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## FIRE RESEARCH NOTE

NO. 515

CAUSES OF FIRE IN PREMISES OCCUPIED BY THE DISTRIBUTIVE  
TRADES IN THE UNITED KINGDOM 1950-1961

by

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January, 1963

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CAUSES OF FIRE IN PREMISES OCCUPIED BY THE DISTRIBUTIVE TRADES  
IN THE UNITED KINGDOM 1950-1961

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SUMMARY

This note reviews the causes of fires in premises occupied by the distributive trades over the last twelve years. There was an increase in the numbers of fires in these premises but rather smaller than that for all buildings generally.

The most striking increases occurred in fires caused by oil lamps and stoves and by children with matches. Two groups of fires in which the element of carelessness is considerable, viz, those due to smoking materials and the burning of rubbish doubled in frequency in the 12 year period. Smoking materials give rise to more fires in these occupancies than any other single cause.

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Introduction

This note is intended to form part of a series of studies of the supposed causes of fire in various occupancies; it covers those occupancies scheduled under Order XX of the Standard Industrial Classification which has been adopted by the Joint Fire Research Organization for the classification of fire statistics from 1960 onwards. To allow for changes in definition some of the figures quoted for years prior to 1960 have been reclassified since the publication of the Annual Tables of Fire Statistics<sup>(1)(2)</sup> in which they originally appeared.

Frequencies of fires attributed to various causes

Table 1 gives the numbers of fires due to various groups of causes. Any single cause with an annual frequency greater than 200 or any in which striking changes occurred during the review period are shown singly. The remainder have been grouped together either according to type of fuel used or as miscellaneous causes.

During the period under review there was a change in the major causes of fires in these premises. In 1950 the largest single item was electric refrigerators with smoking materials next on the list of known causes. In 1961 smoking materials constituted the longest single group, with electrical appliances other than refrigerators next. Unknown causes were also high on the list in 1961 and it is suspected that among these there are many fires which could be attributed to smoking materials.<sup>(3)</sup>

### Changes in total frequencies

The total numbers of fires in premises occupied by the distributive trades remained fairly constant during the period up to 1958; there was then a gradual rise to the 1961 figure which was 1.4 times that of 1950.

In contrast to this the frequencies of fires in all buildings rose from 43744 in 1950 to 69588 in 1961, thus increasing by a factor of 1.6. During this period there were two distinct increases (in 1955 and 1959); the frequencies for 1950-4, 1955-8 remained fairly constant and there was an increase from 1959 to 1961.

### Changes in frequencies of different causes

To assess the changes which have occurred the frequency for each cause has been expressed as an index of the corresponding frequency in 1950 which has been taken as 100. These indices are set out in Table II and are graphically represented by Figs 1 to 5.

The figures show increases in the numbers of fires attributed to the following causes during the period 1950-1961:

- (i) Oil lamps and stoves by a factor of 2.6
- (ii) Children with matches by a factor of 2.5
- (iii) Electrical appliances other than refrigerators  
by a factor of 2.1
- (iv) Rubbish burning by a factor of 2.1
- (v) Smoking materials by a factor of 2.0
- (vi) Unknown causes by a factor of 2.0

These were the most serious increases, but increases also occurred in fires attributed to electrical installation (although there was a decrease during the middle of the review period) and to a lesser extent miscellaneous causes.

It is possible that the increase in fires caused by oil-fuelled space heating appliances in recent years has resulted entirely, or almost entirely from an increasing use of this form of heating.

The most striking decreases in the numbers of fires are those attributed to "fire in grate" (by a factor of 0.3) and electric refrigerators (by a factor of 0.5). The former may have resulted from the use of other means of space heating and the latter from improvements in the manufacture of electric refrigerators. A rather smaller decrease occurred in the numbers of fires caused by town gas appliances.

Figs 2 and 3 show that the frequency of fires due to slow combustion stoves has remained fairly constant whilst that of oil appliances other than stoves or lamps has fluctuated sharply during the period.

### Conclusions

During the 12 years 1950-61 there was an increase in the annual frequency of fires in premises used by the distributive trades, although this was somewhat smaller than the overall increase in fires in buildings during the same period. A reduction in the numbers of fires due to some causes (the most notable being those due to "fire in grate" and those due to electric refrigerators) was more than offset by increases in fires attributed to some other causes.

The most striking increases were in fires caused by oil lamps and stoves (increased 2.6 times) and those caused by children with matches (increased 2.5 times). However, neither of these is among the six largest cause groups and there are indications that the upward trend in the oil stove fires may have been halted.

Fires attributed to electrical apparatus other than refrigerators are probably increasing with the growing use of such equipment. Adequate maintenance and care in use should eliminate some of these fires, but approximately half of them start in fluorescent lighting equipment and it may be that there are design faults (eg. under-design of chokes) which could be overcome.

Two groups of fires in which the element of carelessness is considerable - those due to smoking materials and those due to rubbish burning - doubled in frequency during the period examined. For several years smoking materials have given rise to more fires than any other cause in premises occupied by distributive trades. Only a greater

awareness of the dangers can do much to prevent these fires, and the discouragement of smoking and/or the generous provision of suitable ash trays are obvious lines of action open to managements. Fires due to the burning of rubbish could be completely eliminated if all shops and stores adopted the use of properly designed incinerators and avoided unnecessary accumulation of large quantities of packaging materials and other refuse.

#### References

- (1) Statistical Analysis of Reports of Fires attended by Fire Brigades in the United Kingdom (Annual 1947-1959). Joint Fire Research Organization.
- (2) United Kingdom Fire Statistics (Annual from 1960) London, H.M.S.O.
- (3) Hogg, J. M. . Cigarette smoking and fires, Department of Scientific and Industrial Research and Fire Offices' Committee Joint Fire Research Organization. F.R. Note No. 514.

Table I

Supposed causes of fire in buildings in distributive trades in the United Kingdom 1950 - 1961

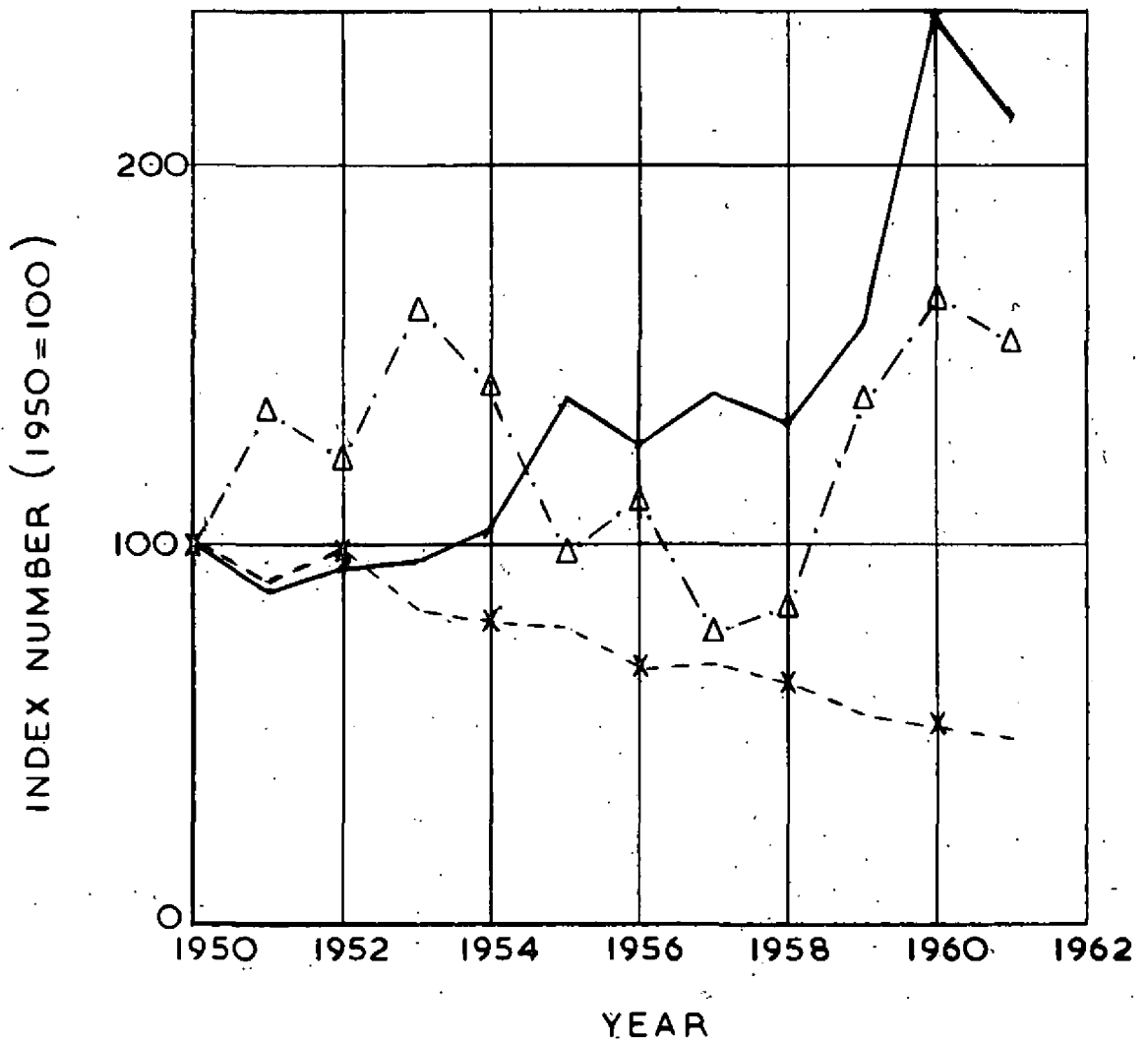
Supposed cause of fire	Numbers of fires											
	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
Electrical appliances other than refrigerators	342	302	320	330	354	476	396	479	452	540	816	724
Electric refrigerators	734	650	720	605	580	576	492	505	468	404	372	360
Electrical installation	196	264	240	315	278	192	220	152	164	272	324	300
Solid fuel appliances												
Fire in grate	252	164	184	135	142	120	72	87	92	60	80	84
Slow combustion stove	110	130	148	80	116	160	120	114	124	120	120	116
Gas (town) appliances	238	176	220	185	222	248	216	187	188	208	188	198
Matches, children with	108	134	124	130	134	132	148	220	224	248	236	272
Oil lamps or stoves	48	48	60	35	62	48	120	99	140	148	120	124
Oil, other appliances	74	98	68	120	52	56	88	46	56	48	88	58
Rubbish burning	114	100	56	150	102	136	148	132	148	212	180	238
Smoking materials	464	472	432	455	454	500	488	619	600	824	948	908
Other causes not specified above	532	584	552	515	550	636	588	558	520	676	704	734
Unknown causes	360	324	468	375	404	532	648	586	556	584	536	734
<b>TOTAL</b>	<b>3 572</b>	<b>3 446</b>	<b>3 592</b>	<b>3 430</b>	<b>3 450</b>	<b>3 812</b>	<b>3 744</b>	<b>3 784</b>	<b>3 732</b>	<b>4 344</b>	<b>4 712</b>	<b>4 850</b>

Table II

Numbers of fires related to the corresponding numbers in 1950 (taken as 100)

Electrical appliances other than refrigerators	100	88	94	96	104	139	116	140	132	158	239	212
Electric refrigerators	100	89	98	82	79	78	67	69	64	55	51	49
Electrical installation	100	135	122	161	141	98	112	77	83	139	165	153
Solid fuel appliances: fire in grate	100	65	73	54	56	48	29	36	36	24	32	33
slow combustion stove	100	118	135	72	105	145	109	104	113	109	109	105
Gas town appliances	100	74	92	77	93	104	90	79	78	87	78	83
Matches, children with	100	124	115	120	124	122	137	203	207	230	219	251
Oil lamps and stoves	100	100	124	73	129	100	250	206	292	308	250	258
Oil, other appliances	100	132	92	162	70	76	119	62	76	65	119	78
Rubbish burning	100	88	49	131	89	119	130	116	130	186	158	208
Smoking materials	100	101	93	98	98	108	105	133	129	178	204	196
Other causes not specified above	100	110	104	97	103	120	111	105	98	127	132	138
Unknown causes	100	90	130	104	112	148	180	163	154	162	149	204
<b>TOTAL commercial premises</b>	<b>100</b>	<b>96</b>	<b>100</b>	<b>96</b>	<b>97</b>	<b>107</b>	<b>104</b>	<b>106</b>	<b>104</b>	<b>122</b>	<b>132</b>	<b>136</b>





- Electrical appliances other than refrigerators
- △-△- Electrical installations
- \*-\*- Electrical refrigerators

FIG. I. INDEX NUMBERS OF FIRES CAUSED BY ELECTRICITY 1950 - 1961

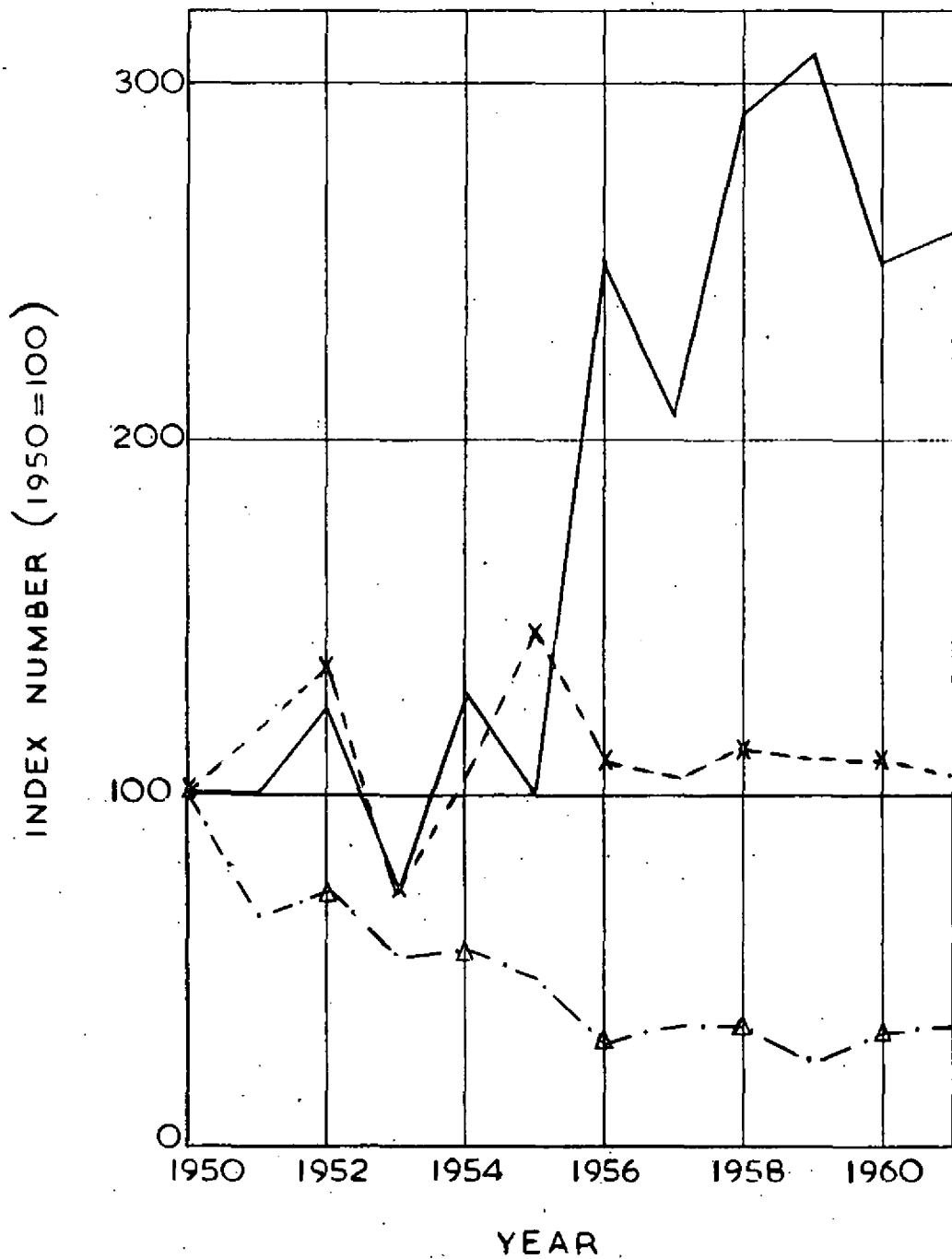
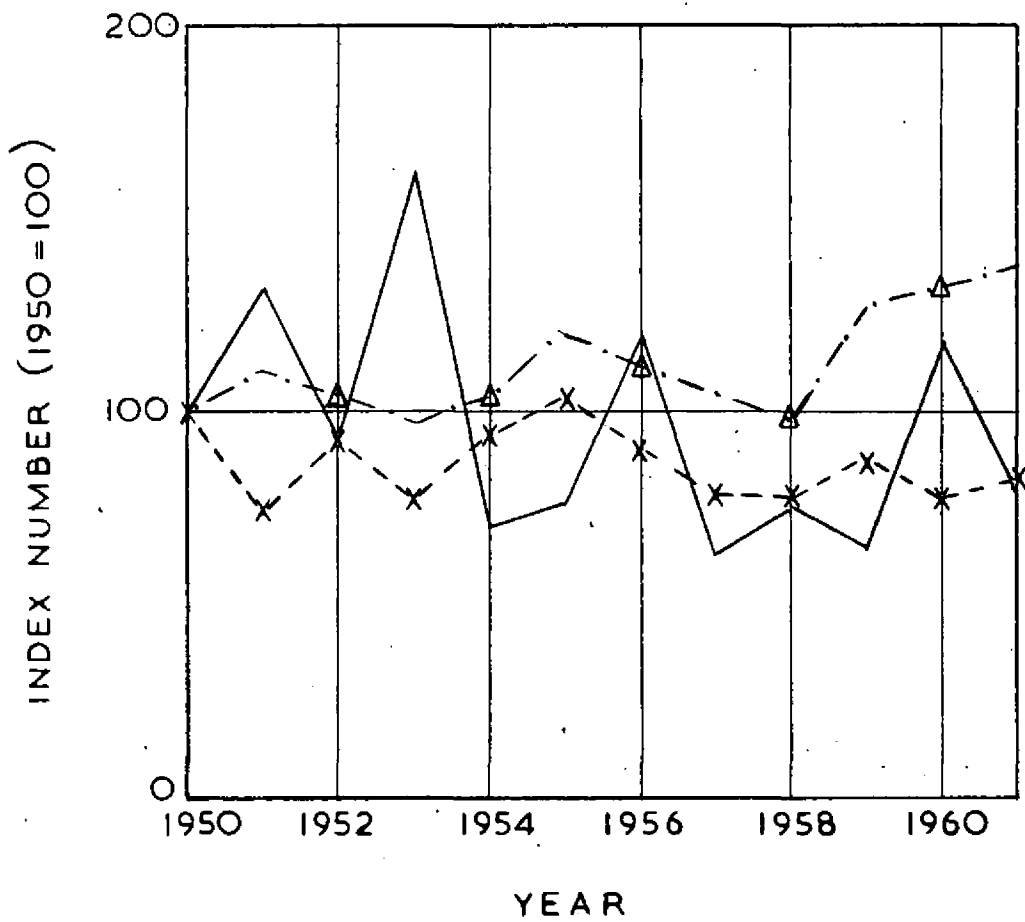


FIG.2. INDEX OF NUMBERS OF FIRES CAUSED BY HEATING APPLIANCES 1950 - 1961.



- △· —△· Miscellaneous causes
- x· —x· Gas (town) appliances
- Oil appliances not stoves or lamps

FIG. 3. INDEX OF NUMBERS OF FIRES ATTRIBUTED TO OIL AND GAS APPARATUS AND MISCELLANEOUS CAUSES 1950-1961

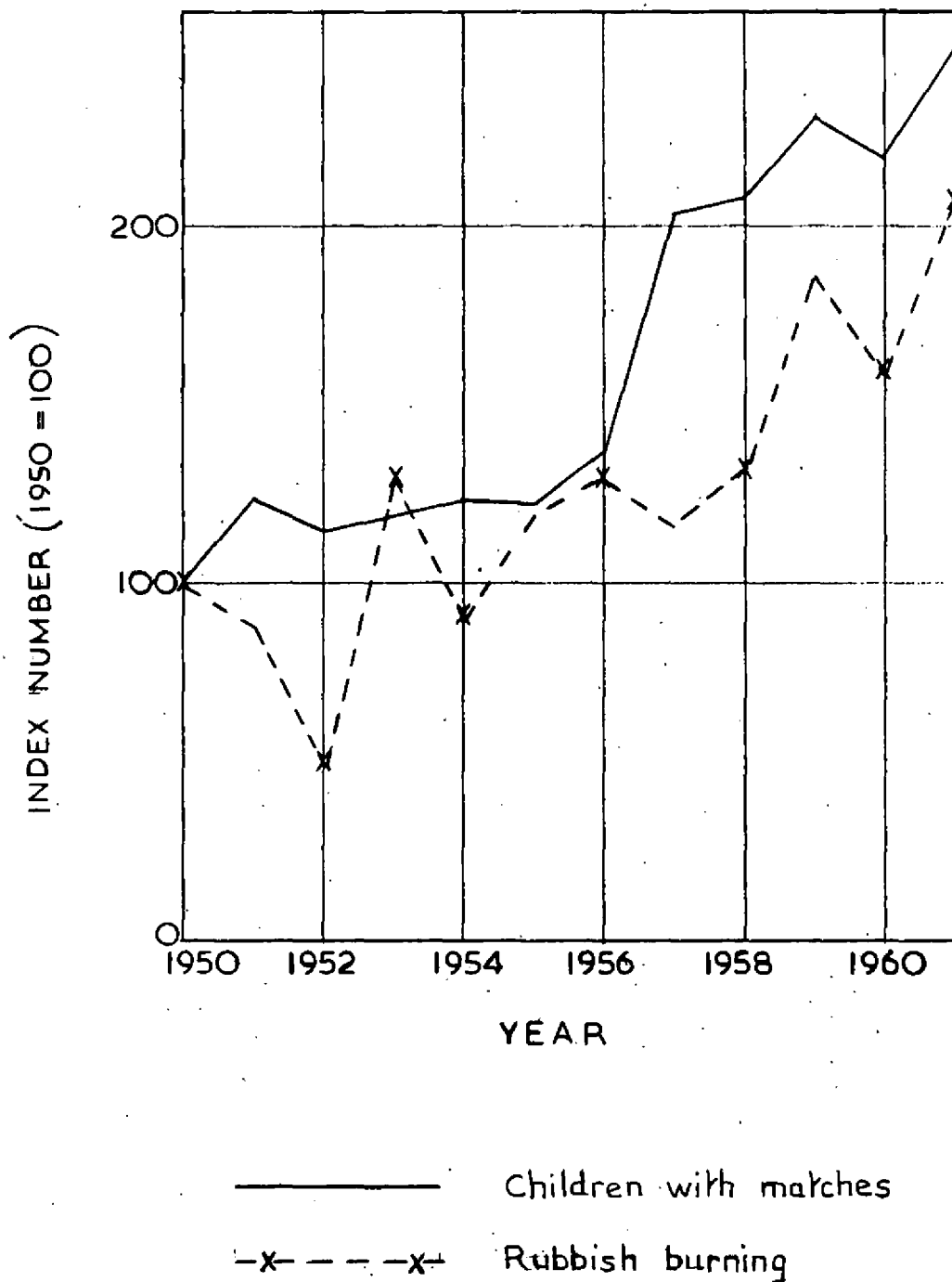
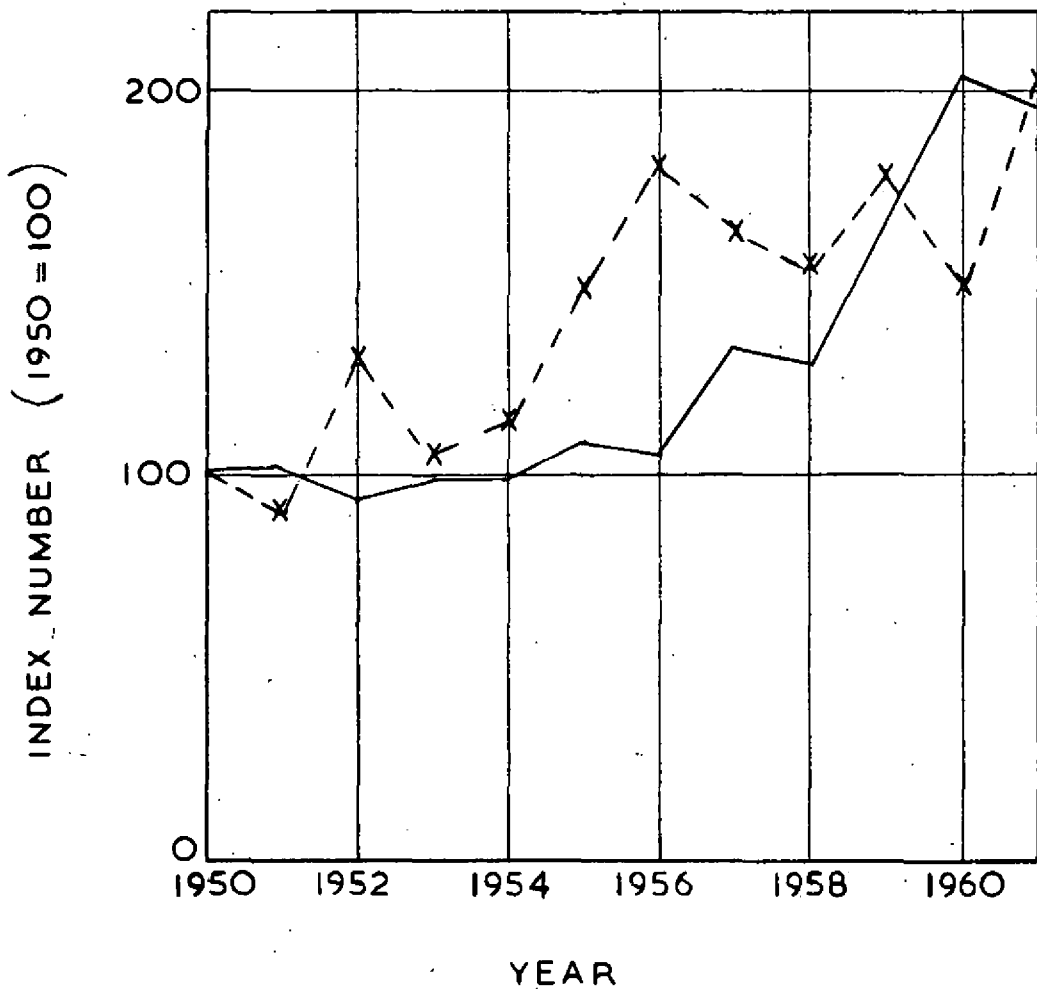


FIG. 4. INDEX OF NUMBERS OF FIRES CAUSED BY RUBBISH BURNING AND CHILDREN WITH MATCHES 1950 - 1961



— Smoking materials  
 -x- -x- Unknown causes

FIG. 5. INDEX OF NUMBERS OF FIRES ATTRIBUTED TO SMOKING MATERIALS AND UNKNOWN CAUSES 1950 - 1961