

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH AND FIRE OFFICES'  
COMMITTEE JOINT FIRE RESEARCH ORGANIZATIONStatistical Analysis of reports of fires attended by Fire Brigades  
in the United Kingdom during 1951

Reports on form K.433 of fires attended by the Fire Brigades in the United Kingdom during 1951 have been analysed and the following ten statistical tables have been prepared for England and Wales, for Scotland and for Northern Ireland: the tables are set out in Appendices I, II and III respectively.

No.	TABLE
1	Method of calling Fire Brigades to fires.
2	Fires classified according to hazard in which fire started.
3	Supposed cause of fires.
4A	Supposed cause of fires in buildings in relation to hazard in which fire started.
4B	Supposed cause of fires other than those in buildings in relation to hazard in which fire started.
5	Material first ignited in fires.
6	Method of extinction of fires.
7	Behaviour of sprinkler systems at fires.
8	Attendance of special appliances at fires.
9	Persons rescued or escaped by emergency means from fires.
10	Nature of injuries of casualties in fires.

Zero percentages and percentages less than 0.05% are indicated by a dash (-) in the tables.

All reports were analysed to prepare Tables 1, 8, 9 and 10. Because of shortage of staff, a random one-in-two sample of reports was analysed for Tables 2, 3, 4A, 4B, 5, 6 and 7; the results of analysis of this sample were multiplied by two to obtain the figures given in the tables (except for Table 7). The method of selecting the sample and the accuracy of the estimated yearly totals and of the percentages of different types of occurrence are discussed in Appendix IV.

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APPENDIX I  
STATISTICAL TABLES FOR FIRE BRIGADES IN ENGLAND AND WALES, 1951

Table 1

## METHOD OF CALLING FIRE BRIGADES TO FIRES

Reports from England and Wales, 1951

(Frequencies obtained from results of analysis of all reports)

Method of Calling	County Fire Brigades																														
	Anglesey	Bedfordshire	Berkshire and Reading C.B.	Breconshire and Radnorshire	Buckinghamshire	Caernarvonshire	Cambridgeshire		Cheshire	Cornwall	Cumberland	Denbighshire and Montgomeryshire	Derbyshire	Devon	Dorset	Durham	ELY, Isle of	Essex	Flintshire	Glamorgan	Gloucestershire	Hampshire	Herefordshire	Hertfordshire	Huntingdonshire	Kent and Canterbury	Lancashire	Leicestershire and Rutland	Lincolnshire, Holland	Lincolnshire, Kesteven	Lincolnshire, Lindsey
By Special Fire Service methods	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Automatic fire alarm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fire and police pillar box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Police telephone	-	43	35	-	20	-	5	15	18	2	9	-	41	12	13	22	-	76	1	40	8	10	5	39	-	125	22	8	10	6	13
Private fire telephone	-	-	8	-	2	-	-	-	23	-	-	-	2	-	-	37	-	32	-	1	-	9	-	17	-	38	22	-	-	-	-
Street fire alarm	-	9	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	83	-	-	1	-	-	-	-	23	1	-	1	-	-
Total	-	52	43	-	22	-	5	15	41	2	9	-	43	12	22	59	-	192	1	41	9	19	5	56	-	186	45	8	11	6	13
Exchange telephone	59	312	529	77	487	159	205	238	869	462	188	229	574	660	495	663	122	1989	128	703	507	1102	160	830	98	1865	2333	230	130	137	321
Running call	3	37	29	15	24	14	24	10	93	24	37	28	38	49	29	89	18	148	29	88	27	56	6	52	10	152	241	30	15	9	37
Late call	1	5	22	4	5	19	-	19	14	5	9	9	-	6	15	60	-	152	13	120	3	58	2	20	5	156	32	-	1	1	2
Other and undefined methods	4	2	-	1	2	5	2	5	12	1	1	4	7	-	11	11	1	6	1	4	8	6	-	6	-	19	7	3	-	1	2
Total fires	67	408	623	97	540	197	236	287	1029	494	244	270	662	727	572	882	141	2487	172	956	554	1241	173	964	113	2378	2658	271	157	154	375

## APPENDIX I (Contd.)

Table 1 (contd.)

## METHOD OF CALLING FIRE BRIGADES TO FIRES

Reports from England and Wales, 1951

(Frequencies obtained from results of analysis of all reports)

Method of Calling	County Fire Brigades (Contd.)																										
	London		Middlesex	Monmouthshire	Norfolk	Northamptonshire	Northumberland	Nottinghamshire	Oxfordshire	Pembrokeshire	Peterborough, Soke of	Salop	Scilly, Isles of	Somerset	Staffordshire	Suffolk and Ipswich C.B.	Surrey	Sussex, East	Sussex, West	Warwickshire	Westmorland	Wight, Isle of	Wiltshire	Worcestershire and Worcester C.B.	Yorkshire East Riding	Yorkshire North Riding	Yorkshire West Riding
By Special Fire Service methods																											
Automatic fire alarm	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fire and police pillar box	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	1	-	1
Police telephone	7	-	4	6	-	13	18	2	25	-	7	18	-	6	89	37	56	24	16	28	3	1	8	31	5	46	47
Private fire telephone	98	-	42	-	-	-	1	3	-	-	-	8	-	1	4	2	3	-	-	2	1	-	-	2	-	16	4
Street fire alarm	368	-	229	-	-	-	-	-	-	-	-	-	-	-	-	2	53	-	-	4	-	-	2	-	-	1	1
Total	479	-	275	6	-	13	19	5	25	-	7	26	-	7	97	41	118	24	16	34	4	1	10	33	6	63	53
Exchange telephone	5150	57	2485	210	488	243	400	612	213	119	65	300	1	568	623	529	1576	503	372	615	44	111	491	492	169	343	1597
Running call	487	4	166	38	46	26	59	63	32	11	8	34	-	31	92	56	90	31	17	38	17	11	50	52	11	35	170
Late call	464	-	343	8	5	9	13	35	3	3	10	27	-	3	39	6	93	9	9	37	1	1	20	27	8	27	60
Other and undefined methods	29	-	5	2	2	-	17	6	2	2	-	4	1	4	3	7	4	9	5	12	19	1	11	7	2	4	19
Total fires	6609	61	3274	264	541	291	508	721	275	135	90	391	2	613	854	639	1881	576	419	736	85	125	582	611	196	472	1899

## APPENDIX I (Contd.)

Table 1 (contd.)

## METHOD OF CALLING FIRE BRIGADES TO FIRES

Reports from England and Wales, 1951

(Frequencies obtained from results of analysis of all reports)

Method of Calling	County Borough Fire Brigades																																										
	Barnsley	Barrow in Furness	Bath	Birkenhead	Birmingham	Blackburn	Blackpool	Bolton	Bootle	Bournemouth	Bradford	Brighton	Bristol	Burnley	Burton upon Trent	Bury	Cardiff	Carlisle	Cheshire	Coventry	Croydon	Darlington	Derby	Dewsbury	Doncaster	Dudley	Eastbourne	East Ham	Exeter	Gloucester	Great Yarmouth	Grimsby	Halifax	Hastings	Huddersfield	Kingston upon Hull	Leeds	Leicester	Lincoln	Liverpool	Manchester		
By Special Fire Service methods																																											
Automatic fire alarm	-	-	-	-	1	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Fire and police pillar box	-	-	2	6	-	2	4	8	-	-	-	-	5	-	-	-	-	1	-	-	-	-	1	-	1	-	-	-	-	-	-	-	2	-	-	-	-	2	-	-	2	-	-
Police telephone	22	19	11	37	107	60	30	25	29	5	122	31	97	46	1	15	42	27	10	77	21	24	19	15	14	21	1	6	23	-	5	20	19	13	28	105	100	24	14	175	167		
Private fire telephone	2	1	-	11	40	-	9	8	22	-	2	4	18	-	2	-	6	-	-	1	14	-	2	-	-	-	2	6	-	-	-	-	1	-	-	1	6	-	-	-	35	14	
Street fire alarm	-	-	-	-	139	-	-	-	-	-	-	5	1	-	-	-	18	-	-	-	8	-	1	-	-	-	1	18	-	-	-	-	-	-	-	-	2	4	10	-	168	69	
Total	24	20	13	54	287	62	43	41	51	5	124	40	123	46	3	15	66	28	10	78	43	24	24	15	15	21	4	30	23	-	5	20	22	13	28	109	112	34	16	378	250		
Exchange telephone	67	71	112	185	1519	112	198	194	95	185	341	157	519	127	45	101	342	108	101	286	230	82	138	67	73	66	80	143	103	98	83	79	127	74	165	338	532	289	101	748	743		
Running call	7	7	7	47	190	7	26	13	23	10	21	10	29	16	-	12	11	13	6	22	14	15	6	26	3	9	7	5	7	10	11	5	15	5	8	30	33	14	9	84	120		
Late call	2	1	7	33	49	4	28	7	29	2	43	6	50	6	5	-	1	5	-	-	35	1	1	2	6	4	5	11	1	2	1	1	3	6	10	21	47	-	1	135	126		
Other and undefined methods	2	1	5	2	5	2	7	2	2	1	-	-	3	1	-	2	5	1	1	9	17	8	5	-	-	-	1	1	-	3	2	-	-	2	1	11	-	3	-	2	7		
Total fires	102	100	144	321	2050	187	302	257	200	203	529	213	724	196	53	130	425	155	118	395	339	130	174	110	97	100	97	190	134	113	102	105	167	100	212	509	724	340	127	1347	1246		

## APPENDIX I (Contd.)

Table 1 (contd.)

## METHOD OF CALLING FIRE BRIGADES TO FIRES

Reports from England and Wales, 1951

(Frequencies obtained from results of analysis of all reports)

Method of Calling	County Borough Fire Brigades (Contd.)																													Total fires attended in England and Wales											
	Merthyr Tydfil	Middlesbrough	Newcastle upon Tyne and Gateshead	Newport	Northampton	Norwich	Nottingham	Oldham	Oxford	Plymouth	Portsmouth	Preston	Rochdale	Rotherham	St. Helens	Salford	Sheffield	Smethwick and West Bromwich	Southampton	Southend	Southport	South Shields	Stockport	Stoke on Trent	Sunderland	Swansea	Tynemouth	Wakefield	Wallasey	Walsall	Warrington	West Ham	West Hartlepool	Wigan	Wolverhampton	York	No.	per cent			
By Special Fire Service methods																																									
Automatic fire alarm	-	-	-	-	1	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	
Fire and police pillar box	-	-	-	-	-	-	-	4	-	2	16	-	-	-	-	-	-	1	1	-	-	-	2	-	-	-	-	-	13	-	-	-	5	-	7	-	96	0.1			
Police telephone	7	48	135	50	22	21	41	25	11	28	23	5	23	21	19	82	113	18	20	15	23	35	41	18	59	39	21	17	28	24	10	-	18	14	30	22	3848	6.0			
Private fire telephone	-	-	1	-	-	-	4	2	-	24	24	-	1	-	-	26	2	6	2	3	-	-	3	2	4	-	1	-	19	-	-	2	-	-	3	-	720	1.1			
Street fire alarm	-	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	3	9	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	1287	2.0				
Total	7	66	136	50	23	21	45	31	11	54	63	5	25	22	19	108	115	42	26	27	23	35	46	20	63	39	22	17	47	37	10	13	23	14	40	22	5965	9.3			
Exchange telephone	49	114	336	133	83	172	406	166	101	222	193	203	133	91	74	149	500	135	200	149	110	88	145	218	242	187	73	46	120	89	63	273	88	92	147	119	50170	78.1			
Running call	5	6	34	13	9	-	19	6	7	15	28	17	7	11	9	7	26	23	17	16	7	5	14	20	15	19	15	7	3	16	11	29	16	8	14	6	4529	7.1			
Late call	7	14	4	31	1	6	13	-	3	3	7	4	-	1	6	34	103	7	4	6	-	1	4	6	1	18	2	-	12	3	1	14	3	-	5	2	3041	4.7			
Other and undefined methods	3	-	2	2	4	3	-	-	-	6	1	1	4	1	-	8	2	-	14	3	1	-	-	1	1	-	-	5	2	-	1	2	1	-	4	-	1495	0.8			
Total fires	71	200	512	229	120	202	483	203	122	300	292	230	169	126	108	306	746	207	261	201	141	129	209	265	322	263	112	75	184	145	86	331	131	114	210	149	64200	100.0			

APPENDIX I (Contd.)

Table 2

FIRES CLASSIFIED ACCORDING TO HAZARD IN WHICH FIRE STARTED

Reports from England and Wales, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Hazard	Total	
	No.	Per cent.
Fires in buildings classified according to trade or business carried on		
<u>Agriculture</u>		
Farming (not fruit or poultry), horse and stock rearing	1,350	2.1
Allotments, market gardening, fruit and poultry farming	356	0.6
Total	1,706	2.7
<u>Mining, quarrying and treatment of non-metalliferous mine and quarry products (excluding gas works)</u>	152	0.2
<u>Manufacture of bricks, pottery, glass, etc.</u>	96	0.2
<u>Manufacture of chemicals, dyes, explosives, paints, oils</u>		
Chemicals	208	0.3
Explosives	16	-
Paints, varnish, oils, grease	112	0.2
Miscellaneous	58	0.1
Total	394	0.6
<u>Manufacture of metals, machines, implements, conveyances</u>		
Smelting, converting, refining, rolling of iron, steel	142	0.2
Extracting, refining, smelting of other metals	50	0.1
Founding, other secondary processes in metal working	178	0.3
Engineering (not marine or electrical)	372	0.6
Electrical installations, cables and apparatus	146	0.2
Construction and repair of vehicles	236	0.4
Shipbuilding and repairing, marine engineering	50	0.1
Cutlery and small tools	58	0.1
Other metal industries	240	0.4
Total	1,472	2.4
<u>Manufacture of textiles and textile goods (not dress)</u>		
Cotton	308	0.5
Wool, worsted, and shoddy	124	0.2
Silk, natural and artificial	20	-
Other or mixed fibres	64	0.1
Miscellaneous	68	0.1
Textile dyeing, printing, bleaching, finishing	56	0.1
Total	640	1.0

APPENDIX I (Contd.)

Table 2 (Contd.)

FIRES CLASSIFIED ACCORDING TO HAZARD IN WHICH FIRE STARTED

Reports from England and Wales, 1951

(Frequencies obtained by multiplying results of analysis  
of one-in-two sample of reports by two)

Hazard	Total	
	No.	Per cent.
Fires in buildings classified according to trade or business carried on (contd.)		
<u>Preparation of skins and leather and manufacture of goods of leather and leather substitute (not clothing or footwear)</u>	58	0.1
<u>Manufacture of clothing (not knitted) including footwear</u>	268	0.4
<u>Manufacture of food, drink, tobacco</u>		
Food	438	0.7
Drink	52	0.1
Tobacco, cigars, cigarettes, snuff	6	-
Total	496	0.8
<u>Wood working: manufacture of cane and basket ware, furniture, fittings</u>		
Woodworking and basket ware	260	0.4
Furniture (not metal or basket)	186	0.3
Fittings	16	-
Total	462	0.7
<u>Paper making: manufacture of stationery and stationery requisites, printing and book binding</u>	214	0.3
<u>Building, decorating, contracting; slate and stone cutting and dressing</u>	680	1.1
<u>Rubber and synthetic rubber</u>	66	0.1
<u>Other manufacturing industries</u>	186	0.3
<u>Gas, water, electricity, sewage</u>	212	0.3
<u>Transport and communication</u>		
Railway - stations etc.	262	0.4
Road - garages, depots, etc.	1,086	1.7
Water - dock buildings other than warehouses	50	0.1
Air - aerodromes, etc.	20	-
Other communication (post, telephone, wireless)	124	0.2
Total	1,542	2.4

## APPENDIX I (Contd.)

Table 2 (Contd.)

## FIRES CLASSIFIED ACCORDING TO HAZARD IN WHICH FIRE STARTED

Reports from England and Wales, 1951

(Frequencies obtained by multiplying results of analysis  
of one-in-two sample of reports by two)

Hazard	Total	
	No.	Per cent.
Fires in buildings classified according to trade or business carried on (contd.)		
<u>Commerce</u>		
Departmental stores	90	0.1
Retail shops	2,458	3.8
Wholesale dealers	346	0.5
Dock and other warehouses	54	0.1
Total	2,948	4.5
<u>Offices, Government and other</u>		
Government departments	120	0.2
Local authorities	158	0.3
Other offices	218	0.3
Total	496	0.8
<u>Navy, Army and Air Force establishments</u>	302	0.5
<u>Fire Service establishments</u>	34	0.1
<u>Professional establishments (other than offices); public institutions, Educational establishments</u>	566	0.9
Hospitals, homes, etc. for care of the sick and infirm	450	0.7
Places of worship	186	0.3
Other public and professional services	234	0.4
Total	1,436	2.3
<u>Places of public entertainment</u>		
Cinemas and theatres	254	0.4
Other places of entertainment	278	0.4
Total	532	0.8
<u>Private residential and personal service (including hotels and catering)</u>		
Private residential houses	14,376	22.4
Private residential flats	2,584	4.0
Clubs, hotels, restaurants, public houses	2,568	4.0
Private huts, unoccupied houses; personal service	1,420	2.2
Total	20,948	32.6
<u>Miscellaneous</u>	1,092	1.7
<u>Undefined</u>	22	-
Total fires in buildings	36,454	56.7



## APPENDIX I (Contd.)

Table 2 (Contd.)

## FIRES CLASSIFIED ACCORDING TO HAZARD IN WHICH FIRE STARTED

Reports from England and Wales, 1951

(Frequencies obtained by multiplying results of analysis  
of one-in-two sample of reports by two)

Hazard	Total	
	No.	Per cent.
Fires other than those in buildings		
<u>Agriculture and forestry</u>		
Crops, standing or stooked (including hay fields)	134	0.2
Crops, ricks and stacks	1,616	2.5
Agricultural machinery	378	0.6
Agricultural waste	164	0.3
Other agricultural hazards	198	0.3
Allotments and gardens	224	0.4
Railway embankments	2,898	4.5
Grassland, heathland	6,628	10.3
Woods, forests, plantations	506	0.8
Single trees	944	1.5
Felled timber	24	-
Total	13,714	21.4
<u>Transport and communication</u>		
Aircraft	96	0.2
Railway rolling stock, etc.	342	0.5
Road vehicles - electrically driven	140	0.2
- oil, petrol, or gas driven	5,150	8.0
- other	82	0.1
Water vessels - craft on inland waters	98	0.2
- ships in dock	234	0.4
- ships at sea	-	-
- marine structures	38	0.1
Total	6,180	9.7
<u>Outdoor storage</u>		
Chemicals, explosives, ammunition, oils, grease	350	0.6
Coal and coke	88	0.1
Refuse	2,984	4.6
Timber	618	1.0
Cotton, metal, packing materials, rubber etc.	652	1.0
Total	4,692	7.3
<u>Other outdoor structures</u>	3,160	4.9
Total fires other than those in buildings	27,746	43.2
Total fires attended	64,200	100.0

APPENDIX I (Contd.)

Table 3

SUPPOSED CAUSE OF FIRES

Reports from England and Wales, 1951

(Frequencies obtained by multiplying results of analysis  
of one-in-two sample of reports by two)

Each item in the list of supposed causes of fire given in the table represents a group of causes which have a common source of ignition. In some cases the groups have been divided into sub-groups according to the nature of the material first ignited, and in others according to the act with the source of ignition which led to the outbreak of fire.

Supposed cause of fires	Fires in buildings		Fires other than those in buildings		Total	
	No.	Per cent	No.	Per cent	No.	Per cent
Aircraft, crashed	4	-	78	0.1	82	0.1
Ashes	856	1.3	682	1.1	1,538	2.4
Brazier	88	0.1	142	0.2	230	0.4
Candle	304	0.5	8	-	312	0.5
Chimney on fire, not confined to chimney	820	1.3	-	-	820	1.3
Chimney, sparks from (outside building)	310	0.5	42	0.1	352	0.6
Doubtful	100	0.2	68	0.1	168	0.3
Electric cooker	734	1.1	-	-	734	1.1
fire, heater, radiator	1,082	1.7	12	-	1,094	1.7
iron	324	0.5	-	-	324	0.5
motor	262	0.4	22	-	284	0.4
refrigerator	916	1.4	-	-	916	1.4
television	134	0.2	-	-	134	0.2
wire and cable, lead to apparatus	166	0.3	248	0.4	414	0.6
wire and cable, other than lead to apparatus	2,186	3.4	2,222	3.5	4,408	6.9
wireless	374	0.6	4	-	378	0.6
other apparatus	858	1.3	312	0.5	1,170	1.8
Explosives, fireworks	170	0.3	306	0.5	476	0.7
Fire in grate igniting bedding, clothing, linen	998	1.6	-	-	998	1.6
Fire in grate igniting furniture and furnishings	636	1.0	-	-	636	1.0
Fire in grate igniting structural timber under hearth	1,554	2.4	-	-	1,554	2.4
Fire in grate igniting other materials	2,872	4.5	-	-	2,872	4.5
Fish frying range (all fuels)	956	1.5	32	-	988	1.5
Flue	774	1.2	44	0.1	818	1.3
Furnace (coal or coke)	58	0.1	2	-	60	0.1
Gas (coal) burner, jet, ring	598	0.9	244	0.4	842	1.3
cooker	892	1.4	-	-	892	1.4
fire, heater, radiator	246	0.4	-	-	246	0.4
other apparatus	422	0.7	38	0.1	460	0.7
Incendiarism	8	-	12	-	20	-
Incubator, brooder (all fuels)	540	0.8	6	-	546	0.9

## Table 3 (contd.)

## Reports from England and Wales, 1951

Supposed cause of fires	Fires in buildings		Fires other than those in buildings		Total	
	No.	Per cent	No.	Per cent	No.	Per cent
Intentional burning of grassland, gorse, etc.	14	-	262	0.4	276	0.4
Lightning	74	0.1	34	0.1	108	0.2
Lime	16	-	32	-	48	0.1
Locomotives, sparks from	164	0.3	4,488	7.0	4,652	7.2
Matches	536	0.8	350	0.5	886	1.4
Matches, children playing with	1,910	3.0	4,964	7.7	6,874	10.7
Mechanical heat or sparks	482	0.8	426	0.7	908	1.4
Metal, hot	234	0.4	88	0.1	322	0.5
Oil, blow lamp	836	1.3	36	0.1	872	1.4
engine (including petrol)	204	0.3	1,868	2.9	2,072	3.2
lamp, stove	830	1.3	116	0.2	946	1.5
tractor	66	0.1	204	0.3	270	0.4
other apparatus	152	0.2	72	0.1	224	0.3
Oxyacetylene cutting and welding apparatus	322	0.5	230	0.4	552	0.9
Rubbish burning	476	0.7	2,272	3.5	2,748	4.3
Slow combustion stove igniting structural woodwork	322	0.5	-	-	322	0.5
Slow combustion stove igniting other materials	828	1.3	222	0.3	1,050	1.6
Smoking materials	3,178	5.0	2,712	4.2	5,890	9.2
Spontaneous combustion in rubbish	4	-	94	0.1	98	0.2
in other materials	334	0.5	612	1.0	946	1.5
Static electricity	32	-	-	-	32	-
Steam roller, engine, traction engine	2	-	4	-	6	-
Sun's rays	50	0.1	84	0.1	134	0.2
Taper, lighted paper or sticks	204	0.3	38	0.1	242	0.4
Taper, lighted paper or sticks, children playing with	60	0.1	18	-	78	0.1
Miscellaneous and undefined	1,748	2.7	886	1.4	2,634	4.1
Unknown source of ignition	3,134	4.9	3,110	4.8	6,244	9.7
Total number of fires	36,454	56.8	27,746	43.2	64,200	100.0

APPENDIX I (Contd.)

Table 4A

SUPPOSED CAUSE OF FIRES IN BUILDINGS IN RELATION TO HAZARD IN WHICH FIRE STARTED  
Reports from England and Wales, 1951  
(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	Row No.
Hazard in which fire started	Agriculture	Mining, quarrying and treatment of non-metalliferous mine and quarry products (excluding gas works)	Manufacture of bricks, pottery, glass, etc.	Manufacture of chemicals, explosives, paints, oils	Manufacture of metals, machines, implements, conveyances	Manufacture of textiles and textile goods (not dress)	Manufacture of clothing (not knitted) including footwear, and goods of leather and leather substitute; preparation of skins and leather	Manufacture of food, drink, tobacco	Woodworking; manufacture of cane and basket ware, furniture, fittings	Paper making; manufacture of stationery and stationery requisites, printing and bookbinding	Building, decorating, contracting; slate and stone cutting and dressing	Other manufacturing industries, including rubber and synthetic rubber	Gas, water, electricity, sewage	Transport and communication	Commerce; retail shops, including departmental stores	Commerce; wholesale dealers and warehouses	Offices; Government and other	Navy, Army, Air Force establishments	Fire Service establishments	Professional establishments (other than offices), public institutions	Places of public entertainment	Private residential houses	Private residential flats	Clubs, hotels, restaurants, public houses	Private huts, unoccupied houses, personal service	Miscellaneous and undefined	Total	Row No.
Supposed cause of fire	1 Aircraft, crashed	2 Ashes	3 Brazier	4 Candle	5 Chimney on fire, not confined to chimney	6 Chimney, sparks from (outside building)	7 Doubtful	8 Electric cooker	9 Electric fire, heater, radiator	10 Electric motor	11 Refrigerator	12 Television	13 Wire and cable, lead to apparatus	14 Wire and cable, other than lead to apparatus	15 Other than lead to apparatus	16 Other than lead to apparatus	17 Other than lead to apparatus	18 Other than lead to apparatus	19 Other than lead to apparatus	20 Other than lead to apparatus	21 Other than lead to apparatus	22 Other than lead to apparatus	23 Other than lead to apparatus	24 Other than lead to apparatus	25 Other than lead to apparatus	26 Other than lead to apparatus	27 Other than lead to apparatus	28 Other than lead to apparatus
1	60	6	4	10	108	28	18	24	14	18	28	8	30	234	188	30	52	16	4	90	34	860	134	126	54	8	2186	15

16	Electric wireless	-	-	-	2	-	-	-	-	-	-	-	-	2	14	-	-	-	-	12	2	276	54	12	-	-	374	16	
17	other apparatus	22	4	4	14	76	18	4	14	4	4	8	10	28	72	90	8	6	6	4	52	24	262	72	38	14	-	858	17
18	Explosives, fireworks	10	-	-	4	4	-	-	4	2	-	2	-	-	8	14	2	4	4	-	12	4	48	10	-	30	8	170	18
19	Fire in grate igniting bedding, clothing, linen	2	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	4	-	-	12	-	842	114	18	2	-	998	19
20	Fire in grate igniting furniture and furnishings	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	4	-	542	78	10	-	-	636	20
21	Fire in grate igniting structural timber under hearth	2	2	-	-	2	-	2	4	-	2	8	-	-	2	42	4	20	6	4	18	6	1022	308	96	2	2	1554	21
22	Fire in grate igniting other materials	10	2	-	-	4	2	6	4	8	4	10	2	-	16	66	8	26	6	-	40	2	2266	260	102	16	12	2872	22
23	Fish frying range (all fuels)	-	-	-	2	14	-	2	34	-	-	2	-	2	4	6	2	6	8	-	16	2	-	2	854	-	-	956	23
24	Flue	40	2	4	4	50	12	2	34	10	12	26	4	2	38	36	10	4	20	-	72	8	254	22	86	16	6	774	24
25	Furnace (coal or coke)	4	-	-	4	34	2	-	-	2	-	-	2	-	4	-	-	-	-	-	6	-	-	-	-	-	-	58	25
26	Gas (coal) burner, jet, ring	2	-	-	20	30	6	16	8	4	12	4	16	4	8	56	2	4	4	-	36	12	192	82	60	20	-	598	26
27	Gas (coal) cooker	-	-	-	-	-	-	4	6	2	-	2	-	-	2	28	-	12	2	-	34	4	520	166	104	6	-	892	27
28	fire, heater, radiator	-	-	-	2	2	-	4	-	-	2	-	2	-	4	16	-	6	-	-	34	8	98	48	16	4	-	246	28
29	other apparatus	-	-	2	10	52	6	12	20	4	4	-	10	8	4	32	2	4	4	-	28	4	122	42	36	14	2	422	29
30	Incendiarism	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	4	-	-	-	-	8	30
31	Incubator, brooder (all fuels)	336	-	-	-	2	-	-	-	-	-	-	-	-	10	12	2	-	-	-	8	-	52	2	10	104	2	540	31
32	Intentional burning of grassland, gorse	2	-	-	-	-	-	-	-	-	-	2	-	-	4	2	-	-	-	-	-	-	-	-	-	4	-	14	32
33	Lightning	4	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-	-	58	2	-	4	-	74	33
34	Lime	4	2	-	2	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	2	-	-	-	-	4	-	16	34
35	Locomotives, sparks from	8	-	-	2	14	-	-	2	-	-	6	-	2	78	4	2	-	-	-	2	2	6	2	-	30	4	164	35
36	Matches	18	2	2	6	10	6	6	2	4	10	10	4	-	32	40	12	8	2	2	26	10	220	46	20	24	14	536	36
37	Matches, children playing with	144	2	6	4	22	12	8	6	10	10	78	12	4	82	114	16	26	4	-	62	44	266	66	24	162	726	1910	37
38	Mechanical heat or sparks	2	8	2	38	70	248	8	24	20	8	4	8	4	10	6	8	8	-	-	-	2	2	-	-	2	-	482	38
39	Metal, hot	2	4	-	10	112	2	4	4	4	4	10	2	2	6	6	-	2	4	-	10	-	30	8	4	2	2	234	39
40	Oil, blow lamp	18	2	-	-	22	-	-	4	-	4	32	-	4	14	64	8	20	2	2	82	2	470	28	34	20	4	836	40
41	Oil, engine (including petrol)	22	4	-	-	18	6	-	2	-	-	8	-	2	72	8	8	-	4	2	6	2	6	-	6	28	-	204	41
42	lamp, stove	64	4	-	4	8	-	4	-	4	4	18	2	2	114	42	4	4	12	-	8	2	360	46	18	90	16	830	42
43	tractor	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	66	43
44	other apparatus	30	2	-	18	16	2	-	16	-	-	-	2	2	4	2	-	2	4	-	4	4	32	4	-	8	-	152	44
45	Oxyacetylene cutting and welding apparatus	4	14	6	26	106	10	-	6	6	-	32	2	8	62	8	-	-	6	-	8	-	-	-	-	6	12	322	45
Column No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	

Table 4A (contd.)

## SUPPOSED CAUSE OF FIRES IN BUILDINGS IN RELATION TO HAZARD IN WHICH FIRE STARTED

Reports from England and Wales, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Row No.	Column No.	Hazard in which fire started	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	Row No.
			Agriculture	Mining, quarrying and treatment of non-metallic mineral substances and quarry products (excluding gas works)	Manufacture of bricks, pottery, glass, etc.	Manufacture of chemicals, explosives, paints, oils	Manufacture of metals, machines, implements, conveyances	Manufacture of textiles and textile goods (not dress)	Manufacture of clothing (not knitted) including footwear, and goods of leather and leather substitute; preparation of skins and leather	Tobacco	Woodworking; manufacture of cane and basket ware, furniture, fittings	Paper making; manufacture of stationery and stationery requisites, printing and bookbinding	Building, decorating, contracting; slate and stone cutting and dressing	Other manufacturing industries, including rubber and synthetic rubber	Gas, water, electricity, sewage	Transport and communication	Commerce; retail shops, including departmental stores	Commerce; wholesale dealers and warehouses	Offices; Government and other establishments	Navy, Army, Air Force establishments	Fire service establishments	Professional establishments (other than offices), public institutions	Places of public entertainment	Private residential houses	Private residential flats	Clubs, hotels, restaurants, public houses	Private huts, unoccupied houses, personal service	Miscellaneous and undefined	Total	
46		Rowbush burning	50	-	2	-	22	6	6	12	36	4	28	6	2	22	78	16	6	2	-	10	8	38	4	8	84	26	476	46
47		Slow combustion stove igniting structural woodwork	22	4	2	4	14	2	6	2	4	8	36	-	-	16	10	6	8	18	-	46	18	36	10	22	16	12	322	47
48		Slow combustion stove igniting other materials	72	16	-	6	60	28	4	6	56	2	56	20	-	48	60	34	18	10	2	76	6	142	24	50	20	12	828	48
49		Smoking materials	106	8	12	22	152	56	58	30	72	30	94	36	12	156	336	62	78	38	-	140	178	834	216	220	148	84	3178	49
50		Spontaneous combustion in rubbish.	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2	-	-	-	-	-	-	-	4	50
51		Spontaneous combustion in other materials	118	4	2	30	22	18	6	10	4	10	2	4	6	4	12	4	6	2	4	12	2	10	-	34	8	-	334	51
52		Static electricity	-	-	-	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32	52
53		Steam roller, engine, traction engine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	53
54		Sun's rays	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	54
55		Taper, lighted paper or sticks	2	2	-	4	8	2	2	2	-	2	-	2	-	10	22	-	8	-	-	6	8	94	16	6	8	-	204	55
56		Taper, lighted paper or sticks, children playing with	-	-	-	-	-	-	-	-	-	-	-	-	-	2	4	-	-	-	-	-	42	12	-	-	-	-	60	56
57		Miscellaneous and undefined	88	8	34	40	144	54	14	98	58	12	26	10	24	110	30	16	16	22	-	96	22	554	40	84	56	34	1748	57
58		Unknown source of ignition	320	40	12	84	164	72	56	60	70	32	94	34	32	220	220	66	62	72	-	152	82	632	142	130	220	90	3134	58
59		Total fires in buildings	1706	152	96	394	1472	640	326	496	462	214	680	252	212	1542	2548	400	496	302	34	1436	532	14376	2584	2568	1420	1114	36454	59
		Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	

## APPENDIX I (Contd.)

Table 4B

SUPPOSED CAUSE OF FIRES OTHER THAN THOSE IN BUILDINGS IN RELATION TO HAZARD IN WHICH FIRE STARTED

Reports from England and Wales, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

	Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
Row No.	Hazard in which fire started  Supposed cause of fire	Crops	Agricultural machinery	Agricultural waste	Agriculture, other	Gardens and allotments	Railway embankments	Grassland, heathland	Woods, forests, plantations	Single trees	Felled timber	Transport and communications				Outdoor storage					Miscellaneous outdoor structures	Total	Row No.	
												Air	Rail	Road - oil, petrol or gas driven vehicles	Road - other vehicles	Water	Chemicals, explosives, ammunition, oils, grease	Coal and coke	Refuse	Timber				other materials
1	Aircraft, crashed	-	-	-	-	-	-	-	-	-	-	74	-	2	-	-	-	-	-	-	2	-	78	1
2	Ashes	4	-	-	-	10	14	28	-	2	-	-	10	60	8	12	6	26	416	18	36	30	682	2
3	Brazier	4	-	-	-	-	-	4	-	-	-	-	-	4	-	-	12	-	6	6	8	98	142	3
4	Candle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	4	-	-	-	8	4
5	Chimney, sparks from (outside building)	6	-	-	-	2	-	4	-	4	-	-	-	4	-	-	-	-	-	4	10	8	42	5
6	Doubtful	12	-	-	-	-	-	18	-	-	-	-	-	20	-	2	2	-	-	-	2	12	68	6
7	Electric fire, heater, radiator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	6	12	7
8	motor	-	-	-	-	-	-	-	-	-	-	-	-	-	16	2	-	-	-	-	-	4	22	8
9	wire and cable, lead to apparatus	-	16	-	-	-	-	-	-	-	-	-	-	218	6	2	-	-	-	-	-	6	248	9
10	wire and cable, other than lead to apparatus	2	56	-	-	-	-	-	-	-	-	-	20	1494	70	14	4	-	-	-	2	560	2222	10
11	wireless	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	4	11
12	other apparatus	-	34	-	-	-	-	2	-	-	-	2	4	134	46	22	-	-	-	-	-	68	312	12
13	Explosives, fireworks	40	2	-	-	2	-	36	2	36	-	-	2	16	-	-	2	-	10	2	4	152	306	13
14	Fish frying range, all fuels	-	-	-	-	-	-	-	-	-	-	-	-	32	-	-	-	-	-	-	-	-	32	14
15	Flue	-	-	-	-	2	-	-	-	-	-	-	2	-	-	6	-	-	-	-	8	26	44	15
16	Furnace (coal or coke)	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	2	16
17	Gas (coal) burner, jet, ring	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	242	244	17
18	other apparatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	38	18
19	Incendiarism	8	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	4	12	19
20	Incubator, brooder (all fuels)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	6	20

## APPENDIX I (Contd.)

Table 4B (contd.)

## SUPPOSED CAUSE OF FIRES OTHER THAN THOSE IN BUILDINGS IN RELATION TO HAZARD IN WHICH FIRE STARTED

Reports from England and Wales, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

	Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
Row No.	Hazard in which fire started  Supposed cause of fire	Crops	Agricultural machinery	Agricultural waste	Agriculture, other	Gardens and allotments	Railway embankments	Grassland, heathland	Woods, forests, plantations	Single trees	Felled timber	Transport and communications					Outdoor storage					Miscellaneous outdoor structures	Total	Row No.
												Air	Rail	Road - oil, petrol or gas driven vehicles	Road - other vehicles	Water	Chemicals, explosives, ammunition, oils, grease	Coal and coke	Refuse	Timber	Other materials			
21	Intentional burning of grassland, gorse, etc.	-	-	-	-	14	34	164	22	4	-	-	2	-	-	-	-	2	2	10	-	8	262	21
22	Lightning	20	2	-	-	-	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	6	34	22
23	Lime	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	2	4	2	16	32	23
24	Locomotives, sparks from	114	-	6	24	12	2666	910	42	14	-	-	150	4	-	4	22	2	48	96	42	332	4488	24
25	Matches	22	-	4	-	-	2	106	8	4	2	-	-	34	-	4	24	-	80	2	2	56	350	25
26	Matches, children playing with	256	2	28	54	38	80	2070	110	564	8	-	16	122	22	6	48	-	1070	84	178	208	4964	26
27	Mechanical heat or sparks	-	4	-	-	-	-	2	-	-	-	2	6	346	2	8	30	-	2	2	4	18	426	27
28	Metal, hot	-	-	-	-	-	-	-	-	-	-	-	10	18	-	18	2	-	2	2	10	26	88	28
29	Oil, blow lamp	-	-	-	-	2	-	2	-	-	-	-	-	-	-	2	8	-	-	2	-	20	36	29
30	engine (including petrol)	4	32	-	2	-	-	2	-	-	-	6	-	1734	-	24	4	-	-	2	4	54	1868	30
31	lamp, stove	-	-	-	-	2	-	4	-	-	-	-	-	32	-	8	4	-	-	2	-	64	116	31
32	tractor	46	154	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	204	32
33	other apparatus	8	34	-	6	-	-	-	-	-	-	-	-	10	-	4	-	-	-	-	-	10	72	33
34	Oxyacetylene cutting and welding apparatus	-	-	-	-	-	-	2	-	-	-	-	10	28	-	66	28	-	6	24	10	56	230	34
35	Rubbish burning	132	2	70	46	80	18	780	60	154	6	-	8	18	4	2	18	4	550	152	86	82	2272	35
36	Slow combustion stove igniting materials other than structural woodwork	-	-	2	-	-	-	2	-	-	-	-	2	12	2	6	12	-	2	6	4	172	222	36
37	Smoking materials	152	10	14	26	42	38	1074	90	34	-	-	16	318	16	54	14	-	360	98	102	254	2712	37
38	Spontaneous combustion in rubbish	-	-	4	-	-	-	4	-	-	-	-	-	2	-	2	-	-	80	-	-	2	94	38



39	Spontaneous combustion in other materials	428	-	10	6	-	-	2	2	2	-	-	14	4	-	14	14	28	28	18	30	12	612	39
40	Steam roller, engine, traction engine	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	4	40
41	Sun's rays	2	-	2	-	-	4	54	2	-	-	-	2	4	-	-	-	10	4	-	-	-	84	41
42	Taper, lighted paper or sticks	-	-	-	-	-	-	4	-	2	-	-	-	-	-	-	-	2	2	4	24	38	42	
43	Taper, lighted paper or sticks, children playing with	-	-	-	-	2	-	2	-	2	-	-	-	2	-	-	-	2	2	-	6	18	43	
44	Miscellaneous and undefined	96	8	8	10	2	14	204	48	6	-	-	22	112	12	36	24	16	48	22	24	174	886	44
45	Unknown source of ignition	392	22	14	24	14	28	1144	120	112	6	12	38	356	18	44	68	10	254	54	78	302	3110	45
46	Total fires other than those in buildings	1750	378	164	198	224	2898	6628	506	944	24	96	342	5150	222	370	350	88	2984	618	652	3160	27746	46
	Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

## APPENDIX I (Contd.)

Table 5

## MATERIAL FIRST IGNITED IN FIRES

Reports from England and Wales, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Material first ignited	Fires in buildings		Fires other than those in buildings		Total	
	No.	Per cent	No.	Per cent	No.	Per cent
<u>Agriculture and Forestry</u>						
Crops, ricks, stacks						
Barley	6	-	44	0.1	50	0.1
Hay	216	0.3	690	1.1	906	1.4
Straw	92	0.1	258	0.4	350	0.5
Stubble	2	-	40	0.1	42	0.1
Other	20	-	154	0.2	174	0.3
Loose straw or hay	558	0.9	606	0.9	1,164	1.8
Grass, heather, bracken	90	0.1	6,448	10.0	6,538	10.2
Trees, hedges, undergrowth, brushwood, bushes, (including gorse), twigs, touchwood	18	-	3,496	5.4	3,514	5.5
Other agricultural materials	24	-	122	0.2	146	0.2
Total	1,026	1.6	11,858	18.5	2,884	20.1
<u>Chemicals - gases</u>						
Acetylene	98	0.2	24	-	122	0.2
Coal gas	1,036	1.6	436	0.7	1,472	2.3
Other gases	66	0.1	40	0.1	106	0.2
Total	1,200	1.9	500	0.8	1,700	2.6
<u>Chemicals - oils</u>						
Animal and vegetable oils	146	0.2	4	-	150	0.2
Mineral oil						
Parrafin	468	0.7	86	0.1	554	0.9
Petrol in vehicles	314	0.5	2,182	3.4	2,496	3.9
Petrol not in vehicles	422	0.7	220	0.3	642	1.0
Other mineral oils	138	0.2	64	0.1	202	0.3
Oil, waste and undefined	354	0.6	276	0.4	630	1.0
Total	1,842	2.9	2,832	4.4	4,674	7.3
<u>Chemicals - other</u>						
Celluloid (including films)	72	0.1	4	-	76	0.1
Paint, enamel, lacquer, varnish, stains and French polish	154	0.2	26	-	180	0.3
Pitch, tar	150	0.2	192	0.3	342	0.5
Rubber, vulcanite, ebonite	148	0.2	254	0.4	402	0.6
Other chemicals	760	1.2	220	0.3	980	1.5
Total	1,284	2.0	696	1.1	1,980	3.1
<u>Paper, cardboard, wood (not part of a structure)</u>						
Paper, cardboard	1,552	2.4	612	1.0	2,164	3.4
Wood chippings, flour, sawdust, shavings, wool	586	0.9	294	0.5	880	1.4
Wood barrels, boxes, cases, firewood etc.	678	1.1	130	0.2	808	1.3
Timber	102	0.2	232	0.4	334	0.5
Total	2,918	4.5	1,268	2.0	4,186	6.5

APPENDIX I (Contd.)  
Table 5 (contd.)

MATERIAL FIRST IGNITED IN FIRES

Reports from England and Wales, 1951

(Frequencies obtained by multiplying results of analysis  
of one-in-two sample of reports by two)

Material first ignited	Fires in buildings		Fires other than those in buildings		Total	
	No.	Per cent	No.	Per cent	No.	Per cent
<u>Textiles</u>						
Canvas and canvas goods	68	0.1	160	0.2	228	0.4
Clothing on person	450	0.7	26	-	476	0.7
Clothing not on person	1,152	1.8	42	0.1	1,194	1.9
Cotton	348	0.5	38	0.1	386	0.6
Jute, hessian, sacking	348	0.5	230	0.4	578	0.9
Rags (including oily rags)	280	0.4	140	0.2	420	0.7
Tarpaulin, waterproof sheeting, oilskins	102	0.2	348	0.5	450	0.7
Other textiles	292	0.5	50	0.1	342	0.5
Total	3,040	4.7	1,034	1.6	4,074	6.3
<u>Furniture, furnishings, household goods</u>						
Bedding	840	1.3	42	0.1	882	1.4
Carpets, rugs	402	0.6	24	-	426	0.7
Curtains	658	1.0	2	-	660	1.0
Furniture	1,840	2.9	12	-	1,852	2.9
Linen articles (unspecified), laundry	448	0.7	10	-	458	0.7
Seating in vehicles	76	0.1	232	0.4	308	0.5
Other furnishings	618	1.0	22	-	640	1.0
Total	4,882	7.6	344	0.5	5,226	8.1
<u>Building materials, structural woodwork</u>						
Building materials other than wood	264	0.4	2	-	266	0.4
Structural woodwork						
External	594	0.9	990	1.5	7,816	12.2
Internal						
Door, window frame	420	0.7				
Floor, stairs	1,498	2.3				
Partitions, linings to walls	670	1.0				
Roof	712	1.1				
Timber in chimney, flue	420	0.7				
Timber under hearth	1,594	2.5				
Other fittings	918	1.4				
Total	7,090	11.0	992	1.5	8,082	12.6
<u>Miscellaneous</u>						
Coal, coke	108	0.2	118	0.2	226	0.4
Electrical insulation	3,108	4.8	2,002	3.1	5,110	8.0
Fat (margarine, suet, butter, cooking fat, lard)	1,902	3.0	20	-	1,922	3.0
Food other than fat	368	0.6	8	-	376	0.6
Refuse, rubbish, debris	1,854	2.9	3,184	5.0	5,038	7.8
Soot	1,102	1.7	4	-	1,106	1.7
Other	2,134	3.3	648	1.0	2,782	4.3
<u>Unknown</u>	2,596	4.0	2,238	3.5	4,834	7.5
Total number of fires	36,454	56.7	27,746	43.2	64,200	100.0

## APPENDIX I (Contd.)

Table 6

## METHOD OF EXTINCTION OF FIRES

Reports from England and Wales, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Row No.	Method of extinction	Fires in buildings						Fires other than those in buildings						Total No. of fires		Row No.
		Extinguished by Fire Brigade		Extinguished before arrival of Fire Brigade		Total		Extinguished by Fire Brigade		Extinguished before arrival of Fire Brigade		Total				
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	
1	Burned out	-	-	666	1.0	666	1.0	-	-	794	1.2	794	1.2	1460	2.3	1
2	Removal	3048	4.7	1012	1.6	4060	6.3	576	0.9	320	0.5	896	1.4	4956	7.7	2
3	Automatic sprinkler system	-	-	34	0.1	34	0.1	-	-	-	-	-	-	34	0.1	33
4	Beating	52	0.1	160	0.2	212	0.3	3346	5.4	440	0.7	3786	5.9	3998	6.2	4
5	Smothering	222	0.3	812	1.3	1034	1.6	26	-	354	0.5	380	0.6	1414	2.2	5
6	Sand, earth, etc.	44	0.1	146	0.2	190	0.3	122	0.2	222	0.3	344	0.5	534	0.8	6
7	Water from buckets	2334	3.6	2966	4.6	5300	8.3	452	0.7	632	1.0	1084	1.7	6384	9.9	7
8	Water from stirrup or hand pumps	2746	4.3	40	0.1	2786	4.3	146	0.2	8	-	154	0.2	2940	4.6	8
9	Chemicals and chemical extinguishers	1860	2.9	1050	1.6	2910	4.5	1520	2.4	882	1.4	2402	3.7	5312	8.3	9
10	Two or more methods 4-9	242	0.4	356	0.6	598	0.9	266	0.4	230	0.4	496	0.8	1094	1.7	10
11	Water from garden hose, etc.	-	-	156	0.2	156	0.2	-	-	48	0.1	48	0.1	204	0.3	11
12	Hose reel jets (using water in tank only)	10606	16.5	36	0.1	10642	16.6	9582	14.9	56	0.1	9638	15.0	20280	31.6	12
13	Hose reel jets (using more water than that in tank)	2068	3.2	6	-	2074	3.2	1156	1.8	4	-	1160	1.8	3234	5.0	13
14	Jets from inside hose reel or inside hydrant	88	0.1	62	0.1	150	0.2	2	-	4	-	6	-	156	0.2	14
15	Hose reel jets and jets from inside hose reel	18	-	-	-	18	-	4	-	-	-	4	-	22	-	15
16	Jets from pumps and hydrants	4802	7.5	100	0.2	4902	7.6	6054	9.4	134	0.2	6188	9.6	11090	17.3	16
17	Other and undefined methods	346	0.5	376	0.6	722	1.1	120	0.2	246	0.4	366	0.6	1088	1.7	17
18	Total	28476	44.3	7978	12.4	36454	56.8	23372	36.4	4374	6.8	27746	43.2	64200	100.0	18

## Notes on methods of extinction.

1. "Removal" includes occurrences where (a) burning material was removed from the building, (b) gas supply was turned off. If the burning material was tackled with methods 3-11 before removing it from the building, then such occurrences were classified under whichever of these methods applied.
2. Methods 11-15 and method 16 include those occurrences in which methods 3-10 and 3-15 respectively may also have been used.
3. "Fires extinguished by Fire Brigade" include those fires which were tackled but not extinguished before the arrival of the Fire Brigade.

# APPENDIX I (Contd.)

Table 7

## BEHAVIOUR OF SPRINKLER SYSTEMS AT FIRES

Reports from England and Wales, 1951

(FREQUENCIES OBSERVED IN THE ANALYSIS OF A RANDOM ONE-IN-TWO SAMPLE OF REPORTS)

NOTE. These figures are not on a comparable basis with those in Tables 1-6, or Tables 8-10.

Behaviour of sprinklers	Incidents in which the following number of heads were actuated						Total number of incidents
	Nil	1-5	6-10	11-20	More than 20	Number not reported	
Installed but did not operate							
(i) because insufficient heat was generated by fire	47	-	-	-	-	-	47
(ii) because heat did not reach the heads	2	-	-	-	-	-	2
(iii) because fire was extinguished before the heads operated	3	-	-	-	-	-	3
(iv) because system was in state of disrepair	2	-	-	-	-	-	2
(v) because the heads were damaged by explosion	1	-	-	-	-	-	1
Total	55	-	-	-	-	-	55
Operated but did not control fire							
(i) because sprinklers were below fire or screened from it	-	5	1	-	-	-	6
(ii) because water was turned off to avoid damage to ceiling	-	-	1	-	-	-	1
(iii) because explosion damaged heads	-	1	-	-	-	-	1
(iv) because of shortage of water in old mains system	-	-	-	-	1	-	1
(v) because partition between heads prevented even distribution of water	-	1	-	-	-	-	1
Total	-	7	2	-	1	-	10
Controlled but did not extinguish fire	-	58	7	6	4	4	79
Extinguished fire	-	16	-	-	-	1	17
Number of calls to fires where sprinkler systems were installed	55	81	9	6	5	5	161

Note: In addition to the above incidents, sprinkler systems were installed in three ships in dock, two cargo vessels and a passenger and cargo vessel. In two of the ships the heads failed to operate, due to insufficient heat being generated by the fire and in the other, one head operated and controlled, but did not extinguish the fire.

APPENDIX I (Contd.)

Table 8

ATTENDANCE OF SPECIAL APPLIANCES AT FIRES

Reports from England and Wales, 1951

(Frequencies obtained from results of analysis of all reports.)

Attendance	No. of * occasions	Percentage of total no. of fires
Breakdown lorries	13	-
Canteen vans	104	0.2
Control units	96	0.1
Emergency tenders	1,572	2.4
Escape carriers	596	0.9
Escape carrying units	150	0.2
Fire boats	95	0.1
Foam tenders	552	0.9
Hose carriers	55	0.1
Hose-laying lorries	276	0.4
Land Rovers	351	0.5
Pump escapes	34,440	53.6
Pump salvage tenders	2,707	4.2
Salvage tenders	1,593	2.5
Turntable ladders (hand operated)	150	0.2
Turntable ladders (mechanical)	5,123	8.0
Utility vans or trucks	6,596	10.3
Water tenders	17,598	27.4
Wireless cars	8,237	12.8

\* The number of occasions in which fires were attended by one or more of the different special appliances is given.

## APPENDIX I (Contd.)

Table 9

## PERSONS RESCUED OR ESCAPED BY EMERGENCY MEANS FROM FIRES

Reports from England and Wales, 1951

(Frequencies obtained from results of analysis of all reports.)

Appliance or method used	Number of persons
Rescue with Fire Brigade assistance from	
Buildings	
Escape (hand operated)	61
Ladder, extension	25
first floor	6
hook	3
other or undefined	18
Ladder and line	2
Other apparatus	4
Without apparatus	76
Ships	6
Other locations	2
Road vehicles	1
Total	204
Rescue without Fire Brigade assistance from	
Aircraft	1
Buildings	
Carried or assisted out	176
Jumping sheet	13
Ladder	126
Lowered from window, roof etc.	42
Other or undefined methods	85
Road vehicles	13
Ships	1
Other locations	3
Total	460
Escape by emergency means from	
Aircraft	
Baled out	17
Through exits or from debris	3
Thrown clear	2
Method not stated	1
Buildings	
Climbing over roof	18
Fixed fire escape	11
Jumping from upstairs window, roof	107
Sliding down drainpipe, sheets, rope etc.	41
Through ground floor windows	14
Other or undefined methods	74
Road vehicles	4
Total	292
Total persons rescued or escaped	956

## APPENDIX I (Contd.)

Table 10

## NATURE OF INJURIES OF CASUALTIES IN FIRES

Reports from England and Wales, 1951

(Frequencies obtained from results of analysis of all reports.)

\* Casualties who suffered shock in addition to another injury have been classified according to the nature of the other injury

Nature of injury	Fire Brigade	Other casualties	Total
Fatal casualties			
Burns and scalds	-	357	357
Overcome by gas or smoke	-	71	71
Other and undefined injuries	3	142	145
Total	3	570	573
Non-fatal casualties			
Burns and scalds	246	2,641	2,887
Bruises, cuts, abrasions	552	384	936
Dislocations, sprains, fractures	95	40	135
Overcome by gas or smoke	38	118	156
More than one of the above injuries	22	91	113
* Shock	9	307	316
Other and undefined injuries	184	124	308
Total	1,146	3,705	4,851
Total casualties	1,149	4,275	5,424



APPENDIX II  
STATISTICAL TABLES FOR FIRE BRIGADES IN SCOTLAND, 1951

Table 1  
METHOD OF CALLING FIRE BRIGADES TO FIRES  
Reports from Scotland, 1951  
(Frequencies obtained from results of analysis of all reports)

Method of calling	Fire Brigade											Total	
	Glasgow	Lanark	Central	Western	South Western	South Eastern	Fife	Perth and Kinross	Angus	North Eastern	Northern	No.	Per cent
By Special Fire Service methods													
Automatic fire alarm	4	-	1	-	-	1	-	-	-	-	-	6	0.1
Fire and police pillar box	1	-	-	-	-	-	-	-	-	1	-	1	-
Police telephone	395	94	46	158	22	278	14	3	168	285	10	1,473	20.5
Private fire telephone	14	4	-	5	1	6	-	-	1	1	-	32	0.5
Street fire alarm	262	-	-	1	-	1	-	-	-	2	-	266	3.7
Total	675	98	47	164	23	286	14	3	169	289	10	1,778	24.8
Exchange telephone	975	527	340	432	451	807	222	193	324	304	210	4,785	66.7
Running call	230	37	28	50	33	80	26	8	19	9	5	525	7.3
Late call	7	-	-	1	1	-	-	-	-	1	1	11	0.2
Other and undefined methods	7	6	18	9	1	17	1	2	2	8	2	73	1.0
Total fires	1,894	668	433	656	509	1,190	263	206	514	611	228	7,172	100.0

## APPENDIX II (Contd.)

Table 2

## FIRES CLASSIFIED ACCORDING TO HAZARD IN WHICH FIRE STARTED

Reports from Scotland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two.)

Hazard	Total	
	No.	Per cent.
Fires in buildings classified according to trade or business carried on		
<u>Agriculture</u>		
Farming (not fruit or poultry), horse and stock rearing	188	2.6
Allotments, market gardening, fruit and poultry farming	42	0.6
Total	230	3.2
<u>Mining, quarrying and treatment of non-metalliferous mine and quarry products (excluding gas works)</u>	14	0.2
<u>Manufacture of bricks, pottery, glass, etc.</u>	2	-
<u>Manufacture of chemicals, dyes, explosives, paints, oils</u>		
Chemicals	8	0.1
Explosives	-	-
Paints, varnish, oils, grease	14	0.2
Total	22	0.3
<u>Manufacture of metals, machines, implements, conveyances</u>		
Smelting, converting, refining, rolling of iron, steel	10	0.1
Extracting, refining, smelting of other metals	2	-
Founding, other secondary processes in metal working	30	0.4
Engineering (not marine or electrical)	58	0.8
Electrical installations, cables and apparatus	12	0.2
Construction and repair of vehicles	18	0.3
Shipbuilding and repairing, marine engineering	14	0.2
Cutlery and small tools	2	-
Other metal industries	12	0.2
Total	158	2.2
<u>Manufacture of textiles and textile goods (not dress)</u>		
Cotton	6	0.1
Wool, worsted and shoddy	8	0.1
Silk, natural and artificial	-	-
Other or mixed fibres	14	0.2
Miscellaneous	20	0.3
Textile dyeing, printing, bleaching, finishing	8	0.1
Total	56	0.8

# APPENDIX II (Contd.)

Table 2 (contd.)

## FIRES CLASSIFIED ACCORDING TO HAZARD IN WHICH FIRE STARTED

Reports from Scotland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two.)

Hazard	Total	
	No.	Per cent
Fires in buildings classified according to trade or business carried on (contd.)		
<u>Preparation of skins and leather and manufacture of goods of leather and leather substitute (not clothing or footwear)</u>	4	0.1
<u>Manufacture of clothing (not knitted) including footwear</u>	20	0.3
<u>Manufacture of food, drink, tobacco</u>		
Food	84	1.2
Drink	8	0.1
Tobacco, cigars, cigarettes, snuff	-	-
Total	92	1.3
<u>Wood working: manufacture of cane and basket ware, furniture, fittings</u>		
Woodworking and basket ware	58	0.8
Furniture (not metal or basket)	24	0.3
Fittings	2	-
Total	84	1.1
<u>Paper making: manufacture of stationery and stationery requisites, printing and book binding</u>	26	0.4
<u>Building, decorating, contracting: slate and stone cutting and dressing</u>	104	1.5
<u>Rubber and synthetic rubber</u>	6	0.1
<u>Other manufacturing industries</u>	36	0.5
<u>Gas, water, electricity, sewage</u>	20	0.3
<u>Transport and communication</u>		
Railway - stations etc.	50	0.7
Road - garages, depots, etc.	120	1.7
Water - dock buildings other than warehouses	6	0.1
Air - aerodromes, etc.	2	-
Other communication (post, telephone, wireless)	10	0.1
Total	188	2.6
<u>Commerce</u>		
Departmental stores	28	0.4
Retail shops	394	5.5
Wholesale dealers	32	0.5
Dock and other warehouses	10	0.1
Total	464	6.5

## APPENDIX II (Contd.)

Table 2 (contd.)

## FIRES CLASSIFIED ACCORDING TO HAZARD IN WHICH FIRE STARTED

Reports from Scotland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two.)

Hazard	Total	
	No.	Per cent
Fires in buildings classified according to trade or business carried on (contd.)		
<u>Offices, Government and other</u>		
Government departments	10	0.1
Local authorities	18	0.2
Other offices	22	0.3
Total	50	0.6
<u>Navy, Army and Air Force establishments</u>	10	0.1
<u>Fire Service establishments</u>	6	0.1
<u>Professional establishments (other than offices), public institutions</u>		
Educational establishments	60	0.8
Hospitals, homes, etc. for care of the sick and infirm	42	0.6
Places of worship	34	0.5
Other public and professional services	46	0.6
Total	182	2.5
<u>Places of public entertainment</u>		
Cinemas and theatres	26	0.4
Other places of entertainment	40	0.6
Total	66	1.0
<u>Private residential and personal service (including hotels and catering)</u>		
Private residential houses	858	12.0
Private residential flats	1878	26.2
Clubs, hotels, restaurants, public houses	224	3.1
Private huts, unoccupied houses; personal service	224	3.1
Total	3184	44.4
<u>Miscellaneous</u>	216	3.0
<u>Undefined</u>	6	0.1
Total fires in buildings	5246	73.1

## APPENDIX II (Contd.)

Table 2 (Contd.)

## FIRES CLASSIFIED ACCORDING TO HAZARD IN WHICH FIRE STARTED

Reports from Scotland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Hazard	Total	
	No.	Per cent
Fires other than those in buildings		
<u>Agriculture and forestry</u>		
Crops, standing or stooked (including hay fields)	-	-
Crops, ricks and stacks	136	1.9
Agricultural machinery	38	0.5
Agricultural waste	12	0.2
Other agricultural hazards	26	0.4
Allotments and gardens	10	0.1
Railway embankments	138	1.9
Grassland, heathland	310	4.3
Woods, forests, plantations	42	0.6
Single trees	26	0.4
Felled timber	2	-
<b>Total</b>	<b>740</b>	<b>10.3</b>
<u>Transport and communication</u>		
Aircraft	4	0.1
Railway rolling stock etc.	52	0.7
Road vehicles - electrically driven	48	0.7
- oil, petrol, or gas driven	332	4.6
- other	8	0.1
Water vessels - craft on inland waters	6	0.1
- ships in dock	54	0.7
- ships at sea	-	-
- marine structures	14	0.2
<b>Total</b>	<b>518</b>	<b>7.0</b>
<u>Outdoor storage</u>		
Chemicals, explosives, ammunition, oils, grease	34	0.5
Coal and coke	6	0.1
Refuse	194	2.7
Timber	58	0.8
Cotton, metal, packing materials, rubber etc.	42	0.6
<b>Total</b>	<b>334</b>	<b>4.6</b>
<u>Other outdoor structures</u>	<b>334</b>	<b>4.6</b>
<b>Total fires other than those in buildings</b>	<b>1926</b>	<b>26.8</b>
<b>Total fires attended</b>	<b>7172</b>	<b>100.0</b>

APPENDIX II (Contd.)

Table 3

SUPPOSED CAUSE OF FIRES

Reports from Scotland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Each item in the list of supposed causes of fire given in the table represents a group of causes which have a common source of ignition. In some cases the groups have been divided into sub-groups according to the nature of the material first ignited and in others according to the act with the source of ignition which led to the outbreak of fire.

Supposed cause of fires	Fires in buildings		Fires other than those in buildings		Total	
	No.	Per cent.	No.	Per cent.	No.	Per cent.
Aircraft, crashed	-	-	2	-	2	-
Ashes	200	2.8	64	0.9	264	3.7
Brazier	10	0.1	14	0.2	24	0.3
Candle	34	0.5	-	-	34	0.5
Chimney on fire, not confined to chimney	336	4.7	-	-	336	4.7
Chimney, sparks from (outside building)	40	0.6	16	0.2	56	0.8
Doubtful	4	0.1	2	-	6	0.1
Electric cooker	50	0.7	-	-	50	0.7
fire, heater, radiator	90	1.3	2	-	92	1.3
iron	36	0.5	-	-	36	0.5
Electric motor	46	0.6	6	0.1	52	0.7
refrigerator	98	1.4	-	-	98	1.4
wire and cable, lead to apparatus	34	0.5	24	0.3	58	0.8
wire and cable, other than lead to apparatus	270	3.8	164	2.3	434	6.1
wireless	34	0.5	2	-	36	0.5
Electric other apparatus	78	1.1	36	0.5	114	1.6
Explosives, fireworks	8	0.1	4	0.1	12	0.2
Fire in grate igniting bedding, clothing, linen	90	1.3	-	-	90	1.3
Fire in grate igniting furniture and furnishings	148	2.1	-	-	148	2.1
Fire in grate igniting structural timber under hearth	378	5.3	-	-	378	5.3
Fire in grate igniting other materials	614	8.6	-	-	614	8.6
Fish frying range (all fuels)	66	0.9	4	0.1	70	1.0
Flue	68	0.9	4	0.1	72	1.0
Furnace (coal or coke)	6	0.1	-	-	6	0.1
Gas (coal) burner, jet, ring	58	0.8	30	0.4	88	1.2
Gas (coal) cooker	140	2.0	-	-	140	2.0
fire, heater, radiator	22	0.3	-	-	22	0.3
other apparatus	54	0.8	-	-	54	0.8
Incendiarism	12	0.2	2	-	14	0.2
Incubator, brooder (all fuels)	44	0.6	-	-	44	0.6

## APPENDIX II (Contd.)

Table 3 (contd.)

## SUPPOSED CAUSE OF FIRES

Reports from Scotland, 1951

(Frequencies obtained by multiplying results of analysis  
of one-in-two sample of reports by two)

Supposed cause of fires	Fires in buildings		Fires other than those in buildings		Total	
	No.	Per cent.	No.	Per cent.	No.	Per cent.
Intentional burning of grassland, gorse, etc.	2	-	30	0.4	32	0.4
Lightning	2	-	2	-	4	0.1
Lime	4	0.1	4	0.1	8	0.1
Locomotives, sparks from	42	0.6	268	3.7	310	4.3
Matches	92	1.3	46	0.6	138	1.9
Matches, children playing with	206	2.9	318	4.4	524	7.3
Mechanical heat or sparks	40	0.6	22	0.3	62	0.9
Metal, hot	28	0.4	2	-	30	0.4
Oil, blow lamp	82	1.1	-	-	82	1.1
engine (including petrol)	8	0.1	104	1.5	112	1.6
Oil, lamp, stove	68	0.9	14	0.2	82	1.1
tractor	20	0.3	28	0.4	48	0.7
other apparatus	8	0.1	2	-	10	0.1
Oxyacetylene cutting and welding apparatus	48	0.7	34	0.5	82	1.1
Rubbish burning	38	0.5	158	2.2	196	2.7
Slow combustion stove igniting structural woodwork	52	0.7	-	-	52	0.7
Slow combustion stove igniting other materials	94	1.3	20	0.3	114	1.6
Smoking materials	514	7.2	146	2.0	660	9.2
Spontaneous combustion in materials other than rubbish	14	0.2	16	0.2	30	0.4
Static electricity	-	-	-	-	-	-
Steam roller, engine, traction engine	2	-	-	-	2	-
Sun's rays	6	0.1	2	-	8	0.1
Taper, lighted paper or sticks	46	0.6	4	0.1	50	0.7
Taper, lighted paper or sticks, children playing with	70	1.0	24	0.3	94	1.3
Miscellaneous and undefined	324	4.5	96	1.3	420	5.9
Unknown source of ignition	368	5.1	210	2.9	578	8.1
Total number of fires	5,246	73.1	1,926	26.9	7,172	100.0

APPENDIX II (Contd.)  
Table 4A

SUPPOSED CAUSE OF FIRES IN BUILDINGS IN RELATION TO HAZARD IN WHICH FIRE STARTED  
Reports from Scotland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Row No.	Column No.	Hazard in which fire started	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	Row No.
		Supposed cause of fire	Agriculture	Mining, quarrying and treatment of non-metalliferous mine and quarry products (excluding gas works)	Manufacture of bricks, pottery, glass, etc.	Manufacture of chemicals, explosives, paints, oils	Manufacture of metals, machines, implements, conveyances	Manufacture of textiles and textile goods (not dress)	Manufacture of clothing (not knitted) including footwear, and goods of leather and leather substitute; preparation of skins and leather	Manufacture of food, drink, tobacco	Woodworking; manufacture of cane and basket ware, furniture, fittings	Paper making; manufacture of stationery and stationery requisites, printing and book binding	Building, decorating, contracting; slate and stone cutting and dressing	Other manufacturing industries, including rubber and synthetic rubber	Gas, water, electricity, sewage	Transport and communication	Commerce; retail shops, including departmental stores	Commerce; wholesale dealers and warehouses	Offices; Government and other	Navy, Army, Air Force establishments	Fire Service establishments	Professional establishments (other than offices), public institutions	Places of public entertainment	Private residential houses	Private residential flats	Clubs, hotels, restaurants, public houses	Private huts, unoccupied houses, personal service	Miscellaneous and undefined	Total	
1		Asbes	2	-	-	2	-	-	2	6	2	-	-	-	-	4	10	-	2	-	-	14	-	16	66	-	72	4	200	1
2		Brazier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	2	-	10	10	-	-	-	10	2
3		Candle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	-	-	-	2	-	10	10	-	-	-	34	3
4		Chimney on fire, not confined to chimney	2	-	-	-	2	-	-	-	2	-	-	-	-	-	8	-	-	-	-	4	-	112	200	-	-	-	336	4
5		Chimney, sparks from (outside building)	4	-	-	-	-	-	-	2	2	-	-	-	-	-	2	2	-	-	-	2	-	12	10	4	-	-	40	5
6		Doubtful	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	26	-	-	-	4	6
7		Electric cooker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	2	-	28	28	4	-	-	50	7
8		Electric fire, heater, radiator	-	-	-	-	-	-	-	4	-	-	-	-	-	-	6	6	-	-	-	4	-	10	22	2	2	-	90	8
9		Iron motor	-	-	-	-	-	-	-	2	2	-	-	-	-	-	12	12	-	-	-	4	-	28	28	2	2	-	36	9
10		Electric refrigerator	-	-	-	-	-	-	-	4	-	-	-	-	-	-	6	6	-	-	-	2	-	6	16	-	-	-	46	10
11		Electric refrigerator	-	-	-	-	-	-	-	4	-	-	-	-	-	-	2	2	-	-	-	2	-	-	2	-	-	-	98	11
12		wire and cable, lead to apparatus	2	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	-	-	-	-	-	6	16	-	-	-	34	12
13		wire and cable, other than lead to apparatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14		wireless apparatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15		other apparatus	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	270	13
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34	14
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	15



16	Explosives, fireworks	-	-	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	2	-	2	8	16		
17	Fire in grate igniting bedding, clothing, linen	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	42	42	-	-	-	90	17	
18	Fire in grate igniting furniture and furnishings	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	40	102	-	-	-	148	18	
19	Fire in grate igniting structural timber under hearth	-	-	-	-	-	-	-	2	-	2	-	-	-	2	10	-	6	-	2	4	2	70	270	8	-	-	378	19
20	Fire in grate igniting other materials	4	-	-	-	-	2	-	2	-	-	8	2	-	2	16	-	2	-	-	8	2	124	426	4	6	6	614	20
21	Fish frying range (all fuels)	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	64	-	-	66	21	
22	Flue	2	-	-	-	8	-	-	2	-	2	-	-	-	2	6	4	-	-	-	8	2	12	8	4	6	2	68	22
23	Furnace (coal or coke)	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	6	23	
24	Gas (coal) burner, jet, ring	-	-	-	-	2	-	-	6	-	2	-	2	-	-	6	-	-	-	-	4	-	8	24	2	2	-	58	24
25	cooker	-	-	-	-	-	-	-	-	-	2	-	-	-	-	6	2	-	-	-	6	-	26	86	12	-	-	140	25
26	Gas (coal) fire, heater, radiator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	2	-	-	2	4	6	2	-	-	-	22	26
27	other apparatus	-	-	-	-	-	-	2	6	-	-	-	-	-	-	16	2	-	-	-	2	-	-	14	-	12	-	54	27
28	Incendiarism	-	-	-	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	2	-	6	-	-	-	12	28
29	Incubator, brooder (all fuels)	34	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	2	-	-	4	-	44	29
30	Intentional burning of grassland, gorse	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2	30
31	Lightning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2	31
32	Lime	2	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	32
33	Locomotives, sparks from	4	-	-	-	-	-	-	-	2	-	-	-	-	20	6	-	-	-	-	-	-	-	2	4	2	42	33	
34	Matches	2	-	-	-	-	-	2	-	2	2	2	2	-	6	8	-	2	-	-	4	-	6	38	-	4	12	92	34
35	Matches, children playing with	22	-	-	-	-	2	-	2	6	-	10	-	-	8	6	-	-	-	-	15	2	18	32	4	12	66	206	35
36	Mechanical heat or sparks	2	-	-	-	8	12	2	4	6	2	-	-	-	-	2	-	-	-	-	2	-	-	-	-	-	-	40	36
37	Metal, hot	2	2	-	-	10	-	-	-	-	-	2	-	-	2	-	2	-	-	-	2	-	2	-	-	2	2	28	37
38	Oil, blow lamp	2	-	-	-	-	-	2	-	-	-	4	-	-	-	8	-	2	-	-	10	-	36	16	-	2	-	82	38
39	engine (including petrol)	2	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	8	39
40	lamp, stove	6	-	-	-	2	-	-	2	-	-	-	-	-	8	-	2	-	-	-	4	2	26	6	-	10	-	68	40
	Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	

APPENDIX II (Contd.)  
Table 4A (contd.)

SUPPOSED CAUSE OF FIRES IN BUILDINGS IN RELATION TO HAZARD IN WHICH FIRE STARTED  
Reports from Scotland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Hazard in which fire started	Agriculture	Mining, quarrying and treatment of non-metalliferous mine and quarry products (excluding gas works)	Manufacture of bricks, pottery, glass, etc.	Manufacture of chemicals, explosives, paints, oils	Manufacture of metals, machines, implements, conveyances	Manufacture of textiles and textile goods (not dress)	Manufacture of clothing (not knitted) including footwear, and goods of leather and leather substitute; preparation of skins and leather	Manufacture of food, drink, tobacco	Woodworking; manufacture of cane and basket ware, furniture, fittings	Paper making; manufacture of stationery and stationery requisites, printing and bookbinding	Building, decorating, contracting; slate and stone cutting and dressing	Other manufacturing industries, including rubber and synthetic rubber	Gas, water, electricity, sewage	Transport and communication	Commerce; retail shops, including departmental stores	Commerce; wholesale dealers and warehouses	Offices; Government and other	Navy, Army, Air Force establishments	Fire Service establishments	Professional establishments (other than offices) public institutions	Places of public entertainment	Private residential houses	Private residential flats	Clubs, hotels, restaurants, public houses	Private huts, unoccupied houses, personal service	Miscellaneous and undefined	Total
Supposed cause of fire																											
Row No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
41	Oil tractor	16	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
42	other apparatus	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
43	Oxyacetylene cutting and welding apparatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48
44	Rubbish burning	4	-	-	-	26	-	2	2	-	6	-	2	10	6	-	2	-	-	4	-	6	8	-	-	-	38
45	Slow combustion stove igniting structural woodwork	10	-	-	-	-	-	-	-	-	6	-	-	2	-	2	-	2	-	-	-	6	4	4	2	2	52
46	Slow combustion stove igniting other materials	8	2	-	2	2	6	2	8	2	18	4	4	4	12	6	4	4	-	10	4	6	6	4	2	8	94
47	Smoking materials	26	-	-	4	10	-	6	20	-	10	10	4	30	60	6	4	4	-	16	14	46	136	36	16	-	514
48	Spontaneous combustion in materials other than rubbish	4	-	-	-	-	-	2	-	-	-	4	-	-	-	-	-	-	-	-	2	-	-	-	2	-	14
49	Steam roller, engine, traction engine	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	48
50	Sun's rays	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49
51	Taper, lighted paper or sticks	-	-	-	-	-	-	-	-	-	-	-	-	-	4	2	2	-	-	-	-	-	-	-	-	-	6
52	Taper, lighted paper or sticks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51
53	children playing with miscellaneous and undefined	2	-	-	2	2	-	-	4	-	4	-	2	4	-	2	-	-	-	-	2	6	28	2	-	-	46
54	Unknown source of ignition	4	2	-	24	2	2	18	14	-	8	4	6	10	28	2	4	2	-	6	10	32	20	10	8	20	70
55	Total fires in buildings	230	14	2	158	56	24	92	84	26	104	42	20	188	422	42	50	10	6	182	66	858	1878	224	224	222	5246
Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Row No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27

## APPENDIX II (Contd.)

Table 4B

SUPPOSED CAUSE OF FIRES OTHER THAN THOSE IN BUILDINGS IN RELATION TO HAZARD IN WHICH FIRE STARTED

Reports from Scotland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

	Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
Row No.	Hazard in which fire started  Supposed cause of fire	Crops	Agricultural machinery	Agricultural waste	Agriculture, other	Gardens and allotments	Railway embankments	Grassland, heathland	Woods, forests, plantations	Single trees	Felled timber	Transport and communications				Outdoor storage					Miscellaneous outdoor structures	Total	Row No.	
												Air	Rail	Road - oil, petrol or gas driven vehicles	Road - other vehicles	Water	Chemicals, explosives, ammunition, oils, grease	Coal and coke	Refuse	Timber				Other materials
1	Aircraft, crashed	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2	1
2	Ashes	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	6	64	2
3	Brazier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	-	-	-	-	14	3
4	Chimney, sparks from (outside building)	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	4
5	Doubtful	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	2	5
6	Electric fire, heater, radiator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	6
7	motor	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	6	7
8	wire and cable, lead to apparatus	-	-	-	-	-	-	-	-	-	-	-	-	22	-	2	-	-	-	-	-	-	24	8
9	wire and cable, other than lead to apparatus	-	4	-	-	-	-	-	-	-	-	-	-	-	24	10	2	-	-	-	-	24	164	9
10	wireless	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	2	10
11	Electric other apparatus	-	2	-	-	-	-	-	-	-	-	-	-	8	16	4	-	-	-	-	-	6	36	11
12	Explosives, fireworks	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	12
13	Fish frying range, all fuels	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	4	13
14	Flue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	2	4	14
15	Gas (coal) burner, jet, ring	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	30	15
16	Incendiarism	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	16
17	Intentional burning of grassland, gorse, etc.	-	-	-	-	-	4	18	6	-	-	-	-	-	-	-	-	-	-	-	-	2	30	17
18	Lightning	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	18
19	Lime	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	4	19
20	Locomotives, sparks from	2	-	-	4	2	116	36	-	-	-	-	16	2	-	2	2	-	-	10	2	74	268	20
	Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	222	

## SUPPOSED CAUSE OF FIRES OTHER THAN THOSE IN BUILDINGS IN RELATION TO HAZARD IN WHICH FIRE STARTED

Reports from Scotland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

	Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
Row No.	Hazard in which fire started  Supposed cause of fire	Crops	Agricultural machinery	Agricultural waste	Agriculture, other	Gardens and allotments	Railway embankments	Grassland, heathland	Woods, forests, plantations	Single trees	Felled timber	Transport and communications					Outdoor storage					Miscellaneous outdoor structures	Total	Row No.
												Air	Rail	Road - oil, petrol or gas driven vehicles	Road - other vehicles	Water	Chemicals, explosives, ammunition, oils, grease	Coal and coke	Refuse	Timber	Other Materials			
21	Matches	4	-	2	-	-	4	8	2	4	-	-	-	-	-	-	-	-	12	2	-	8	46	21
22	Matches, children playing with	32	2	2	8	4	-	110	8	16	-	-	8	10	4	-	2	-	50	14	12	36	318	22
23	Mechanical heat or sparks	2	-	-	-	-	-	-	-	-	-	-	2	16	-	-	-	-	-	-	-	2	22	23
24	Metal, hot	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2	24
25	Oil engine (including petrol)	-	-	-	2	-	-	2	-	-	-	-	-	94	-	2	2	-	-	-	-	2	104	25
26	Oil lamp, stove	-	-	-	-	-	-	2	-	-	-	-	-	4	-	-	-	-	-	-	-	8	14	26
27	tractor	6	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	27
28	other apparatus	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	28
29	Oxyacetylene cutting and welding apparatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	4	-	4	2	-	8	34	29
30	Rubbish burning	8	2	2	6	2	2	42	8	6	-	-	2	6	-	2	4	-	34	16	10	6	158	30
31	Slow combustion stove igniting materials other than structural woodwork	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	18	20	31
32	Smoking materials	14	-	-	2	-	2	30	4	-	2	-	6	16	-	12	-	-	12	8	8	30	146	32
33	Spontaneous combustion in materials other than rubbish	4	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2	-	4	-	-	4	16	33
34	Sun's rays	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2	34
35	Taper, lighted paper or sticks	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2	4	35
36	Taper, lighted paper or sticks, children playing with	-	-	-	-	-	-	2	-	-	-	-	2	2	-	-	-	-	2	4	2	10	24	36
37	Miscellaneous and undefined	8	-	-	2	-	2	22	4	-	-	-	6	8	2	8	2	2	6	-	6	18	96	37
38	Unknown source of ignition	36	4	4	-	2	6	36	8	-	-	2	8	34	2	12	10	-	20	2	-	24	210	38
39	Total fires other than those in buildings	136	38	12	26	10	138	310	42	26	2	4	52	332	56	74	34	6	194	58	42	334	1926	39
	Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

## APPENDIX II (Contd.)

Table 5

## MATERIAL FIRST IGNITED IN FIRES

Reports from Scotland, 1951

(Frequencies obtained by multiplying results of analysis  
of one-in-two sample of reports by two)

Material first ignited	Fires in buildings		Fires other than those in buildings		Total	
	No.	Per cent.	No.	Per cent.	No.	Per cent.
<u>Agriculture and Forestry</u>						
Crops, ricks, stacks						
Barley	-	-	2	-	2	-
Hay	24	0.3	20	0.3	44	0.6
Straw	12	0.2	26	0.4	38	0.5
Stubble	-	-	-	-	-	-
Other	2	-	22	0.3	24	0.3
Loose straw or hay	84	1.2	80	1.1	164	2.3
Grass, heather, bracken	14	0.2	408	5.7	422	5.9
Trees, hedges, undergrowth, brushwood, bushes (including gorse), twigs, touchwood	-	-	138	1.9	138	1.9
Other agricultural materials	6	0.1	10	0.1	16	0.2
Total	142	2.0	706	9.8	848	11.8
<u>Chemicals - gases</u>						
Acetylene	18	0.3	8	0.1	26	0.4
Coal gas	192	2.7	36	0.5	228	3.2
Other gases	14	0.2	4	0.1	18	0.3
Total	224	3.1	48	0.7	272	3.8
<u>Chemicals - oils</u>						
Animal and vegetable oils	4	0.1	-	-	4	0.1
Mineral oil						
Paraffin	40	0.6	6	0.1	46	0.6
Petrol in vehicles	28	0.4	114	1.6	142	2.0
Petrol not in vehicles	44	0.6	30	0.4	74	1.0
Other mineral oils	12	0.2	2	-	14	0.2
Oil, waste and undefined	50	0.7	50	0.7	100	1.4
Total	178	2.5	202	2.8	380	5.3
<u>Chemicals - other</u>						
Celluloid (including films)	4	0.1	-	-	4	0.1
Paint, enamel, lacquer, varnish, stains, and French polish	18	0.3	4	0.1	22	0.3
Pitch, tar	18	0.3	24	0.3	42	0.6
Rubber, vulcanite, ebonite	20	0.3	22	0.3	42	0.6
Other chemicals	74	1.0	16	0.2	90	1.3
Total	134	1.9	66	0.9	200	2.8
<u>Paper, cardboard, wood (not part of a structure)</u>						
Paper, cardboard	246	3.4	56	0.8	302	4.2
Wood chippings, flour, sawdust, shavings, wool	82	1.1	28	0.4	110	1.5
Wood barrels, boxes, cases, firewood, etc.	90	1.3	12	0.2	102	1.4
Timber	18	0.3	28	0.4	46	0.6
Total	436	6.1	124	1.7	560	7.8

## APPENDIX II (Contd.)

Table 5 (contd.)

## MATERIAL FIRST IGNITED IN FIRES

Reports from Scotland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Material first ignited	Fires in buildings		Fires other than those in buildings		Total	
	No.	Per cent.	No.	Per cent.	No.	Per cent.
<u>Textiles</u>						
Canvas and canvas goods	18	0.3	6	0.1	24	0.3
Clothing on person	6	0.1	-	-	6	0.1
Clothing not on person	130	1.8	4	0.1	134	1.9
Cotton	14	0.2	2	-	16	0.2
Jute, hessian, sacking	62	0.9	18	0.3	80	1.1
Rags (including oily rags)	32	0.4	10	0.1	42	0.6
Tarpaulin, waterproof sheeting, oilskins	10	0.1	32	0.4	42	0.6
Other textiles	28	0.4	4	0.1	32	0.4
Total	300	4.2	76	1.1	376	5.2
<u>Furniture, furnishings, household goods</u>						
Bedding	134	1.9	12	0.2	146	2.0
Carpets, rugs	58	0.8	2	-	60	0.8
Curtains	70	1.0	-	-	70	1.0
Furniture	242	3.4	2	-	244	3.4
Linen articles (unspecified), laundry	10	0.1	-	-	10	0.1
Seating in vehicles	6	0.1	20	0.3	26	0.4
Other furnishings	78	1.1	6	0.1	84	1.2
Total	598	8.3	42	0.6	640	8.9
<u>Building materials, structural woodwork</u>						
Building materials other than wood	32	0.4	-	-	32	0.4
Structural woodwork						
External	104	1.5				
Internal						
Door, window frame	90	1.3				
Floor, stairs	268	3.7				
Partitions, linings to walls	88	1.2	150	2.1	1,544	21.5
Roof	154	2.1				
Timber in chimney, flue	42	0.6				
Timber under hearth	402	5.6				
Other fittings	246	3.4				
Total	1,426	19.9	150	2.1	1,576	22.0
<u>Miscellaneous</u>						
Coal, coke	22	0.3	6	0.1	28	0.4
Electrical insulation	284	4.0	160	2.2	444	6.2
Fat (margarine, suet, butter, cooking fat, lard)	202	2.8	2	-	204	2.8
Food other than fat	84	1.2	-	-	84	1.2
Refuse, rubbish, debris	326	4.5	154	2.1	480	6.7
Soot	352	4.9	-	-	352	4.9
Other	274	3.8	60	0.8	334	4.7
<u>Unknown</u>	264	3.7	130	1.8	394	5.5
Total number of fires	5,246	73.1	1,926	26.9	7,172	100.0

## APPENDIX II (Contd.)

Table 6

## METHOD OF EXTINCTION OF FIRES

Reports from Scotland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Row No.	Method of extinction	Fires in buildings						Fires other than those in buildings						Total No. of fires		Row No.
		Extinguished by Fire brigade		Extinguished before arrival of Fire Brigade		Total		Extinguished by Fire Brigade		Extinguished before arrival of Fire Brigade		Total				
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	
1	Burned out	-	-	24	0.3	24	0.3	-	-	18	0.3	18	0.3	42	0.6	1
2	Removal	428	6.0	92	1.3	520	7.3	64	1.0	12	0.2	76	1.1	596	8.3	2
3	Automatic sprinkler system	-	-	2	-	2	-	-	-	-	-	-	-	2	-	3
4	Beating	8	0.1	16	0.2	24	0.3	198	2.8	36	0.5	234	3.3	258	3.6	4
5	Smothering	12	0.2	46	0.6	58	0.8	2	-	8	0.1	10	0.1	68	0.9	5
6	Sand, earth, etc.	2	-	6	0.1	8	0.1	12	0.2	10	0.1	22	0.3	30	0.4	6
7	Water from buckets	216	3.0	222	3.1	438	6.1	22	0.3	24	0.3	46	0.6	484	6.7	7
8	Water from stirrup or hand pumps	1300	18.1	4	0.1	1304	18.2	62	0.9	2	-	64	0.9	1368	19.1	8
9	Chemicals and chemical extinguishers	176	2.5	58	0.8	234	3.3	104	1.5	48	0.7	152	2.1	386	5.4	9
10	Two or more methods 4-9	70	1.0	34	0.5	104	1.5	36	0.5	16	0.2	52	0.7	156	2.2	10
11	Water from garden hose, etc.	-	-	14	0.2	14	0.2	-	-	8	0.1	8	0.1	22	0.3	11
12	Hose reel jets (using water in tank only)	1268	17.7	-	-	1268	17.7	646	9.0	-	-	646	9.0	1914	26.7	12
13	Hose reel jets (using more water than that in tank)	296	4.1	-	-	296	4.1	68	0.9	-	-	68	0.9	364	5.1	13
14	Jets from inside hose reel or inside hydrant	10	0.1	-	-	10	0.1	-	-	2	-	2	-	12	0.1	14
15	Hose reel jets and jets from inside hose reel	6	0.1	-	-	6	0.1	-	-	-	-	-	-	6	0.1	15
16	Jets from pumps and hydrants	820	11.4	4	0.1	824	11.5	502	7.0	6	0.1	508	7.1	1332	18.6	16
17	Other and undefined methods	70	1.0	42	0.6	112	1.6	8	0.1	12	0.2	20	0.3	132	1.8	17
18	Total	4682	65.3	564	7.9	5246	73.1	1724	24.0	202	2.8	1926	26.9	7172	100.0	18

## Notes on method of extinction

1. "Removal" includes occurrences where (a) burning material was removed from the building, (b) gas supply was turned off. If the burning material was tackled with methods 3-11 before removing it from the building, then such occurrences were classified under whichever of these methods applied.

2. Methods 11-15 and method 16 include those occurrences in which methods 3-10 and 3-15 respectively may also have been used.

3. "Fires extinguished by Fire Brigade" include those fires which were tackled but not extinguished before the arrival of the Fire Brigade.

APPENDIX II (Contd.)

Table 7

BEHAVIOUR OF SPRINKLER SYSTEMS AT FIRES

Reports from Scotland, 1951

(FREQUENCIES OBSERVED IN THE ANALYSIS OF A RANDOM ONE-IN-TWO SAMPLE OF REPORTS)

NOTE. These figures are not on a comparable basis with those in Tables 1-6, or Tables 8-10.

Behaviour of sprinklers	Incidents in which the following number of heads were actuated						Total number of incidents
	Nil	1-5	6-10	11-20	More than 20	Number not reported	
Installed but did not operate because insufficient heat was generated by fire	2	-	-	-	-	-	2
Operated but did not control fire because (i) fire was screened by fibre boarding or bench (ii) conveyor belt carried fire out of reach	2	-	-	-	-	-	2
	1	-	-	-	-	-	1
	3	-	-	-	-	-	3
Controlled but did not extinguish fire	-	5	1	-	2	-	8
Extinguished fire	-	-	-	-	-	1	1
Number of calls to fires where sprinkler systems were installed	5	5	1	-	2	1	14

Table 8

ATTENDANCE OF SPECIAL APPLIANCES AT FIRES

Reports from Scotland, 1951

(Frequencies obtained from results of analysis of all reports)

Attendance	No. of occasions	Percentage of total no. of fires
Breakdown lorries	1	-
Canteen vans	1	-
Emergency tenders	161	2.2
Escape carriers	11	0.2
Escape carrying units	6	0.1
Fire boats	52	0.7
Foam tenders	69	1.0
Hose carriers	12	0.2
Hoselaying lorries	1	-
Pump escapes	2,992	41.7
Pump salvage tenders	125	1.7
Salvage tenders	319	4.4
Turntable ladders (hand operated)	250	3.6
Turntable ladders (mechanical)	1,470	20.5
Utility vans or trucks	233	3.2
Water tenders	504	7.0
Wireless cars	34	0.5



APPENDIX II (Contd.)

Table 9

PERSONS RESCUED OR ESCAPED BY EMERGENCY MEANS FROM FIRES

Reports from Scotland, 1951

(Frequencies obtained from results of analysis of all reports)

Appliance or method used	Number of persons
Rescue with Fire Brigade assistance from	
Buildings	
Ladder, extension	9
Other apparatus	3
Without apparatus	56
Total	68
Rescue without Fire Brigade assistance from	
Buildings	
Carried or assisted out	32
Ladder	1
Lowered from window, roof, etc.	4
Other or undefined methods	4
Road vehicles	10
Total	51
Escape by emergency means from	
Aircraft	
Baled out	1
Buildings	
Sliding down drainpipe, sheets, rope, etc.	5
Through ground floor windows	3
Other or undefined methods	3
Ships	6
Total	18
Total persons rescued or escaped	137

APPENDIX II (Contd.)

Table 10

NATURE OF INJURIES OF CASUALTIES IN FIRES

Reports from Scotland, 1951

(Frequencies obtained from results of analysis of all reports)

\*Casualties who suffered shock in addition to another injury have been classified according to the nature of the other injury.

Nature of injury	Fire Brigade	Other casualties	Total
Fatal casualties			
Burns and scalds	-	22	22
Overcome by gas or smoke	-	6	6
Other and undefined injuries	-	17	17
Total	-	45	45
Non-fatal casualties			
Burns and scalds	15	146	161
Bruises, cuts, abrasions	48	20	68
Dislocations, sprains, fractures	10	-	10
Overcome by gas or smoke	7	18	25
More than one of above injuries	2	6	8
*Shock	-	34	34
Other and undefined injuries	33	16	49
Total	115	240	355
Total casualties	115	285	400

## APPENDIX III

## STATISTICAL TABLES FOR FIRE BRIGADES IN NORTHERN IRELAND, 1951

Table 1

## METHOD OF CALLING FIRE BRIGADES TO FIRES

Reports from Northern Ireland, 1951

(Frequencies obtained from results of analysis of all reports)

Method of calling	Fire Brigade				Total	
	North	South	West	Belfast	No.	Per Cent
By Special Fire Service methods						
Automatic fire alarm	-	-	-	-	-	-
Fire and police pillar box	-	-	-	-	-	-
Police telephone	-	-	18	31	49	4.4
Private fire telephone	-	-	3	4	7	0.6
Street fire alarm	-	-	-	31	31	2.8
Total	-	-	21	66	87	7.7
Exchange Telephone	213	329	206	242	990	88.1
Running call	8	6	7	20	41	3.7
Late call	-	-	1	-	1	0.1
Other and undefined methods	-	-	4	1	5	0.4
Total fires	221	335	239	329	1124	100.0

## APPENDIX III (Contd.)

Table 2

## FIRES CLASSIFIED ACCORDING TO HAZARD IN WHICH FIRE STARTED

Reports from Northern Ireland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Hazard	Total	
	No.	Per cent
Fires in buildings classified according to trade or business carried on		
<u>Agriculture</u>		
Farming (not fruit or poultry), horse and stock rearing	60	5.3
Allotments, market gardening, fruit and poultry farming	4	0.4
Total	64	5.7
<u>Mining, quarrying and treatment of non-metalliferous mine and quarry products (excluding gas works)</u>	-	-
<u>Manufacture of bricks, pottery, glass, etc.</u>	2	0.2
<u>Manufacture of chemicals, dyes, explosives, paints, oils</u>	4	0.4
<u>Manufacture of metals, machines, implements conveyances</u>	16	1.5
<u>Manufacture of textiles and textile goods (not dress)</u>	32	2.9
<u>Preparation of skins and leather and manufacture of goods of leather and leather substitute (not clothing or footwear)</u>	-	-
<u>Manufacture of clothing (not knitted) including footwear</u>	10	0.9
<u>Manufacture of food, drink, tobacco</u>	10	0.9
<u>Wood working: manufacture of cane and basket ware, furniture, fittings</u>	4	0.4
<u>Paper making: manufacture of stationery and stationery requisites, printing and book binding</u>	-	-
<u>Building, decorating, contracting: slate and stone cutting and dressing</u>	14	1.2
<u>Rubber and synthetic rubber</u>	-	-
<u>Other manufacturing industries</u>	2	0.2
<u>Gas, water, electricity, sewage</u>	4	0.4
<u>Transport and communication</u>		
Railway - stations etc.	-	-
Road - garages, depots, etc.	12	1.0
Water - dock buildings other than warehouses	-	-
Air - aerodromes, etc.	-	-
Other communication (post, telephone, wireless)	6	0.5
Total	18	1.5

## APPENDIX III (Contd.)

Table 2 (contd.)

## FIRES CLASSIFIED ACCORDING TO HAZARD IN WHICH FIRE STARTED

Reports from Northern Ireland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Hazard	Total	
	No.	Per cent
Fires in buildings classified according to trade or business carried on (contd.)		
<u>Commerce</u>		
Departmental stores	2	0.2
Retail shops	62	5.5
Wholesale dealers	4	0.4
Dock and other warehouses	2	0.2
Total	70	6.3
<u>Offices, Government and other</u>	6	0.6
<u>Navy, Army and Air Force establishments</u>	10	0.9
<u>Fire Service establishments</u>	-	-
<u>Professional establishments (other than offices), public institutions</u>		
Educational establishments	8	0.7
Hospitals, homes, etc. for care of the sick and infirm	10	0.9
Places of worship	4	0.4
Other public and professional services	-	-
Total	22	2.0
<u>Places of public entertainment</u>		
Cinemas and theatres	-	-
Other places of entertainment	10	0.9
Total	10	0.9
<u>Private residential and personal service (including hotels and catering)</u>		
Private residential houses	332	29.5
Private residential flats	6	0.5
Clubs, hotels, restaurants, public houses	30	2.6
Private huts, unoccupied houses; personal service	24	2.1
Total	392	34.7
<u>Miscellaneous</u>	4	0.4
Total fires in buildings	694	62.0

## APPENDIX III (Contd.)

Table 2 (contd.)

## FIRES CLASSIFIED ACCORDING TO HAZARD IN WHICH FIRE STARTED

Reports from Northern Ireland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Hazard	Total	
	No.	Per cent
Fires other than those in buildings		
<u>Agriculture and forestry</u>		
Crops, standing or stooked (including hay fields)	-	-
Crops, ricks and stacks	56	5.0
Agricultural machinery	10	0.9
Agricultural waste	2	0.2
Other agricultural hazards	6	0.5
Allotments and gardens	2	0.2
Railway embankments	18	1.6
Grassland, heathland	148	13.1
Woods, forests, plantations	-	-
Single trees	12	1.0
Total	254	22.5
<u>Transport and communication</u>		
Aircraft	-	-
Railway rolling stock, etc.	-	-
Road vehicles - electrically driven	-	-
- oil, petrol, or gas driven	64	5.7
Water vessels - craft on inland waters	2	0.2
- ships in dock	4	0.4
Total	70	6.3
<u>Outdoor storage</u>		
Chemicals, explosives, ammunition, oils, grease	4	0.4
Coal and coke	4	0.4
Refuse	26	2.3
Timber	8	0.7
Cotton, metal, packing materials, rubber etc.	14	1.2
Total	56	5.0
<u>Other outdoor structures</u>	50	4.4
Total fires other than those in buildings	430	38.2
Total fires attended	1,124	100.0

APPENDIX III (Contd.)

Table 3

SUPPOSED CAUSE OF FIRES

Reports from Northern Ireland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Each item in the list of supposed causes of fire given in the table represents a group of causes which have a common source of ignition. In some cases, the groups have been divided into sub-groups according to the nature of the material first ignited and in others according to the act with the source of ignition which led to the outbreak of fire.

Supposed cause of fires	Fires in buildings		Fires other than those in buildings		Total	
	No.	Per cent	No.	Per cent	No.	Per cent
Aircraft, crashed	-	-	-	-	-	-
Ashes	8	0.7	4	0.4	12	1.1
Brazier	2	0.2	-	-	2	0.2
Candle	6	0.5	-	-	6	0.5
Chimney on fire, not confined to chimney	36	3.2	-	-	36	3.2
Chimney, sparks from (outside building)	20	1.8	-	-	20	1.8
Doubtful	-	-	-	-	-	-
Electric cooker	-	-	-	-	-	-
fire, heater, radiator	8	0.7	-	-	8	0.7
iron	4	0.4	-	-	4	0.4
Electric motor	2	0.2	-	-	2	0.2
refrigerator	6	0.5	-	-	6	0.5
television	-	-	-	-	-	-
wire and cable, lead to apparatus	4	0.4	6	0.5	10	0.9
wire and cable other than lead to apparatus	34	3.0	58	5.2	92	8.2
Electric wireless	6	0.5	-	-	6	0.5
other apparatus	12	1.1	2	0.2	14	1.2
Explosives, fireworks	4	0.4	2	0.2	6	0.5
Fire in grate igniting bedding, clothing, linen	8	0.7	-	-	8	0.7
Fire in grate igniting furniture and furnishings	14	1.2	-	-	14	1.2
Fire in grate igniting structural timber under hearth	24	2.1	-	-	24	2.1
Fire in grate igniting other materials	130	11.6	-	-	130	11.6
Fish frying range (all fuels)	18	1.6	-	-	18	1.6
Flue	6	0.5	-	-	6	0.5
Furnace (coal or coke)	-	-	-	-	-	-
Gas (coal) burner, jet, ring	2	0.2	-	-	2	0.2
cooker	6	0.5	-	-	6	0.5
fire, heater, radiator	-	-	-	-	-	-
other apparatus	4	0.4	-	-	4	0.4
Incendiarism	-	-	-	-	-	-
Incubator, brooder (all fuels)	8	0.7	-	-	8	0.7

## APPENDIX III (Contd.)

Table 3 (contd.)

## SUPPOSED CAUSE OF FIRES

Reports from Northern Ireland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Supposed cause of fires	Fires in buildings		Fires other than those in buildings		Total	
	No.	Per cent	No.	Per cent	No.	Per cent
Intentional burning of grassland, gorse, etc.	-	-	2	0.2	2	0.2
Lightning	-	-	-	-	-	-
Lime	2	0.2	-	-	2	0.2
Locomotives, sparks from	2	0.2	26	2.3	28	2.5
Matches	18	1.6	10	0.9	28	2.5
Matches, children playing with	12	1.1	30	2.7	42	3.7
Mechanical heat or sparks	14	1.2	-	-	14	1.2
Metal, hot	2	0.2	2	0.2	4	0.4
Oil, blow lamp	2	0.2	-	-	2	0.2
engine (including petrol)	8	0.7	20	1.8	28	2.5
Oil, lamp, stove	8	0.7	4	0.4	12	1.1
tractor	2	0.2	6	0.5	8	0.7
other apparatus	-	-	-	-	-	-
Oxyacetylene cutting and welding apparatus	4	0.4	-	-	4	0.4
Rubbish burning	6	0.5	34	3.1	40	3.6
Slow combustion stove igniting structural woodwork	4	0.4	-	-	4	0.4
Slow combustion stove igniting other materials	20	1.8	8	0.7	28	2.5
Smoking materials	62	5.5	60	5.4	122	10.9
Spontaneous combustion in rubbish	-	-	-	-	-	-
in other materials	-	-	4	0.4	4	0.4
Static electricity	-	-	-	-	-	-
Steam roller, engine, traction engine	-	-	-	-	-	-
Sun's rays	-	-	-	-	-	-
Taper, lighted paper or sticks	16	1.4	4	0.4	20	1.8
Taper, lighted paper or sticks, children playing with	2	0.2	2	0.2	4	0.4
Miscellaneous and undefined	22	2.0	2	0.2	24	2.1
Unknown source of ignition	116	10.3	144	12.8	260	23.1
Total number of fires	694	61.7	430	38.3	1,124	100.0



APPENDIX III (Contd.)

Table 4a

SUPPOSED CAUSE OF FIRES IN BUILDINGS IN RELATION TO HAZARD IN WHICH FIRE STARTED

Reports from Northern Ireland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Row No.	Column No.	Hazard in which fire started	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Row No.
		Supposed cause of fire	Agriculture	Manufacture of bricks, pottery, glass, etc.	Manufacture of chemicals, explosives, paints, oils	Manufacture of metals, machines, implements, conveyances	Manufacture of textiles and textile goods (not dress)	Manufacture of clothing (not knitted) including footwear, and goods of leather and leather substitute; preparation of skins and leather	Manufacture of food, drink, tobacco	Woodworking; manufacture of cane and basket ware, furniture, fittings	Building, decorating, contracting; slate and stone cutting and dressing	Other manufacturing industries, including rubber and synthetic rubber	Gas, water, electricity, sewage	Transport and communication	Commerce; retail shops, including departmental stores	Commerce; wholesale dealers and warehouses	Offices; Government and other	Navy, Army, Air Force establishments	Professional establishments (other than offices), public institutions	Places of public entertainment	Private residential houses	Private residential flats	Clubs, hotels, restaurants, public houses	Private huts, unoccupied houses, personal service	Miscellaneous and undefined	Total	
1		Ashes	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	6	1	1	1	1	8	1
2		Brazier	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	2
3		Candle	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	3
4		Chimney on fire, not confined to chimney	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20	4
5		Chimney, sparks from (outside building)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	36	5
6		Electric fire, heater, radiator	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	2	1	2	1	1	1	1	8	6
7		Iron	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	7
8		Motor	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	8
9		Refrigerator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	9
10		Wire and cable, lead to apparatus	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	10
11		Electric wire and cable, other than lead to apparatus	4	1	1	1	1	1	2	1	1	1	1	1	12	2	1	1	2	4	2	1	1	1	1	34	11
12		Wireless	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	12
13		Explosives, other apparatus	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	12	13
14		Explosives, fireworks	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	14
15		Fire in grate igniting bedding, clothing, linen	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	15
16		Fire in grate igniting furniture and furnishings	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	16
17		Structural timber under hearth	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	17
18		Other materials	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	6	2	1	1	1	1	1	130	18
19		Fish frying range (all fuels)	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	18	19
20		Flue	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	20
21		Gas (coal) burner, jet, ring	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	21
22		Cooker	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	22
		Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	

APPENDIX III (Contd.)  
Table 4A (Contd.)  
SUPPOSED CAUSE OF FIRES IN BUILDINGS IN RELATION TO HAZARD IN WHICH FIRE STARTED  
Reports from Northern Ireland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Row No.	Column No.	Hazard in which fire started	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Row No.
		Supposed cause of fire	Agriculture	Manufacture of bricks, pottery, glass, etc.	Manufacture of chemicals, explosives, paints, oils	Manufacture of metals, machines, implements, conveyances	Manufacture of textiles and textile goods (not dress)	Manufacture of clothing (not knitted) including footwear, and goods of leather and leather substitute; pre-paration of skins and leather	Manufacture of food, drink, tobacco	Woodworking; manufacture of cane and basket ware, furniture, fittings	Building, decorating, con-tracting; slate and stone cutting and dressing	Other manufacturing industries, including rubber and synthetic rubber	Gas, water, electricity, sewage	Transport and communication	Commerce; retail shops, including departmental stores	Commerce; wholesale dealers and warehouses	Offices; Government and other	Navy, Army, Air Force establishments	Professional establishments (other than offices), public institutions	Places of public entertainment	Private residential houses	Private residential flats	Clubs, hotels, restaurants, public houses	Private huts, unoccupied houses, personal service	Miscellaneous and undefined	Total	
23		Electric other apparatus	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	4	1	1	1	4	23
24		Incubator, brooder (all fuels)	4	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	24
25		Lime	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	25
26		Locomotives, sparks from	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	18	26
27		Matches	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12	27
28		Matches, children playing with	10	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	12	28
29		Mechanical heat or sparks	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	29
30		Metal, hot	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	30
31		Oil, blow lamp	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	31
32		engine (including petrol)	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	32
33		lamp, stove	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	33
34		tractor	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	34
35		Oxyacetylene cutting and welding apparatus	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	35
36		Rubbish burning	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	6	36
37		Slow combustion stove igniting structural woodwork	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	37
38		Slow combustion stove igniting other materials	4	1	2	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	20	38
39		Smoking materials	6	1	1	2	4	2	2	1	1	1	1	4	12	1	1	1	6	1	1	1	1	1	1	62	39
40		Taper, lighted paper or sticks	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	16	40
41		Taper, lighted paper or sticks, children playing with	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	41
42		Miscellaneous and undefined	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22	42
43		Unknown source of ignition	26	2	1	4	8	4	2	2	10	1	2	6	12	6	6	4	2	4	18	1	4	1	1	116	43
44		Total fires in buildings	64	2	4	16	32	10	10	4	14	2	4	18	64	6	6	10	22	10	332	6	30	24	4	694	44
		Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	

## APPENDIX III (Contd.)

Table 4B

SUPPOSED CAUSE OF FIRES OTHER THAN THOSE IN BUILDINGS IN RELATION TO HAZARD IN WHICH FIRE STARTED

Reports from Northern Ireland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Row No.	Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Row No.
	Hazard in which fire started  Supposed cause of fire	Crops	Agricultural machinery	Agricultural waste	Agriculture, other	Gardens and allotments	Railway embankments	Grassland, heathland	Single trees	Transport and communications		Outdoor storage				Miscellaneous outdoor structures	Total			
										Road - oil, petrol or gas driven vehicles	Road - other vehicles	Water	Chemicals, explosives, ammunition, oils, grease	Coal and coke	Refuse			Timber	Other materials	
1	Ashes	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	4	1
2	Electric wire and cable, lead to apparatus	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1	1	6	2
3	wire and cable, other than lead to apparatus	1	4	1	1	1	1	1	1	30	1	2	1	1	1	1	1	22	58	3
4	Electric other apparatus	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	4
5	Explosives, fireworks	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	5
6	Intentional burning of grassland, gorse, etc.	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	6
7	Locomotives, sparks from	2	1	1	1	1	16	4	1	1	1	1	1	1	1	1	1	4	26	7
8	Matches	1	1	1	1	1	1	8	1	1	1	1	1	1	1	1	1	2	10	8
9	Matches, children playing with	8	1	2	1	1	2	8	4	1	1	1	1	1	4	2	1	1	30	9
10	Metal, hot	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	10
11	Oil engine (including petrol)	1	1	1	1	1	1	1	1	18	1	1	1	1	1	1	1	2	20	11
12	lamp, stove	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	4	12
13	tractor	1	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	13
14	Rubbish burning	4	1	1	2	2	1	6	4	1	1	1	1	1	12	1	4	1	34	14
15	Slow combustion stove igniting materials other than structural woodwork	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	6	8	16
	Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

## APPENDIX III (Contd.)

Table 4B (contd.)

SUPPOSED CAUSE OF FIRES OTHER THAN THOSE IN BUILDINGS IN RELATION TO HAZARD IN WHICH FIRE STARTED

Reports from Northern Ireland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Row No.	Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Row No.
	Hazard in which fire started  Supposed cause of fire	Crops	Agricultural machinery	Agricultural waste	Agriculture, other	Gardens and allotments	Railway embankments	Grassland, heathland	Single trees	Transport and communications			Outdoor storage					Miscellaneous out-door structures	Total	
										Road - oil, petrol or gas driven vehicles	Road - other vehicles	Water	Chemicals, explosives, ammunition, oils, grease	Coal and coke	Refuse	Timber	Other materials			
16	Smoking materials	10	-	-	-	-	-	34	-	-	-	2	-	-	2	6	4	2	60	27
17	Spontaneous combustion in materials other than rubbish	-	-	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-	4	17
18	Taper, lighted paper or sticks	2	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	4	18
19	Taper, lighted paper or sticks, children playing with	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	2	19
20	Miscellaneous and undefined	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2	20
21	Unknown source of ignition	28	-	-	4	-	-	86	-	6	-	-	-	-	6	-	6	8	144	21
22	Total fires other than those in buildings	56	10	2	6	2	18	148	12	64	-	6	4	4	26	8	14	50	430	22
	Column No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

## APPENDIX III (Contd.)

Table 5

## MATERIAL FIRST IGNITED IN FIRES

Reports from Northern Ireland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Material first ignited	Fires in buildings		Fires other than those in buildings		Total	
	No.	Per cent	No.	Per cent	No.	Per cent
<u>Agriculture and Forestry</u>						
Crops, ricks, stacks						
Barley	-	-	-	-	-	-
Hay	4	0.4	8	0.7	12	1.1
Straw	2	0.2	4	0.4	6	0.5
Stubble	-	-	-	-	-	-
Other	2	0.2	4	0.4	6	0.5
Loose straw or hay	18	1.6	2	0.2	20	1.8
Grass, heather, bracken	4	0.4	80	7.1	84	7.5
Trees, hedges, undergrowth, brushwood, bushes (including gorse), twigs, touchwood	-	-	34	3.0	34	3.0
Other agricultural materials	-	-	-	-	-	-
Total	30	2.7	132	11.7	162	14.4
<u>Chemicals - gases</u>						
Acetylene	4	0.4	-	-	4	0.4
Coal gas	8	0.7	2	0.2	10	0.9
Other gases	4	0.4	-	-	4	0.4
Total	16	1.4	2	0.2	18	1.6
<u>Chemicals - oils</u>						
Animal and vegetable oils	-	-	-	-	-	-
Mineral oil						
Paraffin	6	0.5	-	-	6	0.5
Petrol in vehicles	8	0.7	24	2.1	32	2.8
Petrol not in vehicles	4	0.4	6	0.5	10	0.9
Other mineral oils	-	-	-	-	-	-
Oil, waste and undefined	8	0.7	6	0.5	14	1.2
Total	26	2.3	36	3.2	62	5.5
<u>Chemicals - other</u>						
Celluloid (including films)	2	0.2	-	-	2	0.2
Paint, enamel, lacquer, varnish, stains, and French polish	4	0.4	-	-	4	0.4
Pitch, tar	4	0.4	10	0.9	14	1.2
Rubber, vulcanite, ebonite	2	0.2	2	0.2	4	0.4
Other chemicals	8	0.7	2	0.2	10	0.9
Total	20	1.8	14	1.2	34	3.0
<u>Paper, cardboard, wood (not part of a structure)</u>						
Paper, cardboard	40	3.6	10	0.9	50	4.4
Wood chippings, flour, sawdust, shavings, wool	4	0.4	4	0.4	8	0.7
Wood barrels, boxes, cases, firewood etc.	12	1.1	2	0.2	14	1.2
Timber	-	-	2	0.2	2	0.2
Total	56	5.0	18	1.6	74	6.6

## APPENDIX III (Contd.)

Table 5 (Contd.)

## MATERIAL FIRST IGNITED IN FIRES

Reports from Northern Ireland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Material first ignited	Fires in buildings		Fires other than those in buildings		Total	
	No.	Per cent	No.	Per cent	No.	Per cent
<u>Textiles</u>						
Canvas and canvas goods	-	-	-	-	-	-
Clothing on person	-	-	-	-	-	-
Clothing not on person	16	1.4	-	-	16	1.4
Cotton	-	-	-	-	-	-
Jute, hessian, sacking	8	0.7	-	-	8	0.7
Rags (including oily rags)	-	-	-	-	-	-
Tarpaulin, waterproof sheeting, oilskins	2	0.2	2	0.2	4	0.4
Other textiles	14	1.2	-	-	14	1.2
Total	40	3.6	2	0.2	42	3.7
<u>Furniture, furnishings, household goods</u>						
Bedding	14	1.2	2	0.2	16	1.4
Carpets, rugs	4	0.4	-	-	4	0.4
Curtains	6	0.5	-	-	6	0.5
Furniture	28	2.5	-	-	28	2.5
Linen articles (unspecified), laundry	-	-	-	-	-	-
Seating in vehicles	-	-	4	0.4	4	0.4
Other furnishings	2	0.2	-	-	2	0.2
Total	54	4.8	6	0.5	60	5.3
<u>Building material, structural</u>						
<u>woodwork</u>						
Building materials, other than wood	62	5.5	2	0.2	64	5.7
Structural woodwork						
External	8	0.7	8	0.7	158	14.1
Internal						
Door, window frame	8	0.7				
Floor, stairs	26	2.3				
Partitions, linings to walls	6	0.5				
Roof	34	3.0				
Timber in chimney, flue	24	2.1				
Timber under hearth	24	2.1				
Other fittings	20	1.8				
Total	212	18.9	10	0.9	222	19.8
<u>Miscellaneous</u>						
Coal, coke	2	0.2	6	0.5	8	0.7
Electrical insulation	44	3.9	54	4.8	98	8.7
Fat, (margarine, suet, butter, cooking fat, lard)	18	1.6	-	-	18	1.6
Food other than fat	-	-	-	-	-	-
Refuse, rubbish, debris	12	1.1	14	1.2	26	2.3
Soot	16	1.4	-	-	16	1.4
Other	34	3.0	12	1.1	46	4.1
<u>Unknown</u>	114	10.1	124	11.0	238	21.2
Total number of fires	694	61.7	430	38.2	1,124	100.0

## APPENDIX III (Contd.)

Table 6

## METHOD OF EXTINCTION OF FIRES

Reports from Northern Ireland, 1951

(Frequencies obtained by multiplying results of analysis of one-in-two sample of reports by two)

Row No.	Method of extinction	Fires in buildings						Fires other than those in buildings						Total No. of fires		Row No.
		Extinguished by Fire Brigade		Extinguished before arrival of Fire Brigade		Total		Extinguished by Fire Brigade		Extinguished before arrival of Fire Brigade		Total				
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	
1	Burned out	-	-	12	1.1	12	1.1	-	-	16	1.4	16	1.4	28	2.5	1
2	Removal	42	3.7	2	0.2	44	3.9	4	0.4	6	0.5	10	0.9	54	4.8	2
3	Automatic sprinkler system	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
4	Beating	-	-	4	0.4	4	0.4	90	8.0	8	0.7	98	8.7	102	9.1	4
5	Smothering	2	0.2	10	0.9	12	1.1	-	-	2	0.2	2	0.2	14	1.2	5
6	Sand, earth etc.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
7	Water from buckets	6	0.5	52	4.6	58	5.2	4	0.4	8	0.7	12	1.1	70	6.2	7
8	Water from stirrup or hand pumps	138	12.3	-	-	138	12.3	16	1.4	-	-	16	1.4	154	13.7	8
9	Chemicals and chemical extinguishers	14	1.2	6	0.5	20	1.8	32	2.8	12	1.1	44	3.9	64	5.7	9
10	Two or more methods 4-9	2	0.2	16	1.4	18	1.6	10	0.9	4	0.4	14	1.4	32	2.8	10
11	Water from garden hose, etc.	-	-	2	0.2	2	0.2	-	-	-	-	-	-	2	0.2	11
12	Hose reel jets (using water in tank only)	86	7.7	-	-	86	7.7	42	3.7	-	-	42	3.7	128	11.4	12
13	Hose reel jets (using more water than that in tank)	36	3.2	-	-	36	3.2	14	1.2	-	-	14	1.2	50	4.4	13
14	Jets from inside hose reel or inside hydrant	2	0.2	2	0.2	4	0.4	-	-	-	-	-	-	4	0.4	14
15	Hose reel jets and jets from inside hose reel	2	0.2	-	-	2	0.2	-	-	-	-	-	-	2	0.2	15
16	Jets from pumps and hydrants	236	21.0	8	0.7	244	21.7	152	13.5	2	0.2	154	13.7	398	35.4	16
17	Other and undefined methods	10	0.9	4	0.4	14	1.2	2	0.2	6	0.5	8	0.7	22	2.0	17
	Total	576	51.2	118	10.5	694	61.7	365	32.6	64	5.7	430	38.3	1124	100.0	18

## Notes on method of extinction

1. "Removal" includes occurrences where (a) burning material was removed from the building, (b) gas supply was turned off. If the burning material was tackled with methods 3-11 before removing it from the building, then such occurrences were classified under whichever of these methods applied.
2. Methods 11-15 and method 16 include those occurrences in which methods 3-10 and 3-15 respectively may also have been used.
3. "Fires extinguished by Fire Brigade" include those fires which were tackled but not extinguished before the arrival of the Fire Brigade.

# APPENDIX III (Contd.)

Table 7

## BEHAVIOUR OF SPRINKLER SYSTEMS AT FIRES

Reports from Northern Ireland, 1951

In the one-in-two sample of reports, there were two incidents where sprinklers were reported as being installed; in one the sprinklers failed to operate due to the fire failing to reach the heads; in the other, 12 heads operated, but did not control the fire, due to the water not reaching the fire, which was under a pile of linen goods.

Table 8

## ATTENDANCE OF SPECIAL APPLIANCES AT FIRES

Reports from Northern Ireland, 1951

(Frequencies obtained from results of analysis of all reports)

Attendance	No. of occasions	Percentage of total no. of fires
Canteen vans	1	0.1
Emergency tenders	153	13.6
Escape carrying units	103	9.2
Fire boats	1	0.1
Pump escapes	380	33.8
Turntable ladders (mechanical)	30	2.7
Utility vans or trucks	339	30.2
Water tenders	5	0.4



APPENDIX III (Contd.)

Table 9

PERSONS RESCUED OR ESCAPED BY EMERGENCY MEANS FROM FIRES

Reports from Northern Ireland, 1951

(Frequencies obtained from results of analysis of all reports)

Appliance or method used	No. of persons
Rescue with Fire Brigade assistance from	
Buildings	
Ladder, extension	1
Without apparatus	2
Total	3
Rescue without Fire Brigade assistance from	
Buildings	
Carried or assisted out	2
Other and undefined methods	7
Total	9
Escape by emergency means from	
Buildings	
Jumping from upstairs window, roof	2
Total	2
Total persons rescued or escaped	14

APPENDIX III (Contd.)

Table 10

NATURE OF INJURIES OF CASUALTIES IN FIRES

Reports from Northern Ireland, 1951

(Frequencies obtained from results of analysis of all reports)

\*Casualties who suffered shock in addition to another injury have been classified according to the nature of the other injury.

Nature of injury	Fire Brigades	Other casualties	Total
Fatal casualties			
Burns and scalds	-	3	3
Total	-	3	3
Non-fatal casualties			
Burns and scalds	2	26	28
Bruises, cuts, abrasions	10	10	20
Dislocations, sprains, fractures	2	-	2
Overcome by gas or smoke	-	3	3
* Shock	-	4	4
Other and undefined injuries	7	3	10
Total	21	46	67
Total casualties	21	49	70

## APPENDIX IV

### DISCUSSION OF SAMPLE ANALYSIS FOR PREPARATION OF TABLES 2, 3, 4A, 4B, 5, 6 AND 7

#### Method of selecting sample

The procedure adopted for selecting the one-in-two sample of reports for the preparation of Tables 2, 3, 4A, 4B, 5, 6 and 7 was first to add to each of the figures, 1, 3, 5, 7, 9, 11 etc. one of the figures 0, 1 taken at random (tables of random numbers were used). A series of approximately 8,000 numbers, the first ten of which were 1, 4, 6, 8, 10, 12, 13, 15, 18, 20 was obtained. These numbers were used for extracting from the reports of each Fire Brigade separately the sample to be coded.

#### Accuracy of estimated percentages of different types of fires

Of the total number of reports in 1951, a sample, N, has been analysed: of this sample a percentage, p, has been observed to fall into a certain group e.g. fires caused by sparked from locomotives. This percentage is an estimate of the corresponding percentage which would have been obtained had the total number of reports been analysed. The accuracy of the estimate, p, can be defined by means of its 'standard error', s, which is given by the equation

$$s = \sqrt{\frac{p(1-p)(1-f)}{N}}$$

where f = sampling fraction which is  $\frac{1}{2}$  in the present instance.

This formula can be used for estimating s even if N does not denote the total number of reports in the sample, but the number in a sub-category of the sample e.g. fires in buildings and the percentage, p, is based on this number. The sampling fraction is then not exactly known to be, but is assumed to be  $\frac{1}{2}$ .

The figures in the tables have been obtained by multiplying the results of analysis of the sample by two, and therefore  $N = N'/2$  where N' is the estimated total of a particular category of fire on which p is based.

It is unlikely (only 19 to 1 chance) that the actual percentage will differ from the sample estimate by more than  $\pm 2s = E$

$$E = \pm 2 \sqrt{\frac{p(100-p)}{N'}}$$

The following examples show the method of calculating the value of E.

#### Example 1.

10.7% of the 64,200 fires in England and Wales were attributed to children playing with matches (Appendix I, table 3).

$$E = \pm 2 \sqrt{\frac{10.7 \times 89.3}{64,200}} = \pm 0.2\%$$

There is therefore a 19 to 1 chance that the true percentage lies between 10.5% and 10.9%

#### Example 2

0.4% of the 7,172 fires in Scotland were extinguished with sand, earth, etc. (Appendix II, Table 6).

$$E = \pm 2 \sqrt{\frac{0.4 \times 99.6}{7,172}} = 0.1\%$$

The sampling error in this instance is large and there is a 19 to 1 chance that the actual percentage lies between 0.3% and 0.5%

### Accuracy of estimates of yearly totals of fires

An estimate of the returns of 1951 which would have been obtained had all reports been analysed, has been made by multiplying the results of analysis of the sample by two. The 'standard error',  $s'$ , of this estimate is given by the equation

$$s' = \sqrt{\frac{n'(N'-n')(1-f)}{N'f}}$$

where  $n'$  = figure in table.

$N'$  = estimated total of a particular category of fire  
e.g. incidents in England and Wales.

It is unlikely (a 19 to 1 chance) that the actual yearly total for a particular group of fires will differ from the estimated figure,  $n'$ , by more than  $\pm 2s' = E'$

$$E' = \pm 2 \sqrt{\frac{n'(N'-n')}{N'}}$$

The two examples considered above show the method of calculating the value of  $E'$ .

#### Example 1. (Large value of $n'$ )

6,874 fires in England and Wales were attributed to children playing with matches (Appendix I, Table 3). The total number of fires in the country was 64,200.

$$E' = \pm 2 \sqrt{\frac{6,874(64,200 - 6,874)}{64,200}} = \pm 157$$

There is therefore a 19 to 1 chance that the true yearly total lies between 6,717 and 7,031.

#### Example 2. (Small value of $n'$ )

30 of the 7,172 fires in Scotland were extinguished with sand, earth etc. (Appendix II, Table 6).

$$E' = \pm 2 \sqrt{\frac{30(7,172 - 30)}{7,172}} = \pm 11$$

The proportionate sampling error here is large: there is a 19 to 1 chance that the actual yearly total lies between 19 and 41.