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A REVIEW OF CAUSES OF FIRES IN DWELLINGS IN THE UNITED KINGDOM 1950 - 1961

by

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November, 1963.

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Summary

This note reviews the causes of fires in dwellings during the twelve years 1950 - 1961. The frequency of all fires in dwellings increased by a factor of 1.4 in the period. Increases occurred in fires due to almost all causes, the most notable being in those due to oil lamps and stoves and those due to electric cooking appliances. Decreases were noted in the fires caused by open fireplaces and gas appliances other than cookers.

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Introduction

This paper continues a series of reviews of causes of fires in various occupancies or groups of occupancies in the United Kingdom and considers fires in residential houses and flats. No attempt is made to distinguish between houses of pre-war or post war construction. The data have been taken from the annual statistical tables(1)(2), produced annually by the Joint Fire Research Organization. During 1956 a detailed survey was made of fires in dwellings and fuller details of the causes of fires in this type of occupancy have already been given(3).

Frequencies of fires attributed to various causes

Table 1 sets out the numbers of fires due to various groups of causes. The groups have been arranged according to the fuel used in the appliance or appliances which caused the fires. Individual items have been combined to form groups in which the frequency is generally of the order of 500 fires. Where single items have high frequencies these have been shown separately; they include such items as oil lamps and stoves and smoking materials.

It should be noted that figures for 1960 presented in this report differ from that previously published(2) because in that year the totals for all occupancies included fires in derelict or unoccupied premises and premises under construction or demolition. Adjustments have therefore been made so that the figures for all years are comparable.

The numbers of fires in dwellings each year during 1950 - 1961 are shown graphically in Fig.1 together with the numbers of fires caused by certain groups of appliances.

There was an increase in the numbers of fires in residential property during the twelve years 1950 - 1961 from approximately 20,000 to 30,000 fires each year. Throughout the period the largest single cause was "fire in grate" despite the reduction in frequency from approximately 8,400 to 4,000 during the twelve years. In 1950 the second largest group was the miscellaneous group of fires due to "other causes not specified" followed by "chimneys and flues" and then "smoking materials". In 1961 "chimney and flue" fires had taken second place followed by electric cooking appliances and then oil lamps and stoves. Because separate records were not kept in the earlier years oil lamps and stoves have been grouped together, but the numbers of fires due to oil lamps are not large and the group consists mainly of oil stoves. It should be noted that the chimney and flue fires recorded are those that spread beyond the chimney or flue.

Changes in total frequencies.

The total numbers of fires in residential property remained fairly constant from 1950 to 1954, there was a slight but gradual increase in numbers from 1954 to 1958 followed by a sharper rise from 1959 to 1961. The total number of fires in these occupancies rose to a 1961 figure 1.4 times that of 1950. A similar pattern was followed by the total number of fires in all buildings, which rose from 43,744 in 1950 to 69,588 in 1961 thus increasing by a factor of 1.6.

Changes in frequencies of different causes.

To assess the changes the frequency for each cause has been expressed as a multiple of the corresponding frequency in 1950. These indices are set out in Table II and are represented graphically by Figs 2-7.

The figures show increases in the numbers of fires attributed to almost all causes during the period 1950 - 1961 of which the following are the most notable:

(i) Oil lamps and stoves by a factor of 5.7
(ii) Electric cooking appliances by a factor of 4.1
(iii) Chimneys and flues by a factor of 3.0
(iv) Children with matches by a factor of 2.8
(v) Smoking materials by a factor of 2.5
(vi) Electrical appliances not further specified by a factor of 2.3
(vii) Gas cooking appliances by a factor of 2.3
(viii) Electric radio and television by a factor of 2.1

It is possible that the increase in fires caused by oil fuelled space heating appliances has resulted entirely or almost entirely from an increasing use of this form of heating. Electricity is being used for cooking purposes to an increasing extent and this will have contributed to the numbers of fires caused by electric cooking appliances. Uncertainty about the changes in the numbers at risk, however, precludes accurate assessment of the effect of this factor on the fire incidence.

The yearly increase both in fires due to oil lamps and stoves and in those due to electric cooking appliances became most pronounced from 1954 to 1961; this is also characteristic of other causes in which a rising trend was exhibited during the period under review. Although there were approximately two and a half times as many fires caused by smoking materials in 1961 compared with 1950, it should be noted that smoking materials were responsible for 1 in 11.4 fires in dwellings compared with 1 in 8.7 fires in all buildings during 1958 - 1961.

The most striking decreases in numbers of fires are in those attributed to "fire in grate" (by a factor of 0.5) and gas appliances other than cookers (by a factor of 0.7). The first named may have resulted from a change to other forms of space heating, but it is interesting to note that despite a possible decrease in the use of "fires in grates" for space heating, the numbers of fires attributed to chimneys and flues has, since 1954, remained fairly constant at a figure approximately three times that obtaining in 1950. From 1954 to 1956 fires attributed to miscellaneous causes not directly specified (Fig.7) decreased to one half the figure of 1950 but there was then a gradual return to the original figure.

Figs 3 and 4 show that the frequencies of fires due to slow combustion stoves and to oil burning appliances other than lamps and stoves remained fairly constant between 1950 and 1961.

Conclusions.

During the period 1950 - 1961 there was an increase in the annual frequency of fires in dwellings, a trend which followed fairly closely that of the overall increase in fires in all buildings during the same period. A reduction in the numbers of fires due "fire in grate" was more than offset by increases in fires attributed to other causes.

The most notable increases were in fires caused by oil lamps and stoves (increased 5.7 times) and electric cooking appliances (increased 4.1 times) both of which were among the six largest cause groups in 1961 but not in 1950. There is some evidence that the upward trend in the oil stove fires had been halted by the end of the period, but it is not yet known whether this effect was nullified by the severe weather of the winter of 1962 - 63. Fires associated with electric cookers have been studied in some detail and reported elsewhere(4).

Fires attributed to all kinds of electrical apparatus are probably increasing with the extending use of such apparatus. Although such fires are frequently not due to electrical faults, but to some degree of misuse, it is possible that some allowance for potential misuse could be made in their design, thus reducing the chance of fire.

The frequency of fires caused by radio and television sets together doubled during 1950 - 1961 despite the fact that the numbers of licences for TV sets rose from approximately one half million to nearly 12 million during the same period; it therefore appears that the risk of fire with this type of equipment has reduced.

The element of carelessness enters into many of the fires in dwellings, for example, it is often associated with those caused by oil heaters when attempting to refuel them whilst still alight, and with the careless disposal of smoking materials.

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: Her Majesty's Stationery Office.

3. Weston, M. A. and Fry, J. F. The causes of fires in dwellings: Department of Scientific and Industrial Research and Fire Offices' Committee, Joint Fire Research Organization. F.R. Note No.499.

4. Hogg, J. M. Fires associated with electric cooking appliances: Fire Research Technical Paper No.9: London 1963: Her Majesty's Stationery Office.

TABLE I

Supposed causes of Fires in Dwellings 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
Solid fuel: fire in grate	8394	6706	7688	6150	7006	6744	6412	4907	5012	4580	4160	4022
slow combustion stove	250	236	320	220	248	248	252	245	248	248	308	230
chimneys, flues	1232	1602	2908	3305	3586	3440	3464	2987	3028	3224	3816	3660
Electric cooking appliances	672	706	756	855	860	864	1092	1259	1388	1736	2372	2750
Electric fire	706	796	732	675	824	956	912	750	940	856	912	1030
Electric radio and television	408	494	544	520	544	480	544	625	620	668	764	840
Electric wire & cable (installation)	926	1126	1204	1265	1180	1136	1092	923	1192	1452	1440	1552
Electrical appliances not otherwise specified	906	866	948	915	1026	1212	1252	1339	1312	1432	1656	2070
Gas cooking appliances (not rings)	804	802	944	980	1018	1164	1336	1361	1396	1464	1548	1818
Gas other appliances	584	642	496	550	606	536	500	353	400	388	364	394
Matches children with	358	382	328	335	416	468	508	617	568	772	712	992
Naked lights	818	814	912	870	1112	1172	1028	983	1004	1064	1036	1132
Oil lamps and stoves	420	444	408	345	510	604	1152	1301	2176	2356	2244	2402
Oil other appliances	634	602	532	615	656	724	776	588	544	828	516	746
Smoking materials	1138	1250	1252	1230	1314	1656	1752	1811	2012	2348	2336	2812
Other causes not specified above	1896	1680	1448	1325	966	1056	1072	1404	1388	1776	2036	1836
Unknown causes	868	886	1068	1085	936	1060	1324	1314	1104	1448	1412	1516
Total fires in dwellings	21014	20034	22488	21240	22808	23520	24468	22767	24332	26640	27632	29802
Total fires in all buildings	43744	42394	46696	43875	45970	50492	51464	50694	51992	61328	62460	69588

TABLE II

Numbers of fires related to the numbers occurring in 1950

Supposed cause of fire	Numbers of fires											
	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
Solid fuel: fire in grate	1.00	0.80	0.92	0.73	0.83	0.80	0.76	0.58	0.60	0.55	0.50	0.48
slow combustion stove	1.00	0.94	1.28	0.88	0.99	0.99	1.01	0.98	0.99	0.99	1.23	0.92
chimneys, flues	1.00	1.30	2.36	2.68	2.91	2.79	2.81	2.42	2.46	2.62	3.10	2.97
Electric cooking appliances	1.00	1.05	1.13	1.27	1.28	1.29	1.63	1.87	2.07	2.58	3.53	4.09
Electric fire	1.00	1.13	1.04	0.96	1.17	1.35	1.29	1.06	1.33	1.21	1.29	1.46
Electric radio and television	1.00	1.21	1.33	1.27	1.33	1.18	1.33	1.53	1.52	1.64	1.87	2.06
Electric wire and cable installation	1.00	1.22	1.30	1.37	1.27	1.23	1.18	1.00	1.29	1.57	1.56	1.68
Electric appliances not otherwise specified	1.00	0.96	1.05	1.01	1.13	1.34	1.38	1.48	1.45	1.58	1.83	2.28
Gas cooking appliances not ring	1.00	1.00	1.17	1.22	1.27	1.45	1.66	1.69	1.74	1.82	1.93	2.26
Gas other appliances	1.00	1.10	0.84	0.94	1.04	0.92	0.86	0.60	0.68	0.67	0.62	0.67
Matches children with	1.00	1.07	0.92	0.94	1.16	1.30	1.42	1.72	1.59	2.16	1.99	2.77
Naked lights	1.00	1.00	1.11	1.06	1.36	1.43	1.26	1.20	1.23	1.30	1.27	1.38
Oil lamps and stoves	1.00	1.06	0.97	0.82	1.21	1.44	2.74	3.10	5.18	5.61	5.34	5.72
Oil other appliances	1.00	0.95	0.84	0.97	1.03	1.14	1.22	0.93	0.86	1.31	0.81	1.18
Smoking materials	1.00	1.10	1.10	1.08	1.15	1.46	1.54	1.59	1.77	2.06	2.05	2.47
Other causes not specified above	1.00	0.89	0.76	0.70	0.51	0.55	0.57	0.74	0.73	0.94	1.07	0.97
Unknown causes	1.00	1.02	1.23	1.25	1.08	1.22	1.53	1.51	1.27	1.67	1.63	1.75
Total fires in dwellings	1.00	0.95	1.07	1.01	1.09	1.12	1.16	1.08	1.16	1.27	1.31	1.42
Total fires in all buildings	1.00	0.99	1.01	1.00	1.05	1.15	1.18	1.16	1.19	1.40	1.43	1.59

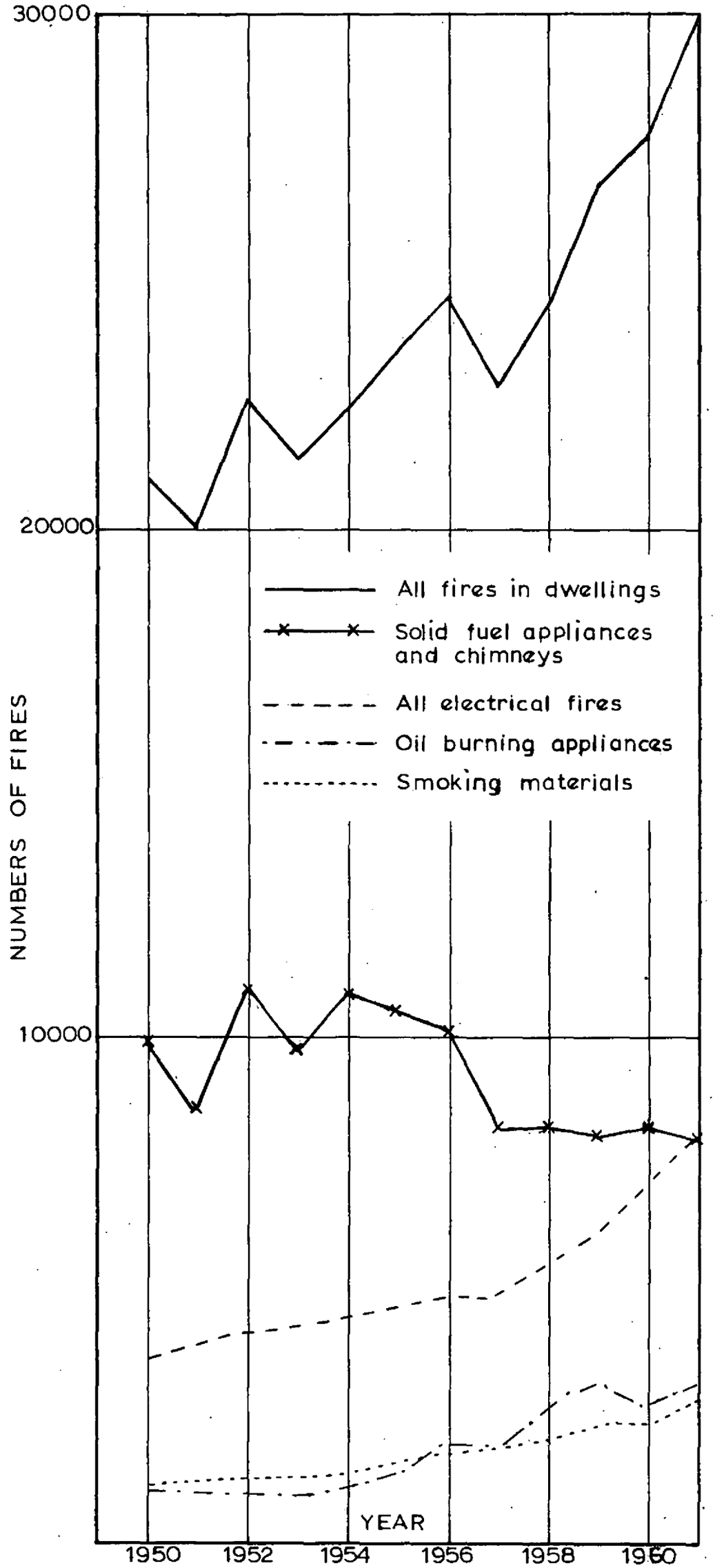

FIG.1. NUMBERS OF FIRES IN DWELLINGS

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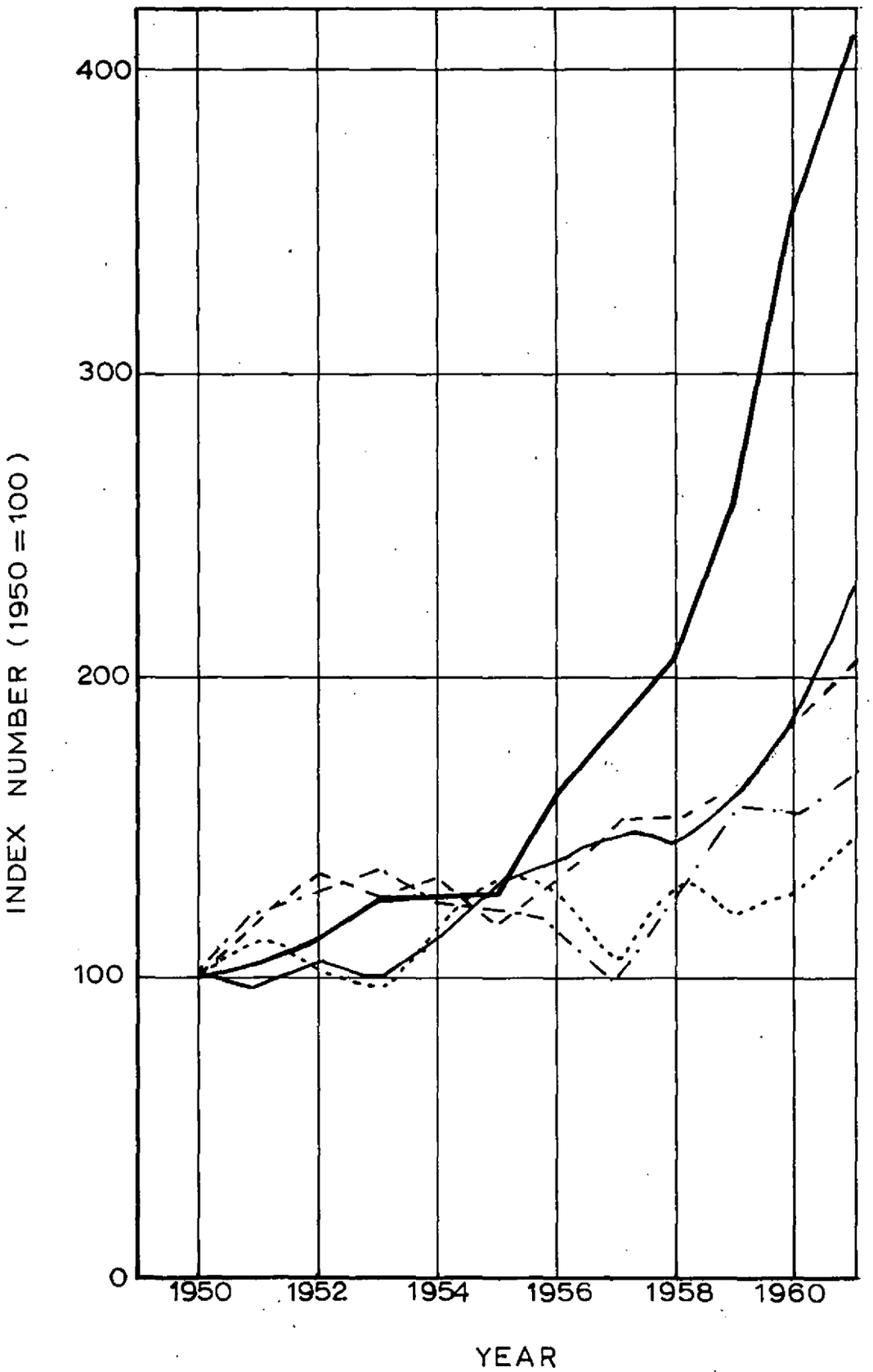

Electric cookers
Radios and television
Electrical installation
Electric fires
All other electrical appliances

FIG. 2, INDEX NUMBERS OF FIRES CAUSED BY ELECTRICITY 1950 – 1961

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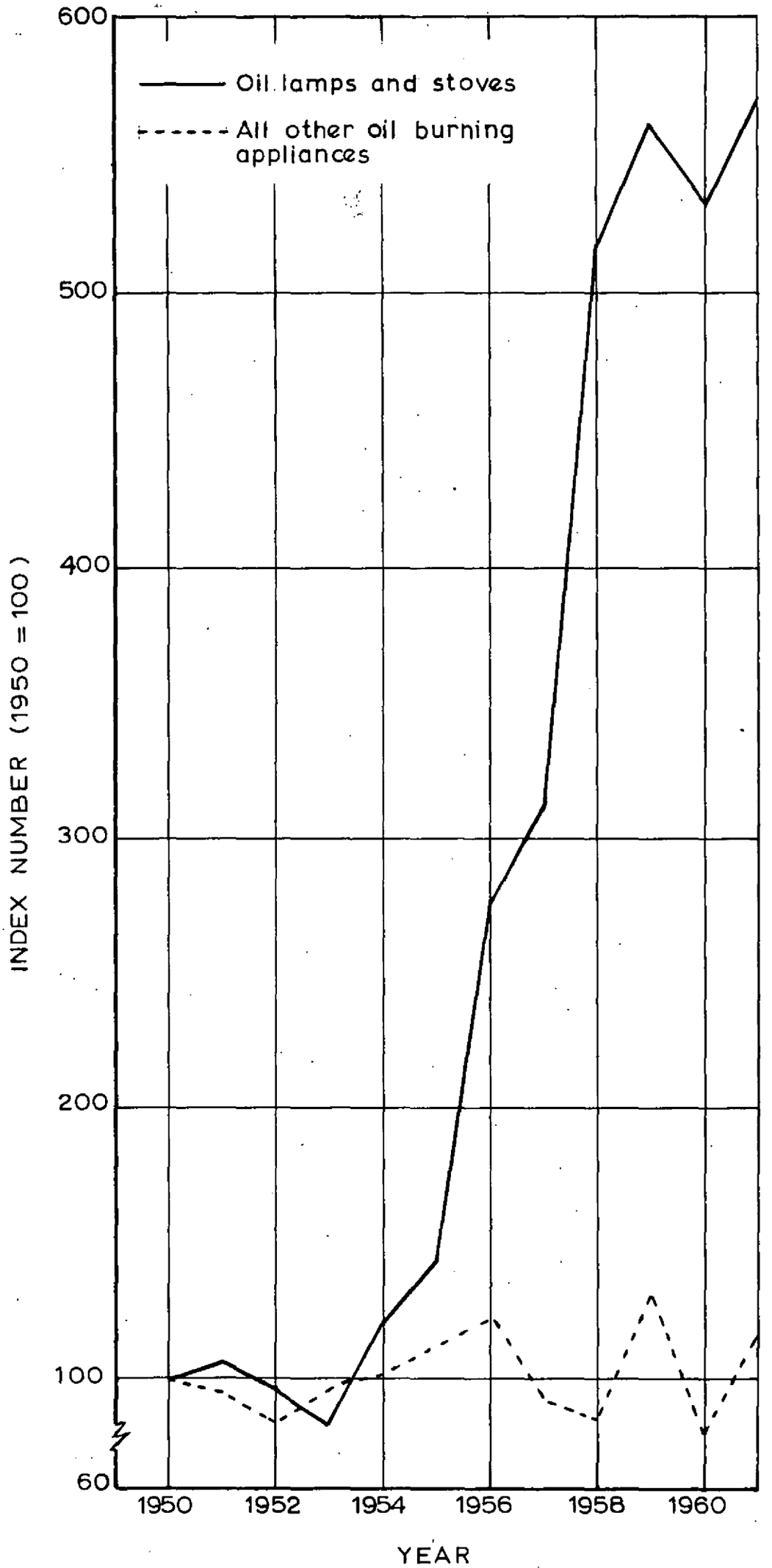

FIG.3. INDEX OF NUMBERS OF FIRES ATTRIBUTED TO APPLIANCES BURNING OIL. 1950–1961

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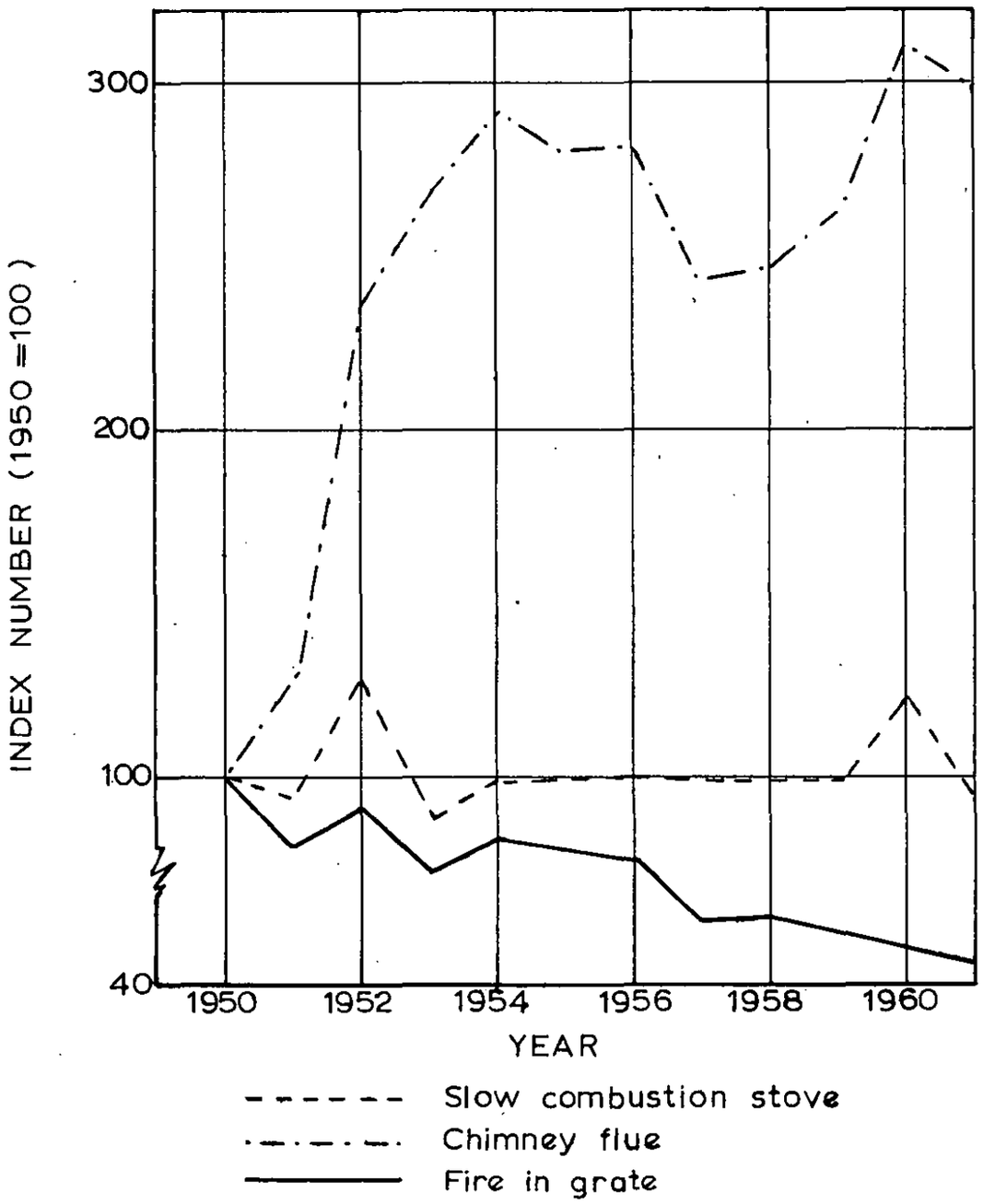

FIG.4. INDEX OF NUMBERS OF FIRES ATTRIBUTED TO APPLIANCES BURNING SOLID FUEL. 1950-1961

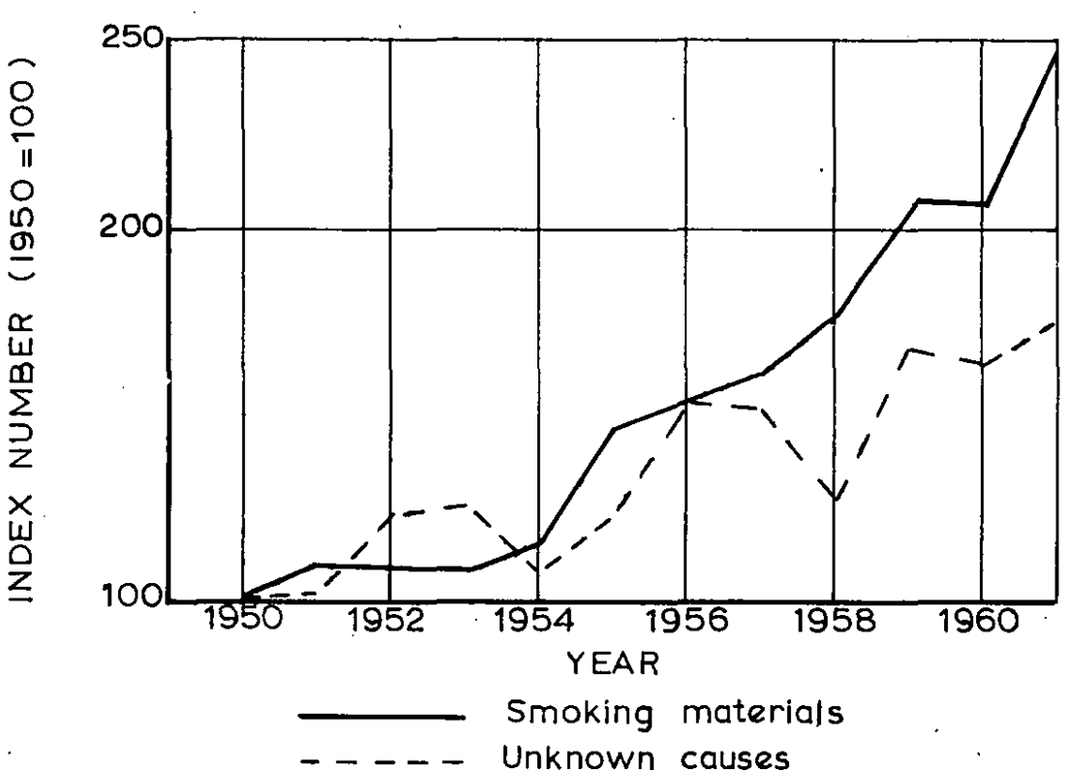

FIG.5. INDEX OF NUMBERS OF FIRES ATTRIBUTED TO SMOKING MATERIALS AND UNKNOWN CAUSES 1950-61

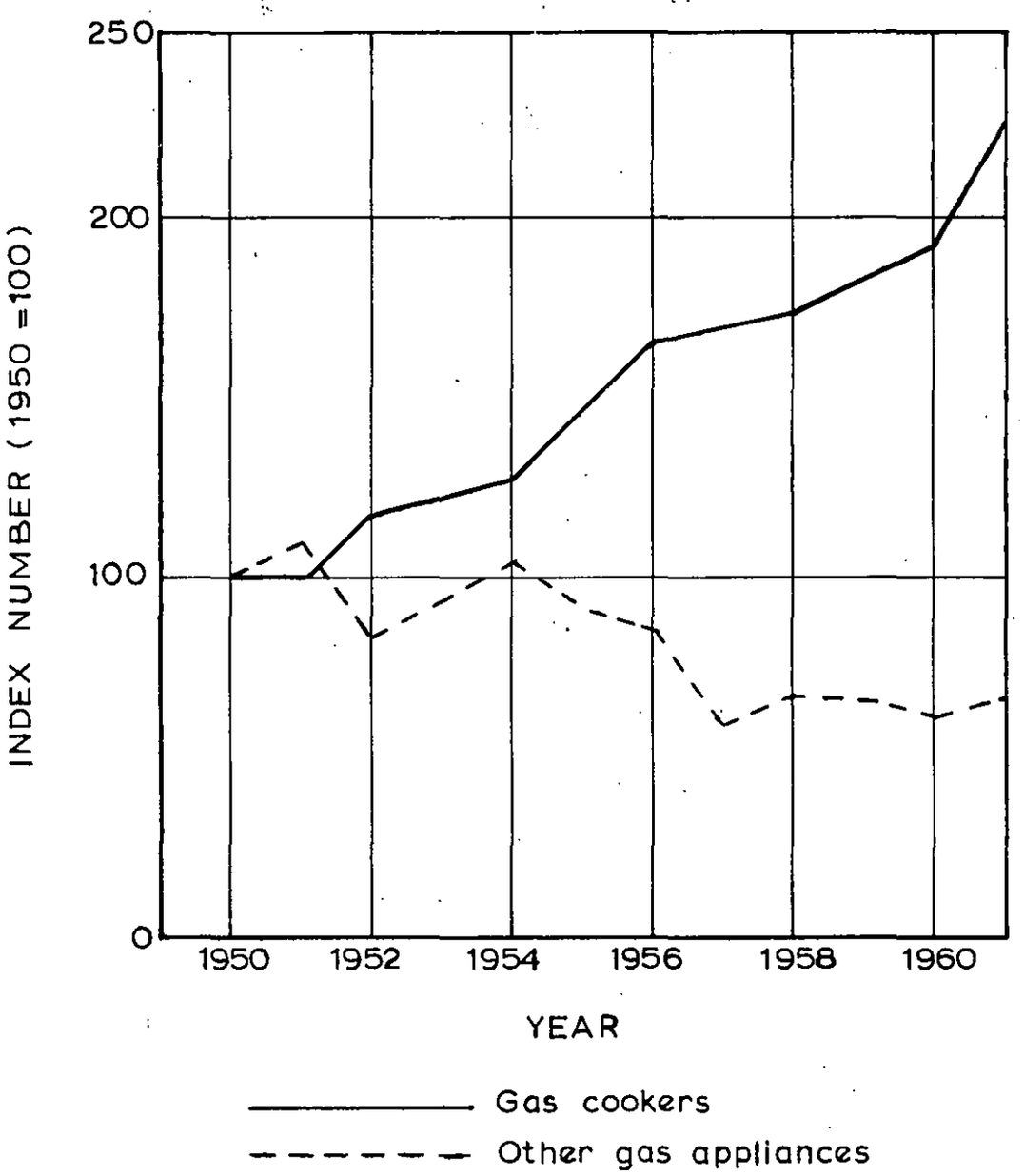

FIG.6. INDEX OF NUMBERS OF FIRES ATTRIBUTED TO APPLIANCES BURNING TOWN GAS. 1950-1961

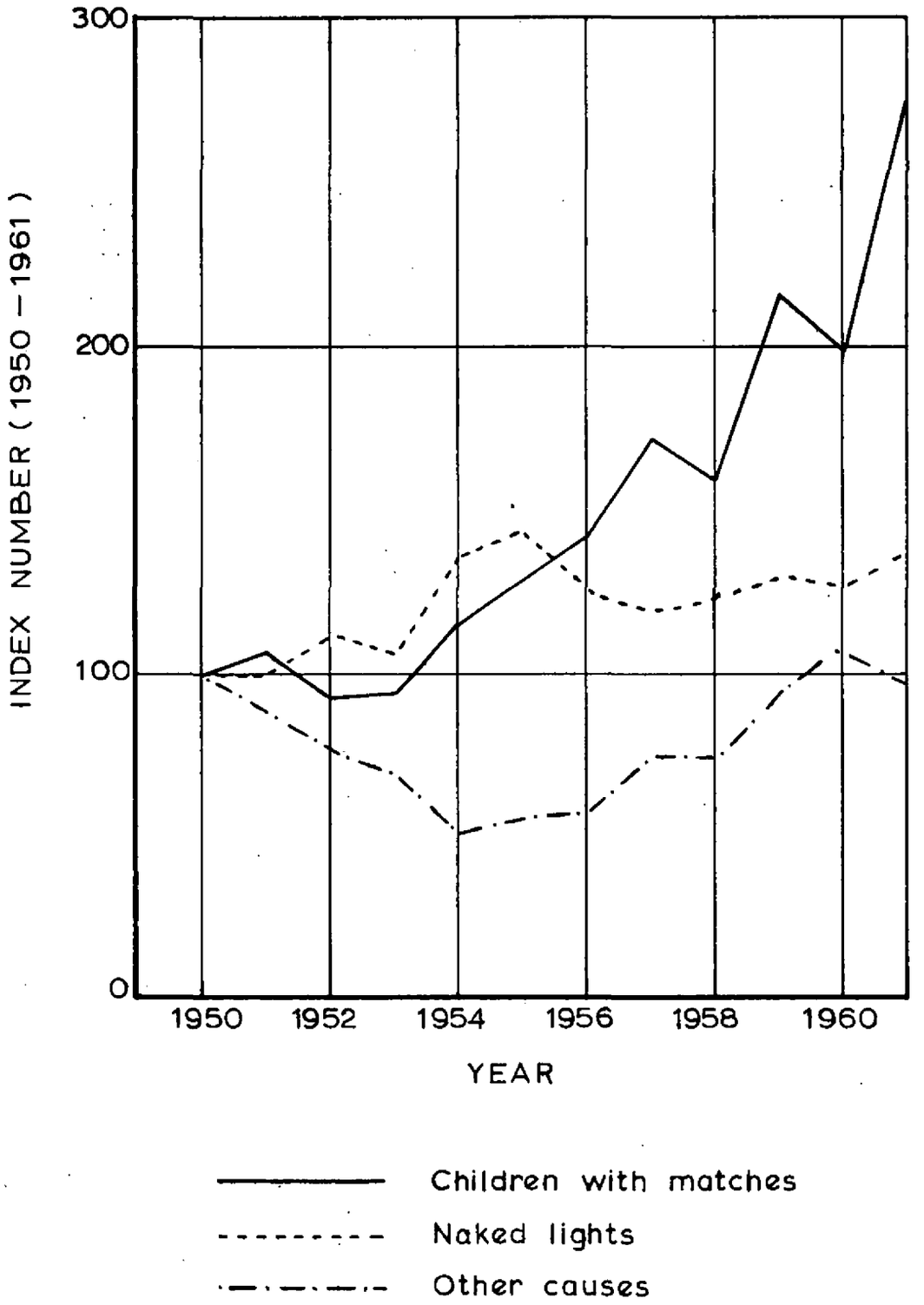

FIG.7. INDEX OF NUMBERS OF FIRES ATTRIBUTED TO CHILDREN WITH MATCHES, NAKED LIGHTS AND OTHER (SPECIFIED) CAUSES. 1950 – 1961