

F.R. Note No. 448/1960
Research Programme
Objective

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH AND FIRE OFFICES' COMMITTEE
JOINT FIRE RESEARCH ORGANIZATION

This report has not been published and should be considered as confidential advance information. No reference should be made to it in any publication without the written consent of the Director, Fire Research Station, Boreham Wood, Herts. (Telephone: ELStree 1341 and 1797).

FIRES IN POST-WAR DWELLINGS XLI (AN ANALYSIS OF
REPORTS OF FIRES ATTENDED BY FIRE BRIGADES IN
GREAT BRITAIN 1956)

by

H. Woolfe

An analysis has been made of reports of fires in post-war temporary and permanent non-traditional dwellings in 1956. This is intended as the last of a series of similar analyses.

The rate of incidence of fires in temporary dwellings has continued to increase, and is now greater than that in dwellings of all types grouped together.

Permanent non-traditional dwellings appear to have a fire risk well below the average.

It is possible that the high incidence rate in temporary dwellings, which were originally expected to last ten years only, may be partly due to age.

Fire Research Station,
BOREHAM WOOD,
Herts.

November, 1960.

FIRES IN POST WAR DWELLINGS XLI (AN ANALYSIS OF
REPORTS OF FIRES ATTENDED BY FIRE BRIGADES IN
GREAT BRITAIN 1956)

by

H. Woolfe

INTRODUCTION

As part of a general study of fires in dwellings in 1956, an analysis has been made of all reports of fires in post-war temporary dwellings (298 incidents) and in post-war permanent non-traditional dwellings (360 incidents). These latter dwellings are those in which the construction differs in some major way from the load bearing brick walls, tiled roofs, and timber floors commonly used in this country, and which are known by particular type names. Two hundred and ninety-eight temporary dwellings were damaged by fire in 1956 (19.3 per 10 000 at risk) and 366 permanent non-traditional dwellings (10.1 per 10 000 at risk) were also involved in fires.

The causes of these incidents, the materials first ignited, and the extent of fire have been analysed.

I TEMPORARY DWELLINGS

FACTUAL SUMMARY

Rate of incidence

From an earlier survey⁽¹⁾ and the known number of demolitions in 1956, it has been possible to estimate the number of temporary dwellings at risk in 1956, and hence, from this and the known number of fires, to obtain the rate of incidence. As no information is available on the numbers of various types of dwellings demolished in 1956, this rate cannot be broken down to show the rate of incidence for each type. The total number of dwellings at risk, and the extent of fires in the various types of temporary dwellings are shown in Table 1.

Causes of fire

The causes of fires in temporary dwellings are analysed in Table 2. The largest number of fires (21.7% of the total) was caused by electric wire and cable installations, and 83% of these particular incidents occurred in Aluminium and Arcon houses⁽²⁾. Fires caused by domestic cooking appliances were responsible for 17.1% of the total, and those caused by fires in grates, or by heat conducted through defective hearths, amounted to a further 16.1% of all fires.

Materials first ignited

The nature of the materials first ignited is shown in Table 3. In the largest number of cases (23.2% of the total), the material first ignited was electrical insulation. Furniture and furnishings were the materials first ignited in 17.8% of fires, and constructional materials were first ignited in 14.8% of the total.

Spread of fires

There were 26 fires which appear to have damaged more than half the dwelling in post-war temporary houses in 1956 (1.7 per 10 000 dwellings at risk). This amounts to 8.7% of the total number of these fires. The types of dwellings in which they occurred are shown in Table 1.

Casualties

Five fatal casualties and 29 non-fatal casualties occurred as a result of fires in temporary dwellings in 1956.

DISCUSSION

Comparison with previous analyses

The total rate of incidence of fires in post-war temporary dwellings increased from 18.0 per 10 000 at risk in 1955 to 19.3 in 1956 (Fig. 1). It is not possible to state with certainty the cause of this increase, since data for the rates of fire incidence in the various temporary dwellings are not available. The increase in the number of fires in Aluminium dwellings, and in the "other and unknown" category, are the most noticeable.

II PERMANENT NON-TRADITIONAL DWELLINGS

FACTUAL SUMMARY

Rate of incidence

The total construction of houses in this class is known for 1956. This, together with figures used in an earlier analysis, put the number at risk as 421 500. As with temporary dwellings, no information on the number of each type is available. The extent of fires in the various types is shown in Table 4.

Causes of fire

The causes of fires in permanent non-traditional dwellings are analysed in Table 5. Domestic open fires were responsible for the largest number of incidents (17.5% of the total), domestic cooking appliances caused 12.8%, chimney fires caused 10.6%, radiated heat and sparks from flues caused 8.5%, and faults in electric wire and cable caused 3.3% of the total number of fires.

Materials first ignited

The nature of the material first ignited is shown in Table 6. In the construction of these houses, the materials used are somewhat different from those used in traditional dwellings, and new types of electrical wiring (e.g. plastic covered cable) were coming into use when the houses were being built, so that these items are of particular interest.

In 23.5% of the incidents, the materials first ignited were constructional. In 5.7% of the incidents, the roof, or roofing felt or lining, was the material first ignited, in 4.9% partitions, walls or wall linings were first ignited, and in a further 3.5% electrical insulation was the material first ignited.

Spread of fires

There were 21 fires which damaged more than half the dwelling, in post-war permanent non-traditional dwellings in 1956 (0.5 damaged dwellings per 10 000 at risk). This amounts to 5.7% of the total number of these fires. The types of dwellings in which they occurred are shown in Table 4.

Casualties

Four fatal and 20 non-fatal casualties occurred as a result of fires in these types of dwellings in 1956.

Position of origin of fires

The positions of origin of the 366 fires are analysed in Table 7. Two hundred and twenty-two fires originated on the ground floor.

DISCUSSION

Comparison with previous analyses

The total rate of incidence of fires in post-war permanent dwellings of non-traditional type has increased from 7.5 in 1955 to 8.7 damaged dwellings per 10 000 at risk in 1956, thus returning to the level of incidence in 1954.

The rate of incidence of fires which damaged more than half the dwelling has also risen from 0.2 in 1955 to 0.5 per 10 000 at risk in 1956.

CONCLUSIONS

The rate of incidence of fires in dwellings of all types in 1956 is estimated to be approximately 15.8 per 10 000 at risk.

Temporary houses, therefore, present a worse than average and increasing risk (Fig. 1).

Permanent non-traditional post-war dwellings present a far better average risk which is generally falling, though the fall was halted in 1956; it cannot be said whether this change of direction of the curve is significant.

Amongst temporary dwellings, Aluminium and Arcon houses present the worst risk. Even if it could be assumed that none of these has been demolished, the rate of incidence in each type would still be high.

The temporary dwellings were originally expected to have a life of 10 years only. The rate of incidence of fires in these temporary dwellings has increased steadily during their lifetime and has now reached a value greater than the overall rate of fires in all dwellings in 1956. This may be partly an ageing effect. The cause groups in which the major increases in numbers occurred were flues, electric cookers and electric wire and cable.

REFERENCES

1. HINTON, J. E. L. Fires in Post-War Dwellings, XL. An analysis of Reports of Fires attended by Fire Brigades in Great Britain during 1955. Joint Fire Research Organization F.R. Note No. 253, 1956.
2. See also:- MILLAR D. W. and FRY J.F. Fires in Post-War Dwellings, XXXVII. Review of Statistical Work on Reports of Fires attended by the N.F.S. and Fire Brigades, 1946-1952. Joint Fire Research Organization F.R. Note No. 70, 1953.
Table 2 gives the rate of incidence of fires in occupied post-war temporary dwellings.

NUMBER AND EXTENT OF FIRES IN OCCUPIED POST-WAR TEMPORARY DWELLINGS

Reports from Fire Brigades in Great Britain 1956.

Table 1

Type of dwelling	Number of incidents	Number of damaged dwellings			
		Total	Fire confined to room of origin	Fire spread beyond room damaging	
				less than half the dwelling	more than half the dwelling
Aluminium	118	118	101	6	11
Arcon	76	76	69	2	5
Miller	1	1	1	-	-
Orlit	1	1	1	-	-
Phoenix	2	2	2	-	-
Spooner	3	3	3	-	-
Tarran	23	23	16	1	6
Universal	3	3	3	-	-
Uniseco	37	37	34	1	2
U.S.A.	13	13	12	-	1
Other	21	21	19	1	1
Total	298	298	261	11	26

Total number of dwellings at risk 154,163

CAUSES OF FIRE IN OCCUPIED POST-WAR TEMPORARY DWELLINGS

Reports from Fire Brigades in Great Britain 1956.

Table 2

Cause of Fire	Type of Dwelling						Total
	Aluminium	Arcon	Tarran	Uniseco	U.S.A.	Other and Unknown	
<u>DOMESTIC HEATING APPLIANCE</u>							
Ashes, soot	-	-	-	2	-	-	2
Chimney fire	-	-	-	-	-	1	1
Electric fire, heater	2	1	-	1	1	1	6
Electric immersion heater	1	-	-	-	-	-	1
Fire in grate	15	12	4	6	2	5	44
Fire in grate (defective hearth)	-	2	1	-	-	1	4
Flue - radiated heat	5	6	1	1	1	2	16
Flue - sparks from defective	5	3	1	1	1	1	12
Oil stove	6	4	1	5	2	1	19
Slow combustion stove, Ideal boiler etc.	-	1	-	-	-	-	1
Spark from chimney outside building	1	1	-	1	-	-	3
<u>DOMESTIC COOKING APPLIANCE</u>							
Coal gas	3	-	2	2	1	3	11
Electric	11	10	6	7	1	2	37
Gas ring	-	1	-	-	-	-	1
Electric kettle	-	1	-	-	-	1	2
<u>REMOVABLE DOMESTIC APPLIANCE</u>							
Wireless, T.V., Radiogram	2	1	-	1	-	2	6
Electric leads to apparatus	1	-	1	1	-	-	3
Electric, other apparatus	1	-	-	1	1	-	3

<u>FIXED DOMESTIC INSTALLATION</u>							
Electric wire and cable	41	13	-	3	1	7	65
<u>OTHER CAUSES</u>							
Blowlamp	-	-	1	-	-	-	1
Matches	3	1	-	2	-	-	6
Children playing with matches	-	2	1	2	-	-	5
Naked light	1	3	-	-	-	-	4
Tapers, candles	-	-	1	-	-	-	1
Smoking materials	9	6	2	-	2	1	20
Spread from other hazard	1	1	-	-	-	2	4
Other causes	7	2	-	1	-	-	10
Unknown cause	3	5	1	-	-	1	10
Total Fires	118	76	23	37	13	31	298

NATURE OF MATERIAL FIRST IGNITED IN FIRES IN
POST-WAR TEMPORARY DWELLINGS

Reports from Fire Brigades in Great Britain, 1956.

Table 3

Country	England and Wales	Scotland	Total
Material First Ignited			
<u>CONSTRUCTIONAL MATERIALS</u>			
Roof	2	1	3
Roofing felt or lining	7	-	7
Ceiling	6	2	8
Partitions, walls, wall linings	7	-	7
Floorboards or flooring	2	-	2
Timber under hearth	2	1	3
Built in cabinets, cupboards	1	1	2
Other wooden fittings	7	1	8
Pipe and tank laggings	2	1	3
Flue casing	1	-	1
<u>INSULATION OF ELECTRIC WIRING</u>			
No fire spread	2	-	2
Fire spread to water heater jacket or pipe and tank lagging	1	1	2
Fire spread to floorboards, rafter walls, ceiling	11	1	12
Fire spread to fuse box panels, distribu- tion board:			
(a) No further spread	31	6	37
(b) Spread to contents only	3	-	3
(c) Spread to constructional materials	9	-	9
Other materials	1	-	1
Other constructional materials	2	1	3
<u>CONTENTS</u>			
Airing linen, clothing or bedding	12	4	16
Apparatus, through fault in apparatus	7	3	10
Clothing in airing cupboard	2	-	2
Clothing on person	7	-	7
Flammable liquids	18	2	20
Food	22	8	30
Furniture and furnishings	47	6	53
Bedding	11	2	13
Other contents	13	3	16
Rubbish	7	-	7
Unknown	7	4	11
Total	250	48	298

NUMBER AND EXTENT OF FIRES IN OCCUPIED
POST-WAR PERMANENT NON-TRADITIONAL DWELLINGS

Reports from Fire Brigades in Great Britain 1956.

Table 4

Type of dwelling	Number of incidents	Number of damaged dwellings			
		Total	Fire confined to room of origin	Fire spread beyond room damaging	
				less than half the dwelling	more than half the dwelling
Airey	28	30	23	2	5
B.I.S.F.	63	64	50	12	2
Cruden	3	3	3	-	-
Easiform	30	30	30	-	-
Howard	8	8	7	1	-
Lamella	1	1	1	-	-
Miller	1	2	1	-	1
Orlit	14	14	14	-	-
Steane	1	1	1	-	-
Stuart	1	1	1	-	-
Swedish	16	16	13	1	2
Trusteel	1	1	1	-	-
Unity	9	9	9	-	-
Wates	5	5	4	1	-
Watling	1	1	1	-	-
Concrete: Weir, Quality	10	10	8	1	1
Whitson Fairhurst	2	2	2	-	-
Wimpey	23	24	22	1	1
Woolaway	2	2	2	-	-
Cornish Unit	12	12	12	-	-
Spooner	2	2	1	1	-
Aluminium:	6	6	6	-	-
Reema	7	7	7	-	-
Blackburn	11	12	10	1	1
Weir Paragon	3	3	3	-	-
Other types	100	100	84	8	8
Total	360	366	316	29	21

Total number of dwellings at risk 421,500

CAUSES OF FIRE IN OCCUPIED POST-WAR PERMANENT NON-TRADITIONAL DWELLINGS

Reports from Fire Brigades in Great Britain 1956.

Table 5

Cause of Fire	Type of Dwelling															Total
	Airey	B.I.S.F.	Basiform Laing	Howard	Orlit	Swedish	Unity	Wates	Weir (quality)	Wimpey	Cornish Unit	Aluminium	Reema	Blackburn	Other and Unknown	
<u>DOMESTIC HEATING APPLIANCE</u>																
Ashes, soot	-	1	-	-	2	-	-	1	-	1	-	-	-	1	2	8
Chimney fire	5	4	9	-	3	1	-	-	-	1	1	-	4	-	11	39
Electric fire, heater	-	2	2	-	3	-	-	-	1	-	1	-	-	-	1	10
Electric immersion heater	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Fire in grate	3	3	4	2	-	3	2	1	2	6	3	-	1	4	25	59
Fire in grate - defective hearth	1	-	-	-	-	-	-	-	1	-	-	-	-	-	3	5
Flue - radiated heat	2	6	2	-	2	-	2	-	-	3	-	-	-	-	3	20
Flue - sparks from defective	-	8	-	-	-	-	-	-	-	-	1	-	-	-	2	11
Oil stove	3	1	1	-	-	1	1	-	-	-	-	-	1	-	2	10
Slow combustion stove, ideal boiler etc.	-	-	1	1	-	-	-	-	-	-	-	-	-	-	4	6
Spark from chimney outside building	-	5	-	2	-	-	-	-	-	-	-	-	-	-	3	10
<u>DOMESTIC COOKING APPLIANCE</u>																
Coal gas	-	1	2	1	1	-	-	-	1	3	1	1	-	1	5	17
Electric	-	7	-	1	-	1	-	-	1	-	1	2	-	-	4	17
Oil	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2
Gas ring	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Kitchen range (combination stove heating and cooking)	1	-	-	-	-	-	-	-	-	-	2	-	-	-	-	3
Cooker undefined	1	1	-	-	-	1	-	-	-	-	-	-	1	-	3	7
<u>REMOVABLE DOMESTIC APPLIANCE</u>																
Electric iron	-	1	1	-	-	-	-	-	-	-	-	-	-	-	1	3
Wireless, Television, Radiogram	-	1	2	-	-	-	-	-	1	1	1	-	-	-	2	8
Electric lamp	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Electric leads to apparatus	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	2
Electric, other apparatus	-	2	1	-	-	1	-	-	-	-	-	-	-	-	1	5
Gas wash boiler	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Gas, other apparatus	-	-	-	-	-	-	1	-	-	-	1	-	-	-	1	3
Oil lamp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Oil, other apparatus	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>FIXED DOMESTIC INSTALLATION</u>																
Electric wire and cable	-	3	1	-	-	1	-	-	-	1	-	1	-	1	4	12
Other	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<u>OTHER CAUSES</u>																
Blowlamp	2	-	-	-	-	1	-	-	1	-	-	-	-	-	-	4
Lightning	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2
Matches	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2
Children playing with matches	-	1	-	-	1	2	1	1	-	-	-	-	-	-	6	12
Naked light	2	3	1	-	-	-	1	-	-	1	-	-	-	-	-	8
Tapers, candles	-	1	-	-	1	-	-	-	-	-	-	-	-	-	3	5
Smoking materials	3	3	2	-	-	2	-	1	1	2	2	-	-	1	9	26
Spread from other dwelling	2	1	-	-	-	-	-	-	-	4	-	-	-	2	2	11
Spread from other hazard	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	2
Other causes	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3	4
Unknown cause	2	6	-	1	1	-	-	-	1	1	-	-	-	1	13	26
Total	30	64	30	8	14	16	9	5	10	24	12	6	7	12	119	366

NATURE OF MATERIAL FIRST IGNITED IN FIRES IN
POST-WAR PERMANENT NON-TRADITIONAL DWELLINGS

Reports from Fire Brigades in Great Britain 1956.

Table 6

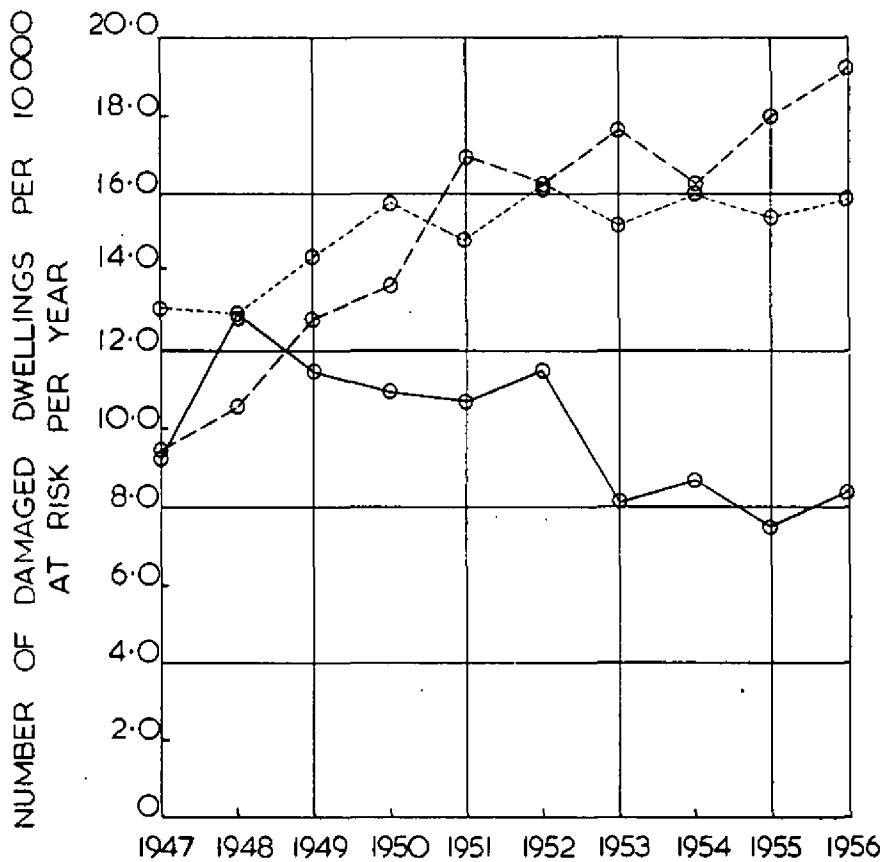
Country Material First Ignited	England and Wales	Scotland	Total
<u>CONSTRUCTIONAL MATERIALS</u>			
Roof	9	4	13
Roofing felt or lining	8	-	8
Ceiling	7	2	9
Partition, walls, wall linings	13	5	18
Floorboards or flooring	3	4	7
Timber under hearth	2	1	3
Timber set in chimney	-	2	2
Built in cabinets, cupboards	3	-	3
Other wooden fittings	6	4	10
Pipe and tank lagging	8	-	8
Flue casing	5	-	5
<u>INSULATION OF ELECTRIC WIRING</u>			
No fire spread	1	2	3
Fire spread to floorboards, rafter walls, ceiling	2	1	3
Fire spread to fuse box panel, distribution board:			
(a) No further spread	2	1	3
Other constructional materials	4	-	4
<u>CONTENTS</u>			
Soot in or behind fireplace	2	-	2
Soot in chimney	23	-	23
Airing linen, clothing or bedding	15	3	18
Apparatus, through fault in apparatus	11	3	14
Clothing in airing cupboard	5	3	8
Clothing on person	10	1	11
Flammable liquids	9	3	12
Food	24	11	35
Furniture and furnishings	46	17	63
Bedding	7	6	13
Floor covering (including carpets)	2	1	3
Other contents	25	10	35
Coal gas	4	-	4
Rubbish	6	1	7
Unknown	16	3	19
Total	278	88	366

POSITION OF ORIGIN OF FIRES IN POST-WAR
PERMANENT NON-TRADITIONAL DWELLINGS

Reports from Fire Brigades in Great Britain 1956.

Table 7

Type of Dwelling	Position of origin of fire				Total
	Ground floor	First floor	Second floor	Unknown or other situations	
Airey	15	7	-	8	30
B. I. S. F.	29	15	-	20	64
Cruden	1	1	1	-	3
Easiform	23	5	-	2	30
Howard	5	-	-	3	8
Lamella	1	-	-	-	1
Miller	1	1	-	-	2
Orlit	7	5	-	2	14
Steane	-	1	-	-	1
Stuart	-	1	-	-	1
Swedish	9	4	-	3	16
Trusteel	1	-	-	-	1
Unity	6	2	-	1	9
Wates	3	2	-	-	5
Watling Concrete	1	-	-	-	1
Weir Quality	5	4	-	1	10
Whitson Fairhurst	1	1	-	-	2
Wimpey	14	7	2	1	24
Woolaway	2	-	-	-	2
Cornish Unit	11	1	-	-	12
Spooner	1	1	-	-	2
Aluminium	5	-	-	1	6
Reema	3	1	-	3	7
Blackburn	9	2	-	1	12
Weir Paragon	1	-	-	2	3
Other	68	15	-	17	100
Total	222	76	3	65	366



_____ Fires in post-war permanent non-traditional dwellings
 - - - - - Fires in post-war temporary dwellings
 Fires in all dwellings

FIG. 1. INCIDENCE OF FIRES IN DWELLINGS 1947-1956
(Reports from Fire Brigades in Great Britain)