

Science and the Farmer: the Development of the Agricultural Advisory Service in England and Wales, 1900–1939*

By COLIN J HOLMES

IN 1890 public funds first became available for agricultural education in England and Wales. Over the next ten years only a few county councils started to provide facilities for farm advisory work, usually in conjunction with local agricultural colleges or universities. Five rare and successful examples of such ventures in the 1890s are provided by the county authorities in Cambridge, Essex, Kent, Northumberland, and Yorkshire; these were very much the exception and not the rule. By the early years of the twentieth century about thirty of the sixty county authorities in England and Wales were involving themselves in agricultural education and advisory work. On a country-wide basis, however, the public provision of advisory services for Edwardian farmers was uneven, inadequate, and unco-ordinated.¹

I

A state-financed network of agricultural research centres was created in 1910, and a collateral Provincial Advisory Service was introduced in 1912. The functions of the advisory service were to speed into

farming practice the introduction of proven, useful research results, and to provide special technical advice to farmers. For this purpose England and Wales were divided into twelve advisory 'provinces' each with its own centre located at an existing agricultural college or university department. As indicated in Table 1 below, nine of the provincial centres were functioning by the outbreak of war in 1914, and six more were added by 1924. In 1932 Oxford University was removed from the system, as an economy measure in the wake of a government financial crisis.² In its final form, the Provincial Advisory Service contained thirteen districts served by fourteen centres.

The number of advisory officers in post increased from sixteen in 1914 to sixty-eight in 1928. The figures in Table 2 below show that there were only four veterinary advisers in the service by 1928. Their number increased to nine by 1939 but, in the meantime, the zoologists disappeared. The advisory economists were appointed on a temporary basis in 1923, but their services proved to be so valuable that they were made permanent in 1929.³

There were two aspects to the work of individual advisory officers. First, they had to provide specialist advice in response to local farmers' problems referred to them by the county advisory services. Second, they had to decide which local farming

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¹ J A Hanley, 'Agricultural Education in College and County', in H E Dale et al, *Agriculture in the Twentieth Century: Essays on Research, Practice, and Organization*, Presented to Sir Daniel Hall, Oxford, 1939, pp 86–97; E J Russell, *A History of Agricultural Science in Great Britain*, 1966, pp 191–231, 232–67, 255–6; Board of Agriculture and Fisheries, Report of the Departmental Committee on Agricultural Education, Cd 4206, BPP XXI, 1908, pp 36–8.

² Development Commission, Tenth Annual Report for 1919/20 [hereafter – DC 1919–20], BPP XIII, 1920, p 3; DC 1911/12, BPP XVII, 1912/13, p 8; DC 1932/33, BPP XI, 1932/33, p 49.

³ DC 1929/30, BPP, IX, 1929/30, p 20.

TABLE 1
The Provincial Advisory Service 1912/13-1945/46

<i>Centre</i>	<i>Province</i>	<i>Centre established</i>
Dept of Agriculture, University College of Wales, Aberystwyth	<i>Mid-Wales</i> Brecknockshire, Cardiganshire, Carmarthenshire, Merionethshire, Montgomeryshire, Pembrokeshire	1913-14
Dept of Agriculture, University College of North Wales, Bangor	<i>North Wales</i> Anglesey, Caernarvonshire, Denbighshire, Flintshire	1913-14
Agricultural Advisory Dept, University of Bristol	<i>West</i> Gloucestershire, Herefordshire, Somersetshire, Wiltshire, Worcestershire	1913-14
School of Agriculture, University of Cambridge	<i>East</i> Bedfordshire, Cambridgeshire, Essex, Hertford, Huntingdon, Norfolk, Suffolk, Isle of Ely, Lincolnshire - Holland Division	1913-14
Dept of Agriculture, University of Leeds	<i>Yorkshire</i>	1913-14
The Midlands Agricultural College, Sutton Bonington, Loughborough	<i>Midlands</i> Derbyshire, Leicestershire, Nottinghamshire, Rutland, Lincolnshire - Lindsey & Kesteven Divisions	1913-14
Dept of Agriculture, King's College, Newcastle-upon-Tyne	<i>North</i> Cumberland, Durham, Northumberland, Westmorland	1913-14
Faculty of Agriculture and Horticulture, University of Reading	<i>South</i> Berkshire, Buckinghamshire, Dorset, Hampshire, Isle of Wight, Middlesex After 1932 - Northamptonshire, Oxfordshire	1913-14
South Eastern Agricultural College, Wye, Kent	<i>South-East</i> Kent, Surrey, Sussex	1913-14
Seale-Hayne Agricultural College, Newton Abbot, Devon	<i>South-West</i> Cornwall, Devon, Scilly Isles	1914-15
The Harper Adams Agricultural College, Newport, Shropshire	<i>West Midlands</i> Shropshire, Staffordshire, Warwickshire	1918-19
Agricultural Advisory Dept, University College of South Wales & Monmouthshire, Cardiff	<i>South Wales</i> Glamorganshire, Monmouthshire	1922-23
(i) Agricultural Advisory Dept, University of Manchester	<i>North-West</i> Cheshire, Lancashire	1922-23
(ii) Dept of Veterinary Pathology, University of Liverpool		
School of Rural Economy, Oxford University	<i>South Midlands</i> Oxfordshire, Northamptonshire. Transferred to the Southern Province in 1932, and thereafter served by Reading University	1923-24 (Ceased to exist as an advisory centre in 1932)

Source: Development Commission, Annual Reports 1911/12-1932/33, *BPP* (1912/13-1932/33).

questions required investigation, and then begin the necessary field work with the cooperation of local farmers. These local investigations rapidly became important;

very often they provided the field work that was necessary to follow up laboratory-based studies in progress at the research institutes. The entomologists in the Pro-

TABLE 2
Provincial Advisory Officers – Number in Post and Subjects Represented; 1914, 1928 and 1938

Subject area	1914	1928	1938
Agricultural chemistry	5	13	12
Zoology	2	4	—
Mycology	1	11	13
Dairy bacteriology	—	10	9
Veterinary science	—	4	9
Botany	4	2	1 ^c
Entomology	1 ^b	10	13
Plant pathology	2	2	—
Economics	—	12	11
Other ^a	1	—	—
TOTAL	16	68	68

Notes:

^a An 'agricultural biologist';

^b Classified here as an entomologist but listed as 'agricultural zoologist and entomologist';

^c A grassland specialist.

Sources: DC 1927/28, BPP, VII, 1928, pp 103–20; Political and Economic Planning, *Report on Agricultural Research in Great Britain*, 1938, pp 34–6; PRO, MAF 33/390, TPB 9173, Minute Sheet Reference TPY 587, 1938–44, J A Hanley, 'History of the Advisory Services', typescript, c1939.

vincial Advisory Service made detailed investigations of insect damage to crops, in conjunction with Rothamsted Experimental Station and the Ministry of Agriculture (MAF). The advisory mycologists did similar work with fungus infections in crops. The information thereby gained was used as the basis for subsequent preventive and remedial measures. By 1926, a large amount of the mycological and entomological research in England and Wales was being done in the Provincial Advisory Service. Similarly, most of the soil survey work under way in the late twenties was in the hands of the advisory chemists. The salient point here is that one should not make an unduly sharp distinction between much of the work being done at the research institutes and in the Provincial Advisory Service. Advisory officers conducting their own local research projects often were able to gather information that scientists at the research institutes could not otherwise obtain. Incidentally, by the late 1920s staff at the research institutes

were undertaking a significant amount of direct advisory work themselves.⁴

The Provincial Service was almost wholly state-financed, and some basic details are summarized in Table 3 below. Average annual expenditure increased from £4700 in 1911/12–1915/16 to £105,000 by 1936/37–1940/41. The greater part of that sum consisted of salaries and collateral expenses. If the figures are deflated by an index of civil service pay, then the 'real' level of expenditure by the late 1930s may be estimated at approximately £65,000 per annum. Expenditure on the Provincial Advisory Service as a proportion of the total agricultural research budget rose from c9 per cent in 1911/12–1915/16 to c24 per cent by 1936/37–1940/41.

II

Valuable though its work was, the effec-

⁴ DC 1919/20, BPP XIII, 1920, pp 96–7; DC 1923/24, BPP VIII, 1924, pp 72–5; DC 1925/26, BPP IX, 1926, pp 89–90; DC 1926/27, BPP VIII, 1927, pp 91–2.

TABLE 3
State Expenditure on the Provincial Advisory Service in England and Wales, in Five-year
Annual Averages from 1911/12-1915/16 to 1936/37-1940/41

Five-year period	1911/12- 1915/16	1916/17- 1920/21	1921/22- 1925/26	1926/27- 1930/31	1931/32- 1935/36	1936/37- 1940/41
(i) Total state expenditure on Agricultural Research	£50,100	£78,500	£217,900	£333,400	£319,900	£431,900
(ii) State expenditure on the Provincial Advisory Service	£4,700	£10,500	£33,000	£64,900	£73,300	£105,100
(iii) ii as % of i	9.4	13.4	15.1	19.5	22.9	24.3
(iv) 'Real' expenditure on the Provincial Service, in constant 1911-13 prices	£4,700	£7,300	£18,600	£38,400	£46,000	£64,700

Sources: UK Government, Civil Services and Revenue Departments, Appropriation Accounts 1911/12-1940/41, BPP 1911/12-1941/42; Development Commission, Annual Reports, 1911/12-1938/39, BPP (1911/12-1939/40); G Routh, 'Civil Service Pay 1875 to 1950', *Economica*, new series, XXI, 1954, p 16.

tiveness of the Provincial Service in the inter-war period was impaired by six discernible weaknesses; three of them were general in nature and three were specific to certain subject areas. One important general weakness was that the range of specializations covered did not encompass the whole range of agricultural science: the omission of animal feeding, crop nutrition, and agricultural engineering is conspicuous. In these important subjects farmers' problems were referred directly to the appropriate research institute. The underlying difficulty was that many of the problems raised by farmers did not fit comfortably into the conventional academic delineations of subject used by the Provincial Service. Advisory chemists, for example, were required to deal with all chemical problems relating to fertilizers and feeding stuffs, and all soil problems. But by the 1930s soil science was as much concerned with physics and bacteriology as with chemistry, and the provision of informed advice on feeding stuffs required some considerable knowledge of animal nutrition and physiology.⁵ Provincial staff

were trained and recruited too much on the basis of academic specialization, and too little on the basis of husbandry topic or problem.

A second general weakness was the severe understaffing which so detracted from the effectiveness of the Provincial Service. In the 1930s, with sixty-eight staff in post and 248,000 farmers in England and Wales, the overall provincial advisory officer:farmer ratio was 1:3647. It is little wonder that many provincial officers were often insufficiently familiar with local farming conditions to win the confidence of the farmers they served. The third problem was that at some provincial centres advisory work was made more difficult by the inadequacy of the accommodation provided by the university or college concerned. Whilst the MAF paid salaries and general expenses, it made no provision for accommodating advisory staff. This illustrates the small degree of overall direction and control exercised by the MAF over the provincial centres. For provincial advisory officers there existed a real danger of divided loyalties between the work of the advisory service, and that of the academic institution which housed their provincial centre.⁶

⁵ Report of the Committee on Post-war Agricultural Education in England and Wales, Cmd 6433, 1943, BPP IV, 1942/43, p 43; V C Fishwick, *Dairy Farming: Theory and Practice*, 1947, pp 39-60; Political and Economic Planning (PEP), *Report on Agricultural Research in Great Britain*, 1938, p 58.

⁶ Cmd 6433, *op cit*, p 43.

It is evident that such a conflict of loyalties was felt amongst the advisory economists in the 1930s, as they struggled to divide their time between providing advice for farmers, supplying the MAF with statistical data, and producing independent academic research. But the agricultural economists also had problems endemic in their subject: no agreement existed as to uniformity of methods in data collection, or the usefulness of different types of survey methodology. So, some pursued cost-accounting studies using the whole farm as the unit of enterprise; some preferred to concentrate on particular areas of husbandry within the farm's total activities; and others concentrated on straight advisory work.⁷

The dairy bacteriologists also had problems. The staple item of their work was routine analysis of milk samples performed on a fee-paying basis. Any research or local investigations had to be financed from the income earned in this way. If they analysed sufficient milk samples to pay for their research they had little time in which to do it, but if they devoted time to their research they could not earn the money necessary to sustain it.⁸

The third subject-based problem concerns veterinary advisers. The etiquette of the veterinary profession did not allow advisers to lecture to farmers on the cure of animal diseases, and their advisory responsibilities were carefully defined to exclude matters that impinged on private practice. Thus their work was limited to investigating the causes of disease, and they could only advise in the most general terms about preventive measures. Their ability to disseminate the results of veterinary research was thereby impaired.⁹

III

The Provincial and County Advisory Services were administered quite separately before 1939. Co-ordination was supposed to be secured by periodic conferences but, in reality, relations between the two services often reflected a lack of co-ordination and even a lack of communication. In theory, provincial officers were only supposed to deal with cases referred to them by advisory staff in the county services; in practice, the provincial centres often received and acted upon requests for advice directly from farmers.¹⁰

As noted above, approximately half of the county authorities in England and Wales were engaged in agricultural education and, to a lesser extent, advisory work by 1914. A more systematic organization developed after 1920 when the County War Agricultural Committees were reconstituted as permanent sub-committees of the county councils. By 1939, fifty-five of the sixty counties in England and Wales had appointed an Agricultural Organizer, and the total county agricultural staff numbered 468. Their functions were to provide education and advice: instruction in basic farming methods, and a general advisory service to deal with the routine problems encountered in everyday farming practice. County agricultural authorities were empowered to make small grants for research, but only half-a-dozen of them had their own experimental stations in the 1930s (East Suffolk, Norfolk, Hampshire, Monmouth, Northumberland, and Warwickshire). Usually at the county level research was a residual activity which depended upon the limited spare time of an overworked county officer.¹¹

The power conferred on local authorities to provide an advisory service was permissive, they were not compelled to do so. In

7 K A H Murray, 'Agricultural Economics in Retrospect', *J. Agric. Econ.* XIII, 1960, pp. 374-82; E H Whetham, 'The Search for the Cost of Production, 1914-30', *Jnl. Agric. Econ.*, XXIII, 1972, pp. 201-11; J P Maxton, 'Professional Stock-Taking', *Jnl. Agric. Econ.*, VI, 1940, pp. 142-80.

8 PEP, *op cit.*, pp. 59-60.

9 Cmd 6433, *op cit.*, p. 27; PEP, *op cit.*, p. 60.

10 Cmd 6433, *op cit.*, pp. 42, 55; PEP, *op cit.*, p. 61.

11 Cmd 6433, *op cit.*, pp. 17, 25; PEP, *op cit.*, pp. 36, 60, 129; E H Whetham, *The Agrarian History of England and Wales*, VIII, 1914-1919, Cambridge, 1978, pp. 122-3.

consequence, county expenditure on advisory work was often reduced in times of financial stringency, and the level of service offered varied enormously from one authority to another. The disparity in facilities provided also reflects, to some extent, differences in size and wealth between county authorities. Administrative areas ranged from 1,661,000 acres (Devon) to 52,000 (the Soke of Peterborough), and populations from 1,780,000 (Lancashire) to 17,000 (Rutland). Counties which were predominantly agricultural had the greatest need of a good advisory service, but were usually the least able to afford one because their rates produced a much smaller income than those of less rural, more prosperous counties. Shortage of funds in the county agricultural service frequently resulted in gross understaffing and exceedingly heavy workloads. The demands of other duties seriously reduced the amount of time available for 'front-line' advisory work, and made it very difficult for the county adviser to keep up with innovations in modern farming practice. The effectiveness of the county service was further impaired by the poor quality of much of the training given to new staff.¹²

As a result of these deficiencies the county service was unable to maintain contact with more than a small proportion of all farmers. According to an independent report published in 1938, '... the majority of farmers never consult the County Organizer, and ... if they did he would not have enough time to attend to them'. In a wartime Social Survey carried out in 1944, only 17 per cent of the 1968 farmers questioned said that they had consulted their County Organizer in the years before 1939; 68 per cent said they had not; and a further 9 per cent claimed not to have

known of his existence.¹³ The Luxmoore Committee on Agricultural Education, which reported in 1943, could find '... no definite channel whereby the results of the work done by the advisory officers or the research institutes can be transmitted to the farmers'.¹⁴ But the task of providing such a channel had clearly been the prime responsibility of the pre-1939 advisory services.

IV

Before the Second World War little use was made of films, radio, and publications in agricultural advisory work in Britain. Astor and Rowntree's classic enquiry into the state of British agriculture referred to the radio in 1938 as a development 'which might become important' – if only farming programmes could be broadcast at times which were not inconvenient during the working day.¹⁵ Probably four-fifths of all farmers read the agricultural articles in their local newspapers; but before 1939 the advisory services largely neglected this outlet which offered contact with a far larger audience than could be reached through farm visits, lectures, films, or classes. From an early stage in the twentieth century the MAF published for farmers a series of more than 300 advisory leaflets and pamphlets. They were inexpensive, clearly written, practically orientated, and covered a wide range of husbandry topics. However, this literature was not always readily available and methods of distribution were deficient. Not all advisory literature was as readable as the MAF's leaflets.¹⁶

¹² Cmd 6433, *op cit*, p 41; PEP, *op cit*, pp 53, 61; 'Agricultural Education', *The Times*, 29 April 1935, p 19; Report of the Committee on Agricultural Higher Education, Cmd 6728, 1945, BPP, X, 1945/46, p 32.

¹³ D Chapman, *Agricultural Information and the Farmer*, An inquiry made for the MAF, new series, no 38, May 1944, pp 1, 34; PEP, *op cit*, p 112.

¹⁴ Cmd 6433, *op cit*, p 43.

¹⁵ Viscount Astor and B Seebohm Rowntree, *British Agriculture: the Principles of Future Policy*, 1938, p 419.

¹⁶ 'Farming Research', *The Times*, 18 May 1921, p 5; 'Agricultural Education', *The Times*, 8 July 1935, p 20; R G Stapledon (ed), *Farming and Mechanized Agriculture*, 4th ed, 1950, pp 366–71; PEP, *op cit*, pp 63–4; Astor & Rowntree, *op cit*, p 419; Chapman, *op cit*, p 11; Board of Agriculture & Fisheries, *Leaflets: Numbers 1 to 300*, 3 volumes, 1919.

Of the national newspapers and agricultural journals, the *Journal of the Ministry of Agriculture* and *The Times* invariably contained much useful, clearly-written information; but neither of them was read by more than around 3 per cent of the country's farmers. The *Farmer's Guide to Agricultural Research*, published annually from 1926 by the Royal Agricultural Society, must have been far more useful for scientists, advisers, lecturers and undergraduates than it ever was for farmers. In spite of its title, it was uncompromisingly academic in style and content. A wartime Social Survey showed that the two most widely read periodicals were *Farmer's Weekly* (43 per cent of respondents) and *The Farmer and Stockbreeder* (51 per cent). Although 87 per cent of the 1968 farmers questioned read some farming magazine regularly, only 49 per cent of them admitted to actually having tried any of the suggestions made in the articles.¹⁷

By the late 1930s, farmers were probably receiving more information from the sales and technical staff of the large feed and fertilizer manufacturers than from the advisory services. The reputable companies, such as ICI and Spillers, usually provided reliable information based on genuine field trials and objective testing of their products. But the advice given about particular products would not always be impartial, and that which emanated from the less scrupulous firms was downright unreliable.¹⁸

V

The lack of contact between farmers and

the advisory service was not entirely the fault of the latter. Undoubtedly, a great many farmers were hostile and unreceptive to new methods. A survey of farmers' letters to *The Times* from 1918 to 1938, whilst not a sufficiently large or representative sample to warrant confident generalization, suggests four main objections to the work of the advisory service. Many farmers upheld in all circumstances the value of practical experience over theory, and were suspicious of any scientist or 'expert' who had never had to earn his own living as a practising farmer. Some exhortations to improve methods, were rejected by farmers who detected, and resented, the implication that they were guilty of ignoring easily-rectifiable faults in their husbandry. Some farmers were antagonized by the callow over-zealousness of young, college-trained advisers. Others regarded all advisers as unwelcome evidence of a proliferating, expensive, and unnecessary bureaucracy.¹⁹ These attitudes were not confined to ill-educated or poor farmers: they were displayed by some who moved in the highest social circles of the agricultural world.²⁰ The farmers' scepticism was not always unreasoned prejudice: some rejected new methods which seemed to them to be based on insufficient evidence of practical success.²¹

The low general level of education amongst farmers has been identified as an important reason for their resistance to innovation. The wartime Social Survey cited above found that 72 per cent of farmers questioned had no more than an

¹⁷ Chapman, *op cit*, pp 11-12.

¹⁸ A D Hall, *Reconstruction and the Land*, 1941, p 78; W Gavin, *Jealotts Hill: The Agricultural Research Station of ICI Ltd*, ICI, 1953; PEP, *op cit*, pp 65, 68, 70; Astor & Rowntree, *op cit*, pp 226, 417; personal communication from the late Dr J B M Coppock, former Director of Research, Spillers Limited, Summer 1972; personal communication from Mr G L Beveridge, Agricultural Engineer of Barrowford, Lancashire, Summer 1972; C J Holmes, 'Spillers, 1829-1969: The Company's History', unpublished essay, 1971, pp 29-30.

¹⁹ 'The Land and the Nation', *The Times*, 10 Jan 1922, p 6; 'Rural Education', *The Times*, 29 May 1925, p 20; 'The Test of Knowledge', *The Times*, 13 Jan 1930, p 18; 'Bureaucracy and Farming', *The Times*, 5 May 1930, p 20; 'Science and the Farm', *The Times*, 1 Dec 1930, p 20; 'Science and the Farm', *The Times*, 6 Dec 1930, p 8; 'Farmers and Science', *The Times*, 13 June 1938, p 20.

²⁰ J Wentworth Day, *Farming Adventure*, 1943, pp 118-19, 134-6, 142-3; H J Massingham (ed), *England and the Farmer*, 1941, pp 1-70.

²¹ 'Farmers and the Government', *The Times*, 2 Feb 1918, p 7; 'Science and Farming', *The Times*, 20 April 1925, p 20; 'The Farmer and his Advisers', *The Times*, 3 Aug 1925, p 13.

TABLE 4
The Terms of Trade for Farmers. Indices of Agricultural Product Prices and the Price of Farm Inputs, England and Wales 1911-1940 (1911-13 = 100)

Year	Product prices	Input prices	Ratio of product: input price	Year	Product prices	Input prices	Ratio of product: input price
1911	96	98	98	1926	151	158	96
1912	102	100	102	1927	144	155	93
1913	102	102	100	1928	148	155	95
1914	101	103	98	1929	144	153	94
1915	127	113	112	1930	132	148	89
1916	160	131	122	1931	122	144	85
1917	201	156	129	1932	117	139	84
1918	232	178	130	1933	112	135	83
1919	258	197	131	1934	113	135	84
1920	292	232	126	1935	119	136	88
1921	219	213	103	1936	120	138	87
1922	169	171	99	1937	132	146	90
1923	157	155	101	1938	131	148	89
1924	161	157	103	1939	132	151	87
1925	159	159	100	1940	183	183	100

Notes:

- (a) The input price index is based upon the prices of seven items, and is weighted according to farmers' estimated annual purchases of them: animal feed, fertilizers, store cattle, seeds, machinery, rent, and labour.
- (b) The product price:input price ratio stands at 100 when prices are at the same relative level as in 1911-13. It is greater than 100 when product prices are high relative to input prices, and less than 100 when product prices are low relative to input prices.

Sources: MAFF, *A Century of Agricultural Statistics: Great Britain 1866-1966*, 1968; MAF, *Annual Agricultural Statistics 1911-1940*; E M Ojala, *Agriculture and Economic Progress*, Oxford, 1952.

elementary school education; but it also showed that the farmers questioned had a substantive appreciation of the value of education, and largely approved of agricultural colleges.²² Four years of wartime farming may well have caused a marked change in attitudes; but a distinguished agricultural scientist, Sir Daniel Hall, argued in 1941 that it would be wrong to condemn British farmers for their ignorance of science or lack of technical training in the inter-war period, notwithstanding their low level of general education. 'But neither education nor scientific advice could have turned the typical British smaller farms . . . into economic propositions during the last thirty years . . . for science and discovery can find little scope

in businesses of that size . . . It is not so much the farmers as the system that has been at fault.'²³

The scope that farmers had for incorporating the results of scientific research into farming practice was determined to a significant extent by the financial condition of agriculture. High costs of production and low product prices were a substantial impediment to the widespread adoption of new methods. The price data in Table 4 above show how the internal terms of trade were adverse for farmers after 1925. The small farmer was particularly affected by these unfavourable price trends: cost records show that value of output per capita was lower, and the unit cost of equipment higher, on farms of less than

²² MAF, *Agricultural Improvement Council for England and Wales: First Report*, 1942, p 7; Chapman, *op cit*, pp 7, 10, 61-3.

²³ Hall, *op cit*, pp xi, 78-9.

100 acres. In 1925, holdings between 5 and 100 acres accounted for 30 per cent of the total acreage of crops and grass (excluding rough grazings), and constituted 76 per cent of all holdings over 5 acres in England and Wales.²⁴ Clearly, the large majority of farmers in England and Wales between the wars came into the 'small' category, and at this point it is appropriate to note that the dissemination of much agricultural research was criticized in the 1930s for being geared to the needs of large rather than small farmers.²⁵

It must be made clear that the farming community was by no means totally indifferent to research and advisory work. The experience of the 1914-18 war showed many farmers the benefits to be gained from the application of science to husbandry. In the inter-war period, contemporary reports indicate that a growing minority of farmers – especially horticulturists – had an increasing appreciation of the work of the research and advisory services.²⁶ This evidence is corroborated by the first-hand observations of four leading agricultural scientists and a former Minister of Agriculture.²⁷

VI

In spite of all the difficulties, some solid successes were achieved by the pre-1939 advisory services. Activities at the county

level helped greatly in the local implementation of MAF improvement campaigns for clean milk and better grassland in the 1930s. The success of the 1937 Land Fertility Scheme, which stimulated greater use of lime and basic slag by offering a subsidy on farmers' purchases of them, was based upon the enormous amount of soil sampling and advisory work performed by chemists in both the provincial and county services. A few county centres undoubtedly rendered great assistance to their local farmers. Wiltshire was successful in starting several original schemes: an Agricultural Accounting Society (1925); a Wild White Clover Certification Scheme (1929); a County Register of Accredited Milk Producers (1929); and a Pig Recording Scheme (1930). The work of the Norfolk county authority was notable, too. It maintained its own experimental station and two well-equipped demonstration plots, and published its own agricultural journal. Altogether in the 1930s, thirty-six of the sixty counties in England and Wales maintained farm institutes, demonstration centres, or similar establishments.²⁸

In the Provincial Advisory Service, as noted above, valuable work was done by the advisory mycologists and entomologists in crop protection and disease control. Provincial advisers in the west midlands and the west of England collaborated with the British Sugar Research Organization in an investigation which clearly demonstrated the agricultural value of by-product lime from the beet-sugar factories. By the late thirties advisory economists were making valuable contributions to national investigations into farm management, sugar-beet cultivation, and milk production.²⁹

In spite of continued staff shortages and

²⁴ C S Orwin, 'The Farmer's Business', in Dale, *op cit.* p 144; MAFF, *A Century of Agricultural Statistics: Great Britain 1866-1966*, 1968, pp 19-20.

²⁵ PEP, *op cit.* pp 69-70.

²⁶ DC, 1919/20, BPP, XIII, 1920, pp 21, 96; 'Farmers and Research', *The Times*, 1 Feb 1921, p 11; 'Farmers and Research', *The Times*, 23 May 1921, p 17; 'Future of Agriculture', *The Times*, 4 Dec 1922, p 13; 'Science and Farm Practice', *The Times*, 3 Jan 1927, p 18; 'Farmers and Research', *The Times*, 23 Jan 1928, p 18; 'Farmers and Education', *The Times*, 22 Oct 1928, p 20; 'Farming Research in Norfolk', *The Times*, 14 Oct 1929, p 20; 'Farmers and Science', *The Times*, 6 June 1938, p 15; 'Science and the Farmer', *The Times*, 21 Aug 1939, p 16; 'Cheshunt Research Station', *The Times*, 19 June 1925, p 14.

²⁷ Hanley, *loc cit.* pp 120-1; R G Stapledon, *The Land Now and Tomorrow*, 1935, p 230; Hall, *op cit.* pp 77-9; Lord Addison, *A Policy for British Agriculture*, 1939, pp 37-40; E J Russell, 'Work of the Rothamsted Experimental Station from 1914 to 1919', *Journal of the Ministry of Agriculture*, XXVI, 1919/20, pp 497-507.

²⁸ PEP, *op cit.* pp 60, 129; Hanley, *loc cit.* pp 104-7, 113.

²⁹ 'Science and the Farmer', *The Times*, 21 Aug 1939, p 16; Committee of the Privy Council for the Organization and Development of Agricultural Research, *Agricultural Research in Great Britain*, 1943, pp 86-8.

a lack of financial resources, the advisory service available to farmers by 1939 was a marked improvement on the scattered and rudimentary facilities of 1900. One important aspect of this improvement was the vastly superior means of transport afforded by the motor cycle and motor car. Before the First World War, reliance on local railways and the horse and trap had meant that an advisory visit to just one farm could take up a whole working day.³⁰ Although there were palpable deficiencies

in the relationship between agricultural advisers and farmers, the advisers' achievements were substantive, and their work was appreciated by a growing minority of farmers. The antipathy or indifference of the majority must not be regarded as wilful: the farmer's ability to innovate was constrained by adverse financial circumstances, especially from 1925 onwards. To conclude that the shortcomings of the pre-1939 advisory service are as conspicuous as its achievements, is not to disparage the efforts of a body of hard-working people who were feeling their way in a new and difficult profession.

³⁰ Addison, *op cit*, pp 37-8; Hanley, *loc cit*, p 102.