

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH AND FIRE OFFICES' COMMITTEE
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FIRES IN SCHOOLS. AN ANALYSIS OF ALL REPORTS OF INCIDENTS ATTENDED BY FIRE BRIGADES IN ENGLAND AND WALES, 1953

by

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Summary

An analysis has been made of all reports of fires in schools attended by Fire Brigades in England and Wales during 1953. There were 535 incidents reported, 329 of which occurred in schools run by local education authorities. Three hundred and sixty-two incidents occurred in primary or secondary non-residential schools.

One hundred and fifty-two incidents, 28 per cent of the total, were due to heating apparatus, and 46 to cookers (gas, electric or cooking ranges). Seventy-three incidents occurred in kitchens and canteens, 53 in classrooms, and 72 in structures separated from the main school buildings.

It has been possible to obtain the cost of reinstatement of the damage caused by some of the fires. In 79 incidents in which the cost of the damage was estimated to be greater than £10, the total cost of reinstatement was about £92,000.

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Mrs. J. E. L. Hinton

INTRODUCTION

An analysis has been made of all reports of fires in schools attended by Fire Brigades in England and Wales during 1953. This note continues the survey of reports of fires in schools made for earlier years at the request of the Ministry of Education.

Data have been collected on the type of school, the causes of fire, the materials first ignited, the locations of the outbreaks, and the extent of the damage. The schools have been separated into two broad categories, those run by local educational authorities and those run by other bodies.

TYPE OF SCHOOL

The separate types of educational establishments considered, and the frequency of the fires occurring in them are shown in Table 1 and, graphically, in Fig 1. A total of 535 incidents occurred in educational establishments, of which 362 (68 per cent) were in primary or secondary non-residential schools, and 58 were in primary and secondary residential schools.

Seven incidents occurred in primary or secondary L.E.A. schools of non-traditional construction.

CAUSE OF FIRE AND LOCATION OF OUTBREAK

The frequency of outbreaks is shown in relation to causes in Table 2. One hundred and fifty-two incidents (28.4 per cent of the total) were due to heating apparatus; this total includes 41 incidents due to radiated heat and sparks from flues. There were 46 incidents (8.6 per cent of the total) due to cooking apparatus; half of these were caused by gas cookers. Seventy-nine incidents (14.8 per cent of the total) were caused by smokers materials and matches, and of this latter group 30 incidents were due to children playing with matches.

In Tables 3a and 3b the causes of fire are analysed in relation to the location of the outbreaks. Seventy-three incidents (13.6 per cent of the total) occurred in kitchens and canteens, and 72 incidents were located in huts, sheds, sports pavilions and similar structures separated from the main buildings. Fifty-three incidents occurred in classrooms, 15 of which were caused by slow combustion stoves.

Fifty-four incidents started in stokeholes and boiler houses; 23 of these were caused by slow combustion stoves, usually the central heating boilers.

MATERIALS FIRST IGNITED

There were 151 incidents (28.2 per cent of the total) in which constructional materials were ignited first. The causes of these incidents are shown in Tables 4a and 4b. The most common cause of ignition of such materials in 1953 was "radiated heat and sparks from flues"; these incidents accounted for about 23 per cent of the fires in which constructional materials were ignited first, and the parts of the structure most frequently ignited were roof, walls and wall linings.

DAMAGE AND EXTINCTION OF FIRE

Four hundred and seven incidents (76 per cent of the total) were fairly small fires causing damage less than 50 sq. ft. in area. In only 26 of the incidents in which it was possible to estimate the damage by area was the area damaged greater than 500 sq. ft.

About one-third of the fires were extinguished before the Fire Brigades arrived.

CASUALTIES

There were 42 non-fatal casualties reported as a result of fires in schools in 1953, of these only two were children and 12 were Fire Brigade personnel. All the injuries were slight.

COST OF FIRES

It has been possible to discover the cost of the majority of the incidents in which the fire damage was estimated to amount to more than £10. In 79 such incidents the total damage amounted to about £92,000. Each of 18 fires caused damage costing over £1,000, 7 cost between £500 and £1,000 each, 23 cost between £100 and £500 each, and 31 less than £100 each. A frequency diagram showing the costs of the fires is given in Fig.2.

DISCUSSION OF RESULTS AND COMPARISON WITH PREVIOUS ANALYSES

It has been possible in this report to analyse all reports of fires in schools attended by Fire Brigades during 1953. In general the results of this analysis show characteristics similar to those of the analyses for the two previous years 1951 and 1952 for which 1 in 2 and 1 in 4 random samples of all reports were considered.

The causes of fire are, in the main, those common to domestic dwellings and a high proportion (76 per cent) of incidents caused damage of less than 50 sq. ft. About one-third of the incidents were extinguished before the Fire Brigades arrived.

Forty-two non-fatal casualties occurred in fires in schools in 1953, but only two of these were children and all the injuries were slight.

It is not advisable to make direct comparisons in detail between this analysis and the earlier ones since some of the figures quoted in the tables of the sample analyses may have been subject to fairly large sampling errors, especially where they were concerned with small frequencies.

FIRES IN SCHOOLS, 1953

Frequencies obtained by analysis of all reports from
Fire Brigades in England and Wales

TABLE 1

Frequencies of fires in relation to type of school.

Type of school	L.E.A. Establish- ments	Non-L.E.A. Establish- ments	Total
Primary non-residential	129	42	171
Primary residential	-	15	15
Secondary non-residential	143	20	163
Secondary residential	2	41	43
Non-residential (primary or secondary)	28	-	28
Polytechnics	11	-	11
Universities, non-residential	-	8	8
Universities, residential	-	9	9
F.E. Non-residential	4	2	6
F.E. Residential	3	6	9
Special schools	5	19	24
Homes and orphanages	1	34	35
Other and undefined	3	10	13
Total	329	206	535

TABLE 2

Frequencies of fires in relation to cause

Cause of fire	L.E.A. Establish- ments	Non-L.E.A. Establish- ments	Total
Ashes, hot	10	6	16
Blowlamp	20	9	29
Electric cooker	18	-	18
fire	4	7	11
other apparatus	14	8	22
wire and cable	14	11	25
Fire in grate	7	27	34
Flue	25	16	41
Gas cooker	16	7	23
fire	1	2	3
other apparatus	23	7	30
Smokers' materials and matches	33	16	49
Children playing with matches	18	12	30
Naked light	9	5	14
Oil lamp - stove	8	1	9
Kitchener stove	3	2	5
Slow combustion stove	41	13	54
Miscellaneous causes	38	31	69
Unknown causes	27	26	53
Total	329	206	535

TABLE 3a

Cause of fire in relation to location of occurrence

Frequencies obtained from analysis of all reports from Fire Brigades in England and Wales, 1953.

Incidents occurring in L.E.A. establishments.

Cause of fire	Location											
	Kitchen	Domestic Science room	Stokehole or Boiler house	Laboratories	Workshops	Cloakroom	Stores	Classrooms	Halls, pavilions out buildings	Roof	Other	Total
Ashes, hot	-	-	7	-	-	-	-	-	3	-	-	10
Blowlamp	-	-	-	-	-	1	-	1	2	5	11	20
Electric cooker	16	-	1	-	-	-	-	-	-	-	1	18
Electric, other apparatus	1	-	2	-	1	-	2	1	1	-	10	18
Electric wire and cable	1	-	-	1	-	-	1	2	-	1	8	14
Fire in grate	-	-	-	-	-	-	-	2	-	-	5	7
Flue	1	-	5	-	-	-	-	6	1	5	7	25
Gas cooker	15	-	-	1	-	-	-	-	-	-	-	16
Gas, other apparatus	10	2	-	2	-	1	-	2	1	1	5	24
Matches and smokers' materials	1	-	3	-	-	2	5	5	2	1	14	33
Matches, children playing with	-	-	-	-	-	-	2	4	8	-	4	18
Naked light	1	-	1	1	-	1	-	-	3	-	2	9
Oil lamp, stove	2	-	-	1	-	-	-	2	3	-	-	8
Kitchener stove	3	-	-	-	-	-	-	-	-	-	-	3
Slow combustion stove	-	3	17	-	-	-	-	12	1	1	7	41
Miscellaneous causes	2	1	4	5	1	2	2	3	7	1	10	38
Unknown cause	1	-	-	-	1	2	3	1	4	2	13	27
Total fires	54	6	40	11	3	9	15	41	36	17	97	329

TABLE 3b

Cause of fire in relation to location of occurrence

Frequencies obtained from analysis of all reports from Fire Brigades in England and Wales, 1953.

Incidents occurring in Non-L.E.A. establishments

Cause of fire	Location										Total	
	Kitchen	Domestic Science Room	Stokehole or Boiler house	Laboratories	Workshops	Cloakroom	Stores	Classrooms	Huts, pavilions, out buildings	Roof		Other
Ashes, hot	-	-	2	-	1	-	-	-	-	-	3	6
Blowlamp	-	-	-	-	-	-	-	-	-	1	8	9
Electric cooker	-	-	-	-	-	-	-	-	-	-	-	-
Electric, other apparatus	2	-	-	1	1	-	-	2	1	-	8	15
Electric wire and cable	-	-	1	1	-	1	1	-	-	-	7	11
Fire in grate	1	-	-	-	-	-	-	-	-	-	26	27
Flue	1	-	3	-	-	-	1	3	-	2	6	16
Gas cooker	7	-	-	-	-	-	-	-	-	-	-	7
Gas, other apparatus	3	-	-	2	-	-	-	1	-	-	3	9
Matches and smokers' materials	1	-	-	-	1	1	-	-	4	-	9	16
Matches, children playing with	1	-	-	-	-	1	1	1	3	-	5	12
Naked light	-	-	1	-	-	-	-	-	2	-	2	5
Oil lamp, stove	-	-	-	-	-	-	-	-	-	-	1	1
Kitchener stove	1	-	-	-	-	-	-	-	-	-	1	2
Slow combustion stove	-	-	6	-	-	-	-	3	4	-	-	13
Miscellaneous causes	2	-	-	2	-	1	5	-	11	1	9	31
Unknown cause	-	-	1	1	1	2	-	2	11	1	7	26
Total fires	19	-	14	7	4	6	8	12	36	5	95	206

TABLE 4a

Causes of Fires in relation to Constructional Materials first ignited

Frequencies obtained from analysis of all reports from Fire Brigades in England and Wales, 1953.

Incidents occurring in L.E.A. establishments

Cause of fire	Nature of constructional material												
	Roof	Ceiling	Partitions, walls, etc.	Floor	Timber under hearth	Other wooden fittings	Elec. insulation - no fire spread	Elec. insulation - floorboards, rafters walls, ceilings	Elec. insulation - fusebox panel, etc only	Fusebox panel etc. spreading to floors rafters, etc.	Elec. insulation spreading to other	Miscellaneous	Total
Blowlamp	1	-	2	-	-	10	-	-	-	-	-	-	13
Electric wire and cable ...	1	-	-	-	-	-	3	1	5	1	-	-	11
Electric other apparatus ..	-	-	1	1	1	-	3	-	-	-	-	-	7
Fire in grate	-	-	1	-	2	-	-	-	-	-	-	-	3
Flue	9	1	5	3	-	2	-	-	-	-	-	-	21
Gas apparatus	-	-	1	-	-	1	-	-	-	-	-	1	3
Slow combustion stove	1	-	12	1	2	1	-	-	-	-	-	-	17
Snokers' materials	-	-	-	1	-	1	-	-	-	-	-	1	3
Miscellaneous	4	-	2	1	-	2	-	-	-	-	-	1	10
Unknown	1	-	-	-	-	-	-	-	-	-	-	-	1
Total	17	1	24	7	5	17	6	1	6	1	-	4	89

Table 4b

Causes of Fires in relation to Constructional Materials first ignited

Frequencies obtained from analysis of all reports from Fire Brigades in England and Wales, 1953

Incidents occurring in non-L.E.A. establishments

Cause of fire	Nature of constructional material											Total	
	Roof	Ceiling	Partitions, walls, etc.	Floor	Timber under hearth	Other wooden fittings	Elec. insulation - no fire spread	Elec. insulation - floorboards, walls, rafters, ceilings	Elec. insulation - fusebox panel, etc. only	Fusebox panel etc. spreading to floors rafters, etc.	Elec. insulation spreading to other		Miscellaneous
Blowlamp	1	-	2	1	-	4	-	-	-	-	-	-	8
Electric apparatus	-	-	-	2	-	-	-	-	-	-	-	-	2
Electric wire and cable ...	-	-	-	2	-	-	-	-	2	3	-	-	8
Fire in grate	-	-	-	4	9	3	-	-	-	-	1	-	16
Flue	3	-	4	1	1	4	-	-	-	-	-	-	13
Gas apparatus	-	-	-	1	-	1	-	-	-	-	-	-	2
Slow combustion stove	-	-	3	1	-	2	-	-	-	-	-	-	6
Smokers' materials	-	-	-	1	-	-	-	-	-	-	-	-	1
Miscellaneous	1	-	2	1	-	1	-	-	-	-	-	-	5
Unknown	-	-	-	-	-	-	-	-	-	1	-	-	1
Total	5	-	11	14	10	15	-	2	3	1	1	-	62

FIG. 1.

NUMBER OF INCIDENTS OCCURRING IN SCHOOLS IN ENGLAND AND WALES, 1953, SHOWN BY TYPE OF SCHOOL

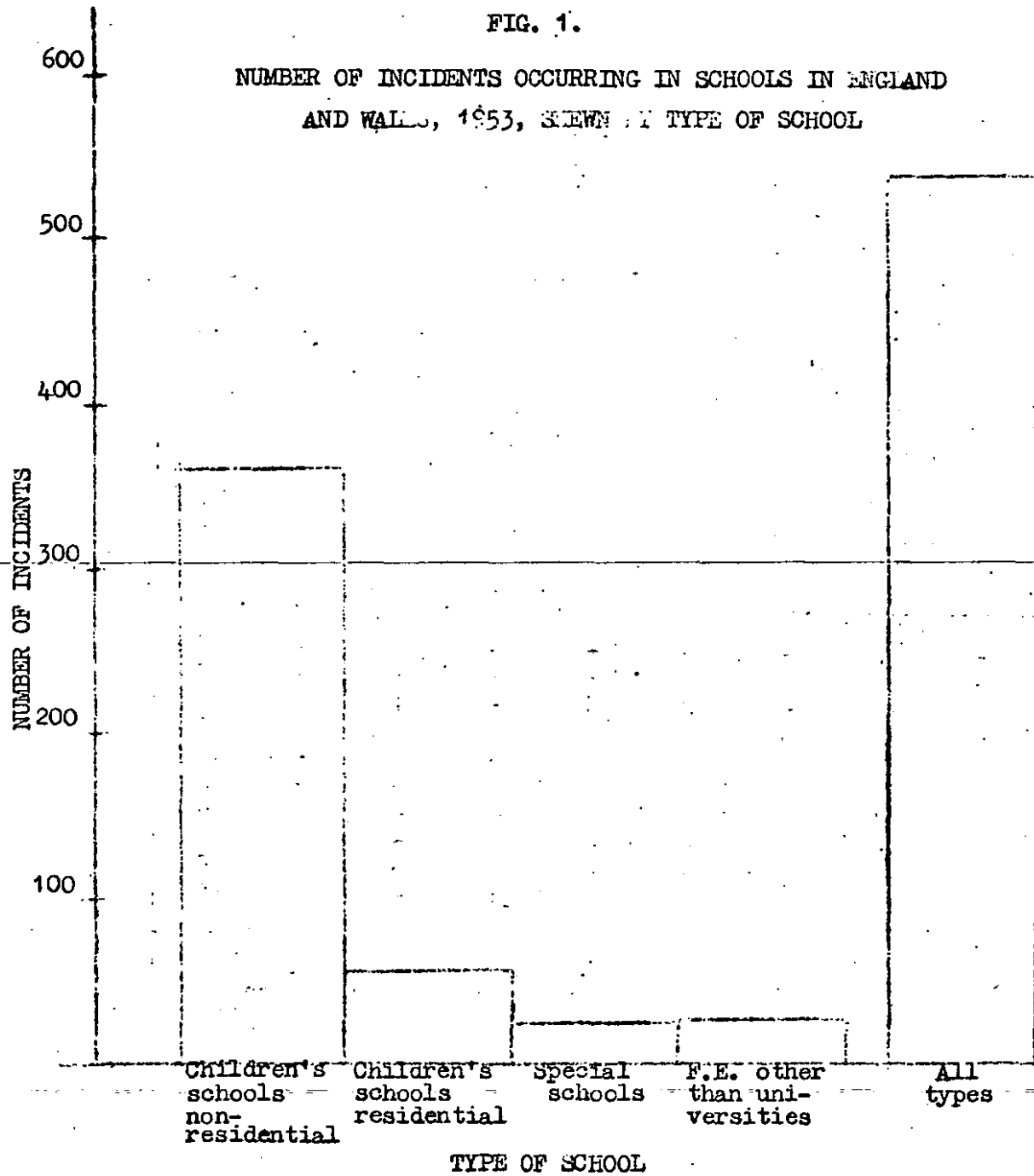


FIG. 2.

COST OF REINSTATEMENT OF DAMAGE CAUSED BY SOME FIRES IN SCHOOLS IN ENGLAND AND WALES, 1953

