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Labor and wages, Agricultural

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A STUDY OF LABOUR UTILISATION ON A SAMPLE OF FARMS IN SOUTH WEST ENGLAND

1960/61

by

E. T. DAVIES

Price Three Shillings and Sixpence

I, COURTENAY PARK
NEWTON ABBOT
DEVON

A Study of Labour Utilisation
On a Sample of Farms in South West England

1960/61

by

E.T. Davies, B.Sc.

FOREWORD

In the last resort a nation's living standards depend on labour efficiency, that is, on the productivity of the national labour force. Better performance in this respect can be brought about in a number of ways. For example, by capital investment in more and better machines, which represent another form of labour; by the switching of labour from one industry to another or from one process within an industry to another; or through better work performance of all workers whoever they are and whatever they are doing, and with whatever equipment they are working. Here aptitudes, skills, attitudes and many other factors combine to motivate man to maximise his own effort.

Better knowledge of the nation's changing man-power position, its total supply, distribution, social and economic characteristics, the changing needs of industry, of agriculture and other sections of a modern society, and measurements of performance in the various areas is vital if the best use is to be made of this scarce resource. This is a vast field and one which, despite a commendable programme of research into the subject in recent years in this country, is still very bare of solid facts. Partly, this is due to the competing demands for the time and research resources available. In the general field of agriculture the subject has been particularly neglected by most research workers. Only at Cambridge has any volume of work been undertaken and that has related to the conditions of the Eastern counties. Little up-to-date information is available for the Western parts of the country.

The study on which this report is based was designed to throw some light on the use of man-power on mixed livestock farms. It does not lay claim to any great originality. Indeed, it constitutes an extension of a similar study undertaken in the area some 30 years previously and to which reference is made. Such studies are time consuming and the justification for them is that they provide essential data for farm planning.

As has been indicated there are many ways of increasing labour productivity and this applies as much to the individual farm as to the nation at large. It is not just a matter of work study, but of the study of the farm as a whole. To quote from a recent report of this Department

in a different context:- "A well-knit combination of enterprises capable of making full use of labour resources is a pre-requisite of successful farming. Because of the small size of most farms this is normally achieved, not by pruning labour to fit the existing load of farm work, but by expanding existing enterprises and introducing new ventures." Equally, on many other farms and by the same token, the solution may be found in a better fit of men and machine, or by adjusting the farming system to fit a pruned labour force. Whatever action is needed, some better knowledge of labour needs under varying conditions of farming and farming systems is a first necessity.

The Department of Economics (Agricultural Economics) of the University of Exeter at Newton Abbot gratefully acknowledges the willing co-operation of those farmers who supplied the information upon which this report is based.

S. T. Morris.

Provincial Agricultural Economist

CONTENTS

	Page
I. Introduction	1
II. General Information	6
III. Sources of Labour and the Overall Pattern of Labour Use on Five Type of Farming Groups - Exeter Province 1960/61	11
IV. The Employment of Direct Labour	20
V. The Employment of Indirect Labour	31
VI. Unit Labour Requirements	36
VII. Appendices	51

I. INTRODUCTION

During the past ten years labour management on British farms has received considerable attention. Many factors have been responsible for this development, but two major factors stand out. First, the general expansion of industrial activity which has steadily drawn workers from farms to the urban areas, and second, the increasing importance of farm labour costs. Both these considerations emphasise the need for a productive and efficient labour force in farming at the present time.

In order to carry out a critical examination of labour utilisation on farms it is first necessary to obtain certain basic information for use as standards. For example, information on the average labour requirements of different farming systems, on the seasonality of labour utilisation and, again, on the proportions of labour employed on productive and unproductive or maintenance work. A study was initiated in the South-West in order to obtain factual information of this nature and, simultaneously, to gain some general appreciation of labour organisation on the farm. The data collected are presented in this report, preceded by a brief description of changes in the supply and cost of farm labour which have stimulated the present acute interest in the subject of farm labour organisation.

The Supply and Cost of Farm Labour

The data presented in Table 1 provide strong indication of the decline which has occurred over the past twelve years in the number of workers employed on agricultural holdings in each of the three South-Western counties and in England and Wales. For the South-West as a whole,

the number of farm workers fell between 1950 and 1962 from 52,416 to 36,802, a decline of 30%. In England and Wales numbers declined from 737,422 to 512,721, again a decrease of 30%.

Table 1. Number of Workers Employed on Agricultural Holdings in Devon, Cornwall, Dorset and England & Wales - 1950 - 1962*

	Devon		Cornwall		Dorset		South West		England & Wales	
	No.	Index	No.	Index	No.	Index	No.	Index	No.	Index
1950	24,292	100	17,015	100	11,109	100	52,416	100	737,422	100
1951	23,222	96	15,770	93	10,755	97	49,747	95	708,061	96
1952	22,584	93	15,712	92	10,554	95	48,850	94	701,901	95
1953	22,415	92	15,746	93	10,368	93	48,529	93	683,136	93
1954	21,831	90	14,957	88	9,975	90	46,763	89	657,726	89
1955	21,431	88	14,506	85	9,991	90	45,928	88	638,564	87
1956	20,495	84	13,646	80	9,582	86	43,723	83	609,617	83
1957	20,540	85	13,826	81	9,546	86	43,912	84	606,751	82
1958	19,984	82	13,356	78	9,226	83	42,566	81	590,644	80
1959	19,844	82	13,467	79	9,189	83	42,500	81	584,545	79
1960	19,099	79	12,779	75	8,729	79	40,607	77	562,107	76
1961	17,923	74	12,447	73	8,231	74	38,601	74	534,719	72
1962	17,203	71	11,698	69	7,901	71	36,802	70	512,721	70
Av. Ann. Change	591	2.4	443	2.6	267	2.4	1,301	2.5	18,725	2.5

* Includes full-time, part-time, seasonal and temporary workers, but excludes occupier, his wife, domestic servants and school children.

Source: Ministry of Agriculture, Fisheries & Food - Agricultural Statistics.

Undoubtedly, the financial and amenity advantages offered by urban employment have been largely responsible for the significant fall in the number of workers on the land during the past twelve years. The data in

Table 2. Average Weekly Earnings in Great Britain of Regular, Full-time Adult Agricultural Workers, including Payments in Kind.

Years ended March	s.	d.	Index
1950/51	115	7	100
1951/52	125	0	108
1952/53	133	0	115
1953/54	142	6	123
1954/55	151	0	131
1955/56	162	10	141
1956/57	174	7	151
1957/58	184	2	159
1958/59	194	8	168
1959/60	199	7	173
1960/61	209	3	181
1961/62	219	7	190

Source: Annual Abstract of
Statistics - H.M.S.O.

Table 3. Average Weekly Earnings and Hours Worked, Manufacturing Industries and Agriculture.

	<u>Weekly Earnings</u>			<u>Hours Worked</u>
	£	s	d	Hrs
1) All manufacturing industries and services - average for second pay week in April, 1962	15	12	10	47.3
2) Agriculture - average April 1961-March, 1962	10	19	7	51.7

Source: Ministry of Labour Gazette.

Table 2 show that the average earnings of farm workers have increased substantially during this period, but figures recently published by the Ministry of Labour, Table 3, indicate that the disparities between average earnings and hours worked in agriculture and in manufacturing industries are still very significant. To family men in particular, the prospects of larger pay packets and a shorter working week, coupled with better social, educational, and, very frequently, housing conditions, must prove a big incentive to move to the industrialised, urban areas of the country.

The effect of a declining labour force on the total farm wages bill appears, however, to have been more than offset by increases in wage rates. In fact, the data in Table 4 show that between 1950/51 and 1960/61 total expenditure on farm labour in the United Kingdom increased by 25%, from £243 million to £301 million. Next to purchased feedingsuffs it is the largest single cost item on British farms, accounting for approximately 23% of total expenditure. On some individual farms, particularly those engaged on livestock rearing, labour is frequently the biggest item of cost, accounting for up to 40% of total expenditure.

Table 4. Estimated Agricultural Expenditure in the United Kingdom.
£ Million

Year	Labour	Machin- ery and power	Labour and Machinery	Feeding- Stuffs	Fert- ilisers	Rent and Interest	Other Expend- itures	Total Expend- iture
1950/51	243	142	385	142	51	62	106	746
1951/52	254	164	418	177	50	65	116	826
1952/53	264	180	444	187	65	69	123	888
1953/54	274	184	458	276	66	72	135	1007
1954/55	275	183	458	334	66	75	147	1080
1955/56	285	193	478	325	82	78	142	1105
1956/57	296	201	497	348	85	83	163	1176
1957/58	304	213	517	325	93	88	174	1197
1958/59	317	219	536	356	92	89	177	1250
1959/60	318	223	541	338	96	96	169	1240
1960/61	301	214	515	352	111	105	180	1263

Source: Annual Abstract of Statistics - H.M.S.O.

The figures in Table 4 underestimate the true importance of labour costs since they do not allow for the farmer's own work which, on many of our small farms, is often the only regular labour. Again, for working

purposes, man and machine are one, and it follows that expenditure on machinery upkeep as well as on manual labour provides a better indication of the real importance of labour. The total of these two items in the United Kingdom in 1960/61 was £515 million, equivalent to just over 40% of total farm expenditure.

II. GENERAL INFORMATION

This report is based on a study of labour utilisation on 28 farms in South-West England during the twelve months from 1st March, 1960 to 28th February, 1961. The information was collected in work diaries, in which the co-operating farmers and their employees recorded daily the various tasks undertaken and the time spent on each task.

Classification & Description of the Study Farms.

Farm Types and their Location

Some measure of how labour requirements vary with farm type was obtained by conducting the investigation on holdings representing five different systems of production. Each of these was selected from the sample of Farm Management farms studied by the Department on the basis of the following classification:-

- Group 1. Mainly Dairy - with milk accounting for at least 70% of gross output.
- Group 2. Dairy with Pigs - with the two enterprises combined accounting for 70% or more of gross output, with pigs contributing at least 30%.
- Group 3. Dairy with Poultry - with the two enterprises combined accounting for 70% or more of gross output, with poultry contributing at least 30%.
- Group 4. Mixed Livestock - with the livestock enterprises, including milk, accounting for 70% or more of gross output, and with each enterprise contributing at least 10%.
- Group 5. Cattle & Sheep Rearing - with the two enterprises combined accounting for 70% or more of gross output.

In Table 5 the 28 study farms have been classified according to type of farming and location. Seven of the thirteen Dairy-type farms studied were located in Dorset, around Dorchester and Sherborne, whilst four farms were located in the Honiton district of East Devon and two near Truro in Cornwall. With the exception of one farm in Cornwall, the Mixed Livestock holdings were all situated in South Devon, mainly in the Totnes and Kingsbridge areas. The Cattle & Sheep rearing farms, on the other hand, were located in the Bideford - Barnstaple - South Molton areas of North Devon.

Table 5. Classification of Farms by Type of Farming and Geographical Location.

	Mainly Dairy	Dairy with Pigs	Dairy with Poultry	Mixed Live-stock	Cattle and Sheep	All Groups
	Number of Farms					
Location:						
Cornwall	-	2	-	1	-	3
Devon	1	-	3	7	7	18
Dorset	4	2	1	-	-	7
Total Number of Farms	5	4	4	8	7	28

Numbers of Records and Composition of the Labour Force

Table 6. Number of Weekly Records kept according to Class of Worker and System of Farming.

	Mainly Dairy	Dairy with Pigs	Dairy with Poultry	Mixed Live-stock	Cattle & Sheep	Total Number of Records
	Number of Records					
<u>Family Labour</u>						
Farmer	5	4	4	8	7	28
Son	-	1	1	5	4	11
Wife	1	2	2	4	2	11
*Other	-	-	1	3	-	4
Total Family	6	7	8	20	13	54
<u>Hired Labour</u>						
Full-time	9	8	7	8	7	39
Part-time	1	2	-	6	1	10
Casual	1	-	2	1	-	4
Total Hired	11	10	9	15	8	53
Total Number of Weekly Records	17	17	17	35	21	107

* Children of school age

In all, 107 work diaries were completed weekly throughout the study period. An analysis of these records by class of worker is presented in Table 6 and this reveals that one-half of the total refers to family workers. This proportion includes 28 records for the farmers themselves, 11 each for sons and farmers' wives and 4 for children of school age. The records for the hired workers refer to 39 full-time, 10 part-time and 4 casual workers.

The composition of the labour force varied significantly on the study farms. For example, the data presented in Table 7 show that on

Table 7. Distribution of Farms according to the Type of Male Labour Force

Labour Force	Mainly Dairy	Dairy with Pigs	Dairy with Poultry	Mixed Live-stock	Cattle & Sheep	Total Number of Farms
	Number of Farms					
Farmer Only	-	-	1	1	-	2
Farmer Plus Hired:						
Full-time	3	1	1	-	3	8
Part-time	-	1	-	-	1	2
Full-time plus Part-time	1	1	-	2	-	4
Full-time plus Casual	1	-	1	1	-	3
Farmer Plus Son	-	-	-	1	3	4
Farmer, Plus Son, Plus Hired:						
Part-time	-	-	-	3	-	3
Full-time plus Part-time	-	1	-	-	-	1
Casual	-	-	1	-	-	1
Total Family Labour Only	-	-	1	2	3	6
Total Family Plus Hired Labour	5	4	3	6	4	22
Total Number of Farms	5	4	4	8	7	28

six farms the labour force was comprised entirely of family labour. On eight holdings, only regular full-time workers were employed and on five there were regular part-time workers in addition to the family labour.

Of the remaining farms, five had a labour force consisting of family, full-time and part-time workers, three had family, full-time and casual workers and one farm had its family labour supplemented by casual labour only.

Cropping and Stocking

Detailed analyses of the cropping and stocking on the study farms are presented in Appendix I. (Tables A and B). The relevant table shows that, with the exception of the Dairy with Pigs group, the proportion of land in tillage did not vary greatly between groups, ranging only from 16% to just over 25% of the total farm area. In the Dairy with Pigs group, nearly 43% of land was in tillage, but this relatively high ratio was largely due to one particular farm in the group which devoted a substantial acreage to the production of malting barley.

Barley was the most important cereal grown in all groups, although in the Cattle & Sheep group mixed corn was nearly of equal importance. The number and types of root and green fodder crops grown, however, offer an interesting comparison in cropping policies between the three Dairy groups of farms on the one hand, and the Mixed Livestock and Cattle & Sheep groups on the other. Whereas in the former dependence for winter keep was placed almost entirely on kale, in the latter a wide variety of crops was grown, the most important being kale, rape and turnips or swedes. Furthermore, with regard to conservation, silage accounted for nearly 60% of total conservation in the combined Dairy groups compared with only 10% in the Mixed Livestock and Cattle & Sheep groups.

Farm size did not vary significantly between groups, the average size ranging from 124 adjusted acres in the Mixed Livestock to 167 adjusted acres in the Cattle & Sheep group, but individual farm size varied from 28 to 304 adjusted acres.

As might be expected, the stocking policies on the five type-groups exhibited quite significant differences, both in terms of the relative importance of specific enterprises and stocking densities. In this latter respect, the data in Appendix I. (Table B) show that the numbers of animal units per 100 adjusted acres varied from 53 in the Cattle & Sheep to 75 in the Dairy with Pigs to as much as 98 in the Dairy with Poultry group of farms. The relatively high density of stocking exhibited by the two latter groups is due, however, to the presence of sizeable pig and poultry enterprises rather than to numbers of grazing livestock.

The numerical relationships between cows and other cattle and between breeding ewes and other adult sheep, provide further examples of differences in stocking policies on the study farms. In the three Dairy groups, the ratio between cows and followers was approximately one to one compared

with a ratio of nearly two to one in the Mixed Livestock and Cattle & Sheep groups. In the case of sheep, there were approximately three ewes to one follower in the Mixed Livestock group, compared with two ewes to one follower in the Cattle & Sheep group. This difference for sheep is largely attributable to the traditional practice on upland farms to retain all the ewe lambs either for sale as two-tooth hoggets or for flock replacement. On the more lowland type of Mixed Livestock farm, only that number of ewe lambs required for replacement purposes are retained, the remainder being sold earlier either as fat or store lambs.

III. THE SOURCES OF LABOUR AND THE OVERALL PATTERN
OF LABOUR USE ON FIVE TYPE OF FARMING GROUPS
Exeter Province - 1960/61

This section is concerned with two main considerations. First, an account of the total annual input of labour and its division between various classes of family and hired workers, and second, the broad distribution of total labour between direct work on crops and stock and indirect work on maintenance and managerial tasks.

The total labour input figures, which are expressed in terms of man hours worked, cover all the different classes of workers employed. Wives and children of school age have been given equal weighting with adult male labour in terms of input per hour, since it is considered that in the tasks on which they were principally engaged, such as egg collecting and cleaning, they were equally effective as male labour. The annual figures do not include the labour supplied by contracting firms, but work of this nature was relatively unimportant on the sample farms and its inclusion would have had little effect on the general pattern of labour input. Part-time labour refers to workers hired on a contractual basis of a fixed number of days per week, or alternatively, a certain number of hours per day. Casual labour refers to those workers employed at intermittent periods as required.

Sources of Labour

Annual Labour Input by Class of Worker

Table 8 gives details of the total annual input of labour, according to class of worker, for each of the five type of farming groups. The total hours worked per 100 acres, expressed in terms of man equivalents, varied from 3.4 for the Dairy with Poultry farms at one extreme to 1.8 for Cattle & Sheep farms at the other, a man equivalent representing the labour of a full-time adult male employed for 50 weeks, excluding holidays, at the statutory rate of 46 hours per week. These figures broadly reflect the variation in total labour requirements of different systems of farming, but considerable variations in the total labour employed per acre did also exist between farms in the five groups. These variations result from physical differences, such as type of soil, layout of farm and farm buildings etc., as well as of differences in intensity of production. Farmers wishing to assess their own labour performances against those obtained on the study farms should do so, therefore, with this particular reservation in mind.

Table 8 shows that family labour becomes relatively more important as

one moves from the Mainly Dairy to the Cattle & Sheep group. In the former, family labour accounted for only 37% of total labour input, but in the latter group the proportion was 63%. Over the entire sample of farms, 52% of the annual labour input was supplied by family workers, with farmers contributing 37%, their sons 11% and their wives 4% to this total. Full-time workers were by far the most important type of hired personnel, providing 43% of total input compared with 4% and 1% for part-time and casual workers respectively.

Table 8. Division of Total Annual Labour Input according to Class of Worker and System of Farming - Hours per 100 Adjusted Acres

	Mainly Dairy		Dairy with Pigs		Dairy with Poultry		Mixed Live-stock		Cattle & Sheep		All Groups	
	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%
Family Labour:												
Farmer	1960	34	2045	33	2803	36	2047	36	1590	39	2085	37
Son	-	-	430	7	769	10	1023	18	890	22	622	11
Wife	174	3	184	3	545	7	227	4	82	2	240	4
*Other	-	-	-	-	10	..	114	2	-	-	25	..
Total Family	2134	37	2659	43	4127	53	3411	60	2562	63	2972	52
Hired Labour:												
Full-time	3341	58	3295	54	3582	46	1638	29	1386	34	2434	43
Part-time	230	4	184	3	-	-	624	11	130	3	234	4
Casual	58	1	-	-	77	1	11	..	-	-	29	1
Total Hired	3629	63	3479	57	3659	47	2273	40	1516	37	2697	48
Total Labour	5763	100	6138	100	7786	100	5684	100	4078	100	5669	100
No. Man Equivalents	2.5		2.7		3.4		2.5		1.8		2.5	

*Refers to children of school age

The importance of family labour in the groups is a reflection, not only of the relative numbers of family and hired workers employed, but also of the hours actually worked annually per person. From the data already presented in Table 6 it will be seen that in the Mainly Dairy group there were nearly two full-time hired workers to every one full-time family worker. Throughout the range of groups this ratio narrows progressively until, in the Mixed Livestock and Cattle & Sheep groups, it is reversed

with farmers and sons outnumbering full-time hired workers by almost two to one. The details in Table 9 show that in each group both farmers and their sons worked more hours than the full-time hired staff. For the sample of farms as a whole, farmers worked a total of 3040 hours and their sons 2869 hours per annum, compared with 2502 hours by the full-time non-

Table 9. Actual Number of Hours Worked Annually per Person according to Class of Worker

	Mainly Dairy	Dairy with Pigs	Dairy with Poultry	Mixed Live-stock	Cattle & Sheep	All Groups
Family Labour:	Hours Worked Annually per Person					
Farmer	2860	3272	3475	2886	2705	3040
Son	-	2752	3816	2307	2601	2869
Wife	1270	588	1351	640	479	866
Other	-	-	50	429	-	240
Hired Labour:						
Full-time	2711	2636	2538	2309	2315	2502
Part-time	1679	588	-	1173	1520	1239
Casual	423	-	191	124	-	246

family workers.

The significance of the total hours actually worked by the respective family members is better appreciated when they are considered in relation to the current statutory minimum rate of 46 hours per week. After making allowance for time lost through sickness and holidays, Appendix II (Table A) shows that, as a group, farmers worked 15 hours per week in excess of the statutory rate, and their sons nearly 12 hours. In comparison, the amount of overtime recorded for the hired full-time workers amounted to $4\frac{1}{2}$ hours per week.

The average amounts of overtime worked annually per farm and per 100 adjusted acres are set out in Table 10. In total the amount of overtime incurred annually per 100 acres was 888 hours, equivalent to 16% of total labour input. Considerable variation existed between groups, with the three most intensive groups incurring substantially more overtime than the other two groups. For example, for the combined Dairy groups of farms the annual overtime recorded per 100 acres averaged approximately 1220 hours, equivalent to 18% of total labour input. For the Mixed Livestock and Cattle & Sheep groups total overtime amounted to only 433 hours per annum, 9% of total labour. Furthermore, in the former three groups family labour on average accounted for 60% of total overtime, compared

with over 90% in the latter two groups. This variation reflects the relative numerical importance of family workers in the Mixed Livestock and Cattle & Sheep groups rather than of actual hours worked since, as shown in Appendix II both farmers and their sons in these groups worked considerably less overtime per head than their counterparts in the three Dairy groups. For the entire sample, family labour accounted for 76% of total annual overtime.

Table 10. Distribution of Total Annual Overtime between Full-time Family and Full-time Hired Workers - Hours per Farm and per 100 Adjusted Acres

	Per Farm			Per 100 Acres			Percentages			Overtime as % Total Labour Input
	Fam-ily	Hired	To-tal	Fam-ily	Hired	To-tal	Fam-ily	Hired	To-tal	
Mainly Dairy	Hrs. 577	Hrs. 754	Hrs. 1331	Hrs. 395	Hrs. 516	Hrs. 911	% 43	% 57	% 100	% 16
Dairy with Pigs	1085	672	1757	678	420	1098	62	38	100	18
Dairy with Poultry	1556	486	2042	1255	392	1647	76	24	100	21
Mixed Livestock	612	29	641	434	21	455	95	5	100	8
Cattle & Sheep	620	66	686	371	40	411	90	10	100	10
All Groups	981	316	1297	672	216	888	76	24	100	16

The allocation of total overtime between weekends (Saturday p.m. and Sunday)

Table 11. Allocation of Total Overtime between Weekends and Weekdays - Hours per 100 Adjusted Acres

	Sat. p.m. and Sundays		Weekdays		Total	
	Hrs.	%	Hrs.	%	Hrs.	%
Mainly Dairy	820	90	91	10	911	100
Dairy with Pigs	813	74	285	26	1098	100
Dairy with Poultry	1255	75	392	25	1647	100
Mixed Livestock	455	100	-	-	455	100
Cattle & Sheep	411	100	-	-	411	100
All Groups	722	87	166	13	888	100

and weekdays in Table 11 reveals that, for the entire sample, 87% of the total was incurred at weekends. Only in two of the Dairy groups was any appreciable amount - 25% of the total - of weekday overtime recorded, its incidence here being a daily feature of the dairy enterprise. This factor, together with the relative importance of weekend overtime, contribute to a fairly uniform weekly overtime pattern throughout the year, a fact which is borne out by the data in Table 12.

Table 12. Seasonal Distribution of Total Overtime

	Mainly Dairy	Dairy with Pigs	Dairy with Poultry	Mixed Live-stock	Cattle & Sheep	All Groups
	Hours per 100 Adjusted Acres					
March	64	90	118	36	34	68
April	73	91	149	39	31	77
May	82	100	124	41	28	74
June	73	85	131	40	36	72
July	73	90	123	37	30	70
August	73	90	124	32	30	70
September	73	93	134	36	30	72
October	83	93	153	37	35	78
November	82	91	175	35	37	82
December	82	91	135	41	39	75
January	82	90	144	41	40	75
February	71	94	137	40	41	75
Total	911	1098	1647	455	411	888

The Overall Pattern of Labour Use

Division of Total Labour between Direct and Indirect Work.

The details in Table 13 show how total labour was allocated in each group between direct work on livestock and crops and indirect work on maintenance and managerial tasks. In the three Dairy groups a bigger proportion of labour was employed on direct work than in the Mixed Livestock and Cattle & Sheep groups, the respective proportions amounting to 85% and 72% respectively. On the Dairy farms, the care of livestock accounted for nearly 69% and crops for 16% of total labour. On the Mixed Livestock and Cattle & Sheep farms, livestock accounted on average for 50% and crops for 22% of total labour.

Of the labour employed on indirect tasks, the greater proportion by

far was expended on maintenance work. In the Dairy groups, for example, approximately 13% of total labour resources were used on maintenance tasks compared with only 2% on managerial duties. In the combined Mixed Livestock and Cattle & Sheep groups, the comparative figures were 23% and 5% respectively.

Table 13. Allocation of Total Annual Labour Input
Between Direct and Indirect Tasks

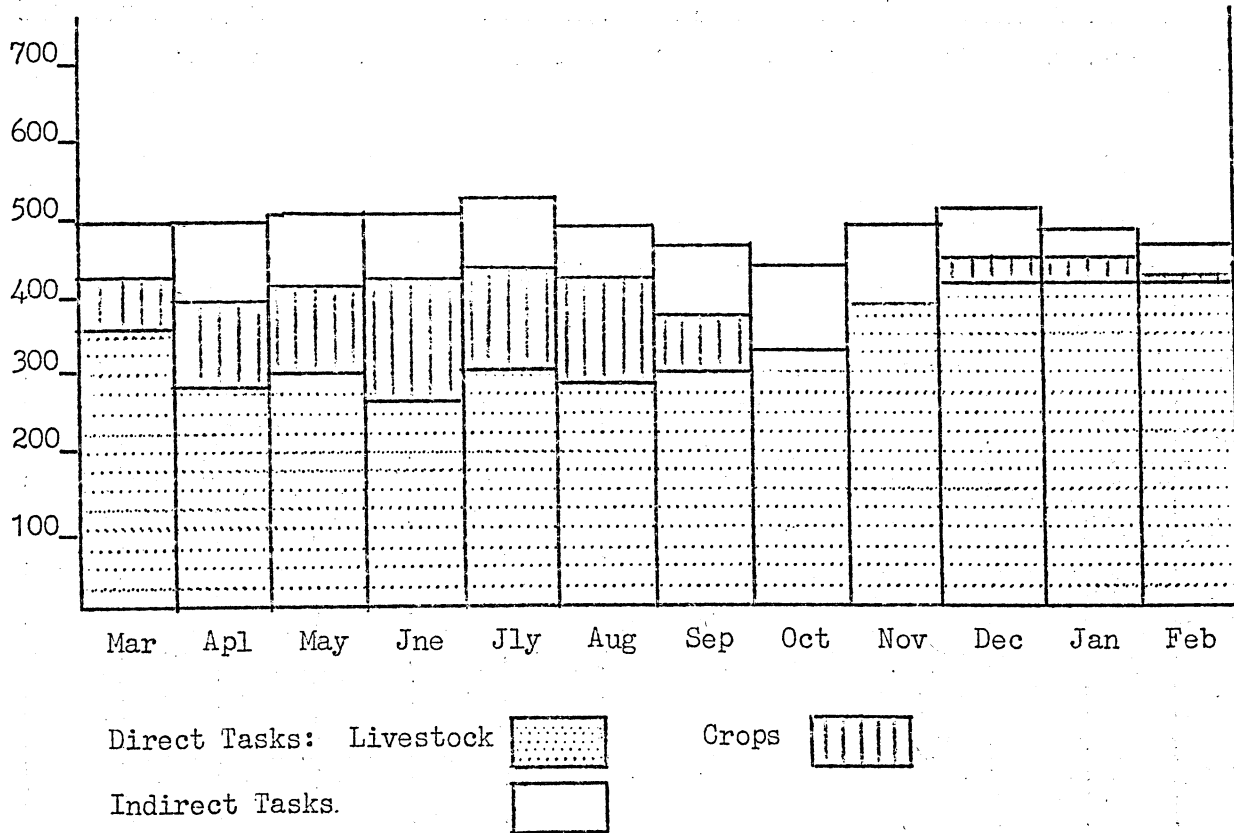
	Mainly Dairy	Dairy with Pigs	Dairy with Poultry	Mixed Live-stock	Cattle & Sheep	All Groups
Direct Tasks:	Hours per 100 Adj. Acres					
Livestock	4093	3376	6229	3013	1916	3231
Crops	807	1534	778	1137	979	1134
Total Direct	4900	4910	7007	4150	2895	4365
Indirect Tasks:						
Maintenance	805	1105	623	1250	979	1134
Managerial	58	123	156	284	204	170
Total Indirect	863	1228	779	1534	1183	1304
TOTAL LABOUR	5763	6138	7786	5684	4078	5669
Direct Tasks:	Percentages					
Livestock	71	55	80	53	47	57
Crops	14	25	10	20	24	20
Total Direct	85	80	90	73	71	77
Indirect Tasks:						
Maintenance	14	18	8	22	24	20
Managerial	1	2	2	5	5	3
Total Indirect	15	20	10	27	29	23
TOTAL LABOUR	100	100	100	100	100	100

The monthly distribution of the total annual labour employed on direct and indirect tasks are presented in Appendix III (Table A). The pictorial presentation of these data in Histograms A1-A5 shows that the

Histograms A1-A5 Seasonal Distribution of Total Labour
on Direct and Indirect Tasks
(Man Hours per 100 Adjusted Acres)

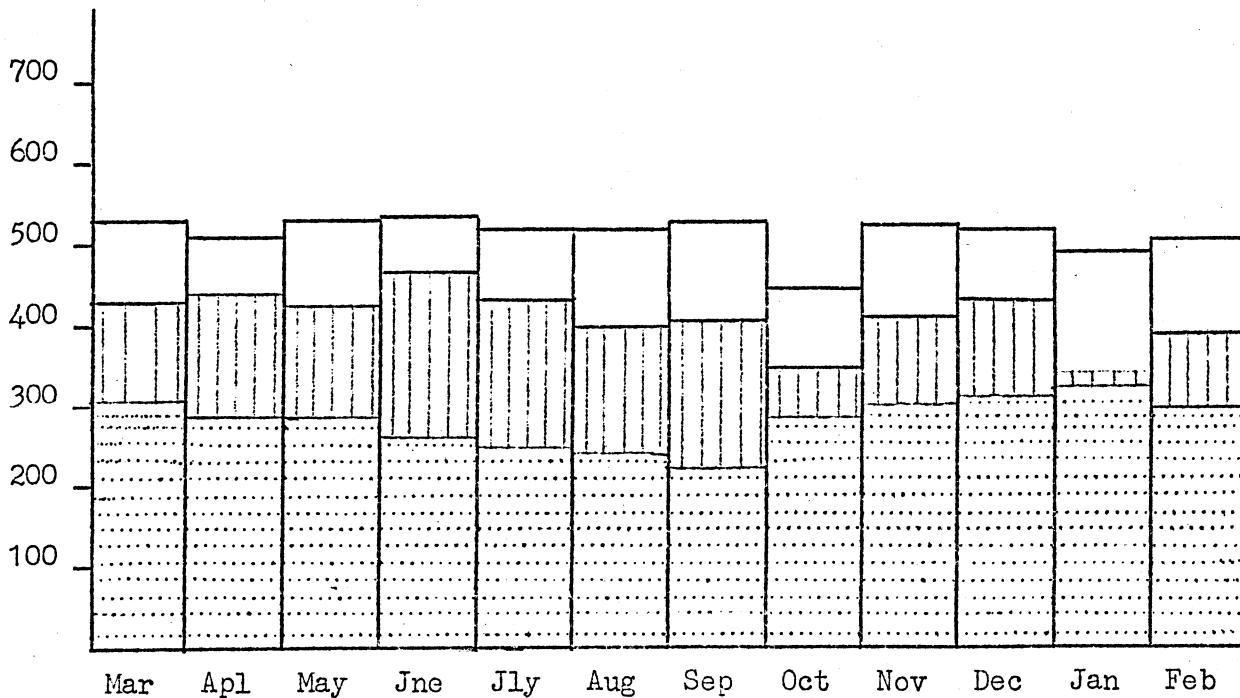
Hrs/100 Acs

A1. Mainly Dairy



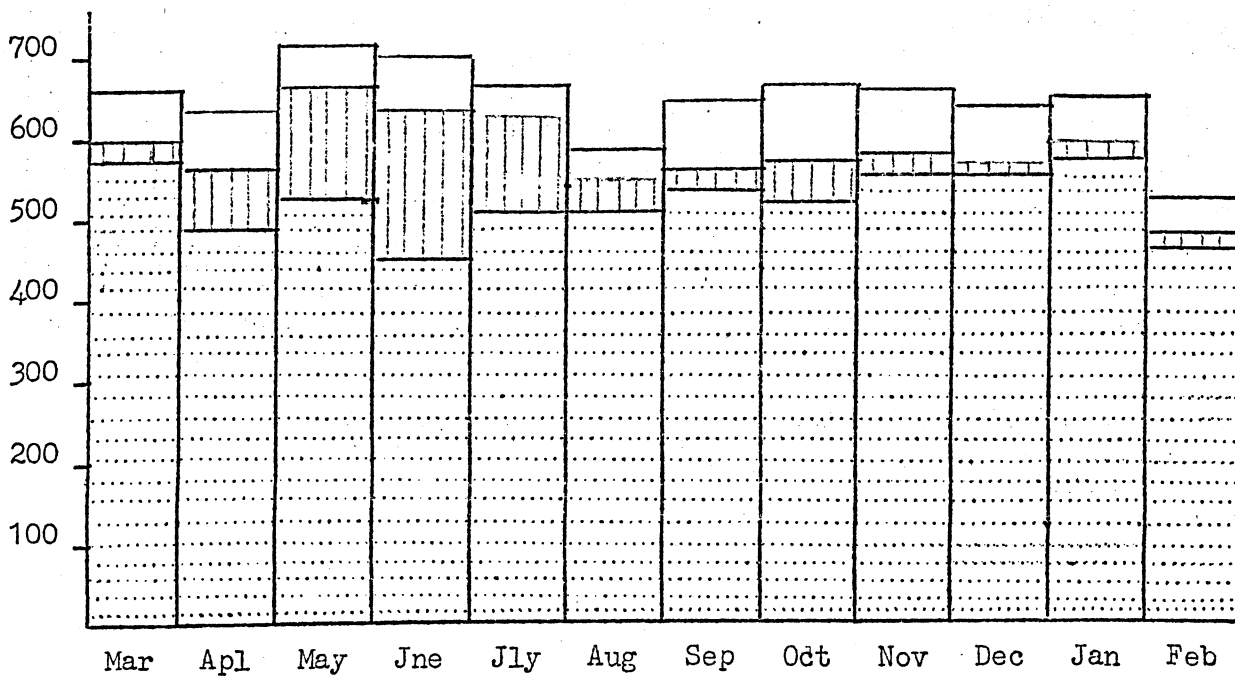
Hours/100 Acs

A2. Dairy with Pigs



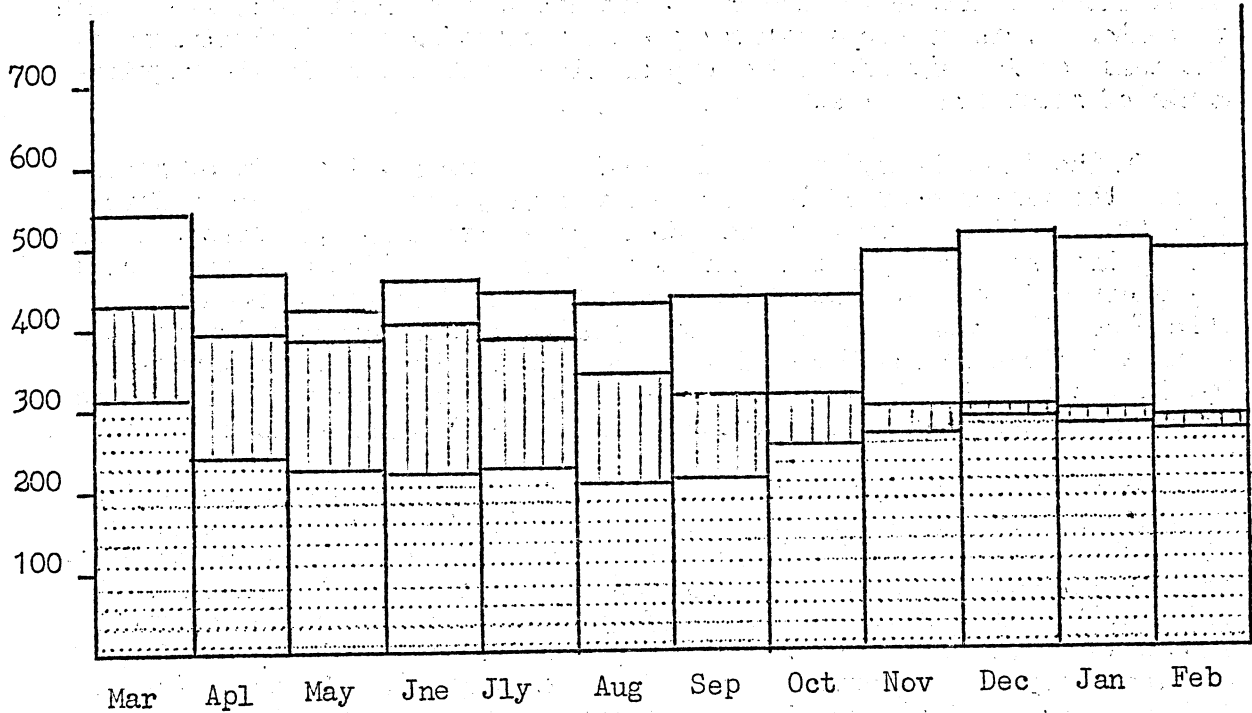
Hours/100 Acs

A3. Dairy with Poultry



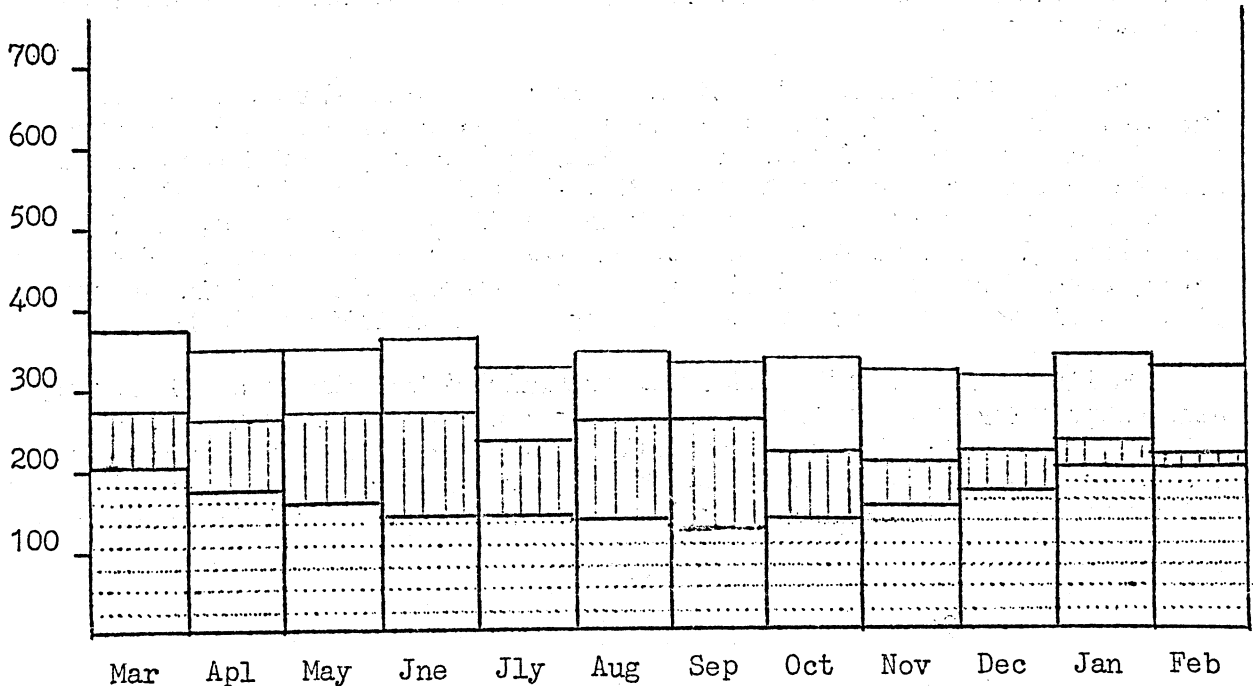
Hours/100 Acs

A4. Mixed Livestock



Hours/100 Acs

A5. Cattle & Sheep



total input of labour in each group did not vary significantly from month to month. Work on crops naturally showed marked seasonal fluctuations, but this was largely offset by compensating fluctuations in the requirements of stock and indirect work.

In the three Dairy groups, the higher labour requirements of stock during the winter ensured the productive employment of the labour force at this time. It is true that cows do compete with crops for labour during the spring and summer, but in the main, they do function as a successful "balance" and thereby contribute to a fairly uniform labour requirement throughout the year. On the study farms, excessive competition between crops and stock during the spring and summer months was in part avoided by the growing of kale as the main source of winter fodder in preference to the more labour consuming crops such as mangolds and turnips or swedes.

On farms pursuing extensive systems of cattle and sheep production, maintaining regular labour in continuous productive employment is often difficult. The winter labour requirements of the stock are not so critical as with dairy herds, since on many of our upland and hill farms the older cattle and the sheep are outlying. In such circumstances, the little work available involves periodic inspections and the provision of supplementary feeding during the most severe weather. On these farms, the main source of alternative employment is provided by maintenance tasks such as hedging and ditching, and capital establishment work on buildings and equipment. Indeed, in both the Mixed Livestock and the Cattle & Sheep groups, approximately one-third of the winter labour resources were devoted to these particular tasks. During the spring and early summer, on the other hand, the balance was maintained by the requirements of a wide range of fodder crops which provided a fairly steady demand for labour when stock were out on grass.

Labour utilisation on the study farms may be summed up briefly as follows. In the Dairy groups of farms the pattern of crop and livestock organisation created a demand for a fairly regular supply of direct labour all the year round, and hence indirect work followed a similar trend. On the more extensive Mixed Livestock and Cattle & Sheep groups, on the other hand, the demand for direct labour was far more seasonal in character, occurring mainly in spring and early summer, thus providing a surplus capacity of labour in winter for employment on indirect tasks.

On livestock generally, it is an established fact that a significantly high proportion of the total labour is incurred in or around the farm buildings. It will be seen from Table 14 that the proportion varies, of course, with the type of farm, but for all groups studied, approximately 77% of the total time employed on livestock was spent in buildings and

yards. Bearing in mind the heavy labour requirements of livestock, it

Table 14.

The Proportion of Labour
Employed in Buildings and Yards

	Percentage of:-	
	Labour Devoted to Livestock	Total Farm Labour
	%	%
Mainly Dairy	87	62
Dairy with Pigs or Poultry	83	57
Mixed Livestock	74	39
Cattle & Sheep	53	25
All Groups	77	48

is evident that labour saving in buildings, either by means of better design and layouts or improved work routines, is a subject which merits a great deal of consideration.

IV. THE EMPLOYMENT OF DIRECT LABOUR

The General Pattern of Labour Use on Livestock

The Division of Total Livestock Labour between Enterprises

The details in Table 15 show the total labour directly employed on cattle, sheep, pigs and poultry. The pattern of distribution varied considerably between the individual type groups, although in each, cattle absorbed by far the highest proportion of total labour. This ranged from as high as 93% of the total on the Mainly Dairy farms to 63% on the Dairy with Pigs, Mixed Livestock and Cattle & Sheep farms and 50% on the Dairy with Poultry group of farms.

Table 15. The Division of Total Direct Labour on Livestock according to Enterprise

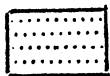
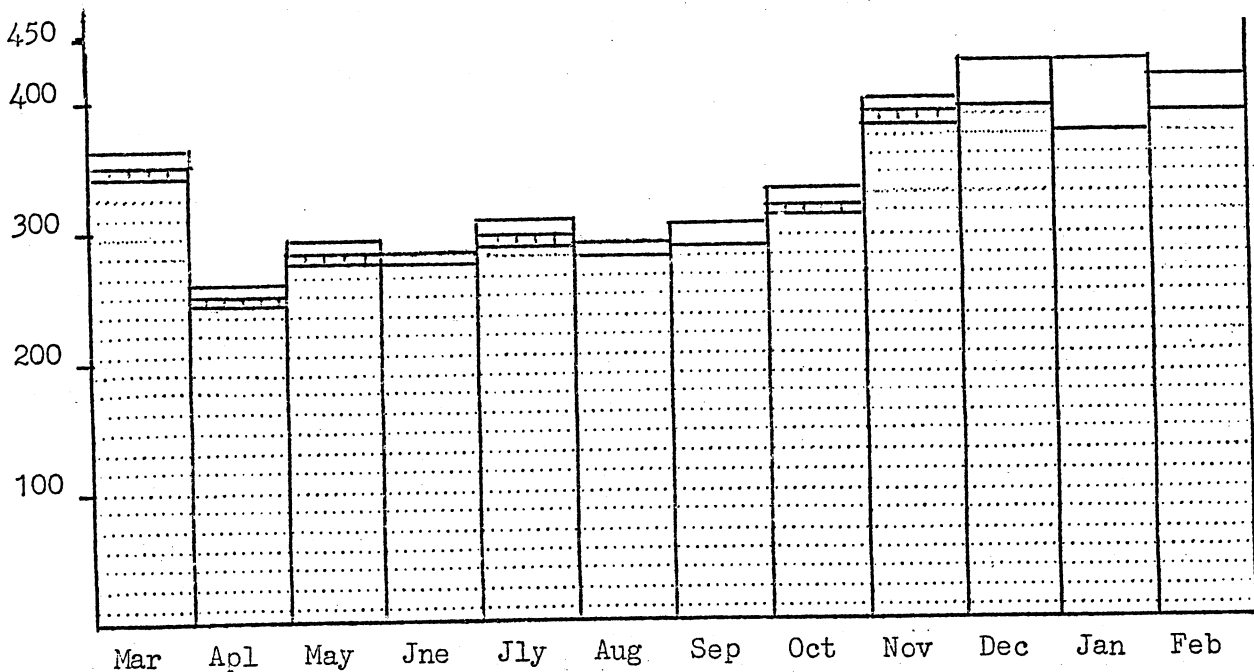
	Mainly Dairy	Dairy with Pigs	Dairy with Poultry	Mixed Live-stock	Cattle & Sheep	All Groups
	Hours per 100 Adj. Acres					
Cattle	3806	2090	3126	1837	1180	2097
Sheep	41	58	100	310	667	204
Pigs	-	1040	187	323	38	268
Poultry	246	188	2816	543	31	662
Total	4093	3376	6229	3013	1916	3231
	Percentages					
Cattle	93.0	61.9	50.2	61.0	61.6	64.9
Sheep	1.0	1.7	1.6	10.3	34.8	6.3
Pigs	-	30.8	3.0	10.7	2.0	8.3
Poultry	6.0	5.6	45.2	18.0	1.6	20.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

The monthly distribution patterns of the total labour employed on individual enterprises, presented in Histograms B1-B5, show that the requirements of cattle as a whole were higher in winter than in summer, peak requirements occurring between November and March. By comparison, sheep exhibited little variation, but minor peaks occurred at lambing from January to early April and again at shearing in late May and June. Pigs and poultry both showed a steady demand for labour throughout the year. Details of the actual hours employed monthly on the individual

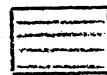
Histograms B1-B5. Seasonal Distribution of Total Labour
on Livestock
(Man Hours per 100 Adjusted Acres)

Hrs/100 Acs

B1. Mainly Dairy



Cattle



Pigs



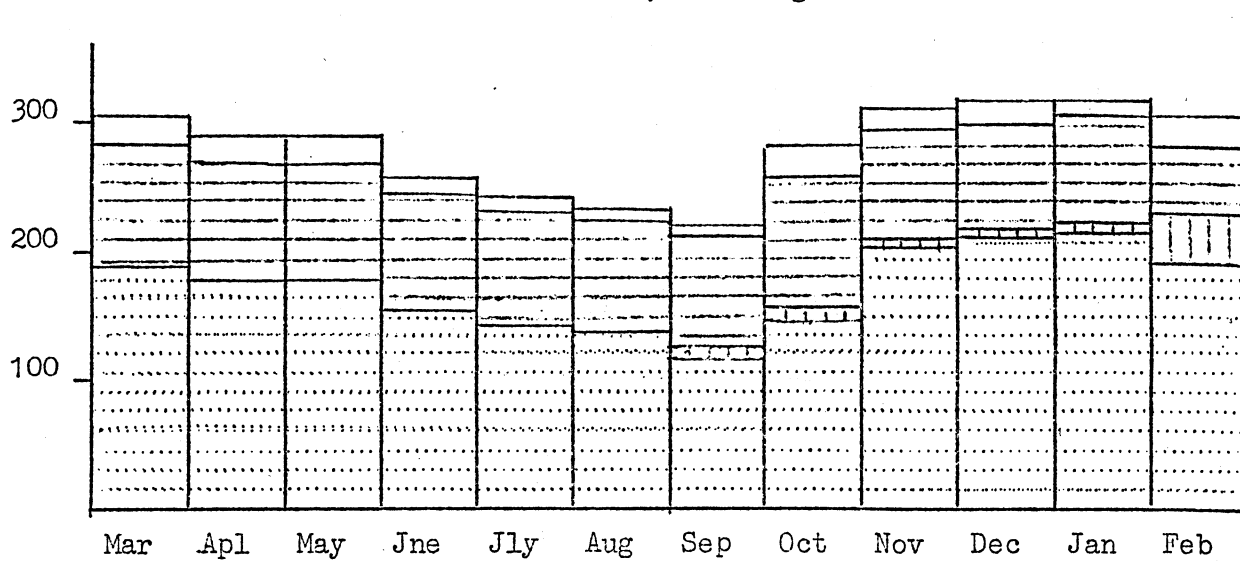
Sheep



Poultry

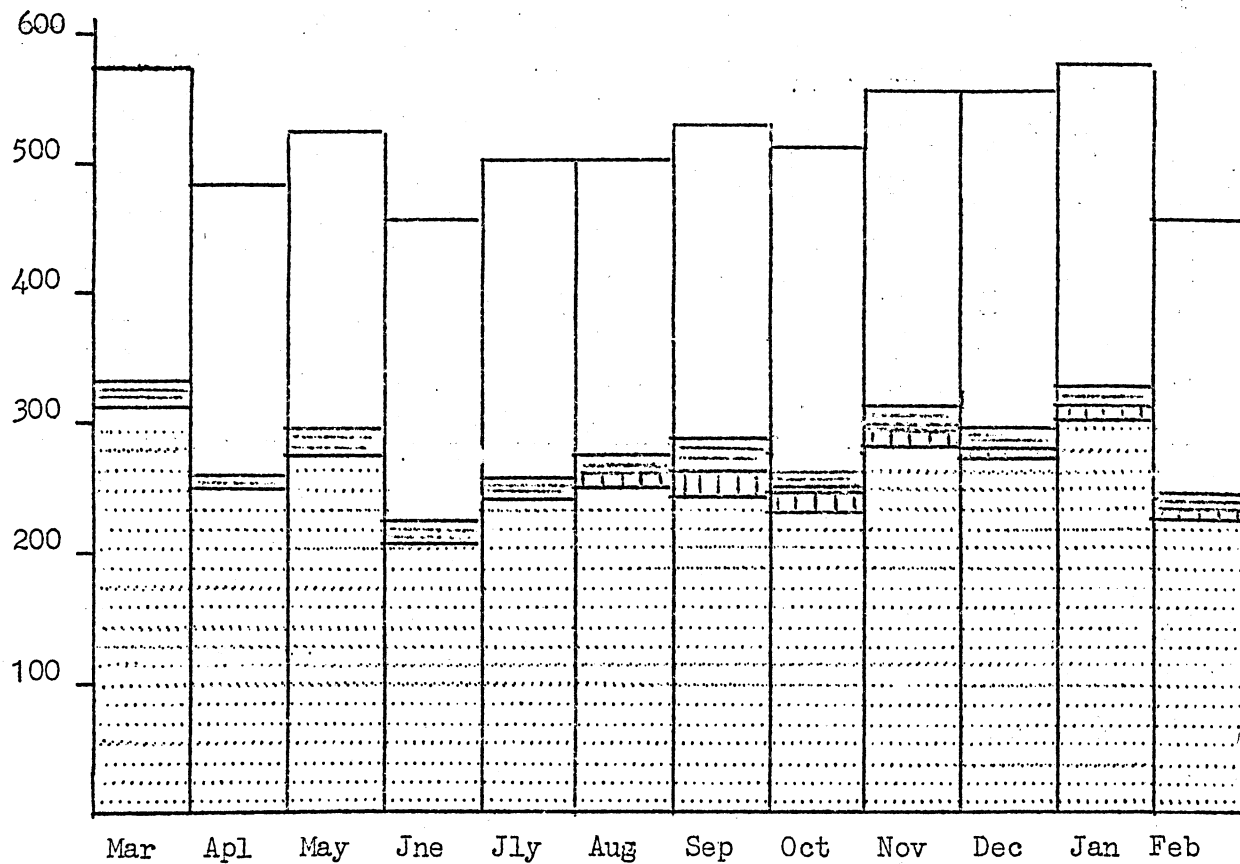
Hrs/100 Acs

B2. Dairy with Pigs



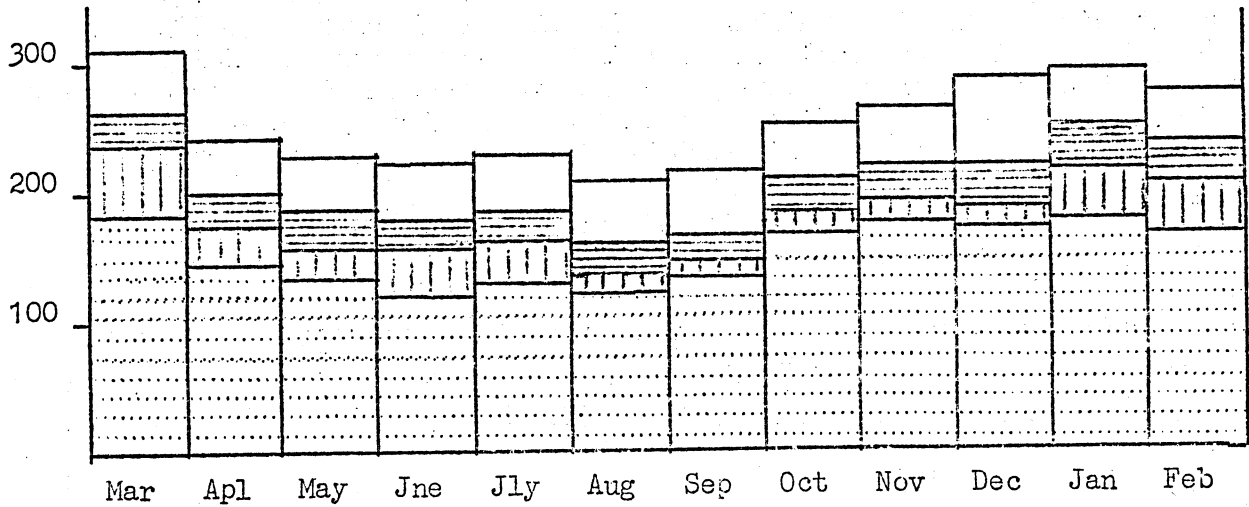
Hrs/100 Acs

B3. Dairy with Poultry



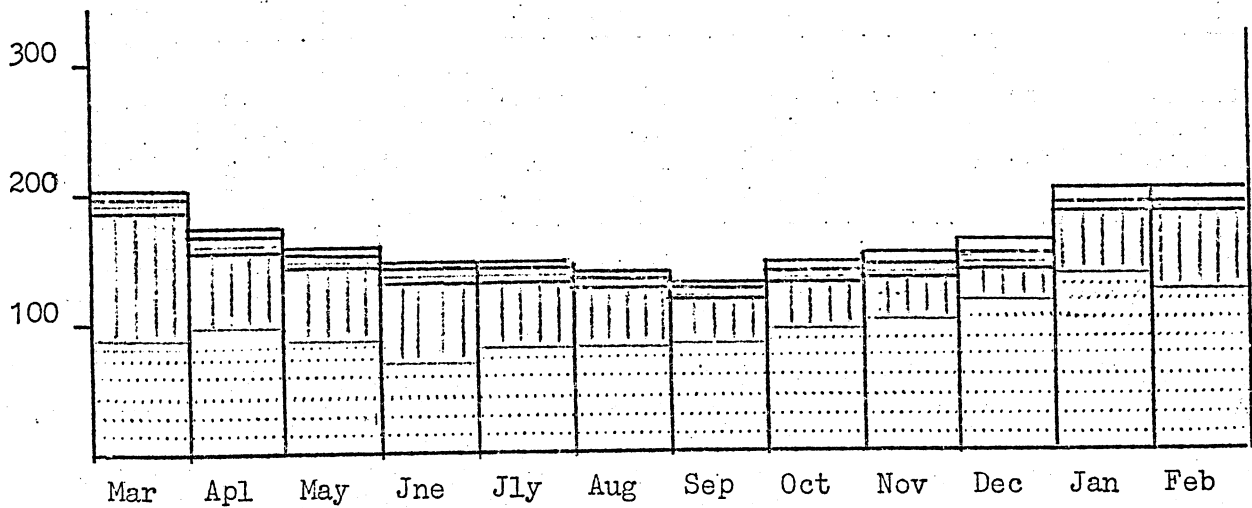
Hrs/100 Acs

B4. Mixed Livestock



Hrs/100 Acs

B5. Cattle & Sheep



enterprises are presented in Appendix IV (Table A).

The Employment of Direct Labour on Cattle

In Table 16 the total annual labour employed on cattle has been subdivided between four main tasks, (1) milking, (2) feeding, (3) cleaning and bedding and (4) general work. In those groups where milk production was important, and these include the Mixed Livestock group of farms, the time absorbed by the daily milking routine accounted for between 48% and 62% of the total labour employed on cattle. For the combined Dairy and the Mixed Livestock groups, this particular task accounted for approximately 56% of total labour. Feeding accounted for a further 25%, cleaning out buildings and the provision of fresh bedding 15%, and general work 4%.

Table 16. The Division of Total Direct Labour on Cattle
between Various Tasks

	Mainly Dairy	Dairy with Pigs	Dairy with Poultry	Mixed Live-stock	Cattle & Sheep	All Groups
	Hours per 100 Adj. Acres					
Milking & Associated Tasks	2364	1006	1878	1003	317	1051
Feeding	863	509	750	514	497	604
Cleaning & Bedding	476	514	441	155	88	272
General Work	103	61	57	165	278	170
Total	3806	2090	3126	1837	1180	2097
	Percentages					
Milking & Associated Tasks	62.1	48.1	60.1	54.6	26.9	50.1
Feeding	22.7	24.4	24.0	28.0	42.1	28.8
Cleaning & Bedding	12.5	24.6	14.1	8.4	7.5	13.0
General Work	2.7	2.9	1.8	9.0	23.5	8.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

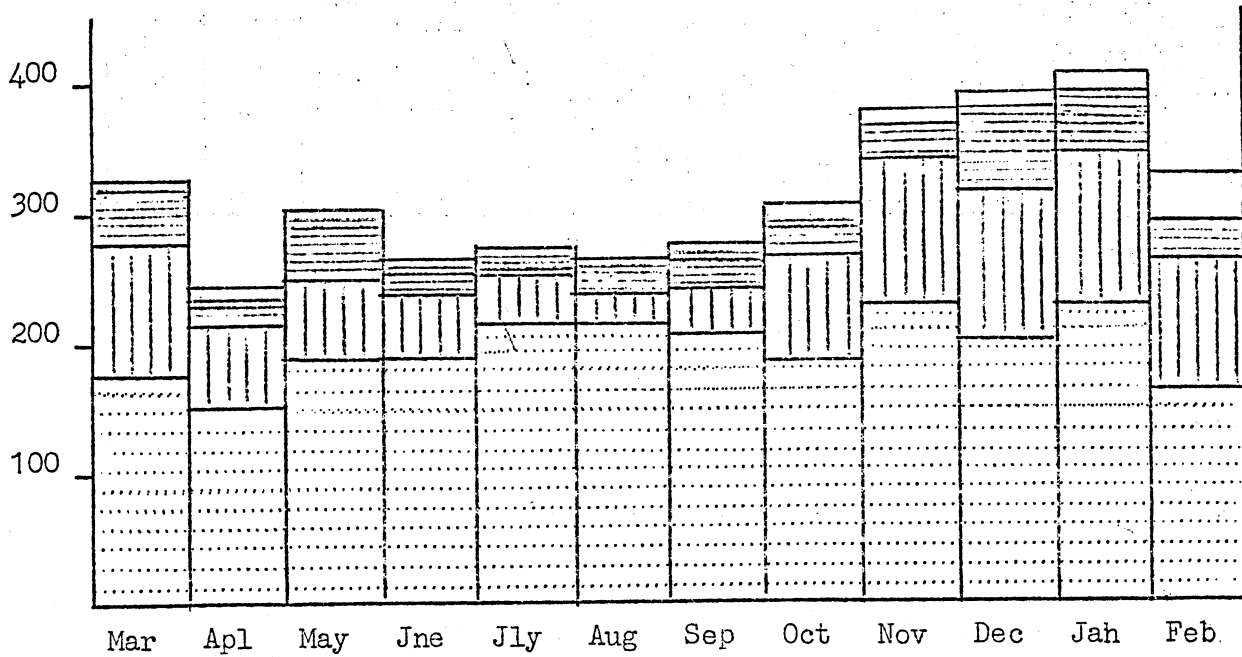
On the Cattle & Sheep farms the production of milk for sale was largely incidental to the requirements of calves and, consequently, the time devoted to milking amounted to only 27% of the total labour devoted to cattle. Feeding, however, accounted for about 42%, cleaning and bedding for 7% and general work, such as routine inspection of outlying stock, for approximately 24%.

Histograms C1-C5

Seasonal Distribution of Total Labour
on Cattle according to Task
(Man Hours per 100 Adjusted Acres)

Hours/100 Acs

C1. Mainly Dairy



Milk

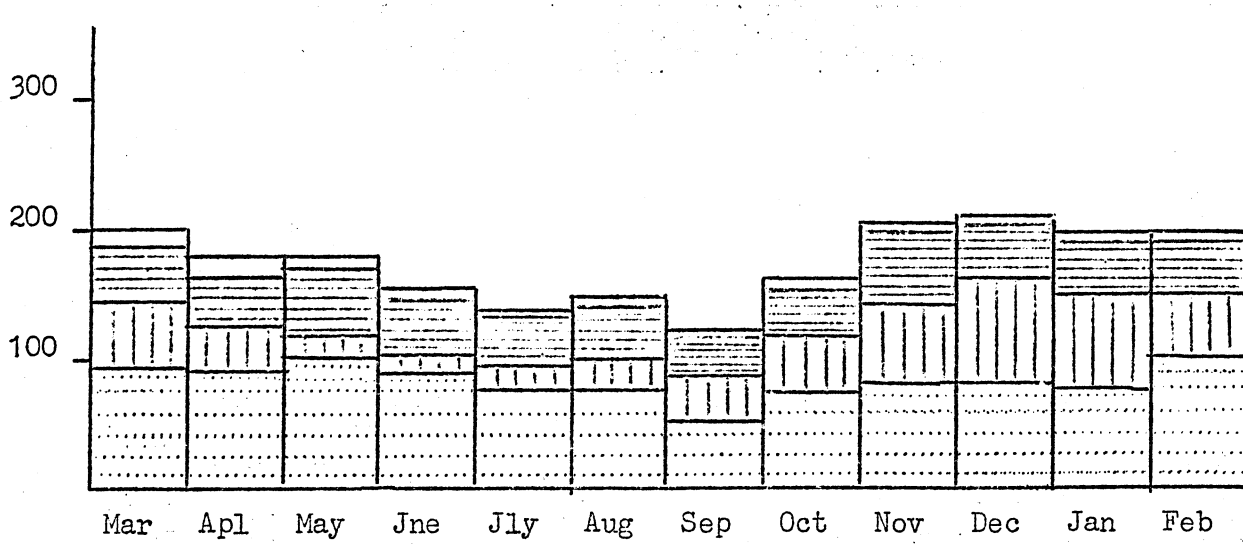
Clean

Feed

General

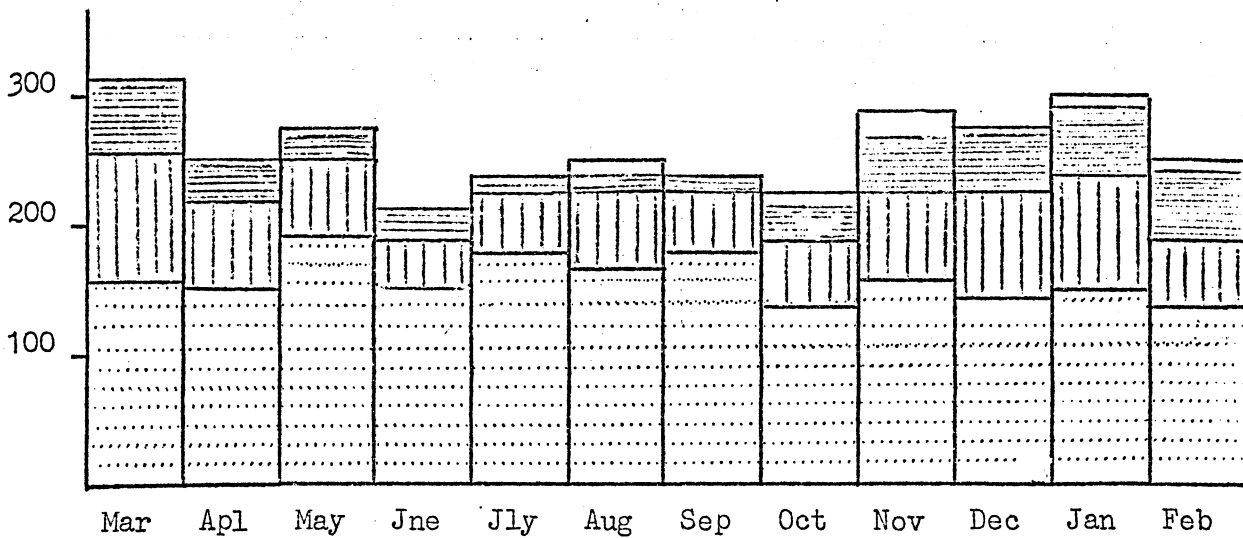
Hours/100 Acs

C2. Dairy with Pigs



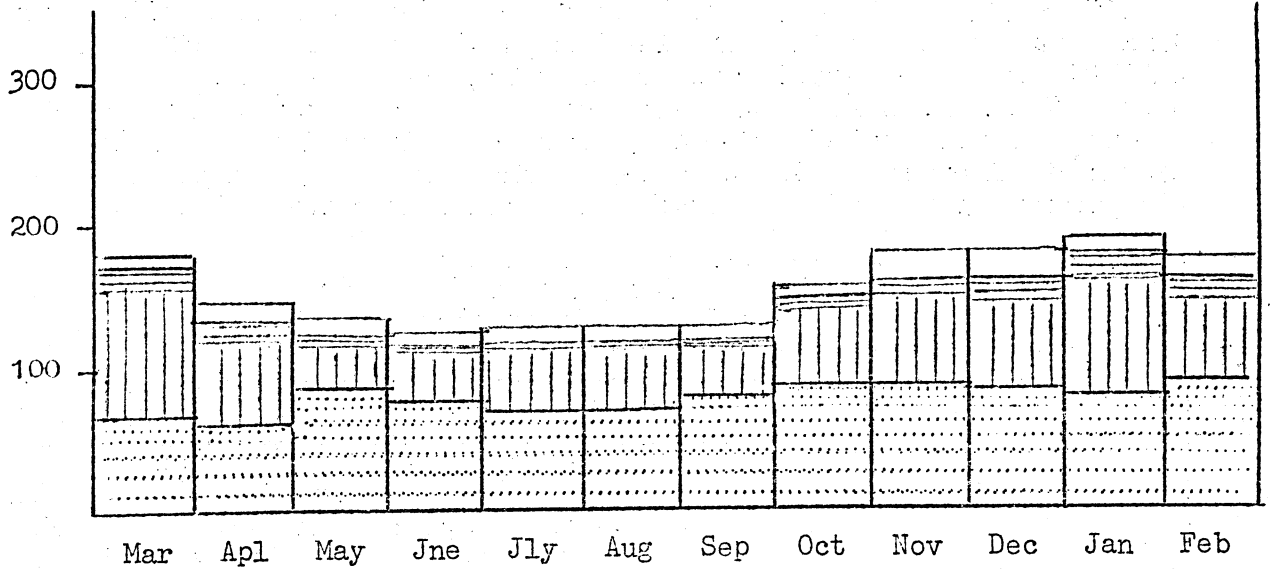
Hours/100 Acs

C3. Dairy with Poultry



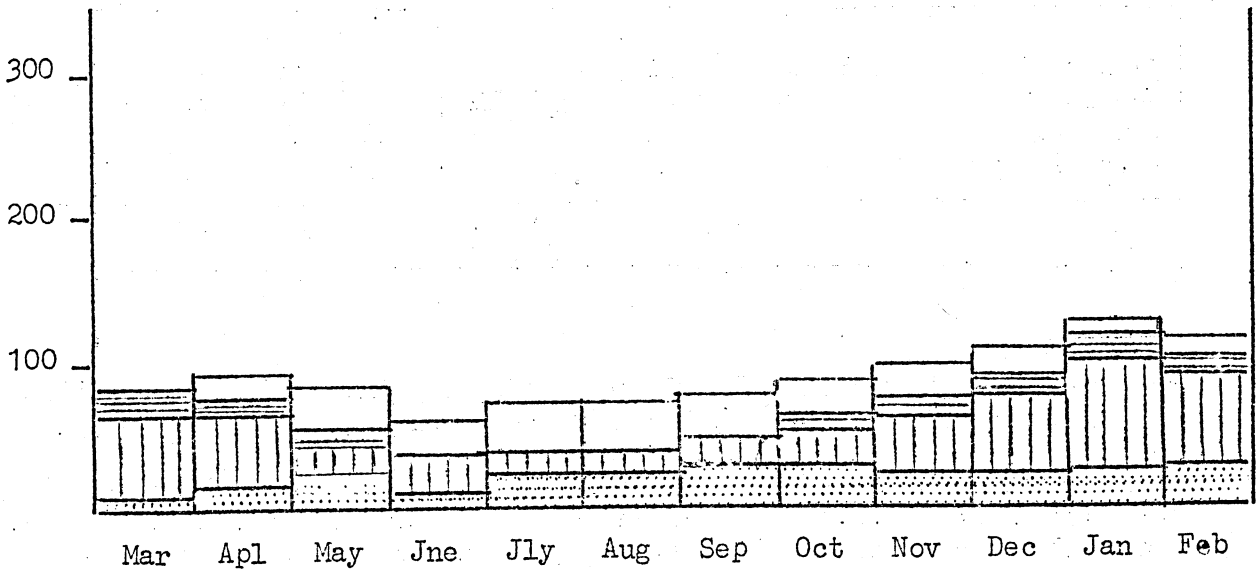
Hours/100 Acs

C4. Mixed Livestock



Hours/100 Acs

C5. Cattle & Sheep



The seasonal distribution of labour employed on each of the main tasks associated with the cattle enterprise are presented in pictorial form in Histograms C1 - C5, which are based on the physical details given in Appendix IV (Table B). It will be seen that although milking did exhibit certain seasonal labour fluctuations, these were not so pronounced as the fluctuations in feeding and cleaning. The seasonal patterns of labour in feeding and cleaning are, however, influenced considerably by system of management. For example, a dairy herd managed under the yard and parlour system will show smaller seasonal fluctuations than one housed

Table 17. The Division of Total Direct Labour according to Class of Stock

	Milk Producing Farms				Cattle Rearing Farms			
	Dairy Cows	Followers		Total Labour	Nurse Cows	Followers		Total Labour
		Over 1 yr	Under 1 yr			Over 1 yr	Under 1 yr	
	Hours per 100 adj. Acres							
Milking & Associated Tasks	1551	-	-	1551	317	-	-	317
Feeding	272	136	272	680	159	151	187	497
Cleaning	163	109	136	408	24	31	33	88
General Work	27	33	22	82	98	107	73	278
Total	2013	278	430	2721	598	289	293	1180
	Percentages							
Milking & Associated Tasks	57	-	-	57	27	-	-	27
Feeding	10	5	10	25	13	13	16	42
Cleaning	6	4	5	15	2	2	3	7
General Work	1	1	1	3	8	9	7	24
Total	74	10	16	100	50	24	26	100

and milked in a conventional shippon. The significance of this particular consideration is shown in a later section on unit labour requirements.

A further appreciation of labour utilisation on cattle is provided by the data in Table 17, which show how total labour was distributed between cows and other cattle. The data show that the distribution varied signifi-

cantly between the milk producing and the cattle rearing groups of farms. In the milk producing group, the cows absorbed 74% of the total labour employed on the cattle enterprise, whereas on the rearing farms the proportion was 50%. This difference is attributable to two factors. First, a ratio of one cow to one follower in the milk producing group of farms compared with one cow to two followers on the rearing farms; and second, the relatively high labour requirements of dairy cows compared with nurse cows.

The Employment of Direct Labour on Sheep

Sheep on the study farms were essentially grassland flocks, but nearly all received some supplementary feeding during the winter, principally in the form of folded turnips or swedes and rape. Management policy, however, did vary in one salient respect between the Dairy and Mixed Livestock farms on the one hand, and the Cattle & Sheep farms on the other. Whereas in the former most of the annual lamb crop was marketed as fat lambs, retaining only ewe lambs required for flock replacement, on the Cattle & Sheep group of farms the wether lambs were sold in store condition and all the ewe lambs retained either for subsequent sale as two-tooth hoggets or for transfer into the breeding flock.

In Table 18 the total direct labour on sheep is distributed between the main tasks associated with the enterprise. By far the most important labour task in all groups was the daily routine inspection of the flock. For all farms, this particular task, including the time spent on travelling to and from the flock, accounted for approximately 45% of the total labour employed on sheep. The lambing requirements of the flock accounted for a further 24% of total labour, which is a significantly high proportion when it is borne in mind that this particular aspect of management is incurred over a comparatively short period of time. Feeding, including the hurdling or fencing of sheep in roots, accounted for 10% and dipping, drenching and docking together for 9%. The time devoted to shearing and the packing of wool amounted to 9%, whilst 3% of total labour input was devoted to miscellaneous tasks such as tailing and castrating lambs and selecting sheep for marketing.

As previously stated, sheep exhibit a relatively steady demand for labour throughout the year, with slight peaks occurring at lambing and shearing time. On the lowland farms lambing extended from early January to the end of February, but on the upland farms it was a more prolonged affair, extending from January to early April. Shearing was normally done in late May or early June, followed a few weeks later by dipping. Docking or tail trimming was undertaken in August or September when the flocks had

been "made-up" in readiness for tuppung. Drenching was carried out as considered necessary during the summer months.

Table 18. The Division of Total Direct Labour on Sheep between Various Tasks

	Dairy Groups	Mixed Livestock	Cattle & Sheep	All Groups
	Hours per 100 Adj. Acres			
Daily Inspection	31	121	313	93
Lambing	19	71	169	48
Feeding	8	36	60	20
Dipping, Drenching and Docking	4	30	62	19
Shearing	3	39	49	18
Other Work	2	13	14	6
Total	67	310	667	204
	Percentages			
Daily Inspection	46	39	47	45
Lambing	28	23	26	24
Feeding	12	12	9	10
Dipping, Drenching and Docking	6	10	9	9
Shearing	5	12	7	9
Other Work	3	4	2	3
Total	100	100	100	100

The Employment of Direct Labour on Pigs and Poultry

The patterns of labour use on pigs and poultry are presented in Tables 19 and 20 respectively. Of the total labour used in pig production, Table 19 shows that feeding and watering accounted for 53%, cleaning and bedding for 33%, weighing and marking for nearly 2% and general work, which included castrations, injections and other veterinary tasks, for 12%.

For poultry, feeding and watering again accounted for the largest proportion of the total labour employed, just over 48%. Cleaning houses and nest boxes accounted for just under 17%, egg handling for 24% and general work, principally killing and dressing cull birds, for 11%.

Table 19. The Division of Total Direct Labour on Pigs
between Various Tasks - all Farms

	Total Labour
	%
Feeding & Watering	53.0
Cleaning & Bedding	33.3
Weighing & Marking	1.8
General Work	11.9
Total Labour	100.0

Table 20. The Division of Total Direct Labour on Poultry
between Various Tasks - all Farms

	Total Labour
	%
Feeding & Watering	48.3
Cleaning Houses & Nests	16.8
Collecting Eggs	10.7
Cleaning & Packing Eggs	13.6
General Work	10.6
Total Labour	100.0

The General Pattern of Labour Use on Crops

The Division of Total Crop Labour between Enterprises.

The details in Table 21 show how the total labour input on crops was distributed on the study farms between corn, roots and greenfodder and grassland. The proportions of labour devoted to these classes of crops

Table 21. The Division of Total Labour on Crops
between Corn, Roots & Greenfodder and Grassland

	Mainly Dairy	Dairy with Pigs	Dairy with Poultry	Mixed Live-stock	Cattle & Sheep	All Groups
	Hours per 100 Adj. Acres					
Corn	115	770	194	330	264	340
Roots & Greenfodder	112	299	120	377	346	325
Grassland	580	465	464	430	369	469
Total	807	1534	778	1137	979	1134
	Percentages					
Corn	14.2	50.2	24.6	29.0	27.0	30.0
Roots & Greenfodder	13.9	19.5	15.4	33.2	35.4	28.7
Grassland	71.9	30.3	60.0	37.8	37.6	41.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

reflect the cropping in the individual groups, details of which are presented in Appendix I (Table A). There are exceptions to this, particularly in the Cattle & Sheep group with its relatively high inputs of labour on corn and roots & greenfodder crops. For corn, this was due to the joint effects of adverse weather conditions at harvest time, and the predominance of small fields which precluded, to a large extent, the use of combine harvesters. Furthermore, the Cattle & Sheep farmers devoted a substantially higher proportion, approximately 50%, of the root break to potatoes, swedes and mangolds, all of which have high labour requirements per acre. Hence in relation to the total acreage of roots and green fodder grown, labour input per acre on the Cattle & Sheep farms was high.

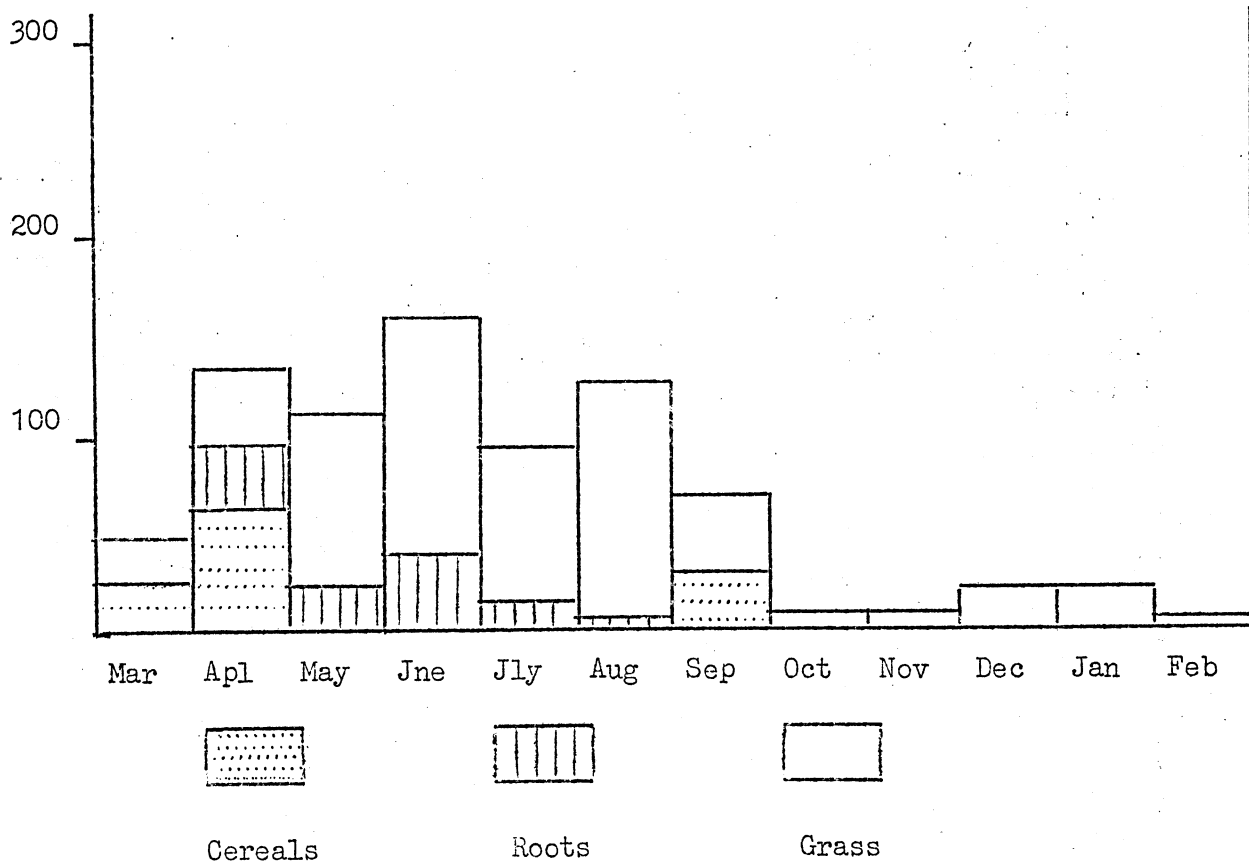
The seasonal distribution of the labour employed on these three classes of crops is shown in Histograms D1 - D5. In all groups labour input per month varied significantly and marked seasonal peaks are evident. In general, these occurred mainly at tilling time in April, in June and July when

Histograms D1-D5

Seasonal Distribution of Total Labour
on Crops
(Man Hours per 100 Adjusted Acres)

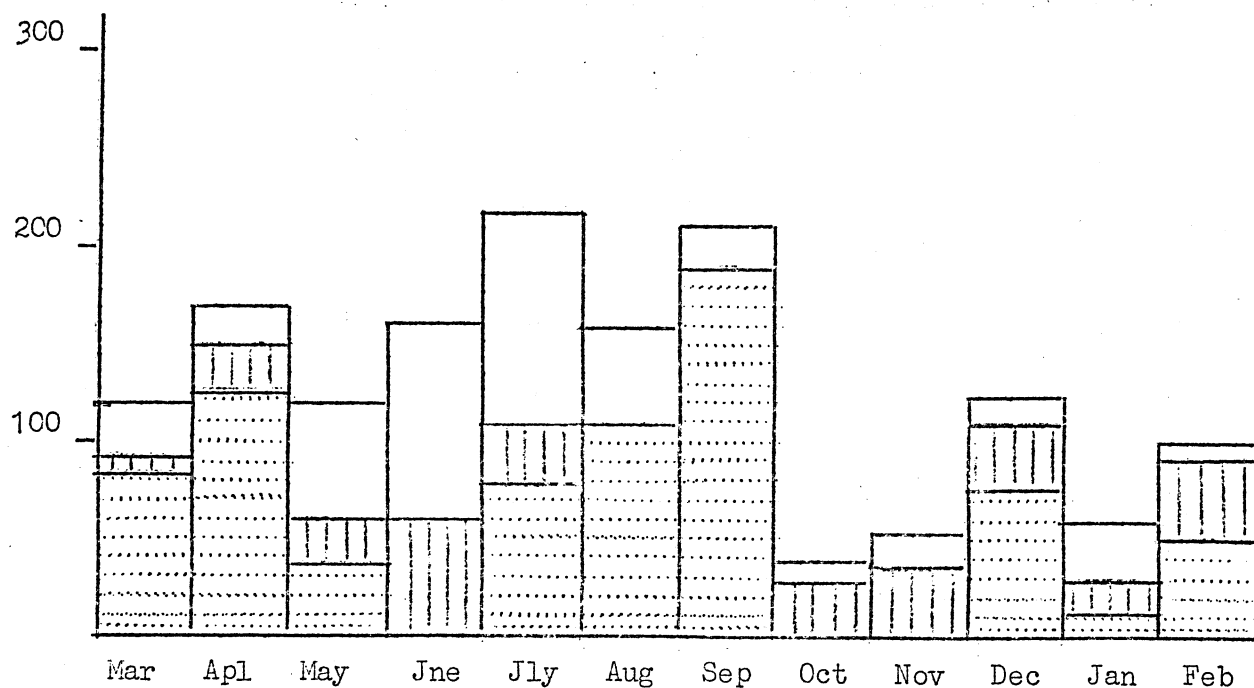
Hours/100 Acs

D1. Mainly Dairy



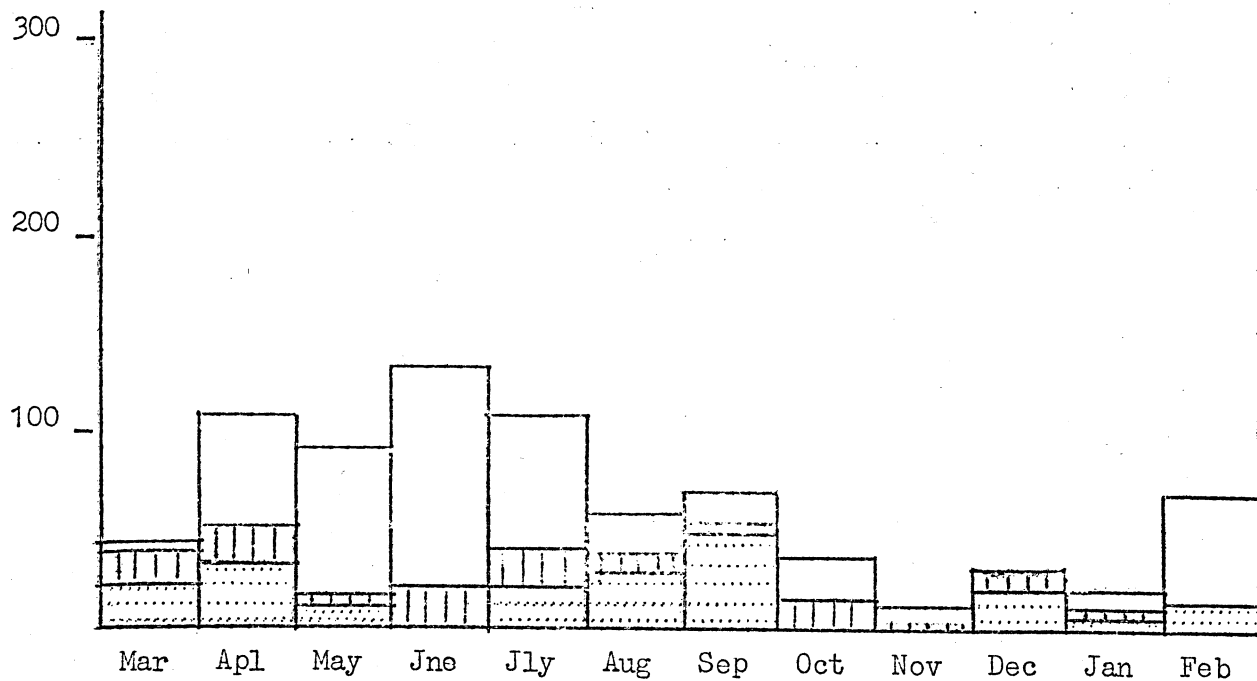
Hrs/100 Acs

D2. Dairy with Pigs



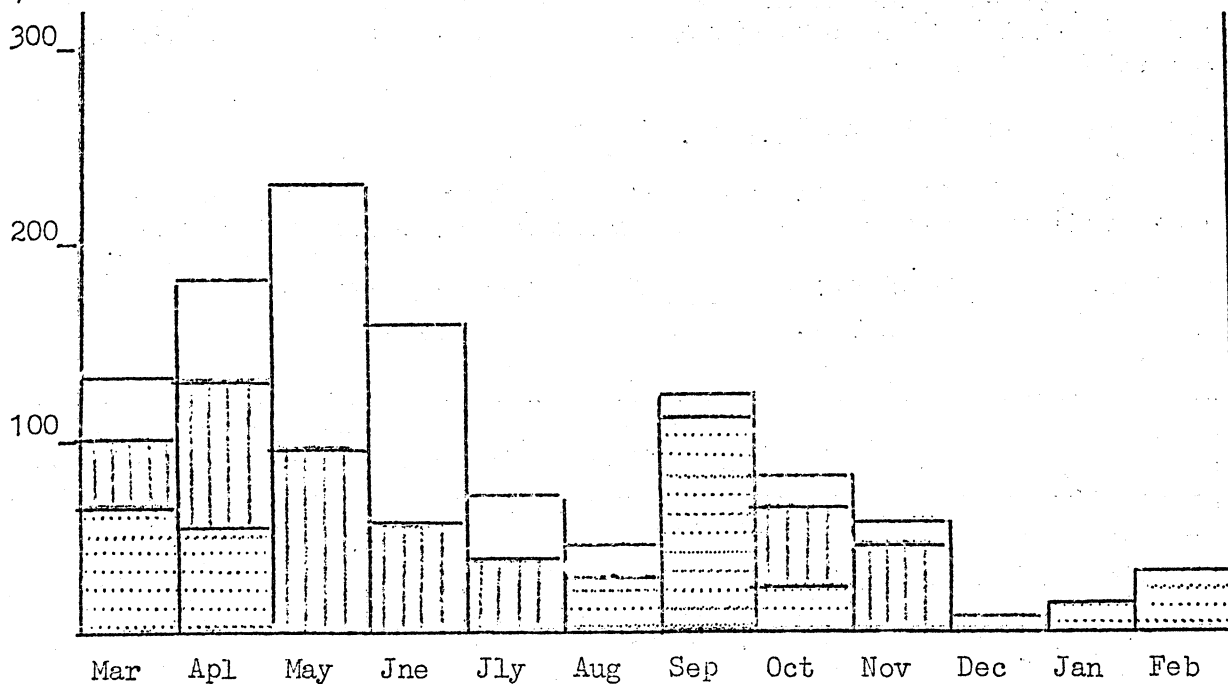
Hrs/100 Acs

D3. Dairy with Poultry



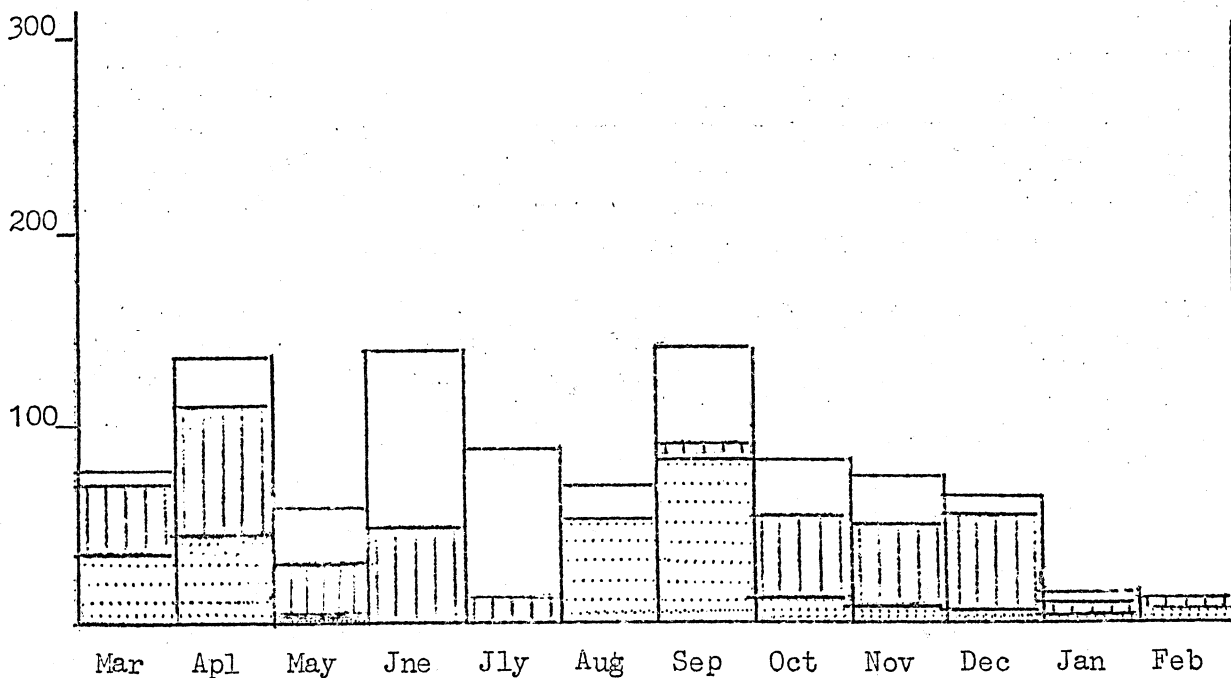
Hrs/100 Acs

D4. Mixed Livestock



Hrs/100 Acs

D5. Cattle & Sheep



grass conservation competed with the singling and hoeing requirements of root crops, and again during corn harvest in August and September. The data on which the foregoing Histograms are based are set out in detail in Appendix V (Table A).

The Employment of Direct Labour on Crops

In Table 22 the total annual labour employed on specific crops has been subdivided between the various tasks associated with their production.

Table 22. The Division of Total Direct Labour on Crops
between Various Tasks - all Farms

	Cereals		Maincrop	Swedes	Man- golds	Kale (Un- thinned)	Rape	*Grass- land
	Combine	Binder	Potatoes					
	%	%	%	%	%	%	%	%
Plough	21	14	5	4	3	29	38	7
Harrow, Roll etc.	19	12	3	6	5	38	29	
Apply Fertilisers	7	4	1	1	1	5	2	4
Apply FYM	-	-	6	3	5	18	17	24
Drill/Plant	13	8	16	2	2	10	14	-
Hoe, Spray or cut Weeds	2	1	16	25	36	-	-	14
Harvest	38	61	53	59	48	-	-	51
Total Labour	100	100	100	100	100	100	100	100
Requirement per Acre (Hrs.)	14.8	22.9	187.0	81.5	134.1	14.4	14.9	5.6

* Refers to all grassland, i.e., grazing, hay & silage

For all crops, except those folded in situ, harvesting absorbed by far the highest proportion of labour, ranging from 38% of the total for cereal crops harvested by combine to approximately 60% for binder harvested cereals, and for swedes. The seasonal distribution of labour on these crops may be seen in Appendix V (Table B).

V. THE EMPLOYMENT OF INDIRECT LABOUR

The General Pattern of Labour Use

The Division of Total Indirect Labour Between Maintenance and Managerial Tasks

The data in Table 13 on page 16 revealed that for the study farms as a whole approximately 23% of total labour input - equivalent to just over 13 hours per acre - was devoted to indirect work. The details in Table 23 show how the labour so employed on indirect work was distributed between the various constituent aspects of maintenance and managerial tasks respectively.

For all groups, maintenance tasks accounted for by far the highest proportion of total indirect labour, the average for the five groups of farms amounting to 87%, equivalent to just over 11 hours per acre, compared with 13% or nearly 2 hours per acre for managerial tasks. Expressed as a percentage of total direct labour employed on stock and crops maintenance tasks and management amounted to 26% and 4% respectively.

The time devoted to field work such as hedging, fencing, ditching and drainage accounted for the highest proportion of total indirect labour in all but one of the type groups and for the entire sample averaged nearly 33% of the total, or 4.3 hours per acre. Miscellaneous work accounted for just over 27%, 3.5 hours per acre, and included such tasks as corn grinding, cutting and carting firewood, gardening etc., and odd jobs. The relative importance of these tasks is shown in Appendix VI (Table A). The time devoted to repairs and general maintenance of equipment on the one hand, and buildings and roads on the other, accounted for approximately 16% and 11% respectively of the total, equivalent to 2.1 hours and 1.4 hours per acre.

The time spent annually on general office work and accounts was somewhat higher on the Dairy groups of farms, but even here it was only 0.9 hours per acre. For all farms, the figure was approximately 0.6 hours per acre, equivalent to 4.4% of total indirect labour or just over 1.0% of total farm labour. It is indeed a sad reflection that at a time when so much attention is being paid nationally to the business aspects of farming that such an insignificant amount of labour was devoted to office work and accounts.

Family workers in the Dairy groups devoted considerably less time to visiting markets and shows etc., than their counterparts in the Mixed Live-stock and Cattle & Sheep groups. In the former these visits averaged under 3% of total indirect labour and in the latter 15%. For all farms, visits to markets and shows accounted for 8.6% of total indirect labour, equivalent to 1.1 hours per acre of crops and grass.

Table 23.

The Division of Total Annual Labour
Employed on Indirect Work, according to Task

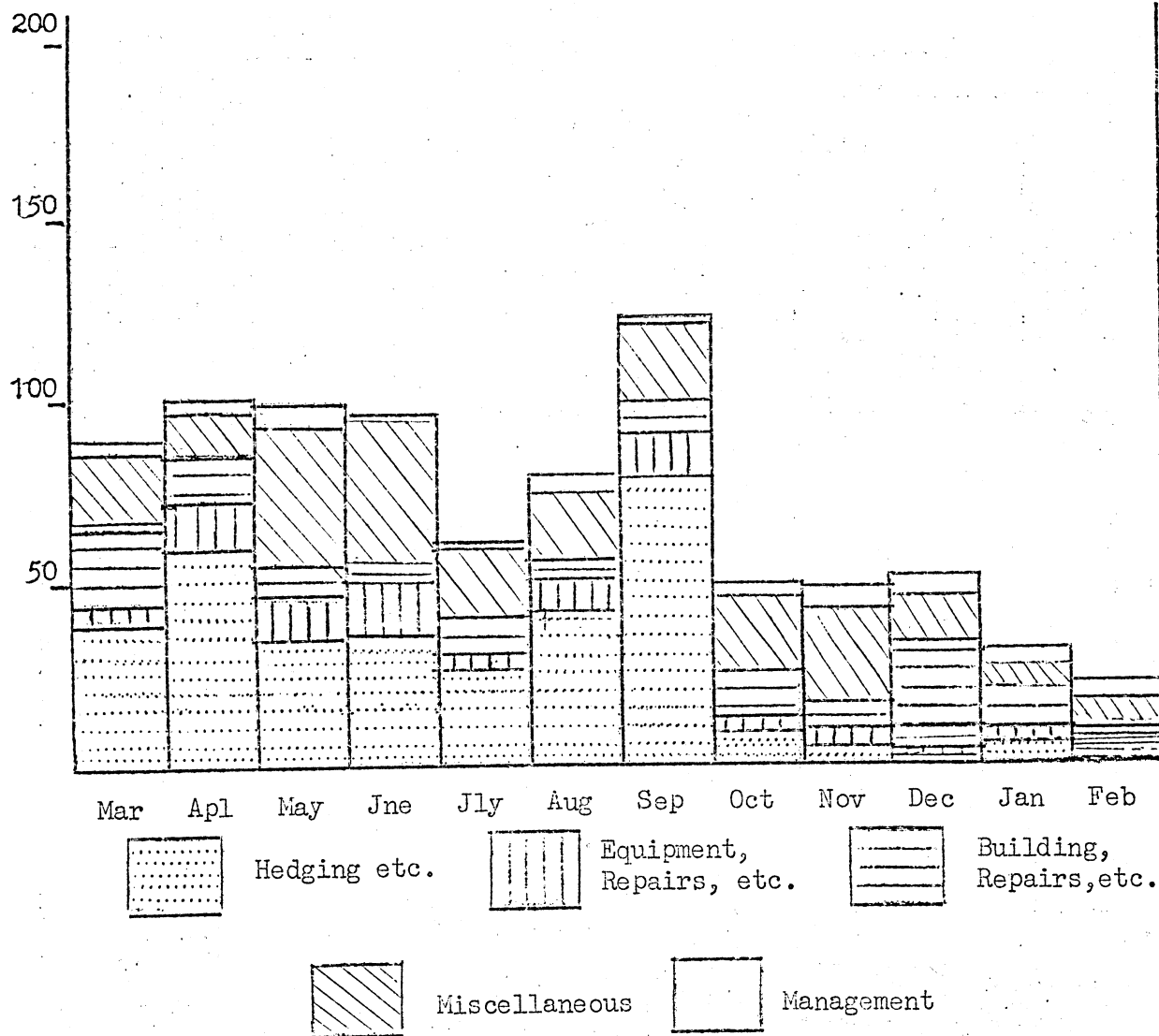
	Mainly Dairy	Dairy with Pigs	Dairy with Poultry	Mixed Live-stock	Cattle & Sheep	All Groups
<u>Maintenance:</u>	Hours per 100 Adj. Acres					
Hedging, Ditching, Drainage & Fencing	335	243	281	495	587	428
Repairs & Maintenance of Equipment	83	402	60	136	76	206
Repairs & Maintenance of Buildings & Roads	150	97	31	190	143	145
Miscellaneous Work	237	363	251	429	173	355
Total Maintenance	805	1105	623	1250	979	1134
<u>Managerial:</u>						
Office Work & Accounts	53	93	116	61	20	58
Visits to Markets, Shows, etc.	5	30	40	223	184	112
Total Managerial	58	123	156	284	204	170
Total Indirect Labour	863	1228	779	1534	1183	1304
<u>Maintenance:</u>	Percentages					
Hedging, Ditching, Drainage & Fencing	38.8	19.8	36.1	32.3	49.6	32.8
Repairs & Maintenance of Equipment	9.6	32.7	7.7	8.8	6.5	15.8
Repairs & Maintenance of Buildings & Roads	17.4	7.9	4.0	12.4	12.1	11.1
Miscellaneous Work	27.5	29.6	32.2	28.0	14.6	27.3
Total Maintenance	93.3	90.0	80.0	81.5	82.8	87.0
<u>Managerial:</u>						
Office Work & Accounts	6.1	7.6	14.9	4.0	1.7	4.4
Visits to Markets, Shows, etc.	0.6	2.4	5.1	14.5	15.5	8.6
Total Managerial	6.7	10.0	20.0	18.5	17.2	13.0
Total Indirect Labour	100.0	100.0	100.0	100.0	100.0	100.0

Histograms E1-E5

Seasonal Distribution of Total Labour
on Indirect Work according to Task
(Man Hours per 100 Adjusted Acres)

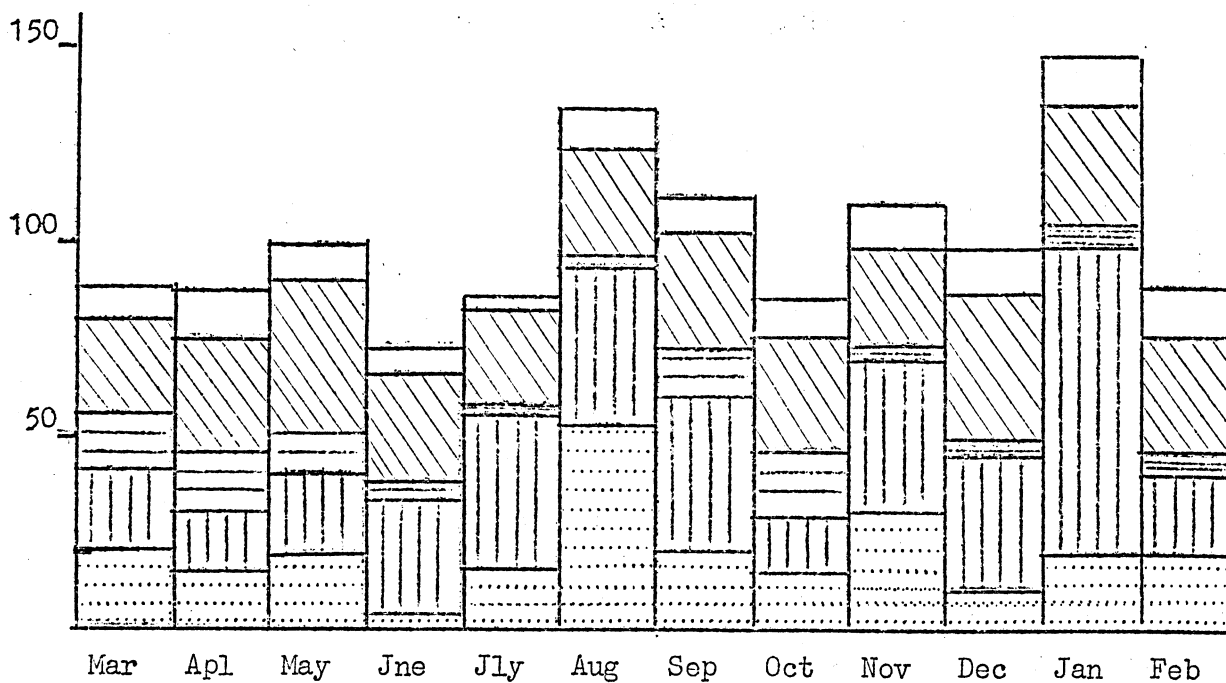
Hrs/100 Acs

E1. Mainly Dairy



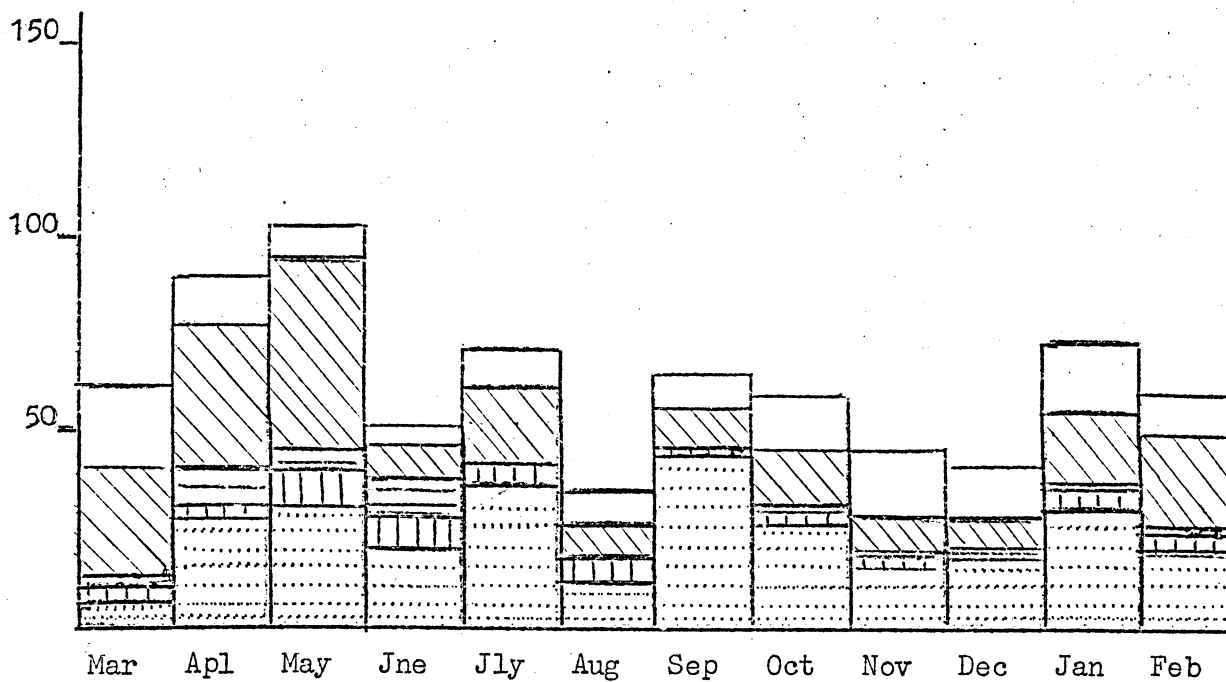
Hrs/100 Acs

E2. Dairy with Pigs



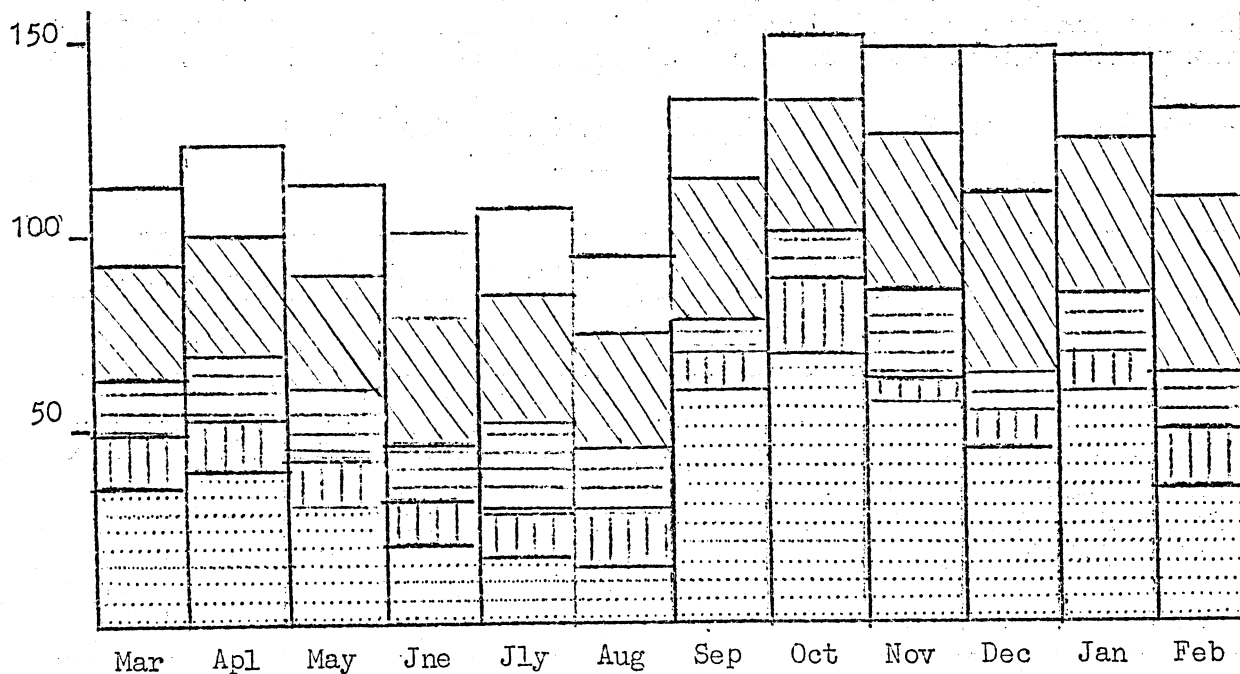
Hrs/100 Acs

E3. Dairy with Poultry



Hrs/100 Acs

E4. Mixed Livestock



Hrs/100 Acs

E5. Cattle & Sheep

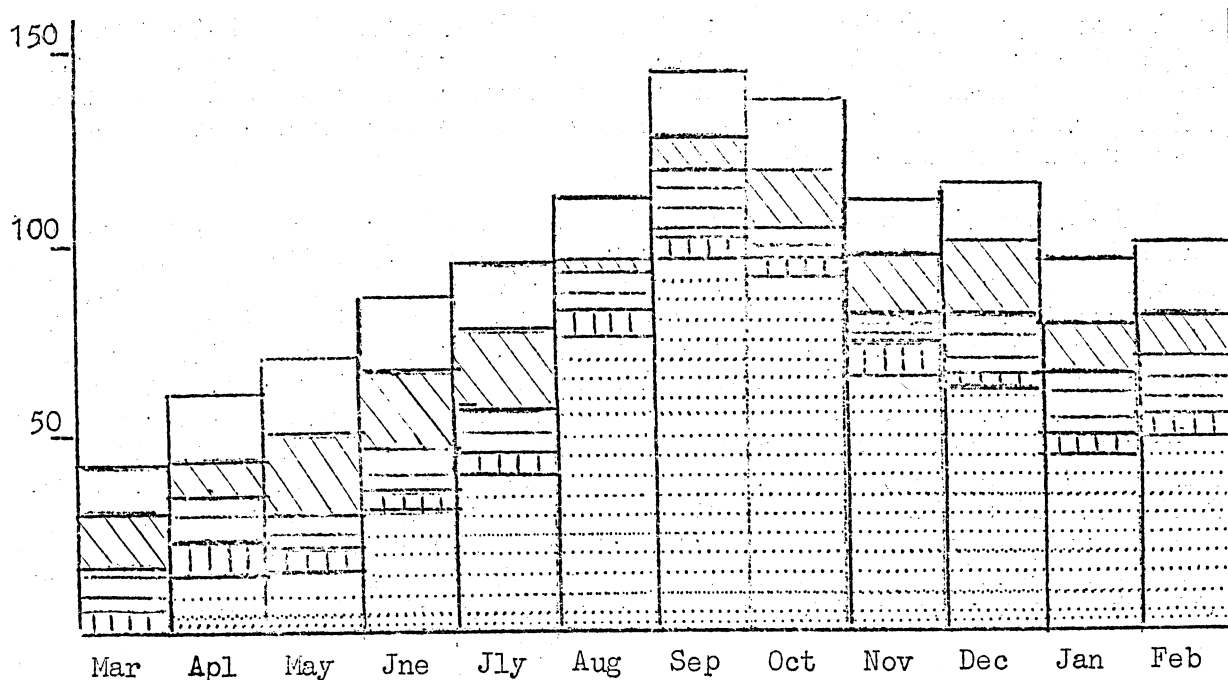


Table 24 shows that, on average, the Dairy farmers visited markets and shows and sales on seven occasions during the study year, remaining on each occasion for approximately 3.7 hours. The Mixed Livestock and Cattle & Sheep farmers, on the other hand, paid a total of fifty four and thirty-six visits respectively, and remained for 4.3 hours and 5.1 hours. On the

Table 24. Annual Attendance at Markets, Shows and Sales
per Male Family Worker

	Markets				Shows & Sales				Markets Shows & Sales			
	Farmer		Son		Farmer		Son		Farmer		Son	
	Number and Average Duration of Visit											
	No.	Hrs.	No.	Hrs.	No.	Hrs.	No.	Hrs.	No.	Hrs.	No.	Hrs.
Mainly Dairy	2	1.5	-	-	2	2.7	-	-	4	2.1	-	-
Dairy with Pigs	5	4.4	3	4.3	1	3.3	1	10.0	6	4.2	4	5.7
Dairy with Poultry	6	3.3	-	-	4	7.0	-	-	10	4.8	-	-
Mixed Livestock	48	4.1	12	4.3	6	6.1	4	6.2	54	4.3	16	4.8
Cattle & Sheep	30	5.0	23	5.8	6	6.0	4	6.0	36	5.1	27	5.8
All Groups	23	4.3	13	5.1	4	5.8	3	6.2	27	4.5	16	5.3

whole, sons paid far fewer visits to markets and sales than their fathers, but tended to remain slightly longer. The general pattern for all farms was one of farmers frequenting markets or sales every alternate week, remaining on each occasion for 4.5 hours, and their sons once every three weeks for a duration of 5.3 hours.

The seasonal distribution of total labour on indirect work, presented in Histograms E1 - E5, exhibits a certain degree of fluctuation in all groups. It will be noticed, however, that the amount of labour employed on tasks other than field work remained relatively constant throughout the year. The seasonal fluctuations in total labour input on indirect work correspond directly in all groups with the variations in manual labour inputs on field maintenance tasks. In this latter respect the Histograms show three different patterns of labour distribution. First, on the Mainly Dairy farms the work is performed almost entirely between March and September, at a time when the labour needs of the herd are at a minimum. Second, in the intensive Dairy with Pigs and Dairy with Poultry groups, the supplementary enterprises create a relatively uniform demand for labour throughout the year, and hence, the labour available for hedging and

fencing does not vary much during the year. Finally, there is the more traditional pattern of labour use associated with the rather extensive Mixed Livestock and Cattle & Sheep farms, on which field tasks are mainly performed during the autumn and winter months. The information on which the foregoing Histograms are based is set out in Appendix VI (Table B).

VI. UNIT LABOUR REQUIREMENTS

The preceding three sections of this report have been devoted to a descriptive analysis of the overall pattern of labour utilisation. This section presents an account of the direct labour devoted to individual classes of stock and crops on the study farms, and in Table 25 these unit labour standards are compared with those, derived from enterprise cost studies, which are currently being used in farm management analysis in the South-West.

Table 25. Standard Unit Labour Requirements

	Livestock (Hours per Head)			Crops (Hours per Acre)	
	Study	Farm Management		Study	Farm Management
<u>Cattle:</u>			<u>Cereals:</u>		
<u>Dairy Cows Machine</u>			Combine (Own)	15	16
<u>Milked in:</u>			Binder	23	28
Cowsheds	104	144	<u>Roots & G'fodder:</u>		
Parlours	84	80	Potatoes (M.C.)	187	160
<u>Nurse Cows:</u>			Mangolds	134	160
Single Suckling	33	24	Swedes:		
Multiple Suckling	66	64	Harvested	82	72
<u>Other Cattle:</u>			Folded	34	44
Over 1 year	22	20	Kale (Folded)	14	16
Under 1 year:			<u>Grassland:</u>		
Bucket Reared	34) 32	Cultivations, Manuring etc.	2½	4
Single Suckled	19		Hay Harvesting (1 cut)	8	8
Multiple Suckled	22		Silage Harvesting:		
<u>Sheep:</u>			Buckrake	8½)) 12
Ewes & Rams	6	8	(1 cut)		
Replacements	3	4	Harvester (1 cut)		
<u>Pigs:</u>					
Sows & Gilts	32	40			
Baconers	4	6			
Porkers	2½	4			
<u>Poultry:</u>					
Layers	1¼	2			
Growers	¼	¼			

The Livestock Enterprises

Dairy Cows

Labour requirements in milk production depend upon a large number of inter-related factors, the more important of which perhaps are the work methods or routines pursued, yield per cow, size of herd and system of milking.

Although it was not one of the objectives of the present study to assess the influence of work routines on labour requirements, it was observed on many of the study farms that these had not kept pace with the type of equipment used. Frequently, for example, a team of two men operated only three milking units in a cowshed whereas it would have been well within their capacity to operate four, and in some instances even six units, if a good work routine were pursued. The work methods employed had been practised for so long that they had become fixed by habit, and it was common to see units out of action. Here, therefore, existed tremendous scope for the application of work study to promote a more efficient utilisation of labour, and at the same time, reduce a great deal of the fatigue and drudgery which so often accompany ill-conceived and outmoded work methods. Work study can accomplish a great deal in both these respects, and its claims can best be stated in the words of the farmer who wrote - "When you have been farming all your life, the results of work study make you realise that you have had your nose too near the grindstone to see what people unhampered by tradition and custom can see."

With regard to yield per cow and herd size, the relatively small sample involved precluded any valid analyses of the effects of these two factors on labour requirements on the study farms. However, the data did permit an examination of the labour requirements of the two main systems of machine milking, i.e., cowshed and parlour, the results of which are presented in Table 26.

Compared with cowshed-milked cows, the low unit labour requirements of parlour-milked cows results not so much from economies in the milking operation itself as from economies in some of the tasks associated with the operation and in feeding and cleaning. On milking a saving of two hours per cow per annum was recorded, but on the post-milking tasks of washing down buildings and the cleaning or sterilisation of equipment, the saving was of the order of seven hours per cow. Furthermore, since parlour-milking was linked in each case with a system of yarding and self-feed silage, considerable economies were also recorded in feeding and cleaning, amounting in total to just over six-and-a-half hours annually per cow.

Table 26.

The Dairy Herd
Annual Direct Labour Requirements per Cow
according to Task & System of Milking

	Machine Milking			
	Cowshed		**Parlour	
	Hrs.	%	Hrs.	%
Milking Tasks:				
Assemble Equipment	4.2	4.0	3.6	4.0
*Milking	47.5	45.7	45.5	54.4
Wash. down Bldgs. & Equipment	12.0	11.6	4.7	5.9
Cows In and Out	7.2	6.9	4.6	5.5
Milk to Stand	2.0	1.9	2.0	2.4
Total Milking	72.9	70.1	60.4	72.2
Feeding Tasks:				
Feeding	12.5	12.0	8.2	9.8
Cart in Foods	4.7	4.5	2.7	3.2
Electric Fence	2.0	1.9	4.7	5.6
Total Feeding	19.2	18.4	15.6	18.6
Clean Houses, Yards, Etc., and Bedding	9.0	8.9	6.0	7.2
General Work	2.6	2.6	1.7	2.0
Total Labour per Cow	103.7	100.0	83.7	100.0
Average Yield per Cow (Gals.)	780		813	
Average Number Cows per Herd	25		26	

* Includes feeding of concentrates

** Parlours were mainly of the 6 stall abreast type

The data in Table 27 show that whereas labour requirements for milking under both cowshed and yard and parlour system showed little variation between winter and summer, winter requirements per cow for feeding and cleaning under the cowshed system were nearly double the summer requirements, 18.6 hours compared with 9.6 hours. For the yard and parlour system, the disparity between winter and summer amounted to only 3.2 hours per cow.

Table 27.

The Dairy Herd
Winter and Summer Labour Requirements
Per Cow according to Task

	Machine Milking											
	Cowshed					Yard and Parlour						
	*Winter		Summer		Total	*Winter		Summer		Total		
	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%		
Milking & Associated Tasks	35.5	34	37.4	35	72.9	70	29.4	35	31.0	37	60.4	72
Feeding	12.8	12	6.4	6	19.2	18	9.2	11	6.4	8	15.6	19
Cleaning & Bedding	5.8	6	3.2	3	9.0	9	3.2	4	2.8	3	6.0	7
General Work	1.6	2	1.0	1	2.6	3	0.9	1	0.8	1	1.7	2
Total Labour	55.7	54	48.0	46	103.7	100	42.7	51	41.0	49	83.7	100

* Winter period - October to March. Summer period - April to September.

Nurse Cows

The labour requirements of single suckling and multiple suckling nurse cows are presented in Table 28. Single suckling was practised mainly on the Cattle & Sheep group of farms, whilst multiple suckling was the more normal practice on the Mixed Livestock farms. Although on most of these latter farms only a certain number of cows were retained for suckling, with the remainder of the herd devoted solely to milk production, considerable variation existed within the general system of multiple suckling. On some farms the nurse cows were employed entirely on rearing calves, on others they were milked for the first few months of the lactation and then employed on rearing, whilst on still others milking and suckling were carried on simultaneously.

The average annual labour requirements of multiple suckled cows were double those of single suckled cows. The deduction of the time spent on

milking leaves the labour requirements for rearing proportionately the same for both groups, 42.8 hours per cow for the multiple suckling herds

Table 28. The Breeding Herd
Winter & Summer Labour Requirements
Per Nurse Cow according to Task & System of Rearing

	Single Suckling Cows						Multiple Suckling Cows					
	Winter		Summer		Total		Winter		Summer		Total	
	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%
Milking	6.3	19	6.5	20	12.8	38	11.4	17	11.9	18	23.3	35
Feeding	7.0	21	3.5	10	10.5	32	22.5	34	10.1	15	32.6	49
Cleaning & Bedding	1.8	5	0.6	2	2.4	7	4.3	7	1.2	2	5.5	9
General Work	3.3	10	4.5	13	7.8	23	1.5	2	3.2	5	4.7	7
Total Labour	18.4	55	15.1	45	33.5	100	39.7	60	26.4	44	66.1	100
Number Calves reared per cow	1.0						3.3					

compared with 20.7 hours for the single suckling herds. Due to the greater number of calves reared per cow, however, the share of cow labour requirements per calf was considerably lower under the multiple suckling system of rearing.

Other Cattle

Table 29 shows that the labour requirements of 33.8 hours per head for

Table 29. Other Cattle
Annual Direct Labour Requirements per Head
according to Age, Task and System of Rearing

	Calves 0 - 1 year						Cattle over 1 year	
	Bucket Reared		Single Suckled		Multiple Suckled			
	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%
Feeding	19.5	58	10.1	54	16.6	74	11.6	53
Cleaning & Bedding	11.8	33	2.6	14	3.2	14	4.5	21
General Work	2.5	9	6.0	32	2.5	12	5.8	26
Total Labour	33.8	100	18.7	100	22.3	100	21.9	100

bucket reared calves was substantially higher than the requirement of either the single-suckled (18.7 hours), or the multiple-suckled calves (22.3 hours). The former were generally housed for a longer period during the initial year than the suckled calves, hence the high labour inputs incurred on feeding and cleaning. In the case of cattle over one year old, very little variation was found in labour requirements between stock of different ages, or indeed, between stock reared as dairy herd replacements or beef stores. The figure of 21.9 hours per head in the table, therefore, represents the average annual requirement of all types of stock over a year old.

Ewes and Ewe Hoggets

The details in Table 30 show that a significant difference in labour requirements existed between the lowland flocks of the Dairy and Mixed Livestock groups, and the upland flocks of the Cattle & Sheep group. In

Table 30. Annual Direct Labour Requirements per Ewe
and per Ewe Hogg
Lowland & Upland Farms

	Lowland Flocks		Upland Flocks		All Flocks	
	*Per Ewe	Per Ewe Hogg	*Per Ewe	Per Ewe Hogg	*Per Ewe	Per Ewe Hogg
	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.
Daily Attention	1.9	1.4	2.9	2.2	2.4	1.8
Lambing	1.4	-	2.0	-	1.7	-
Feeding	0.6	0.6	0.5	0.6	0.5	0.6
Dipping & Drenching	0.4	0.4	0.5	0.5	0.4	0.4
Shearing	0.5	0.5	0.4	0.4	0.5	0.5
Other Work	0.2	-	0.2	-	0.2	-
Total Labour	5.0	2.9	6.5	3.7	5.7	3.3

* Includes labour on lambs up to weaning

the former, annual requirements per ewe and per ewe hogg amounted to 5.0 hours and 2.9 hours respectively, compared with 6.5 hours and 3.7 hours for the upland flocks.

Sows and Fattening Pigs

Table 31 shows that the average time devoted annually to breeding

sows and gilts amounted to 32 hours per head. With baconers and porkers the requirement from weaning to maturity was 4 hours and 2.5 hours respectively. The analysis of the relevant data revealed, however, that the standard requirements of fattening pigs varied quite considerably with type of housing. Baconers, fattened either in specialised buildings or buildings specifically adapted for pig production, required nearly 3.0 labour hours per pig less than those fattened in unadapted buildings. The difference for porkers amounted to 1.3 hours per pig. The unadapted buildings refer to any makeshift accommodation available at a given time.

Table 31. Annual Direct Labour Requirements per Sow or Gilt, per Baconer and per Porker according to Task

	Per Sow or Gilt	Per Baconer Sold			Per Porker Sold		
		Specialised or Adapted Bldgs.	*Unadapted Bldgs.	All Baconers	Specialised or Adapted Bldgs.	*Unadapted Bldgs.	All Porkers
Feeding & Watering	Hrs. 17	Hrs. 1.2	Hrs. 3.0	Hrs. 2.2	Hrs. 0.9	Hrs. 1.9	Hrs. 1.3
Cleaning & Bedding	11	0.8	1.6	1.2	0.7	1.0	0.8
Weighing & Marking	-	0.2	0.2	0.2	0.1	0.1	0.1
General Work	4	0.3	0.5	0.4	0.3	0.3	0.3
Total Labour	32	2.5	5.3	4.0	2.0	3.3	2.5

* Composed mainly of various makeshift buildings around the farmyard

Laying Birds & Growers

The data in Table 32 show an annual labour requirement of 178 hours per 100 birds for all laying flocks and 30 hours for growers. The total requirements for layers varied considerably, however, according to system of management, the most economical by far being the deep litter system, averaging 126 hours per 100 birds compared with 183 hours and 250 hours for the battery (static type) and free range systems respectively.

Table 32. Annual Direct Labour Requirements per 100 Birds according to Task & System of Management

	Laying Flocks				Growers
	Deep Litter	Battery (Static)	Free Range	All Laying Flocks	
	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.
Feeding & Watering	56	67	108	75	17
Cleaning Houses, Nests etc.	20	78	38	41	6
Collecting Eggs	19	12	27	19	-
Cleaning & Packing Eggs	24	11	34	23	-
General Work	7	15	43	20	7
Total Labour	126	183	250	178	30
Minutes per Day	21	30	41	29	5

The Crop Enterprises

Cereals

The individual cereal crops are not discussed separately in this section since it was ascertained that their labour requirements were very similar. Consequently, the data in Table 33 refer to the annual per acre labour requirements of cereal crops as a whole, but a distinction has been made between harvesting methods.

The table shows that the combining of crops saved a significant amount of labour in harvesting corn. This saving amounted to just over 8 hours per acre, but it must be borne in mind that some of this saving was achieved, not at the busy harvest period itself, but at threshing time which is normally during the slack winter months. However, the saving attained at harvest still amounted, on average, to 4.6 hours per

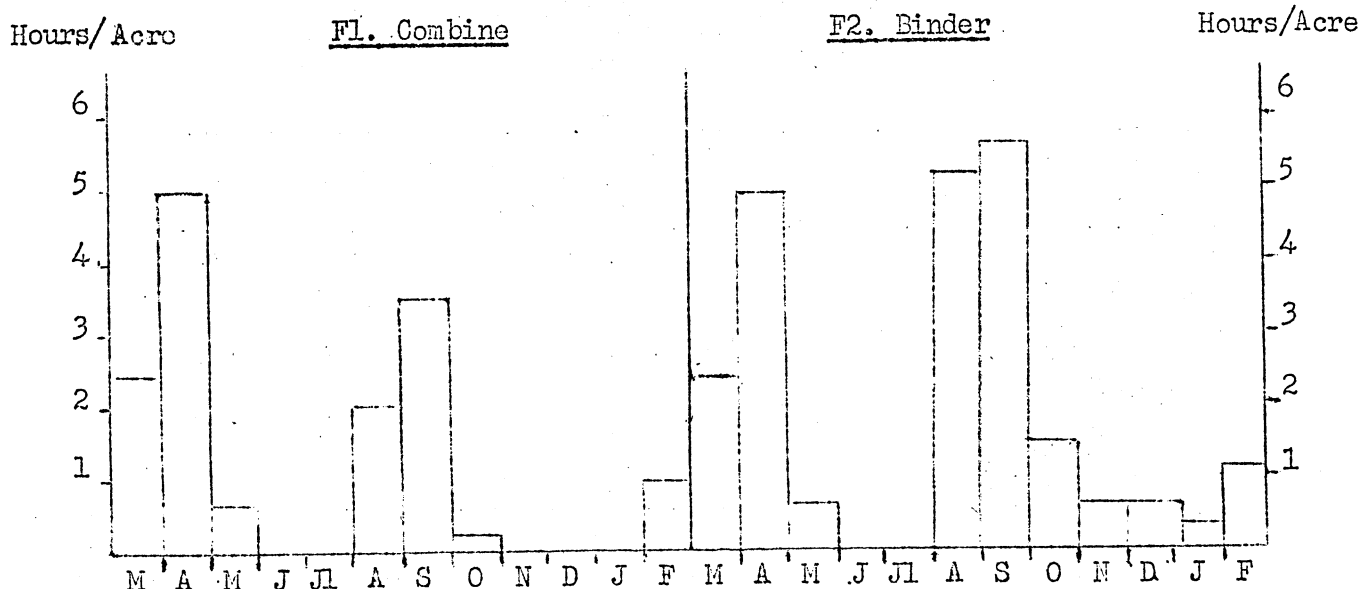
Table 33. Annual Direct Labour Requirement per Acre according to Task and Method of Harvesting

	Combine Harvested	Binder Harvested
	Hrs.	Hrs.
Cultivations:		
Ploughing	3.1	3.1
Harrowing, Rolling, etc.	2.8	2.8
Applying Fertilisers	1.0	1.0
Drilling Corn	1.4	1.4
Drilling Grass Seed	0.5	0.5
Spraying	0.3	0.3
Total Cultivations	9.1	9.1
Harvesting:		
A) Combine & Store Corn	3.6	-
Dry Corn	0.2	-
Rake, Bale & Store Straw	1.9	-
Total Harvesting by Combine	5.7	-
B) Cut	-	2.4
Stock & Restock	-	3.0
Cart & Store	-	4.9
Thresh	-	3.5
Total Harvesting by Binder	-	13.8
Total Labour	14.8	22.9

acre. This difference in harvesting requirements is clearly illustrated in Histograms F1 and F2 which are based on the data in Appendix V (Table B.)

Histograms Fl. & F2.

Cereals
Seasonal Distribution of Labour



Roots & Greenfodder

Table 34 sets out the total labour requirements per acre of the various root and greenfodder crops. The only cash root crop of note was main-crop potatoes. Total labour requirements for the main crop amounted to 187 hours per acre, of which approximately 45%, 84 hours, were incurred on cultivations, and 55%, 103 hours, on harvesting.

Planting, which was invariably done by hand, took place during April and early May. Throughout May and June the crop was both hand and tractor hoed once, and finally earthed up and left until harvest. Lifting was mainly undertaken during October and November, although on some farms this did extend into December. Invariably, a spinner was employed on this work, and the crop was stored either in clamps or some frost-free building. The riddling and weighing of the crop prior to sale occurred on most farms at fairly regular intervals throughout the winter months. The seasonal distribution of the work involved on potatoes is presented in Histogram G1.

The data in Table 34 reveal considerable variation between individual fodder root crops in terms of labour requirements. Mangolds required most labour per acre, just over 134 hours, compared with 81.5 hours for swedes 14.4 hours for kale (unthinned) and 14.9 hours per acre for rape. In

contrast to the two latter crops, both mangolds and swedes required considerable amounts of labour for hoeing, singling and harvesting. Hoeing

Table 34.

Roots & Green Fodder
Annual Direct Labour Requirements per Acre
according to Task

	Main-crop Potatoes	Swedes	Man- golds	*Kale ¹	Rape
	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.
Cultivations:					
Ploughing	5.0	3.5	3.6	4.2	5.6
Harrowing, Rolling etc.	6.2	4.6	6.1	5.4	4.4
Applying Fertilisers	2.0	1.0	0.8	0.7	0.3
Applying Dung	10.8	2.0	7.0	2.6	2.5
Drilling/Planting	30.0	1.7	2.6	1.5	2.1
Hoeing/Singling	30.0	20.7	48.7	-	-
Total Cultivations	84.0	33.5	68.8	14.4	14.9
Harvesting:					
Spinning, Lifting, Carting & Storing	73.0	48.0	65.3	-	-
Sorting & Weighing	30.0	-	-	-	-
Total Harvesting	103.0	48.0	65.3	-	-
Total Labour	187.0	81.5	134.1	14.4	14.9

* Unthinned

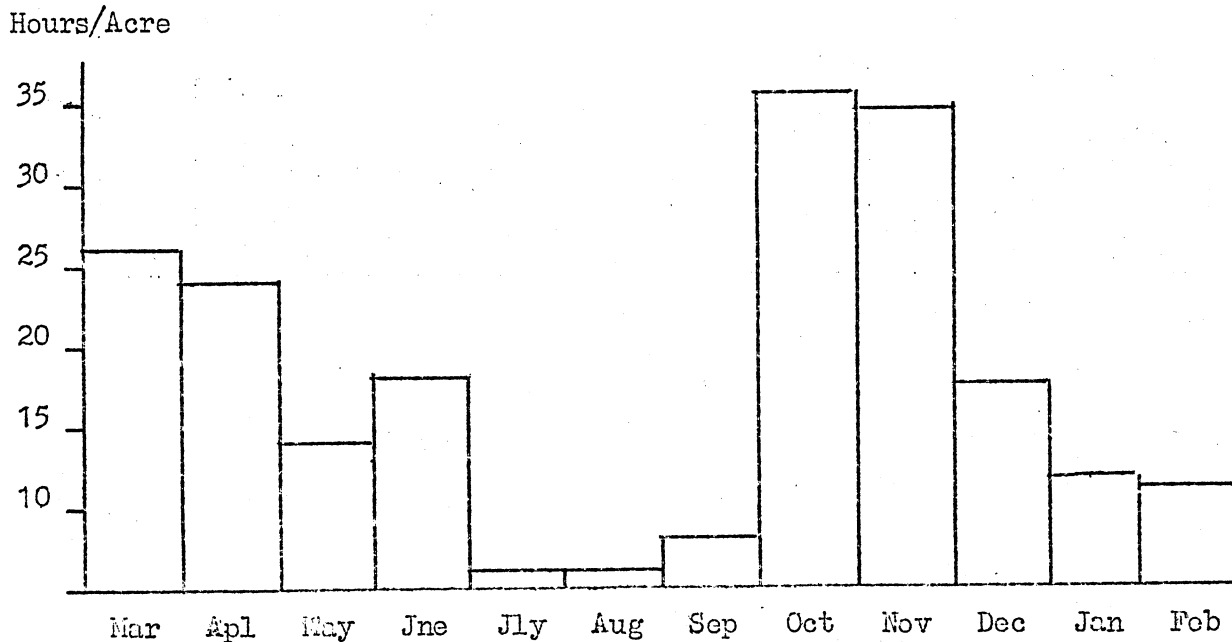
mangolds took twice the labour used in hoeing swedes due to the fact that they were invariably hoed twice and swedes only once. The overall requirement for hoeing and singling averaged approximately one-third of an acre per man day of $8\frac{1}{2}$ hours. The high harvesting requirements of mangolds relative to swedes is attributable to yield differences - mangolds yielding just over 30 tons per acre compared with 16 tons for swedes.

Kale was mainly broadcast and folded in situ on the study farms, but a few crops were drilled and singled and subsequently cut and carted to the stock. Unfortunately, it has not been possible to account for the time devoted to "harvesting" an acre of kale, since most farmers recorded the cutting and carting operations under the general heading of feeding.

However, where the crop was grown in rows, the average time devoted to singling and hoeing amounted to 15.3 hours per acre, which means an over-

Histogram G1.

Main Crop Potatoes
Seasonal Distribution of Labour

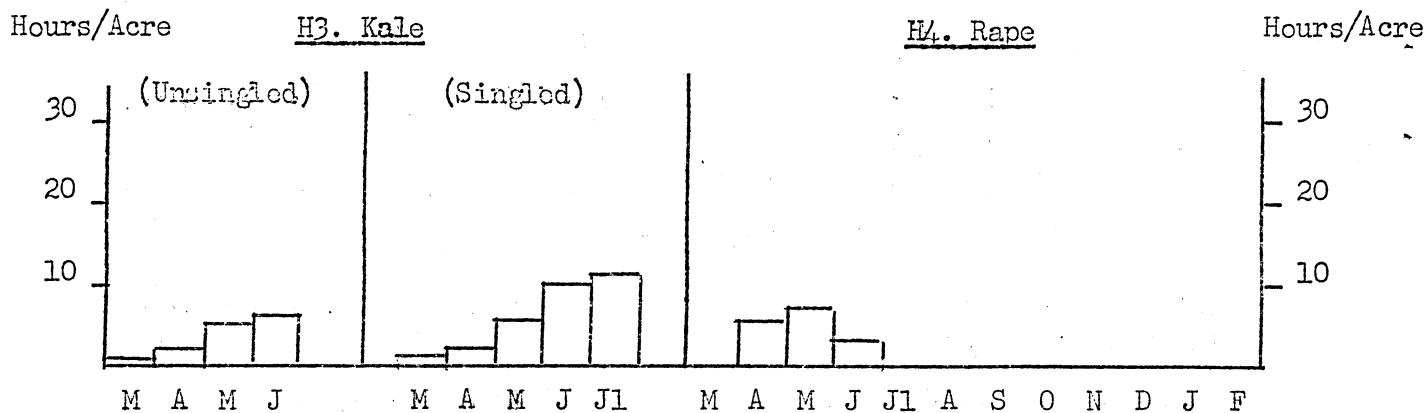
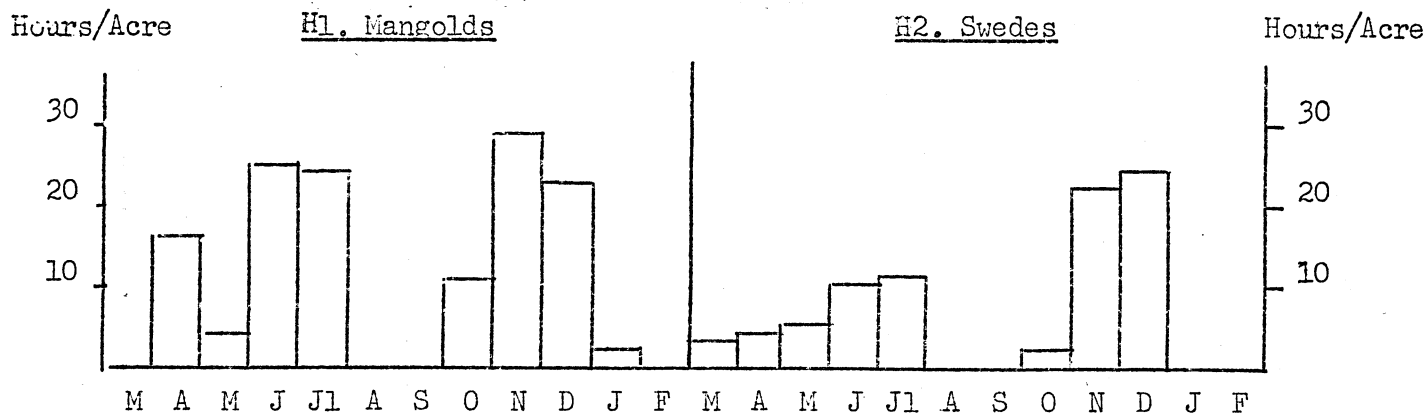


all cultivation requirement of 30 hours per acre compared with 14.4 hours for the unsingled crop.

The seasonal distribution of the total labour employed on individual fodder crops, Histograms H1 - H4 reveals the competitive relationship which exists between mangolds and swedes, particularly at hoeing and again at harvest time. Excessive reliance on these crops can set up a strain on labour resources, especially during the summer months when they compete not only with one another for labour on singling and hoeing, but also with other crops such as hay and silage. The substitution of broadcast kale for swedes and mangolds contributes towards "evening-out" labour requirements at this peak period. Full details of the seasonal labour requirements of the various fodder crops are set out in Appendix V (Table B).

Histograms H1 - H4.

Fodder Root Crops
Seasonal Distribution of Labour



Grassland

The data in Table 35 show the average time devoted to various cultural operations on the grassland area as a whole. Total labour input amounted to 2.5 hours per acre, of which dung spreading accounted for nearly 50%, 1.2 hours per acre, and cutting or pulling weeds for 32%, 0.8 hours per acre.

Table 35.

Grassland Cultivations
Annual Labour Requirements per Acre according
to Task - All Grassland

	All Grassland	
	Hrs.	%
Cultivations:		
Harrowing, Rolling etc.	0.3	12
Applying Fertilisers	0.2	8
Applying Dung	1.2	48
Cutting or Pulling Weeds	0.8	32
Total Cultivations	2.5	100

The harvesting labour requirements of hay and silage are shown in Table 36. For hay, which was invariably baled, average requirements amounted to 8.1 man hours per acre. Mowing and swath turning etc.

Table 36.

Harvesting
Annual Direct Labour Requirement per Acre
according to Task and Method of Conservation

	Hay		Silage			
	Baled		Buckrake		Harvester	
	Hrs.	%	Hrs.	%	Hrs.	%
A) Hay: Cutting	1.3	16.0	-	-	-	-
Swath Turning etc.	2.0	24.7	-	-	-	-
Baling	1.7	21.0	-	-	-	-
Carting Bales & Storing	3.1	38.3	-	-	-	-
Total Hay	8.1	100	-	-	-	-
B) Silage: Cutting	-	-	2.3	27.0	-	-
Harvesting	-	-	3.2	37.7	3.5	53.8
Pit Work	-	-	3.0	35.3	3.0	46.2
Total Silage	-	-	8.5	100	6.5	100

accounted for nearly 41% of this total, and baling, carting and storing bales for 59%. In the case of silage made with buckrakes, average requirements per acre were 8.5 man hours, compared with 6.5 hours with a forage harvester.

An attempt has been made wherever possible in this chapter to show the effect on labour requirement of specific items of machinery and equipment such as combines and forage harvesters. Since mechanical draught power and its ancillary equipment was present on all farms, it has not been possible to show the effect of this basic form of mechanisation on labour requirements. In fact, the labour requirements shown in this chapter are based on a given level of general mechanisation. However, some indication of the influence which mechanical draught power has had on crop labour requirements may be gained from a comparison with an earlier study carried out in the South-West nearly 30 years ago,¹ when tractor power was the exception rather than the general rule. This comparison is set out in Table 37.

Table 37. Some Comparisons in Labour Requirements
per Crop Acre - 1934 & 1961

Crop	1934	1961
	Hours per Acre	
Corn	41	19
Potatoes	229	187
*Turnips/Swedes	58	34
Mangolds	141	134
Rape	25	15

* Refers to time up to and including the last hoeing

¹ Labour Requirements of Crops and Stock in the South-West 1934 by W.H. Long, M.A. and N.F. McCann, B.Sc, N.D.A. Pamphlet No. 41. Dept. of Agricultural Economics (now with Exeter University) Seale Hayne Agricultural College, Newton Abbot.

APPENDICES I - VI

Data for the 28 Farms in the Study.

South-West England, 1960/61.

APPENDIX I.

Table A. Cropping per 100 Adjusted Acres - 1960 Crop Year
Group Averages

Cropping	Mainly Dairy	Dairy with Pigs	Dairy with Poultry	Mixed Live-stock	Cattle & Sheep	All Groups
	Acs.	Acs.	Acs.	Acs.	Acs.	Acs.
Wheat	1.9	4.7	1.6	0.3	-	1.7
Barley	7.7	28.3	11.8	13.3	5.4	13.3
Oats	1.8	6.3	-	3.1	1.5	2.5
Mixed Corn	-	-	-	0.8	4.8	1.1
Total Cereals	11.4	39.3	13.4	17.5	11.7	18.6
Potatoes	-	1.2	0.3	0.8	0.6	0.6
Turnips/Swedes	-	-	0.4	0.6	1.1	0.4
Mangolds	-	0.4	-	0.6	0.4	0.3
Kale	4.8	1.7	4.0	4.8	0.6	3.2
Rape	-	-	-	1.2	1.5	0.5
Cabbage	-	-	-	0.1	-	-
Total Roots & G'fodder	4.8	3.3	4.7	8.1	4.2	5.0
Temporary Grass:						
Silage	11.6	5.3	14.2	2.6	-	6.7
Hay	14.1	9.5	16.9	9.9	10.2	12.1
Grazing	16.3	10.7	16.7	8.9	5.5	11.6
Total Temporary	42.0	25.5	47.8	21.4	15.7	30.4
Permanent Grass:						
Silage	3.0	-	3.2	0.8	-	1.4
Hay	5.6	12.4	5.4	7.9	8.8	8.0
Grazing	30.2	18.4	24.7	43.2	57.8	35.0
*R.G. Equivalent	3.0	1.1	0.8	1.1	1.8	1.6
Total Permanent	41.8	31.9	34.1	53.0	68.4	46.0
TOTAL CROPS & GRASS	100	100	100	100	100	100
Average Size of Farm (Adj. Acs.)	146	160	124	141	167	146
Size Range (Adj. Acs.)	60-214	28-271	40-304	49-265	123-208	28-304

* Rough Grazing adjusted to an equivalent acreage of grazing land in proportion to the relative feeding values.

APPENDIX 1.

Table B. Number of Livestock per 100 Adjusted Acres
Annual Group Averages - 1960/61

Stocking	Mainly Dairy	Dairy with Pigs	Dairy with Poultry	Mixed Live-stock	Cattle & Sheep	All Groups
	No.	No.	No.	No.	No.	No.
Bulls	-	-	1	-	-	-
Cows	33	17	26	16	10	20
Stores: 2 years & over	11	6	6	7	5	7
1 - 2 years	7	7	9	9	6	8
Under 1 year	11	7	11	11	12	10
Total Cattle	62	37	53	43	33	45
Ewes & Rams	3	14	16	51	78	32
Other Weaned Sheep	6	-	8	15	40	14
Total Sheep	9	14	24	66	118	46
Sows, Gilts & Boars	-	4	2	3	1	2
Other Weaned Pigs	-	246	25	46	4	64
Total Pigs	-	250	27	49	5	66
Hens & Pullets	122	164	1689	247	17	428
Rearing	103	74	1665	228	-	414
Total Poultry	225	238	3354	475	17	842
Animal Units:						
Cattle	55	32	46	36	26	38
Sheep	2	3	6	15	26	11
Pigs	-	37	4	6	1	8
Poultry	3	3	42	6	-	11
Total Animal Units	60	75	98	63	53	68

APPENDIX II.

Table A. Number of Hours Overtime Worked Annually per Person according to Class of Full-time Male Worker

	Mainly Dairy			Dairy with Pigs			Dairy with Poultry			Mixed Livestock			Cattle & Sheep			All Groups		
	Farm-er	Son	Hired	Farm-er	Son	Hired	Farm-er	Son	Hired	Farm-er	Son	Hired	Farm-er	Son	Hired	Farm-er	Son	Hired
Hours Worked	2860	-	2711	3272	2752	2636	3475	3816	2538	2886	2307	2309	2705	2601	2315	3040	2869	2502
<u>Add Time Lost through Sickness</u>	17	-	8	-	-	-	-	9	40	17	8	20	-	76	51	8	25	25
Total Hours	2877	-	2719	3272	2752	2636	3475	3825	2578	2903	2315	2329	2705	2677	2366	3048	2894	2527
<u>Less Basic Hours per Annum*</u>		2300			2300			2300			2300			2300			2300	
Hours Over-time:																		
Per Annum	577	-	419	972	452	336	1175	1525	278	603	15	29	405	377	66	748	584	227
Per Week	11.5	-	8.4	19.4	9.0	6.7	23.5	30.4	5.6	12.0	0.3	0.6	8.1	7.5	1.3	15.0	11.9	4.5

* Calculated on the basis of 50 weeks x 46 hours per week. Annual holidays and other free periods amounted to two weeks.

APPENDIX III.

Table A.

The Seasonal Distribution of Total Labour on
Direct and Indirect Tasks

	Mainly Dairy				Dairy with Pigs				Dairy with Poultry			
	Live-stock	Crops	Mainten- ance and Management	Total	Live-stock	Crops	Mainten- ance and Management	Total	Live-stock	Crops	Mainten- ance and Management	Total
	Hours per 100 Adjusted Acres											
March	360	59	67	486	302	124	98	524	572	27	63	662
April	278	120	90	488	286	144	81	511	485	82	71	638
May	291	120	91	502	285	138	110	533	527	142	47	716
June	284	134	85	503	260	202	73	535	454	199	51	704
July	306	125	85	516	247	188	85	520	502	129	36	667
August	290	129	67	486	242	158	120	520	502	43	47	592
September	303	64	81	448	226	179	120	525	533	27	94	654
October	325	-	100	425	280	72	91	443	510	50	106	666
November	394	-	93	487	310	95	116	521	556	12	94	662
December	423	22	45	490	316	122	79	517	554	20	68	642
January	423	22	27	472	318	22	147	487	572	27	55	654
February	416	12	32	460	304	90	108	502	462	20	47	529
Total	4093	807	863	5763	3376	1534	1228	6138	6229	778	779	7786

Table A. (cont'd)

The Seasonal Distribution of Total Labour on
Direct and Indirect Tasks

	Mixed Livestock				Cattle & Sheep			
	Live- stock	Crops	Mainten- ance and Management	Total	Live- stock	Crops	Mainten- ance and Management	Total
	Hours per 100 Adjusted Acres							
March	310	118	120	548	203	73	103	379
April	244	153	80	477	173	89	85	347
May	228	153	44	425	158	108	81	347
June	222	181	57	460	140	126	85	351
July	228	158	60	446	138	99	89	326
August	208	135	110	433	132	126	89	347
September	212	101	125	438	127	130	73	330
October	251	62	125	438	136	80	118	334
November	262	39	192	493	144	64	118	326
December	285	16	211	512	164	52	106	322
January	289	5	214	508	201	24	118	343
February	274	16	196	486	200	8	118	326
Total	3013	1137	1534	5684	1916	979	1183	4078

APPENDIX IV.

Table A.

The Seasonal Distribution of Total Direct
Labour on Livestock according to Enterprise

	Mainly Dairy					Dairy with Pigs					Dairy with Poultry				
	Cat- tle	Sheep	Pigs	Poul- try	Total	Cat- tle	Sheep	Pigs	Poul- try	Total	Cat- tle	Sheep	Pigs	Poul- try	Total
	Hours per 100 Adjusted Acres														
March	340	8	--	12	360	191	--	98	13	302	316	--	19	237	572
April	245	4	--	29	278	181	--	91	14	286	248	--	19	218	485
May	271	8	--	12	291	181	--	91	13	285	278	--	12	237	527
June	272	--	--	12	284	155	--	88	17	260	211	--	13	230	454
July	281	13	--	12	306	145	--	88	14	247	241	--	18	243	502
August	278	--	--	12	290	141	--	88	13	242	248	12	18	224	502
September	281	--	--	16	303	121	3	88	14	226	240	31	19	243	533
October	305	4	--	16	325	155	7	94	24	280	229	19	19	243	510
November	378	4	--	17	394	203	3	88	16	310	288	13	12	243	556
December	393	--	--	30	423	207	4	88	17	316	280	6	13	255	554
January	370	--	--	53	423	214	10	78	16	318	305	12	12	243	572
February	386	--	--	30	416	196	31	60	17	304	242	7	13	200	462
Total	3806	41	--	246	4093	2090	58	1040	188	3376	3126	100	187	2816	6229

Table A. (cont'd)

The Seasonal Distribution of Total Direct
Labour on Livestock according to Enterprise

	Mixed Livestock					Cattle & Sheep				
	Cat- tle	Sheep	Pigs	Poul- try	Total	Cat- tle	Sheep	Pigs	Poul- try	Total
	Hours per 100 Adjusted Acres									
March	183	51	33	43	310	90	109	2	2	203
April	145	33	24	42	244	98	69	4	2	173
May	135	24	27	42	228	90	63	3	2	158
June	122	36	24	40	222	65	69	4	2	140
July	126	36	24	42	228	79	54	3	2	138
August	123	18	24	43	208	82	42	4	4	132
September	128	15	24	45	212	85	36	4	2	127
October	160	15	28	48	251	98	33	2	3	136
November	177	12	28	45	262	104	36	2	2	144
December	174	12	33	66	285	120	38	2	4	164
January	192	22	30	45	289	140	53	4	4	201
February	172	36	24	42	274	129	65	4	2	200
Total	1837	310	323	543	3013	1180	667	38	31	1916

APPENDIX IV.

Table B.

The Seasonal Distribution of Total Direct Labour
on Cattle according to Task

	Mainly Dairy					Dairy with Pigs					Dairy with Poultry				
	Milk	Feed	Clean	Gen- eral	Total	Milk	Feed	Clean	Gen- eral	Total	Milk	Feed	Clean	Gen- eral	Total
	Hours per 100 Adjusted Acres														
March	176	95	53	4	328	93	52	42	11	198	157	97	59	3	316
April	148	65	30	3	246	85	42	42	12	181	152	59	34	3	248
May	194	57	46	8	305	99	25	48	9	181	184	66	25	3	278
June	192	49	27	4	272	85	21	42	7	155	151	41	19	-	211
July	223	27	27	4	281	76	23	33	2	134	178	47	16	-	241
August	221	23	30	4	278	75	25	38	4	142	166	56	16	10	248
September	206	30	46	4	284	54	27	38	2	121	177	44	19	-	240
October	180	87	30	8	305	80	40	42	4	166	130	56	37	6	229
November	226	103	38	11	378	86	56	57	4	203	157	72	44	15	288
December	202	110	69	12	393	86	75	44	2	207	143	78	56	3	280
January	230	114	50	11	405	83	71	44	2	200	151	84	63	7	305
February	166	103	30	30	329	104	52	44	2	202	132	50	53	7	242
Total	2364	863	476	103	3806	1006	509	514	61	2090	1878	750	441	57	3126

Table B. (cont'd)

The Seasonal Distribution of Total Direct Labour
on Cattle according to Task

	Mixed Livestock					Cattle & Sheep				
	Milk	Feed	Clean	Gen- eral	Total	Milk	Feed	Clean	Gen- eral	Total
	Hours per 100 Adjusted Acres									
March	76	79	17	11	183	12	58	14	6	90
April	66	51	15	13	145	20	53	8	17	98
May	84	29	9	13	135	27	27	5	31	90
June	75	31	5	11	122	14	20	-	31	65
July	78	31	6	11	126	28	19	1	31	79
August	83	22	5	13	123	27	22	3	30	82
September	86	22	9	11	128	30	22	3	30	85
October	91	34	17	18	160	39	27	5	27	98
November	93	53	11	20	177	27	42	8	27	104
December	90	46	20	18	174	28	59	11	22	120
January	85	70	22	15	192	30	78	17	15	140
February	96	46	19	11	172	35	70	13	11	129
Total	1003	514	155	165	1837	317	497	88	278	1180

APPENDIX V.

Table A.

The Seasonal Distribution of Total Direct
Labour on Crops

	Mainly Dairy				Dairy with Pigs				Dairy with Poultry			
	Corn	Roots	Grass-land	Total	Corn	Roots	Grass-land	Total	Corn	Roots	Grass-land	Total
	Hours per 100 Adjusted Acres											
March	23	-	24	47	86	7	27	120	22	18	5	45
April	62	34	41	137	128	23	19	170	32	18	58	108
May	-	23	89	112	38	23	59	120	10	4	77	91
June	-	38	122	160	-	59	105	164	-	18	116	134
July	-	12	82	94	77	30	116	223	19	22	66	107
August	-	5	122	127	110	-	29	139	27	7	23	57
September	30	-	39	69	193	-	23	216	48	5	15	68
October	-	-	6	6	-	30	9	39	-	14	23	37
November	-	-	6	6	-	37	19	56	-	2	8	10
December	-	-	23	23	77	33	16	126	20	9	4	33
January	-	-	19	19	11	17	31	59	3	2	15	20
February	-	-	7	7	50	40	12	102	13	1	54	68
Total	115	112	580	807	770	299	465	1534	194	120	464	778

Table A. (cont'd)

The Seasonal Distribution of Total Direct
Labour on Crops

	Mixed Livestock				Cattle & Sheep			
	Corn	Roots	Grass- land	Total	Corn	Roots	Grass- land	Total
	Hours per 100 Adjusted Acres							
March	66	34	36	136	38	34	10	82
April	55	75	54	184	44	69	27	140
May	-	94	137	231	3	29	27	59
June	-	54	107	161	-	50	92	142
July	-	34	36	70	-	13	74	87
August	30	-	14	44	53	-	20	73
September	110	-	15	125	88	5	52	145
October	22	42	14	78	12	43	27	82
November	-	44	10	54	9	43	23	75
December	-	-	7	7	6	50	10	66
January	16	-	-	16	4	4	7	15
February	31	-	-	31	7	6	-	13
Total	330	377	430	1137	264	346	369	979

APPENDIX V.

Table B.

The Seasonal Distribution of Total Labour
Employed on Individual Crops
All Farms
(Hours per Acre)

	Corn		Pot-atoes	Swedes	Man-golds	Kale		Rape	Grassland		
	Com-bine	Bin-der				Un-thinned	Thinned		Cult-ivations	Harvesting	
			Hay	Silage							
	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.
March	2.6	2.6	26.0	3.5	-	1.0	1.0	-	0.3	-	-
April	5.0	5.0	24.0	4.0	16.6	2.0	2.0	5.0	0.5	-	0.4
May	0.5	0.5	14.0	5.0	3.4	5.0	5.0	6.9	0.4	0.9	4.9
June	-	-	18.0	10.0	25.0	6.4	10.3	3.0	0.2	4.1	1.0
July	-	-	1.0	11.0	24.0	-	11.4	-	0.2	2.8	0.6
August	2.0	5.2	1.0	-	-	-	-	-	0.2	0.3	0.6
September	3.5	5.5	3.0	-	-	-	-	-	0.2	-	-
October	0.2	1.4	35.6	2.0	10.6	-	-	-	0.2	-	-
November	-	0.6	34.4	22.0	29.4	-	-	-	0.1	-	-
December	-	0.6	17.5	24.0	23.0	-	-	-	0.1	-	-
January	-	0.3	6.5	-	2.0	-	-	-	0.1	-	-
February	1.0	1.2	6.0	-	-	-	-	-	-	-	-
Total	14.8	22.9	187.0	81.5	134.1	14.4	29.7	14.9	2.5	8.1	7.5

162

APPENDIX VI.

Table A. Analysis of Miscellaneous Tasks
(Hours per 100 Adjusted Acres)

	Mainly Dairy		Dairy with Pigs		Dairy with Poultry		Mixed Live-stock		Cattle & Sheep		All Groups	
	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%	Hrs.	%
Grinding Corn	-	-	145	40	-	-	47	11	8	5	43	12
Cutting & Carting Fire-wood	33	14	-	-	13	5	56	13	35	20	35	10
Gardening & Orchards	5	2	-	-	63	25	94	22	35	20	50	14
Odd Jobs	199	84	218	60	175	70	232	54	95	55	227	64
Total	237	100	363	100	251	100	429	100	173	100	355	100

APPENDIX VI.

Table B.

The Seasonal Distribution of Total Labour
Employed on Indirect Work according to Task

	Mainly Dairy				Dairy with Pigs				Dairy with Poultry						
	Hedg- ing etc.	Repairs & Mainten'ce		Misc. Tasks	Man- age- ment	Hedg- ing etc.	Repairs & Mainten'ce		Misc. Tasks	Man- age- ment	Hedg- ing etc.	Repairs & Mainten'ce		Misc. Tasks	Man- age- ment
		Equip- ment	Bldgs				Equip- ment	Bldgs				Equip- ment	Bldgs		
	Hours per 100 Adjusted Acres														
March	40	5	22	20	4	20	22	14	25	8	6	4	2	38	21
April	59	14	14	11	6	15	20	16	30	12	27	4	11	38	12
May	33	12	10	38	7	20	20	10	40	10	31	10	4	49	9
June	35	15	7	37	2	3	30	5	29	8	19	10	6	13	6
July	25	4	11	18	2	16	40	2	25	6	37	6	-	20	13
August	43	8	7	18	4	53	40	4	28	8	11	7	-	9	9
September	80	12	7	20	3	20	40	12	30	10	43	3	-	12	10
October	8	5	12	21	4	14	15	19	28	10	26	3	2	15	14
November	3	3	10	27	7	30	40	3	27	11	15	3	1	8	18
December	2	2	29	14	7	12	35	2	41	13	17	1	1	8	14
January	6	2	12	7	5	20	80	5	30	14	31	4	2	18	18
February	1	1	9	6	7	20	20	5	30	13	18	5	2	23	12
Total	335	83	150	237	58	243	402	97	363	123	281	60	31	251	156

Table B. (cont'd)

The Seasonal Distribution of Total Labour
Employed on Indirect Work according to Task

	Mixed Livestock					Cattle & Sheep				
	Hedg- ing etc.	Repairs & Mainten'ce		Misc. Tasks	Man- age- ment	Hedg- ing etc.	Repairs & Mainten'ce		Misc. Tasks	Man- age- ment
		Equip- ment	Bldgs				Equip- ment	Bldgs		
	Hours per 100 Adjusted Acres									
March	36	15	14	30	20	-	7	11	14	14
April	40	13	16	31	24	15	8	11	12	17
May	30	13	18	31	26	15	6	9	19	21
June	20	12	15	32	23	30	5	12	20	20
July	17	11	24	33	23	45	6	12	21	17
August	14	14	17	30	20	74	8	10	4	17
September	60	10	9	36	21	95	7	17	9	16
October	70	19	13	34	19	90	6	7	15	19
November	57	6	24	40	24	65	8	8	16	14
December	46	8	10	47	38	63	4	14	20	15
January	60	10	16	40	23	45	5	17	12	15
February	35	15	14	45	23	50	6	15	11	19
Total	485	146	190	429	284	587	76	143	173	204