THE UNIVERSITY OF ASTON IN BIRMINGHAM

DEPARTMENT OF BUILDING

'HOUSES AND THEIR REPAIR - AN ECONOMIC STUDY'

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SUMMARY

Previous work on the maintenance of houses is reviewed chronologically with particular reference to expenditure.

To verify the hypothesis that maintenance expenditures on local authority owned dwellings can be related to dwellings owned by a private landlord a detailed study of a sample of houses from both sectors is discussed. Particular attention is given to the comparability of the maintenance profile of the two sectors with regard to the pattern of incidence of defects, the average number of hours spent on each maintenance item, the cost of work related to each maintenance item, the cost of maintenance related to the type of house and to the age of the occupant, the complaint to completion time for each maintenance item and the seasonal variation in maintenance work.

The lack of maintenance and its relationship to tenure groups is identified and two surveys used to reveal the relationship are discussed. The derivation of a house fitness index to carry out one of the surveys is also considered and the inbalance between rent income and maintenance expenditure is discussed.

The factors affecting maintenance are identified and the influence of improvement grants studied.

Recent legislation having intensified the need for close attention to maintenance it is proposed that the complaint to completion time for maintenance work is reduced and it is anticipated that yardstick controls will be introduced for maintenance expenditures. From these considerations

it is recommended that maintenance departments should examine their maintenance profile and predict, plan and control the flow of maintenance work. Consideration is given to house design in relation to maintenance.

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INTRODUCTION

Subject of Thesis

The subject of this thesis is "Houses and their Repair - An Economic Study".

Origin of Thesis

Research carried out in 1969/70 into the interpretation of the term "reasonable expense" used in housing legislation revealed a considerable lack of information with regard to the maintenance expenditure in the private sector of the housing market. Such was the lack of infirmation that previous research into house maintenance had been based on the statistics compiled by the Institute of Municipal Treasurers and Accountants relating to local authority dwellings. From this earlier study it was recommended that research be conducted into the repair expenditure in the private sector.

Each week public and private landlords receive complaints from their tenants concerning the deterioration of their housing environment. Such complaints must be recorded, investigated and if necessary remedied. Since the majority of private landlords own only one house each the rent income does not permit the employment of the necessary staff to maintain accurate records thus information concerning the deterioration of the fabric of a house is often not available and cannot be studied.

In order to study the build up of the annual expenditure on house maintenance in the private sector reliance must be placed on the records kept by those private landlords with an estate of sufficient size to support administrative and technical staff.

Such a landlord made available his complete maintenance records as also did the local authority in whose area the majority of the private landlord's houses were situated. The opportunity was thus taken to study and compare the maintenance activity of the two housing sectors.

Object of Thesis

The primary object was to verify the hypothesis previously accepted that the maintenance expenditures on local authority owned dwellings can be applied to those which are privately owned. This is done by a detailed study of the job cards of 52 privately owned houses and a similar number of local authority owned houses. The objects being to discover and compare what were the defects, which defects occurred most frequently, which were most costly to remedy and what was the time delay in reacting to a tenants complaint.

This study forms the focal point in this composite study of house maintenance. The other facets of the study consisting of a door-to-door survey of 38 dwellings utilising a house fitness index in order to contrast owner-occupied and privately rented accommodation, a random sample survey of one thousand houses in order to confirm the conclusions of the door-to-door survey, and a 14 day study tour of property improved with the aid of an improvement grant in order to ascertain the effect on the annual maintenance expenditure of schemes of grant aided modernisation.

Such a study is believed to be the first of its kind due to the availability of detailed maintenance records in the private sector. The object has been to identify maintenance intensive house

components and to consider the need for local authority involvement in questions of compelling landlords and owner-occupiers to remedy minor defects before major defects result and thus release vital building labour from house maintenance to the less labour intensive building construction aspect of the construction industry.

Scope of Thesis

The thesis applies primarily to property in the south-east and the dwellings studied were built before 1939 and were within a 10-mile radius of High Wycombe. In the case of the maintenance record investigation the defects were those which had been reported by the house occupant. The majority of the houses were of traditional brick construction of one or two storeys high. Reference is made to sub-standard temporary housing in the review of previous work but these are excluded from the present study.

CHAPTER ONE

Review of Previous Work

"The Maintenance of Hygenic, Safe and Decent housing is of great importance in fulfilling human requirements". (W.H.O. 1961 116)

Summary

The studies of maintenance in relation to housing have been divided into two major areas. In the 1920's and 30's any investigations into maintenance were aimed at discovering the cost of maintenance and the effect of rent control legislation. At this time the only reason that costs were of concern was that landlords of privately let accommodation were claiming rent increases as a result of the inflation of repair work costs and the studies were aimed at verifying or otherwise these claims.

Following this early pre-occupation with rents and repairs, work began on studies of maintenance at the Building Research Station and the 1950's saw various reports published on the maintenance costs of local authority housing. Such work led Dr. Stone in the early 1960's to propose the term "Cost-in-use" which opened the way for extensive studies into the economic life of building materials and forms of construction. The then Minister of Public Building and Works appointed a Standing Committee in August 1965 (D.O.E. 1972 23) with terms of references which aimed to unify this work.

1. Government intervention in the free market of house letting came with the passing in December 1915 of the Increase of Rent and Mortgage Interest (War Restrictions) Act which froze rents at the level they had attained in August 1914. Although this measure was

to have been of a purely temporary nature the concept of Government control of rents remains to the present day. After the 1914-1918 war the concessions that were granted were based on the need to help the landlord meet the rising cost of maintenance and repair. In 1919 increases of 10% and in 1920 of 40% were permitted on the 1914 "Standard Rent". (A)

2. The Marley Report 1931 (Marley 1931 67) made little reference to the cost of house repair but accepted a definition of repair given in a case Proudfoot v. Hart 1890 where it had been held that repair meant "Having regard to the age, character and locality of the house would make it reasonably fit for the occupation of a reasonably minded tenant of the class who would be likely to take it".

3. It was deduced (Craven-Ellis 1935 13) that 16¼% of the gross rent was required to cover the cost of repairs, outside painting, voids and management.

4. Still pursuing the policy of only considering repair expenditures in relation to rent control the second Ridley Report was published in April 1945. (Ridley 1945 97) The Committee reported that it was difficult to assess accurately the amount of increase in the cost of repairs since 1939. The Committee found

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A The expression "Standard Rent" means the rent at which the dwelling-house was let on the 3rd day of August 1914 or where the dwelling-house was not let on that date, the rent at which it was last let before that date, or, in the case of a dwelling-house which was first let after the said 3rd day of August, the rent at which it was first let. (Section 2 of the Increase of Rent and Mortgage Interest (War Restrictions) Act 1915).

that wages were up by 20%, materials up by 55% and the cost of house building up by 75%. From these figures the Committee deduced that a fair and reasonable estimate of the increase in cost of repairs was between 50% and 75%. It was decided, however, that since the cost of labour and materials in 1943 had only risen to the level prevailing in 1920 there was no justification for further rent increases up to that date. The Committee could not tell if costs would go up, down or stay where they were and it was pointed out that many owners failed to take advantage of income tax provisions under which it was possible to claim relief from taxation, on an average of five years expenditure in respect of sums spent in excess of the statutory allowances for repairs of house property. Some justification for the landlord's failure to adequately maintain his property was, however, given for the Committee commented:-

> "There is evidence of a tendency among some owners to look upon house property as an investment to give a perpetual income without much expenditure on repairs or replacement and it is perhaps more difficult for the owner of a small number of houses to accumulate from taxable income the relatively large sum needed for periodical major repairs or for replacement when the house becomes obsolete".

Later studies have shown how important the last point made in the above quote is. It has been shown (Cullingworth 1966 15) that 78% of the landlords in London own only one house each. The Ridley Committee recommended that a technical committee be appointed to report on the one question of cost of repairs.

5. Also in 1945 a report on the conversion of existing houses

produced by a committee headed by Mr. Lewis Silkin, MP was published. (Silkin 1945 105) The report was mainly concerned with the conversion and provision of accommodation after the rigours of a world war but comment was made on the comparison between expenditure and income under certain conditions. Although hypothetical, examples were given in which the allowance for repairs, management, voids and insurance was given as 25% of the rent income. This gave a range of annual allowances from between £39 and £78. Whilst appreciating that these figures include an allowance for management and voids their size will be considered later when present day repair costs are considered.

6. Cullingworth, considering the housing in Lancaster noted that the repair expenditure on the council houses more than doubled between 1949 and 1953 from £15,400 to £33,000. (Cullingworth 1963 16)

7. The early 1950's was a period in which the amount of work, which was subject to the limitations imposed by licencing arrangements, was reduced. In 1950 the free limit was £100 and this was raised in July 1952 to £200, in January 1953 to £500 and in January 1954 to £1,000. Up to June 1953 licences were obtainable from local authorities who were acting on behalf of the Minister of Works. The local authority were given a quota of work which could be licenced in each year. The Ministry of Housing and Local Government Reports for this period commented that the financial implications of rent restriction legislation affected the amount of work being carried out. (MHLG 1951/54 49)

8. Professor F.W. Paish in an article on the economics of rent restriction (Paish 1950 87) commented that whilst it was probable

that the cost of maintaining and repairing houses had risen more than twice in all areas of Britain, in some areas it had risen three times or more between 1945 and 1950. Professor Paish went on:-

> "At these prices, many landlords are unable to pay for adequate repairs out of the controlled rents and leave themselves any income at all ..... thus much property is being allowed to degenerate into slums, or at best maintained at a level much below that which is economically desirable and which it would have paid landlords to achieve if rents had been allowed to find their market level".

9. By 1951 local authorities were spending an average of nearly 25p a week on repairs to their post-1918 houses, yet the average weekly net rent of privately let houses was only 41p and 11% had rents of less than 25p a week. The move to owner-occupation was thus catalysed and the ability of local authorities to require the remedying of defects in private landlord houses impaired.

10. The then Sanitary Inspectors Association continued the discussion of rent control and repair by publishing a memorandum on the subject in 1951. (S.I.A. 1951 100) Despite the wealth of evidence to show the effects of failing to allow rent levels to rise with repair costs the memorandum contained a quote from a letter received by the Association from the Minister of Health, Mr. Aneuran Bevan. It read:-

> "Mr. Bevan appreciates that the cost of repairs to property is much higher than pre-war and he has given full and careful consideration to representations made

to him to allow an increase in rent to cover the increased cost of repairs. He can, however, hold out no prospect of early legislation to deal with the matter".

11. Also in 1951 the Royal Institution of Chartered Surveyor's suggested to the Government that the principle of relating rent increases to the statutory deduction be accepted. The statutory deduction, being the difference between the gross annual value and the net annual value, is an allowance in respect of repairs and insurance. This suggestion was later adopted by the Government and incorporated into the provisions of the Housing Repairs and Rents Act 1954.

12. The problem of the adequate maintenance of the housing stock was confronting all European governments and a report on European rent policies (UNECE. 1953 113) showed how the various governments were tackling this ubiquitous problem. At this time only Switzerland incorporated a specific provision in their legislation to allow for the increasing cost of maintenance and other running expenses. Even so the increases in rent which were allowed were aimed at only a partial compensation to the landlord for the increased maintenance costs. In France a National Housing Improvement Fund had been set up to subsidise housing repairs and alterations. The fund was financed out of a 5% tax on rents and out of state subsidies and advances. West Germany had tackled the problem by giving loans at a low rate of interest for repair work. The report concluded:-

"..... lack of maintenance is generally confined to old houses which need most maintenance but have the lowest rents. Where the sole problem is the level of rent, on

the other hand, it should be remembered that many landlords expect the abolition or mitigation of rent control at some future date, and therefore much property is maintained in the light of these expectations, but would be neglected if rent control were to continue indefinitely".

13. A further memorandum by the then Sanitary Inspector's Association (S.I.A. 1953 99) again drew attention to the problem of rent control and its deleterious effect on maintenance activity. The memorandum commented:-

"Observation shows that there is general evidence of inadequate external maintenance, such as painting and pointing, during post-war years. But the deterioration of brickwork and woodwork is relatively slow and some years may elapse before dampness penetrates the brickwork and reaches the interior, or windows and doors collapse".

14. The Girdwood Committee reported in 1953 that on average defects which had cost £100 to repair in 1939 were costing £316 in April 1953. (Girdwood 1953 34) The following tables produced in the report show the comparative cost of labour and materials to do a given amount of work in 1939 and 1953 and are an indication of how inflation had affected the cost of maintenance.

TABLE A1

Comparitive Costs of Labour for 1939 and 1953

	Hourly rates of wages	1939 £ p	1953 £ p
1.	Craftsman	8	17½
2.	Labourer	6	15½
3.	Handyman (estimated average)	7	16½
4.	Average rate for a labour force of 40% Craftsmen, 25% Labourers, 35% Handymen (1939)	7½	
5.	Average rate for a labour force of 60% Craftsmen, 20% Labourers, 20% Handymen (1953)		17
6.	Average wage for week of 44 hours	3 22½	7 49
7.	"Extra payments" travelling and subsistence	9½	45
	Total of item 6 plus 7	3 32	7 94
8.	Guaranteed time in 1953: 1%		8
9.	Employers insurance against common law liabilities say	3½	4½
10.	Health and Unemployment Insurance	8	
11.	National Insurance		25
12.	Employers Contribution to annual and public holiday fund		41
		3 43½	8 72½
13.	Addition to cover loss of output and/or payment of bonus		2 18½
	Total	3 43½	10 91
14.	Index of cost of labour for a given quantity of work (1939=100)	100 -	318 -

TABLE B1

Comparative Costs of Materials for 1939 and 1953

Materials	Cost in 1939 £	1953 Index (1939=100)	Cost in 1953 £
Painter, Decorator & Paperhanger	11.6	300	34.8
Plumber, Gasfitter & Smith	7.6	290	22.0
General Labourer, Paviour, Bricklayer, Roofer, Plasterer & Fencer	3.8	260	9.9
Carpenter & Joiner	3.5	460	16.1
Electrician	0.5	250	1.2
	27	311	84

Drawing these two tables together the Committee produced a further table showing a typical sub-division of house maintenance costs which is reproduced below:-

TABLE C1

House Maintenance Costs for 1939 and 1953

	Labour	Materials	
1939	73	27	100
1953	232	84	316

15. Shortly after the publication of the Girdwood Committee's findings the Government published a white paper giving the broad outlines of the housing problems and the measures which it proposed to take. (1953 43) The white paper indicated that the Government had become aware that merely providing new houses without attending to the repair and maintenance of the existing stock was like trying to fill a bath with the plug out. The paper commented:-

> "But housing conditions do not depend solely on the building of new houses ..... they depend also on maintaining the houses built before the war; on overtaking the arrears of repair work which has been neglected each year since war broke out in 1939; on keeping structurally sound houses in good order .....".

The government laid the blame for the deterioration of the housing stock largely at the feet of the 1939-1945 war. It was accepted that rents had become too low to allow for landlords to maintain their property adequately. It was thus proposed to accept in principle the scheme for raising rents put forward by the Royal Institution

of Chartered Surveyors in May 1951 and discussed previously in paragraph 11.

16. Due to the scarcity of information relating to the cost of maintenance in the private sector attention was turned to the data published by the Institute of Municipal Treasurer's and Accountants and studies were carried out into some of the features of the maintenance costs of local authority housing. A report (Reiners 1955 95) from the Building Research Station made reference to the average maintenance cost per local authority dwelling which had been shown in a report by Political and Economic Planning (1950 31) to have risen from £4.39 in 1938/39 to £9.45 per annum in 1948/49. Due to the inflation which had occurred during this period it was suggested that this rise indicated a lowering of maintenance standards. From a study of pre-war houses in four local authority areas it was concluded that the rate of increase in maintenance cost was on average 24p per year. It was further found that while the increase was fairly uniform in all elements, it was notable that the increase in structural repairs (bricklaying and roofing) occurred principally after the first 20 years. From an analysis of the statements of maintenance costs for the year 1951-52 given by 12 authorities it was shown that external painting accounted for 32% of maintenance costs with the next most important being plumbing at 17%. Repairs to the external structure were shown to be relatively small in cost barely exceeding the cost of repairs to paths, fences, gates and drains. It was calculated that the maintenance cost of a local authority owned house with an assumed 60 year life was probably equivalent (at 1955 prices) to

an initial capital charge of around £225. Reiners concluded that in the ten years leading up to 1955 the rents of local authority houses had not included a sufficient allowance for increased maintenance charges.

17. The repair of property particularly those owned by private landlords had become of considerable political importance. In the Labour Party's policy for housing (1956 61) it was stated that whilst repair costs had steadily dropped in the 1920's repair activity had not increased. From this relationship it was concluded that the majority of private landlords had neglected their responsibilities and were only interested in obtaining the maximum return. Attention was also turned to the owner-occupier and the difficulty which such a person met when maintenance became due. It was put forward that all persons purchasing a house with the aid of a local authority mortgage should be required to contribute to a repairs fund. It was stated that once a purchaser had the sum of £100 to his credit in the fund no further contributions would have to be made.

18. After considering the rehabilitation of houses it was pointed out (Marriott 1956 68) that the cost of maintenance in 1956 was four times higher than it had been in 1914. It was also pointed out that the ratios between the value of materials and labour for various classes of building work had remained fairly constant and were:-

TABLE D1

Relationship between labour and materials cost for various classes of building work

	Labour	Materials
House Maintenance	73%	27%
House Erection	40%	60%
Improvement & Conversion	60%	40%

Having shown that the cost of maintenance had risen by nearly 400% between 1914 and 1956 attention was drawn to the fact that rents had risen by only 40%.

19. It was pointed out that (Lawton 1957 64) the Girdwood Report of 1953 had based its figures on urban districts. Since wage rates in rural areas had increased to a far greater extent than in the urban districts, the problem faced in rural areas was more acute than the problem already revealed by the Girdwood Report. Lawton also pointed out that the maximum rent for the typical poor rural cottage was between £14 and £18 per annum and by 1952/53 the average annual maintenance cost of a local authority dwelling in England and Wales had risen to £9.06. To emphasise the difficulty facing the private landlord the average maintenance cost for the pre-1945 built local authority house was £11.70 and the average age of such property was only 21 years. The typical rural cottage was much older, had thus a higher maintenance cost and yet was limited to a rent level of only £14 to £18.

20. With mounting pressure and increasing evidence that rents were too low the government put before Parliament a Rent Bill which became the Rent Act 1957. The Act caused a major upheaval in the rent control situation. In order to discover the effects of the Act the Government decided that an enquiry should be made and its findings were published in December 1960. (MHLG 1960 52) The enquiry showed that 42% of tenants of controlled accommodation had not asked their landlord to carry out repairs between the passing of the Act in 1957 and May 1959. This percentage covered tenants in England and Wales excluding Metropolitan London where the figure

was 50%. Where tenants had asked for repairs to be carried out in accordance with the provisions of the Rent Act 1957 the landlords had complied with their requests in 54% of the cases investigated in England and Wales and 61% in Metropolitan London. Where tenants had informally requested that repairs be carried out the landlords had done so in 66% of the cases in England and Wales and 67% of the cases in Metropolitan London. Despite the fact that rent increases were tied to repair work being carried out it was found that in a third of the cases where no work had been carried out tenants were paying the newly-fixed rent limit.

21. Not all authorities put the blame for poor maintenance on rent control. Greve (1961 38) commented:-

> "It is one of the myths of housing that rented houses are in their present state because of rent control".

Such arguments are based on the slow decontrol which took place in the 1920's and 1930's and the substantial fall in the cost of labour and materials which occurred at approximately the same time with the concurrent lack of maintenance activity. It is further pointed out that even before the introduction of rent control private landlords were never pioneers of higher standards. It is also pointed out that as the property ages so also in many cases does the landlord with the accompanying lack of interest in the maintenance of his asset.

22. In 1961 the Parker-Morris Committee reported on the standard of design and equipment applicable to family dwellings. (1961 88) The Committee had been appointed by the Central Housing Advisory Committee. In their report comment was made on the question of

the maintenance of landscaped areas and houses thus:-

> "It is essential that the landscaping should be designed for ease of maintenance as well as that funds should be provided for the maintenance of both the dwellings themselves and the spaces between them".

On this aspect the Committee felt that private development lagged behind local authority owned property for the latter as landlords could maintain the whole estate. It was felt that the use of restrictive covenants governing repainting and the maintenance of landscaped areas in the private sector of housing coupled with non-profit making companies who carry out this work could prove successful.

23. The relationship between ageing property and owner has been considered. (Cullingworth 1962 17) He questioned how many ageing owners were able to cope with the maintenance of their property or indeed could afford major repairs and he made reference to an earlier paper (Metcalfe 1958 7) in which it was stated:-

> "Many of our new owner-occupiers do not possess the necessary 'know-how' to even deal with minor repairs let alone the major defects which crop up all too often..... ..... Many cases are occurring where, on the death of the owner a widow with very limited means becomes the owner-occupier. In these and similar cases the proper maintenance of the property becomes impossible, and rapid deterioration can take place some times with serious consequences to adjacent property".

24. Reiners (1962 96) reported on a study into the ratio of

maintenance to initial cost amongst the various building elements. He produced the following table based on a study of local authority houses:-

TABLE E1

Components of Maintenance and Initial Cost at 1955 levels of Cost

	Maintenance Cost		Initial Cost	Total Cost	Maintenance as % of Initial Cost
	Annual £	Capitalised £	£	£	
Water Service	1.90	42	50	92	84
Sanitary Fittings	0.50	11	50	61	22
Heating, Cooking & Lighting	1.50	33	100	133	33
Internal Structure & Finishes	1.50	33	500	533	7
Main Structure	1.15	26	500	526	5
External Services & Site Works	0.90	20	100	120	20
External Painting	3.55	80	80	160	100
	11.00	245	1,380	1,625	

Reiners further estimated that the increase in cost of maintenance had risen to 35p per house per year for houses between 5 and 30 years old. Above that age it was suggested that costs may tend to settle down to a steady level. Table E1 again highlights external painting, water service and sanitary fittings as being amongst the most costly to maintain in relation to their initial cost.

25. The Building Research Station carried out a further study of local authority housing maintenance statistics produced by the I.M.T.A. from which it was shown that the overall average cost for the maintenance of local authority dwellings in 1959/60 was £13.90. (Clapp 1963 8) Of more interest to this study is the following table which relates maintenance cost with approximate age of

construction.

TABLE F1

Variability between authorities of average cost per house excluding decorations 1957/58 (Groups of less than 50 houses excluded)

Average Cost per House	No. of Authorities				
	1919 Act Houses A	Other Pre-War B	Post-War Traditional C	Post-War Non-Traditional D	Temp. Bungalows E
Less than £2	-	-	6	9	1
£2 - £4	2	3	43	20	-
£4 - £6	3	10	81	35	15
£6 - £8	11	21	43	23	34
£8 - £10	14	35	11	13	32
£10 - £12	22	31	1	5	28
£12 - £14	15	26	1	3	28
£14 - £16	13	14	-	1	14
£16 - £18	13	12	-	2	5
£18 - £20	8	5	-	-	3
Over £20	21	6	-	1	4
Total No. of L.A's	122	163	186	112	164

An estimate was made of the rate of increase in maintenance cost with age and this was 31p per house per year. This figure only applied to traditional houses, although as can be seen from Figs 1 and 2 non-traditional houses and temporary bungalows were considered. Clapp further showed that the breakdown of maintenance costs for 1919 Act houses in 1957/58 was as follows:-

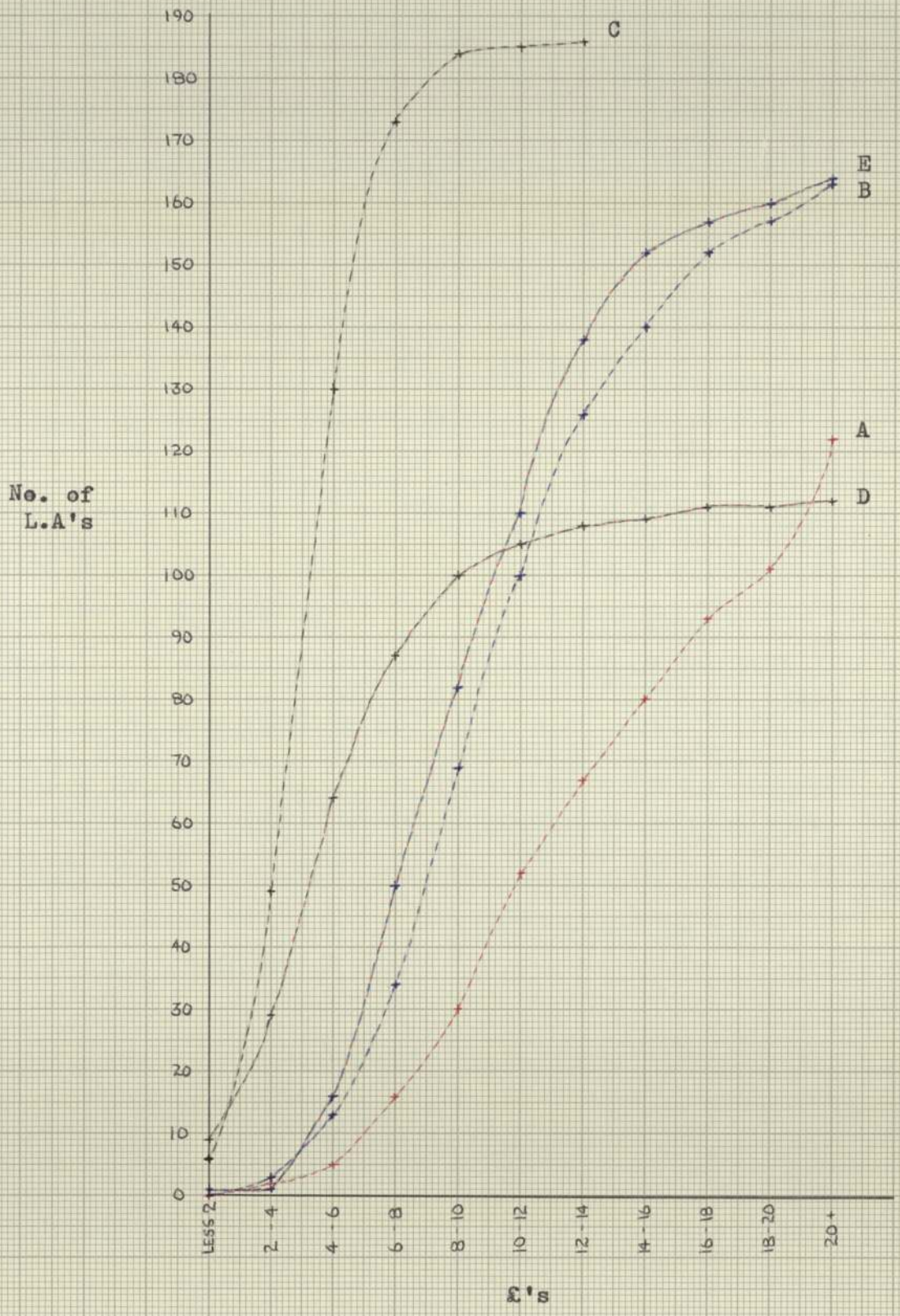
TABLE G1

Average Operation Costs per house for 1919 Act houses 1957/58

Plumbing	£ 3 30p
Structural Repairs	£ 6 70p
Grates, Coppers and Ranges	£ 1 0p
Gas and Electrical Repairs	£ 80p
Paths, Fences, Drains	£ 1 80p
Other Fittings, Other Items, Special Repairs	£ 2 30p
Total excluding decorations	£15 90p
Internal Decorations	£ 2 10p
External Decorations	£ 3 20p
Total including decorations	£21 20p

Fig. 1.

Variability between authorities of average cost per house excluding decoration 1957-58 taken from Table F1 (Cumulative frequency)



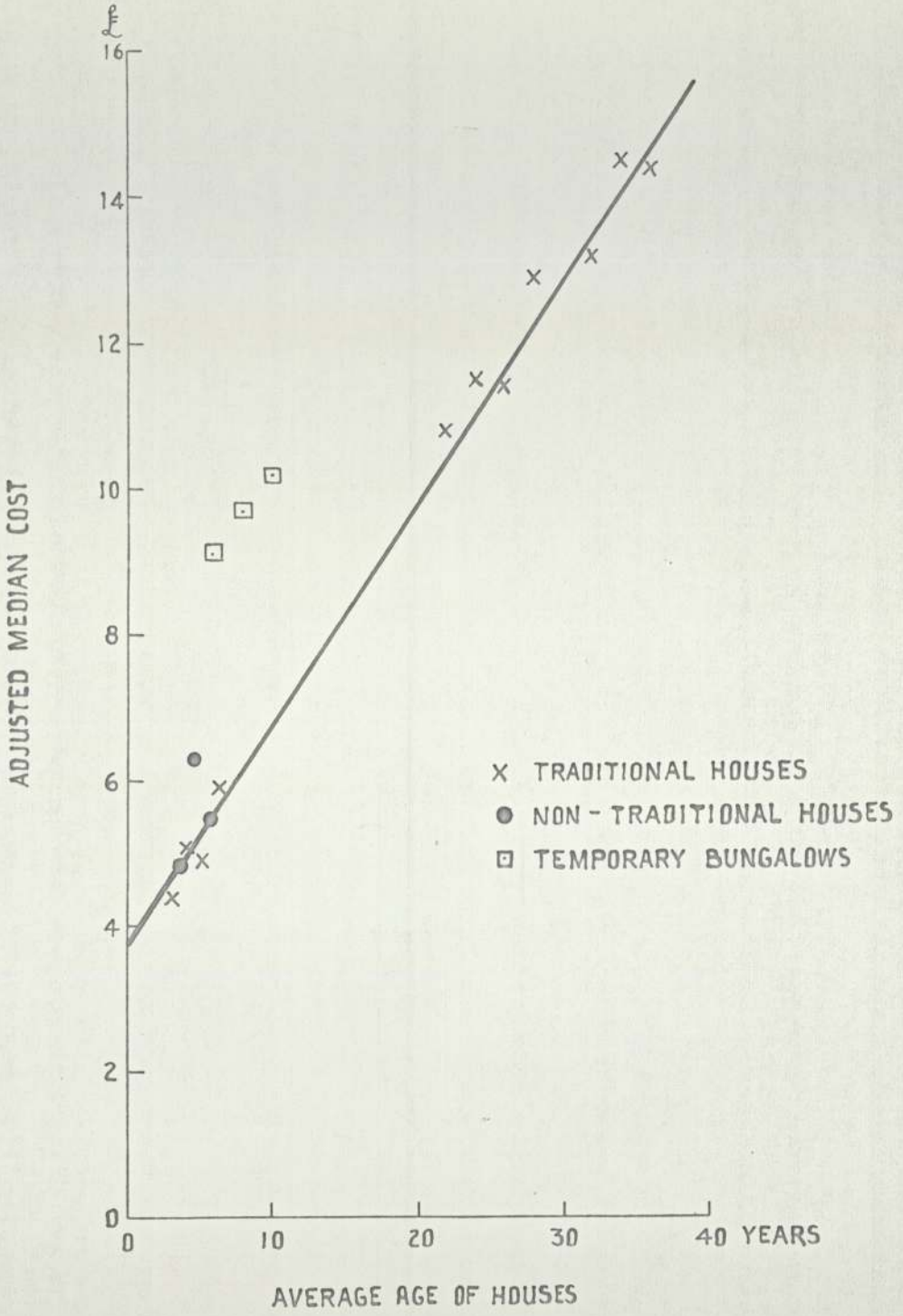


Fig. 2.

COST PER HOUSE EXCLUDING DECORATIONS ADJUSTED TO 1959 COST LEVELS.

26. The cost of non-traditional house maintenance was also analysised and compared with traditional forms of construction. The comparison is given in Table H1 reproduced from Clapp's paper in which she points out that the non-traditional houses have a rather greater different age than the traditional houses considered. It can be seen that the BISF houses have considerably higher costs due to the greater expenditure on decoration.

TABLE H1

Maintenance Costs of non-traditional houses 1957/58

Operation	BISF	Traditional	Airey Rural	Traditional
Plumbing	1.08	1.07	2.24	1.23
Gas & Electrical	0.62	0.37	0.35	0.28
Grates, Coppers, Ranges	0.63	0.34	0.71	0.48
Other Fittings	0.32	0.20	0.27	0.20
Paths, Fences, Drains	0.62	0.35	1.40	0.72
Structural	1.33	1.44	1.32	1.42
Other Items	0.84	0.89	0.45	0.59
Total	5.44	4.66	6.74	4.92
Int. Decorations	4.22	1.23	0.24	0.26
Ext. Decorations *	7.16	1.86	1.43	2.00
Special Repairs	0.55	0.02	-	0.12
Total	17.37	7.77	8.41	7.30

* Average for 3 years adjusted to 57/58 prices

27. In 1963 a report on the study of the housing problems in Lancaster was published. (Cullingworth 1963 16) The report showed that while the local authority were spending an average of nearly 25p a week on repairs to their 2,500 post-1918 houses, the average weekly net rent of privately let houses was only 41p, and 11% had rents of less than 25p a week. It was thus impossible to finance repairs out of such low incomes. Cullingworth referred to a 1952 report of the Public Health Department of the City of Lancaster in

which it had been estimated that the 5,195 old houses in the city required at least £311,700 to be spent on repairs to bring them up to a satisfactory standard.

28. The study of Lancaster also revealed the attitudes that many tenants and landlords adopt on the question of repair. There was a general view that extensive repairs would lead to rent increases and this it was felt was not worth it. This attitude resulted in a bargaining between landlord and tenant whereby the landlord agreed not to raise the rent at all if the tenant agreed not to ask for any repairs to be carried out. Only 1% of the landlords regularly inspected their property and undertook necessary repairs. 19% did necessary repairs when asked by the tenant, and 34% did likewise when it was considered that the repairs were not only necessary but also absolutely essential. 8% did repairs only when legal action was taken or threatened and a further 12% had either come to an informal agreement with the tenant or had tenants who never asked for repairs to be carried out. Due to the fact that few landlords in the study kept business-like accounts the information on the question of maintenance costs was too meagre to permit detailed analysis.

29. In Lancaster some landlords had spent nothing on repairs for many years and the average annual maintenance expenditure on pre-1865 terraced two-bedroom dwellings ranged from Nil to £29 during the years 1958/60. For three-bedroom terraced dwellings built in 1890 the range was from Nil to £65. For comparison the average maintenance expenditure on council houses in 1958/60 was £11.67½p. On the question of the variation in annual expenditures Cullingworth commented:-

> "The owner of 26 houses (who kept his repairs to the minimum) had an expenditure on repairs over eight years ranging from 6% to 80% of the rent income for the individual houses. To some extent this difference is explained by the differing standards of care maintained by different tenants".

30. Cullingworth also surveyed owner-occupied pre-1915 houses and reported that major works of improvement or repair had been carried out by 83% and only 8% had done no repairs or decorations at all. The survey further showed that 56% of owners had carried out major structural repairs such as new floors, new ceilings or major repairs to the roof or walls; 36% had installed amenities usually a bath or an inside toilet and as many as 60% had modernised their kitchens, bathrooms or living rooms. 29% had replaced, improved or installed electricity or hot water systems. In his summary of owner-occupation Cullingworth declared that the case for some kind of repairs insurance scheme for owner-occupiers seemed clear.

31. In the 1963 white paper (1963 44) the Minister of Housing and Local Government commented:-

> "Fear of rent control, and the problems associated with management, maintenance and repair, has discouraged private investment".

Concern was expressed that the maintenance of a proper standard of repair of rented houses was a general problem. Whilst giving no definite proposals the government stated their belief that it would be right to insist that all privately rented houses should be kept in a proper state of repair, having regard to their age, and condition and to what could be done at a reasonable cost.

32. In the "Principles of Modern Building" the Building Research Station commented in 1964 that examination of the maintenance costs of local authority housing had shown that their total expenditure (excluding internal decoration) over the life of the house was equivalent to only about 18% of the first cost. (1964 29)

33. A.E.Eames (1964 30) pointed out that the repair and maintenance of privately rented properties was creating serious difficulties. He commented:-

> "In the last few years most repair work to rented property seems to have been financed by insurance companies, following flooding or frost and snow damage".

34. Eames had again referred to the failure of the Rent Act 1957 to provide a sufficient income for landlords to ensure that rented houses were adequately maintained. Indeed it was estimated that tenants of rent controlled property were receiving financial "assistance" of roughly £40-£50 per year. (Kaim-Caudle 1964 59) This assistance had to be borne by the private landlords although some of the real cost had been passed on to the houses themselves by way of neglect.

35. During this period Stone of the Building Research Station had been developing the concept of "cost-in-use". The purpose of the technique being to provide a single cost figure covering the initial, running and operation costs attributable to a particular design of building or to a particular design feature. An example of the application of this technique to a specific design problem was published in 1964. (Stone 1964 109) In arriving at the cost-in-use figure the initial and periodic costs are amortised over an assumed

life for the building and expressed as annual equivalents on the money value at the time of construction. The main purpose being to compare different forms of construction.

36. The 1965 white paper was concerned primarily with the house building programme. (1965 55) Comment was made that a proper share of building resources should be devoted to the maintenance and repair of older houses. The Government were concerned that maintenance was mainly the field of the smaller builder where productivity was generally lower and the scope for industrialisation less than with new building. A committee had been set up to consider the ways and means of improving the productivity of this relatively neglected sector of the building industry. The view was expressed that the move from rented to owner-occupied stock should be encouraged since owner-occupation brought with it a standard of maintenance and repair by no means always found in privately rented houses.

37. It was shown that the repairs and maintenance output of the construction industry in the 1960/62 period amounted to £521 million which was 18.5% of the total output. (Needleman 1965 83) In 1962 about 40% of the 400,000 operatives employed by private firms in England and Wales in the house building section of construction were engaged on repair, maintenance and conversions. In 1960 56% of the operatives employed by firms with less than 20 operatives were engaged on repair work. Consideration was given to the economic issues involved when determining whether to repair or renew the existing structure or to demolish and rebuild. One of the issues was the difference in annual repair costs between the improved and

rebuilt property and here Needleman turned to the average repairs expenditure per dwelling by local authorities in England and Wales for 1961/62. From these figures it was assumed that a difference of £8 would be appropriate due to pre-war local authority houses requiring an expenditure of £20.3 p.a. and post-war houses £12.3 p.a.

38. Concern was expressed at the rapidly increasing repair expenditure on local authority property. (Gregory 1965 37) It was pointed out that at the same time as repair expenditure was rapidly increasing there was a general decrease in reserves and it was predicted that in the years to come very serious financial problems would arise as the vast number of post-war houses required more and more maintenance expenditure.

39. The Central Housing Advisory Committee's sub-committee on standards of housing fitness considered the policy adopted by Birmingham C.B.C. of acquiring unfit houses in advance of clearance and patching them to make living conditions tolerable prior to demolition. (MHLG 1965 72) The patching normally involved reroofing, rebuilding defective walls and chimneys, replacement of gutters and down pipes, partial replastering, repairs to floors, replacement of firegrates, decorating and, where necessary, provision of piped water, electric light and new w.c's. At the time when the sub-committee was considering this policy the council had reconditioned 50,000 houses. The average cost of patching a house was £390 plus £12 a year for maintenance.

40. At the same time as the sub-committee mentioned in paragraph 39 was sitting so also was a committee under the chairmanship of Milner-Holland C.B.E.,Q.C. which was studying the housing in

Greater London. On repairs the committee reported that costs varied with size, age and condition of dwellings. From the evidence submitted it was estimated that about £20-£30 per year was spent on the maintenance of older property. From a survey conducted repairs were reported by housewives to be needed in 51% of privately rented dwellings, 33% of council dwellings and 27% of owner-occupied dwellings. 29% of private tenants had repair work outstanding and 44% of these households had been waiting more than a year for the landlord to rectify the defects. (Milner-Holland 1965 71)

41. The Milner-Holland Report contained comments on the tax position applying to housing associations and private landlords. In particular the taxing of funds used for amortization or depreciation was said to have a serious impact. The committee commented:-

> "From our examination of the tax position of the private landlord we conclude that, unless some remedy is found and the burden of taxation reduced, the private landlord will turn his attention more and more to other forms of investment..... We received evidence from many landlords that since 1945 their rent revenues were too low to permit of the proper maintenance and improvement of their properties.....".

42. In the nine years 1957 to 1965 the annual Ministry of Labour family expenditure survey revealed that on average 1.9% of the household budget was allocated to repairs, maintenance and decoration. The following tables are compiled from the survey reports. (1957/65 78)

TABLE I1

Average Weekly Expenditure on Housing excluding Repairs

1957 £0.99½ 1958 £1.11½ 1959 £1.17 1960 £1.21 1961 £1.27½

1962 £1.36 1963 £1.63½ 1964 £1.85 1965 £1.98½

Average Weekly Expenditure on Repairs, Maintenance and Decoration

1957 £0.24½ 1958 £0.23½ 1959 £0.27 1960 £0.33 1961 £0.34

1962 £0.35½ 1963 £0.39½ 1964 £0.33½ 1965 £0.48½

Total Average Weekly Expenditure on Housing

1957 £1.24 1958 £1.35 1959 £1.44 1960 £1.54 1961 £1.61½

1962 £1.71½ 1963 £2.03 1964 £2.18½ 1965 £2.47

Repair Expenditure as a percentage of the total household expenditure

1957 1.720% 1958 1.594% 1959 1.744% 1960 1.998% 1961 1.979%

1962 2.019% 1963 2.065% 1964 1.719% 1965 2.306%

43. The average figure of 1.9% deduced in the previous paragraph is derived from an expenditure survey which is unrelated to the family's form of tenure. Since it can be assumed that approximately 50% of the families within the survey would be owner-occupiers, who would be responsible for all their maintenance expenditure, and 50% tenants responsible for only part of the maintenance expenditure, mainly internal decoration, then it can be argued that owner-occupiers are on average spending approximately 3.8% of their weekly income on repair and maintenance.

44. Nevitt (1966 85) suggested that at least £100 per year was required to cover the cost of insurance, management and repairs falling upon a landlord. The taxation of "sinking funds" was also the subject of discussion and it was pointed out that a tenant who had to pay £20 a year into a fund for outside painting etc. had to

pay a total of £32.65 to the landlord. The landlord could then put £20 into the repairs fund and pay the tax imposed of £12.65. Nevitt comments:-

> "Thus every tenant pays more for the repairs which are carried out in the early years of the estate than an individual who goes directly to a builder and pays the builder out of his current income".

45. In 1803 Addington whilst reintroducing income tax introduced a method of imposing taxes under five different schedules (A through to E). Up to 1963 landlords and owner-occupiers were subject to schedule A tax. Under this tax the landlord could only obtain the property maintenance allowance if the average amount spent on repairs each year exceeded the statutory deduction over a period of five years. Owner occupied houses were given a hypothetical income based on a valuation carried out in the years preceeding 1936/37. Before paying tax on this hypothetical income owner-occupiers were allowed to make the same deductions as private landlords. The first of these deductions was the statutory allowance for repairs which varied depending on the gross annual value. Owner-occupiers had the same rights as the private landlord to deduct the full and true costs of all repairs carried out over a five year period. In the year 1959/60 only 10% claimed relief under the latter condition. The following table shows that the average relief claimed by the higher income group making a claim exceeded the schedule A assessment. The table is based on average figures and therefore can only show the average position.

TABLE J1

Tax "burden" on owner-occupiers 1959/60

Income Range £	Average Schedule A addition to owner's income £	Average Property Maintenance relief claimed £	Average Taxable Amount £
over under			
1,000 to 1,250	24.4	23.2	1.2
1,250 to 1,500	29.3	27.7	1.6
1,500 to 1,750	34.2	30.5	3.7
1,750 to 2,000	39.7	37.4	2.3
2,000 to 2,500	44.2	40.4	3.8
2,500 to 3,000	50.6	46.5	4.1
3,000 to 4,000	56.9	63.6	- 6.7
4,000 to 5,000	66.4	67.9	- 1.5
5,000 to 6,000	72.9	160.0	- 87.1
6,000 to 8,000	91.4	156.4	- 65.0
8,000 to 10,000	102.4	185.9	- 83.5

Table based on statistics supplied by Inland Revenue from their 1959/60 survey of incomes. (Nevitt 1966 85)

46. Since 1964 rents are subject to tax under schedule D and landlords are now able to offset current expenditure against current income although no provision is made to permit landlords to depreciate capital assets or to obtain an allowance to cover the wear and tear of equipment installed in houses. The position of the owner-occupier, since the abolition of schedule A, is more favourable in the majority of cases and is unchanged in the rest.

47. Utilising the results of a survey of housing conditions in England carried out by the Rowntree Housing Study Team in 1962 and the Inland Revenue statistics of schedule A payments by owner-occupiers, previously given in paragraph 45, Nevitt produced the following table relating rent with net income.

TABLE K1

Net Rents; Repairs and Management; Net Income

Rent	Repairs and Management	Net Income	Percentage of tenants
Less than £10	£18	- £8	9%
£15	£18	- £3	
£25	£18	£7	30%
£35	£18	£17	
£45	£18	£27	23%
£55	£18	£37	
£65	£18	£47	12%
£75	£18	£57	
£85	£18	£67	7%
£95	£18	£77	

The £18 was made up of £12 for repairs and £6 for management based on 1962 figures. Nevitt suggested that by late 1965 the figure of £18 should be raised to at least £25.

48. The sub-committee on the standards of housing fitness previously mentioned in paragraph 39 made their report in 1966. The committee, known as the Denington Committee, was concerned that if houses were allowed to become unfit when this could be prevented or delayed then they would have to be replaced at a substantial expense to the community. The committee concluded:-

> "We consider, therefore, that there is a public interest in ensuring a reasonable level of maintenance for all houses and that repair and improvement should be looked at as part of the same effort to preserve the national assets represented by the stock of existing house". (Denington 1966 51)

49. At this time studies were being carried out into the possibilities of rejuvenating areas of the urban landscape. Areas such as

Fulham and Barnsbury were being studied and the government had assembled a team to consider a part of Rochdale in Lancashire known as Deeplish. The report (MHLG 1966 54) contained valuable information on the question of repair and maintenance. The study revealed that during the previous year owner-occupiers had been far more active in this field than landlords and, indeed, five-sixths of the owner-occupiers had done some form of maintenance whilst a third had spent more than £50 on repairs and maintenance. Over a third of the rented property had had nothing done and only one in ten had more than two items of work completed. During the previous year, the average amount spent on repairs and improvements by owner-occupiers was about £15 compared with about £5 spent by tenants. A survey of landlords showed that £6-£7 was the landlord's annual repair cost.

50. Apart from tenure the study at Deeplish revealed that age and income had an effect on the amount spent on repairs. Of the 20-24 year old age group, 26% had spent over £50 on repairs during the past year compared with 11% of the over 65 age group. As expected the higher income households spent more on repairs than the lower income households.

51. The report pointed out that the data on repair costs were extremely scrappy. A table was produced relating repair costs with the size of the landlords holdings.

TABLE L1

Distribution of repair costs during the previous year according to size of holdings

	Landlords with small holdings (1-5)	Landlords with medium holdings (6-10)	Landlords with large holdings (10 plus)
Nothing	5	2	-
Up to £10	7	10	3
£10 - £19	3	2	-
£20 - £29	1	1	-
£30 - £39	1	-	-

(5 miscellaneous. Not known etc)

The report of the study commented:-

"The feature which should be emphasised ..... is that the level (of repair costs) is so low, particularly bearing in mind the need of any old house for maintenance".

52. Of particular interest to this study was the table produced by the Deeplish Study team relating the type of repair to the landlord differentiated by the number of houses owned. The differentiation was the same as that given in Table L1 in paragraph 51.

TABLE M1

Repairs done in the previous year

	All Landlords	Small (18)	Medium (16)	Large (4)
None	7	5	2	-
Roofs	13	3	7	3
Painting Exteriors	8	6	-	2
Plumbing (bursts)	14	5	8	1
Repointing	7	4	2	1
Joinery	12	6	5	1
Drains	2	-	2	-
General Maintenance	6	2	1	3
Electricity	-	-	-	-
Carpentry	-	-	-	-

53. Grigsby of the Institute of Urban Studies, University of

Pennsylvania in a paper to a conference held in 1965 suggested that annual maintenance was assumed to be 1½% of market value of the new home and equal, in absolute terms, on the old structure. (Nevitt 1967 86)

54. At a one-day conference in London in 1967 the General Council of the Association of Public Health Inspectors expressed their belief that the powers given to local authorities for dealing with the repair and maintenance of houses should be strengthened so that decay could be halted at its earliest stages. (1967 3) At this time the law only allowed a local authority to take action if the disrepair was such that it was causing a nuisance or was prejudicial to health or if the property had become statutorily unfit. It was thus more economically feasible both from a national and an individual point of view for repair work to be carried out before deterioration in the property had progressed to such a stage as to come within the categories under which a local authority could act.

55. In 1967 a sub-committee, under the chairmanship of J.B.Cullingworth, of the Scottish Housing Advisory Committee reported on Scotland's unfit houses. (SHAC 1967 53) The report laid part of the blame for the lack of maintenance of Scotland's housing stock on the hesitancy of local authorities to invoke the powers available. Most of the blame however was placed on the inadequacy of the legislation. The Committee thus recommended that the fragmentary legislation be brought together into one enactment and that the local authorities powers to enforce repair be strengthened. The whole question of determining what is a "reasonable expense" in deciding whether work should be done was found to be bedevilled by the existing rent structure and that under the present rent

structure it was quite impossible to operate on a principle of "reasonable expense". (A) It was felt that further investigation was required to find a workable formula given a basis of fair rents.

56. In the spring of 1967 the Ministry of Housing and Local Government organised a house condition survey of the permanent housing stock in England and Wales. The survey covered 6,000 dwellings and was carried out by skilled public health inspectors. In 1967 the annual investment in new house building was over £1,000 million and the annual output of contractors concerned with the repair, maintenance and improvement of housing amounted to about £300 million. Despite this outlay a substantial backlog of repairs and maintenance existed. The survey showed that about two-thirds of the housing stock, 10.1 million dwellings, were in a reasonable state of repair requiring an expenditure of under £125 to remedy any defects. There were, however, some 2.5 million dwellings which required up to £249 for repairs, over 1.3 million required £250-£499, almost 1.0 million £500-£999 and over 0.7 million required at least £1,000 to be spent on repairs. The statistical aggregates for the costs of repairs were £3,350 million.

(A) The term "reasonable expense" is used in housing legislation and must be calculated before a local authority determines whether an unfit house should be rendered fit or closed. Section 39(1) of the Housing Act 1957 requires that in determining "reasonable expense" regard should be had to the estimated cost of the works necessary to render the house fit and the value the house will have on completion of the work.

57. The survey also showed that local authority housing was in a much better state of repair than either owner-occupied housing or other tenures: 83% required less than £125 for repairs and most of the remainder needed less than £250. The condition of owner-occupied housing was substantially better than that of rented housing. Of the owner-occupied sector 70% needed less than £125, 15% under £250 and the remaining 15% £250 or more whereas of the rented sector only 30% required under £125 and almost 50% required £250 or more to be spent to bring them up to a satisfactory standard. (1967 42)

58. In 1961 a World Health Organisation Expert Committee on the Public Health Aspects of Housing established the "fundamentals of a healthful residential environment". One of the facets of this environment was that the structure should be safe, structurally sound and adequately maintained. (WHO 1961 116) In 1967 a further expert committee considered that housing could be improved by continuous maintenance inspection and control. This was to involve the periodic official inspection of housing to encourage owners, managers and occupants to maintain as high standards of repair as may be practicable. (WHO 1967 117)

59. Utilising the United Nations studies of industrial countries, which had shown that roughly a third of their expenditure on housing work was normally devoted to repair and maintenance, (UNECE 1963 112) Donnison pointed out that if a house typically lasts one hundred years and the new ones built each year amount to 2% of the existing stock, expenditure on repair and maintenance will average approximately 1% of capital costs each year. In the United Kingdom which has a

relatively slow rate of new building and a relatively elderly housing stock a larger than average share of building resources should be devoted to repair and maintenance. (Donnison 1967 28)

60. Donnison also pointed out that the advance in the rate of growth in productivity had been far greater in new work than in maintenance and repair work. At this time 70% of the building firms employed fewer than 6 workers and it was these small firms who appeared to be just about holding their own who were involved in the maintenance of the housing stock.

61. In March 1967 the report on the Housing Survey carried out in 1964 by the social survey section under the direction of the Ministry of Housing and Local Government was published. (Woolf 1967 115) Of particular relevance to this study of the maintenance in the public and private sector was the details revealed by the survey concerning the date of construction and form of tenure of the housing stock. The results are shown below:-

TABLE N1

Date of Construction and form of tenure for England and Wales

Year Built	O/O	L/A rented	Privately Rented Unfurnished		Furnished	Other types	Total
			Cont-rolled	Not Cont-rolled			
	%	%	%	%	%	%	%
Before 1919	40	7	77	74	75	52	39
1919-1944	35	29	19	15	20	14	29
1945-1960	14	52	3	6	3	20	22
After 1960	10	12	-	3	2	10	9
No Information	1	-	1	2	-	4	1
Sample size estimated number (000's)	6,887	3,777	1,755	1,551	466	422	14,828

62. In order to determine the relative proportions of the total

value of materials used in new work and in maintenance work Cullen utilised 1962 figures from which he deduced that the value of materials in new work was about £1,150 million and in maintenance about £245 million a proportion of roughly 5:1.(Cullen 1967 14) Cullen produced tables of which abridged versions appear below:-

TABLE 01

Components of initial and maintenance costs per cent

Element	Houses and bungalows, high and low flats	
	Initial Cost	Maintenance Cost
Structure	37	15
Partitions	28	14
Decorations	14	36
Fittings	-	-
Services	14	30
Other	7	5
Total	100	100

Source: Building Research Station surveys

TABLE P1

Relationship between initial and maintenance usage of materials

Element	Houses and bungalows, high and low flats		
	Initial Cost	Scaled down maintenance cost	Maintenance Cost as % of initial cost
Structure	37	3	8
Partitions	28	3	11
Decorations	14	7	50
Fittings	-	-	-
Services	14	6	43
Other	7	1	14
Total	100	20	

63. In 1968 the Chief Public Health Inspector of Lancaster reported on the condition of 181 houses within the city in an area built between 80 to 100 years before. Details of 176 of the properties were produced and these included the cost of repairs, improvements and whether or not improvement grants had previously been paid.

(Shaw 1968 102) It was estimated that the total cost of putting the properties into a satisfactory state of repair was £41,310. The total cost to repair the properties which had not been the subject of an improvement grant was £29,808. The remaining 56 properties which had at some time been the subject of a grant still required £11,502. On average properties which had been the subject of a grant required 18% less expenditure on repairs than those which had not. Those with previous improvements requiring on average £205 and those which had not been improved with the aid of a grant £249. The table below relates repair costs with the date when an improvement grant was paid.

TABLE Q1

Repair costs related to improvement grants

Year	1955	1956	1957	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968
Repair Cost	300	213	369	169	96	875	181	197	780	90	203	210	269
				285		166	167	200	121	293	115	71	71
						213	142	159	262	105	123	10	79
							139	67	195		171	197	432
							141	105	94		236	485	232
							289		38		557	55	52
							134		89		258		
							84		75				
							336		214				
									182				
									111				
Total	300	213	369	454	96	1254	1613	728	2161	488	1663	1028	1135
Average	300	213	369	227	96	418	157	146	196	163	238	171	189
Annual Repair Cost				22	11	52	22	24	39	41	79	85	189

The figures for 1968 in the above table can be discounted for the high repair costs are probably due to grants having been approved and the work not carried out at the time of the survey. With the exclusion of 1968 the average annual maintenance requirement was £42. This

assumption is based on the fact that when an improvement grant is paid the property must be in a good state of repair and thus the repair costs given in Table Q1 must have arisen since the grant was paid.

64. Clapp and Cullen studied the data on maintenance and running costs from 104 schools for a period of 10 years. Their analysis (1968 9) showed that redecorating costs accounted for about half of all maintenance expenditure. Half the remaining costs were repairs to water heating apparatus, roofs, floors, electrical installations and doors.

65. In a paper published by the Fair Rent Association on the reconditioning of older houses S. Rosenberg calculated that property owners had required about £400-£500 over the 22 years from 1946 to 1968 to maintain each dwelling in a good state of repair. This figure was deduced by assuming that the annual average maintenance cost per dwelling from 1946 to 1956 was £15, from 1957 to 1966 £25 and 1967 to 1968 £30. He arrived at an acceptable figure for annual general maintenance for older privately owned property as being in the region of £30-£35 a year. This figure was not to include major repairs such as rewiring, reroofing, timber preservation or damp proofing. The figure was arrived at by comparison with local authority and housing corporation maintenance allowances. The former allowing a figure of £25-£30 for a pre-war house and the latter allowing between £21 and £26 for a newly built dwelling. (Rosenberg 1968 98) The solution proposed was to provide a repair grant to landlords of up to £500 and a rent increase of £30 to cover the cost of annual maintenance.

66. The National Board for Prices and Incomes reported in 1968 on the increases in rents of local authority housing. (1968 81) In their report the Board noted that there had been an increase in the cost of repairs but were unable to explain the wide variation in the annual expenditure per dwelling charged to the Repairs Account. In 1966/67 the figure ranged from £38 in Harrow to £10 in Kirkcaldy. By 1970/71 the variation had increased from £58 in Lambeth to £6 in Appleby.

67. The White Paper in 1968 shifted the emphasis of the housing effort from new building to the renovation of the existing stock. The paper commented:-

> "The government intend that within a total of public investment in housing at about the level it has now reached, a greater share should go to the improvement of older houses". (1968 50)

The government also proposed to allow local authorities to secure the repair of houses before they became unfit and increased improvement grants from £400 to £1,000. In certain circumstances one half of the improvement grant could be for meeting half the cost of repairs or replacements in a property.

68. The standing committee on building maintenance appointed in August 1965 sponsored a conference on the technology of building maintenance at Bath University of Technology in 1968. At the conference Gibson, of the Forest Products Research Laboratory, estimated that the total annual bill to the country of making good and eradicating troubles due to insect and fungal attacks was probably between £25 and £30 million a year. (1968 22) He further

pointed out that the average cost of treatments per house in the privately owned sector is about three times the figure obtained for local authority operations. He suggested that three treatments might be required during the life of a property and thus the capital required at the time of building to provide for this maintenance, assuming a 5% interest rate, was about £35.5.

69. Dr. Stephenson, an assistant scientific advisor with the G.L.C. pointed out at the Bath conference that in the year 1966/67 the total maintenance cost for the G.L.C's 220,000 dwellings was £8½ million or about £38 a dwelling per annum. Of the total maintenance cost £2½ million was devoted to internal decoration, a figure inflated in part by spoilage of decoration by condensation and the consequent mould growth. External decorating amounted to £1.1 million, structural repairs £0.6 million, structural fixings £0.8 million and water and sanitary services £0.9 million per annum.

70. The Housing Act 1969 implemented the policy of the area improvement of houses and their environment. In Circular 65/69 the economic aspects of area improvement were outlined and a table produced relating the maximum cost of improvement per dwelling as a proportion of the cost of a new building. This table took no account of maintenance costs on which the Circular commented:-

> "Maintenance costs ..... are likely to be higher for improved dwellings than for new". (MHLG 1969 45)

It was stated that the difference in maintenance costs could be allowed for by estimating the annual average difference in cost over the useful life of the dwelling, and multiplying by the present value factor corresponding to the useful life. Whilst no figures were

given for this difference the inference was that the maintenance cost of an improved dwelling was likely to be £10 a year more than a new dwelling. The present value of the extra maintenance was required to be deducted before the total amount worth spending on the improvement of the dwelling could be calculated.

71. It has been the policy in this country to recognise maintenance activity when a property is included for slum clearance either individually or with others. The Housing Act 1969 fixed the payment for good maintenance at an amount equal to four times the rateable value. (A) The act also introduced the concept of allowing up to twice the rateable value if the property had been partly well maintained. This was particularly aimed at tenanted property where the tenant had actively maintained the interior but the landlord had failed to maintain the external structure. (MHLG 1969 46)

72. As discussed in paragraph 67 the 1968 White Paper proposed an increase of the improvement grant to £1,000 and the Housing Act 1969 implemented this proposal. Repairs and replacements needed for the purpose of making fully effective other improvement carried out at the same time became eligible for grant providing their cost did not exceed 50% of the whole amount approved. In a joint circular it was stated that ministers did not consider that it was practicable to list those repairs and replacements which might qualify for grant

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(A) Due to the revaluation of property and inflation the multiplier was increased to 8 in 1972 and changed to 3.$\frac{1}{8}$ths by the Housing(Payments for well maintained houses) Order 1973.

and this led to a considerable variation in the work that was eligible for grant up and down the country. Whilst some local authorities strictly limited the repairs which were eligible for grant others accepted that all repairs should be grant aidable. The latter policy considerably assisted in the attack on the national deficiency of maintenance. In a sample of 100 houses selected at random from those receiving grants within the Wycombe Rural District Council's area from October 1971 to May 1972 the total cost of the eligible repairs amounted to £60,649 or £606.49 per house which indicates the backlog in the maintenance of the housing stock. The question of distinguishing between repair and improvement has been dealt with elsewhere. (A) The Ministry of Housing and Local Government through a circular (MHLG 1969 47) commenting on the repairs that could be grant aidable stated:-

> "When a house is being rehabilitated works may become necessary which would not arise unless the property were deliberately having its life extended for a further measurable span of years. Structural repairs might be needed because parts of the building had worn out..... ..... examples are the replacement of damp-proof courses, and roof repairs. Rainwater pipes and gutters might need renewing. Worn out installations, like electrical wiring

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(A) (a) Improvement, Or Is It? N.C.Skedge. University of Aston and the Association of Public Health Inspectors. November 1971.

(b) Memorandum on certain aspects of house improvement grants. APHI. September 1972.

which had become inadequate and unsafe, might need to be replaced. Defects due to ground movement and settlement might need rectifying. Sanitary fittings which had worn out or had become obsolescent might need to be renewed".

Thus the way was open for local authorities to heavily subsidise the repair of the housing stock.

73. It has been suggested that any question of limiting the economic life of a structure must depend on matters of land value, land usage, rating and taxation. It being felt that materials and construction were likely to play only a minor role. (Blakey 1969 6) In arriving at this conclusion Blakey had utilised a concept of "cost-in-use" previously discussed in paragraph 35.

74. The problems of the rehabilitation of the housing stock became a political issue when at a constituency meeting the then Opposition Front Bench spokesman on housing and local government Peter Walker stated:-

"It is my intention to ..... find ways of creating an effective rehabilitation industry ..... for houses built before the first world war". (1969 21)

75. The interim report of the standing committee on building maintenance appointed in August 1965 was published in 1969. The committee estimated that building maintenance accounted for an expenditure of some £1,550 million, of which £360 million was incurred by industry and commerce using their own labour and by householders providing their own labour free. The remaining £1,190 million being distributed between contractors (£750 million) and public authorities (£440 million) and accounted for a quarter of all expenditure on

construction and two-fifths of the construction labour force. (MPBW 1969 40) See Figures 3, 4 and 5 reproduced from the interim report.

76. The committee found that they could not entirely adopt as a working rule the British Standard definition of maintenance which was given as "work undertaken in order to keep or restore every facility, i.e. every part of a site, building and contents, to an acceptable standard". (BS 3811 1964) Definitions of maintenance in legislation have always tended to be inclusive as, for example, that found in the Public Health Act 1936:-

> "'Maintenance' in relation to any length of public sewer ..... includes repair, renewal and improvement..... .....". (1936 93)

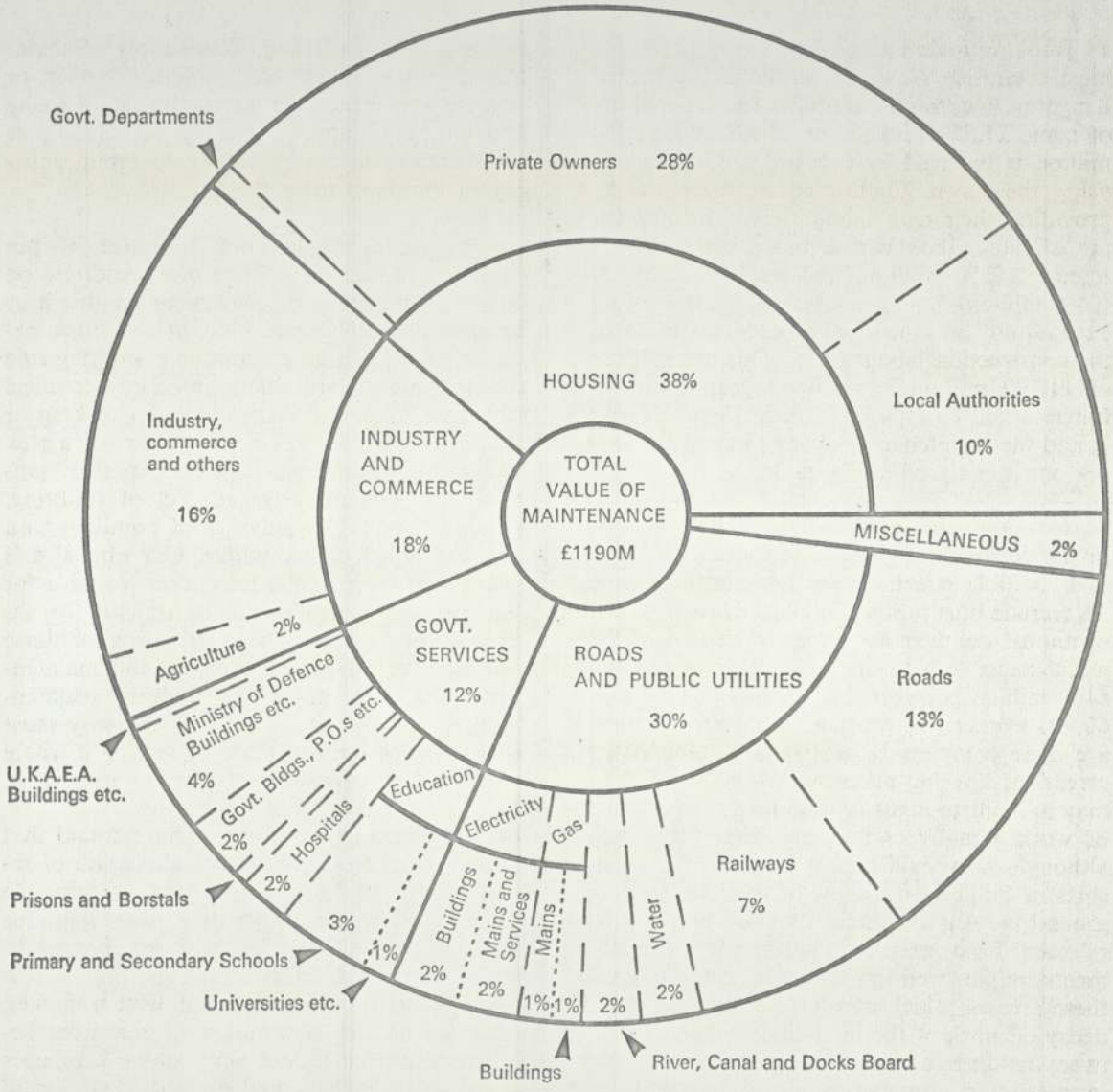
or that found in the Housing Repairs and Rents Act 1954 section 49 which stated:-

> "'Repair' includes maintenance, but does not include improvement or structural alteration or the provision of additional or improved fixtures or fittings".

In other legislation no definition has been given as for example in the Housing Act 1969 where in section 36(2) the phrase "ordinary repair" was used.

77. Due to the possibility of neglecting maintenance the committee found that there was a preference for other forms of expenditure. It was indeed stated that maintenance enjoyed a somewhat hostile environment. Being an interim report the principal recommendations related to further research or examination of aspects of the building maintenance industry.

Fig. 3 ESTIMATED PERCENTAGE EXPENDITURE ON CONSTRUCTION MAINTENANCE IN 1967
(*Analysis by function*)



Note: All figures taken to the nearest whole percent.

(*The basis of the collection of figures is such that they include Minor New Works*)

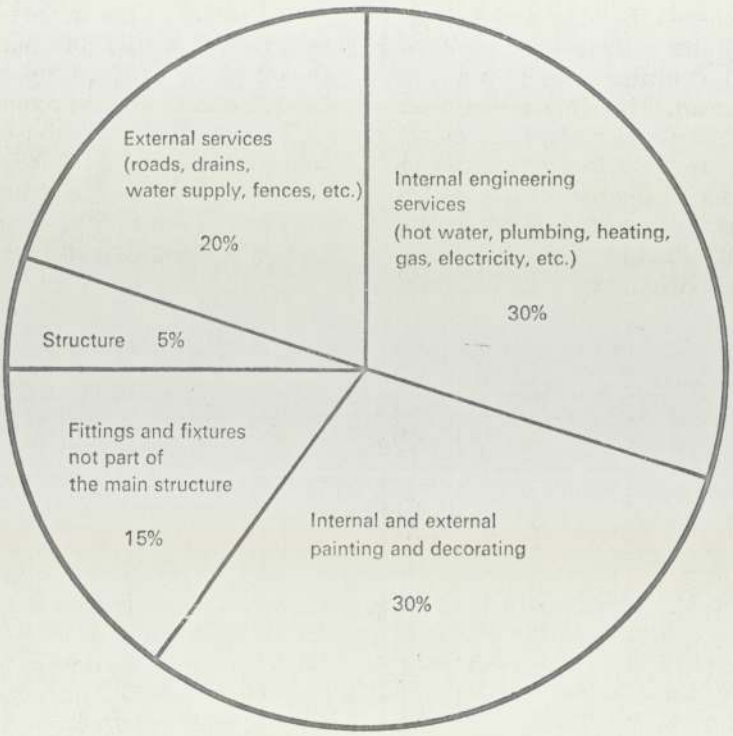


Fig. 4 FINANCIAL BREAKDOWN OF MAINTENANCE EXPENDITURE BY TYPE OF WORK
(Total expenditure £1,190m.)

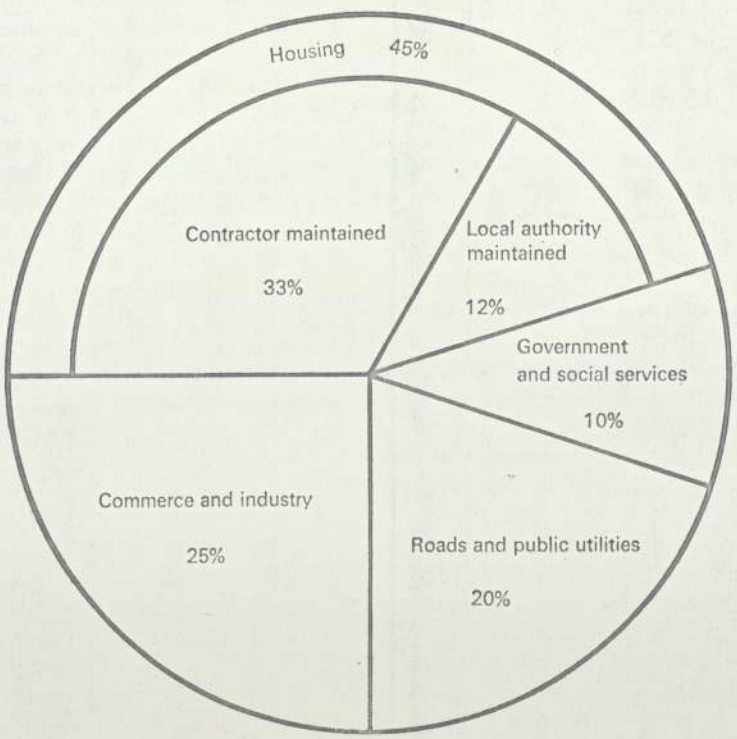


Fig. 5 DISTRIBUTION OF THE LABOUR EMPLOYED ON MAINTENANCE
(Total labour 585,000.)

78. Also in 1969 a working group of the committee on building maintenance completed its study. (MPBW 1969 74) The group had the following terms of reference:-

> "To consider whether there is evidence that tax considerations affect decisions on the balance of capital expenditure and subsequent maintenance expenditure on buildings, and if so, to examine the practical effects".

Although domestic property accounted for about 55% of building maintenance expenditure the group decided to exclude the taxation of residential property. Such a decision was regrettable.

79. The Labour Party's Housing Policy Study Group reported in 1969 on their housing policy for the 1970's. (1969 62) The report noted that the output per man was lower in the repair and maintenance field than in any other sector of construction. It was stated that in 1968 the total output on repair and maintenance had been £194 million. Since the number of men employed to produce this output was 285,000 the value of output per man per year was £2,800 which compared unfavourably with the output per man per year in the house building sector which was £4,031 for those employed on local authority housing and £4,601 for those in the private sector. The main conclusion reached was, however, that further intensive research was needed in this sector of the construction industry.

80. Another aspect of the maintenance industry is that of historic buildings. The Historic Buildings Council finance, repair and restoration programmes to a total of about £500,000 per year. There is, however, no upper limit set by the government on how much money, in the form of grants and loans, can be allocated for this

purpose. An enquiry in 1969 suggested, however, that considerable resistance to applications for such grants was encountered. (Powney 1969 91) In the year 1968/69 £200,000 was paid out on the repair of historic buildings and this was a record year. When averaged over the number of listed buildings throughout the country it was shown that in this record year the average grant per listed building was 84p. Again it was calculated that if a realistic grant of £100 per listed building was paid then the total expenditure for 1968/69 would have been £25 million.

81. As part of the attempt by the committee on building maintenance to further the knowledge in the maintenance field a second national building maintenance conference was held in London in November 1969. (MPBW 1969 75)

82. The Fair Rent Association in their submission to the committee on the Rent Act repeated their assertion that low rents had led to an alarming lack of maintenance in controlled property and to early structural decay and lack of improvement. (1970 32) It was argued that in the five years 1965/1970 the value of the pound had declined by 25% and building costs had risen by 22% but controlled rents had remained static with the median rent in England and Wales being £0.84p per week.

83. In his study of population trends and housing in the urban development of Britain, Stone pointed out that any improvement in the standard of Britain's very aged stock of dwellings would require a very large allocation of national resources to the built environment. He noted that about an eighth of the gross national product of Great Britain was currently used for the maintenance,

renewal and extension of the built environment. (Stone 1970 111)
The lack of research into the maintenance expenditure in the private sector led Stone to utilise the level of expenditures on maintenance returned by local housing authorities. Thus from the figures given by Clapp (1963 8) Stone devised a formula for relating the expenditure on repairs with the age of the dwelling:

$$Y = £3.8 + x \cdot £0.305$$

Where Y is the annual expenditure per dwelling of age x and X is the age in years.

This original formula was based on 1959 price levels and the formula was corrected to 1964 prices:

$$Y = £5.0 + x \cdot £0.4$$

Because the formula was based on local authority owned property there is no evidence that the relationship suggested is effective for property over 40 years old. Stone states that it is reasonable to assume that the relationship does so apply. Utilising this revised formula and amending the 1964 based formula to reflect 1970 prices the following table was produced. (Skedge 1973 106)

TABLE R1

Annual Repair Costs against Age

x yrs.	y = £5.0 + x . £0.4	y' = £5.0 + x . £0.45	
5	7	7.25	
10	9	9.5	
15	11	11.75	
20	13	14.	
25	15	16.25	
30	17	18.5	
35	19	20.75	
40	21	23.	
45	23	25.25	
50	25	27.5	
56	27.4	30.2	Average age of house in England and Wales at 31.3.64.
60	29	32	
70	33	36.5	
80	37	41	
90	41	45.5	
100	45	50	
110	49	54.5	
120	53	59	
130	57	63.5	
140	61	68	
150	65	72.5	

Thus if a house survives for 150 years some £6,645 would have been spent on its maintenance. The present value of such an expenditure is just over £100 if invested at 10% compound interest. (A)

84. Stone had earlier shown that the maintenance costs for low blocks of flats, i.e. of two to four storeys, were 13% higher than for housing and the corresponding figure for high blocks was 39%. (Stone 1963 110) Since a large proportion of maintenance costs are for the repairing and renewing of services and other fittings, the quantity of which is not greatly affected by the size of the dwelling,

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(A) For derivation of this expenditure see Table A in the appendix.

Stone suggests that maintenance costs are not proportionate to the size of the dwelling. Utilising the annual costs of maintaining an average local authority dwelling as at March 1964 it was shown that maintenance costs increased by a factor of about $2\frac{1}{2}$ over the life of the building as shown below.

TABLE S1

Annual Costs of maintaining an average local authority dwelling.

Age of Dwelling Years	Total Cost of Maintenance £
0	20
25	30
50	40
75	50

Source: NIESR Estimates (Stone 1970 111) Figures for England and Wales excluding London.

85. The question of a Repairs Fund is clearly of value particularly for tenanted property and for owner occupiers in the initial stages of repaying a mortgage when commitments are such that any large maintenance expenditures can be a financial embarrassment. The Burgh of Greenock took the question of a Repairs Fund a stage further when in 1963/64 it set up an improvement fund into which £3 per annum from the rent of each council house was allocated. By 1970 six pre-war housing schemes had been improved. (Bathgate 1970 4)

86. The Committee on Building Maintenance was during this period investigating various facets of the maintenance industry one of which was the "image" of maintenance with the general public. A survey was thus carried out of house owners and the maintenance facilities open to them. The main conclusion was that there was a high level of satisfaction with the building maintenance work

that was done in people's homes and business premises. Dissatisfaction was found with only 6 per cent of the households where work was carried out during the 12 months prior to the report. (1971 27) It was also found that there was a close correspondence between the opinions expressed by the houseowner and the surveyor's report which belied any suggestion that houseowners are not reasonably good judges of the standard of work done for them.

87. The change of ownership of a property can often be a time for massive repair activity. The majority of potential homeowners must look to building societies for a mortgage and since the societies are anxious to ensure that the property will not depreciate in value they will insist that before the issue of the mortgage the property must be surveyed and certain requirements will be made with regard to repair work. In 1970 a survey was carried out to ascertain whether or not building societies were requiring house buyers to carry out unnecessary repairs. (Poole 1970 89) As the survey relied on the public to write in their views the conclusions were vague. It did, however, show that a great deal of repair and maintenance work was carried out due to the requirements of building societies much of which could otherwise have been neglected.

88. The Law Commission ruled in 1970 that architects and builders should be liable for any defect found in a property within six years of the completion of the work. (1970 63) This was in direct contrast with the existing legal doctrine of caveat emptor for it was felt that a purchaser should not have to examine a new property to ensure that it was in a sound condition. This ruling was embodied in the Defective Premises Act 1972 which received the

Royal Assent on 29th June,1972. (See paragraph 128).

89. In 1970 a further report by the Chief Public Health Inspector of Lancaster was made on an area of the city containing 419 houses. 78 of the houses (18.6%) were built before 1864, 238 (56.7%) were built between 1865 and 1890, 92 (21.9%) were built between 1890 and 1919, and 11 (2.7%) were built in the inter-war period. It was estimated that the total cost of putting the properties into a satisfactory state of repair was £57,099. Since 336 properties were included in the survey this put the average cost of repair at £170. The survey did not, however, confirm the previous relationship between repair costs and improvement grants shown by the 1968 survey. (See paragraph 63) In this area the total cost to repair houses which had not been the subject of an improvement grant was £41,106 an average of £166 whereas the total cost to repair the houses which had been the subject of an improvement grant was £15,993 an average of £179. Of the latter, 19 properties had been the subject of discretionary grants and these required £3,232 to bring them up to a satisfactory state of repair, an average of £170. The table T1, as with Table Q1,relates repair costs with the date when an improvement grant was paid.

TABLE T1

Repair Costs related to Improvement Grants

Year	1955	1956	1957	1959	1960	1961	1962	1963	1964	1965	1966	1967
	293	160	96	155	121	244	205	519	229	225	70	82
	305			206	248	100	26	288	120	130	169	23
					213	138	3	383	308	279	110	72
					115	80	82	21	201	337	54	328
					67	319	284	73	435	327	130	36
					138	229		497	360			210
					9	289			354			287
						191						
Total	598	160	96	361	911	1590	600	1781	2007	1298	533	1038
Average	299	160	96	180	130	199	120	297	287	259	103	148
Annual Repair Cost					12	19	13	37	41	43	21	37

Year	1968	1969	1970
	56	131	331
	310	231	103
	242	57	287
	198	70	162
	218	105	86
	121	150	341
	143	219	171
	19	160	118
	112	34	
		38	
		7	
		175	
		169	
		100	
		73	
		283	
Total	1419	2002	1599
Average	158	125	199
Annual Repair Cost	53	62	

Again discounting the high repair costs for 1970 as these are probably due to grants having been approved and the work not carried out at the time of the survey it is found that the average annual maintenance requirement was £34 as compared with the £42 found with the 1968

survey. (Shaw 1970 103)

90. A further report of a working group of the committee on building maintenance reported in 1970 on the question of building maintenance statistics. (MPBW 1970 73) Their conclusions made reference to the problems of defining maintenance and to the lack of information which was available on which they commented:-

> "No reliable picture can be formed until the collection of statistical data pays more explicit attention to building maintenance".

The recommendations of the working group were mainly aimed at securing more detailed knowledge of the nation's maintenance activities.

91. Also in 1970 a further working group of the committee on building maintenance studied and reported on the relationship between design and maintenance. (MPBW 1970 76) Due to the width of the subject under review the group limited their study to defining the needs for research and development in the field. It was felt that in order to make a design decision it was essential to know the total cost and not just the initial cost. It was concluded that the figures available were subject to so many limitations that a great deal of experience was required to make reliable deductions from them.

92. In a paper on the Co-operative Ownership of Council Houses the Co-operative Party stated that since repairs and maintenance accounted for no more than 16% of the total expenditure debited to a housing revenue account it was not very significant. (1970 12) Referring to a report, of a committee set up in January 1948 in Oslo, dated 5th May, 1950 it was shown that for each property the total calculated maintenance cost had been derived from which had been

subtracted the actual expenditure over the same period to determine the "lack of maintenance sum". This was found to be approximately 11.6% of the calculated maintenance cost.

93. During the improvement of an area of older terraced houses, approximately 127 years old, it was found that the average cost to repair some 200 houses was £350. (Combey 1970 11) A similar situation was found in the Kensington Fields General Improvement area at Liverpool. Here an area of dwellings built between 1875 and 1900 were surveyed in detail and it was found that of the 343 houses inspected the average cost of repairs was estimated to be £350. In the report of the area it was pointed out that this figure was likely to be higher than the average for the 1,377 houses contained within the whole area. (Amos 1970 2) The detailed breakdown of the repair costs within this area was as follows:-

TABLE U1

Repair to dwellings in Kensington Fields, Liverpool

Type of Repair	No.of Dwellings	Average Cost per Unit £	Total Cost £
Major repairs to small dwellings	69	350	24,150
Major repairs to large dwellings	147	400	58,800
Minor repairs to small dwellings	21	100	2,100
Minor repairs to large dwellings	872	100	87,200
Repairs to drains	132	50	6,600

94. Thus at the advent of the 70's with Britain's population standing at some 55 million and housed in 18.8 million dwellings the public expenditure on housing totalled about £1,100 million which represented 3% of the gross national product. (1970 48) With running costs and maintenance expenditures being realised as major outlays of capital it was important that the maintenance work that

was carried out should be well planned and controlled. Although the private landlord was facing the most difficult maintenance backlog it was to the local authority owned property that the operational research was turned. In 1970 the Local Government Operational Research Unit reported on a study of the maintenance work carried out by the maintenance department of the Borough of Slough. (1970 65) After studying the flow of work and the distribution of jobs throughout the year the unit developed a rolling work programme for such maintenance departments. Such programmes would not assist the majority of private landlords who owned only one house each and who at this time were owning a declining sector of the nation's housing, three-quarters of which were 50 years old or more.

95. From the evidence of a Building Research Station survey and the earlier work of Doctor Stone it was now obvious that one could no longer consider building costs purely on the basis of the initial construction cost but this had to be modified by the estimated running costs and maintenance requirements. The magnitude of the running costs were such as to represent, in the case of houses, 78% of the initial construction cost. With labour costs rising it was in the field of maintenance that owner-occupiers began to undertake more work themselves. It was estimated that four out of five families were carrying out most of their own decorating at this time.

96. By 1971 the National Federation of Housing Societies was suggesting that although in general the voluntary housing movement was allowing approximately £30 per unit per year for maintenance this was to be considered too low in many areas. (Hall 1971 77) Frank Allaun whilst applying for leave to introduce the Finance

of Council House Building Bill suggested that a typical charge for repairs and management for local authority property was 50p. a week. (1971 1)

97. From 1961 to 1970 the value of work carried out by the directly employed labour of local authorities in Great Britain on maintenance of houses had risen by 38% taken at constant 1963 prices. The following table shows this rise:-

TABLE V1

Value of work done in the first and third quarters of each year by the directly employed labour of local authorities in Great Britain

Year	New Work	Repairs and Maintenance	Total Housing Work
1961	15.3	26.1	41.4
1962	15.3	27.4	42.7
1963	15.2	28.7	43.9
1964	18.7	28.6	47.3
1965	20.6	28.0	48.6
1966	20.6	29.7	50.3
1967	24.3	32.6	56.9
1968	21.5	34.3	55.8
1969	19.9	33.8	53.7
1970	17.1	35.9	53.0

Note: Table in £m. At constant 1963 prices for six months each year. (1971 80)

98. Britain having spent £1,720 million on building maintenance in 1970 the government gave a grant of £25,000 to set up the Building Maintenance Cost Information Service which was based at Bath University. The service was designed to supply and exchange information on the technical, organisational and design aspects of properties. It was aimed to recruit 500 members. The service was the result of a recommendation of the committee on building maintenance.

99. Detailed assessments of the costs of house management and repair by the London Housing Associations' Committee showed that at

least £80 a year was required. The Greater London Council was at this time allowing the Associations to include only £50 a year in rents to cover management and maintenance. (Kemp 1971 60) If one allows £15 a year for management this indicates an annual maintenance expenditure per house of £65.

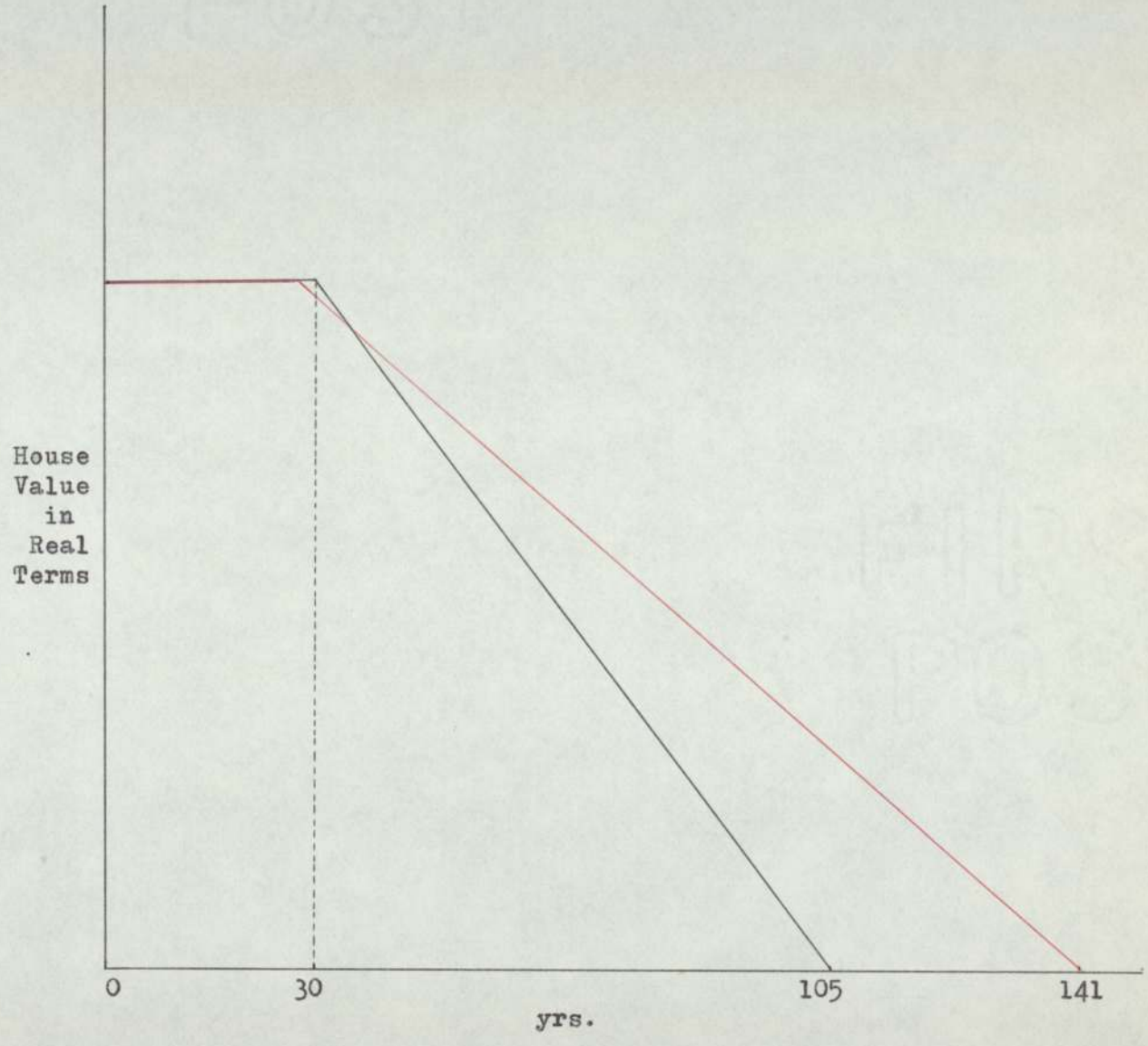
100. Despite this growing awareness of the maintenance aspects of the construction industry, the report on the construction industry's prospects by a joint working party published by The National Economic Development Office made little comment on this aspect. (NEDO 1971 82) It was felt that the rehabilitation and improvement market would show a marked increase in expenditure and whilst the estimated value of rehabilitation in 1969 was £47 million at 1963 prices it was predicted that by 1974 this expenditure could well be between £150 and £200 million at 1963 prices.

101. Reflecting the ageing nature of Britain's housing stock Hole and Pountney in their study of housing from 1861 to 1961 noted that there had been a marked growth in expenditure on maintenance, repairs and improvement to dwellings in the 1950's and 1960's. (1971 58)

102. The question of the depreciation of houses is vexed. Anstey suggested that the value of a house in real terms should not depreciate for its first thirty years although other work has suggested this may be nearer twenty-six years. After that Anstey proposed a uniform straight-line depreciation rate of 1⅓% per year to bring the real value of the house to zero at the age of 105 years. Such a depreciation rate would seem high for the average life of a house in the United Kingdom has been estimated to be 141 years and not 105 years. (See Fig. 6) Clark and Jones discussing this

Fig. 6.

Depreciation of Property



depreciation of a house suggested that the critical factor of physical deterioration was generally the woodwork. (CES 1971 10) From this depreciation rate it was suggested that when the value of the site became greater than the value of the house on it the property should be demolished.

103. From their analysis of data from the Family Expenditure Survey, Clark and Jones concluded that the young appear to spend relatively more on repairs and suggested that this was probably due in the main to more rigid repair clauses in new leases. They also found that there appeared to be a tendency for smaller families to prefer a higher regular expenditure on housing as income rose associated with a lower repair expenditure.

104. One of the principle difficulties with maintenance is that it can be delayed and in some cases indefinitely postponed. Such short term gains lead inevitably to massive capital injection in order to retrieve a declining situation. Whilst an owner-occupier will often utilise such postponement in order to meet other expenditures and be willing to retrieve the situation in order to protect his asset, a landlord having postponed expenditures on maintenance has in the past found that rent control has forced him to meet the cost of reinstating the property from his own pocket. This either means that the landlord must subsidise his tenant or as Shelter found in their study of "slum housing" that repairs are carried out to only the lowest standards and usually only after weeks or even months of waiting. (1971 104) Thus a landlord must include an allowance for repairs and maintenance in the rent of the property. This, as McKie pointed out, means that the cost of a

house to let includes two components in addition to the apparent cost of owner-occupation namely the cost of repairs and maintenance, which the owner-occupier can ignore initially, and the landlords profit. (McKie 1971 69)

105. Maintenance then is often a matter to which little attention is paid in order to minimise expenditure. Such a policy can lead to further unnecessary expense for as Smolira commented:-

> "Failure to discover the true cause of a defect can lead to unsatisfactory repair work, or to an unnecessary high cost of repairs to cover a variety of possible causes". (1972 107)

To underline the argument that owner-occupiers postpone the heavy expense of property maintenance the relationship between income, age and expenditure should be considered. Nevitt showed the fluctuation between poverty and affluence during the family life cycle as follows:-

TABLE W1

Family Income Life Cycle

Age of Individual	Poverty/Affluence	Years
0 - 10	Poverty	10
10 - 15	Relative Poverty	5
15 - 20	Relative Affluence	5
20 - 22	Affluence	2
22 - 37	Poverty	15
37 - 45	Relative Poverty	8
45 - 65	Relative Affluence	20
65 -	Poverty	? 10

(Nevitt 1971 84)

Thus it is not until later life that the average property owner can afford to deal with those maintenance problems that whilst deteriorating the fabric of the property do not immediately affect the inner living condition standard.

106. At this time the Housing Act 1969 was having a considerable effect on the repair and improvement of the housing stock. In St. Albans, for example, the city council bought six cottages built about 1840 and carried out extensive renovations. The analysis of the costs of works showed that the following expenditures had been made with regard to repairs and renewals:-

Property A	£1,019
Property B	£1,023
Property C	£1,027
Property D	£ 878
Property E	£ 914
Property F	£ 976
Total	£5,837
Average	£ 973 (1971 108)

This expenditure can be regarded as the backlog of repair work over the last 130 years. With the individual and the area improvement of houses becoming a major part of the nations attack on poor housing conditions the Department of the Environment issued Improvement Notes on various aspects of the improvement of the internal and external environment of houses. One such note was particularly concerned with the carrying out of house condition surveys. (DOE 1971 25) Supplement 3 contained details of the type of repairs to be found in a property but it was pointed out that future maintenance was not to be over anticipated whilst carrying out a survey in a potential General Improvement Area. This attitude was taken bearing in mind that with the interest rate then prevailing a 10% capital expenditure was approximately equal to 70% capital expenditure in 20 years time or continuous maintenance of 1% a year. For simplicity it was pointed out that capitalisation of annual maintenance costs can be achieved by adding a zero. (e.g.

£40 per year becomes £400).

107. During the course of this study a survey of 1,000 houses built prior to 1939 and selected at random from a housing stock of just over 9,000 was carried out as also was a door-to-door survey in an area of houses built at the turn of the century. Details of both surveys will be given later, however, the door-to-door survey revealed the degree to which landlords were neglecting maintenance in order to resuscitate their meagre rent income.

108. This relationship between low controlled rents and improper maintenance was accepted by the government in their 1971 White Paper when it was pointed out that tenants were being subsidised by their landlords. It was further accepted that many landlords were poorer than their tenants and that the typical rent outside London was only 85p. a week. Since the nations housing stock was having its deterioration accelerated by this rent controlled policy the government felt that there was an urgent need for a thorough reform of housing finance. (1971 41) The trend towards owner-occupation was found to be a rewarding move since such property was "visibly better maintained and at less cost in real resources than the rented one". The government's proposed alterations to local authority housing finance included the abolition of the Housing Repairs Account.

109. A study of maintenance and energy costs for services in office buildings showed that broad estimates of such costs could be made in terms of floor area with better estimates being given by allowing for the capacity of the installed plant. (Milbank 1971 70) The study showed that £1.11 per square metre of floor area should be allowed

to cover such costs.

110. The maintenance and repair of property is not a problem peculiar to older property for in a survey carried out by Powell in 1971 5,372 defects were analysised in the first two years after the construction of new houses. (Powell 1971 90) The analysis showed that the average vost of remedying such defects was about £30 with the average cost per house being £113. The majority of defects were found to be in finishes. It was felt that the geographical variation of the incidence of defects was due to the interaction of the following factors:-

a) Climate
b) General economic and labour history
c) Sophistication or otherwise of market
d) Size of builders
e) Efficiency of remedying defects
f) Incidence of sub-contracting

Whilst Powell was relating the above factors with defects in newly constructed property their importance in the maintenance of our older stock of houses should not be forgotten. Lack of information does not permit the comparison between these factors, as they prevailed at the time of construction, and the present maintenance problems of the property the nation is now faced with restoring.

111. Powell noted that approximately 2% of purchasers complained of defects and of the defects complained of 78.4% cost under £15 to remedy, 19% cost between £15 and £100 and 1.9% cost over £100. Of the defects reported the following table indicates their degree of occurrence:-

TABLE XI

Occurrence of defects in new property

Structural Component	Percentage of all defects
Roof covering and rain-water disposal	9.6
Ground work and concrete	7.8
Brickwork and blockwork	11.3
Carpentry (first fixings)	3.5
Joinery	29.1
Plumbing	7.9
Engineering Services	5.7
Plastering	11.4
Floor finishing	3.3
Painting and decoration	9.2

It was also noted that social groups A and B complained more often than groups C, D and E. Such lack of response from the lower social groups is also to be found with older property where serious structural housing conditions are only isolated during the course of a survey and not because of tenant complaint.

112. In 1972 the Building Research Establishment began a two year study on an experimental house at Grenville Green, Aylesbury into the wind loading on low-rise building roofs. This research was aimed at achieving a proper balance between the initial building costs and the cost of repairing wind damage. It had been estimated that wind damage to housing was costing the nation £7 million annually. (1972 79)

113. During the passage of the Housing Finance Act and the Housing (Financial Provisions)(Scotland) Act the question of low rents and the landlords duty to maintain his property gained prominence. It was pointed out that landlords of controlled properties had been allowed one rent increase since 1939 and this an average of 30p in 1957. The present average controlled rent of 73p outside London was felt to be insufficient to cover even basic maintenance. (Gold 1972 35)

The question of fair rents provoked angry exchanges in the House of Commons when it was revealed that fair rent levels were expected to rise by about 5% a year on average. (1972 20)

114. A similar situation existed in Scotland where the average controlled tenancy was about 30p a week and controlled houses were as Mr. Gordon Campbell, Secretary of State for Scotland, stated:-

> "..... for the most part being poorly maintained or not maintained at all. If these houses are to be saved from complete dilapidation more money must be made available". (1972 18)

115. Another area of concern during the passage of the Housing Finance Act was the question of service charges. It was recorded that in one case the maintenance charge of £106 had been raised to £250. (1972 19) This led to the Bill being amended in the House of Lords to give tenants the right to ask landlords for audited accounts supporting any variable service charges of more than £80 per year. (A)

116. A Canadian report discussing the defects in ten year old houses identified spalling concrete drives and the failure of mechanical parts as, for example, water tanks, taps and window fittings as common problems. (Veall 1970 114) The importance of the durability of concrete was underlined by the estimation that £4.5 million was spent annually in the United Kingdom on rectifying appearance

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(A) Service charge is defined by section 90 of the Housing Finance Act 1972 as meaning "any charge for services, repairs, maintenance or insurance, being a charge which is payable as part of, or in addition to, the rent, and which varies or may vary according to any costs (including charges for overheads) incurred from time to time by or on behalf of the landlord or any superior landlord.

failures in concrete. Research into the repair and matching of concrete is being carried out at the John Laing Research and Development Laboratories for the Building Research Station. (1972 94)

117. The results of the 1971 house condition survey were published in 1972 and revealed that 40.3% of the housing stock of England and Wales required an expenditure of over £100 to bring the stock up to a satisfactory repair standard. (DOE 1972 26) The following table relates dwellings with repair costs:-

TABLE Y1

Repair Costs and the Housing Stock

Repair Costs (A)	No. of Dwellings 1,000's	Percentage
Under £100	10,212	59.7
£100 - £249	4,141	24.2
£250 - £499	951	5.6
£500 - £999	1,080	6.3
£1,000 - £1,499	396	2.3
£1,500 - £1,999	149	0.9
£2,000 and over	171	1.0

118. The results of the house condition survey bore an inverse relationship to the study of defects by Powell previously discussed in paragraph 110. Whilst Powell found that defects occurred more frequently in the west than the east and in the south than the north the condition survey showed that the south-east was the best area with

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(A) Repair costs. These were the estimated costs of repairs which a local authority would carry out if it acquired the dwelling for letting for a period of, say, 20 years. Costs of installing the basic amenities for the first time were not included but the necessary costs of replacing existing amenities were. Internal decoration costs were also excluded unless these would have been required as a result of other repairs. Repairs to outbuildings, boundary walls etc. were excluded.

regard to low repair costs. Such a relationship may be due to the setting of lower standards by housing occupants in the north which results in few complaints to the National House Builder's Registration Council about new houses and high subsequent repair costs. The table below gives the breakdown between repair costs and regions as shown by the house condition survey:-

TABLE Z1

Repair Costs related to Region — Thousand dwellings: percentage

Repair Costs	Northern Yorkshire and Humberside and North West		South East		Rest of England and Wales (A)	
Under £100	2,570	48.2	4,054	69.5	3,588	60.4
£100 - £249	1,634	30.6	1,155	19.8	1,352	22.8
£250 - £499	387	7.3	236	4.1	328	5.5
£500 - £999	493	9.2	249	4.3	338	5.7
£1,000 - £1,499	142	2.7	84	1.4	170	2.9
£1,500 - £1,999	50	0.9	23	0.4	76	1.3
£2,000 and over	57	1.1	28	0.5	86	1.4
Total Stock	5,333	100.0	5,829	100.0	5,938	100.0

(A) East Midlands, East Anglia, South-West, West Midlands and Wales

119. Against this backcloth of housing maintenance the Standing Committee on Building Maintenance made its final report. (DOE 1972 24) The question of the definition of maintenance had been discussed in the interim report,(see paragraph 76) however, the matter was discussed further and after considering British Standard BS 3811: 1964 and the definition of "maintained" as given by section 176 of the Factories Act 1961 as "maintained means maintained in an efficient state, in efficient working order, and in good repair" the committee recommended the following definition should be accepted as reflecting the main objective of building maintenance:-

> "Building maintenance is work undertaken in order to keep, restore or improve every facility, i.e. every part of a

building, its services and surround, to a currently accepted standard and to sustain the utility and value of the facility".

120. It was estimated that whilst the total output of the construction industry in 1969 was £4,700 million, some £1,315 million (28%) was spent on repair, maintenance and minor improvement work. It was further estimated that unrecorded maintenance and associated work by industry and commerce using their own direct labour amounted to £200 million and by house occupants providing their own labour free amounted to £350 million. The estimated total cost of maintenance in 1969 was thus £1,865 million or an annual expenditure of about 1.8% of the total estimated value of the building stock. The committee felt that maintenance expenditure should reflect the physical condition and composition of the building stock. It was unfortunate that no distinction was made between owner-occupied and tenanted houses in the private sector. It was stated that whilst some £652 million was spent on the privately owned property only £188 million was spent on public authority housing and this, it was felt, was due either to the private sector being maintained to a higher standard, or that maintenance in the public sector is more efficient because of economies of scale or because of differences in the characteristics of the stock.

121. Although it had been found that small builders provided the public with a satisfactory service it was felt by the committee that a more efficient and economical maintenance service could be obtained with a larger volume of work. It was thus foreseen that the development of maintenance co-operatives was a means of providing a

more efficient maintenance work programme. Half of the maintenance work at this time was carried out by firms with less than 25 employees.

122. The general conclusion from the deliberations of the standing committee was that whilst building maintenance consumed a very substantial part of the output of the economy, the total expenditure was well justified and indeed there was a pressing need for the expenditure to be increased. To achieve this end there was a feeling that the government should consider incentives to encourage house owners to carry out maintenance before further deterioration of the housing stock occurs. To further assist the collection of information was a vital task for the committee were surprised how insufficient was the knowledge with regard to maintenance amongst large property owning organisations.

123. In their evidence to the Housing Associations Sub-Committee of the Department of the Environment's Standing Working Party on London housing, the London Housing Associations Committee concluded that the figure for management and maintenance costs would be much higher than the Greater London Council's current figure of £54 per annum. In trying to arrive at the real cost of management and maintenance the Associations Committee considered an exercise carried out in the autumn of 1968 by the representatives of the Notting Hill Housing Trust, the Family Housing Association and the Paddington Churches Housing Association and a similar exercise undertaken by the Quadrant Housing Association carried out in 1971. Bearing in mind that such Associations often own rehabilitated houses of between 70 and 120 years old the following indicates the

results of the two exercises. The first exercise assumed an association had 1,000 dwellings, with an even mix of unit sizes, giving average costs per dwelling as follows:-

a) Management and Rent Collection: £15 p.a. (With a total staff of 7 and a low office rental)

b) Repairs and Maintenance: £54 p.a. (Including £13 for internal decoration)

c) Insurance: £5 p.a.

d) Voids and Bad Debts: £6 p.a.

The Quadrant survey, based on a similar number of tenancies, produced the following result:-

a) Management and Rent Collection: £30.25 p.a. (With a total staff of 12 full-time and 2 part-time)

b) Repairs and Maintenance: £68 p.a. (Including £26 for internal decoration)

c) Insurance: £3 p.a.

d) Voids and Bad Debts: £9 p.a.

The higher cost of internal decoration in the second survey is partly explicable by Quadrant using a 7 year cycle as against the earlier surveys 10 year cycle. (Best 1972 5) It was further pointed out that if one set aside 1% of the capital value of each dwelling for maintenance and repairs a figure of £55 - £60 would be so set aside for the average housing association flat.

124. Such was the increase in redecoration costs that the Redbridge Housing Committee proposed to alter their tenancy regulations to allow tenants moving into relet properties to do any necessary internal decorating and be paid allowance for doing it. For this the tenant would receive £10 per room with a maximum payment of £60. The Committee hoped to save £10,000 a year by reducing the loss of

rent due to properties being vacant between lets whilst decorating was taking place and due to the average cost of redecorating having reached in 1971/72 £77 per dwelling. (1972 92) The cost of internal decoration was also affected by the increasing problem of condensation which was said in 1969 to be costing about £700 million per year in repair and redecorating costs. (1972 66)

125. With escalating maintenance expenditures in the public sector the efficient management of the maintenance service was becoming imperative. The Greater London Council by improved methods and the introduction of a work study based incentive bonus scheme made a financial saving of over £1,250,000per annum. (Graham 1972 36) The size of work force employed by local authorities to carry out repair work shows a considerable variation which may reflect the efficiency of management. In 1969 for example, Grimsby County Borough had only 34 operatives for 7,500 dwellings whilst two other County Boroughs in the next county had 63 for 7,200 dwellings and 150 for 11,200 dwellings.

126. It is often a valid criticism of most local authority housing maintenance organisations that they are "Complaint - orientated" i.e. That their administration is geared to satisfying tenants' complaints rather than insuring a desirable all round standard of maintenance to its housing. (Fox 1972 33) In order to ensure an efficient and economic maintenance survey it is essential to organise, plan and timetable the resources of the labour force to meet the annual and seasonal variations in demand for maintenance and to utilise good public relations in informing tenants of the reason for delay in attending to defects. The carrying out of

research into the development of a rolling programme for maintenance was previously discussed in paragraph 94 and with the passage of the Housing Finance Act 1972 and the Defective Premises Act 1972 the necessity for an efficient maintenance programme becomes more imperative. In the public sector with rent collection becoming less and less a door-to-door concern the whole question of housing management may have to be revised along the lines of the Scottish Special Housing Association which has devised a system of annual inspections based upon a five year cycle in order to ensure the adequate maintenance of some 77,000 houses of which 6,000 were built between 1914 and 1945. (SSHA 1972 101)

127. The control over the standard of maintenance work could be affected by a proposal from the National House Builders Registration Council that a voluntary register be set up of builders who carry out house improvements, conversions, extensions and repairs. This proposal resulted from a recommendation of the Forbes Committee of enquiry into the registration of builders and was proposed to cover jobs costing more than £500.

128. The Defective Premises Act 1972 puts a duty on those concerned with the building of dwellings to carry out their work in a workman like and professional manner. The act also extends the duty of a landlord where premises are let under a tenancy which places an obligation for the maintenance and repair on him. The landlord is put under a duty to take reasonable care that all persons who might reasonably be affected by defects are reasonably safe from personal injury or damage to their property caused by a relevant

defect. (A) The provisions of this act come into force on 1st January, 1974.

129. Despite the recommendation of the Standing Committee on building maintenance that incentives should be given to enhance the nation's maintenance activity the government introduced a 10% Value Added Tax on routine maintenance and repair in the 1972 Finance Act. With structural alterations and improvements zero-rated confusion was bound to arise over the definition of maintenance and repair adopted by H.M.Customs and Excise. By notice repair and maintenance was held to include:-

Interior and exterior decorating
Repointing of brickwork
Replacing faulty tiles, slates, guttering etc.
Cleaning buildings
Renewing electric wiring systems
Repairing and renewing plumbing and drainage
Servicing central heating installations (1972 56)

Such was the confusion that a further notice was issued in June 1973 specifying in greater detail the division between repairs and improvements. (1973 57)

130. In June of 1973 the government proposed to make alterations concerning the improvement grant scheme. (1973 39) Among the

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(A) Relevant defect means a defect in the state of the premises existing at or after the material time and arising from, or continuing because of, an act or omission by the landlord which constitutes or would if he had had notice of the defect, have constituted a failure by him to carry out his obligation to the tenant for the maintenance or repair of the premises.

proposals was the introduction of a repairs only grant for certain areas of housing and limited to low income owners. The repairs only grant to be payable at the discretion of the local authority. The existing discretionary grant was proposed to be retained but a specification was to be made that a substantial proportion of it should relate to repair items unless the local authority felt this condition could be waived. A new intermediate grant was proposed which would be available to owners as of right and would not only cover a specified proportion of the cost of installing basic amenities but would also meet a percentage of the cost of necessary repairs. The relationship between low income and poor maintenance was thus recognised.

CHAPTER TWO

Procedure of Investigation

Summary

The investigation was primarily concerned with housing maintenance and in order to study the lack of maintenance, the effects of improvement grants on maintenance, the relationship between tenure and repair and the comparison between the repair expenditure by a local authority and a private landlord a number of surveys, a review of previous work and the detailed analysis of job cards and time sheets was carried out.

1. This research was initiated by a study in 1969/70 of the term "reasonable expense" used in housing legislation. The term is of particular importance to a local authority since before a notice can be served requiring an owner to carry out sufficient repairs to make an unfit house fit the authority must determine if those repairs can be carried out at a reasonable expense. In determining what is reasonable regard must be had to the estimated cost of the repair and the value that the house will have when the works are completed. This initial study considered the question of setting up a repairs fund for private property and an attempt was made to calculate the annual payment required in order to provide sufficient capital to meet the annual expenditure on housing repairs. As with many such studies reliance was placed on the returns made by local authorities giving details of the expenditure on the maintenance of their property. Due to the lack of information this study recommended that research be conducted into the repair expenditure in the private sector. (Skedge 1970 3) A precis of this initial study has since

been published. (Skedge 1973 1)

2. In previous research into house maintenance the scarcity of information with regard to the repair expenditure by private landlords has led to the utilisation of the statistics published by the Institute of Municipal Treasurer's and Accountants relating to the cost of the management and maintenance of publicly owned property. To verify the hypothesis previously accepted that the maintenance expenditures on local authority owned property can be applied to privately owned property a detailed study of the job cards of 52 privately owned houses and a similar number of local authority owned property was carried out.

3. 104 houses in close proximity and suffering from similar weathering agencies e.g. traffic exposure, climatic conditions, atmospheric pollution and sub-soil etc. were selected and the maintenance records from 1966 to 1972 obtained.

4. The study was greatly facilitated by the help of a private landlord who had over the period in question kept accurate details of the repair expenditures incurred with his estate. A typical job sheet is given in Table A2 -

TABLE A2

Private landlord maintenance record

Address .....

Date	Job No	Details	Reps & Mnc.	Capital
2.9.66.	244	Supply 30' of skirting	90p	
25.9.66.	313	External Decoration	£40 -	
1.6.67.	97	Materials	51p	
Sept 69.	242	Fit new cistern	£ 7 86p	

Such a record sheet provides "at a glance" details of all maintenance carried out and is not only a check of the efficiency of the staff

in remedying defects but it also acts as an early warning device for pending major repairs.

5. The information derived from the analysis of the Public and Private landlords records was compared with the type of property e.g. semi-detached, terraced etc. and with the age of the occupant.

6. The difficulty of comparing private and publicly owned tenanted property is often accentuated by the age difference of the housing stock involved. Such variations were reduced to the minimum in this study by selecting privately owned property which had been constructed between 1900 and 1910 and local authority owned property constructed in 1919. This latter condition restricted the size of the sample from each sector to 52 dwellings. A further variation is the number of houses owned by the private landlord. Whilst in this study the local authority managed 910 houses and the private landlord only 170 the latter was also responsible for the maintenance of many farm buildings, offices etc. The details of the work force and the floor area of the properties concerned were also investigated.

7. In order to ascertain whether the council selected was typical, bearing in mind the number of properties managed, reliance was placed on the figures provided by the 28 authorities managing between 800 and 1,000 houses to the Institute of Municipal Treasurers and Accountants. The returns made for the maintenance costs of dwellings built before 1945 for 1969/70 and 1970/71 were considered.

8. The local authority did not maintain their maintenance records in the same form as the private landlord but relied on a system of

job sheets on which the work to be carried out was itemised together with the materials used, the date of complaint by the tenant, the date when the defect was remedied and the operative carrying out the work. In order to cost this work a study was made of the time sheets returned by the operatives each week on which details of their activity were itemised. Whilst job sheets were available from 1966 to 1972 the time sheets for 1966/67 and 1967/68 had been destroyed thus the details of the costs involved relate to the four years from April 1968 to April 1972. (A)

9. The study of job and time sheets enabled the time taken from complaint to completion to be calculated for the various items of work carried out. Also derived were the number of hours per job, the cost per job and, as with the private sector, the results were compared with the type of property and the age of the occupant.

10. The maintenance work carried out by the public and private landlords was broken down into the following items:-

Internal Decoration	Ballvalves
External Decoration	Washers
Brickwork including Chimneys	Bursts
Fireplaces	Plumbing (General)
Gutters	Drainage
Glazing	Windows
Plaster	Doors
Electrical	Locks
Floors	Woodworm, rot etc.
Paths	Wood (General)
Fences	Dustbins
Damp	Others (General)
Roofs	

11. Although the study was not primarily aimed at relating repair

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(A) Examples of the time sheets and job sheets are reproduced in the appendix.

costs with the question of rent and its control, details of rent income and maintenance costs relating to 43 private landlord cottages for the period 1968/1971 were obtained and compared.

12. In order to identify the lack of maintenance and relate it to tenure groups and building structure a house fitness index was derived and in 1971 a door-to-door survey was carried out of 38 dwellings. The survey revealed the estimated cost of repairs, the form of tenure, the type of landlord, the structural components which were showing the greatest deficiencies and enabled comparison between owner-occupied property and privately rented accommodation.

13. To back up the results of the house condition index survey a random sample of 1,000 houses built before 1939 were selected in an area containing 9,150 pre-1939 houses. The sample was then surveyed and details obtained relating to tenure, to the condition of the properties in relation to the standard set by section 4 of the Housing Act 1957 as amended and to the 12 point standard specified by the Minister in circular 64/69 in exercise of his power under section 3(2) of the Housing Act 1969. (A) The results of this survey are discussed.

14. A facet of the repair and maintenance of the housing stock which was also investigated was the effect of the improvement of property, with the aid of a grant from the local authority, on the annual maintenance expenditure. In order to study this aspect a

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(A) The items requiring consideration in relation to section 4 standard and the 12 point standard are enumerated in the appendix.

study tour was carried out in 1971 covering 14 local authorities. The opportunity was taken of visiting properties to be improved and which had been improved. A report of this study tour was produced in November 1971. (Skedge 1971 2) This aspect of the study was greatly assisted by the results of surveys carried out by the Chief Public Health Inspector of Lancaster, the results of which were discussed in paragraphs 63 and 89 of Chapter One.

CHAPTER THREE

Data its Collection and Analysis

Summary

In the previous chapter consideration was given to the method used in this investigation. In this chapter details of the surveys and analysis of time sheets and job cards are given and references are made to the difficulties encountered. The facets of the investigation will be dealt with in the following order:-

a) "Is it worth it?" in relation to house maintenance

b) The House Condition Index survey

c) The sample survey of 1,000 houses

d) The improvement of houses and its effect on repairs

e) Testing the comparability of the local authority used with regard to its maintenance expenditure and that of similar size local authorities

f) Rent and Repair with regard to the private landlord

g) The analysis of the maintenance expenditure of a public and private landlord

"Is it worth it?" in relation to house maintenance

1. As a related aspect of a study of the use of the term "reasonable expense" in housing legislation consideration was given to the question of maintenance and repair. This study formed the final year project for the degree in Environmental Health and was carried out under the auspices of the Department of Building, The University of Aston in Birminham in 1969/1970.

2. The study revealed that many local authorities were utilising a method of calculating the value of tenanted property which involved a percentage deduction from the net rent as an allowance

for the landlord's expenditure on repairs and maintenance. From a study of 23 properties it was shown that such a percentage deduction was illogical and that two identical houses needing identical repair expenditures but which, because of rent legislation had different rent levels, would using such a deduction have differing amounts allowed for repairs and maintenance. In view of the lack of information concerning the maintenance expenditure in the private sector it was recommended that an amount similar to that spent on a comparable council house in the locality of the property under consideration should be allowed.

3. The question of the setting up of a repair fund for privately rented property on the lines of the Housing Repairs Account kept by local authorities was also considered. Utilising the results of the housing survey carried out in 1964 by the social survey section, previously discussed in paragraph 61 of Chapter One and Table N1, and the statistics provided by the Institute of Municipal Treasurers and Accountants it was calculated that some £104,829,449 would be needed annually to cover the repair costs of the 3,306,000 privately rented properties. This figure implied that on 1968 prices just under £32 per house per year was required to maintain private property to the same standard as that achieved in the public sector. It also assumed that it was reasonable to accept the hypothesis that privately rented accommodation would require a similar maintenance expenditure as that required by publicly owned property.

4. As a result of the lack of information this study concluded that further research was needed into the feasibility of setting up a Housing Repairs Fund for privately rented property and into

the maintenance expenditure in the private sector. (Skedge 1970 7) It was to this latter end that much of this present research was aimed.

The House Condition Index Survey

5. In order to compare the maintenance deficiencies in the owner-occupied and privately rented sectors of the housing stock a survey was carried out of 38 properties in an area of houses built at the turn of the century. To facilitate this survey a House Fitness Index sheet was devised.

6. The methods of measuring the quality of houses has recently been the subject of a Masters Degree thesis the results of which were published in 1971. (Duncan 1971 2) The House Fitness Index adopted with considerable modification was that discussed in the report of the sub-committee on the unfit housing in Scotland. (Cullingworth 1967 4) The Index involved the division of housing defects into two classes namely basic deficiencies and cumulative deficiencies. A basic deficiency was one which in itself rendered the property likely to be considered within the purview of section 4 of the Housing Act 1957 as amended. Examples of basic deficiencies are internal bad arrangement, dampness, dangerous ventilation, instability etc. Cumulative deficiencies, on the other hand, are those defects which whilst not rendering the house unfit by itself may do so when combined together. The deficiencies were graded 0 - 5 with 0 indicating no deficiency and 5 extreme deficiency. It is this aspect of any House Condition Index which is inherently weak since it requires a subjective decision on the part of the

surveyor. In this survey all properties were visited and thus the results are comparable. A copy of the House Fitness Index sheet used is reproduced in the appendix.

7. The survey was carried out in 1971 and of the 38 properties visited 18 were owner-occupied (47%), 16 privately rented (42%) and 4 were void (11%). Such a tenure pattern was to be expected bearing in mind the age of the properties and the absence of publicly owned houses. No difficulties were encountered in gaining access to the properties.

8. Of the 16 privately rented properties 10 were occupied by old aged pensioners. It was felt that the age of the occupant could have a significant bearing on the maintenance, or lack of it, of the privately rented properties. In order to test this, the deficiencies of the 10 properties occupied by old aged pensioners were looked at as a group and compared with the privately rented properties occupied by tenants below pensionable age.

9. The following table shows the type of property contained in the survey:-

TABLE A3

Type of Property related to Tenure

Tenure	Flat	Semi-Detached	Terraced
Owner-occupied	-	14	4
Private tenant	2	11	3
Total	2	25	7

10. Of the 16 privately rented properties details of the landlord were obtained. Of these 8 were owned by companies, one by an old aged pensioner and 7 by a landlord who owned more than the one

property under consideration. The companies in question had either obtained the properties for staff or had acquired them whilst acquiring other commercial assets. The following table indicates the owners proposals with regard to the future of their property:-

TABLE B3

Future of Property related to type of Landlord

Proposal	Owner of Other Property	Company	O.A.P.	Total
Maintain and/ or Improve	2	3	1	6 (37%)
Sell	4	5	-	9 (56%)
Not Known	1	-	-	1 (7%)
Total	7	8	1	16 (100%)

11. As well as grading the deficiencies an attempt was made to estimate the cost of the repairs needed to bring the properties inspected up to a satisfactory standard. The results are shown in Table C3:-

TABLE C3

Repair Costs and Tenure

Estimated Repair Costs	Owner-occupied	Private Tenant
Less than £30	6	-
£30 - £100	2	1
£100 - £250	4	2
£250 - £500	3	1
£500 - £1,000	2	9
£1,000 - £1,500	1	3
Over £1,500	-	-
Total	18	16

As can be seen from Table C3 and Fig. 7. the privately rented sector shows a greater degree of lack of maintenance. This is further shown by Table D3 which contains the results of the survey with regard to cumulative and basic deficiencies.

Fig. 7. Cumulative frequency curves of repair costs and tenure

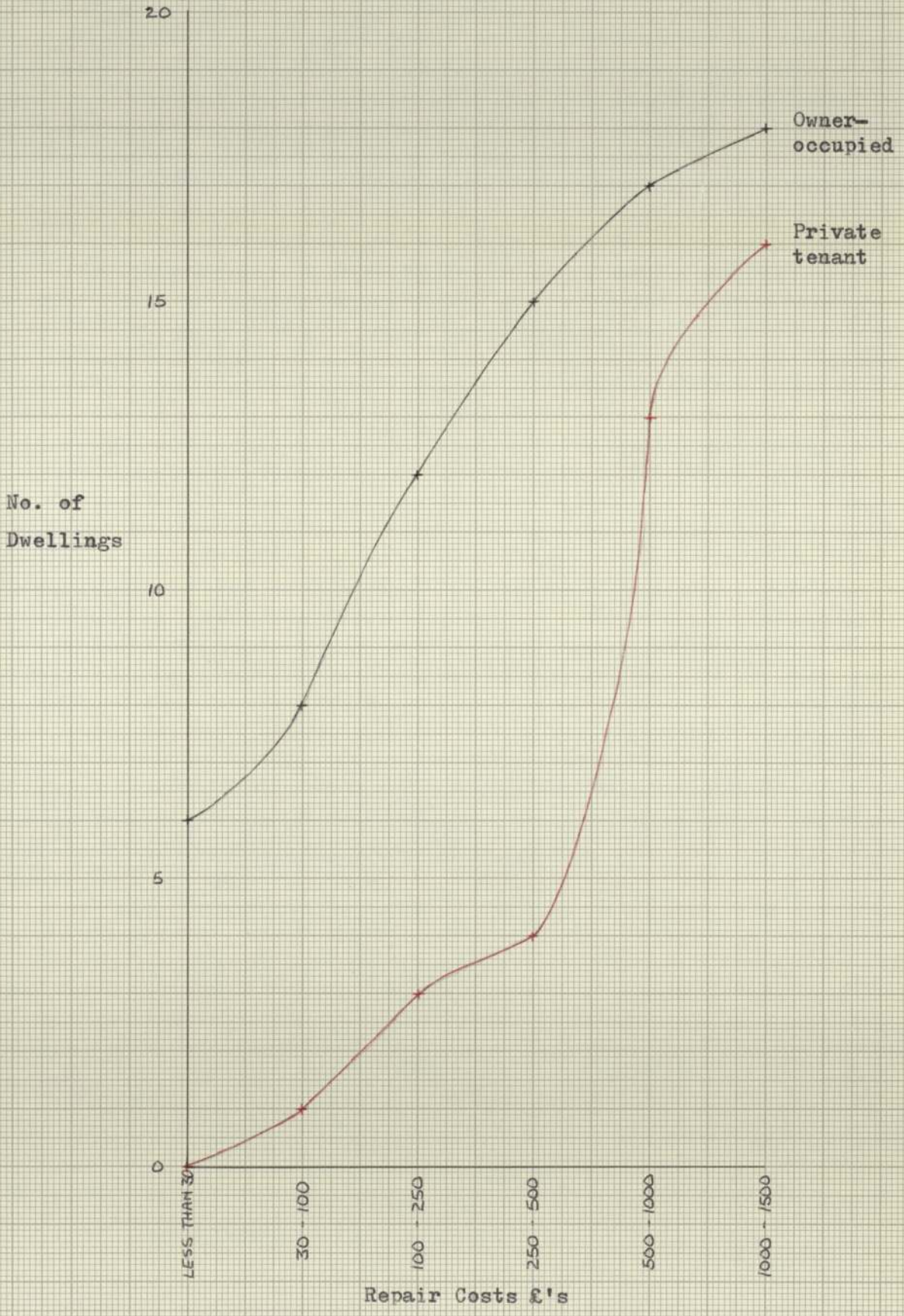

TABLE D3

Cumulative and Basic Deficiencies related to Tenure

Component	Cumulative Deficiencies P.L.			Basic Deficiency P.L.		
	OAP	Not OAP	O/O	OAP	Not OAP	O/O
Progressive instability in walls	-	-	-	20	10	5
Exterior						
Wall surface: broken or loose	15	14	20	-	-	-
Windows: broken or defective	20	8	10	-	-	-
Woodwork: rotten or defective	13	10	5	-	-	-
Roof	24	17	24	-	-	-
Gutters and downpipes defective	12	7	9	-	-	-
Chimney head: defective	20	7	8	-	-	-
DPC: absent or defective	-	-	-	35	20	20
Access						
Paving and Steps: uneven or broken	9	6	2	-	-	-
House Doors: broken or defective	7	4	3	-	-	-
Outbuildings: defective	7	8	-	-	-	-
Interior of Dwelling						
Damp penetrates: Walls	-	-	-	40	25	30
Roofs	-	-	-	30	5	25
Floor	-	-	-	5	10	-
Elsewhere	-	-	-	-	5	-
Walls surface: broken or loose	15	14	12	-	-	-
Ceiling surface: broken or loose	19	15	21	-	-	-
Stair: condition dangerous	2	-	5	-	-	-
Floor: condition defective	7	10	7	-	-	-
Doors: condition defective	4	8	3	-	-	-
Ventilation: condition defective	-	2	-	-	-	-
Lighting(natural): condition defective	6	1	-	-	-	-
condition dangerous	-	-	-	10	-	-
Internal arrangement: unsatisfactory	-	-	-	25	10	40
Fittings						
No bath or shower within dwelling	40	15	10	-	-	-
No wash basin within dwelling	40	15	15	-	-	-
Sink with cold supply only	15	10	5	-	-	-
W.C. unsuitably located (e.g.off kitchen)	-	-	-	10	5	30
No internal W.C.	-	-	-	40	15	5
Drainage						
Not to sewer	-	-	-	-	-	5
Heating and Lighting						
No power points or gas outlets or fixed space heating appliances: in living room	10	8	2	-	-	-
in bedrooms	32	16	7	-	-	-
No electrical power point in kitchen	10	5	5	-	-	-
Gas or electrical installation defective	6	2	-	-	-	-
Solid fuel installations: defective or substandard	10	9	6	-	-	-

TABLE D3 (CONT'D)

Component	Cumulative Deficiencies P.L.			Basic Deficiency P.L.		
	OAP	Not OAP	O/O	OAP	Not OAP	O/O
Facilities						
No cooking facilities	-	-	-	10	-	-
No ventilated food store or fridge	20	8	5	-	-	-
No adequate food preparation area	-	-	-	30	20	30
No adequate clothes drying facilities	-	5	-	-	-	-
Fuel storage inadequate	4	-	-	-	-	-
Totals	367	224	184	255	125	190
No. of Properties	10	6	18	10	6	18
Average (to nearest whole number)	37	37	10	26	21	11

12. The survey thus emphasised the lack of maintenance in the privately rented sector when compared with the owner-occupied sector of the housing market. It also showed the lack of amenities provided by landlords. With regard to cumulative deficiencies no variation was found between the condition of tenanted property whether occupied by an O.A.P or not. There was, however, nearly four times the degree of cumulative deficiency as between tenanted and owner-occupied property. With basic deficiencies tenanted property was just over twice as deficient as owner-occupied property.

13. Structural surveys will reveal the deterioration of items which are normally either costly to maintain and/or do not directly affect the occupant. Thus the working parts requiring immediate attention would be expected to rank low on the deficiency scale whilst such static components as brickwork and plaster would appear high on the scale. This was indeed seen in this survey and the order of deficiency can be seen in Table E3.

TABLE E3

Deficiency rating of structural components

Component	Deficiency Points
Dampness	250
Brickwork	119
Plaster	96
Roofs	65
Windows	38
Wood	35
Doors	29
Gutters	28
Floors	24
Paths	17
Electrical	8

The high ranking for dampness is a reflection of the failure to maintain the main structural components, the roof and brickwork, and the absence of a damp proof course in the original construction. Indeed of the basic deficiencies 31% were connected with some form of dampness and a further 13% due to a lack of, or defective, d.p.c.

14. The lack of adequate maintenance is often attributed to low rents and Table F3 contains details of the rent levels of the properties in the survey:-

TABLE F3

Rent Levels (Weekly)

Below £1.50	including rates	5	excluding rates	-
£1.50 - £2.	including rates	1	excluding rates	3
£2. - £3.	including rates	1	excluding rates	1
Over £3.	including rates	2	excluding rates	1
Total		9		5

After deducting general and water rates, an allowance for voids, management, insurance and annual maintenance, many of these rents are in deficit. A deficit which is balanced either by neglecting maintenance and repair or from the landlords own resources. In this latter case the landlord is subsidising his tenant in the

form of adequate maintenance.

The Sample Survey of a 1,000 Houses

15. The survey consisted of an internal and external inspection of 1,000 houses selected at random from a sample of 9,150 domestic properties constructed before 1939. In order to facilitate the carrying out of this survey a simple yes/no survey sheet was devised a copy of which is reproduced in the appendix.

16. Tables G3 and H3 show the results of this survey.

TABLE G3

No. of Properties unsatisfactory when related to the unfitness standard

Component	Owner-occupied		Private Landlord	
	No. unsatis.	%	No. unsatis.	%
Repair	123	18.3	108	47.8
Stability	22	3.27	18	7.96
Freedom from damp	89	13.22	93	41.2

Of the 1,000 houses 673 were found to be owner-occupied, 226 privately rented and 101 of other tenures. The degree of error and the percentage breakdown of the 1,000 houses with regard to their unsatisfactory condition in respect of repair, stability and freedom from damp is given in Table H3.

TABLE H3

Percentage of properties found to be unsatisfactory and the degree of error

Component	Owner-occupied		Private Landlord	
	%	Degree of Error	%	Degree of Error
Repair	12.3	2.0	10.8	2.0
Stability	2.2	0.9	1.8	0.81
Freedom from damp	8.9	1.85	9.3	1.9

17. Thus from Table G3 it can be seen that whilst only 18.3% of the owner-occupied property was unsatisfactory with regard to repair, 47.8% of the tenanted property was unsatisfactory in this respect. Similarly in comparison with owner-occupied property the privately rented sector shows a marked degree of instability and dampness. The survey also showed that the rented sector poorly compared with the owner-occupied group with regard to the provision of such amenities as a hot water supply and a bath in a bathroom. It was found that whilst only 7.13% (8.4%) (A) of the owner-occupied group lacked a hot water supply, 30.1% (36.9%) of the privately rented properties were so deficient. The comparison with regard to a bath was 8.62% (6.9%) and 31.9% (29.8%) respectively.

18. Table H3 shows the total percentage picture. Thus 12.3% of the 1,000 inspected were owner-occupied and unsatisfactory with regard to repair. Due to the smaller number of privately rented houses (673 compared with 226) only 10.8% of the total were privately rented and unsatisfactory with regard to repair.

19. During the inspection of the 1,000 houses time was taken to explain the improvement grants which a local authority could make. Despite the fact that repair items were grant attracting only 29.5% of the owner-occupiers and 26.1% of the privately renting sector were interested in receiving further details. This underlines the tolerance shown by occupants towards their housing environment and it is this, coupled with inertia and the dislike of disturbance, which

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(A) Figures in brackets show the position for England and Wales and are taken from the House Condition Survey 1971. (Housing Survey Reports No.9. D.O.E. June 1973)

is the main retardant to a well maintained housing stock. The low response in the rented sector is also influenced by the landlord-tenant relationship. This relationship is often developed over many years and an understanding is achieved in which the tenant does not request the carrying out of routine maintenance and major improvements providing the landlord does not raise the rent. In order not to destroy or disturb this relationship many tenants are concerned not to involve their landlord in the question of modernisation. It is clear that the increase of rent together with the fear of upheaval are major contributary factors and this leads to the hypothesis that tolerance of a decaying housing environment is greatly influenced by cost factors.

20. Comparison between the results of this survey and the national house condition survey carried out in 1971 indicates that the geographical area in which the major aspect of this study of maintenance is to be carried out is a typical housing area of the South-East.

The Improvement of Houses and its effect on Repairs

21. To investigate the relationship between improvement grants and maintenance costs a study tour was arranged in September 1971. The tour, financed partly by the University of Aston and partly by the Association of Public Health Inspectors, has been fully reported elsewhere. (Skedge 1971 6) An analysis of repair costs derived by surveys in the city of lancaster was also carried out and a study was made of 100 approved improvement grant applications relating the approved expenditure on repairs with the estimated date of

construction.

22. From the economists viewpoint the difference in annual repair costs between the improved house and a newly built house is an important factor in the model for determining the amount worth spending on the improvement of houses. The effect of the rehabilitation of property with the aid of grant on the annual maintenance cost depends on the standard of work required by local authorities when approving grants. The study tour revealed a considerable variation in the standards being set. The houses surveyed which had been the subject of grant aided improvements contained such defects as:-

a) Areas of defective wall and ceiling plaster
b) Slipped and broken slates
c) Open jointed brickwork
d) Settlement cracks

The inspection of property being improved can and did reveal defects which could not have been seen on the original inspection. Such defects can often be covered up thus delaying but often increasing maintenance expenditures. The nature of the defects given above whilst resulting in a steady deterioration of the property are such that they are unlikely to evoke tenant complaint and thus in the short term will not affect maintenance costs.

23. The effect of rehabilitation on maintenance expenditure is, due to the number of uncontrollable factors and the lack of statistical information, difficult to quantify. Fundamentally maintenance costs after improvement must reflect the standard required by the local authority paying the grant. Figures alone can often be deceiving for some landlords will neglect repairs to property programmed for

major improvement thus on an annual basis repair costs can show an increase after improvement when normal day to day maintenance is resumed. The analysis carried out on the statistics provided by the survey of two areas of Lancaster revealed an 18% reduction in the repair expenditure on property the subject of grant in one area surveyed but an increase of 7.8% in a further area surveyed. (1) The analysis was thus inconclusive.

24. In an attempt to relate repair costs with the date of construction a study was made of 100 approved improvement grants. The backlog of repairs was measured by the approved expenditure on repairs and by relating this backlog with the estimated date of construction an estimate of the rate of decay could be determined in terms of "repair years". Distinguishing between improvement and repair can be difficult and indeed some items with the general classification of improvement can contain an element of repair as for example the replacement of a damp worn tiled floor. For this element to be incorporated a similar analysis was made of the approved expenditure on improvements which again was related in terms of "improvement years".

25. Of the 100 properties selected from the grants approved between September 1971 and May 1972 70 were found to be owner-occupied and 30 privately rented. Since the repair and improvement costs are a reflection of the previous usage of the property those dwellings which had, immediately prior to the grant application, been occupied by a tenant were classified as privately rented despite the fact that the improvements were being carried out with a view to owner-occupation.

26. The classification with regard to tenure and the approved cost of repair and improvement was precisely known. The date of construction was precisely known only where the property bore an indication of the date of construction. In all other cases an estimate had to be made utilising knowledge of the type of construction and the situation of the property. For this reason too much reliance should not be placed on the following figures which should be regarded only as an indication of trends.

27. The following tables I3 - M3 and figures 8 and 9 indicate a progressive increase in the cost of improving and maintaining property with age. They also show a variation between tenure groups.

TABLE I3

Approved Improvement and Repair Expenditures related to Construction Date for Owner-occupied property

Date of Construction								
1800	Improvement	1,375	2,217					
	Repairs	682	543					
1820	Improvement	1,311						
	Repairs	647						
1840	Improvement	951						
	Repairs	166						
1850	Improvement	1,353						
	Repairs	793						
1860	Improvement	2,230						
	Repairs	1,045						
1870	Improvement	1,292	529	2,218	264			
	Repairs	430	453	406	179			
1880	Improvement	2,360	497	837	411	2,257	1,931	626
	Repairs	850	222	942	416	439	660	408
1890	Improvement	610	182	1,018	474	642	492	1,220
		650	1,063					
	Repairs	207	451	1,111	170	1,769	136	1,037
		196	501					
1900	Improvement	1,077	773	474	160	499	695	
	Repairs	528	372	3,297	122	116		
1910	Improvement	820	166	1,808	1,080	1,095	780	379
		435	402	187				
	Repairs	672	617	149	784	272	318	316
		98	256	485				

TABLE I3 (CONT'D)

Date of Construction								
1920	Improvement	1,420	1,387	1,009	818	711	772	560
		682	796	1,243	331	1,157	654	486
		506	736	577				
	Repairs	1,160	80	176	156	435	173	697
		126	120	761	663	60	588	468
		279	407					
1930	Improvement	483	746	276	974	1,025	145	
	Repairs	390	67	360	516	50	158	
1940	Improvement	446	1,190	1,482				
	Repairs	251	288	28				
1950	Improvement	125						
	Repairs	8						

From Table I3 the totalled expenditure on improvements and repairs was noted and the average expenditure calculated. Taking the present date as 1970 the "improvement year" and "repair year" figures were calculated by dividing the average expenditure by the number of years between the date of construction and the present date. The situation with regard to the owner-occupied sector is shown below in Table J3 and in Figures 8 and 9.

TABLE J3

Repair Years and Improvement Years for the Owner-occupied Sector

Year	1800	1820	1840	1850	1860	1870	1880	1890
Total Expenditure								
Improvements	3592	1311	951	1353	2230	4303	8919	6351
Repairs	1225	647	166	793	1045	1468	3937	5578
Average Expenditure								
Improvements	1796	1311	951	1353	2230	1076	1274	706
Repairs	612	647	166	793	1045	367	562	619
Improvement Years	10.56	8.74	7.31	11.27	20.27	10.76	14.15	8.82
Repair Years	3.60	4.31	1.28	6.61	9.50	3.67	6.24	7.74

TABLE J3 (CONT'D)

Year	1900	1910	1920	1930	1940	1950
Total Expenditure						
Improvements	3678	7152	13845	3649	3118	125
Repairs	4435	3967	6349	1541	567	8
Average Expenditure						
Improvements	613	715	814	608	1039	125
Repairs	739	396	373	257	189	8
Improvement Years	8.76	11.92	16.28	15.20	34.63	6.25
Repair Years	10.56	6.60	7.46	6.42	6.30	0.40

Tables K3 and L3 similarly relate repair and improvement costs with date of construction for property which was or had been recently tenanted.

TABLE K3

Approved Improvement and Repair Expenditures related to construction date for Tenanted Property

Date of Construction							
1820	Improvement	1,568					
	Repairs	424					
1860	Improvement	1,767	1,999	2,776	1,147		
	Repairs	1,090	440	857	891		
1870	Improvement	1,058					
	Repairs	1,324					
1880	Improvement	1,545	2,734	2,113	790	1,204	1,297
	Repairs	681	757	895	614	680	415
1890	Improvement	1,950	2,206	983	1,798	1,854	1,854
		1,520	1,550				
	Repairs	802	819	416	323	1,281	1,281
		332	430				
1900	Improvement	1,098	2,421	1,458			
	Repairs	155	463	250			
1910	Improvement	193	1,385	1,367			
	Repairs	417	728	223			
1920	Improvement	834	976				
	Repairs	729	433				
1930	Improvement	1,200	751				
	Repairs	743	224				

TABLE L3

Repair Years and Improvement Years for the Private Tenant Sector

Year	1820	1860	1870	1880	1890	1900	1910	1920	1930
Total Expenditure									
Improvements	1568	7689	1058	9683	13715	4977	2945	1810	1951
Repairs	424	3278	1324	4042	5684	868	1368	1162	967
Average Expenditure									
Improvements	1568	1922	1058	1614	1714	1659	982	905	975
Repairs	424	819	1324	674	710	289	456	581	493
Improvement Years	10.45	17.47	10.58	17.93	21.42	23.70	16.37	18.10	24.37
Repair Years	2.83	7.45	13.24	7.49	8.87	4.13	7.60	11.62	12.32

28. From a comparison of Tables I3 to L3 it can be seen that with both the average expenditure and the "improvement year" and "repair year" figures the tenanted sector is greater. The difference is greatest with the "repair year" where the tenanted sector is 45.67% greater than the owner-occupied sector compared with an increase of 34.9% in the case of the "improvement year" figures. Figures 8 and 9 also show the greater expenditure required to improve and repair the tenanted sector and also indicate the progressive increase in expenditure when related to the date of construction.

29. Table M3 shows the average expenditures and "improvement year" and "repair year" figures for all tenures.

TABLE M3

Repair Years and Improvement Years for all Tenures

Year	1800	1820	1840	1850	1860	1870	1880	1890
Total Expenditure								
Improvements	3592	2879	951	1353	9919	5361	18602	20066
Repairs	1225	1071	166	793	4323	2792	7979	11262
Average Expenditure								
Improvements	1796	1439	951	1353	1984	1072	1431	1180
Repairs	612	535	166	793	865	558	614	663
Improvement Years	10.56	9.59	7.31	11.27	18.04	10.72	15.90	14.75
Repair Years	3.60	3.57	1.28	6.61	7.86	5.58	6.82	8.29

TABLE M3 (CONT'D)

Year	1900	1910	1920	1930	1940	1950
Total Expenditure						
Improvements	8655	10097	15655	5600	3118	125
Repairs	5303	5335	7511	2508	567	8
Average Expenditure						
Improvements	962	777	824	700	1039	125
Repairs	589	410	395	313	189	8
Improvement Years	13.74	12.95	16.48	17.50	34.63	6.25
Repair Years	8.41	6.83	7.90	7.82	6.30	0.40

30. This study revealed an average "repair year" for tenanted property of £8.39, for owner-occupied property of £5.76 and for all tenures a figure of £5.80. A similar relationship occurred with the average "improvement year" where the respective figures were £17.82, £13.21 and £14.26. Again whilst the average repair cost for tenanted property was £641 the figure for all tenures was £479 and the average improvement cost for tenanted property was £1,377 compared with £1,117 for all tenures.

31. As previously stated this study should be regarded as an indicator of trends. The trend is clearly for an increase of repair and improvement costs with the increase in age of property as shown in Figures 8 and 9. The points on the figures for property over 120 years old should be viewed with suspicion due to the small numbers of properties in the sample of this age and the inaccuracy resulting from the difficulty of estimating the precise date of construction. The study does, however, show the deficit between the amount of maintenance actually carried out in both the owner-occupied and private landlord sectors and the amount of maintenance that is required.

Fig. 8.

Average Repair Costs related to Construction Date

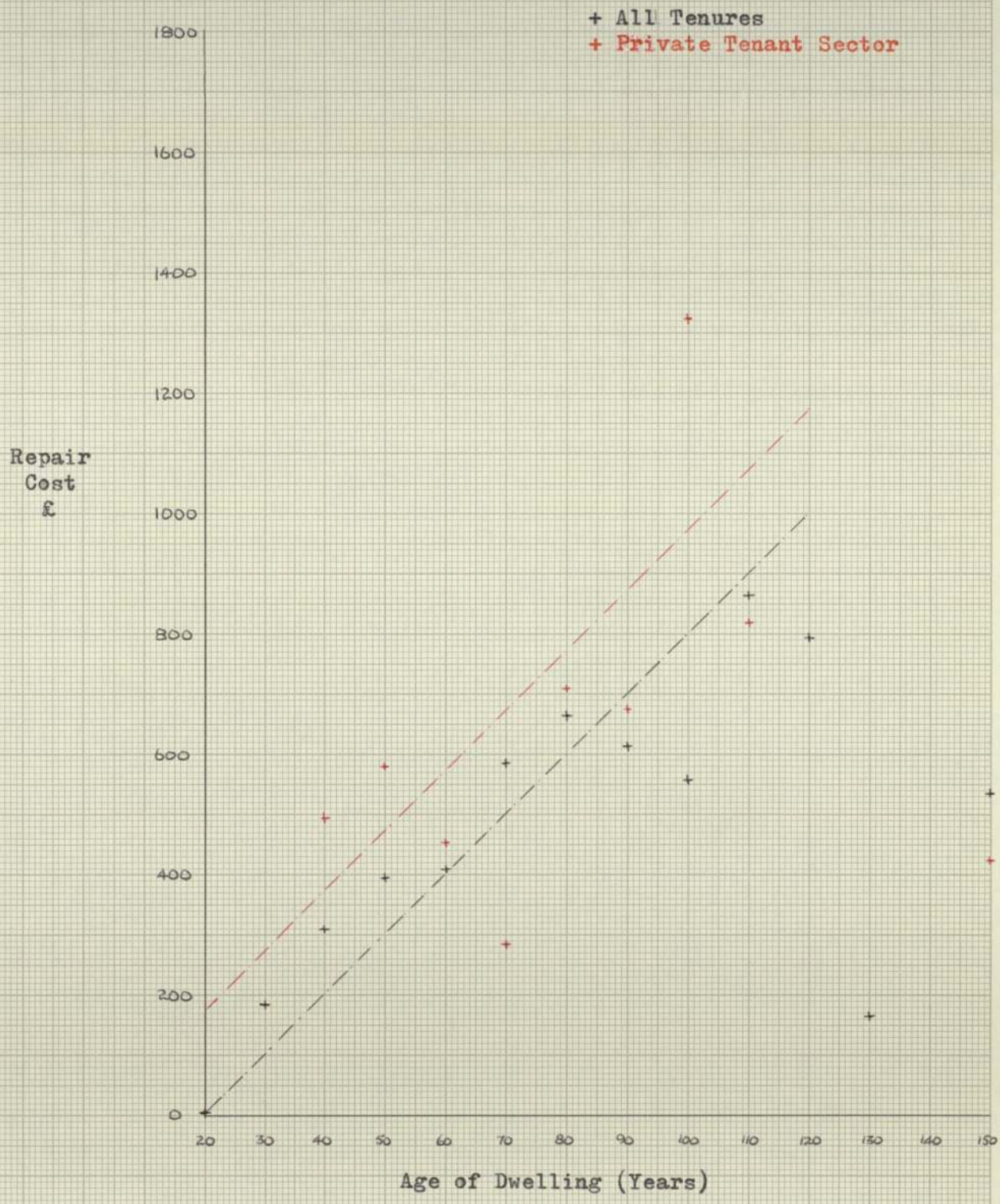
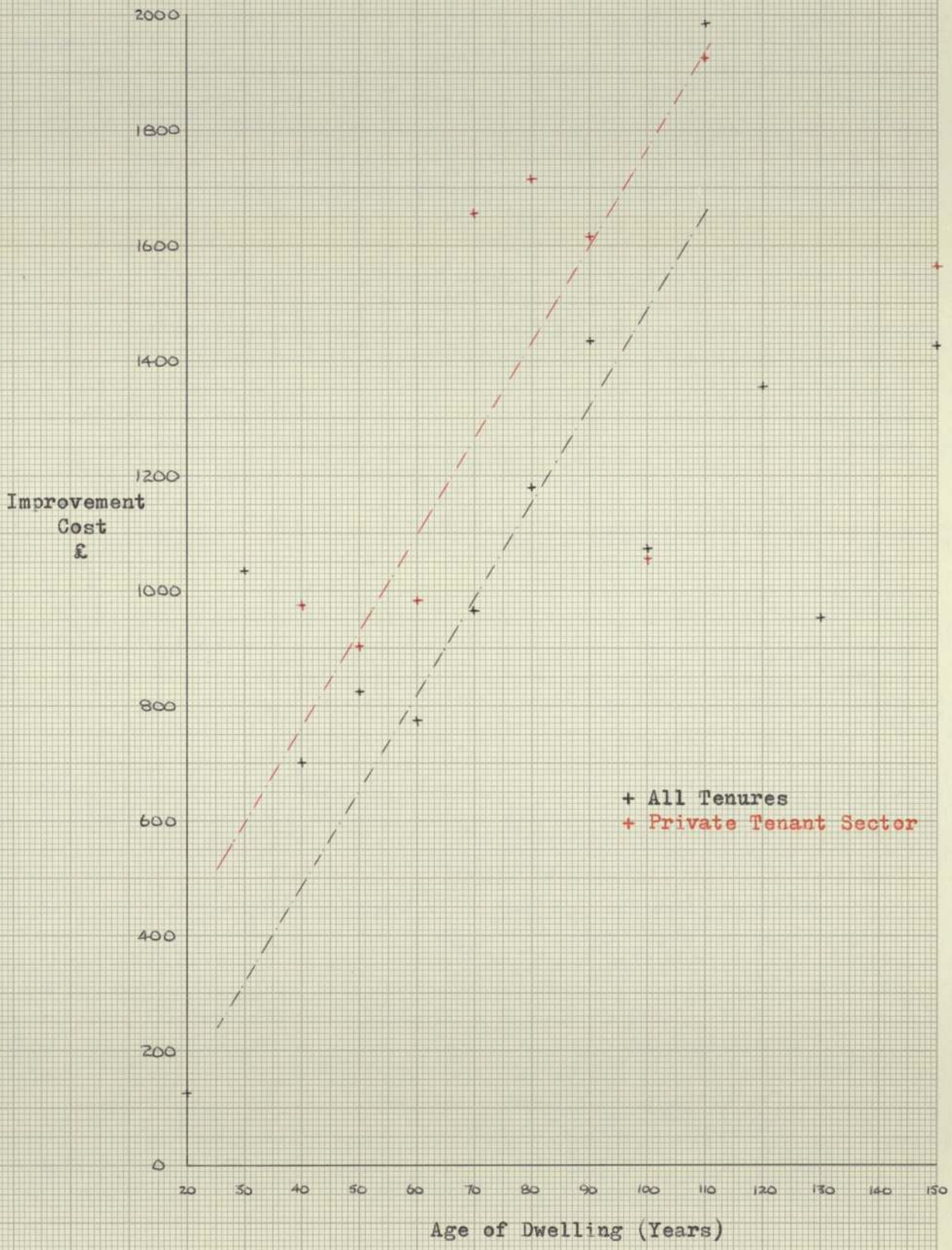


Fig. 9.

Average Improvement Costs related to Construction Date



Testing the Comparability of the Local Authority Selected

32. In order to carry out a comparability study between the maintenance carried out by a private landlord and a public landlord it was decided that the representative from both sectors should preferably be in the same locality in order to reduce the disparity caused by varying weathering agencies, dissimilar forms of construction and variations in labour and material costs. Having been fortunate in obtaining the co-operation of a private landlord of some 170 houses, approaches were made to the Engineer and Surveyor of the local authority in whose area the majority of the private landlord's houses were situated and he readily agreed to assist in the study.

33. As previously shown, workers in this field have had to rely on the returns made by local authorities to the Institute of Municipal Treasurers and Accountants when considering house maintenance expenditures. The general assumption having been made that such figures could be utilised when discussing the maintenance expenditures of private landlords. Thus it is important to relate the costs revealed in this study with the figures provided by the I.M.T.A. particularly with regard to the comparability of the expenditures of the local authority involved and similar local authorities making returns to the I.M.T.A. The authority selected did not make returns and indeed, as will be shown later, did not present their maintenance statistics in a readily usable manner.

34. The authority studied managed a steadily increasing number of domestic properties. The stock of local authority dwellings increased from 862 to 910 during the time of the study and of these

52 had been constructed in 1919. Of the remainder some 107 had been constructed in 1930, a further 26 in 1938 whilst the majority of the remainder were post-war. In order to compare the maintenance expenditure of the authority in question with those submitting returns to the I.M.T.A. the 28 authorities who managed between 800 and 1,000 houses and made returns were studied. The 28 authorities selected were:-

Non-County Boroughs:-	Aberystwyth	
	Harwich	
	Ryde	
Urban District Councils:-	Abram	Ilkley
	Baildon	Neston
	Buckley	Sevenoaks
	Clacton	Sherborne
	Connah's Quay	Skelton & Brotton
	Denby Dale	Sleaford
	East Dereham	Warsop
	Epping	Whitstable
	Haslemere	Whittlesey
	Hoylake	Wirral
Rural District Councils:-	Braughing	Tenterton
	Freebridge Lynn	West Ashford
	Samford	

35. The average cost per dwelling to maintain all the dwellings within the housing stock of these authorities was calculated and was found to be £19.71 for the financial year 1968/69, £21.10 for 1969/70 and £23.86 for the year 1970/71. The authority selected for the study did not keep average maintenance figures but could provide a total figure for the expenditure on the maintenance of its property which is shown in Table N3.

TABLE N3

Average Annual Maintenance Expenditures for the Public Landlord 1968/72

Year	Total Expenditure	No of Dwellings	Average Expenditure £'s per annum 28 L.A's Selected		
			L.A. Studied	All Dwellings	One & Two Storey built before 1945
68-69	22,464	862	26.06	19.71	29.79
69-70	22,725	874	26.00	21.10	32.81
70-71	23,598	884	26.69	23.86	35.28
71-72	24,815	884	28.07	N/K	N/K

It can thus be seen that the authority selected was above the average expenditure on maintenance of those authorities managing a similar number of dwellings and submitting returns to the I.M.T.A. Such a disparity could have resulted from any one or a combination of the following factors:-

a) Although the 28 authorities selected had a similar number of houses to manage the type of construction and the date of construction is not shown in the statistics provided by the I.M.T.A. For comparison the average maintenance cost of the 52 dwellings selected for detailed study which were built in 1919 were compared with the average maintenance cost to the 28 authorities of their dwellings built before 1945. It was found that the average maintenance cost for dwellings built before 1945 and of 1 and 2 storey construction for the 28 authorities was £34.08 whilst the average cost to maintain the 52 dwellings was £35.95. Thus the disparity could be due to the council in the study owning more dwellings constructed before the war than the 28 submitting returns. This would inflate the average figure for the maintenance of the dwellings owned by the authority in the study. Approximately

25% of this authority's dwellings were constructed before 1945.

b) As can be seen the 28 authorities are widely scattered geographically and problems of weathering and subsidence in certain areas could inflate maintenance costs. No comparison can be made with regard to the division of maintenance work between direct labour and contracted work since such information is not available with regard to the 28 authorities. The local authority under study may well be reflecting in its maintenance expenditures the difficulty in obtaining labour in the South-East.

36. From the comparison of average maintenance costs, particularly those relating to dwellings built prior to 1945, it would appear that the authority selected for this study could be regarded as typical after taking into account its size in relation to the number of dwellings it managed.

Rent and Repair with Regard to the Private Landlord

37. The private landlord is not providing a service to the public in the sense that a local authority does when the latter constructs dwellings to let. The private landlord provides dwellings to let in order to make a financial return on the money he has invested in the provision of the accommodation. The gross rent has thus to carry the cost of administration and of all repairs and decoration which are the responsibility of the landlord. The landlord in this study had within his estate 43 cottages which were the property of a trust which he administered. The trust had been set up to provide the landlords children with an income on reaching the age

of 21 years, and thus at the present time it was the policy of the trust to carry out a programme of improvements and repairs thus investing all rent income in the properties. Because of this the landlord could have been regarded from the viewpoint of the tenants of these 43 cottages as paternalistic.

38. From the study point of view this was an ideal situation for the landlord was carrying out an active maintenance programme consisting of a five year cycle for external repair and redecoration with the intervening years being taken up by the attendance to running repairs. Since the landlord relied on the rents being set by a rent officer it was felt that the rent income and the repair expenditure for the 43 cottages was worth reproducing and this can be seen in Table 03. As will be seen one of the properties was occupied rent free by a member of the maintenance staff but of the rest whilst the average cost of repairs was £57 per house per year the average rent was £271. However, after allowing 10% of the gross rent for administration expenses and with £4,768 being spent during the three years in question on improvements there was an overall loss over the three years on the 43 properties of £2,026. With a loss of £2,026 over three years with rents on average being £271 per house per year the critical maintenance problem with privately rented property can be seen from the statement in the 1971 White Paper "Fair Deal for Housing" (1971 3):-

> "Most controlled rents today barely cover the cost of proper maintenance and insurance. Tenants are thus being subsidised by their landlords. The rent of private tenants subject to rent control has not moved since 1957 and is typically

85p a week (£44.20 per year) outside London and £1.50 per week (£78.00 per year) in London".

Since the average cost of repairs in connection with the 43 properties in question was £57 per year and these were situated outside London then it can be argued that on average the controlled rent properties were being either subsidised by the landlord at the annual rate of £12.80 or maintenance was neglected in order to provide the landlord with a profit. Even if all the controlled rent income was spent on repairs a maintenance deficit of £12.80 would accumulate annually. With property the subject of a registered rent the landlords position is more favourable for the average registered rent in 1972 was £159 per year and after making an allowance for repairs, collection and voids the annual "profit" was £70. From this "profit" the landlord must pay tax and make provision for a sinking fund.

39. Table 03 shows the rent income and improvement and repair expenditure on 43 cottages built between 1900 and 1920 for the period 1968/1971.

TABLE 03

Rent Income and Expenditure for 43 Cottages

Prop Serial	1968-69			1969-70			1970-71		
	Rent	Reps	Imps	Rent	Reps	Imps	Rent	Reps	Imps
1	44	2		44	1		46	1	
2	46	30		46	35		46	8	
3	34	23		34	7		34	3	
4	75	10		75	2		75		
5	53	4		53	8		53	4	
6	109	2		109	3		109	2	
7	143			143	1		143	13	
8	195	7		195			195	13	
9	169	4		169			174	10	
10	60	5		60	5		60		
11	169			169	4		176		
12	182	2		182	4		193	6	
13	75	255		75	1		75	6	
14	28	115		28	8		28	14	
15	32	4		32			32	6	
16	32	5		32	86		32	12	
17	252	21		251			251	7	
18	156	7		156	10		242	3	
19	62	2		62	2		62	5	
20	48	10		48	1		48		
21	10	13	915	60	15		60	1	
22	46			46	8		46	1	
23	*	348		*	4		*	50	
24	42	5		36	15			68	
25	36	34		41	342		109	14	
26	182	112		182	23		186	8	
27	52			52			52	72	
28	76	3		76	5		76	87	
29	48	27		48	2		96	70	
30	104	38		104			109	4	
31	24	38		24			24	35	
32	41	58		41			41	62	
33	156	4		12	3		*	1010	1529
34	44	45		44			44	1335	1528
35	46	2		46			11	1475	
36	40	3		40	5		40		
37	36	10		36			36	3	
38	143			143	4		92	93	
39	156			156	4		156	77	
40		3	796	196	727		228	18	
41	42	21		42			42		
42	42	21		42			42		
43	253	51		253	160		253	10	
Total	3584	1346	1711	3681	1494		4110	4656	3057

* Occupied rent free by a member of the maintenance staff

The relationship between income and expenditure may be summarised thus:-

TABLE P3

Income and Expenditure for the Private Landlord

	1968-69	1969-70	1970-71	Total
Rents	2584	3681	4110	11375
Repairs	1346	1494	4656	7496
Improvements	1711		3057	4768
Administration	358	368	411	1137
Profit/Loss	+ 169	+ 1819	-4014	-2026

40. Against the housing maintenance background revealed so far in this chapter the study of the maintenance expenditure of a public and private landlord can now be discussed.

The Analysis of the Maintenance Expenditure of a Public and Private Landlord

41. The co-operation of a private landlord who was actively maintaining his property and accurately detailing and recording the work carried out had been obtained and in order to minimise the disparity in the maintenance profile due to the effects of climate, atmospheric pollution, the presence or absence of skilled building operatives, the effects of the geological strata, type of construction, exposure, and the age of the properties the Engineer and Surveyor of the local authority in whose area the private landlord's houses were situated was approached and he readily agreed to co-operate. In order to minimise the variations still further the 52 oldest local authority dwellings, built in 1919, were selected for study. A sample of 52 of the private landlord's dwellings, which adjoined the local authority sample, was selected in order to neutralise the effects of such aspects as climate, atmospheric pollution, the geological strata and exposure.

42. Both the private and public landlord relied on a direct labour force to carry out the major part of their maintenance programme with the remainder put out to contract. Both landlord's relied on contractors for electrical work but whereas the public landlord utilised contractors for plastering and major roof repairs the private landlord relied on contractors for plumbing and earth moving jobs. Both landlords had a similar size of direct labour force despite the fact that the public landlord owned nearly six times more houses than the private landlord. The latter was however responsible for the maintenance of farm buildings and other assorted structures within the estate. A comparison of the cost and complaint to completion times for the various maintenance components between those carried out by direct labour and those put out to contract would have been highly desirable, however, details relating to contract work were not sufficiently detailed to permit such analysis. The make-up of the direct labour force varied as follows:-

Public Landlord Direct Labour Force

2 Plumbers + 1 Labourer
2 Carpenters
4 Painters + 1 Youth + 1 Part-timer
1 Odd Job Man

Total Staff 12

Private Landlord Direct Labour Force

1 Foreman
2 Bricklayers
2 Labourers
3 Painters
2 Carpenters + 1 Apprentice
1 Yardman
1 Driver/General Work

Total Staff 13

From the structure of the labour forces it would appear that the

local authority houses were subject to a high degree of plumbing defects and were receiving regular decoration since 25% of the labour force were concerned with plumbing and 50% engaged on decoration. In the private landlord's building department painters were again in the majority but unlike the public landlord two bricklayers were employed.

43. Utilising the wage rates paid by the local authority a labour cost index was calculated for the years 1968 to 1972. The following table indicates a 37% increase in labour costs over this period.

TABLE Q3

Labour Cost Index

Year	Average Hourly Wage	Index
1968	36.5p	100
1969	37.5p	103
1970	41.3p	113
1971	46.0p	126
1972	50.0p	137

44. To indicate the extent of the maintenance activity of the two sectors the following tables R3 and S3 indicate the total expenditure by the landlords in question. A feature of these tables is the ratio of material costs to labour costs. In the case of the public landlord the cost of materials is on average 45% the cost of labour whereas with the private landlord this is 116%.

Table R3

Labour and Material Costs for the Private Landlord

	1971/1972	1972/73
Materials	£15,255.10	£16,112.99
Labour	£15,222.60	£12,381.89
Sub-Contract Work	£14,924.72	£23,041.57
% of Materials to Cost of Labour	101%	131%

NB. Figures for 1972/73 refer to a part year.

Table S3

Labour and Material Costs for the Public Landlord

	1969/70	1970/71	1971/72	1972/73
Materials	£4,419	£3,744	£7,485	£6,478
Labour	£10,620	£10,947	£12,926	£13,646
% of Materials to Cost of Labour	42%	34%	58%	47%

NB. Figures for 1972/73 estimated.

45. The higher percentage of materials to cost of labour in the private landlord sector is due to a programme of improvement involving the construction of back additions and internal rearrangements. The effect of such major refurbishing on this relationship can be seen in the public sector in the figures for 1971/72. The higher percentage of 58 was due to a programme of reroofing. This suggests a relationship of materials to labour in respect of house maintenance and house improvement on the lines suggested by Marriott and discussed in paragraph 18 of Chapter One.

46. The age structure of the local authority's 910 domestic properties was previously discussed in paragraph 34 and the 52 properties constructed in 1919 were selected for study in order to obtain a greater comparability with the private landlord's 166 domestic properties the majority of which had been constructed between 1900 and 1920. The 52 private landlord properties selected for study were constructed between 1900 and 1910. The size of the dwellings selected varied considerably for whilst the local authority dwellings had a floor area of 1,152 square feet the private landlord's dwellings had a floor area of only 580 feet. The average cost to maintain the properties related to a unit of floor area will be considered later.

47. The form in which the landlords kept their maintenance record was previously discussed in Chapter Two. The differences in approach to record keeping prevented comparability in certain aspects of the research. The method of study and the results will be dealt with in the following order:-

a) Number of jobs related to maintenance item

b) Average number of hours per job related to maintenance item

c) Cost of work related to maintenance item

d) Cost of Maintenance related to type of house

e) Complaint to completion time related to maintenance item

f) Annual repair costs related to age of occupant

g) Seasonal variation in maintenance items

Number of Jobs related to Maintenance Item

48. The maintenance activity in both sectors was broken down into twenty-five items in order to differentiate as fully as possible between the various facets. The twenty-five items were outlined in paragraph 10 of Chapter Two and are in the main self-explanatory. Whilst the records which were available contained a great deal of detail some items were classified for simplicity into the major category in which the majority of the work was contained. Thus external decoration contained a degree of repair work to brickwork, gutters, woodwork and glazing. Similarly internal decoration contained an element of repair work particularly in relation to plaster. Of the other items fireplaces also contained the cost of repairs to fuel stores and brickwork included repair work to rendering. The category plumbing (general) included repairs to water heaters, lavatory cisterns, leaks, renewing taps etc.

Drainage included repairs to water closet pedestals and blockages. The repairing or renewing of w.c. seats was also included in the drainage item. Windows included all work carried out on the replacement of broken sash cords.

49. The number of jobs related to the twenty-five items of maintenance previously specified totalled 1,385 in the case of the 52 houses in the public sector and 593 in the 52 privately owned dwellings. The total number of jobs related to each item can be seen in Table T3 and Figures 10 and 11.

TABLE T3

Number of Jobs related to Maintenance Item and Tenure Group for the Period 1966-1972

Maintenance Item	No. of Jobs Private Landlord	Public Landlord
Internal Decoration	10	66
External Decoration	81	39
Brickwork	14	32
Fireplaces	31	71
Gutters	18	65
Glazing	10	46
Plaster	4	54
Electrical	22	108
Floors	6	9
Paths	-	10
Fences	17	60
Damp	7	23
Roofs	24	92
Ballvalves	45	33
Washers	11	16
Bursts	8	23
Plumbing	91	223
Drainage	47	72
Windows	46	113
Doors	17	135
Locks	15	9
Woodworm	1	9
Wood	11	30
Dustbins	27	42
Others	30	5
Total	593	1385

Fig. 10.

Number of Jobs related to maintenance item for the private landlord for the period 1966-1972

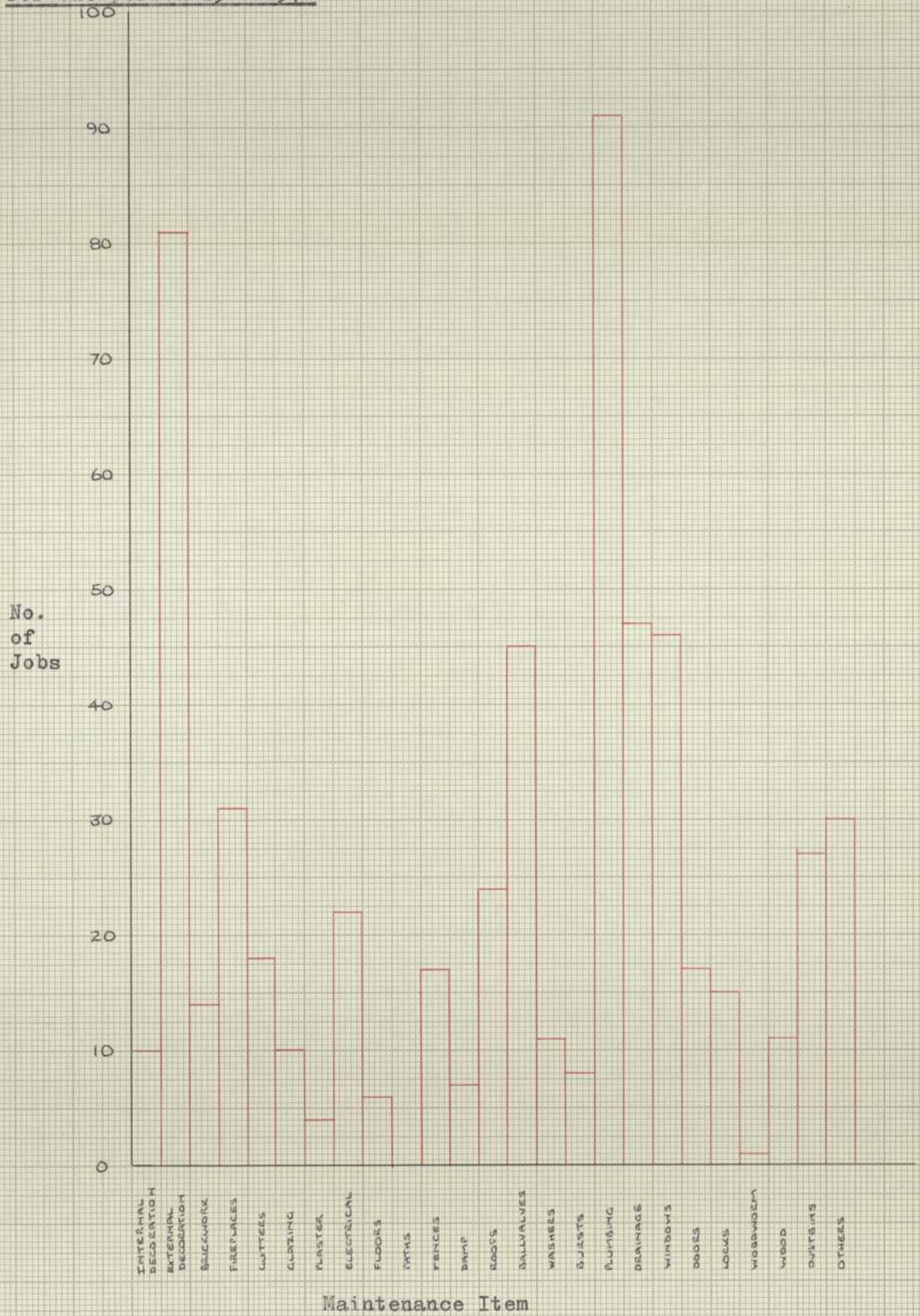
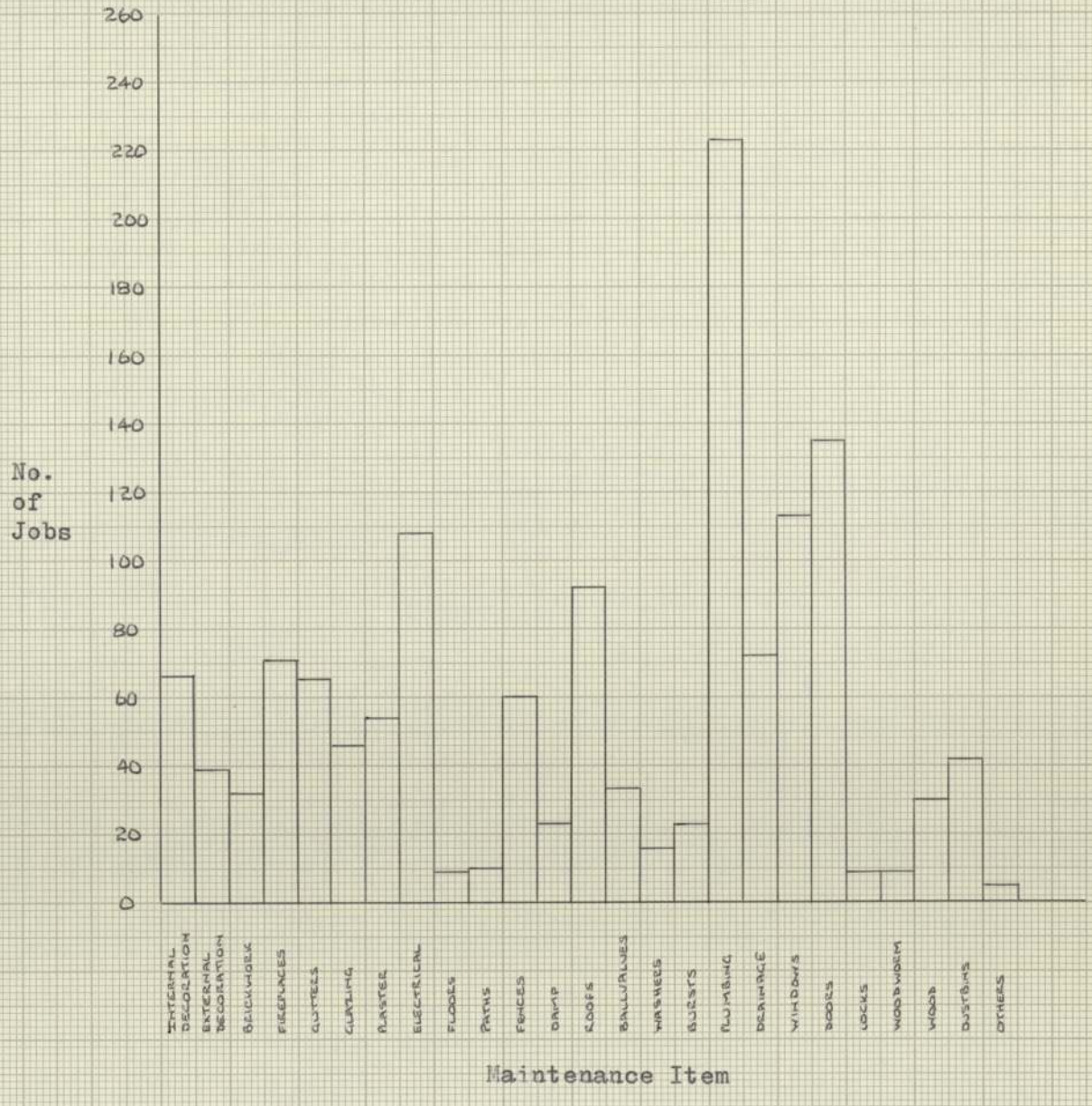


Fig. 11.

Number of Jobs related to maintenance item for the public landlord for the period 1966-1972



50. Over the six year period in question for every job carried out by the private landlord 2.3 jobs were carried out by the public landlord. The following table indicates the order of activity taking the maintenance item having the greatest number of jobs as 1.

TABLE U3

Maintenance Items in order of activity related to tenure group for the period 1966-1972

Maintenance Item	Order of Activity: Private Landlord Order	Private Landlord No.of Jobs	Public Landlord Order	Public Landlord No.of Jobs
Internal Decoration	18 =	10	8	66
External Decoration	2	81	14	39
Brickwork	15	14	16	32
Fireplaces	6	31	7	71
Gutters	11	18	9	65
Glazing	18 =	10	12	46
Plaster	23	4	11	54
Electrical	10	22	4	108
Floors	22	6	22=	9
Paths	25	-	21	10
Fences	12 =	17	10	60
Damp	21	7	18 =	23
Roofs	9	24	5	92
Ballvalves	5	45	15	33
Washers	16 =	11	20	16
Bursts	20	8	18 =	23
Plumbing	1	91	1	223
Drainage	3	47	6	72
Windows	4	46	3	113
Doors	12 =	17	2	135
Locks	14	15	22 =	9
Woodworm	24	1	22 =	9
Wood	16 =	11	17	30
Dustbins	8	27	13	42
Others	7	30	25	5

51. Table U3 clearly shows that plumbing created the greatest number of jobs in both sectors during the six years under study. Although external decoration was high in the order of activity in the private landlord sector it was comparatively low in the public sector. This variation can be explained by the fact that the six year period 1966-1972 covered two of the external redecoration cycles in the

private sector namely 1966 and 1971 but only one in the public sector, that of 1967. Both landlords adopting a five year cycle for external redecoration. A further factor with regard to the private sector was that 1966 was the first year the properties had been painted since they were first constructed. Drainage, windows, fireplaces, gutters, fences, brickwork, wood, bursts, floors and woodworm received a similar position in the order of activity in both sectors. The considerable activity in the public sector on attention to doors will be considered later.

Average Number of Hours per job related to Maintenance Item

52. Consideration of the number of hours per job was only possible in the public sector where the information could be derived from a study of the time sheets for the period 1968 to 1972. Although it would have been preferable to consider a similar six year period the time sheets for the financial years 1966/67 and 1967/68 had been destroyed. A detailed table of the number of hours spent on each maintenance item related to the 52 local authority dwellings can be seen in the Appendix. The following table gives the total number of hours, the number of jobs considered, the number of hours per job and the ranking order taking the shortest time first. The average number of hours per job can be seen diagramatically on Figure 12.

TABLE V3

Time to Complete the Maintenance Items for the Public Sector in the period 1968-1972

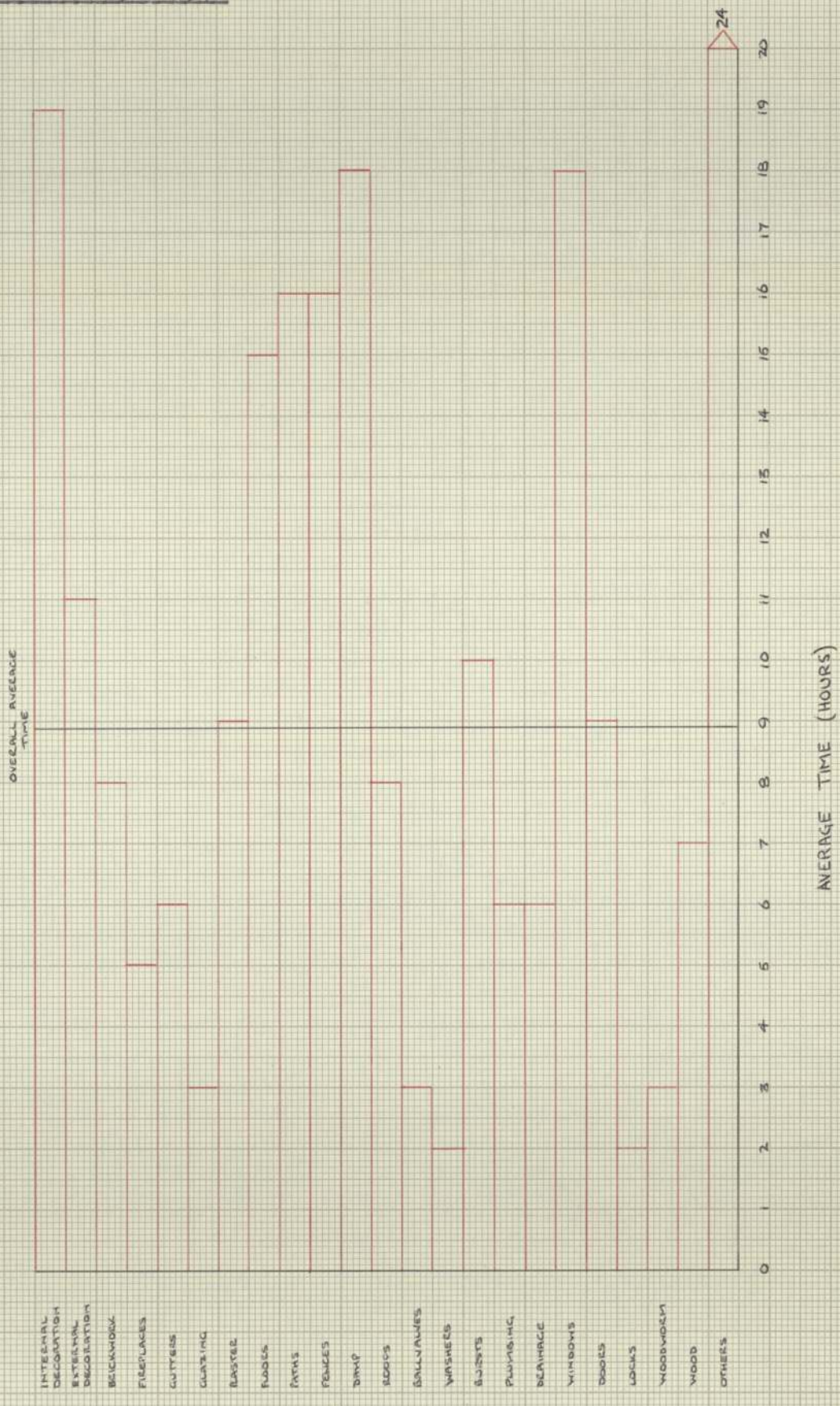
Maintenance Item	Total Hours Spent	% of Total	No.of Entries	Average Time	Order
Internal Decoration	877	10.91	45	19	22
External Decoration	416	5.18	38	11	16
Brickwork	194	2.41	23	8	11 =
Fireplaces	259	3.22	48	5	6
Gutters	294	3.66	48	6	7 =
Glazing	80	0.99	31	3	3 =
Plaster	395	4.92	46	9	13 =
Floors	120	1.50	8	15	17
Paths	146	1.82	9	16	18 =
Fences	732	9.11	47	16	18 =
Damp	183	2.27	10	18	20 =
Roofs	420	5.22	56	8	11 =
Ballvalves	77	0.96	29	3	3 =
Washers	31	0.39	15	2	1 =
Bursts	202	2.51	21	10	15
Plumbing	1,005	12.50	166	6	7 =
Drains	389	4.84	68	6	7 =
Windows	882	10.97	50	18	20 =
Doors	1,045	13.00	111	9	13 =
Locks	9	0.11	4	2	1 =
Woodworm	20	0.25	7	3	3 =
Wood	143	1.78	19	7	10
Others	119	1.48	5	24	23
Total	8,038	100.00	904		

53. The average time overall per job was 8.89 hours. The number of entries shown in Table V3 relate to a four year period and thus are not directly comparable with the number of jobs shown in Table U3. The average time was taken to the nearest hour.

54. As expected the replacement of locks and the re-washering of taps proved to be the shortest maintenance work. Similarly glazing, repairing or renewing ballvalves and the treatment of wood the subject of attack by woodworm were expected to and did take a relatively short time. On the question of the total number of hours spent, the number of hours devoted to the maintenance of doors appears excessively high and, indeed, accounts for 13% of the

Fig. 12.

Average time to complete each maintenance item in the public sector for the period 1968-1972



total number of hours spent in the four year period on the 52 houses in the study. The relatively few hours spent on external decoration is a feature which again appears when the cost of maintenance work is considered and can be attributed mainly to the lack of an external redecoration cycle in the four years studied. The extremely low amount of time spent on this aspect, however, must raise a question as to the adequacy of the decoration taking place. Clearly work on windows (10.97%), plumbing (12.50%), repairing fences (9.11%) and doors (13.00%) and the internal decoration of property (10.91%) account for a large element of the labour available with the repair of doors being the most labour intensive. These five items accounted for 56.49% of the total time spent on maintenance in the four year period.

Cost of Work related to Maintenance Item

55. Due to the destruction by the local authority of the time sheets relating to the financial years 1966/67 and 1967/68 the statistics relating to this sector cover the four years 1968 to 1972. During these four years £7,488.53 was spent on the maintenance of the 52 houses selected for study. In the private sector figures were available for the six years 1966 to 1972 and during this time £10,297.79 was spent on maintenance. The total cost of maintaining the properties under study related to the maintenance items already specified can be seen in Table W3.

TABLE W3

Total Cost of Maintenance related to Maintenance Items

Maintenance Item	Total Cost of Work (£) Public Sector	Private Sector
Internal Decoration	769.47	631.50
External Decoration	373.63	3596.41
Brickwork	112.37	312.84
Fireplaces	285.76	383.21
Gutters	238.91	87.15
Glazing	77.45	9.53
Plaster	368.90	35.81
Electrical	452.72	143.08
Floors	107.58	192.02
Paths	111.10	0.00
Fences	595.94	166.58
Damp	165.19	177.29
Roofs	338.88	1088.76
Ballvalves	66.83	92.54
Washers	27.99	16.23
Bursts	170.14	26.52
Plumbing	887.06	736.99
Drainage	335.08	452.31
Windows	784.73	752.25
Doors	978.41	66.32
Locks	8.34	36.18
Woodworm	17.23	268.93
Wood	124.47	17.71
Dustbins	*	59.68
Others	90.35	947.95
Totals	7,488.53	10,297.79

When considering Table W3 it is important to remember that the figures for the private sector cover a six year period whilst those for the public sector cover only a four year period. No figures are available for the item marked with an *. The considerable difference between the expenditure by the public landlord and private landlord on external decoration is explicable in part only. Although it has been pointed out that the figures for the private sector contain two external decoration cycles compared with the one in the public sector this does not explain a situation in which the private landlord is spending on average three times as much on

external decoration as the public landlord. The low nature of the public landlord's expenditure in this area of maintenance has, it is understood, been commented upon by the District Auditor at the Annual Audit.

56. The expenditure on door maintenance shows considerable variation between the two sectors. During the study period the public sector spent 22 times more money on door maintenance than the private sector. The explanation could lie in the attitude of the tenants or the quality of the doors used in the construction of the property or in the form of construction of door used.

57. The considerable expenditure in the private sector on "other" maintenance items is due to such items as alterations, the delivery of materials and the erection of cupboards and shelves being classified in this group. In certain cases the movement of furniture was also recorded in this item.

58. The large expenditure in the public sector on glazing was due to the replacement of glass broken by the expansion of rusting metal window frames. With regard to the considerable expenditure on paths in the public sector compared with the private sector this is almost certainly due to the siting of the private landlord's property in relation to the public footpath. Whilst the public sector dwellings were set back from the footpath the private sector dwellings were sited with either a small front garden or none at all. The area of paving to be maintained was thus considerably smaller in the case of the private landlord.

59. Due to the form in which the records were kept in the public sector it was necessary to calculate the total cost of maintenance

for each maintenance item from the total cost of labour derived from the time sheets. This calculation took the form of adding to the total cost of labour a 45% addition for materials and a further addition of 66⅔% of the labour cost for on costs. The addition of a figure of 45% of the labour cost to cover the cost of materials had to be adopted despite the fact that the addition would be excessive with such labour intensive items as internal decoration. Although an attempt was made to accurately deduce the cost of materials this proved abortive. It was possible to determine the materials used for each house in the public sector over the four year period but the costing of these items by the local authority was found to be impossible. The build-up of the total cost of maintenance in the public sector given in Table W3 is shown in the following Table.

TABLE X3

Derivation of the Total Maintenance Cost for the Public Sector

Maintenance Item	Total Labour Cost	Materials (45% of Labour)	On-costs (66⅔% of Labour)
Internal Decoration	363.47	163.60	242.40
External Decoration	176.51	79.42	117.70
Brickwork	53.09	23.88	35.40
Fireplaces	134.99	60.74	90.03
Gutters	112.85	50.79	75.27
Glazing	36.58	16.47	24.40
Plaster	174.28	78.42	116.20
Electrical	Sub-Contract Work		
Floors	50.82	22.87	33.89
Paths	52.48	23.62	35.00
Fences	281.54	126.70	187.70
Damp	78.03	35.12	52.04
Roofs	160.13	72.05	106.70
Ballvalves	31.57	14.21	21.05
Washers	13.22	5.95	8.82
Bursts	80.38	36.17	53.59
Plumbing	419.06	188.50	279.50
Drainage	158.34	71.24	105.50
Windows	370.73	166.80	247.20
Doors	462.21	208.00	308.20
Locks	3.94	1.77	2.63
Woodworm	8.14	3.66	5.43
Wood	58.80	26.46	39.21
Others	42.68	19.21	28.46
Totals	3323.84	1495.65	2216.32

60. In order to compare the maintenance expenditure with respect to the maintenance items already discussed, the average expenditure per house per year for each maintenance item was calculated with respect to both sectors. The average cost per job in relation to the maintenance item was also calculated. The average expenditure per house per year and the relationship of this expenditure per item as a percentage of the total average expenditure per house per year can be seen in Table Y3 and Figures 13 and 14. These figures depict the relationship of the average expenditure on each item of maintenance to the total average maintenance expenditure per house per year.

TABLE Y3

The Average Expenditure per house per year for each item of Maintenance for the Public and Private Sectors

Maintenance Item	Average Expenditure per house per year		Expenditure as a % of Total Average Expenditure	
	Public Sector	Private Sector	Public Sector	Private Sector
Internal Decoration	3.70	2.02	10.29	6.13
External Decoration	1.79	11.53	4.98	34.97
Brickwork	0.54	1.00	1.50	3.03
Fireplaces	1.37	1.23	3.81	3.73
Gutters	1.15	0.28	3.20	0.88
Glazing	0.37	0.03	1.03	0.09
Plaster	1.77	0.11	4.92	0.33
Electrical	2.18	0.46	6.06	1.40
Floors	0.52	0.61	1.45	1.85
Paths	0.53	0.00	1.48	0.00
Fences	2.86	0.53	7.96	1.61
Damp	0.79	0.57	2.20	1.73
Roofs	1.63	3.49	4.53	10.58
Ballvalves	0.32	0.29	0.89	0.88
Washers	0.13	0.05	0.36	0.15
Bursts	0.82	0.08	2.28	0.24
Plumbing	4.26	2.36	11.85	7.16
Drainage	1.61	1.45	4.48	4.40
Windows	3.77	2.41	10.49	7.31
Doors	4.70	0.21	13.08	0.64
Locks	0.04	0.11	0.11	0.33
Woodworm	0.08	0.86	0.22	2.61
Wood	0.59	0.06	1.64	0.18
Dustbins	*	0.19	*	0.58
Others	0.43	3.04	1.20	10.58

From Table Y3 it can be seen that the average annual total expenditure on maintenance in the public sector for the houses in the study was £35.95 which excludes the expenditure on the provision of dustbins. Since there were 42 dustbins provided in the public sector compared with the 27 in the private sector it is assumed that the cost of the provision of dustbins in the public sector was $\frac{42}{27}$ x the expenditure in the private sector. This, of course, assumes that the cost of providing dustbins is comparable in the two sectors. Such a calculated produces an average expenditure per house per year on

dustbins in the public sector of £0.45. With this expense included it can be seen that the average annual expenditure per house on maintenance in the public sector was £36.40. This is to be compared with the total average annual expenditure per house on maintenance in the private sector of £32.97.

61. In order to compare the maintenance profile of the two sectors the relationship of the average expenditure on the individual items and the total average expenditure was considered. Due to the inability of achieving an accurate figure for the expenditure on dustbins in the public sector this item was excluded from consideration in this section. If the assumption in the previous paragraph is accepted then the expenditure on dustbins would amount to about 1.25% of the total expenditure in the public sector on maintenance. The following table shows the relationship of the average expenditure per house per year on the individual items with the overall total expenditure.

TABLE Z3

Relationship of the average expenditure per house per year on each maintenance item compared with the total average expenditure per house per year on maintenance

Maintenance Item	% of Total Expenditure	
	Public Sector	Private Sector
Internal Decoration	10.29	6.13
External Decoration	4.98	34.97
Brickwork	1.50	3.03
Fireplaces	3.81	3.73
Gutters	3.20	0.88
Glazing	1.03	0.09
Plaster	4.92	0.33
Electrical	6.06	1.40
Floors	1.45	1.85
Paths	1.48	0.00
Fences	7.96	1.61
Damp	2.20	1.73
Roofs	4.53	10.58
Ballvalves	0.89	0.88
Washers	0.36	0.15
Bursts	2.28	0.24
Plumbing	11.85	7.16
Drainage	4.48	4.40
Windows	10.49	7.31
Doors	13.08	0.64
Locks	0.11	0.33
Woodworm	0.22	2.61
Wood	1.64	0.18
Dustbins	*	0.58
Others	1.20	9.22

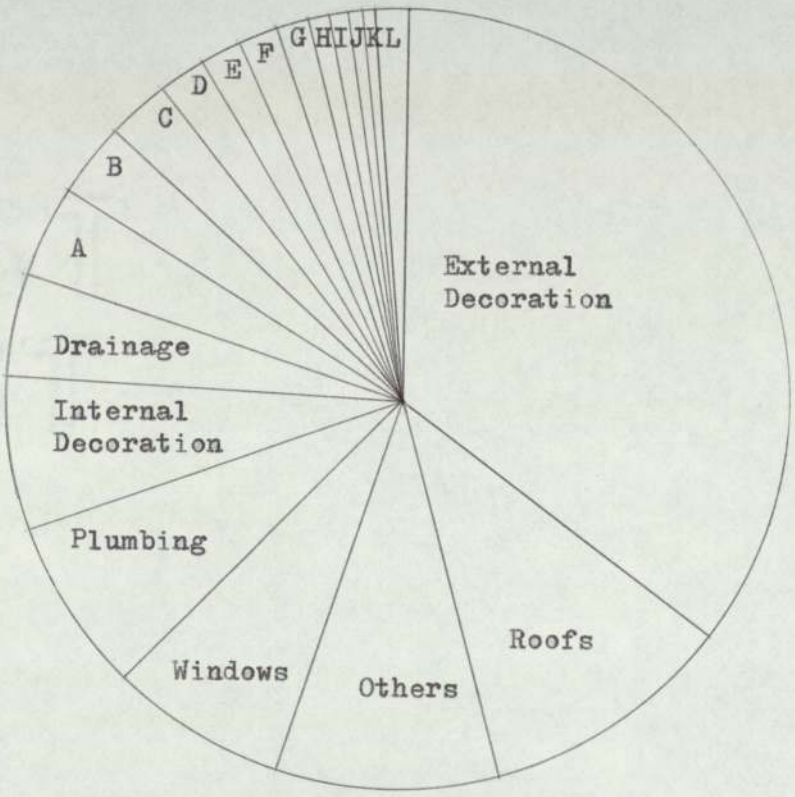
Table Z3 and Figures 13 and 14 again reveal the disparity between the maintenance expenditures on external decoration and doors. Table Z3 indicates a greater expenditure in the public sector on the external environment when the figures for the maintenance of fences and paths are considered.

62. To discover if there was a relationship between the average cost per job in the two sectors these were calculated. The figures can be seen in Table a3 together with the order by cost per job taking the most expensive as one. For comparability purposes it was assumed that the cost of providing dustbins was the same in

Figure. 13.

Private Sector

The relationship of the average expenditure per house per year on each item of maintenance to the total average maintenance expenditure per house per year.

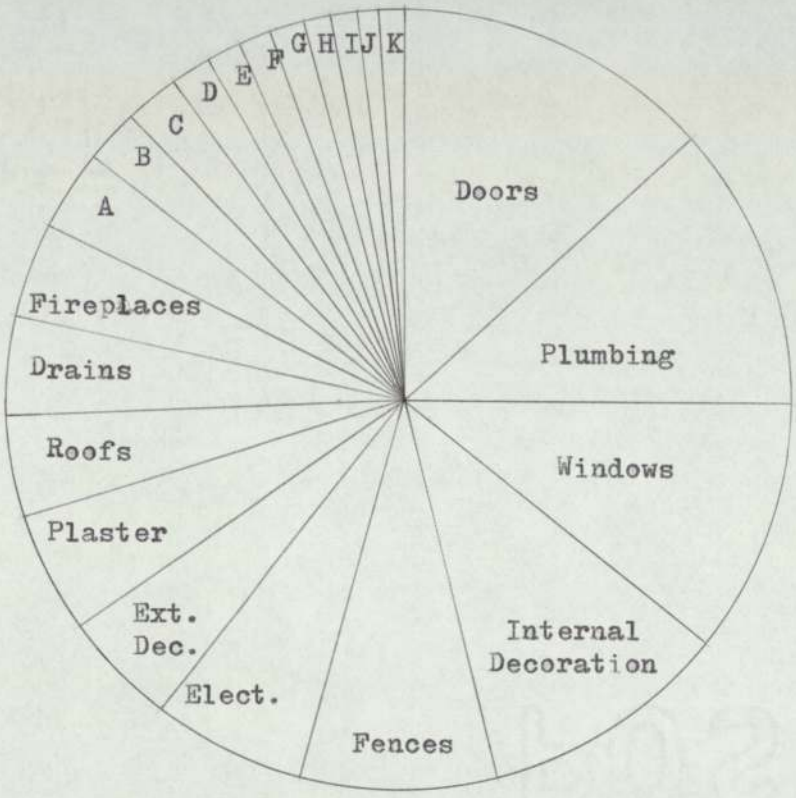


A - Fireplaces
B - Brickwork
C - Woodworm
D - Floors
E - Damp
F - Fences
G - Electrical
H - Ballvalves
I - Gutters
J - Doors
K - Dustbins
L - Plaster, Locks, Bursts, Wood, Washers and Glazing

Figure. 14.

Public Sector

The relationship of the average expenditure per house per year on each item of maintenance to the total average maintenance expenditure per house per year.



A - Gutters
B - Bursts
C - Damp
D - Wood
E - Brickwork
F - Paths
G - Floors
H - Others
I - Glazing
J - Ballvalves
K - Washers, Woodworm and Locks

both sectors.

TABLE a3

Cost per Job for the Public and Private Sectors

Maintenance Item	Cost per Job (£) Public Sector	Private Sector	Order by Cost per Jobs Public Sector	Private Sector
Internal Decoration	17.1	63.15	2	2
External Decoration	9.83	47.95	8	3
Brickwork	4.89	24.06	19	7
Fireplaces	5.95	13.68	15	10
Gutters	4.98	4.58	17	16
Glazing	2.49	1.06	20	24
Plaster	8.02	8.95	11	13
Electrical	7.94	6.50	12	15
Floors	13.45	38.40	5	5
Paths	12.34	0.00	7	25
Fences	12.68	11.10	6	11
Damp	16.51	25.33	3	6
Roofs	6.05	45.36	14	4
Ballvalves	2.30	2.20	22	22
Washers	1.86	1.47	25	23
Bursts	8.10	3.31	10	18
Plumbing	5.34	8.01	16	14
Drainage	4.93	9.42	18	12
Windows	15.69	17.49	4	9
Doors	8.81	4.14	9	17
Locks	2.08	2.78	24	19
Woodworm	2.46	268.93	21	1
Wood	6.55	2.21	13	20 =
Dustbins	2.21	2.21	23	20 =
Others	18.07	23.12	1	8

The figure for woodworm in the private sector should be disregarded since it related to only one job carried out on the 52 properties in the 6 year study period.

63. In order to test if the maintenance expenditure could be related to the floor area of the dwelling and the two sectors compared from this viewpoint, the average maintenance expenditure per square foot was calculated. It was found that the average floor area of the local authority dwelling was approximately twice that of the private landlord dwelling. The floor areas being 1,152

square feet in the public sector and 580 square feet in the private sector.

64. When these floor areas were compared with the average annual maintenance expenditures it was found that the average maintenance expenditure per square foot per year in the private sector was £0.05685, whilst the comparable figure for the public sector was £0.0316. It can be seen that since the major part of the total maintenance expenditure is for such items as doors, decoration, plumbing, windows and fences which do not vary directly with the increase or decrease of floor area such a relationship cannot be used. This confirms the work of Stone discussed in paragraph 84 of Chapter One. It would, however, appear that annual maintenance expenditures vary inversely with floor area.

Cost of Maintenance related to Type of House

65. As part of the study of annual maintenance expenditures it was felt that consideration should be given to relating the expenditures with the type of house to investigate if a relationship existed between these factors. Table b3 gives the average annual maintenance expenditures for the two sectors related to the 104 properties in the study. The table also shows the type of property, whether detached, semi-detached, end-terraced or middle terraced.

TABLE b3

Annual Maintenance Expenditures for 104 properties and form of Construction

Public Sector			Private Sector		
Property Reference	Average Annual Maintenance Expenditure	Form of Construction	Property Reference	Average Annual Maintenance Expenditure	Form of Construction
1	15.01	Semi	A	47.79	Terraced
2	20.71	Semi	B	11.48	E Terraced
3	12.37	Semi	C	22.36	Terraced
4	104.68	Semi	D	12.51	E Terraced
5	59.56	Semi	E	50.26	Terraced
6	6.35	Semi	F	89.80	E Terraced
7	8.02	Semi	G	70.76	Terraced
8	39.55	Semi	H	21.29	Terraced
9	65.40	E Terraced	I	57.91	Terraced
10	35.25	Terraced	J	81.50	E Terraced
11	29.21	Terraced	K	137.60	Detached
12	37.64	E Terraced	L	10.70	Terraced
13	40.90	E Terraced	M	7.93	Terraced
14	63.98	Terraced	N	11.31	Terraced
15	22.12	Terraced	O	13.24	Terraced
16	47.45	E Terraced	P	11.60	Terraced
17	35.85	Semi	Q	7.57	Terraced
18	19.63	Semi	R	13.71	Terraced
19	18.65	Semi	S	15.29	Terraced
20	33.07	Semi	T	32.27	Terraced
21	31.15	Semi	U	23.08	Terraced
22	29.28	Semi	V	14.05	Terraced
23	29.70	E Terraced	W	32.23	Terraced
24	31.21	Terraced	X	32.23	Terraced
25	14.85	Terraced	Y	12.38	Terraced
26	39.60	E Terraced	Z	11.55	Terraced
27	29.95	E Terraced	a	33.68	Terraced
28	15.80	Terraced	b	10.60	E Terraced
29	37.52	Terraced	c	25.51	Semi
30	28.76	E Terraced	d	33.91	Semi
31	20.37	Semi	e	16.35	E Terraced
32	31.22	Semi	f	17.21	Terraced
33	77.34	Semi	g	24.59	Terraced
34	12.82	Semi	h	40.42	E Terraced
35	13.12	Semi	i	22.29	E Terraced
36	16.30	Semi	j	21.08	Terraced
37	49.64	Semi	k	41.71	Terraced
38	24.54	Semi	l	25.03	E Terraced
39	253.99	Semi	m	49.02	E Terraced
40	24.93	Semi	n	37.33	Terraced
41	68.65	Semi	o	42.42	Terraced
42	24.44	Semi	p	59.77	Terraced
43	26.01	Semi	q	49.16	Terraced
44	90.53	Semi	r	68.22	E Terraced

TABLE b3 (CONT'D)

Public Sector			Private Sector		
Property Reference	Average Annual Maintenance Expenditure	Form of Construction	Property Reference	Average Annual Maintenance Expenditure	Form of Construction
45	9.35	E Terraced	s	44.81	E Terraced
46	7.64	Terraced	t	26.40	Terraced
47	15.25	Terraced	u	26.03	Terraced
48	15.36	E Terraced	v	26.53	Terraced
49	16.79	Semi	w	34.11	E Terraced
50	15.69	Semi	x	14.99	Semi
51	35.98	Semi	y	15.78	Semi
52	14.46	Semi	z	59.81	Semi

The figures for the public sector are averaged over a four year period, 1968 to 1972, whilst those for the private sector are averaged over the six year period 1966 to 1972. The detailed derivation of these figures can be seen in the appendix.

66. From Table b3 it can be seen that the average annual maintenance expenditure in the public sector ranged from £6.35 to £253.99 whilst the range in the private sector was from £7.57 to £137.60. In order to show the spread of average annual maintenance expenditures Figures 15 and 16 were prepared. These show a comparable spread for the sample of houses studied in the two sectors. Figures 15 and 16 were produced from the figures given in Table c3 which were also used to calculate the median and modal annual maintenance expenditure for the two sectors. The median annual maintenance expenditure in the public sector was £26.33 compared with £26 in the private sector. The modal maintenance expenditure in the public sector was found to be £14 as compared with £12.67 in the

Fig. 15.

Frequency of occurrence of average annual maintenance expenditures for the public and private landlord

Public Sector red
Private Sector black

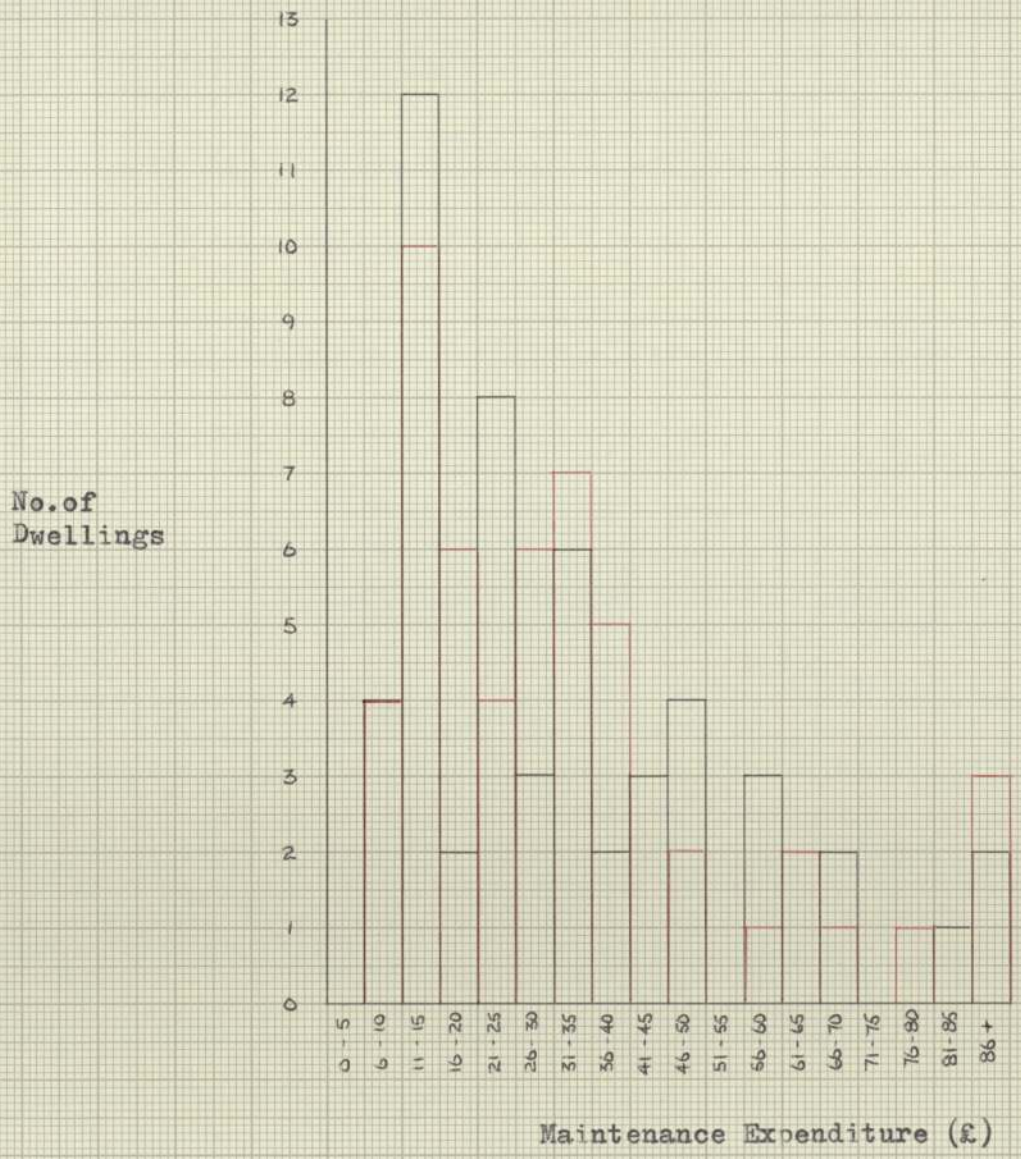
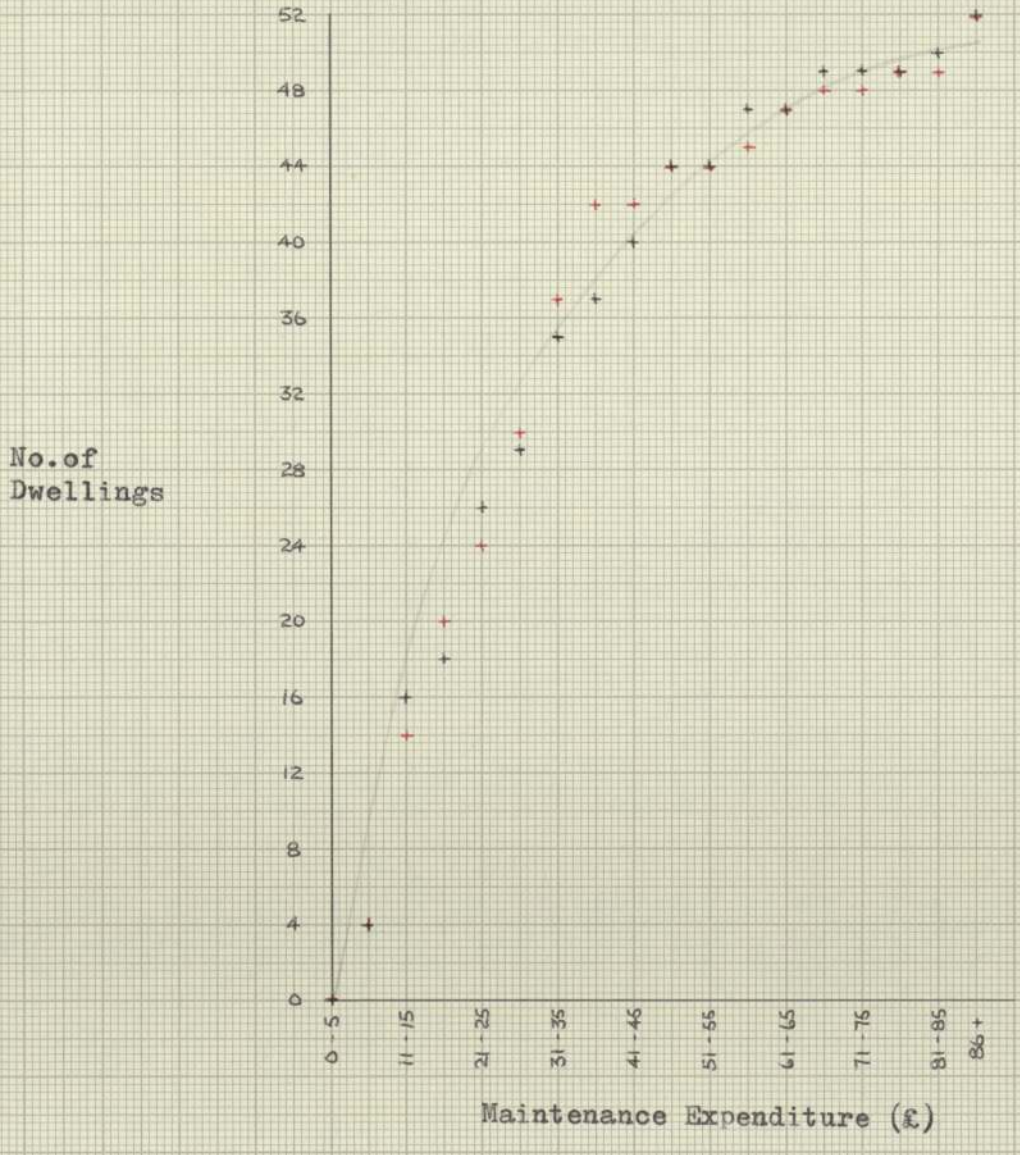


Fig. 16.

Cumulative frequency curve for average annual maintenance expenditures for the public and private landlord

Public Sector red
Private Sector black



private sector. (A)

TABLE c3

Annual Repair Expenditures for the Public and Private Sector

Repair Expenditure in £'s	Private Sector No. of Dwellings	Private Sector Cumulative Frequency	Public Sector No. of Dwellings	Public Sector Cumulative Frequency
0 - 5	0	0	0	0
6 - 10	4	4	4	4
11 - 15	12	16	10	14
16 - 20	2	18	6	20
21 - 25	8	26	4	24
26 - 30	3	29	6	30
31 - 35	6	35	7	37
36 - 40	2	37	5	42
41 - 45	3	40	0	42
46 - 50	4	44	2	44
51 - 55	0	44	0	44
56 - 60	3	47	1	45
61 - 65	0	47	2	47
66 - 70	2	49	1	48
71 - 75	0	49	0	48
76 - 80	0	49	1	49
81 - 85	1	50	0	49
86 plus	2	52	3	52

67. It is difficult to explain from the building technology viewpoint why 52 dwellings of similar construction and age should show such a wide variation in the cost of maintenance. Thus before turning to the question of the relationship between maintenance

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(A) Derivation of median and modal annual maintenance expenditures.

Median annual maintenance expenditure

Private sector $= £26 + \frac{(\frac{52}{2} - 26)}{3} = £26$

Public sector $= £26 + \frac{(\frac{52}{2} - 24)}{6} = £26.33$

Modal annual maintenance expenditure

Private sector $= £11 + \frac{5 \times 2}{4 + 2} = £12.67$

Public sector $= £11 + \frac{5 \times 6}{4 + 6} = £14$

expenditure and form of construction the extremes in average annual maintenance expenditures need further consideration. The influence of the age of the tenant will be considered later. In the private sector the extremes in average annual maintenance expenditures were investigated further to try to ascertain the causes.

68. Property Q, which had the lowest expenditure, was found to be scheduled for modernisation and was occupied by a single man of over 66 years of age who did not wish to be disturbed by modernisation. The landlord was thus only carrying out essential repairs until such time as the tenant could be transferred to a different property or died. Similar sociological reasons were found for the low nature of the maintenance expenditures with properties B, M, P, S, Y, b and x. With the remaining properties having a below average maintenance expenditure it was discovered that they had been the subject of modernisation as, for example, properties N, O, R, V, Z, e and y. The effect of modernisation on maintenance expenditures could not be shown to be related to any regular pattern, indeed, in some cases the maintenance expenditures of modernised properties were well above average as with properties m to s.

69. Returning to the relationship between maintenance expenditure and form of construction it was found that in the sample of 52 public landlord dwellings 32 were semi-detached, 10 were end-terraced and the remaining 10 terraced. The private sector sample contained 33 terraced properties, 13 end-terraced, 5 semi-detached and 1 detached. Although it was found that the average annual maintenance expenditure for the detached property in the samples was £137.60 it was not possible to consider this figure in relation to the study

of expenditure related to form of construction due to their being insufficient detached properties in the sample of 104 properties selected. The following table shows the total and average expenditures on maintenance related to the form of construction. Figure 17 diagramatically represents this relationship.

TABLE d3

Maintenance Expenditures in the Public and Private Sector related to the form of construction

	Private Sector			Public Sector			Both Sectors		
	S	ET	T	S	ET	T	S	ET	T
Total Expenditure	150	506.14	925.42	1250.70	344.11	272.83	1400.70	850.25	1198.25
No. of Dwellings	5	13	33	32	10	10	37	23	43
Average Expenditure	30	38.63	28.04	39.08	34.41	27.28	37.86	36.96	27.86

S - Semi-detached ET - End-terraced T - Terraced

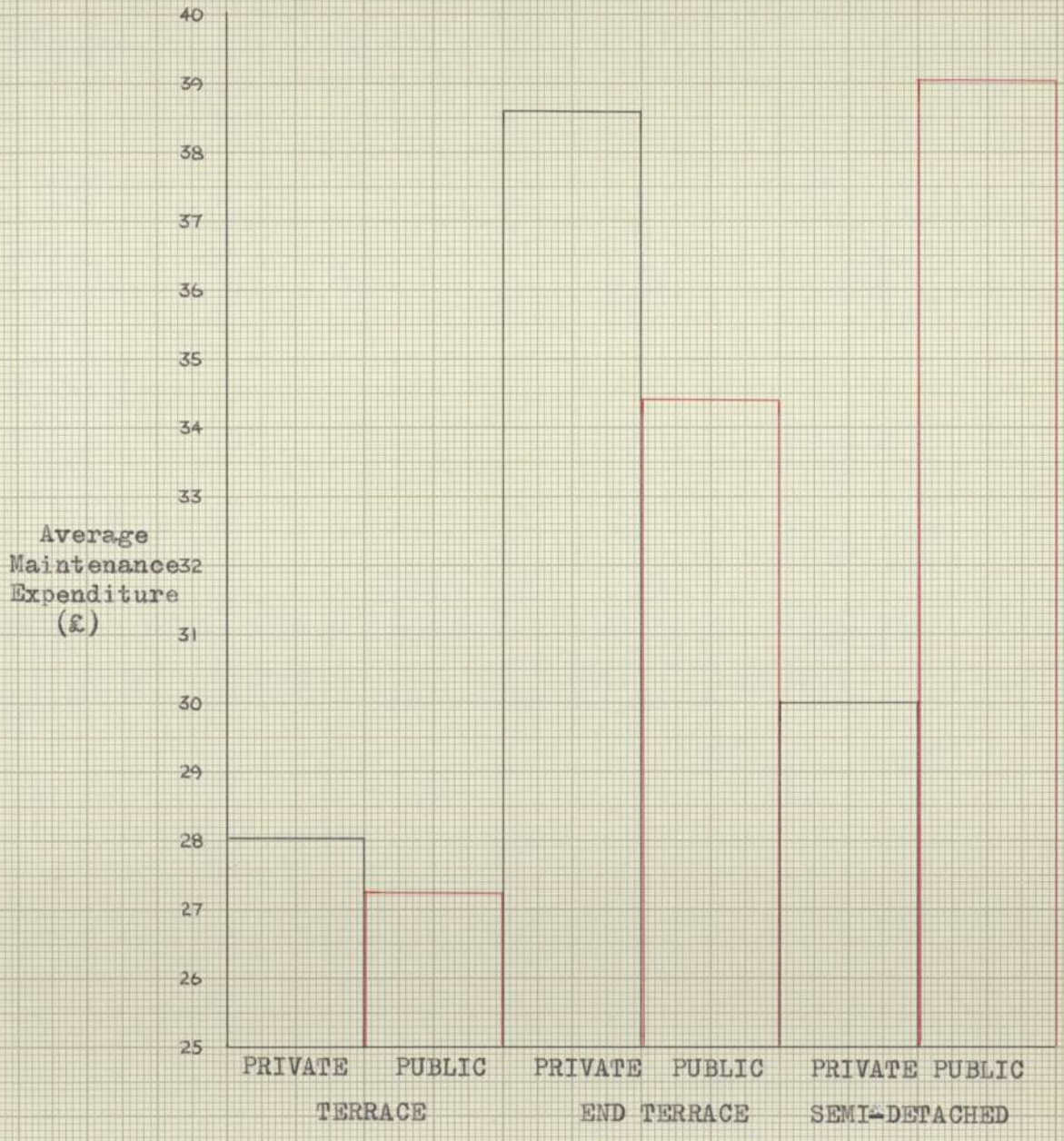
70. The figures show a relationship between maintenance expenditures and form of construction. The cheapest form of construction from the viewpoint of maintenance is the terraced dwelling followed by the end-terraced dwelling and the semi-detached dwelling. If the one detached property is included then it can be seen that maintenance expenditures are directly related to the external surface area. Thus as the external surface area is increased so too is the number of windows, the area of woodwork to be painted and the length of gutters etc. and hence the annual maintenance expenditure is also increased.

Complaint to Completion Time related to maintenance item

71. A comparison between the complaint by the tenant and the completion of the work intervals in relation to the maintenance

Fig. 17.

Maintenance Expenditures in the Public and Private Sector related to the form of construction



items studied was not possible in the private sector due to the fact that such information was not recorded. The owner's agent expressed the view that plumbing and repairs to locks should be carried out within one week of a complaint whilst major items would be carried out within one month. In the public sector due to the availability of records which showed the date of the complaint by the tenant and the date when the work was completed it was possible to calculate for each maintenance item the period of delay in days. The total number of days calculated takes no account of non-working days due to weekends, bank holidays and staff holidays.

72. Table e3 and Figure 18 show the results of this aspect of the study which are based on the information derived from the job sheets. A more detailed breakdown of these statistics can be seen in the appendix. The figures relate to the 6 year period 1966 to 1972.

TABLE e3

Complaint to Completion Time for the Public Sector 1966 to 1972

Maintenance Item	Total Days	No of Jobs	Average Time (Days)	Order (Shortest Completion First)
Internal Decoration	1820	60	30	12
External Decoration	108	7	15	9
Brickwork	4323	26	166	22
Fireplaces	1053	52	20	10
Gutters	3517	44	80	20
Glazing	1387	40	35	14
Plaster	1888	47	40	16
Floors	215	7	31	13
Paths	474	6	79	19
Fences	1601	45	36	15
Damp	2407	21	115	21
Roofs	5094	72	71	18
Ballvalves	233	21	11	8
Washers	45	6	7	6
Bursts	36	7	5	2 =
Plumbing	1202	135	9	7
Drainage	609	27	23	11
Windows	14685	79	186	23
Doors	5309	94	56	17
Locks	24	8	3	1
Woodworm	57	9	6	4 =
Wood	145	23	6	4 =
Dustbins	225	41	5	2 =
Total	46457	877		

Fig. 18.

Complaint to Completion Time related to Maintenance Item for the Public Sector 1966 to 1972

73. The results of this study, as shown in Table e3 and Figure 18, reveal a considerable variation in the time taken in remedying defects brought to the attention of the local authority by the tenant. The average time from complaint to completion for all work was 53 days or 7 weeks 4 days. The range of completion times was from 3 days for repairing and replacing locks to 186 days for repairing and replacing windows. The excessive length of time to deal with window defects is due to the practice of leaving certain joinery work as "bad-weather" work. Thus considerable delays can result if complaints arrive at the local authority office in early spring. This practice is partly responsible for the above average length of time taken to remedy door defects. The doors in the sample of houses studied were of an arch design which could not be ordered from a builder's supplier but had to be made up by the joiner. The short length of time to deal with both internal and external decoration was due to the painters making up their own job sheet when a dwelling became due for decoration and thus is not a true reflection of a complaint to completion time.

74. The average time of 115 days to deal with complaints of dampness would seem unreasonable. Section 4 of the Defective Premises Act 1972 places a duty on a landlord to take such care as is reasonable in all the circumstances to see that the tenant is reasonably safe from personal injury and that the tenant's property is safe from damage due to a relevant defect. Personal Injury in this case includes any disease and any impairment of a persons physical or mental condition. The duty is owed if the landlord knows of the relevant defect and an offence is committed if he fails

to carry out the necessary maintenance or repair. Since dampness is likely to result in damage to furniture and clothing the local authority is likely to be in breach of the duty placed upon it by this act when it comes into force on 1st January, 1974. Particular attention should thus be given by landlords to complaints relating to defects which are liable to cause personal injury or damage to property as for example dampness, burst pipes, woodworm, ceiling plaster, slipped tiles and broken sash cords. It is also clear that more prompt attention should be given to dealing with superficial defects before they develop into major structural defects as for example, a cracked rainwater pipe if left unattended will eventually lead to perished pointing and brickwork, penetrating damp, perished internal wall plaster and depending on the situation rotten woodwork. The study revealed that rainwater pipes took an average of 80 days to be repaired. Rainwater pipes were included with gutters.

Annual Repair Costs related to Age of Occupant

75. The House Condition Index survey revealed no variation in the degree of maintenance deficiency in the private landlord sector between property occupied by tenants above 65 years of age and property occupied by tenants below 65 years of age. To check this result in the public sector the age of the occupant was compared with the average annual maintenance expenditure.

76. Of the 52 properties studied 21 were occupied by tenants who were between 40 and 50 years of age and the remaining 31 were occupied by tenants above 50 years of age. The properties occupied by

tenants in the 40 - 50 age bracket were property numbers 5, 6, 11, 12, 14, 18, 19, 24, 25, 26, 29, 30, 31, 32, 34, 38, 41, 48, 49, 50 and 51. It was found that the average annual repair expenditure for property occupied by tenants in the 40 - 50 years age bracket was £29.92 whereas the average expenditure for the over 50 years age category was £39.98. This result was contrary to expectations and an explanation is difficult to find. It could be that the higher expenditure in the older age bracket is a reflection of the lack of "do-it-yourself" activity in this category.

77. The private sector revealed a total reversal of the relationship found in the public sector. This was due to the low rents which were allied with the older tenants and the resultant lack of modernisation. This relationship was previously considered in paragraph 68.

Seasonal Variation in Maintenance Items

78. In order to plan and control building maintenance work it is essential to prepare an annual plan based on the analysis of the incidence of the various maintenance items. A study carried out by the Local Government Operational Research Unit for Slough Borough revealed a seasonal trend in small electrical jobs with a peak in December (LGORU 1970 5) and it was felt that in view of the availability of statistical information a study should be made to ascertain if a seasonal variation existed in other maintenance items and to compare the variation in the two sectors.

79. In order to study the seasonal variation in maintenance work the occurrence of each maintenance job was related to the month of

the year. In this way 1,385 jobs were related to the month in the public sector and 593 jobs so related in the private sector. The results of this breakdown can be seen in Tables f3 and g3.

TABLE f3

Seasonal Variation in Maintenance Items for the Public Sector 1966-1972

Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Int. Decoration	10	8	5	8	6	4	5	4	6	3	4	3	66
Ext. Decoration	-	-	2	1	21	2	2	-	-	4	2	5	39
Brickwork	5	1	3	-	-	2	1	2	2	3	13	-	32
Fireplaces	11	8	6	4	7	2	2	1	3	6	8	13	71
Gutters	-	11	3	3	9	6	7	8	5	7	2	4	65
Glazing	3	2	7	4	3	5	6	4	3	4	1	4	46
Plaster	3	9	5	10	3	3	7	-	2	2	6	4	54
Electrical	6	16	14	10	1	11	9	5	5	6	11	14	108
Floors	1	-	-	1	1	-	2	1	-	1	1	1	9
Paths	-	-	-	1	1	3	-	1	2	-	1	1	10
Fences	6	2	6	7	6	2	6	5	4	4	6	6	60
Damp	3	4	3	2	2	1	-	1	1	2	2	2	23
Roofs	3	6	4	7	15	2	4	7	11	14	15	4	92
Ballvalves	5	3	3	2	2	1	1	1	3	8	2	2	33
Washers	-	2	-	-	1	2	1	3	1	1	4	1	16
Bursts	1	5	2	1	2	-	1	3	2	1	2	3	23
Plumbing	20	18	15	14	25	16	19	18	21	20	18	19	223
Drainage	12	7	10	2	8	1	5	4	8	5	4	6	72
Windows	2	3	6	9	8	11	16	7	17	16	12	6	113
Doors	11	24	9	9	9	10	4	3	7	18	20	11	135
Locks	-	2	-	2	-	1	1	-	1	1	-	1	9
Woodworm	1	1	1	-	-	-	2	1	1	2	-	-	9
Wood	4	4	4	1	6	1	2	1	-	4	-	3	30
Dustbins	11	2	2	1	-	3	8	6	2	2	4	1	42
Others	-	-	-	1	-	1	2	-	-	-	-	1	5
Total	118	138	110	100	136	90	113	86	107	134	138	115	1385

In order to consider the seasonal variation further Figures 19 to 28 were prepared for external decoration, fireplaces, electrical work, roofs, ballvalves, plumbing, drainage, windows, doors and dustbins. The remaining items were not diagramatically represented due to the small number of jobs being considered.

TABLE g3

Seasonal Variation in Maintenance Items for the Private Sector 1966-1972

Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Int. Decoration	1	-	-	1	-	-	-	2	2	3	-	1	10
Ext. Decoration	-	2	6	29	-	9	6	8	16	5	-	-	81
Brickwork	-	-	1	1	7	-	-	-	1	2	1	1	14
Fireplaces	2	1	4	4	-	1	2	2	4	3	6	2	31
Gutters	1	-	2	1	1	3	7	-	1	2	-	-	18
Glazing	-	1	1	2	-	1	-	-	-	5	-	-	10
Plaster	1	-	2	-	-	1	-	-	-	-	-	-	4
Electrical	-	3	1	1	4	4	1	1	3	1	2	1	22
Floors	-	2	-	1	-	-	1	1	-	1	-	-	6
Paths	-	-	-	-	-	-	-	-	-	-	-	-	-
Fences	-	1	-	1	4	3	1	1	5	-	1	-	17
Damp	-	3	-	-	1	-	-	-	-	1	1	1	7
Roofs	3	5	3	1	1	2	1	2	3	2	1	-	24
Ballvalves	1	4	3	1	4	7	5	5	7	1	4	3	45
Washers	2	1	3	-	-	-	1	1	-	-	2	1	11
Bursts	1	1	-	3	-	1	1	-	1	-	-	-	8
Plumbing	7	5	4	8	4	6	8	8	16	8	8	9	91
Drainage	5	1	3	6	2	7	10	6	1	3	1	2	47
Windows	2	3	3	8	1	10	4	4	3	3	2	3	46
Doors	1	3	3	2	-	1	1	3	1	1	-	1	17
Locks	2	1	1	-	1	2	2	2	3	-	-	1	15
Woodworm	-	-	-	-	-	1	-	-	-	-	-	-	1
Wood	1	-	1	-	-	1	1	-	2	2	1	2	11
Dustbins	3	2	-	2	4	-	6	3	1	3	1	2	27
Others	2	5	4	2	1	5	3	-	-	4	2	2	30
Total	35	44	45	74	35	65	61	49	70	50	33	32	593

80. Figures 19 to 28 and Tables f3 and g3 reveal a considerable variation in the monthly activity with regard to the various maintenance items. With external decoration Figure 19 shows a peak of activity in April/May for both sectors. Whilst the public sector levels out the private sector shows a further peak of activity in September. It is to be expected that the greatest activity should occur during the better weather. Table f3 shows the relationship in activity between internal and external decoration in the public sector.

81. The repair and replacement of defective fireplaces shows a distinct seasonal variation in the public sector which is not,

Fig. 19.

Seasonal Variation in External Decoration for the Public and Private Sector 1966 - 1972

Public Sector red
Private Sector black

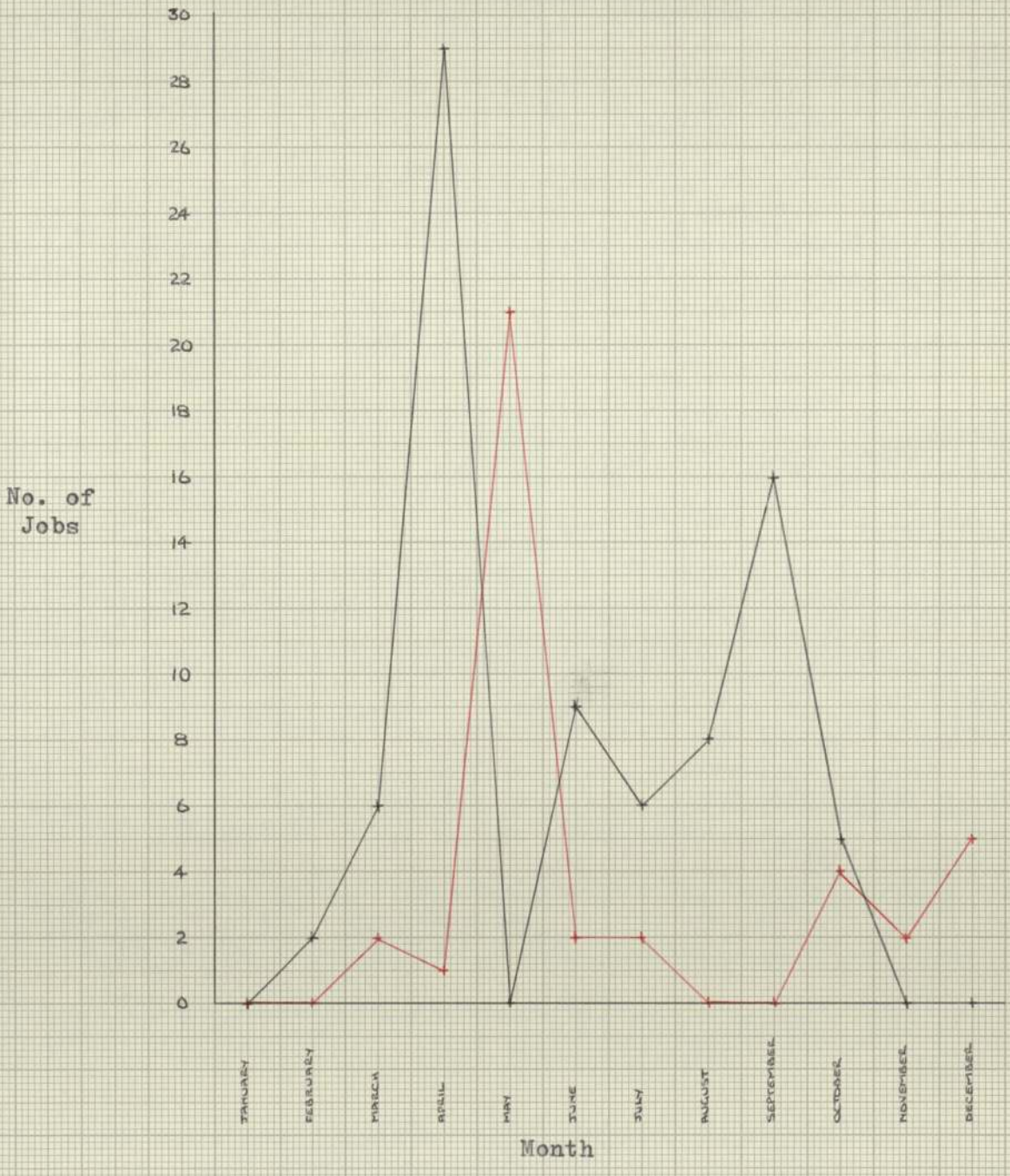


Fig. 20.

Seasonal Variation in Fireplace Work for the Public and Private Sector 1966 - 1972

Public Sector red
Private Sector black

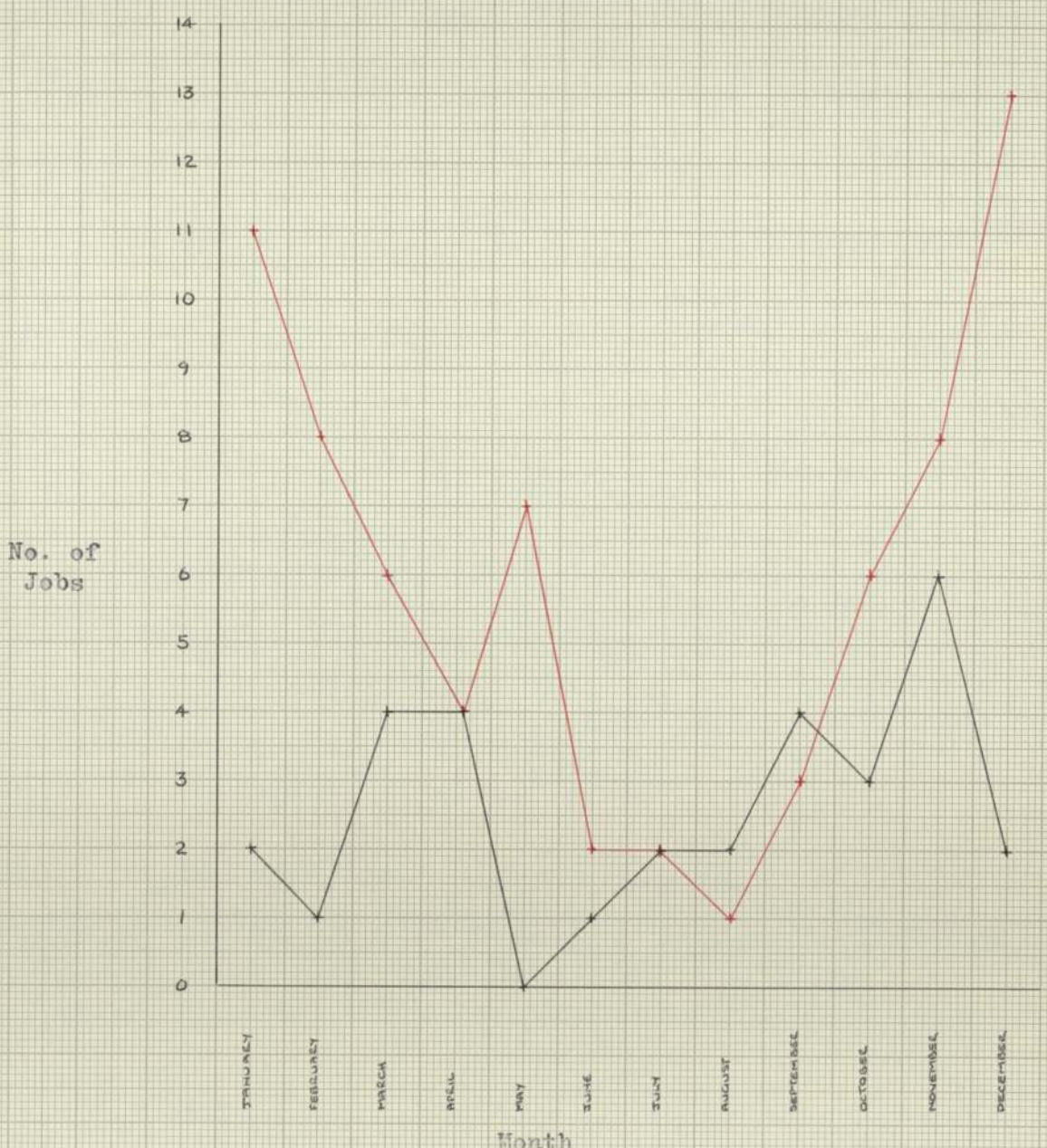


Fig. 21.

Seasonal Variation in Electrical Work for the Public and Private Sector 1966 - 1972

Public Sector red
Private Sector black

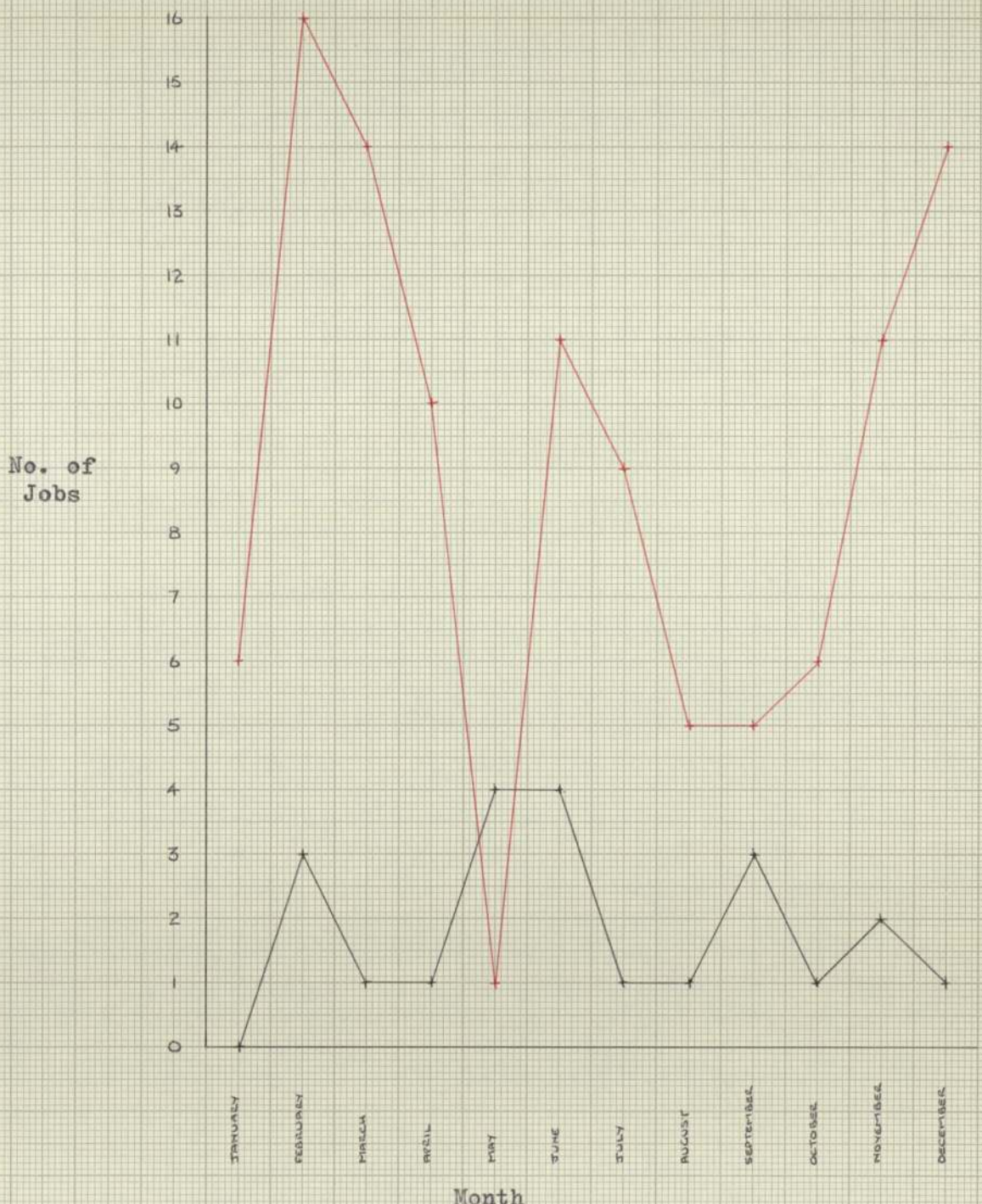


Fig. 22.

Seasonal Variation in Roofing Work for the Public and Private Sector 1966 - 1972

Public Sector red
Private Sector black

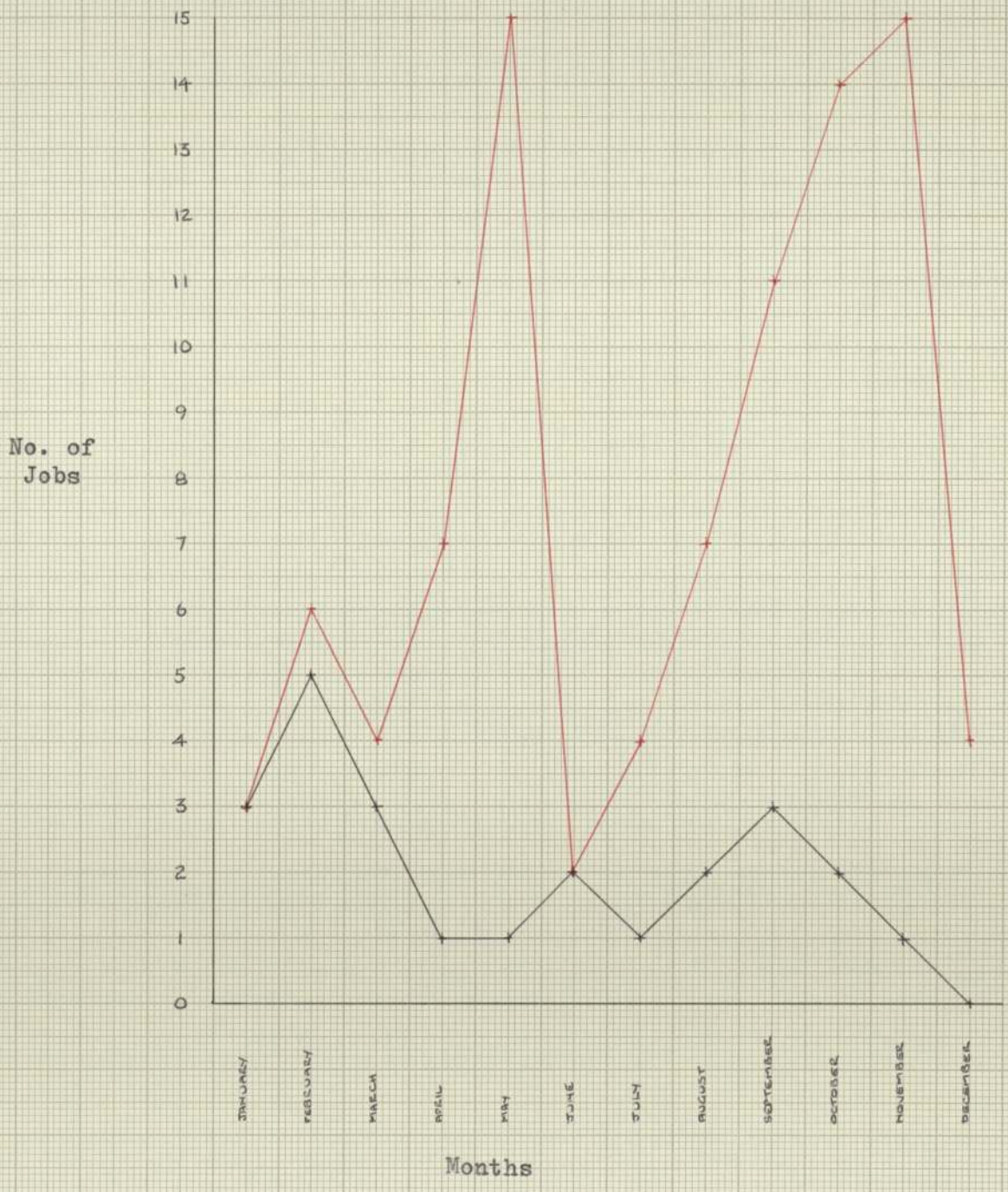


Fig. 23.

Seasonal Variation in Ballvalve Repairs for the Public and Private Sector 1966 - 1972

Public Sector red
Private Sector black

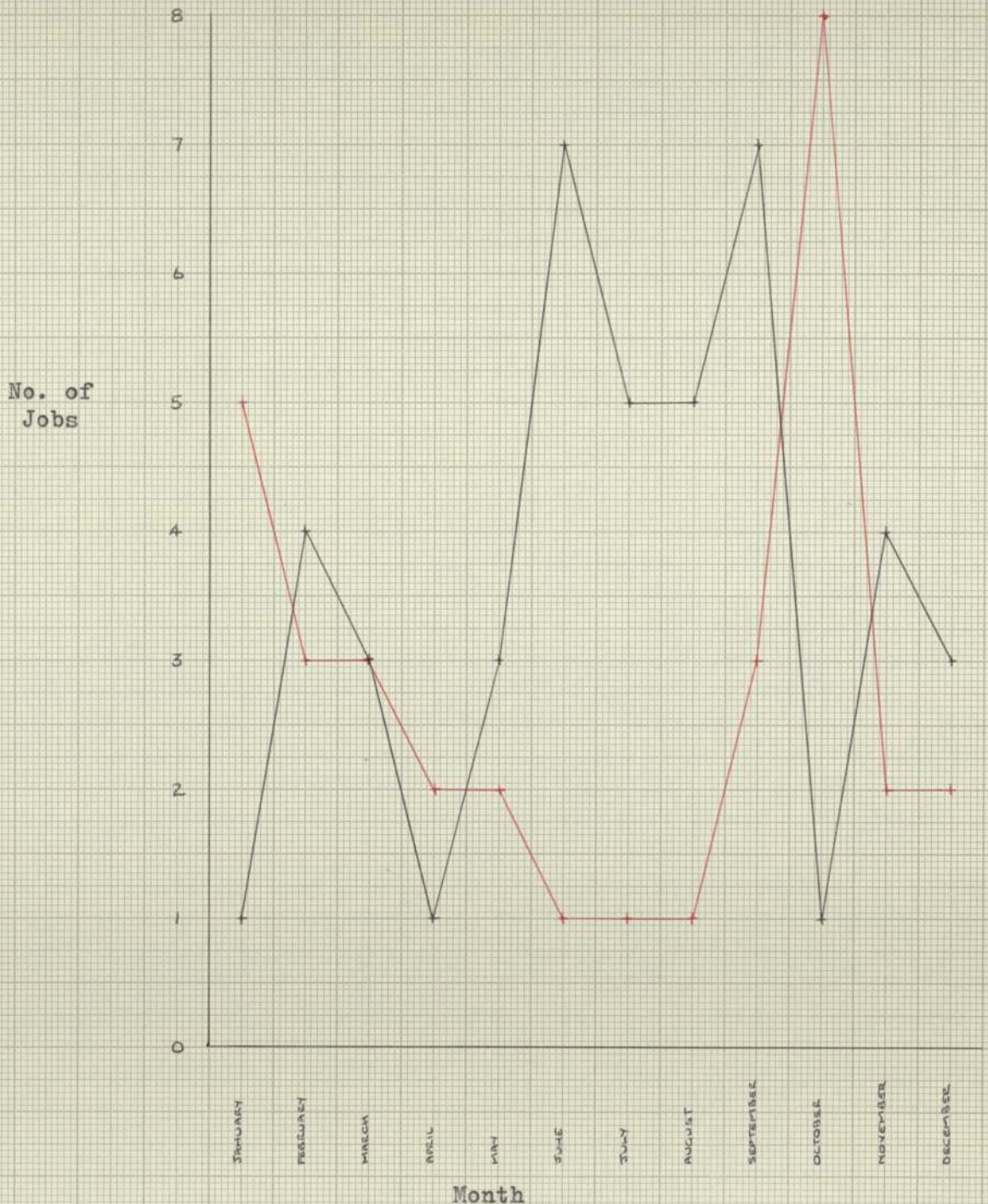


Fig. 24.

Seasonal Variation in Plumbing Repairs for the Public and Private Sector 1966 - 1972

Public Sector red
Private Sector black

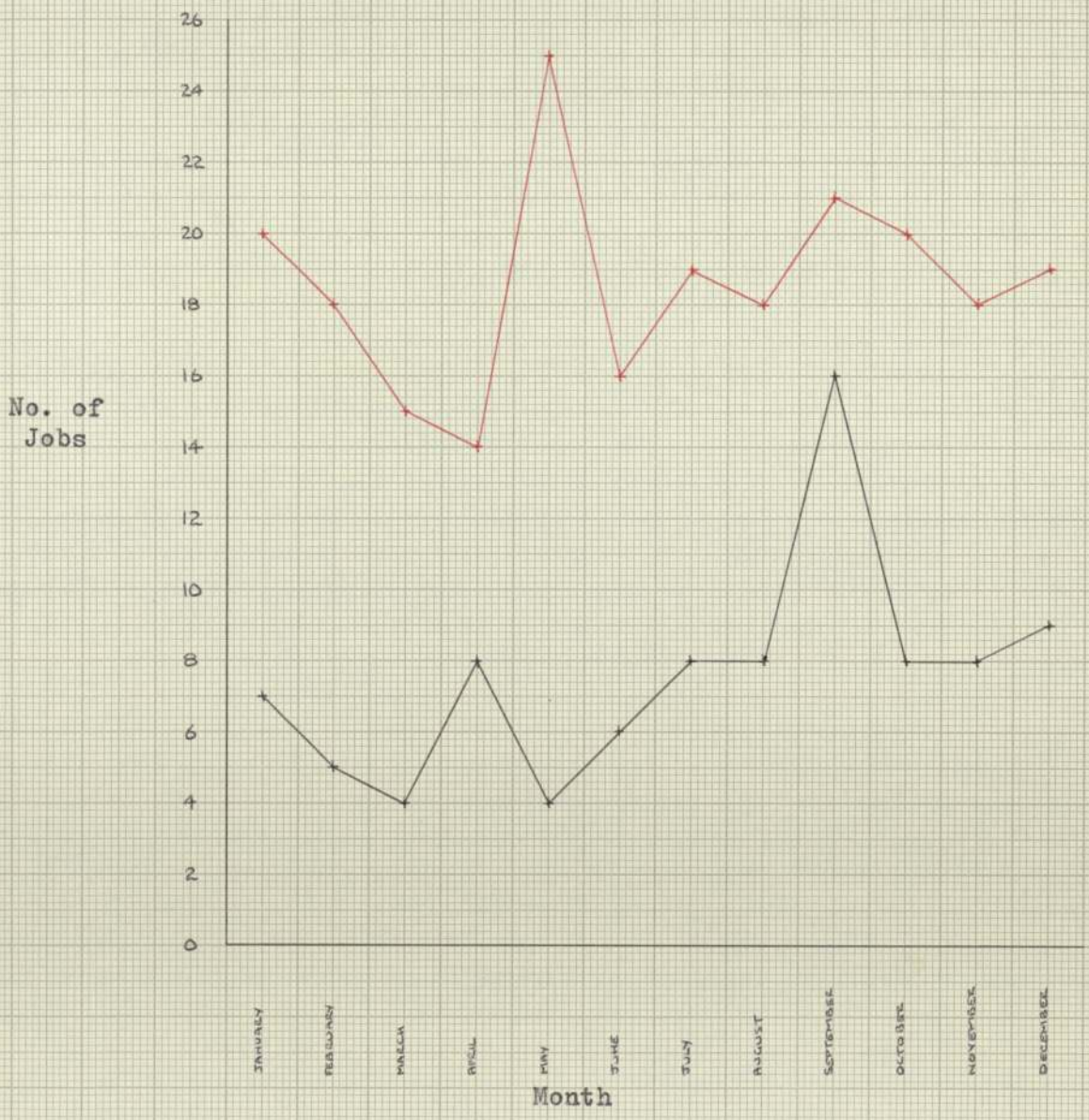


Fig. 25.

Seasonal Variation in Drainage Repairs for the Public and Private Sector 1966-1972

Public Sector red

Private sector black

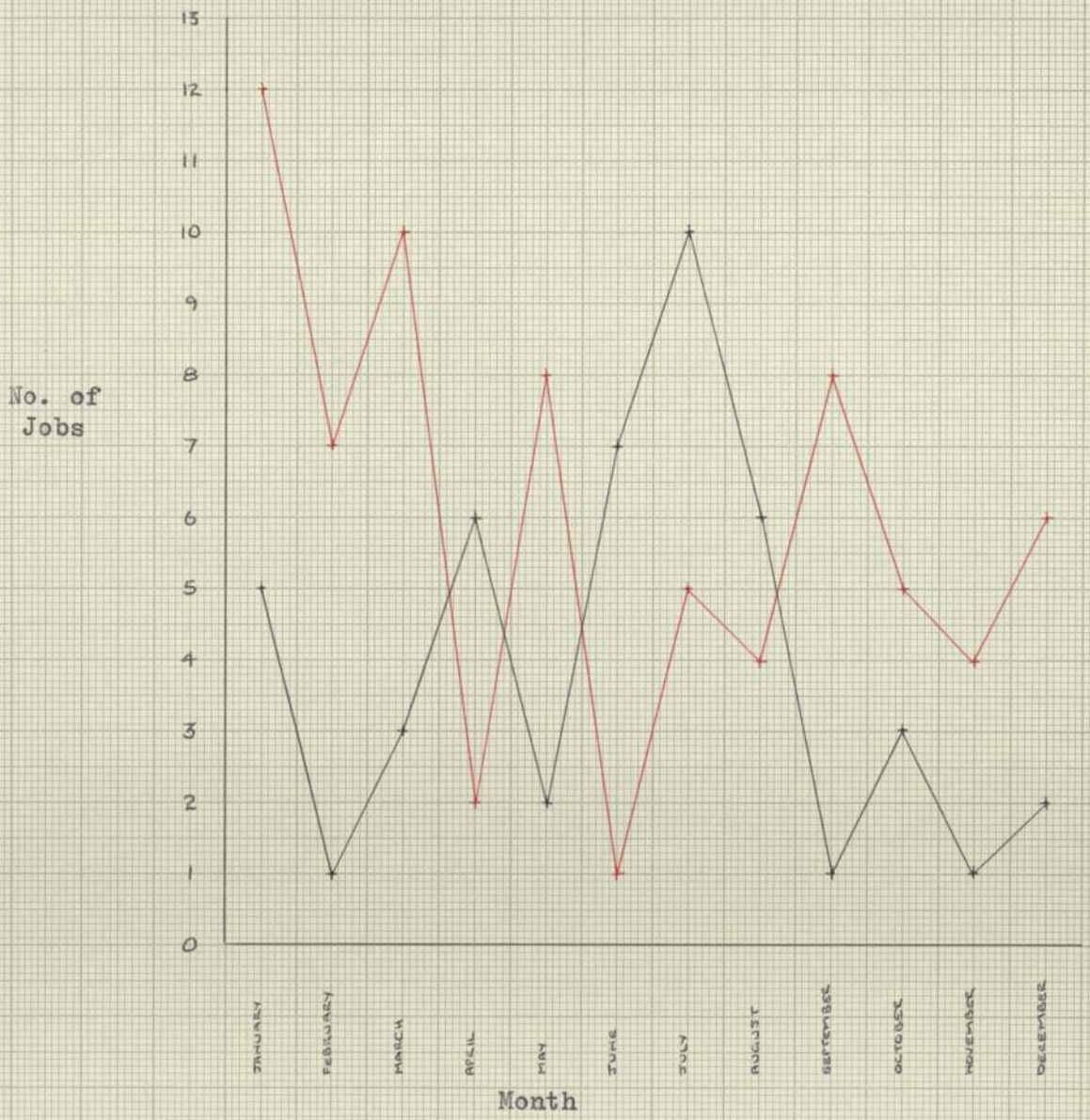


Fig. 26.

Seasonal Variation in Window Repairs for the Public and Private Sector 1966-1972

Public Sector red
Private Sector black

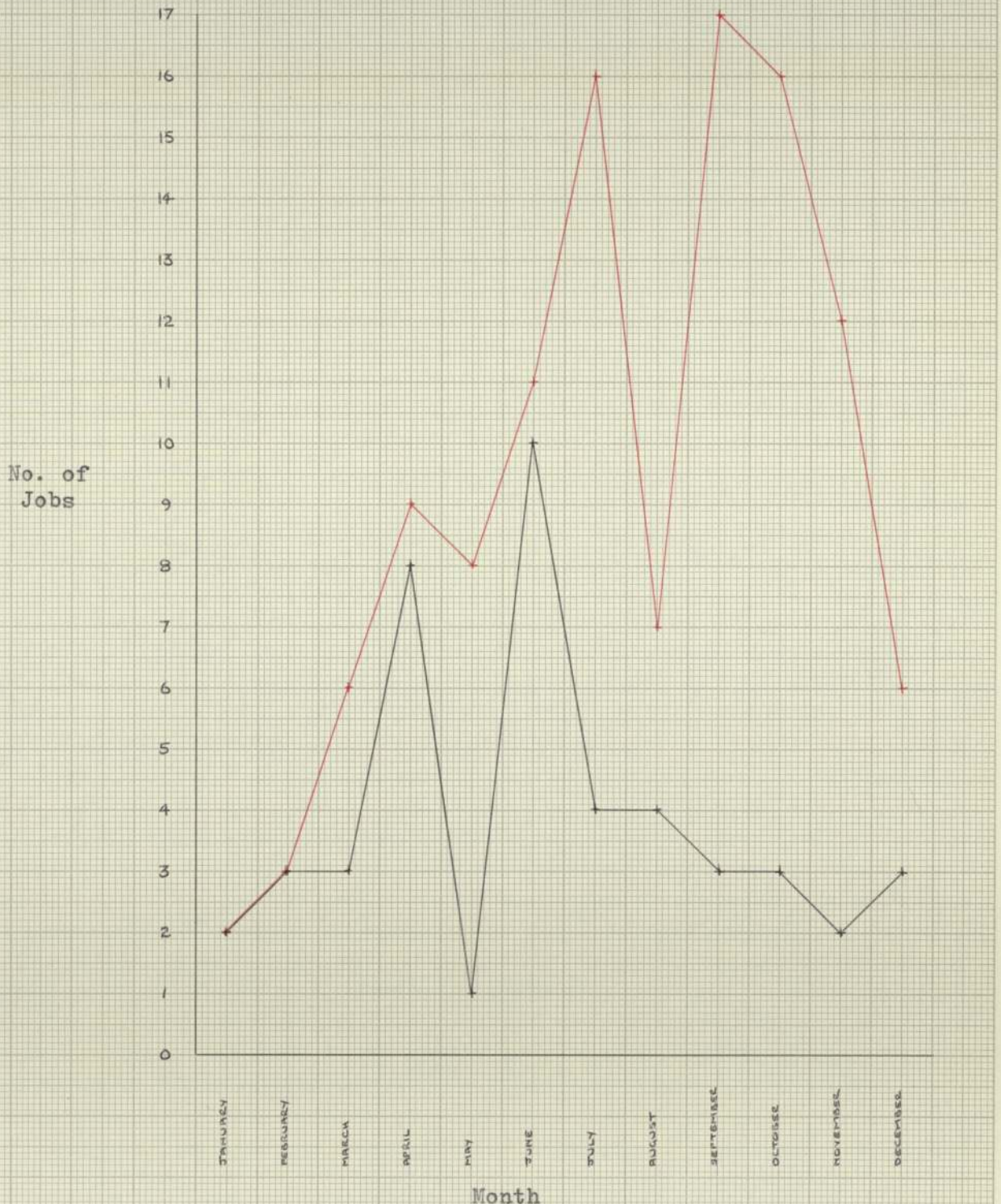


Fig. 27.

Seasonal Variation in Door Repairs for the Public and Private Sector 1966-1972

Public Sector red
Private Sector black

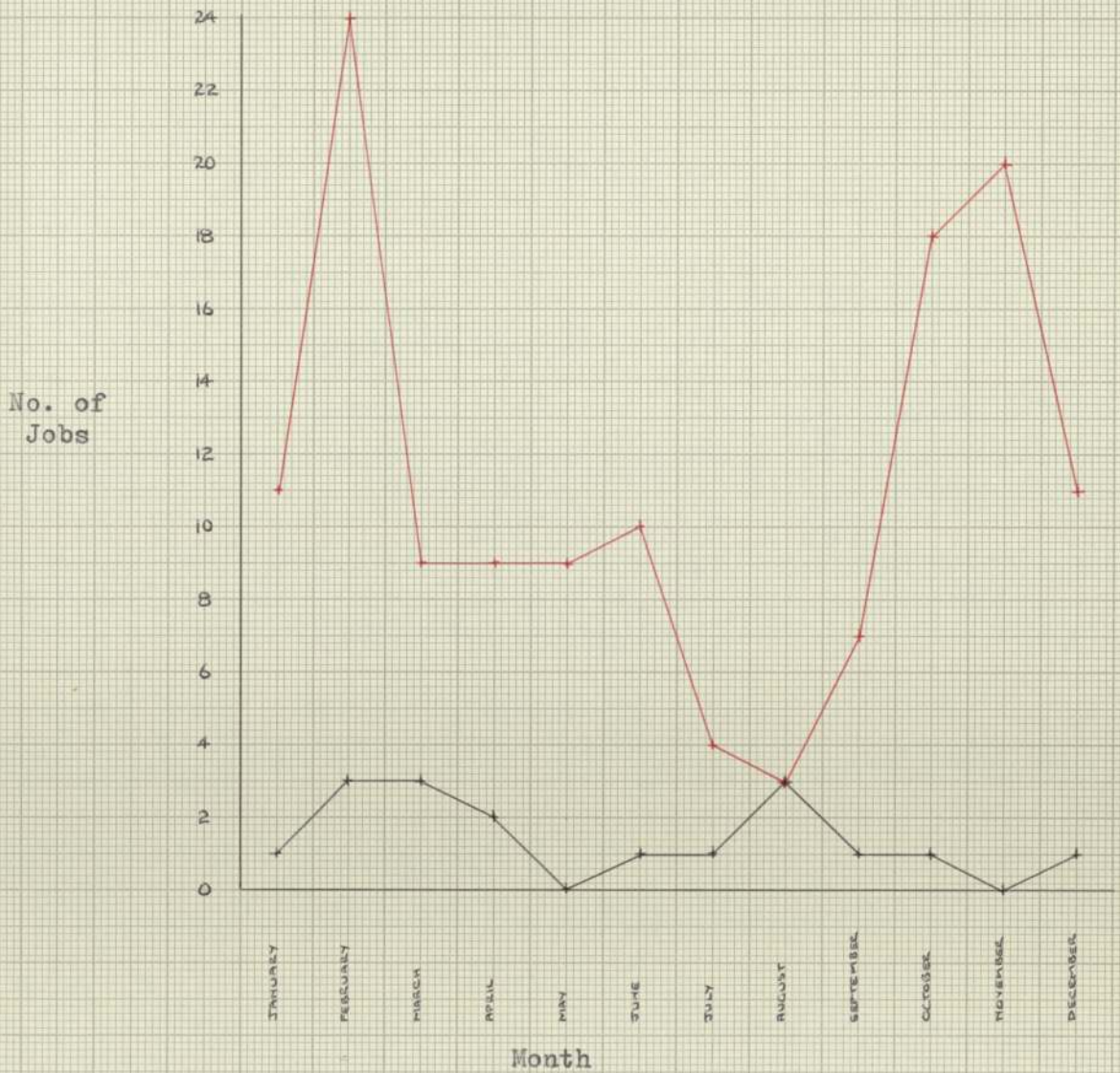
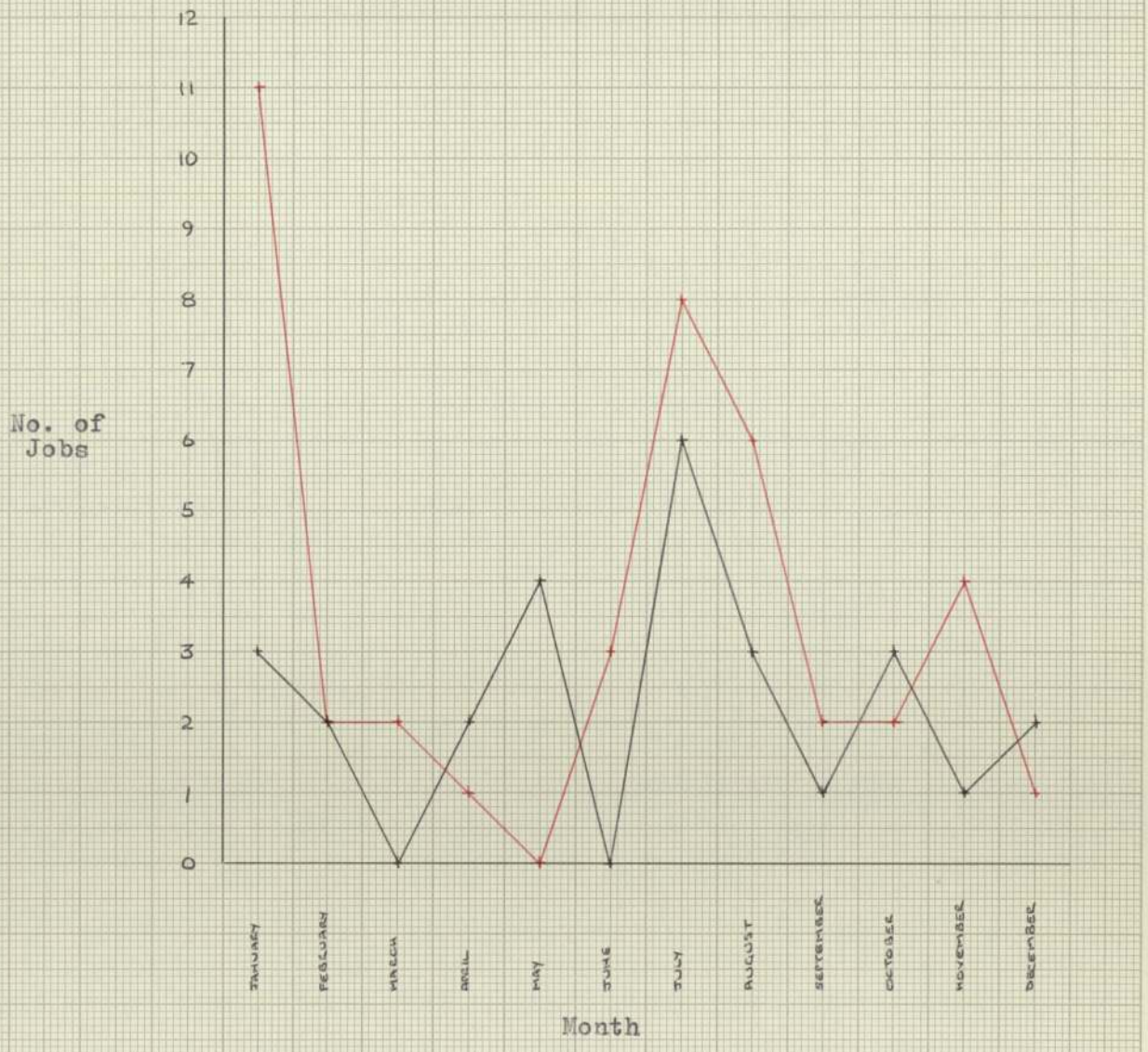


Fig. 28.

Seasonal Variation in Dustbin Replacement for the Public and Private Sector 1966-1972

Public Sector red
Private Sector black



however, so marked in the private sector. The greater activity during the winter months from October to March is a reflection of the use of the appliance concerned. A similar situation occurs with electrical work as shown by Figure 21. The private sector showing little seasonal variation whilst the public sector produces a major peak in February with further peaks in December and June. This latter variation resembles the profile produced by the Local Government Operational Research Unit study (1970 5) and must again be a reflection of the greater use during the winter months.

82. Figure 22 indicates that roofing work is concentrated at the beginning and end of the winter period. This is probably due to the less urgent work being left for attention during better weather giving a peak in May whilst the attention to leaks following rain produces a steady increase in activity from September to November. Figures 23 and 24 show a continual requirement for plumbing maintenance. Little seasonal variation is recorded with general plumbing repairs but attention to ballvalves tends to be concentrated in the September - October period. Figure 23 reflects a greater need for attention to ballvalves in the private sector. A considerable oscillation is shown by figure 25 for repairs to drainage. No explanation can be given for this swing.

83. Attention to windows is required in April, July and September. The summer peak is almost certainly due to the maintenance staff taking advantage of the better weather to replace rotten window frames. The peaks in April and October reflect the movement of timber and its relationship to the moisture content of the air. See Figure 26. This seasonal variation can also be seen in figure 27 in relation

to door repairs. The private sector shows a considerable lack of activity to this maintenance item but the activity in the public sector indicates peaks in February and November.

84. The replacement of defective dustbins appears greatest in January and July.

85. The successful programming of maintenance work and the correct structure of the direct labour force relies on detailed knowledge of the incidence of maintenance defects. It is clear that little attention has in the past been given to this aspect but due to its large labour content and to the increased cost of labour the correct prediction of the flow of housing defect complaints will be of paramount importance in housing maintenance departments.

CHAPTER FOUR

Interpretation, Conclusions and Recommendations

1. It is a basic premise in quality control that a manufactured or assembled article is never perfect but that everything has an acceptable degree of imperfection or tolerance. This principle is basic to a study of housing maintenance for not only are we prepared to accept imperfection in a new house but we are also prepared to tolerate defects in our housing environment until our senses are impinged upon. It is the insidious progression from tolerable to intolerable that makes the timing of maintenance so difficult.

2. The degree of imperfection in new dwellings has been the subject of detailed studies elsewhere and in general "finishes" appear to account for a large percentage of the defects found. Since the studies have been concerned primarily with the analysis of house occupier complaints it follows that as the majority of such occupiers are layman who will not recognise the early symptoms of serious defects it is likely that only those defects which are readily visible and cause offence will be the subject of complaint. This argument can also be applied to the landlord-tenant relationship and hence will affect the maintenance profile identified in this study. Powell revealed that whilst N.H.B.R.C. Inspectors find that 28% - 30% of all faults discovered during the inspection of houses during construction are in the brickwork, his study of complaints showed only 7% of defects involved brickwork and he suggested that the difference was due not to the lack of defects in brickwork but to the fact that the occupier could either not see them or did

not appreciate their presence.

3. The social class of the occupier has also been shown to affect the rate of complaints concerning defects. Since this study concerned property in the privately and publicly rented sector it reflects the work carried out in response to complaints by occupiers the majority of whom will belong to the lower social classes and hence it follows that the work done represents a smaller percentage of the maintenance work than would be regarded as ideal. To indicate the likelihood of occurrence of a maintenance item in this study the formula below was devised. The formula can be expressed thus:-

$$M = M_d \times M_o \times M_a \times M_r \times M_{de} \times M_j$$

where M is the occurrence of the maintenance item in the study, M_d is the number of houses with the defect, M_o is the number of occupiers who observe the defect, M_a is the number of occupiers who are offended by the defect, M_r is the number of occupiers who report the defect to the landlord, M_{de} is the number of reported defects dealt with by the landlord and M_j is the number of the said defects which are recorded on job sheets or job cards.

4. The presence of a maintenance item in this study is due to a chain of events which is fraught with complications the majority of which have no relationship to the physical nature of the defect but are concerned with the subjective response of the observer of the defect to the defect. Since an occupier must accept imperfection in a property it follows that difficulty results as to the degree of tolerance that a tenant should accept before a complaint is justified. Housing is not a static commodity but is continually subject to weathering agencies e.g. weather, occupants, movements etc. and

this is reflected in the need for continual maintenance and by the length of warranty periods adopted for new houses. The House Owners Service Policy offered by the House-Builder's Association of Louisville, for example, allows only 60 days warranty period for general maintenance items and only 90 days for toilet adjustments.

5. The continual deterioration of the housing fabric requires a steady cash flow in order to maintain the status quo. Such a cash flow in connection with rented accommodation must come from the rent income or from the landlord's other resources. Evidence was produced in the first and third chapters that the control of rents leads inevitably to inadequate maintenance or to the landlord subsidising his tenant in the form of adequate maintenance.

6. It is important from the property owners viewpoint to know the structural components which will involve high maintenance expenditures. Earlier research has revealed that decoration and plumbing represent a high proportion of the total maintenance expenditure. A study in 1951/52 showed that external painting accounted for 32% of maintenance costs with the next most important being plumbing at 17%. (Chapter 1. Para. 16) Redecoration was found to account for about half of all maintenance expenditures in a 1968 study. (Chapter 1. Para 64) In 1966/67 out of a total maintenance expenditure of 8½ million pounds the Greater London Council devoted 2½ million pounds to internal decoration, £1.1 million to external decoration and £0.9 million to water and sanitary services. (Chapter 1. Para 69) Such is the high cost of redecoration that some local authority housing committees have altered their tenancy regulations to permit the authority to pay for the tenants

do-it-yourself decorations so as to reduce the expenditures involved. (Chapter 1. Para. 124) The rising cost of internal redecoration has been blamed on the deterioration of decorations caused by condensation.

7. In studies relating maintenance costs with initial costs, services and decorations have again ranked high. (Chapter 1. Paras 24 and 62)

8. Not all investigations into repair work have revealed the above relationship between redecoration and plumbing. A study of repairs carried out in 1965 placed plumbing, roofs, joinery and external redecoration in a descending order of importance. (Chapter 1. Para. 52) In 1971 the critical factor of physical deterioration was said to be generally the woodwork. (Chapter 1. Para. 101) A Canadian report identified spalling concrete drives and the failure of mechanical parts as common problems in 10 year old houses. (Chapter 1. Para. 116) With new buildings the descending order of occurrence of defects was found to be joinery, plastering, brickwork, roofs and decoration in the United Kingdom. (Chapter 1. Para. 111)

9. Thus previous research has indicated that the deterioration of the visual nature of the house and the mechanical parts of the house results in a high maintenance expenditure. This could reflect either that these components are the most prone to deterioration or that by their nature they impinge upon the occupant to a degree which results in a high complaint rate.

10. Unless motivated tenants do not insist on a high level of maintenance activity. The raising of rents does not always result in a requirement from the tenant for the landlord to carry out repairs as shown by the study of the effect of the Rent Act 1957.

(Chapter 1. Para. 20) Many tenants in the private sector feel that the insistence on a high standard of maintenance leads inevitably to rent increases. Repairs thus have a price which many tenants feel is unjustified. (Chapter 1. Para. 28) Studies of maintenance expenditures thus relate to work regarded as necessary by tenants and the results should thus be viewed in this light. The results do not represent the ideal maintenance profile for there is little doubt that many defects occur which are not reported as witnessed by the survey conducted for the Milner-Holland Committee. (Chapter 1. Para. 40) The conclusion that complaint orientated maintenance activity does not adequately maintain the housing stock is the forerunner to the conclusion that adequate maintenance results only from the regular inspection of property by qualified surveyors. (Chapter 1. Para 58) With the steady increase in costs and the impending new landlord obligations local authorities have already begun to devise systems of inspection based on yearly cycles. (Chapter 1. Para. 126)

11. Earlier studies have concentrated on the local authority sector which has been shown by national survey to be in a much better state of repair than either owner-occupied housing or other tenures. This present research has thus broadened the field of maintenance study.

12. Two further conclusions can be drawn from the review of previous work. The first is that maintenance costs are not proportionate to the size of dwelling, (Chapter 1. Para.84) and the second is that there is a high level of satisfaction with the standard of building maintenance work carried out in this country.

(Chapter 1. Para. 86)

13. It is against this backcloth that the results of the present research should be viewed. Clearly a study of maintenance has a direct bearing on the design and method of construction adopted for new dwellings. The increasing cost of internal redecoration, for example, due to deterioration caused by condensation points the way to the need for the consideration of the thermal environment to be an integral part of the design of a dwelling. It is also clear that deviations from the normal in terms of design will result not only in high initial construction costs but also high maintenance expenditures as typified by the expenditure on doors in the public sector. The conclusions are in order of occurrence in the text and not in order of importance.

14. Each property should have an individual chronological record of all maintenance activity in order to act as a check of the efficiency of the staff in remedying repairs and as an early warning device for pending major repairs. (Chapter 2. Para. 4)

15. House Fitness Index surveys are useful only as indicators of trends or for providing a broad picture of the condition of an area of housing. The grading of deficiencies requires a subjective decision on the part of the surveyor which is an inherent weakness. (Chapter 3. Para. 6)

16. It would appear that the decline in the number of properties let by private landlords will continue. The study of the future use of this sector indicated that 56% of landlords would sell their property for owner-occupation when vacant possession was obtained. (Chapter 3. Para. 10)

17. Both the House Fitness Index survey and the sample survey emphasised the lack of maintenance and the deficiency of amenities in the private landlord sector. The House Fitness Index survey revealed four times the degree of cumulative deficiency in tenanted property compared with owner-occupied property and the sample survey showed that whilst only 18.3% of owner-occupied property was unsatisfactory with regard to repair, 47.8% of the tenanted property was unsatisfactory in this respect. (Chapter 3. Paras. 12 and 17)

18. If it is assumed that all the components of a house deteriorate at a similar rate then a structural survey should reveal a profile of deficiencies which is inversely related to the maintenance activity profile. This would appear to be the case for the deficiency rating of structural components shown in Table E3 ranks high those components which are ranked low on the maintenance activity Figures 13 and 14. The high ranking of dampness in Table E3 is a reflection of the inability of tenants to report defects before they manifest themselves in some form of decorative disturbance and the failure of landlords to remedy minor structural defects before they develop into major defects. (Chapter 3. Para. 13)

19. The survey of rents in connection with the House Fitness Index survey underlined the deficit between rent income and outgoings. As previously stated this deficit is balanced by inadequate maintenance. (Chapter 3. Para. 14)

20. During the sample survey a general reluctance was noted by house occupiers to disturb their housing environment. It was recorded that only 29.5% of owner-occupiers and 26.1% of the privately rented sector were interested in receiving details of grants to

enable them to improve their housing environment either by remedying defects or providing lacking amenities. This underlines the tolerance shown by occupants and it is this coupled with inertia and the dislike of disturbance which are the main retardents to a well maintained housing stock. (Chapter 3. Para. 19)

21. The effect of rehabilitation on maintenance expenditure is difficult to quantify due to the number of uncontrollable factors and the lack of statistical information. Figures alone can be deceiving for landlords will often neglect repair work prior to major improvement and thus on an annual basis repair costs can show an increase after improvement when normal day-to-day maintenance is resumed. The analysis of available statistics was inconclusive for whilst one area revealed an 18% reduction in the repair expenditure on property the subject of grant a further area showed an increase of 7.8%. (Chapter 3. Para. 23)

22. The analysis of approved expenditures in relation to improvement grants again revealed the backlog of repairs in the owner-occupied and privately rented sectors. With "repair year" the tenanted sector was 45.67% greater than the owner-occupied sector and with "improvement year" the difference was 34.9%. It was shown that the annual backlog of repairs was £8.39 for tenanted property and £5.76 for owner-occupied property. The respective figures for improvements were £17.28 and £13.21. (Chapter 3. Paras 26 - 30)

23. The study of improvement grants revealed an increase of repair and improvement costs with increasing age of property. (Chapter 3. Para 31)

24. The local authority selected for study had above average

annual maintenance expenditures in comparison with those submitting returns to the I.M.T.A. Such a disparity could be due to variations in the age of stock managed by the local authorities in question, to variations in weathering agencies and to problems with labour. (Chapter 3. Para. 35)

25. After accounting for the variations discussed in the previous paragraph the local authority selected for study would appear typical of local authorities managing between 800 and 1,000 houses. (Chapter 3. Para. 36)

26. The prime motive for the private landlord in letting property is to make a financial return on the capital invested in the provision of the accommodation. Questions of maintenance should be viewed in this light. (Chapter 3. Para. 37)

27. The study of the private landlords rent income revealed that on average, controlled rent properties were being subsidised by the landlord at the annual rate of £12.80 or maintenance was neglected to this extent in order to provide a "profit". With registered rent properties in 1972 the average annual profit was £70. (Chapter 3. Para. 38)

28. As an indicator of the need to constantly review rent levels the labour cost index for the local authority studied showed an annual increase of 7.4% over the period 1968/1972. (Chapter 3. Para. 43)

29. 1,385 maintenance jobs in connection with the 52 houses in the public sector and 593 maintenance jobs in connection with the 52 houses in the private sector were investigated. (Chapter 3. Para. 49)

30. The study revealed that plumbing created the greatest number of jobs in both sectors during the 1966/1972 study period. (Chapter 3.

Para. 51)

31. The average time overall spent on each job in the public sector was 8.89 hours. The shortest time per job was found to be spent on the replacement of locks and the rewashering of taps. The longest time per job was found to be spent on internal decoration, treating damp and repairing windows. (Chapter 3. Paras. 53 and 54)

32. Relatively few hours were spent in the public sector on external decoration and this must raise a question as to the adequacy of the decoration taking place. The repair of windows (10.97%), plumbing (12.50%), fences (9.11%), doors (13%) and the internal decoration of property (10.91%) accounted for 56.49% of the available labour used to maintain the public sector houses for the four year period 1968/1972. (Chapter 3. Para. 54)

33. The private landlord spent on average three times more on external decoration than the public landlord whilst the latter spent twnety-two times more on door maintenance than the former. The disparity in external redecoration expenditure is a reflection of the previous lack of decoration in the private sector. The high cost of door maintenance in the public sector is almost certainly related to the unusual form of construction of door used. Since the door design was not standard any replacement had to be prepared by the direct labour staff and could not be obtained from a builder's merchant. This underlines the need for uniform designs where maintenance expenditures must be kept to a minimum. (Chapter 3. Paras.55 and 56)

34. The average annual total expenditure in the public sector on maintenance was found to be £36.40 whilst that in the private

sector was found to be £32.97. (Chapter 3. Para. 60)

35. A greater expenditure on the external environment was recorded in the public sector compared with the private sector. The repair of fences and paths composed this maintenance element. The repair of windows and plumbing is a prominent expenditure in both sectors as also is decoration. The decay of doors has been in the past considered a minor problem, however, the records of the public sector maintenance suggest that such decay should not be overlooked. (Chapter 3. Para. 61)

36. It was calculated that the average maintenance expenditure per square foot per year in the private sector was £0.05685 and in the public sector £0.0316. Since the major part of the total maintenance expenditure relates to doors, decoration, plumbing, windows and fences which do not vary directly with the increase or decrease of floor area such a relationship is invalid. Such relationship that does exist would appear to be of an inverse nature. (Chapter 3. Para. 64)

37. Such is the amorphous nature of maintenance expenditures that the range of average annual maintenance expenditures is wide. In the private sector the range was from £7.57 to £137.60 whilst in the public sector the range was from £6.35 to £253.99. The median annual maintenance expenditure in the public sector was £26.33 compared with £26 in the private sector. The modal annual maintenance expenditure was £14 in the public sector and £12.67 in the private sector. The wide range of maintenance expenditures would appear to be due to sociological rather than technological considerations. (Chapter 3. Paras. 66 - 68)

38. In the private sector no regular pattern could be determined in connection with the effect of modernisation on maintenance expenditure. In some cases the maintenance expenditures of modernised properties were well above the average which could reflect the raising of the standard expected by the tenant of his housing environment due to the improvement activity. (Chapter 3. Para. 68)

39. On relating maintenance expenditure with form of construction it was shown in Table d3 that the middle terraced dwelling was the cheapest to maintain followed by the end terraced dwelling and the semi-detached dwelling. Thus it would appear that as the external surface area is increased so too is the annual maintenance expenditure. (Chapter 3. Paras. 69 and 70)

40. A considerable variation in the time taken in remedying defects brought to the attention of the local authority by the tenant was observed. The average time from complaint to completion was 53 days and the range of completion times was from 3 days for repairing and replacing locks to 186 days for repairing and replacing windows. (Chapter 3. Para. 73)

41. From 1st January, 1974 the requirement of Section 4 of the Defective Premises Act 1972 may cause landlords in both sectors to review the time taken to deal with reported defects. The average time of 115 days to deal with dampness in the public sector could be regarded as a breach of duty and particular attention should be given by landlords to those defects which are liable to cause damage or injury. It is clear that greater and prompt attention must be given to minor defects to prevent the need for more major work. The complaint to completion times revealed in this study

should also be considered in relation to the time specified by local authorities when requiring work to be carried out under the Housing or Public Health Acts. It is clearly unsatisfactory if a local authority requires a private landlord by notice to carry out remedial work in a property in a shorter period of time than the local authority is taking to remedy that defect following the complaint from its own tenant. (Chapter 3. Para. 74)

42. No clear pattern emerged concerning the relationship between the age of the occupant and the maintenance expenditure on the property. In the public sector a higher expenditure of £39.98 per year was found in houses occupied by the over-50's compared with an average annual expenditure of £29.92 on property occupied by the under-50's. The higher expenditure on property occupied by tenants in the over-50 age bracket could be a reflection of the lack of "do-it-yourself" maintenance particularly decoration by this age group. The private sector showed a complete reversal of this relationship which is possibly due to the older tenants trying to protect their low rents by refraining from insisting on a high level of maintenance. Other factors include a greater attachment to privately let accommodation by elderly tenants and to a lack of plumbing services to maintain. (Chapter 3. Paras. 76 and 77)

43. 1,385 jobs in the public sector and 593 in the private sector were studied in relation to the month of their occurrence. Knowledge of the seasonal variation of maintenance items is essential in the programming of work and in the determination of the structure of the labour force. (Chapter 3. Para. 79)

44. The peak of activity in connection with external decoration

for both sectors was the April/May period. Since redecoration is not a complaint based activity it was to be expected that the peak of activity in this item would be correlated with the advent of better weather. (Chapter 3. Para. 80)

45. The repair and replacement of defective fireplaces and the carrying out of electrical repairs showed greatest activity during the months in which the components were most likely to be used by the tenant. Thus the greatest activity was during the winter months. (Chapter 3. Para. 81)

46. The maintenance of roofs was concentrated at the beginning and end of the winter period. The peak at the beginning of the winter is almost certainly due to rain penetration through cracks which have occurred due to movement during the summer months. The peak at the end of the winter is probably due to less urgent repair work being left by the maintenance staff until the better weather. (Chapter 3. Para. 82)

47. There is a continual requirement for plumbing maintenance which is indicative of the continual usage of this building component. Attention to ballvalves tended to be concentrated in the September/October period and the considerably greater attention needed by the ballvalves in the private sector suggests that consideration should be given to the replacement of these ballvalves with a model of a more robust design. (Chapter 3. Para. 82)

48. The repair and replacement of windows showed peak activity in April, July and September. The April and September peaks relate to the movement of timber which is allied to the changes in the moisture content of the air. A similar pattern was thus expected

and was shown by the maintenance of doors. The July peak is a reflection of the work carried out of replacing windows during the better weather. (Chapter 3. Para. 83)

49. Little attention has in the past been given to the prediction of the flow of housing defects but due to the high labour content and the increasing cost of such labour this will in the future be of paramount importance. The coming into force of the Defective Premises Act 1972 will underline the need for planned maintenance in order to predict defects and remedy them before they become physically and/or aesthetically disturbing to the tenant. (Chapter 3. Para. 85)

50. Overall it would appear that the working parts of a dwelling require continual maintenance and thus as property becomes more sophisticated maintenance costs are likely to rise. It is also apparent that the maintenance costs of the public and private sectors of housing are comparable when a private landlord owning a considerable number of properties is considered. Since the majority of private landlords own insufficient numbers of properties to maintain a direct labour force it is clear that the maintenance expenditure in this sector will be considerably higher than the £32.97 average annual expenditure derived in this study.

51. In order to retain the increased revenue brought about by the provisions of the Housing Finance Act 1972 some local authorities have turned to maintenance. It would appear that such authorities regard maintenance as a bottomless pit into which the surplus revenue can be poured. Since the purpose of the 1972 act was to reallocate the nation's housing revenue it is predicted that housing

maintenance cost yardsticks will be introduced. Such yardsticks must be based on detailed research and should not be arbitarily set since to do so could seriously retard the maintenance of a satisfactory housing stock.

52. In order to reduce maintenance expenditures care must be taken in the design of property to minimise the external area requiring redecoration or to incorporate materials which do not require regular decoration. To this latter end the use of plastics is steadily gaining a foothold in the building industry. Attention must also be given to the design of plumbing components and the standard of joinery and timber used in the building industry. It is imperative that timber should be well seasoned and the mandatory requirement of the National House Builders' Registration Council that window joinery has preservatory treatment should be extended to all joinery items particularly doors.

53. It became apparent on studying the details of the tenants complaint and the work carried out that not only was the complaint justified but that other work although not complained of required attention when the building operative visited the property. It thus follows that tenants suffer a degree of disrepair either through ignorance or because previous requests for repair to be carried out have been ignored. Since maintenance comprises the major outgoing of the property owner an annual allowance, in the case of tenanted property in the rent, should be made for repairs. This allowance should be set by the rent officer and notified to both landlord and tenant, it should also be tied to the cost of living and should rise accordingly on an annual basis. The making of this maintenance

allowance should, however, be allied to the introduction of statutory powers to enable the local authority to require the carrying out of repair which, in their view, if left would lead to further deterioration of the property. It is most unsatisfactory that no action can be taken by the local authority until the tenant has suffered through living in a property which is either a nuisance, prejudicial to health or has substantial disrepair.

RECOMMENDATIONS

1. The question of maintenance should be considered at the design stage, particularly with regard to redecoration and ease of access to the essential services.

2. The maintenance programme should be based on the regular inspection of property by a qualified surveyor and not as a result of tenant complaint.

3. Landlords should be given an annual allowance for maintenance tied to the cost of living and notified to the tenant. This allowance to form part of the rent.

4. Local authorities should be given statutory powers to require the carrying out of repair which, in their view, if left would lead to the further deterioration of the property.

5. The activity of a direct labour maintenance force should be carefully planned after the detailed analysis of at least the previous five years maintenance activity.

6. Further detailed studies should be made to identify the maintenance profiles of property in all tenure groups.

APPENDIX

APPENDIX CONTENTS

TABLE A

Calculation used to derive the Net Present Value of Repair Costs as given in Paragraph 83, Chapter One.

Age of House	Repair Expenditure	Present Value of £1	NPV
1	5.45	0.909091	4.955
2	5.90	0.826446	4.878
3	6.35	0.751315	4.771
4	6.80	0.683013	4.644
5	7.25	0.620921	4.501
6	7.70	0.564474	4.347
7	8.15	0.513158	4.183
8	8.60	0.466507	4.013
9	9.05	0.424098	3.838
10	9.50	0.385543	3.663
11	9.95	0.350494	3.487
12	10.40	0.318631	3.313
13	10.85	0.289664	3.144
14	11.30	0.263331	2.975
15	11.75	0.239392	2.813
16	12.20	0.217629	2.655
17	12.65	0.197845	2.504
18	13.10	0.179859	2.357
19	13.55	0.163508	2.215
20	14.00	0.148644	2.080
21	14.45	0.135131	1.952
22	14.90	0.122846	1.831
23	15.35	0.111678	1.714
24	15.80	0.101526	1.604
25	16.25	0.092296	1.500
Total	271.25	Total	80.037
26	16.70	0.083905	1.402
27	17.15	0.076278	1.309
28	17.60	0.069343	1.220
29	18.05	0.063039	1.138
30	18.50	0.057309	1.060
31	18.95	0.052099	0.9875
32	19.40	0.047362	0.9189
33	19.85	0.043057	0.8548
34	20.30	0.039143	0.7945
35	20.75	0.035584	0.7384
36	21.20	0.032349	0.6858
37	21.65	0.029408	0.6366
38	22.10	0.026735	0.5910
39	22.55	0.024304	0.5480
40	23.00	0.022095	0.5082
41	23.45	0.020086	0.4710
42	23.90	0.018260	0.4364

Age of House	Repair Expenditure	Present Value of £1	NPV
43	24.35	0.016600	0.4042
44	24.80	0.015091	0.3742
45	25.25	0.013719	0.3464
46	25.70	0.012472	0.3204
47	26.15	0.011338	0.2965
48	26.60	0.010307	0.2742
49	27.05	0.009370	0.2534
50	27.50	0.008519	0.2343
Total	551.90	Total	16.8037

NPV	First 25 years	80.037
	Next 25 years	16.8037
	Next 25 years	3.2
	Next 25 years	0.64
	Next 25 years	0.13
	Next 25 years	0.03
	Total £	100.8407 for 150 year life (10% Interest Rate)

Actual	First 25 years	271.25
	Next 25 years	551.90
	Next 50 years	2248.75
	Next 50 years	3573.75
	Total £	6645.65

N.B. a) If setting aside finance for future work then allow for inflation

b) If making a decision between alternatives do not so allow.

LOCK CAPITALS)

DING 2/3/61

TABLE 2

ERE EMPLOYED	HOW EMPLOYED	HOURS BASIC	HOURS O.T.	HOURS PLUS
[illegible]	[illegible]	1		
[illegible]	[illegible]			
[illegible]	[illegible]	2		
[illegible]	[illegible]		2	1/2
[illegible]	[illegible]		3	1/2
[illegible]	[illegible]	1		
[illegible]	[illegible]	1		
[illegible]	[illegible]			
[illegible]	[illegible]		5	1/2
[illegible]	[illegible]			
[illegible]	[illegible]			
[illegible]	[illegible]			
[illegible]	[illegible]			1/2
[illegible]	[illegible]			
[illegible]	[illegible]	4		
[illegible]	[illegible]	1		
[illegible]	[illegible]		1	1/2
[illegible]	[illegible]		5	1 1/2
	TOTAL		6	21/2

	Sewage - General		
	Cesspool Emptying		
	Pumping Stations		
1	Refuse Collection		7 2
	Vehicle Maintenance		
	Highways - Maintenance A 40		
	B 473		
	B 474		
	Class III		
35 7/8	Dist.	14 - 3	
	County U/C		
	- Signs		
	Scavenging - A 40		
	- B 473		
	- B 474		
	- Class III		
	- Dist.		
	- County U/C		
	Cinema		
85/8	Housing - Maintenance	3 2 2	
	- Grate Conversions		
	- Special Expenses		
	Three Gables - Maint.		
	" " Special		
	P.O.S. - General		
	- Oak Lodge Meadow		
	- Oval		
	Public Lighting - A 40		
	" Classified Roads		
	" B 473		
	- Gen + Ins		
	- Improvements		
	Cemetery - Holtspur		
	- Shepherds Lane		
	Closed Church Yard		
	Pub. Offices - Attend. & Clean		
	- Repairs, etc.		
	Depot		
	Public Conv. - Penn Road		
	- Sheph'ds Lane		
	Car Parks - Altons		
	- Council Hall		
	- Penn Croft		
	Salting - A 40		
	B 473		
	B 474		
	Class III		
	Dist.		
	Snow Clear - A 40		
	B 473		
	B 474		
	Class III		
	Dist.		
	Holiday		
	Sickness		

FOR OFFICE USE ONLY

BASIC WAGE	HR. PER HOUR	14	5 4
OVERTIME 5 1/2	HR. 7/2 1/2 PER HOUR	3	1 3
	SUPERVISION		
	TOOLS		
	LOADER DRIVER		

RKMAN'S SIGNATURE

S SUPDT'S SIGNATURE

FIED FOR PAYMENT

TABLE 3

Example of Job Sheet used by Local Authority

№ 5585

SURVEYOR'S DEPARTMENT
COUNCIL HALL

Works Superintendent

Date 2nd November, 1966

Please carry out the following repairs.

Address Malthouse Square

Fit new bath panels

MATERIALS USED

- 80ft 2" x 1½"
- 3 Hardboard Panels.
- ¼ doz. 1½" Chrome screws.

Job Completed Monday. 31.10

Signature W Young & Install

TABLE 4

Section 4 Housing Act 1957-69 and the 12 Point Standard

Section 4 Standard

Laid down in Section 4 Housing Act 1957 and amended by Section 71 Housing Act 1969. Section 4 requires that when determining unfitness regard should be had to the following matters:-

a) Repair
b) Stability
c) Freedom from Damp
cc) Internal Arrangement
d) Natural Lighting
e) Ventilation
f) Water Supply
g) Drainage and Sanitary Conveniences
h) Facilities for Preparation and Cooking of Food and for the Disposal of Waste Water

12 Point Standard

Specified in Circular 64/69 by the Appropriate Minister in exercise of his powers under Section 3(2) of the Housing Act 1969 and relates to the following:-

1) be in a good state of repair and substantially free from damp
2) have each room properly lighted and ventilated
3) have an adequate supply of wholesome water laid on inside the dwelling
4) be provided with efficient and adequate means of supplying hot water for domestic purposes
5) have an internal water closet if practicable, otherwise a readily accessible outside water closet
6) have a fixed bath or shower in a bathroom

7) be provided with a sink and with suitable arrangements for the disposal of waste water
8) have a proper drainage system
9) be provided in each room with adequate points for gas or electric lighting (where reasonably available)
10) be provided with adequate facilities for heating
11) have satisfactory facilities for storing, preparing and cooking food
12) have proper provision for the storage of fuel (where required)

Address of Property
Date of Inspection
Inspector

TABLE 5

Occupants				
Adults			Children	
MC	M	F	M	F

OCCUPATION

Is Property OWNER OCCUPIED/L.A. TENANT/PRIVATE TENANT/LEASEHOLD/OTHER (State)

Tenant

Does tenant want to move YES/NO

Is tenant an O.A.P. YES/NO

Is tenant willing to have house improved YES/NO

Present Rent ± Rates

Is house likely to get C. Cert. YES/NO

Is tenancy FURNISHED/UNFURNISHED

Owner

Address

Does owner wish to IMPROVE/SELL/OTHER(State)

Is owner a COMPANY/O.A.P./OWNER OF OTHER PROPERTY/OTHER (State)

Is property overcrowded YES/NO

Is Occupier handicapped YES/NO

Can house be adapted for handicapped person YES/NO

STRUCTURE AND ENVIRONMENT.

Is Dwelling FLAT/TEMP PREFAB/DETACHED/SEMI DETACHED/TERRACE/OTHER

Date of Construction Pre 1945 1945/1964 Post 1961 Post 1964 state if known

Rateable Value of Property

No. of Rooms in Dwelling

Floor Area of Dwelling

No. of Underground rooms in dwelling

Estimated Cost of Repairs Less than £30/£30-£100/£100-£250/£250-£500/£500-£1000/£1000-£1500/Over £1500

Estimated Value (Freehold)

Is house to Parker Morris Standard YES/NO

No. of Cars

Is Environment Satisfactory YES/NO

Where garaged

Size of Garden (800 sq.ft min)

Has Grant been given YES/NO If YES - (date) Amount

Type of Grant STANDARD/EXTENDED STANDARD/IMPROVEMENT/SPECIAL

SMOKE CONTROL

Are Existing Ground Floor Fireplaces MODERN/APPROVED/OLD (state type)

Is there a GAS/ELECTRIC POINT for Ignition YES/NO

If Area declared would occupier prefer OIL/SMOKELESS FUEL/ELECTRIC/GAS

Was house completed after 16.7.64 YES/NO

If Solid Fuel at present used how much tons

DETERIORATION, FACILITIES AND ACCESS.

			Cumulative Deficiencies O	Cumulative Deficiencies D	Basic Deficiency
I.	1	Progressive Instability Evident in walls	( )		( )
		roof	( )		( )
		floors	( )		( )
		elsewhere (name)	( )		( )
I	2	Exterior			
		Wall surface: broken or loose	( )	( )	
		Windows: broken or defective	( )	( )	
		Woodwork: rotten or defective	( )	( )	
		Roof: coverings or flashings loose or perished	( )	( )	
		Gutters and downpipes defective	( )	( )	
		Chimney head: defective	( )	( )	
		DPC: absent or defective	( )	( )	( )

			Fundamental Deficiencies O	Fundamental Deficiencies D	Basic Deficiency
I.	3	Access			
		Paving & Steps: uneven or broken	( )	( )	
		dangerous	( )	( )	
		House doors: broken or defective	( )	( )	
		Outbuildings: defective	( )	( )	
I.	4	Interior of Dwelling			
		Damp penetrates: walls	( )		( )
		roofs	( )		( )
		floor	( )		( )
		elsewhere (name)			( )
		Wall surface broken or loose	( )	( )	
		Ceiling surface broken or loose	( )	( )	
		Stair - condition dangerous	( )	( )	
		Floors: condition defective	( )	( )	
		condition dangerous	( )	( )	
		Doors: condition defective	( )	( )	
		Ventilation: condition defective	( )	( )	
		condition dangerous	( )		( )
		Lighting (natural): condition defective	( )	( )	
		condition dangerous	( )		( )
		Internal arrangement unsatisfactory	( )		( )
2.	1	Water Supply			
		None inside dwelling	( )		( )
		unwholesome (if Yes state source)	( )		( )
		inadequate	( )	( )	
		internal plumbing defective	( )	( )	
2.	2	Fittings			
		No bath or shower within dwelling	( )	( )	
		No washbasin within dwelling	( )	( )	
		No sink within dwelling	( )		( )
		Bath or shower with cold water only	( )	( )	
		Washbasin with cold supply only	( )	( )	
		Sink with cold supply only	( )	( )	
		No W.C.	( )		( )
		W.C. shared with another family	( )		( )
		W.C. unventilated	( )		( )
		W.C. unsuitably located (e.g. off kitchen)	( )		( )
		W.C. defective	( )	( )	
		No internal W.C.	( )		( )
2.	3	Drainage			
		Not to sewer or approved disposal method	( )		( )
		Internal defective or substandard	( )	( )	
		External defective or substandard	( )	( )	
2.	4	Heating and Lighting			
		No electricity or piped gas in dwelling	( )	( )	
		No power points or gas outlets or fixed space heating appliances:			
		in living room	( )	( )	
		in bedrooms	( )	( )	
		No electrical power point in kitchen	( )	( )	
		Gas or electrical installation defective	( )	( )	
		Solid fuel installations: defective or substandard	( )	( )	
2.	5	Facilities			
		No cooking facilities	( )		( )
		No ventilated food store or fridge	( )	( )	
		No adequate food preparation area	( )		( )
		No adequate clothes drying facilities	( )	( )	
		Fuel storage required but: no fuel storage	( )	( )	
		fuel storage inadequate	( )	( )	

Total Aggregate deficiency points.....

Total Basic deficiencies.....

TABLE 6

1,000 House Survey Sheet

NAME

ADDRESS PARISH

TENURE Owner-Occupied/Private Tenant/Void/Leasehold/Other (state)

HOUSE FITNESS

Is Property in a Clearance Area YES/NO

Is Property Satisfactory as regards:

a)	Repair	YES/NO
b)	Stability	YES/NO
c)	Freedom from Damp	YES/NO
d)	Internal Arrangement	YES/NO
e)	Natural Lighting	YES/NO
f)	Ventilation	YES/NO
g)	Water Supply	YES/NO
h)	Drainage and Sanitary Conveniences	YES/NO
i)	Facilities for preparing and cooking food and disposal of waste water	YES/NO

Is Property Unfit YES/NO Repairable at reasonable expense YES/NO

Is Property Satisfactory as regards:

a)	Repair and free from Damp	YES/NO
b)	Lighting and Ventilation	YES/NO
c)	Water Supply	YES/NO
d)	Hot Water Supply	YES/NO
e)	Internal W.C. or readily accessible outside W.C. (indicate)	YES/NO
f)	Fixed bath or shower in bathroom	YES/NO
g)	Sink with suitable arrangements for waste water disposal	YES/NO
h)	Proper drainage system	YES/NO
i)	Adequate artificial lighting (if gas only, state)	YES/NO
j)	Adequate heating facilities	YES/NO
k)	Facilities for storing, preparing & cooking food	YES/NO
l)	Facilities for storing fuel	YES/NO

If any items marked NO - can these be provided YES/NO

X) Is house suitable for Improvement Grant/Standard Grant/Neither

Y) Is occupant interested in Improvement Grant/Standard Grant

Inspector

TABLE 7

Hours spent related to property and maintenance item for Public Sector 1968-1972

PROP	INT DEC	EXT DEC	BRICK WORK	FIRE-PLACES	GUTTER	GLAZE	PLASTER	FLOORS	PATHS	FENCES	DAMP	ROOFS	BALL-VALVES	WASHERS	BOILERS	PLUMBING	DRAINS	WINDOW	DOORS	LOCKS	WOOD WORK	WOOD OTHERS	DUST-BINS	OTHERS
1											39 1/3					5 1/4						7 1/2		
2				3	9	3				27							12		12					
3					5							26 1/2	11 1/4			3								
4	34 1/2	2	64 3/4	4			52 3/4	22				18 1/4				96 5/4		59 3/4	18 7/8					93
5	21		17 1/4	11 5/8		7 1/2				44 7/8	4	26	6			23 1/8	10 5/8	11 1/8	25 1/8		1 1/6	7 1/2		
6	17 1/3													1 3/4			11 1/4	3 1/3						
7												10				15 1/4								
8			2			3	8			9 1/2					10	44 5/6	11 3/4	13 1/4				2		
9		2 2/3			7 5/8		14 2/3	31 19/24		67 33/24		14				15 1/8	22	57 1/6	40		6			
10		9				3	2 1/2			51 5/6		3				18	10	3	2			40 1/3		
11					2					19 5/12			3 1/3			11 3/8	10	71 3/8	6	4 1/2				
12		1 1/2				3		9	6 3/4					1		38 2/3		26	25 1/4					
13	26				16 7/8			5		6 3/4		9 1/4	8			19	8 5/12	68 1/4						
14	8 2/3			4	13 5/8		4		15		8	35 1/2	2	2	28 1/3	4 1/2	29 7/8	80 5/6	16 2/3			4 1/2		
15				10									1 2/3	1		28 1/2	18 7/8	19	5 1/6			4 1/2		
16	43 1/3	2 1/3		4	31 3/24				12			7 1/4	5	3		12 1/2		3 2/3	64 1/2					
17	16	3	5 1/3		6							31 5/8		2	4	5 1/4	2	11 1/2	56 1/6			5		
18				1	8							18 1/4			4	28	16		4 1/3					
19			15 1/4	11			10			19 7/4						12			5 2/3		4 1/4			
20			10		6	1	10			48 1/8	5 1/3		2	2		21 1/4	24		7 1/8					
21		2 2/3			6					29 3/8		10				13 3/4		23 1/3	56 1/6					
22	16 5/12		43 1/4	14		1				5		4				6 5/8	2	31 1/4						
23	16 2/3	3 1/3			12 1/2		8 2/3			14		17 7/8			4	13 5/8	6	8	15 1/12					
24					29	7 1/2			10			5 1/4	6 1/4		56 7/8	14	17 3/8							
25	8 2/3			3 1/3		1 1/2					5 1/4		3 7/24			22 1/12			2 1/4			7 3/4		
26			1	16 1/2	16		54					15		7 1/8		31	6		19 1/3			4		
27		1	15 1/2	28								6				2	14		32 3/4					
28		2 2/3			11								4 3/4			8	6		24 1/6					

TABLE 7 (CONT'D)

PROP	INT DEC	EXT DEC	BRICK WORK	FIRE-PLACES	GUTTER	GUAGE	PLASTER	FLOOR	PAINT	FENCES	DAMP	FLOOR	BALL-VALVES	WASHERS	JOISTS	PLUMBING	BEAMS	WINDOW	DOORS	LOCKS	WOOD WORK	WOOD OTHERS	DUST-BINS	OTHERS
29		1	4	16	3¾					13½		19⅞	2		8	14	36		25¼			6¾		
30				8	3¾					30½						31⅓			46⅚					
31															6¾	15¼		65⅞						
52	8⅖			8	3¼	3¾			20¼	28¾		7¼	2			19½	8⅕		13⅚		5	6½		
33	3¾	2⅕	2	53	5	1½	43½			1	8	5⅕		2	4	19	6⅕	72½	24½			4		
34						7⅝						5				8½	23½		5¼					
35					13					3		10⅞				9⅖	5¾	4						
36					6	1½										6½	8¼	31½	3	2				
37						3¼	4			18¼		12	5½			31¼		60¾	61⅙			3½		
38		1			12								4⅝			18	5		50½					
39	603⅖	2	7⅓		7⅝		42	44	53⅞	7⅖	111	19¼	1⅖	4	12	37	21⅝	20	45⅝	1½	2	15		
40				9						27⅛			4			30	1		22					
41				9	24⅝	4¼	6			58½	2	14			11⅕	62⅔	11⅓	50½	6¼			17¼		2
42									11¼	12⅞		5¼	2		4½	30⅝			35¾					
43					10					42¼						10		44¼	7½			2		
44	52			26⅔		8½	139½	2		16				2		27½	5⅓	23¼	4½		2	4¾		
45					3¼							19½			7									
46										22¼									2½					
47				11¾						9⅜		15¼			4	7	4		9					
48				7						30⅜						6			11	1½				
49						5⅜				28⅛		6			8	18	3¼							
50					12	3						13¼	2		32	3								
51			8⅔		6		15⅓			19¼		8	1½	3		65⅓		17½						
52						1				19⅛		8			3	13⅔								
1968		211⅛			4	10¼			17¼							2		1						1
1969																	11¼							
1970																			86¼					25½
1971		102½																	98⅝					

TABLE 8

Annual Expenditure on Maintenance related to Property Type and Age of Occupant for the Public Sector 1968-72.

No.of House	Total Cost of Labour	Labour Cost -Electricity		Materials 45% of Lab	On Costs 66⅔% of Lab.	Type	Total + 11.21 + Elect-ricity	Average per Year (4)	Age of Occupant
1	23.95	1.68	22.27	10.02	14.85	S	60.03	15.01	50+
2	41.46	14.46	27.00	12.15	18.01	S	82.83	20.71	50+
3	18.09		18.09	8.14	12.06	S	49.50	12.37	50+
4	214.06	40.89	173.17	77.94	115.50	S	418.71	104.68	50+
5	129.05	41.30	87.75	39.50	58.50	S	238.26	59.56	40+
6	6.71		6.71	3.02	4.47	S	25.41	6.35	40+
7	9.87		9.87	4.44	6.58	S	32.10	8.02	50+
8	93.24	45.10	48.14	21.64	32.10	S	158.19	39.55	50+
9	125.02	12.73	112.29	50.52	74.86	ET	261.61	65.40	50+
10	62.00	1.30	60.70	27.31	40.47	T	140.99	35.25	50+
11	49.91		49.91	22.46	33.28	T	116.86	29.21	40+
12	86.07	38.36	47.71	21.47	31.81	ET	150.56	37.64	40+
13	75.57	6.76	68.81	30.96	45.88	ET	163.62	40.90	50+
14	124.12	16.09	108.03	48.60	72.01	T	255.94	63.98	40+
15	36.50		36.50	16.43	24.34	T	88.48	22.12	50+
16	88.56	7.92	80.64	36.28	53.73	ET	189.81	47.45	50+
17	62.44		62.44	28.10	41.64	S	143.39	35.85	50+
18	31.80		31.80	14.31	21.21	S	78.53	19.63	40+
19	30.34	0.74	29.60	13.32	19.73	S	74.60	18.65	40+
20	57.74	1.04	56.70	25.52	37.81	S	132.28	33.07	50+
21	53.58		53.58	24.11	35.72	S	124.62	31.15	50+
22	50.04		50.04	22.51	33.37	S	117.13	29.28	50+
23	50.82		50.82	22.87	33.89	ET	118.79	29.70	50+
24	53.69		53.69	24.16	35.80	T	124.86	31.21	40+
25	22.76		22.76	10.24	15.18	T	59.39	14.85	40+
26	76.26	12.75	63.51	28.58	42.36	ET	158.41	39.60	40+
27	61.68	19.65	42.03	18.91	28.02	ET	119.82	29.95	50+
28	24.57		24.57	11.06	16.38	T	63.22	15.80	50+
29	74.43	16.74	57.69	25.96	38.47	T	150.07	37.52	40+
30	50.09	1.95	48.14	21.66	32.10	ET	115.06	28.76	40+
31	33.21		33.21	14.94	22.14	S	81.50	20.37	40+
32	53.70		53.70	24.17	35.81	S	124.89	31.22	40+
33	162.27	40.61	121.66	54.75	81.13	S	309.36	77.34	50+
34	18.94		18.94	8.52	12.63	S	51.30	12.82	40+
35	19.90	0.77	19.13	8.61	12.75	S	52.47	13.12	50+
36	25.51		25.51	11.48	17.01	S	65.21	16.30	50+
37	88.52		88.52	39.83	59.02	S	198.58	49.64	50+
38	41.97	1.70	40.27	18.12	26.86	S	98.16	24.54	40+
39	510.65	68.28	442.37	199.10	295.00	S	1015.96	253.99	50+
40	45.11	6.25	38.86	17.49	25.91	S	99.72	24.93	50+
41	134.33	0.80	133.53	60.07	89.01	S	294.62	68.65	40+
42	40.88		40.88	18.40	27.26	S	97.75	24.44	50+
43	43.85		43.85	19.73	29.24	S	104.03	26.01	50+

TABLE 8 (CONT'D)

No.of House	Total Cost of Labour	Labour Cost - Electricity		Materials 45% of Lab.	On Costs 66⅔% of Lab.	Type	Total + 11.21 + Elect. ricity	Average per Year (4)	Age of Occupant
44	188.86	43.78	145.08	65.30	96.76	S	362.13	90.53	50+
45	11.40		11.40	5.13	9.68	ET	37.42	9.35	50+
46	9.14		9.14	4.11	6.09	T	30.55	7.64	50+
47	23.53		23.53	10.59	15.69	T	61.02	15.25	50+
48	24.13	0.75	23.28	10.52	15.59	ET	61.45	15.36	40+
49	26.44		26.44	11.90	17.63	S	67.18	16.79	40+
50	24.35		24.35	10.96	16.24	S	62.76	15.69	40+
51	63.64	1.80	61.84	27.83	41.24	S	143.92	35.98	40+
52	26.53	8.52	18.01	8.10	12.01	S	57.85	14.46	50+

		EXTRAS			Total
1968	121.05	N/A	54.49	80.74	256.28
1969	4.27	N/A	1.92	2.85	9.04
1970	49.32	N/A	22.19	32.88	104.39
1971	100.68	N/A	45.30	67.13	213.11
				Total	582.82

Average for 52 Houses = $\frac{582.82}{52}$ = £11.21

TABLE 9

Annual Maintenance Expenditures related to Property for the Private Sector 1966-1971

Prop	Type	Expenditure	Year						Total	Average
			1966	1967	1968	1969	1970	1971		
A	T	Repair	17.82					268.93	286.75	47.79
B	ET	Repair		0.20	2.26	15.65		50.75	68.86	11.48
C	T	Repair			28.67	41.96	13.51	50.00	134.14	22.36
D	ET	Repair	4.52	2.78		6.06	4.12	57.57	75.05	12.51
		Capital					490.08			
E	T	Repair	0.45	0.64	190.56		57.44	52.50	301.59	50.26
		Capital					445.17			
F	ET	Repair	158.73	1.98	39.89	168.81	52.16	117.24	538.81	89.80
G	T	Repair			189.83	35.97	107.33	91.40	424.53	70.76
		Capital				612.90	17.05			
H	T	Repair	6.30	3.74	10.38	56.15	47.82	3.39	127.78	21.29
		Capital			520.35					
I	T	Repair			305.76		41.71		347.47	57.91
J	ET	Repair		1.32	344.48	17.94	106.44	18.83	489.01	81.50
		Capital			2141.51					
K	D	Repair	37.38	507.01	40.44	159.90		80.87	825.60	137.60
		Capital			158.31		3.20			
L	T	Repair	3.00	39.14	2.77	14.31	2.26	2.75	64.23	10.70
M	T	Repair		0.55		3.04	44.00		47.59	7.93
N	T	Repair		4.00		2.18	61.68		67.86	11.31
O	T	Repair		1.60	2.01	1.49	71.62	2.73	79.45	13.24
P	T	Repair	1.84	6.65	2.67		56.51	1.96	69.63	11.60
Q	T	Repair	1.41				44.00		45.41	7.57
R	T	Repair	21.13		8.58	2.26	46.43	3.85	82.25	13.71
S	T	Repair	1.37	1.92	1.22	40.67	46.56		91.74	15.29
		Capital				126.36				
T	T	Repair	4.10	10.11	9.83	122.46	47.11		193.61	32.27
U	T	Repair		4.85	55.88	0.86	52.37	24.53	138.49	23.08
V	T	Repair	0.81	22.77	7.11	1.01	51.21	1.37	84.28	14.05
		Capital	702.41	1.62						
W & X	T	Repair	25.83	5.95	302.11	2.39	46.38	4.12	386.78	32.23
		Capital			239.98			1258.68		
Y	T	Repair	40.00	3.25		2.94	10.06	18.02	74.27	12.38
Z	T	Repair	45.60	0.51		11.22	9.05	2.90	69.28	11.55
a	T	Repair	40.00	1.97		1.80	135.23	23.11	202.11	33.68
b	ET	Repair	42.46	3.38		6.82		10.93	63.59	10.60
c	SD	Repair		4.11	17.43	6.61	16.18	108.73	153.06	25.51
d	SD	Repair	59.75	5.79	10.38		32.59	94.93	203.44	33.91
e	ET	Repair	33.33		3.48	8.58	3.25	49.45	98.09	16.35
		Capital				2761.92		137.36		
f	T	Repair	34.55	6.88	1.81	2.40	7.81	49.80	103.25	17.21
g	T	Repair	41.98	5.72	6.97	30.11		62.79	147.57	24.59
h	ET	Repair	41.03	4.80	4.50	25.72	21.02	145.47	242.54	40.42
i	ET	Repair	68.38	5.17	11.13	4.40	1.65	43.03	133.76	22.29

TABLE 9 (CONT'D)

Prop	Type	Expenditure	Year						Total	Average
			1966	1967	1968	1969	1970	1971		
j	T	Repair	68.00	1.93	2.00		12.53	42.00	126.46	21.08
k	T	Repair	70.97	21.43	4.34	67.85	28.49	57.21	250.29	41.71
l	ET	Repair	70.52		9.70		21.15	48.83	150.20	25.03
m	ET	Repair	139.00	49.74	8.63		44.04	52.70	294.11	49.02
		Capital			1234.50					
n	T	Repair	141.68	9.59	12.37	3.98	1.38	54.97	223.97	37.33
		Capital			1235.94					
o	T	Repair	180.02		10.60	7.63	1.38	54.90	254.53	42.42
		Capital	895.18							
p	T	Repair	174.59	1.08	8.61	7.88	112.47	54.01	358.64	59.77
		Capital	895.95							
q	T	Repair	141.37	47.64	29.66	4.33	19.97	52.00	294.97	49.16
		Capital		1026.93						
r	ET	Repair	181.35	63.62	11.20	5.92	92.50	54.75	409.34	68.22
		Capital		1018.53						
s	ET	Repair	196.21	1.93	4.03	1.98	16.35	48.38	268.88	44.81
t	T	Repair	103.00			3.75	4.50	47.16	158.41	26.40
u	T	Repair	104.20	0.90	1.99	1.86	1.24	46.00	156.19	26.03
		Capital		322.15						
v	T	Repair	103.00		1.93		7.33	46.93	159.19	26.53
		Capital						1690.97		
w	ET	Repair	106.60		4.66	5.97	2.45	84.98	204.66	34.11
x	SD	Repair	1.30	1.81	81.32		5.51		89.94	14.99
y	SD	Repair			80.12		13.21	1.37	94.70	15.78
		Capital			635.56					
z	SD	Repair	12.23	74.27	67.91	123.76	27.80	52.93	358.90	59.81

TABLE 10

Complaint to Completion Time for the Public Sector 1966-1972.

Total Days
No. of Entries

PROP	INT DEC	EXT DEC	BRICK WORK	PIPE-LINES	GUTTER	CLADD	PLASTER	FLOORS	PATHS	FENCES	DAMP	DOORS	DRAIN-VALVES	WASHERS	BUSTS	PLUMBING	DRAINS	WINDOW	DOORS	LOCKS	WOOD WORK	WOOD OTHERS	DUST-BINS	OTHERS
1											647 1	1042 3				1 1		340 1				3 1	7 1	
2	26 2			2 1	510 2	9 1				65 1						2 1	1 1	503 2	98 1				23 1	
3					156 2	10 1						165 4	26 3					18 1						
4	44 2	12 1	123 2	6 1			11 1					23 1				40 4		29 2	235 3				7 1	11 1
5				2 2		54 1	17 1			42 2		186 4	2 1		3 1	229 2	7 1	290 1	40 2		27 1	2 1	2 1	
6	11 1																	1 1					1 1	
7																		1 1						
8	10 2		49 1	38 1		8 2	3 1			5 1		1 1				16 3	3 1	3 2				1 1	3 1	
9	85 1				25 1		129 3	143 2		123 3		15 2	5 1			28 3	2 2	301 2	272 4		5 1		4 2	
10	10 1	14 1	1581 2		6 1	31 3	2 1			53 2		15 1				4 2	13 1	482 4				20 3	1 1	
11	283 2			1 1	14 1	3 1	20 1			180 1			6 1					7 1		1 1				
12						25 1		3 1	119 1			52 2				11 3		1146 2	12 2				7 1	
13	7 1		35 1		42 2		9 1	4 1		6 2			31 1			49 6			20 1				10 1	
14	8 1			151 5	362 3	1 1	10 2				12 1	554 3		20 1	13 2	32 3		231 1	168 2			9 1	10 1	
15				6 1												17 3		63 1				9 1	1 1	
16	9 1	2 1			23 2				276 1			206 1				1 1		361 2	141 6					
17	8 1					27 1					50 2	89 3		6 1	1 1	39 3		494 2	473 6	1 1			3 1	
18	10 1		603 1	1 1	2 2	29 1	11 1						22 1			18 3	5 1		40 1			2 1	6 1	
19	13 3		611 4	37 2		46 1	153 3					42 2				54 2		21 2	190 3		6 1	8 1	9 1	
20			153 2		32 1	191 2	187 3			331 2	58 3	236 3	7 1	8 1		31 6	18 1		16 2					
21							55 1			201 1	77 1	36 1				4 2		279 2	219 3					
22	79 1		14 1	38 3		7 1	37 1			4 1		101 1				2 1		180 1						
23	9 1	13 1		36 1	69 3		16 2		34 1	15 1		95 6			1 1	5 2	1 1	514 2	275 3					
24	243 3			33 1		367 3						162 1	36 1			1 1	16 1		3 1	16 2				
25	8 2			77 3	653 3	4 1	1 1				499 1		1 1			13 1			187 1			15 2	1 1	
26	6 1			186 4	361 4		72 2	18 1		43 1	200 1	7 1				100 6	2 2	51 1	405 5				1 1	
27	4 1	1 1		74 2						2 1		97 2				7 2		4 2	107 3					
28			62 1		3 1											14 1		352 2	178 1					

TABLE 10 (CONT'D)

Total Days
No. of Entries

ROOM		INT DEC	EXT DEC	BRICK WORK	FIRE-PLACES	GUTTERS	GLAZE	PLASTER	FLOORS	PATHS	FENCES	DAMP	DOORS	BALL-VALVES	WASHERS	BOOSTS	PLUMBING	BEAMS	WINDOW	DOORS	LOCKS	WOOD WORK	WOOD OTHERS	DUST-BINS	OTHERS
29		159 1		61 2	156 5			15 1			55 1		119 1			1 1	20 3	5 3	72 1	62 6		13 3	24 3	5 2	
30				25 1		399 1	85 1				42 1		129 2				24 4	190 1		404 4				52 2	
31		5 2			4 1			13 1									12 3		1 1					5 2	
32		45 3		366 1	15 5		33 4			28 1	54 2	520 2	358 1	29 2			13 3	197 1	13 2	227 3		1 1		4 1	
35		27 5	4 1	16 1	22 3	22 1	7 1	32 3			2 1	5 1	188 2		4 2		5 4		1855 5	267 1			10 2	1 1	
34							79 3				13 1		11 1				12 3	7 2	284 1	1 1	1 1			4 1	
35						4 1					16 1		44 2	1 1			11 2	120 1		30 1				2 1	
36		348 2				10 1	3 1	13 1				35 1					24 6	1 1	653 2	1 1	1 1			6 1	
37					1 1	41 1	37 1				7 1		251 3	9 1			43 4		1323 3	340 2					
38			62 1			22 2		55 2				2 1	73 2	7 1			22 6	2 2	157 1	212 4					
39		229 4		1 1			313 1	9 2	46 1	8 1	34 2	88 2					37 3	6 1	658 3	253 3		3 1	2 1		
40		24 2			3 1					9 1	53 4			1 1			12 4		212 1	24 4					
41		8 1			8 1	276 5	3 1	124 3			20 1		15 2	1 1			8 4		423 2	76 4			29 2	1 1	
42					25 1			6 1			14 1		36 1	6 1			5 2		365 2	123 5			3 1	10 1	
43		26 1			4 1	17 1		17 1			22 2						3 5		878 2	39 5			6 1	3 2	
44		18 3			22 2		12 2	7 1	1 1		9 1	2 1	79 2				38 5		31 5	2 1		2 1	2 1	5 2	
45		9 1			15 2	9 1					52 1	82 1	79 3			17 1	10 2		9 1					2 1	
46											20 2								544 1					1 1	
47		5 1											4 1				5 1		545 1	7 1	2 1				
48		2 1			5 1														11 1	170 1	2 1			3 2	
49		38 3			85 1		32 2						8 1						24 2						
50						10 1	8 1	495 1						26 1			20 4	12 2	248 2	52 1					
51		3 1		623 5		422 2		369 5			129 3	132 2	681 6	17 1	7 1		161 8		584 3					3 1	
52		1 1				87 1	23 1				9 1						1 1	1 1	205 1					22 1	
TOTAL	DAYS	1820	108	4523	1055	3517	1587	1888	215	474	1601	2407	5094	233	45	36	1202	609	14685	5809	24	57	145	225	11
	ENTRIES	60	7	26	52	44	40	47	7	6	45	21	72	21	6	7	135	27	79	94	8	9	23	41	1

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