 7-acre plot comprised two of the new allotments. Another gardener, Thomas Hart, also occupied one of these.

¹ Batchelor, *op. cit.*, p. 457. ² Beavington, 'Early Market Gardening . . .', pp. 93-6.

³ Pre-enclosure references to gardening are found for Old Warden, 1673, Beds. C.R.O., ABP/W/1673/89, and 1727, Old Warden Parish Register 1727 (Beds. C.R.O.), and for Maulden a tithe arrangement in respect of vegetables at Maulden, Beds. C.R.O., ABE/2.

⁴ Batchelor, *op. cit.*, p. 457.

⁵ Enclosure Commissioners' map for the parish of Sandy (Beds. C.R.O.), and Beavington, 'Early Market Gardening . . .', *loc. cit.*, 1965, p. 94.

⁶ Young, *op. cit.*, p. 28. ⁷ Beds. C.R.O., RJ1-46 (Sandy).

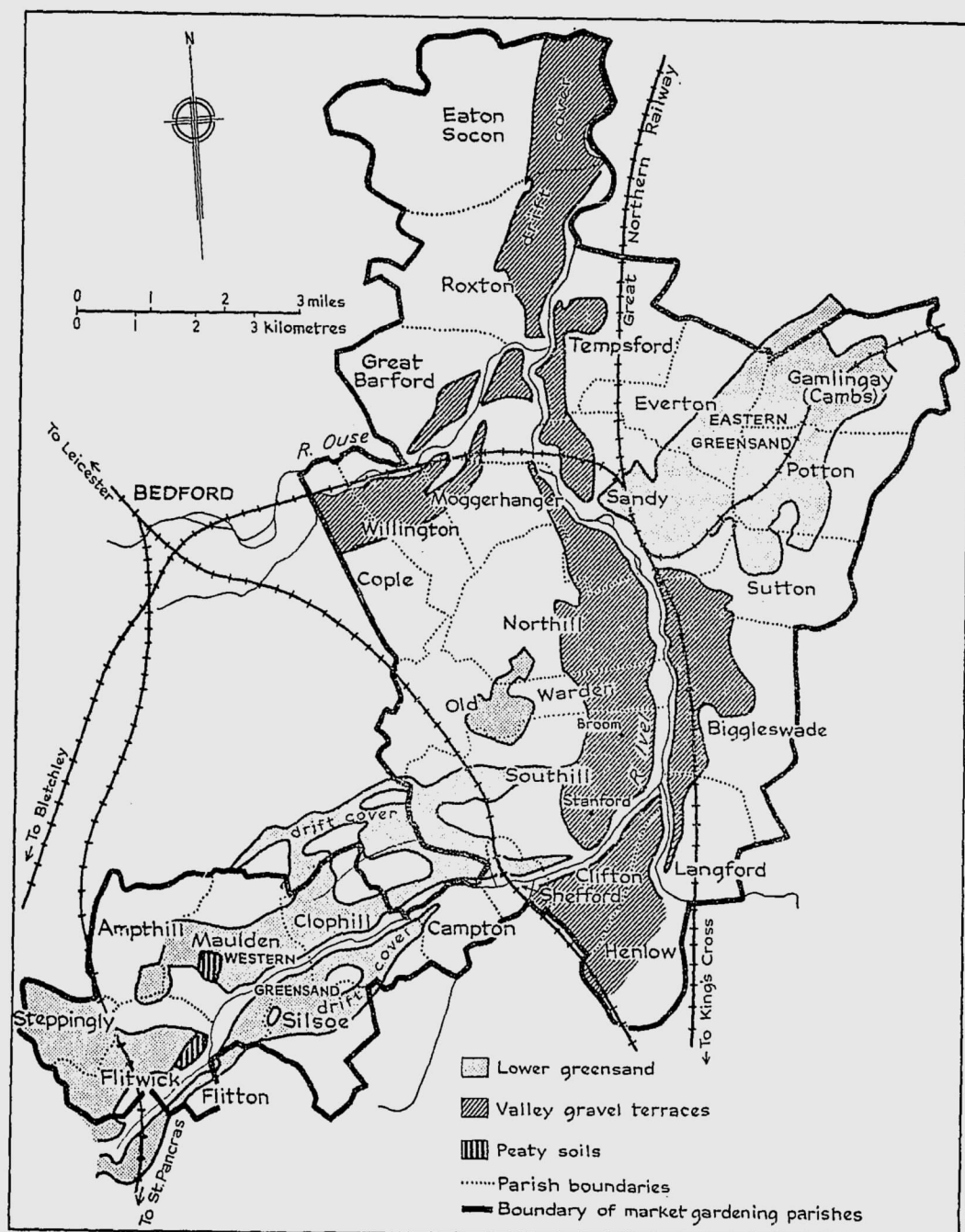


Fig. I

Location map showing the parishes of the market-garden area by the 1930's, the distribution of sandy land, and the railway network.

In the fifty years that followed enclosure there are four independent records of the number of gardeners, the lists of jurors for Sandy, the Sandy Parish Register, wills of gardeners, and the decennial census of 1841; evidence of the acreage and location comes from the Board of Trade, topographies, and tithe documents. Some sources relate to all the market-gardening parishes, others to particular ones.

The list of jurors for Sandy for the period 1780 to 1830¹ shows that there was a marked increase during the second decade of the century in the percentage of jurors denoted as gardeners (table 1).

TABLE I

	<i>Total jurors</i>	<i>Jurors denoted as gardeners</i>	<i>Percentage of jurors denoted as gardeners</i>
1780	12	2	16·5
1785	13	2	15·4
1798	9	2	22·2
1800	13	2	15·4
1810	28	7	25·0
1820	28	17	60·7
1830	23	14	60·9

From 1813 to 1830 the incumbent of Sandy entered fathers' occupations in the baptisms section of the parish register.² This record shows that 12 per cent of the children recorded between 1813 and 1819 were born to gardeners, whilst for the period 1820 to 1830 the corresponding figure was 19 per cent. Altogether, fifty-five different men were recorded as gardeners from 1813 to 1830 in Sandy. Assuming that the birth-rate in gardeners' families was not appreciably different from that in other families, then there was an increase not only in gardeners but in sons to follow their fathers' occupation.

The decennial census returns included occupations for the first time in 1841, but there are difficulties in extracting accurate data.³ Table IV includes every adult who seemed to be a market gardener. Sandy had 58 gardeners in 1841, and even if some allowance is made for this figure being too high there would seem to be more gardeners in 1841 than in the period 1813 to 1830. Biggleswade appeared to have 49 gardeners but this figure, which is not in accord with other data, is discussed below. Other parishes with notable populations of gardeners in 1841 are Potton (21), Maulden (22), Northill (19), and Eaton Socon (16).⁴

The number of surviving wills proved between 1800 and 1850 of gardeners in the market-gardening parishes indicates the importance of gardening in Sandy (table II), and provides a measure of the prosperity of the gardening industry.⁵ The

¹ *Ibid.* ² Held by the Rector, Sandy Parish Church.

³ P.R.O. There is not always a clear distinction between "gardener" and "gardener's labourer," a child of a gardener is described as "gardener," and the return is generally of poor quality, parts being almost illegible.

⁴ Beds. C.R.O., parish wills file. ⁵ *Ibid.*

wills for Sandy showed that nearly all these gardeners owned a cottage, garden land, and often outbuildings. Of the more well-to-do gardeners, William Sutton (1838) owned two cottages and 24 acres, John Marshall's estate (1807) was valued at £180, and William Bean's (1820) at £550, while John Skilleter (1819) left his widow a legacy of £40 per annum. Eight wills specified the area of land, the average being 7 acres.

TABLE II
NUMBERS OF SURVIVING WILLS OF GARDENERS,
1800-50

	Gardeners' wills	Total wills
Sandy	26	72
Biggleswade	6	52
Potton	2	55
Maulden	1	42

The estimates of the acreage of garden land in Sandy indicate a considerable increase during this period. In the 1790's it was reported as "three score and upwards but increases considerably,"¹ in 1801, "above 150 acres,"² whilst in 1810 "upwards of 200 acres."³ An agricultural return of 1835 was made to the Statistical Department of the Board of Trade for Sandy and four other gardening parishes.⁴ The investigator specified gardens under "other land," and "domestic gardens" were probably included. For Sandy the 493 acres of gardens and homesteads confirm that this parish was still the main centre of gardening, whilst 503 acres of waste show that the Greensand was largely uncultivated; 255 acres of "gardens" were recorded for Potton, and 140 for Blunham with Moggerhanger.⁵

The number of gardeners in 1841 and the acreage of gardens in 1835 indicate the average size of market gardens. These averages, 12 acres for Potton and 8½ acres for Sandy, compare closely with the size of the holdings of Sutton (12 acres) and Underwood (8½ acres).

In Biggleswade and three minor market-gardening parishes tithes were not commuted on enclosure, and the distribution of gardens can be accurately mapped from the Tithe Redemption Commissioners' map and schedule.⁶ The latter includes the

¹ Batchelor, *op. cit.*, p. 457. This is an answer in a questionnaire issued in the mid 1790's, by Sir John Sinclair, President of the Board of Agriculture.

² Britton and Brayley, *op. cit.*, p. 78. ³ Cooke, *op. cit.*, pp. 18-19.

⁴ Published in *J. R. Statist. Soc.*, 1 (1838), pp. 89-96. Bedfordshire was chosen for a pilot survey. Questionnaires were sent direct to the clergy, but returns were received for only twenty-seven of the 126 parishes. The complexity of the forms, with fifty-two questions, and the unofficial approach (the Home Office had arranged the completion of the nine-point 1801 returns through the diocese) led to the failure of the scheme. See also D. B. Grigg, 'The changing agricultural geography of England: a commentary on the sources available for the reconstruction of the agricultural geography of England, 1790-1850', *Trans. Inst. Brit. Geog.*, xli, p. 82.

⁵ The form for Northill was completed very loosely. The parish was a gardening centre but the round figure of 500 acres of "gardens" conflicts with other evidence and is disregarded.

⁶ Tithe Redemption Awards and maps for the parishes of Biggleswade, Cople, and Willington are held at the Beds. C.R.O., and for Gamlingay at the Tithe Redemption Office.

acreage of each parcel of garden land as one of some four categories of agricultural land use, whilst the map delineates and numbers the fields and shows settlement. Table III gives the acreage of gardens in the four parishes, and fig. II shows the tithe map for Biggleswade (1838), with the 37 acres of gardens and the arable and grass fields reconstructed from the Award. The gardens are clustered within and around the village core. Only one piece of 5 acres lies more than half a mile from the market square. The rest of the agricultural land including the Ivel terraces was in medium and large farms, with gardening still a small industry. The figure of 49 gardeners which the 1841 census appears to show for Biggleswade (only 9 fewer than at

TABLE III

	<i>Number of gardens over half an acre</i>	<i>Total acreage of gardens over half an acre</i>	<i>Largest (acres)</i>	<i>Average (acres)</i>
Biggleswade	14	37	6 $\frac{3}{4}$	2.6
Cople	6	9 $\frac{3}{4}$	2 $\frac{3}{4}$	1.6
Willington	5	6	1 $\frac{1}{2}$	1.2
Gamlingay	3	5	2 $\frac{1}{2}$	1.7

Sandy) cannot be reconciled with the tithe Award of only three years earlier, nor with the dearth of gardeners' wills for Biggleswade (table II).¹ The Award cannot be discounted for it is a meticulous document with garden land clearly distinguished since there had been a special tithe payment for vegetables.²

The nature of the sources during this period ensures a certain amount of controversy on the development of the gardening industry. Nevertheless, it is clear that there were increases, probably marked increases, particularly during the second and third decades of the nineteenth century, in the number of gardeners and in the acreage of gardening land in Sandy. Gardening in other centres grew steadily during the first half of the nineteenth century, but the Bedfordshire gardening industry which had been nurtured in Sandy for over two centuries was still largely concentrated there. The industry had been carried on continuously throughout this half-century on small, family enterprises and there is no evidence that parliamentary enclosure led to the elimination of the small yeoman gardener. Indeed, in Sandy enclosure allowed some gardeners to increase their acreage with former unenclosed land on the Ivel terraces. Moreover, the financial turnover of many gardeners must have been quite considerable. This is indicated by the intensive nature of inputs and outputs including the high rents and labour costs, and by the marketing

¹ The difficulties of the 1841 census have already been mentioned. The figure of 49 may include gardeners' sons, labourers, and those who sold produce from their cottage gardens.

² The Vicar of Warden wrote in the parish register (Beds. C.R.O.) in 1727, concerning tithe charges "the Gardiners pay me five shillings per annum for an Acre of Garden ground. N.B. Some of the Gardiners at Sandy pay eight shillings per Acre." See also H. C. Prince, 'The tithe surveys of the mid-nineteenth century', *Agric. Hist. Rev.* vii, 1959, pp. 14-26, who discusses the accuracy of the tithe documents.

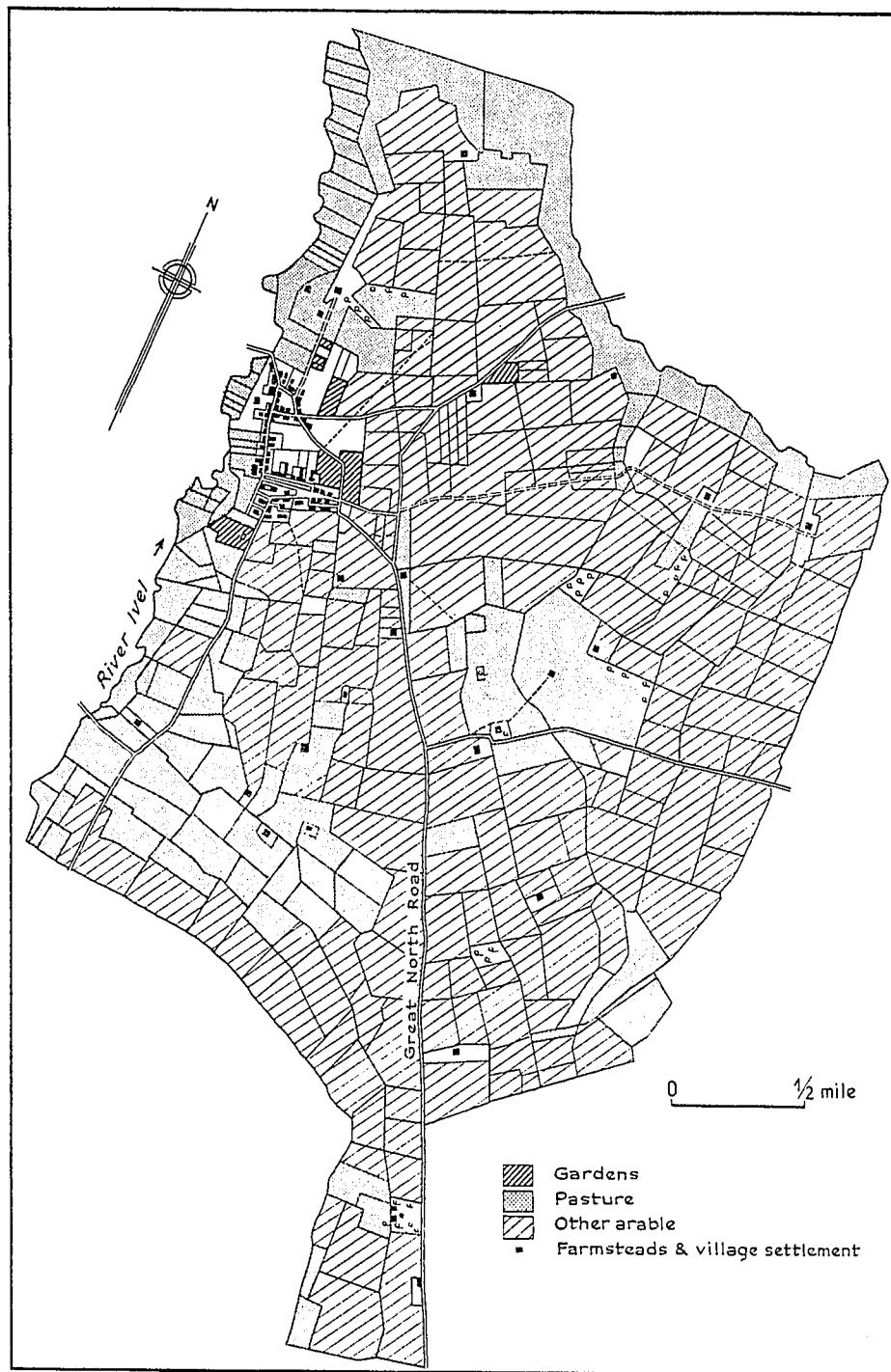


Fig. II

Agricultural land use in the parish of Biggleswade in 1838, reconstructed from the tithe map and Award. The Ivel terraces (fig. 1) which by the 1920's were mainly devoted to market gardening were largely under arable farming in 1838.

arrangements. The contention that gardeners as a group were prosperous is also supported by the large number of Sandy jurors who were gardeners and by the surviving wills of gardeners. Clearly gardeners were prominent among the land and property owners and did not belong to the poorer classes.

PERIOD OF RAILWAY TRANSPORT

For seventy years from the mid-century to the end of the First World War the railways of Bedfordshire (fig. 1) played a vital role in the growth and location of the market-gardening industry. The important line was the Great Northern, built from King's Cross to York along the Ivel valley through Biggleswade and Sandy and opened in 1851. Six years later, a supplementary line was constructed by Captain Peel "from the Great Northern station at Sandy to Potton . . . for use of London manure by his tenants . . . and taking from thence passengers, garden produce etc."¹

In 1857 the Midland Railway built a line from Leicester to join the Great Northern at Hitchin via Bedford, Southill, and Shefford, and in 1868 extended the line from Bedford via Ampthill and Flitwick to St Pancras. A contemporary author states "The Great Northern which runs through the heart of these market gardens has proved a most valuable acquisition . . . [whilst] . . . the Leicester to London [line] . . . will complete the accommodation both in the carriage of their goods and in the supply of manure."²

The railways brought three major advantages to the Bedfordshire market-gardening industry. Far quicker journeys were afforded to London, an already established market, new markets were opened up in the Midlands and north, and vast quantities of horse manure were brought from the railway stables in London to the sidings in Bedfordshire where it cost from 1s. 3d. a ton³ (plus carriage of 6s. or 7s. a ton).⁴ It is claimed that dependence on these heavy imports of manure "concentrated (market gardening) within two miles of the railway sidings."⁵ The most suitable soils, however, were generally no more than two to three miles from the sidings, except on the Western Greensand where market gardening remained a small industry during this period. A similar control is reported in the case of potato growing in Hertfordshire. Here a charge of 4s. 6d. a ton for manure, including carriage,⁶ confirms the charge at Sandy station if allowance is made for the greater distance. There is little contemporary evidence of the immediate impact of the railway on the industry. It is likely, however, that down to the late 1880's a decreasing quantity of vegetables was sent by horse and cart to London.⁷ In this period of railway transport evidence is considered for the industry's expansion, its intensive character, and the development of small holdings.

The magnitude of the industry's expansion during the second half of the nine-

¹ *Herepath's Journal*, 30 May 1857, British Transport Commission Archives.

² W. Bennett, 'The Farming of Bedfordshire', *J.R.A.S.E.*, xviii, 1857, p. 8.

³ Evidence in interview, in Aug. 1959, with Mr G. Truin, retired market gardener of Sandy.

⁴ H. Evershed, 'Market Gardening', *J.R.A.S.E.*, vii, 1871, p. 432. ⁵ *Ibid.*, p. 432.

⁶ J. T. Coppock, 'Agricultural Changes in the Chilterns, 1875 to 1900', *Agric. Hist. Rev.*, ix, pt 1, 1961, p. 15.

⁷ Evidence in interview with Mr G. Truin,

teenth century is shown by the evidence of contemporary writers, estate papers, and a variety of statistical data. In 1857 the "eastern part of Bedfordshire" contained "some of the finest market gardens in the kingdom," but the writer does not mention gardening in the parishes he visited in the Ivel valley north of Sandy, or in the Ouse valley, or on the Western Greensand.¹ Evershed in 1871, affirms an increase in market gardening "due to the increased population," and refers to many "garden farmers" with under 10 acres and others with 10-50 acres.² The main growth, however, was still to come.

In 1906 it was claimed "the area has greatly increased—the output is said to have quadrupled—during the last 20 years." Large farms had been divided into small holdings and "entire villages converted into market gardens."³

The growth in the later nineteenth and early twentieth centuries involved all four major areas, the Eastern Greensand, the Ivel terraces, the Ouse terraces, and the Western Greensand.⁴ In 1912 an agricultural survey of the former heaths of the Eastern Greensand between Sandy, Potton, and Gamlingay referred to the "wonderful changes" since 1875 when this land was described as "So sterile . . . that in places it can support little but Scotch fir."⁵ The five-mile-long terrace between Shefford and Sandy that includes the villages of Stanford and Broom (fig. 1) was developed for market gardening "at the turn of the century."⁶ Elsewhere in the Ivel valley large farms had become market gardens by 1914, comprising an "in-filling" of the established area.⁷ In 1901, an area of 4,056 acres of river terrace and clay land in the Ouse valley, consisting of the parishes of Willington and Cople, was sold from the Bedford estate and resold in farms and small holdings.⁸ About half the acreage became market gardens, and a station was opened on the railway at Willington for market-garden traffic.⁹ Between 1909 and 1911 there were sales of a further 1,277 acres of the Bedford estate in Maulden on the Western Greensand.¹⁰ The land was divided into small holdings and most of them became market gardens. In both newly developing areas many holdings were taken by growers from Sandy and Biggleswade.¹¹

¹ Bennett, *loc. cit.*, pp. 8, 18. ² Evershed, *loc. cit.*, p. 432.

³ E. A. Pratt, *Transition in Agriculture*, 1906, p. 104.

⁴ Market gardening did not spread on the Greensand west of Ampthill, however. Most of this land was in the Bedford estate, and remained so.

⁵ T. Rigg, 'Soils and crops of the market garden district of Biggleswade', *J. Agric. Sci.*, VII, pt iv, 1916, pp. 397-9. Fieldwork of this survey was carried out in 1912-13.—Priv. comm., Sir Theodore Rigg.

⁶ *Ibid.*, p. 399.

⁷ Report of H. Trustram Eve (surveyor) in First Annual Report of Bedfordshire County Council Smallholdings and Allotments Committee, July 1910.

⁸ Bedford Office, Bedford Estate Papers. The documents include a letter to the Duke of Bedford from his agent recommending a sale *en bloc* so that the good land would sell the bad. The land was purchased and resold by Keebles, brick-makers of Peterborough.

⁹ Pratt, *op. cit.*, p. 104.

¹⁰ Bedford Office, Bedford Estate Reports, 1909-11, and Bedfordshire County Council Smallholdings and Allotments Committee Reports. There were three separate sales of 231 acres, 675 acres, and 371 acres in Maulden.

¹¹ A. Ransom, 'Agriculture' in W. Page (ed.), *The Victoria History of the Counties of England: A History of Bedfordshire*, II, 1908, p. 138. Mr A. J. Woodward whose father took a small holding in Maulden in 1911 confirmed in interview that other growers also moved from Biggleswade to Maulden at that time.

Fieldscale production of certain vegetables was common by the turn of the century. Many farmers with suitable land took advantage of the local skilled labour and vegetable marketing channels to include crops of brussels sprouts, potatoes, and onions in their rotations. Others sub-let "their best fields to the market gardener."¹

The maps from Rigg's meticulous survey,² four of which are shown in fig. III, illustrate the extent of market gardening by 1912. Some vegetables, such as onions and parsley, were concentrated almost entirely on the Ivel terraces; others, such as white turnips, were largely confined to the Eastern Greensand; whilst others, particularly early potatoes, were distributed widely over all the sandy land. Production of most vegetables ended abruptly at the boundaries with the adjoining clay land. Brussels sprouts, however, had spread on to the adjoining farmland.

The extent of the industry's growth in this period, 1851-1919, is further confirmed by evidence from the agricultural and population censuses, and railway goods tonnages. The agricultural censuses show an increase from 3,885 to 7,997 acres between 1885 and 1896 in respect of land in Bedfordshire "used by market gardeners for the growth of vegetables and other garden produce," (fig. IV).³ About 90 per cent of the market-garden acreage in Bedfordshire each year was located in the thirty parishes. The corresponding information for the surrounding parishes emphasizes this concentration.

Evidence from the population censuses (table IV), shows a 66 per cent increase in the number of gardeners between 1851 and 1901 in the three main parishes. These figures are subject to the problems of identification and definition already discussed.⁴

TABLE IV
NUMBERS OF MARKET GARDENERS IN SANDY, BIGGLESWADE,
AND POTTON, 1841-1901

	1841	1851	1861	1881	1901
Sandy	58	67	67	76	100 +
Biggleswade	49	52	54	74	85
Potton	21	22	23	48	45
Totals	128	141	144	198	230 +

The populations of parishes on clay land around the market-gardening district declined in the main by 30 to 40 per cent between 1871 and 1901. Yet a greater

¹ Rigg, *loc. cit.*, pp. 401-5. ² *Ibid.*, pp. 425-31.

³ Agricultural Returns. This item was required from 1874 to 1896 in these returns. The earlier years, however, did not show all market-garden land, some parishes which had market gardens showing nil returns.

⁴ Figures for 1851 and 1861 were obtained from the P.R.O., whilst those for the two later years were supplied by the Registrar-General.

employment of people on the land is indicated during these thirty years by the principal market-gardening parishes which exhibited slight falls only, whilst Sandy's population increased by 25 per cent; parishes in which the industry was of



FIG. III

The distribution of four vegetable crops over the Ivel valley and Eastern Greensand, from Rigg's survey 1912-13. (Reproduced from the *Journal of Agricultural Science*, Cambridge.)

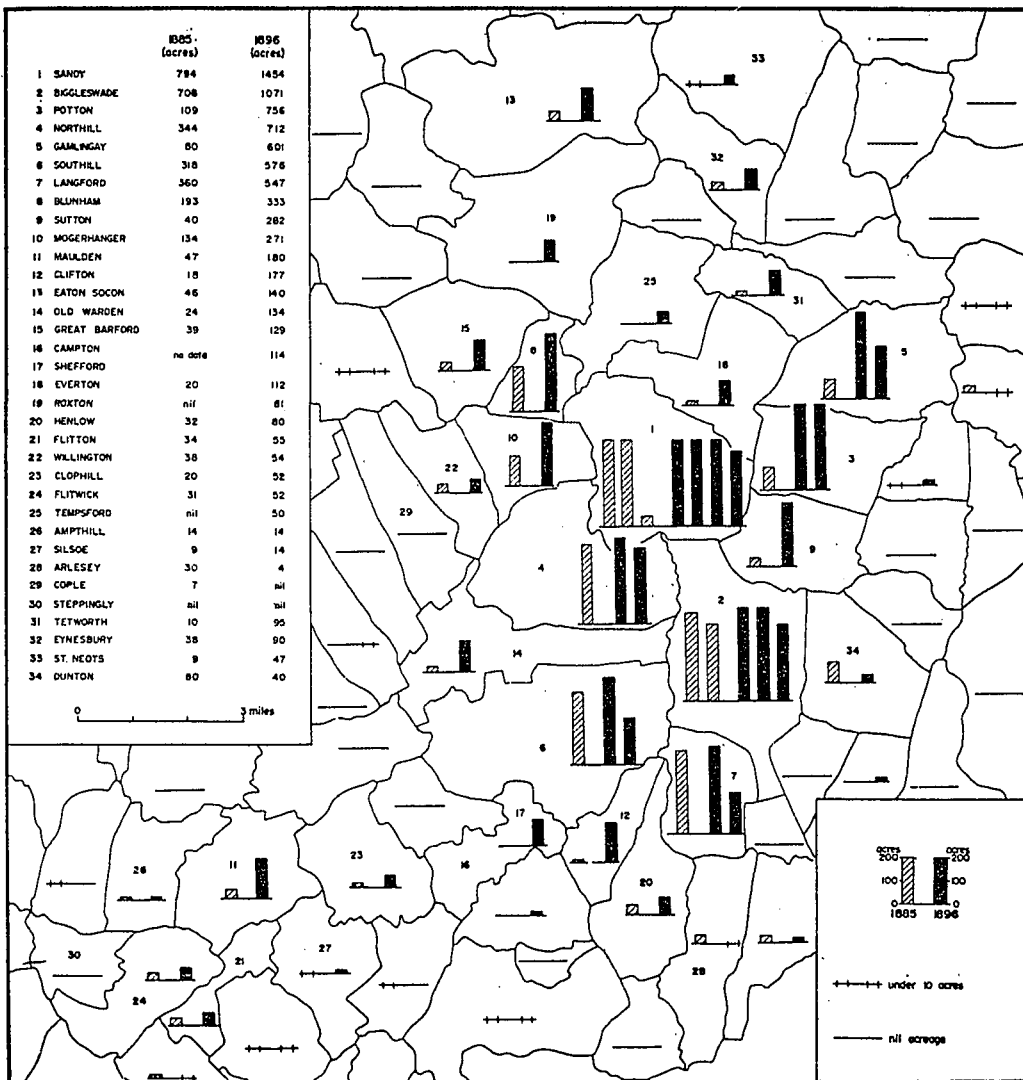


FIG. IV

The growth of market gardening from 1885 to 1896 and its concentration in the parishes of the Ivel valley and Eastern Greensand.

less importance at this time had falls of 10 to 25 per cent (fig. v).¹ The growth of market-gardening in the parishes of the Ivel valley and Eastern Greensand in the later nineteenth century is further emphasized by a highly significant relationship between the parish data for acreage of market gardens and percentage fall in population.²

Further evidence of the expansion of the industry is provided by two local

¹ Population censuses 1851-1901.

² A correlation coefficient of -0.772 (significant at the 0.1 per cent level of probability) was found between these two variables.

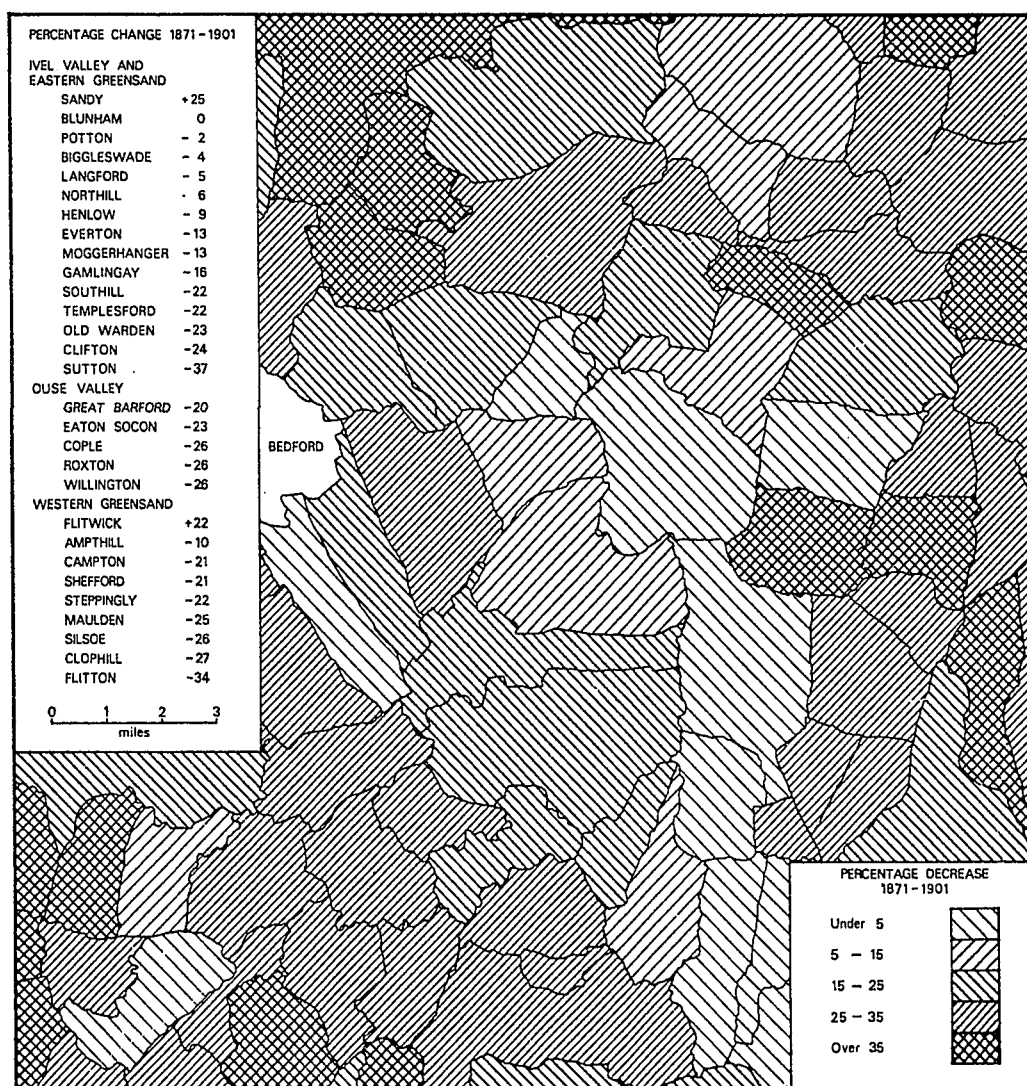


FIG. V

Stability of population in market-gardening parishes, 1871 to 1901. The map also reflects the small development of market gardening on the Western Greensand at this time. The Midland Railway may have stimulated urban growth in Ampthill and Flitwick, whilst the expansion of Bedford and the north Hertfordshire towns led to the growth of some adjacent parishes.

records of tonnages of merchandise from Potton railway station which survive for the years 1857 to 1860, 1896 to 1905, and also later periods (fig. vi).¹ Since Potton had no other significant industry most of the summer exports were vegetables. The average annual output for the two periods was 4,146 tons and 13,325 tons respectively. In 1905, a goods train, specially for vegetables, averaging fifty wag-gons, and with up to twice this provision in July, left Biggleswade for London four

¹ Beds. C.R.O. file and railway goods register inspected at Potton station, Aug. 1958.

days a week during the busy months.¹ A conservative estimate of 4 tons per wagon would give 3,000 tons or more per month from August to January, with probably 5,000 tons in July. Biggleswade is a large parish and these figures are quite feasible since Potton's total export for 1905 is 19,184 tons.

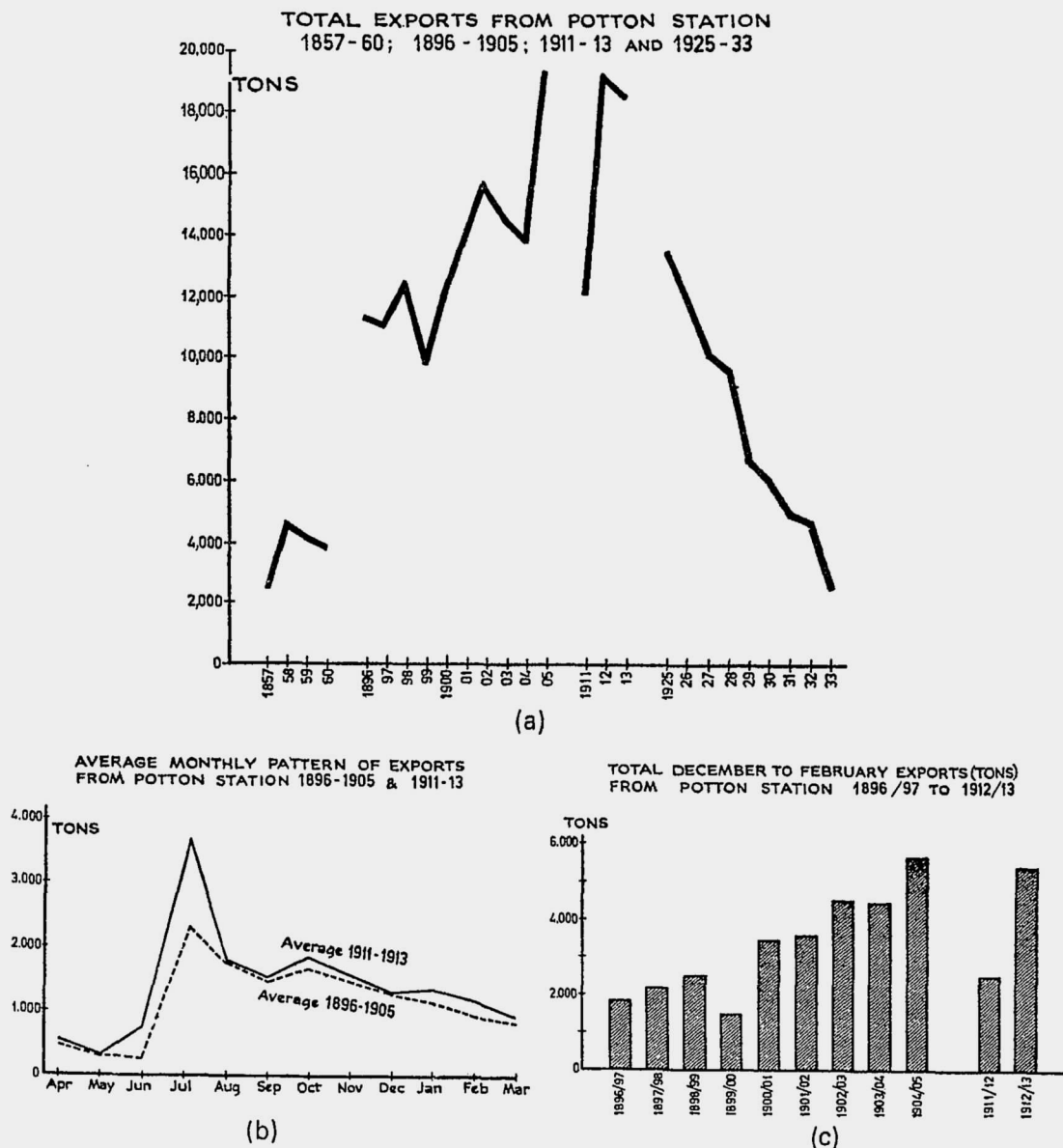


FIG. VI

(a) Rise and fall of the total exports from Potton railway station from 1857 to the 1930's. (b) Average monthly pattern of exports, 1896-1905, 1911-13, showing the peaks in July and October, and the sustained output through the winter reflecting respectively the export of early vegetables, autumn root vegetables, and brussels sprouts. (c) The increasing output of brussels sprouts. (The harvest of 1911-12 was severely affected by the low rainfall of 1911.)

¹ Pratt, *op. cit.*, p. 106.

Clearly there was a very considerable increase in market gardening in Bedfordshire in this period, and particularly in the later nineteenth and early twentieth centuries. This is confirmed by the large areas of the Ivel and Ouse terraces and of the Greensand heath that came under vegetable production, by the evidence for an increase in the number and size of holdings, the growing practice of production at farm scale, the increase in market gardeners, and by the more stable levels of population in the market-garden parishes. The estimate of a fourfold increase in vegetable production is supported by the twofold increase in the acreage of market gardens between 1885 and 1896, and the rail tonnages from Biggleswade and Potton.

Ransom states emphatically his explanation for the growth: "the fact that the Great Northern Railway and the Bedford to Cambridge branch . . . have intersected at right angles . . . [where] . . . the soil was especially adapted to market garden culture."¹ This explanation, however, neither fully relates these two causes nor examines others that led to the growth of the industry. From the second half of the nineteenth century market gardening prospered in response to the rising standard of living and growing population. (The United Kingdom's population had increased from 11.9 million in 1801 to 22.3 million in 1851, 34.3 million in 1891, and 42.1 million in 1911.) The expansion of the rural producing areas such as Bedfordshire (table v) was accelerated still further as cities built over the market gardens around them. Moreover, cottage gardens provided the vegetables for a

TABLE V
TOTAL ACREAGE OF MARKET GARDENS, 1885-96
(leading counties)

	1885	1890	1896	% increase 1885-96
Bedfordshire	3,885	6,025	7,997	106
Kent	8,817	11,308	12,972	47
Worcestershire	2,537	4,599	6,139	142
Cornwall	1,268	1,305	2,101	65
Lancashire	1,308	1,606	1,916	46
Lincolnshire (Kesteven and Lindsey)	884	935	1,582	80

dwindling proportion of families as the population became concentrated in cities. As a consequence of all these causes there was a steep increase in demand for vegetables which was met not only by an increased domestic production but also by exponentially rising imports of vegetables (table vi).² The evidence confirms that

¹ Ransom, *loc. cit.*, p. 138.

² Annual Statement of Trade for 1860, B.P.P. LX, 1861, p. 1; for 1870, LXIII, 1871, pt II, p. 1; for 1880, LXXXVIII, 1881, p. 1; for 1890, LXXXII, 1891, p. 1; for 1900, LXXVI, 1901, pt I, p. 739; for 1910, LXXIX, 1911, p. 393.

by the turn of the century the huge demand for vegetables resulted from a marked dietary change as well as the increased urban population.¹

TABLE VI

IMPORTS OF VEGETABLES INTO THE UNITED KINGDOM, 1860-1910

Year	Bushels	Onions		Vegetables (unenumerated) Value
		Total value	Cost per bushel	
		£	s. d.	£
1860	300,521	94,554	6 5	
1870	1,084,162	390,830	7 2	86,428
1880	2,256,897	534,357	4 9	369,717
1890	3,871,195	724,020	3 8	773,590
1900	7,087,105	852,400	2 5	766,394
1910	8,123,910	1,042,674	2 7	

Moreover, the depression in corn prices contributed to a shift in resources to the more prosperous market-gardening industry and the lighter land. For example, Rigg observed in 1912 that "rank scrub, hawthorne and wild rose stretch almost continuously from Everton to Tempsford" on land on the Oxford Clay that was under cultivation "thirty or forty years ago."² Agricultural statistics confirm that between 1875 and 1910 the total corn acreages in these two parishes fell from 1321 to 674 acres. Sandy land, however, sold for high prices; a surveyor reports on land on the Ivel terraces at Biggleswade that "had always been farmed and never gardened and hence the value to a market gardener was considerably increased."³ Also the reluctance of landlords towards letting land for vegetable growing was lessened by the fact that market gardeners could pay high rents.

From enclosure, and indeed long before, gardening in Bedfordshire exhibited the traditional characteristics of intensive cultivation. In 1857 the author of the Prize Essay noted "during the spring and summer hundreds of these enterprising industrious men," and was surprised also at "the amount which this busy hive will extract from an acre of land."⁴ Although by 1871 the horse-drawn plough had replaced the spade,⁵ hand labour dominated the industry. In 1908 it was stated that "500 acres of market gardening land employed 50 more full time hands throughout the year than farming": an example was a 50-acre market garden with fourteen permanent hands.⁶ By the twentieth century the wide range of vegetables traditionally grown in Bedfordshire, carrots, onions, potatoes, parsnips, turnips, radishes,

¹ Lord Ernle (R. E. Prothero), *English Farming, Past and Present*, 6th edn, 1961, p. 391.

² Rigg, *loc. cit.*, p. 395.

³ Report of H. Trustram Eve in First Annual Report of Bedfordshire County Council Smallholdings and Allotments Committee, 1910.

⁴ Bennett, *loc. cit.*, p. 8.

⁵ Evershed, *loc. cit.*, VII, p. 432.

⁶ Ransom, *loc. cit.*, p. 139.

peas, beans, cabbage, and cucumbers, now included marrows, beetroot, leeks, asparagus, spinach, lettuce, rhubarb, cauliflower, savoy, red cabbage for pickling, and brussels sprouts, as well as vegetables for seed.¹ In Bedfordshire the sandy soils encouraged growers to specialize in early potatoes, carrots, and salad crops, and the rail exports from Potton, 1896 to 1913, confirm this marked peak of production in July (fig. vi). The agricultural returns required few vegetables (for human consumption) before the First World War. However, in 1912 Rigg measured all plots of vegetables in the Ivel valley and on the Eastern Greensand, and reconstructions from his maps show approximately the following acreages: brussels sprouts 3,576, carrots, 834, onions 759, white turnips 657, spring cabbage 655, parsley 611, green peas 504, parsnips 475, and marrows 158.² The distribution of brussels sprouts, onions, early potatoes, and white turnips is shown in fig. iii.

Two crops a year and interplanting were common practice at this time. There were no rotations, but a crop harvested in early summer was often followed by one harvested in the autumn. Thus on the Eastern Greensand the early potato crop was followed by white turnips. Carrots and radishes were commonly broadcast together, the carrot crop being left to develop when the radishes were pulled in March. Potatoes were often interplanted with brussels sprouts or runner beans, and parsley was always interplanted, usually in the onion crop. Vegetables needing considerable hand labour in thinning, weeding, and harvesting were prominent.³

Bedfordshire catered for the demand for bunched early carrots in northern cities. During July and August 1905, 602 tons of carrots, comprising it seems about 866,000 bunches of ten carrots each, were sent from Sandy station alone to the Glasgow wholesale market, the record daily consignment being 57,000 bunches, "and every bunch had to be counted as it was thrown into the waggons."⁴ Carrots kept their importance in Bedfordshire down to the First World War, 1,006 acres and 1,011 acres being grown in the thirty parishes of the market-gardening district in 1906 and 1912 respectively. About one-half was grown in Sandy, Biggleswade, and Potton, with Sandy contributing 23 per cent of the total.⁵

The potato crop came into prominence in Bedfordshire during the nineteenth century. By the 1880's it had become very profitable, as in other areas of concentrated production,⁶ and the cultivation of early potatoes spread widely over the Eastern Greensand where the crop was ready for harvesting up to two weeks earlier than on the Ivel terraces.⁷ Certainly by the turn of the century potatoes had the largest acreage of any vegetable in Bedfordshire, with Early Puritan and King Edward VII as the leading early and main-crop varieties.⁸

The two vegetables that attracted most comment in Bedfordshire at the beginning of the twentieth century were onions, the home production of which had

¹ Pratt, *op. cit.*, pp. 104-5.

² Rigg, *loc. cit.*, pp. 412, 425-31.

³ *Ibid.*, pp. 385-431.

⁴ Pratt, *op. cit.*, p. 107.

⁵ Parish summaries of the agricultural returns.

⁶ Lord Ernle, *op. cit.*, pp. 390-1.

⁷ Rigg, *loc. cit.*, p. 408.

⁸ T. Rigg, 'The Market Garden District of Biggleswade, Bedfordshire', *J. Board Agric.*, xxiv, 1917, pp. 834-5.

steeply declined, and brussels sprouts, which were spreading spectacularly; about 30 per cent of the England and Wales acreage of onions, and 40 per cent of the brussels sprouts were grown in Bedfordshire in 1914.¹

From pre-enclosure times onions had been important in Bedfordshire gardening, emerging as the leading crop in the early nineteenth century as production became concentrated on the Ivel terraces at Sandy. In the second half of the century they were grown at field scale on the Ivel terraces, but never attained any importance on the Greensand (fig. III), the acreage of onions in Potton and Maulden being negligible. The onion crop received very intensive treatment with a carefully prepared and heavily manured seed-bed, followed by the hand operations of planting, hoeing, harvesting, and drying.² The crop was dried first on the ground and then in high, louvre-boarded, black barns that can be seen today on the flat lands around Sandy and Biggleswade. In the heyday of onion production about 2,000 acres had been grown annually in the Ivel valley,³ a feasible estimate, for in 1906, when production had sharply declined, 510 acres were returned for the parishes of the Ivel valley. The decline coincided with the steep rise in imports of onions from 300,521 bushels in 1860 to over 7 million bushels by 1900, and 7.5 million in 1905.⁴ They were sent to Stratford Market from Egypt, Spain, and Holland, and sold as cheaply as 3s. 3d. per hundredweight.⁵ Table VI shows the fall in the average price from 1860.⁶

Brussels sprouts had by 1905 "developed into a very large industry" during the previous "seven or eight years."⁷ The marked development is reflected in the increased winter exports from Potton railway station (fig. VI). The crop became established widely on the Ivel terraces, the Eastern Greensand, and on heavier soils in farm rotations.⁸ From the beginning Bedfordshire grew about 40 per cent of the England and Wales production, with Worcestershire next with 10 to 12 per cent.⁹ The hardy green varieties adopted, the railway facilities, and the marketing channels and skilled labour of an established market-garden district, all helped to make Bedfordshire the main centre for production. Moreover, the crop took up the slack caused by the decline in onion growing, brought in a steady income in the winter months, and fitted well into farm rotations, acting as a good cleaning crop and needing less labour than most vegetables. The expansion was also due to the ready acceptance of brussels sprouts in the British diet.

Throughout this period evidence suggests that holdings producing vegetables continued to grow in number and size. In 1857 there is a reference to the "many

¹ County summaries of the agricultural returns. Brussels sprouts were included first in these returns in 1914, and onions in 1906. Thus the acreage of onions was not recorded for the years of greatest home production, though it seems that Bedfordshire had for long been the leading producer and remained so for some years after the First World War. It may be that the acreage fell more steeply in Bedfordshire than in other counties, for in the partial recovery from 1906 the Bedfordshire share of the England and Wales acreage rose from about one-fifth to one-third.

² Evidence in interview with Mr G. Truin. ³ Pratt, *op. cit.*, p. 105.

⁴ Annual Statement of Trade for 1905, B.P.P. CXVI, 1906.

⁵ Rigg, 'Market Garden...', *loc. cit.*, p. 837; Pratt, *op. cit.*, pp. 104-6. ⁶ Annual Statement of Trade.

⁷ Pratt, *op. cit.*, p. 106. ⁸ Rigg, 'Soils... Biggleswade', *loc. cit.*, pp. 397-410.

⁹ Parish summaries of the agricultural returns (brussels sprouts acreages were required from 1914).

little freeholds" in the Sandy district,¹ and a further reference in 1871 to market gardens being under 10 acres, though it was said also there were others from 10 to 50 acres.²

In 1906 the market gardens in the Ivel valley were said to vary from 2 or 3 acres to 200 acres, though most of them were between 10 and 15 acres.³ The agricultural census of 1905 shows that in the thirty parishes of the market-garden district there were some 500 holdings between 1 and 5 acres, and 680 between 5 and 50 acres, though it is not known how many grew vegetables.

A large increase in small market gardens in Bedfordshire came with the creation of statutory small holdings. A state policy empowering county councils to create small holdings was adopted in 1892, but the measure was permissive and controversial, and Bedfordshire County Council, like most authorities, took little action. The Smallholdings and Allotments Act, 1908, placed a duty on county councils to provide small holdings, with emphasis on tenancy, the intention being to provide the first rungs of the farming ladder for agricultural labourers.⁴ From 1909 to 1915, when acquisitions ceased, the Bedfordshire County Council made seventeen purchases of land in the market-gardening parishes, the ones with the greatest demand for small holdings. The purchases, farms and individual fields, ranged from 10 to 368 acres and totalled 2,378 acres.⁵

In 1911 the Duke of Bedford introduced his own small-holding scheme, experimental in scale and rival in principle.⁶ It aimed to show that in the use of public funds to aid land settlement "smallholders should be small owners and not small tenants," and "that small ownership may be set up on business principles." A 371-acre farm at Maulden was divided into single-plot holdings averaging 21 acres each. Purchase of the holding, including erection of a house and buildings, was provided for by a 100 per cent mortgage with repayment over thirty-five years "at rates slightly above that being paid to rent county council holdings." There was marked stability of occupancy and most of the mortgages were repaid within the period.⁷ This plan, with growers recruited from Biggleswade, was a significant factor in the development of market gardening on the Western Greensand. But the scheme was not extended.

Indications of income in the later nineteenth century suggest, as in earlier years, that market gardeners were among the more wealthy of the agricultural community, whilst market-garden labourers earned more than the local farm labourers' 12s. a week. About 1871, onions sold for £11 a ton in March, yielding probably £150 an acre.⁸ Costs of manure, labour, transport, and rent would leave a net

¹ Bennett, *loc. cit.*, p. 8. ² Evershed, *loc. cit.*, p. 432. ³ Pratt, *op. cit.*, p. 104.

⁴ Departmental Committee of Inquiry into Statutory Smallholdings, (Chairman, Professor M. J. Wise), First Report, Cmnd. 2936, 1966. H.M.S.O., pp. 9-12. Councils were given loans at 3½ per cent, grants for costs, and powers to acquire land. Commissioners would implement schemes, if necessary, and charge them to the council's expense. A summary of the background to the policy may be found in the report.

⁵ Bedfordshire County Council Smallholdings Committee Reports, 1910-16.

⁶ Copy of letter from Duke of Bedford's agent, 1911. Bedford Estate Papers. ⁷ *Ibid.*

⁸ Evershed, *loc. cit.*, pp. 432-3. Yields from the heavily manured onion crop were probably not appreciably below today's production.—Priv. comm., Mr J. Davies, Ministry of Agriculture.

return of about £100 an acre.¹ Early vegetables also seemed profitable. July prices in 1885 (with little variation by 1905) were: potatoes £4-£8 a ton, peas 6s.-8s. a bag, carrots, spring onions, and parsley 2s., 3s., and 1s. 9d. per dozen bunches respectively. The gross value of Sandy's export of carrots to Glasgow in 1905 was £7,200, representing £12 a ton.²

CHANGES FROM 1919 TO 1939

After the First World War fundamental changes in every aspect of the market-gardening industry were brought about by new factors, in particular the advent of the motor lorry, and the end of cheap stable manure with the replacement of the horse on city streets.

Some developments, already established, became accentuated after the war. There was strong wartime support for the settlement of ex-servicemen on the land.³ The Land Settlement (Facilities) Act, 1919, required councils to give preference to ex-servicemen,⁴ many of whom applied for land in the Bedfordshire market-garden parishes. Some sought full-time holdings, others wanted the economic security of a part-time plot. The Council made fifteen purchases in the market-garden parishes in 1919, nine in 1920, and two in 1921, when financial stringency terminated the scheme. The twenty-six acquisitions ranged from 4 to 552 acres and totalled 2,260 acres. They were divided into 660 roughly rectangular plots, of which about two-thirds were of 2 acres or less. On five estates there were some 95 plots between one-half and one-eighth of an acre.⁵ The average size, however, was about 3½ acres. The 60-acre Church Field at Sutton is an example of division. About 200 ex-servicemen demanded a share of this land which was divided into fifty-seven acre strips, roadways taking up 3 acres.⁶ Small plots were not created on clayey soil. Thus the sandy part of Village Farm, Sutton, included forty-five half-acre plots, whereas the remaining 90 acres on Gault Clay comprised only three holdings.

The tiny plots were unfenced and lacked buildings. The tenancies were often short, and this led to fragmented holdings. A grower in the 1920's and 1930's who wished to enlarge his acreage did so by renting relinquished plots or by acquiring privately owned land, and these were often in another part of the parish. Sometimes, however, a grower was able to rent an adjacent plot, and so processes of consolidation went on concurrently with increasing fragmentation. Of all holdings growing vegetables in Bedfordshire in the 1930's it is likely that about 20 per cent were in three to five parts, and 5 per cent in six or more parts.⁷ About a half of the

¹ Confirmed by Pratt, *op. cit.*, p. 105.

² Pratt, *op. cit.*, p. 105, and London market prices from *The Times*.

³ Wise Report, *op. cit.*, pp. 12-13.

⁴ Councils encountered financial problems, however, in that land prices, building costs, and interest rates were much higher after the war.—*Ibid.*, pp. 12-16.

⁵ Bedfordshire County Council Smallholdings Committee Reports 1919-22.

⁶ The tenants were decided by a public draw in Sutton Village Hall.—Priv. comm., Aug. 1957, Mr Clare, Assistant County Land Agent.

⁷ No records exist of the pattern of market-garden holdings at this time. The percentages are based on a later survey by L. G. Bennett, *The marketing of horticultural produce grown in Bedfordshire, West Cornwall, Wisbech*,

unfragmented holdings were under 5 acres. Most of these were worked on a part-time basis, providing the tenant with a supplementary income for work at week-ends and in the summer evenings, though the tenants were no longer solely agricultural labourers, as before the war. A bird's-eye view of the pattern of the Bedfordshire market-gardening district in the 1930's would show a remarkable patch-work. The distinctive estates of the County Council comprised rectilinear assemblages of tiny plots set within the mass of larger and less regular parcels of land formed by private division of farms, with little clusters of old enclosures within the villages. These varied units lie within the framework of the boundaries drawn by the enclosure commissioners and the ancient, irregular boundaries of the former open fields. This intensely fragmented pattern was not typical of other vegetable-growing areas such as south-west Cornwall, the Fens, Kent, or the Lea valley.¹

The motor lorry gave great freedom to the location of market gardening. It carried produce direct to market and so accelerated the spread of market gardening on the productive Western Greensand, parts of which are up to five miles from a railway station. The lorry and the agricultural tractor also made possible the spread and large-scale cultivation of brussels sprouts over the boulder clay farmland. Moreover, the lorry offered the grower efficient and flexible marketing. Produce could be taken direct from the fields to the wholesale market or retail shop by the grower himself or by various wholesalers including other growers, or by haulage contractors specializing in vegetables. Also, road transport was cheaper than rail, especially for small consignments. By the 1930's the lorry transported the bulk of the vegetables from Bedfordshire and rail exports had sharply declined (fig. v).²

However, as horses disappeared from the city streets stable manure became scarcer, and supplies ended by the later 1930's. The organic-matter content and water-holding capacity of these specially coarse sandy soils became very low, so that although chemical fertilizers provided nutrition under humid conditions they were of little use in dry summers. Even when the Greensand soils had been heavily manured yields depended on the rainfall during the period of growth.³ This is verified by a correlation between the October exports (mainly vegetables) from Potton railway station for 1896 to 1905, and for 1911 to 1913,⁴ and the rainfall at Potton for July, August, and September of each year.⁵ Hence in the 1920's and 1930's soil productivity declined. This together with other causes, namely the drift of labour to the towns, economies of large-scale production, and the need to diversify production with less exhaustive crops, led to a change towards more extensive

and the Lea Valley, University of Reading, Department of Agricultural Economics, Miscellaneous Studies, no. 12, 1957, p. 14.

¹ L. G. Bennett, *op. cit.*, p. 14. Neither was such intense, small-scale fragmentation characteristic of the Vale of Evesham.

² Evidence from Beavington, thesis ch. viii, and from field inquiries of a wide range of persons, too numerous to list, concerned with the marketing of vegetables from Bedfordshire.

³ Rigg, 'Soils . . . Biggleswade', *op. cit.*, p. 400.

⁴ Railway goods register inspected at Potton station, Aug. 1958.

⁵ Meteorological Office records. The correlation coefficient of +0.570 is significant at the probability level of 5 per cent.

production. This involved a narrower range of vegetables, fewer crops in each three-year cycle, and the disappearance of interplanting. The rotation of early potatoes and white turnips over the Eastern Greensand disappeared, and labour-intensive crops declined so that by 1933 the acreages of carrots and onions in the thirty parishes were only 334 and 202 respectively. The main peak of vegetable exports was now in winter, on account of the brussels sprouts harvest. In this changed situation the grower with small scattered plots was in a difficult position. The fertility of his scattered plots had declined but his holding was viable only under intensive production, being too small to permit a more conservative system of cultivation involving green manuring or lucerne leys. Moreover, without fences or water the land was unsuitable for livestock. The plots became cropped less intensively so that, taken together, they constituted a special form of extensive production.

Intensively-cultivated market gardens were still characteristic in the 1920's and 1930's in the village centres, especially where irrigation could be used. However, the vegetables that became more and more important were those needing least labour, in particular cabbage, cauliflower, and brussels sprouts, the acreage of which in Bedfordshire approximately doubled between 1922 and 1933.¹ Indeed, the major feature of the trend to extensive production by the 1930's was the fieldscale cultivation of brussels sprouts in farm rotations over the northern and central parts of the county. Thus the acreage of this crop continued to increase reaching 10,206 acres in 1926, when Bedfordshire grew 40 per cent of the national production. In the 1930's the county acreage of brussels sprouts fluctuated between 11,700 and 8,300 averaging about a quarter of the national total as production spread into Hertfordshire, Cambridgeshire, and Huntingdonshire, and as the acreage also increased in Worcestershire, Gloucestershire, and Norfolk (table VII).

TABLE VII

ACREAGE OF BRUSSELS SPROUTS GROWN IN BEDFORDSHIRE AND OTHER COUNTIES, 1914-39

<i>County</i>	<i>1914</i>	<i>1917</i>	<i>1920</i>	<i>1923</i>	<i>1926</i>	<i>1931</i>	<i>1939</i>
Bedfordshire	4,788	4,176	4,740	6,654	10,206	11,541	10,332
Worcestershire	1,014	1,425	1,686	2,167	3,102	4,450	5,259
Hertfordshire	326	303	381	504	1,074	2,449	2,345
Essex	239	341	355	535	666	1,025	1,987
Gloucestershire	152	178	205	376	550	1,479	1,952
Huntingdonshire	354	228	387	641	1,306	2,289	1,945
Norfolk	82	125	93	152	250	617	1,940
Cambridgeshire	369	232	233	255	800	1,931	1,810
Kent	886	998	983	143	1,489	1,484	1,200
England and Wales	11,574	11,631	12,625	16,910	25,800	35,600	37,900

¹ Agricultural returns.

SUMMARY AND CONCLUSIONS

This study has considered the impact of 140 years of economic and technological change on the evolution of a major food-producing industry. Arthur Young's view of the economic prospects of the small garden proprietors at Sandy, deprived of waste and common, may have seemed justified at the time. Yet enclosure gave great potential for expansion to the industry, opening up large new areas of sandy land. During the following half-century the small proprietorships steadily grew in number and size.

The realization of this potential awaited the building of the railways, for they provided the essential link between the cities and the rural market-gardening districts by which lavish inputs of fertility sustained high outputs of produce. Through these functions in Bedfordshire the railway concentrated the industry along the Ivel valley and encouraged intensive production, thus leading to the growth of one of the country's chief market-garden districts for the supply of many kinds of fresh vegetables. It was not by chance that the Great Northern Railway was built through these market gardens, for river terraces highly suitable for market gardening have the terrain favourable for railway construction. However, it was fortuitous that the Ivel valley, with its broad fertile terraces and established gardening industry, was suitably oriented to carry the principal artery of traffic between London and the north, as indeed it had been fortuitous that these sandy terraces ran adjacent to the Greensand slopes that had nurtured the gardening industry before enclosure.

A three- or fourfold expansion in the industry in Bedfordshire during the last quarter of the nineteenth century was characteristic of the growth of rural market gardening. It was accompanied, moreover, by a steep rise in imports of vegetables into the United Kingdom. This combined increase was partly a response to a 35 per cent increase in the United Kingdom's population and partly a consequence of the spread of cities over areas formerly used as market gardens. A further cause, however, was the change to a predominantly urban society in which cottage gardens no longer provided the vegetables for the majority of people. Nevertheless, the substantial increase in the flow of vegetables into the wholesale markets, particularly the exponential rise in cheap imports, allowed a considerable *per capita* increase in the consumption of onions and other vegetables. This dietary change continued into the twentieth century with the adoption of brussels sprouts as a popular winter vegetable. The accompanying steep decline in Bedfordshire in the acreage of onions, and the very marked spread of brussels sprouts, reflect economic and social causes and illustrate the dramatic changes to which the market-gardening industry was becoming susceptible.

The lorry and agricultural tractor revolutionized market gardening. As with enclosure, these major innovations brought great flexibility and potential to the industry yet they cut off the traditional source of fertility on which it had depended. Moreover, after the First World War the deteriorating economic situation crippled the whole economy, and market gardening lacked the stimulus of expand-

ing markets that it had in the 1880's and 1890's. The smallest growers were worst affected and least able to adapt. The Smallholdings Acts came too late, and were political and social measures rather than economic ones. For the newly created small holdings to have been viable for a worthwhile period they would have needed to have been established during the expansion in market gardening and in the earlier years of cheap stable manure, not when these supplies were dwindling or during a time of economic depression. Yet political conditions of the 1870's and 1880's had not favoured this reform. Whereas changes in holding size and structure progressed slowly through the inter-war years, the marketing facilities the lorry offered were readily adopted, especially by the larger growers, and in the 1920's vegetable production spread to the Western Greensand and other areas in Bedfordshire. For growers who made the best use of the economies of the lorry, and those who were successful with early crops, market gardening was more prosperous than other branches of agriculture.

The new set of conditions after the First World War marked the beginning of the end of traditional market gardening as the system for the nation's vegetable production. The intensive market gardening in the Ivel valley and on the Greensand east of Sandy that prevailed down to the early twentieth century differed greatly from the more extensive production with specialization on fewer crops that by 1939 was replacing it. In greater contrast still was the fieldscale cultivation of brassicas which was to spread during the next twenty-five years still further over the farmland of north and central Bedfordshire.

NOTES ON CONTRIBUTORS

Professor Frank Beavington is Head of the Department of Geography of the Abdullahi Bayero College, Kano, Nigeria.

Janet Blackman, Lecturer in Economic and Social History in the University of Hull, is particularly interested in the impact of industrialization and urban growth on agriculture, including food supply and diet.

W. Harwood Long was Head of the Agricultural Economics Department in the University of Leeds from 1935 until he retired in 1968. He has written extensively on the history and economics of Yorkshire farming, including 'A Survey of the Agriculture of Yorkshire' in the R.A.S.E.'s series of county Agricultural Surveys.

Stuart Macdonald has recently completed three years' research for his Ph.D. at the Geography Department of Newcastle University. His subject was agricultural innovation in Northumberland during the late eighteenth and early nineteenth centuries. He is now engaged in research into semiconductors in the Technology Policy Unit, Department of Physics, University of Aston in Birmingham.

J. A. Perkins is a Lecturer in Economic History at the University of New South Wales, and is completing a Ph.D. thesis on Lindsey agrarian history between 1780 and 1850. He is currently working on a study of migratory agricultural workers in nineteenth-century Europe, and researching for a book on modern German economic history.