

Environment Canada Imaging Cover Page

Report N.:



* T E C - 4 2 3 *

SKP Box Number: 672572426

CIR-3719
TEC-423
11 Sept. 62

METEOROLOGICAL BRANCH - DEPARTMENT OF TRANSPORT - CANADA

CANADIAN LIGHTNING DEATHS AND DAMAGE

by

R. A. Hornstein

UDC.551.594.22: 616: 69

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1. INTRODUCTION

1.1. Under normal circumstances there would be no requirement or justification for bringing up to date a previous paper (1) on this subject until statistics were available for at least another decade.

1.2. Events in 1960 changed the mortality picture drastically in two provinces which previously had not reported a lightning fatality. It is thus reasonable to bring up to date published data which would otherwise paint a distorted picture and, incidentally, to provide a more complete record of ancillary factors for which there was previously a limited sample of available information.

2. DATA ON FATALITIES

TABLE I

NUMBER OF DEATHS FROM LIGHTNING, CANADA, 1939-1960

<u>Year</u>	<u>Canada</u>	<u>Nfld</u>	<u>PEI</u>	<u>N.S.</u>	<u>N.B.</u>	<u>Que</u>	<u>Ont</u>	<u>Man</u>	<u>Sask</u>	<u>Alta</u>	<u>B.C.</u>	<u>Yukon</u>	<u>NWT</u>
1939-58*	320	0	0	8	16	80	95	29	51	37	4	0	0
1959	13	0	0	0	0	1	6	2	1	3	0	0	0
1960	9	1	2	0	0	3	2	0	0	1	0	0	0
Total	344	1%	2[@]	8	16	84	103	31	52	41	4	0[#]	0[#]

* Taken from "Lightning Deaths and Damage in Canada" (1)

% 12 years of record 1949-60

[@] 21 " " " 1940-60

[#] 11 " " " 1950-60

Using Table I and the 1951 census figures (2) the average lightning-caused death rate is given by Table II.

TABLE II

NUMBER OF DEATHS FROM LIGHTNING, CANADA, PER ANNUM

PER MILLION OF POPULATION

<u>Canada</u>	<u>Nfld</u>	<u>PEI</u>	<u>N.S.</u>	<u>N.B.</u>	<u>Que</u>	<u>Ont</u>	<u>Man</u>	<u>Sask</u>	<u>Alta</u>	<u>B.C.</u>	<u>Yukon</u>	<u>NWT</u>
1.1	0.2	1.0	0.6	1.4	0.9	1.0	1.8	2.8	2.0	0.2	0	0

TABLE III

NUMBER OF DEATHS FROM LIGHTNING BY MONTHS, CANADA, 1939-51, 1955-60

Year	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1939-58*	289	1	0	0	1	25	62	117	62	15	4	2	0
1959	13	0	0	0	0	1	3	5	4	0	0	0	0
1960	9	0	0	0	0	1	0	7	0	1	0	0	0
TOTAL	311	1	0	0	1	27	65	129	66	16	4	2	0

* Taken from "Lightning Deaths and Damage in Canada" (1)

TABLE IV

DEATHS FROM LIGHTNING ON A MONTHLY PERCENTAGE BASIS, CANADA, 1939-51, 1955-60

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.3	0	0	0.3	8.7	20.9	41.5	21.2	5.3	1.3	0.7	0

TABLE V

LIGHTNING DEATHS IN CANADA, BY PLACE OF DEATH - 1950, 1955-60

	<u>Place of Death</u>	
	<u>Rural</u>	<u>Urban</u>
1950, 1955-58 Totals*	51	12
1959:		1#
Quebec		
Ontario	5	1
Manitoba	2	
Saskatchewan	1	
Alberta	3	
	<u>11</u>	<u>2</u>
1960:		
Newfoundland	1	
Prince Edward Island	2	
Quebec	2	1
Ontario	2	
Alberta	1	
	<u>8</u>	<u>1</u>
TOTAL	70	15.

- * Taken from "Lightning Deaths and Damage in Canada" (1)
- # This is an unusual case in which the death was classified as having taken place in a small town, but the accident occurred on a farm. From the death record this appears to be a case where the farm was on the outskirts of the town but the "farm home" was just inside the town boundary, hence classified as an 'urban' death.

The locations specified in Table V may be subdivided as follows:

TABLE VI

LIGHTNING DEATHS IN CANADA, BY PLACE OF DEATH - 1950, 1955-60

	Rural Home	Farm	Industrial Place	Place of Recreation or Sport	Street or Highway	Public Building	Other Places	Place not Specified
1950, 55-58*	18	14	1	3	1	2	15	9
1959: Que.		1						
Ont.		1	1	1			3	
Man.	2							
Sask.		1						
Alta.	1	2						
1960: Nfld.								1
P.E.I.	2							
Que.							1	2
Ont.		1		1				
Alta.		1						
TOTAL	23	21	2	5	1	2	19	12

* Taken from "Lightning Deaths and Damage in Canada" (1).

3.

COMMENTS

3.1. The Canadian average annual lightning fatality toll is of the order of one per million of population;

3.2. The lightning fatality curve follows the seasonal thunderstorm frequency curve quite closely, peaking in July and with 84% of the fatalities occurring in June, July and August;

- 3.3. Rural fatalities outnumber urban fatalities by almost a 5:1 ratio;
- 3.4. The Prairie Provinces have a significantly higher lightning fatality rate than do the other provinces and territories;
- 3.5. No fatality has been reported in an urban home, 23 in rural homes.

4. DATA ON LIGHTNING-CAUSED PROPERTY FIRE LOSSES (3)

TABLE VII

<u>Decade</u>	<u>Annual Average No. of Fires From All Causes</u>	<u>Average Annual No. of Lightning Fires</u>	<u>Annual Average Fire Loss</u>	<u>Annual Average Lightning Loss</u>
1949-58	70,664	1,786 (2.5%)	\$94,274,663	\$1,351,921 (1.4%)
1950-59	73,032	1,928 (2.6%)	\$99,986,054	\$1,465,618 (1.5%)
1951-60	75,022	2,044 (2.7%)	\$104,766,225	\$1,562,857 (1.5%)

Bracketed figures provide percentage of totals which are attributed to lightning.

5. COMMENTS

5.1. Although lightning starts some 2,000 fires annually in Canada it is responsible for only about 2 1/2% of all fires.

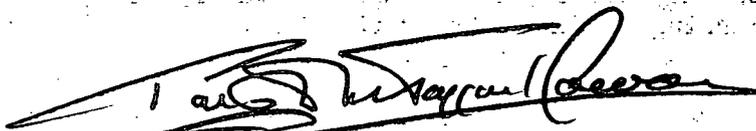
5.2. From a monetary loss point of view lightning is even less of a hazard since only about 1 1/2% of the average annual \$100 million total is attributable to lightning.

5.3. The Dominion Fire Commissioner's report (3) shows that the annual average number of human fatalities caused by fire has increased from 537 in the 1949-58 decade to 550 in the 1951-60 decade while the annual average number of human fatalities caused by lightning during those periods has remained at twelve. Loss of life by fire not attributable to lightning is thus some forty-five times more common than lightning fatalities.

6. ACKNOWLEDGEMENT

6.1. The cordial co-operation of the Chief, Vital Statistics Section, Dominion Bureau of Statistics, Ottawa, in making available the details of lightning-caused deaths is gratefully acknowledged.

APPROVED,



F. D. McTaggart-Cowan,
Director.

7.

REFERENCES

- 7.1. 1. Hornstein, R. A., 1961: Lightning Deaths and Damage in Canada. Canada. Department of Transport, Meteorological Branch, Technical Circular Series. CIR-3452, TEC-349.
2. Canadian Almanac and Directory for 1955. Toronto. The Copp Clark Co., Ltd., p. 349.
3. Department of Public Works, Canada. 1958, 1959, 1960: Fire Losses in Canada. Report of the Dominion Fire Commissioner.

8.

CORRIGENDUM

- 8.1. In CIR-3452, TEC-349, "Lightning Deaths and Damage in Canada", Table II, page 3, correct the Manitoba mortality rate from 1.2 to 1.9.