

NRC Publications Archive Archives des publications du CNRC

Fire investigations by the Fire Section, 1956

Shorter, G. W.; Burnett, C. G.

For the publisher's version, please access the DOI link below. / Pour consulter la version de l'éditeur, utilisez le lien DOI ci-dessous.

Publisher's version / Version de l'éditeur:

<https://doi.org/10.4224/20337940>

Internal Report (National Research Council of Canada. Division of Building Research), 1958-03-01

NRC Publications Archive Record / Notice des Archives des publications du CNRC :

<https://nrc-publications.canada.ca/eng/view/object/?id=059a1170-8d53-4005-8ce1-3c8549b3217f>

<https://publications-cnrc.canada.ca/fra/voir/objet/?id=059a1170-8d53-4005-8ce1-3c8549b3217f>

Access and use of this website and the material on it are subject to the Terms and Conditions set forth at

<https://nrc-publications.canada.ca/eng/copyright>

READ THESE TERMS AND CONDITIONS CAREFULLY BEFORE USING THIS WEBSITE.

L'accès à ce site Web et l'utilisation de son contenu sont assujettis aux conditions présentées dans le site

<https://publications-cnrc.canada.ca/fra/droits>

LISEZ CES CONDITIONS ATTENTIVEMENT AVANT D'UTILISER CE SITE WEB.

Questions? Contact the NRC Publications Archive team at

PublicationsArchive-ArchivesPublications@nrc-cnrc.gc.ca. If you wish to email the authors directly, please see the first page of the publication for their contact information.

Vous avez des questions? Nous pouvons vous aider. Pour communiquer directement avec un auteur, consultez la première page de la revue dans laquelle son article a été publié afin de trouver ses coordonnées. Si vous n'arrivez pas à les repérer, communiquez avec nous à PublicationsArchive-ArchivesPublications@nrc-cnrc.gc.ca.



(Photo by Beauchamp Studio, Valleyfield, Que.)

Scene following a serious fire at
Valleyfield, Que. on 30 December 1956.

NATIONAL RESEARCH COUNCIL OF CANADA
DIVISION OF BUILDING RESEARCH

FIRE INVESTIGATIONS BY THE FIRE
SECTION, 1956

by

G.W. Shorter and C.G. Burnett

Report No. 140
of the
Division of Building Research

Ottawa
March 1958

PREFACE

This is a further progress report of the studies being made by the Fire Section of the Division of Building Research of those fires in buildings which occurred in the year 1956, which the staff were able to visit. This work is a continuation of the efforts being made by the Division as its contribution to the improvement of the tragic fire loss, both of lives and property, which occurs every year in Canada.

This report is the third such report to be issued. When enough information has been assembled in these annual reviews a comprehensive general paper on the results obtained will be prepared and published.

As in previous years these investigations have been confined to the Ottawa area with the exception of the bad fire in Valleyfield, P.Q. Other field studies have been continued into the study of fire fatalities which occurred in the Province of Ontario and these are recorded in another series of reports.

The continued co-operation of the Ottawa Fire Department and the office of the Ontario Fire Marshal is greatly appreciated and valued.

Ottawa
March 1958

R.F. Legget
Director

FIRE INVESTIGATIONS BY THE FIRE
SECTION, 1956

by

G.W. Shorter and C.G. Burnett

During 1956 the Fire Section continued to study fatal and non-fatal fires. This report deals with the study of non-fatal fires and is a companion report to DBR Reports Nos. 78 and 101 covering work in this field from 1950 to 1955, inclusive. It is the third in a series of what will now be annual reports. While only eight non-fatal fires are reported on for 1956, the Fire Section has studied fifteen fatal fires in the Province of Ontario during the same period as compared with nine fatal fires investigated during 1955. These studies of fatal fires have been recorded in DBR Reports Nos. 71, 90 and 127 for the years 1954 to 1956, inclusive.

Although the Fire Section generally restricts its investigation work at non-fatal fires to the Ottawa area it has over the years attempted, where possible, to visit scenes of large fires in other localities. During 1956 one such visit was paid to the scene of a large fire which occurred at Valleyfield, Quebec on 30 December, 1956.

During the year two-way radio communication was acquired for the fire research vehicle which is used for fire investigations. Permission was granted by the Ottawa Fire Department to operate on the radio frequency used by this department which once more emphasizes the splendid co-operation extended to the Fire Section. The acquisition of radio has increased the use of the fire vehicle in providing direct contact with fire department headquarters during the field study of fires and the survey on defective chimneys in the Ottawa area that was undertaken during last winter.

Presentation of Data

As in 1955 this report contains summaries of the eight fires investigated during 1956 as well as photographs taken at the scenes of the fires. The fires are described under five headings: (a) General; (b) Weather Data; (c) Construction; (d) Spread of Fire; (e) Remarks. The weather data is included to indicate climatic conditions at various times in Canada. When one studies the weather conditions existing at the time of the fires reported and the various heating appliances used, it

becomes evident that cold weather not only increases the incidence of fires but also their severity. Efficient fire fighting operations can be severely obstructed during cold weather. Such conditions as icing, and frozen water lines, combined with the heavy clothing required by the fire fighter, are some of the problems encountered in the handling of fire equipment and the control of fire

Data for all the fires investigated since 1950 have, however, been used for the brief analysis appearing in Appendix A. Graphs (Figs. A-1, A-2 and A-3) show the frequency distribution of fires by (a) month (b) day of week and (c) hour of day, respectively. In addition, other miscellaneous data on the fires by occupancy are presented in Table A-1. It should be emphasized that this analysis illustrates the distribution of only those fires which have been investigated by the Fire Section and does not apply to fires in general.

The building referred to in the caption for each summary is always that in which the fire originated. The losses reported refer not only to this building but also to any others involved in the fire. The figures given are only approximate values and may vary considerably from the actual losses sustained. They are included, however, to give some idea of the size of the fire.

DBR FIRE STUDY NO. 1/56

<u>Date of Fire:</u>	8 January 1956	<u>Location:</u>	Ottawa, Ont.
<u>Time of Alarm:</u>	10.53 p.m. (EST)	<u>Day of Week:</u>	Sunday
<u>No. of Storys:</u>	3	<u>Estimated Loss:</u>	\$40,000

RESIDENTIAL TENEMENT ROW

GENERAL. - The brick veneer six-door tenement accommodated approximately fifty people most of whom were in residence at the time of the fire. The fire is believed to have started in the south end of the building on the third floor (Fig. 1) but a definite cause could not be determined. The fire was discovered by an occupant who noticed that the temperature was becoming abnormally high in the building.

WEATHER DATA

<u>Date</u>	<u>Time</u>	<u>Temp. (°F.)</u>	<u>R.H. (%)</u>	<u>Wind Velocity (MPH)</u>
Jan. 8	10 p.m. (EST)	10	81	N. 15
Jan. 8	11 p.m. (EST)	12	82	N. 15
Jan. 8	12 p.m. (EST)	12	80	N. 16

CONSTRUCTION. - The brick veneer building was three storys in height, 120 feet in length and 30 feet in width. The third floor section was wood construction with a mansard roof covered with asbestos shingles on the pitched sides and with tar and gravel on the flat section. Interior construction was wood lath and plaster. An open space between the third floor ceiling and roof extended the length of the building.

SPREAD OF FIRE. - The fire was believed to have started on the third floor level (Fig. 2) extending to the space under the roof and in the walls to the second floor (Fig. 3).

REMARKS. - Failure to investigate rising temperatures in the building permitted the fire to spread before being detected. No parapeted fire walls separated this building and the fire was permitted to extend the length of the building in the unused attic space under the roof.

DBR FIRE STUDY NO. 2/56

<u>Date of Fire:</u>	20 May 1956	<u>Location:</u>	Ottawa, Ont.
<u>Time of Alarm:</u>	7.15 p.m. (EDT)	<u>Day of Week:</u>	Sunday
<u>No. of Storys:</u>	2	<u>Estimated Loss:</u>	\$75,000

WAREHOUSE AND DWELLINGS

GENERAL. - At approximately 7.15 p.m. exploding firecrackers ignited a large wooden building formerly used as an ice-house and presently being used as a storage shed for machinery and equipment. The building was located in an area of wood construction with wood shingle roofs (Fig. 4). Heat radiation and flying embers ignited a number of roof tops threatening to spread the fire in the area (Fig. 5).

WEATHER DATA

<u>Date</u>	<u>Time</u>	<u>Temp.(°F.)</u>	<u>R.H.(%)</u>	<u>Wind Velocity (MPH)</u>
May 20	6.30 p.m. (EDT)	74	31	S. 7
May 20	8.30 p.m. (EDT)	72	33	S.10

CONSTRUCTION. - The wood-frame constructed warehouse was 50 feet in length, 25 feet in width, with a flat roof. The exterior walls were insulated with sawdust.

SPREAD OF FIRE. - The fire spread rapidly in the building of origin releasing flying brands that ignited the surrounding wood shingled roofs (Fig. 6).

REMARKS. - The development of fires which completely involve single buildings, spread to groups of adjoining or adjacent exposed buildings and grow into sweeping conflagrations involving large areas, is generally due to wood exterior construction, wood shingle roofs, strong winds, and heat radiation. This fire, but for the efficient action of the fire department, could have created a serious fire threat in the area.

DBR FIRE STUDY NO. 3/56

<u>Date of Fire:</u>	26 June 1956	<u>Location:</u>	Ottawa, Ont.
<u>Time of Alarm:</u>	10.59 p.m. (EDT)	<u>Day of Week:</u>	Tuesday
<u>No. of Storys:</u>	2	<u>Estimated Loss:</u>	\$40,000

COAL DISPERSAL CHUTE

GENERAL. - The fire originated in the east end of the coal storage shed, spread rapidly the length of the building to ignite piles of coal stored in the bins at ground floor level and damaged a number of empty freight cars located on the railway tracks leading into the sheds on the second floor landing (Fig. 7). Sparks and burning debris fell on the homes and lumber yard in the immediate area. Cause of the fire was not determined.

WEATHER DATA

<u>Date</u>	<u>Time</u>	<u>Temp. (°F.)</u>	<u>R.H. (%)</u>	<u>Wind Velocity (MPH)</u>
June 26	10 p.m. (EDT)	66	48	S. 4
June 26	11 p.m. (EDT)	63	57	S. 5
June 26	12 p.m. (EDT)	61	62	S. 5
June 27	1 a.m. (EDT)	59.5	63.5	S. 5

CONSTRUCTION. - The wood-frame coal-storage shed was 150 feet in length, 30 feet in width, and two storys in height. The flat and pitched roofs were sheathed with rolled roofing and large wood joists were used to support the dispersal chutes on the second floor (Fig. 8).

SPREAD OF FIRE. - The type of construction permitted the fire to spread rapidly throughout the entire building. Flying brands landing on wood shingle roofs and lumber stored in the area caused some concern.

REMARKS. - Storage of coal in bins does not usually involve a hazard because the time it is in storage is short. However wood buildings of this type where coal dust accumulates can create a rapid spreading fire when ignited.

DBR FIRE STUDY NO. 4/56

<u>Date of Fire:</u>	6 November 1956	<u>Location:</u>	Ottawa, Ont
<u>Time of Alarm:</u>	1.37 a.m. (EST)	<u>Day of Week:</u>	Tuesday
<u>No. of Storys:</u>	2	<u>Estimated Loss:</u>	\$150,000

FURNITURE STORAGE

GENERAL. - This fire was discovered by a passer-by when smoke was noticed coming from the building. The building was formerly occupied as a theatre (Fig. 9) but was being used for furniture storage and contained a number of wood-constructed lockers in the basement and upper floors (Fig. 11). Due to the extensive damage, the cause of the fire was not determined. Dense clouds of smoke issued from the building and blanketed the surrounding area.

WEATHER DATA

<u>Date</u>	<u>Time</u>	<u>Temp.(°F.)</u>	<u>R.H.(%)</u>	<u>Wind Velocity (MPH)</u>
Nov. 6	1 a.m. (EST)	34	88	S. 3
Nov. 6	2 a.m. (EST)	32	91	E. 3
Nov. 6	3 a.m. (EST)	34	93	E. 3

CONSTRUCTION. - The brick and masonry building was 110 feet in length, 50 feet in width and two storys in height, with a basement. The flat roof was sheathed with wood plank and covered with tar and gravel.

SPREAD OF FIRE. - The fire was confined to the building of origin. The collapse of the roof and north wall prevented entry to the building (Fig. 10).

REMARKS. - This fire is a good example of what can occur when the occupancy of a building changes without proper alterations to the building structure (Fig. 11). This fire is believed to have originated spontaneously, although it was not possible to definitely establish the cause.

DBR FIRE STUDY NO. 5/56

<u>Date of Fire:</u>	1 December 1956	<u>Location:</u>	Ottawa, Ont.
<u>Time of Alarm:</u>	3.13 p.m. (EST)	<u>Day of Week:</u>	Saturday
<u>No. of Storys:</u>	3	<u>Estimated Loss:</u>	\$20,000

APARTMENT DWELLING

GENERAL. - Young children playing with matches in the third floor apartment of the building ignited comic books placed on the hot-air register. The fire advanced up the walls to the roof before being detected, causing considerable damage to the building and contents, and requiring many of the occupants to vacate their premises (Fig. 12).

WEATHER DATA

<u>Date</u>	<u>Time</u>	<u>Temp.(°F.)</u>	<u>R.H.(%)</u>	<u>Wind Velocity (MPH)</u>
Dec. 1	3 p.m. (EST)	20	76	-
Dec. 1	4 p.m. (EST)	21	80	N. 1
Dec. 1	5 p.m. (EST)	21	84	N. 3

CONSTRUCTION. - The frame building was constructed of mixed materials having exterior walls of brick to the second floor. The third floor was constructed of wood with metal-clad sheathing. The roof was flat with rolled roofing, tar and gravel over wood joist and wood sheathing. Interior finish was mainly lath and plaster papered.

SPREAD OF FIRE. - Fire damage was mainly confined to the third floor where lack of fire stops in the walls permitted the fire to spread in a vertical direction (Fig. 13) to the open unused attic space under the roof (Fig. 14).

REMARKS. - Carelessness in one form or another is responsible for the majority of all fires. Fire prevention, if it is to eliminate fires caused by carelessness must include the education of children in the danger of lighted matches.

DBR FIRE STUDY NO. 6/56

<u>Date of Fire:</u>	1 December 1956	<u>Location:</u>	Ottawa, Ont.
<u>Time of Alarm:</u>	5.30 p.m. (EST)	<u>Day of Week:</u>	Saturday
<u>No. of Storys:</u>	2	<u>Estimated Loss:</u>	\$10,000

RESIDENTIAL TENEMENT ROW

GENERAL. - Five of the dwellings in this six-door tenement row were vacant to provide for renovation of the building (Fig. 15). Fire was discovered burning in one of the vacant residences but its cause could not be determined. It was assumed that children playing in the building had been responsible.

WEATHER DATA

<u>Date</u>	<u>Time</u>	<u>Temp. (°F.)</u>	<u>R.H.(%)</u>	<u>Wind Velocity (MPH)</u>
Dec. 1	5 p.m. (EST)	21	84	N. 3
Dec. 1	6 p.m. (EST)	21	84	NW. 7
Dec. 1	7 p.m. (EST)	21	80	NW. 7

CONSTRUCTION. - The wood-frame building was approximately 60 feet in length, 40 feet in width, and two storys in height. The exterior walls were of mixed construction consisting of wood plank sheathed with brick siding and cement. The roof was flat, covered with rolled roofing, tar and gravel. Interior finish on the walls, ceilings and partitions was lath and plaster papered, combustible board and v-joint wood sheathing.

SPREAD OF FIRE. - The fire originated in the vacant dwelling and spread to the walls, ceilings and attic space under the roof before being brought under control.

REMARKS. - Buildings, in which good housekeeping has been neglected and an accumulation of waste material is present, are a fire hazard when not protected (Fig. 16).

DBR FIRE STUDY NO. 7/56

<u>Date of Fire:</u>	4 December 1956	<u>Location:</u>	Ottawa, Ont.
<u>Time of Alarm:</u>	10.37 a.m. (EST)	<u>Day of Week:</u>	Thursday
<u>No. of Storys:</u>	2	<u>Estimated Loss:</u>	\$10,000

APARTMENT BUILDING

GENERAL. - This fire occurred in a six-unit apartment block while it was under construction (Fig. 17). The interior of the building was being prepared for plastering when an oil heater on a scaffold at the second-floor level ignited a tarpaulin. The fire spread rapidly in the unfinished wood construction and entered the unused attic space under the roof (Fig. 18).

WEATHER DATA

<u>Date</u>	<u>Time</u>	<u>Temp. (°F.)</u>	<u>R.H.(%)</u>	<u>Wind Velocity (MPH)</u>
Dec. 4	10 a.m. (EST)	14	52	NW. 13
Dec. 4	11 a.m. (EST)	13	51	NW. 13
Dec. 4	12 a.m. (EST)	13	50	NW. 13

CONSTRUCTION. - The wood-frame brick-veneer building was 100 feet in length, 40 feet in width and two storys in height. The roof was flat, covered with tar and gravel, and the interior walls, ceilings and partitions were to be plastered.

SPREAD OF FIRE. - The fire originated on the second floor and spread quickly to the walls, ceilings and partitions, and the unused attic space under the roof.

REMARKS. - This instance, and many others, of fires occurring in incompleted buildings emphasizes the need for fire prevention regulations to be enforced during construction.

DBR FIRE STUDY NO. 8/56

<u>Date of Fire:</u>	30 December 1956	<u>Location:</u>	Valleyfield, Que.
<u>Time of Alarm:</u>	5.20 a.m. (EST)	<u>Day of Week:</u>	Sunday
<u>No. of Storys:</u>	3	<u>Estimated Loss:</u>	\$100,000,000

COMMERCIAL AND RESIDENTIAL

GENERAL. - At 5.20 a.m. on Sunday, 30 December 1956, a disastrous fire started in the City of Valleyfield, Quebec, which destroyed a number of buildings in the commercial district and caused a loss estimated at one million dollars in property and equipment.

The fire was discovered burning at the rear of a three-story building on the northwest corner of Cousineau Street and Grand Ile Avenue (Fig. 19). On arrival of the fire department it was reported that the fire had made rapid progress in the building and immediate rescue operations were necessary from the apartments on the second and third floors. As the fire progressed, buildings to the north on Cousineau Street for a distance of 150 feet were ignited and destroyed by radiated heat and flying brands (Fig. 20). At the same time, the fire was advancing east on Grand Ile Avenue to involve two- and three-story buildings, the upper floors of which were apartments.

The fire became more intense as many of the buildings in the block on the north side of the street became involved in fire. Strong winds fanned the fire and flying brands ignited the frame buildings on the south side of the street opposite the fire (Fig. 21). The fire then spread rapidly in an eastern and western direction to destroy all the buildings in the block fronting on Grand Ile Avenue (Fig. 21) and was stopped at the laneway on Havre Blvd. (Fig. 22).

The fire was checked on the south side of the street at street intersections (Fig. 23). A masonry wall separated by a laneway prevented further spread of the fire in a westerly direction on the north side (Fig. 24). It was considered under control at 12 noon 30 December, after destroying or damaging eighteen business and residential buildings.

WEATHER DATA. - This fire occurred in a community situated in the area south of the St. Lawrence River on the bank of Lake St. Francois. At this season of the year, ice and low temperatures are generally prevalent (Fig. 25). In addition to the cold weather strong winds prevailed at the time of the fire. Weather observations for the Valleyfield area for 29 and 30 December are given in the following table:

WEATHER DATA

<u>Date</u>	<u>Time</u>	<u>Temp.(°F.)</u>	<u>R.H.(%)</u>	<u>Wind Velocity</u> <u>(MPH)</u>	<u>Gusts</u> <u>(MPH)</u>
Dec. 30	1.30 a.m.(EST)	7	80	WNW. 16	26
Dec. 30	3.30 a.m.(EST)	3	75	W. 22	33
Dec. 30	5.30 a.m.(EST)	-4	87	W. 30	44
Dec. 30	7.30 a.m.(EST)	-8	78	WSW. 24	35
Dec. 30	9.30 a.m.(EST)	-8	71	WSW. 28	40

CONSTRUCTION. - The buildings destroyed were mainly of wood-frame construction with tin sheathing on the exterior walls. The roofs were flat, covered with tar and gravel.

SPREAD OF FIRE. - The fire spread from the building of origin to the north, east, west and south in the area to destroy or damage eighteen buildings. The cause of the fire was not determined.

REMARKS. - This fire emphasizes the fact that structural conditions must be controlled by adequate building laws. It is obvious that standard fire walls, parapets and proper protection of exposed buildings would have aided materially in preventing the spread and bringing this fire under control. Conflagrations such as this are a result of unfavourable structural conditions and in many cases of inadequate fire-fighting facilities to cope with severe fire conditions (Fig. 26).



Fig. 1. View of six-door row;
fire originated on the
third floor.

Fig. 2. Member of Fire Section
examining open wall
space.

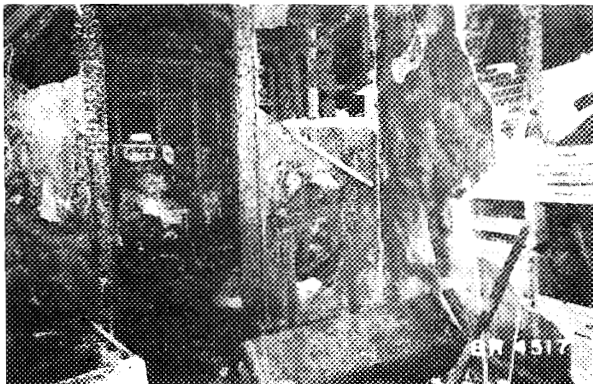
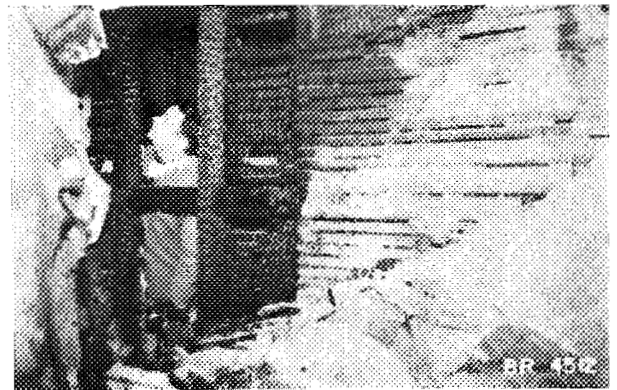


Fig. 3. View showing how fire
spread through rooms on
third floor.



Fig. 4. Remains of wood frame warehouse. Note number of wood shingle roofs involved.

Fig. 5. View of wood frame construction in the area.



Fig. 6. View of fire spread.



Fig. 7. Remains of coal dispersal chute after fire destroyed frame-covered section.

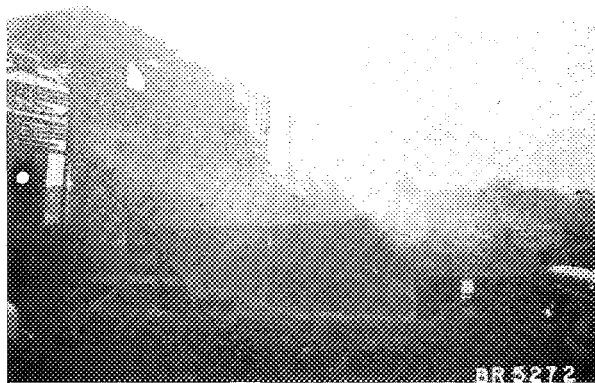


Fig. 8. View showing entrance to coal chutes, where coal remains burning.



Fig. 9. Front view of converted theatre used for furniture storage.

Fig. 10. Roof collapse made entry difficult.

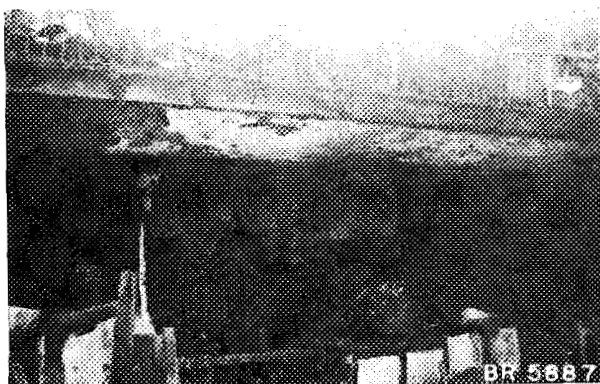
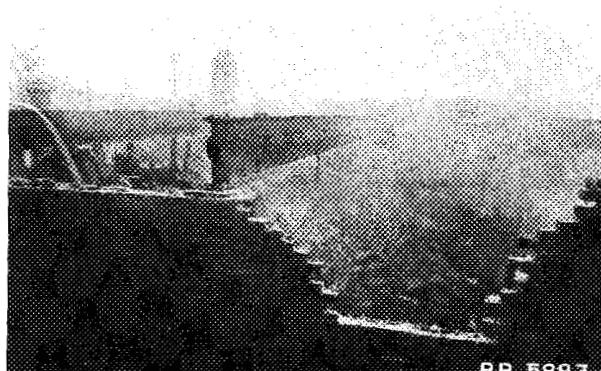


Fig. 11. View of interior of building showing furniture storage in wooden lockers.



Fig. 12. View of apartment dwelling. Fire involved the third floor.

Fig. 13. Lack of fire stops permitted fire to spread.

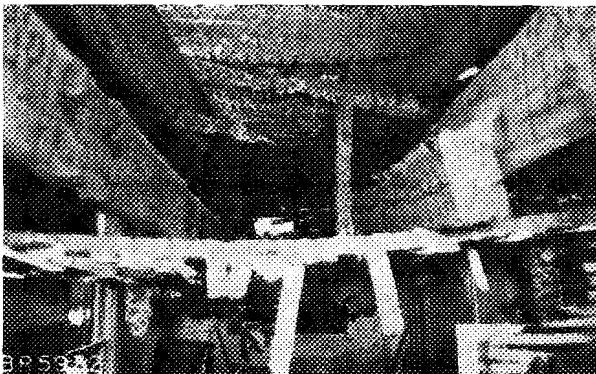


Fig. 14. View of attic space under roof where fire spread.



Fig. 15. View of vacant row. Fire occurred in end dwelling

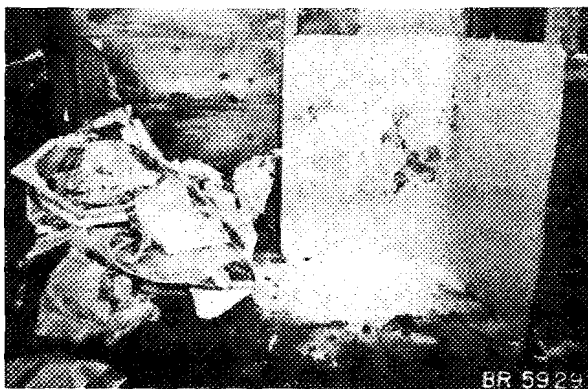


Fig. 16. Accumulation of rubbish creates a fire hazard.



Fig. 17. Front view of apartment (under construction).

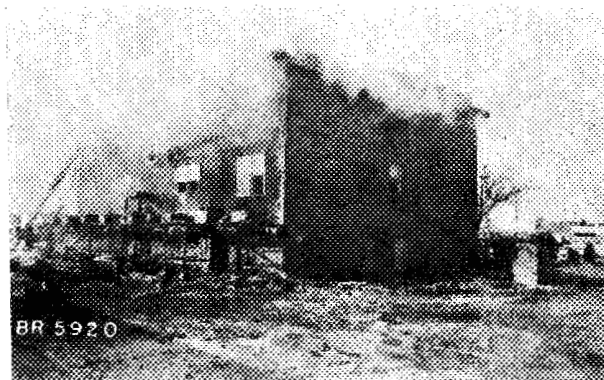


Fig. 18. Rear view of building. Fire involved the attic space.

DBR FIRE STUDY NO. 8/56



Fig. 19. Member of Fire Section and Fire Chief of Valleyfield inspect location where fire originated.

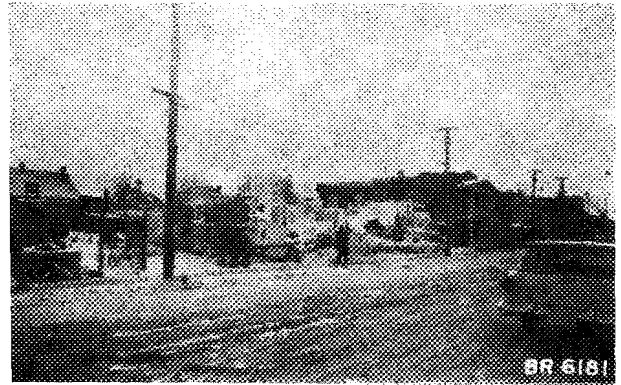


Fig. 20. View showing how fire spread in a northerly direction.

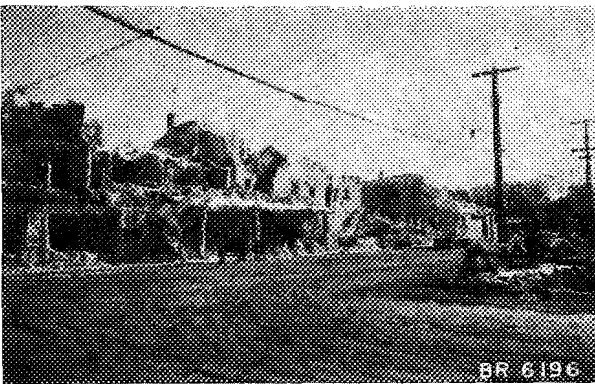


Fig. 21. Wood frame constructions opposite fire were also ignited.

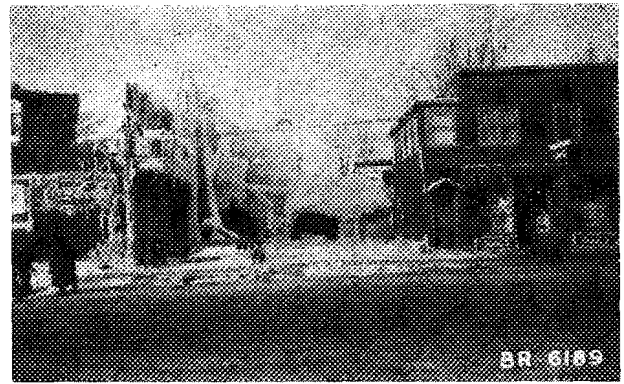


Fig. 22. Laneway provided fire-break in a westerly direction.

DBR FIRE STUDY NO. 8/56



Fig. 23. Fire was checked at street intersections.

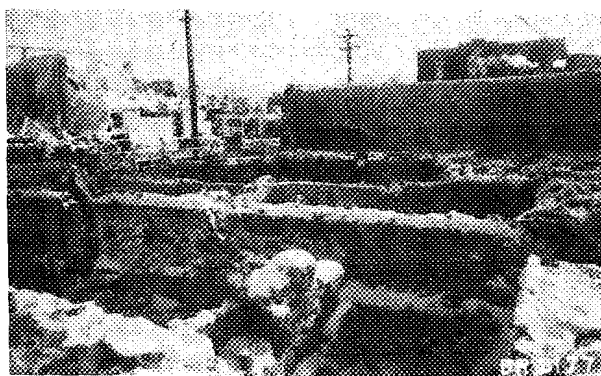


Fig. 24. Solid wall prevented further fire spread in a westerly direction.

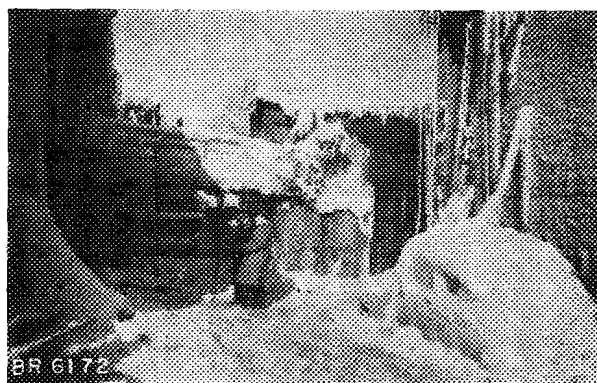


Fig. 25. Fire Chief and member of Fire Section inspect frame construction. Note evidence of climatic conditions.



Fig. 26. Unseparated wood-frame construction permitted rapid fire spread.

APPENDIX A

ANALYSIS OF FIRES INVESTIGATED BY THE FIRE SECTION

- Fig. A-1 Frequency Distribution of Fires by Month
- Fig. A-2 Frequency Distribution of Fires by Day of Week
- Fig. A-3 Frequency Distribution of Fires by Hour of Day
- Table A-1 Miscellaneous Data on Fires by Occupancy

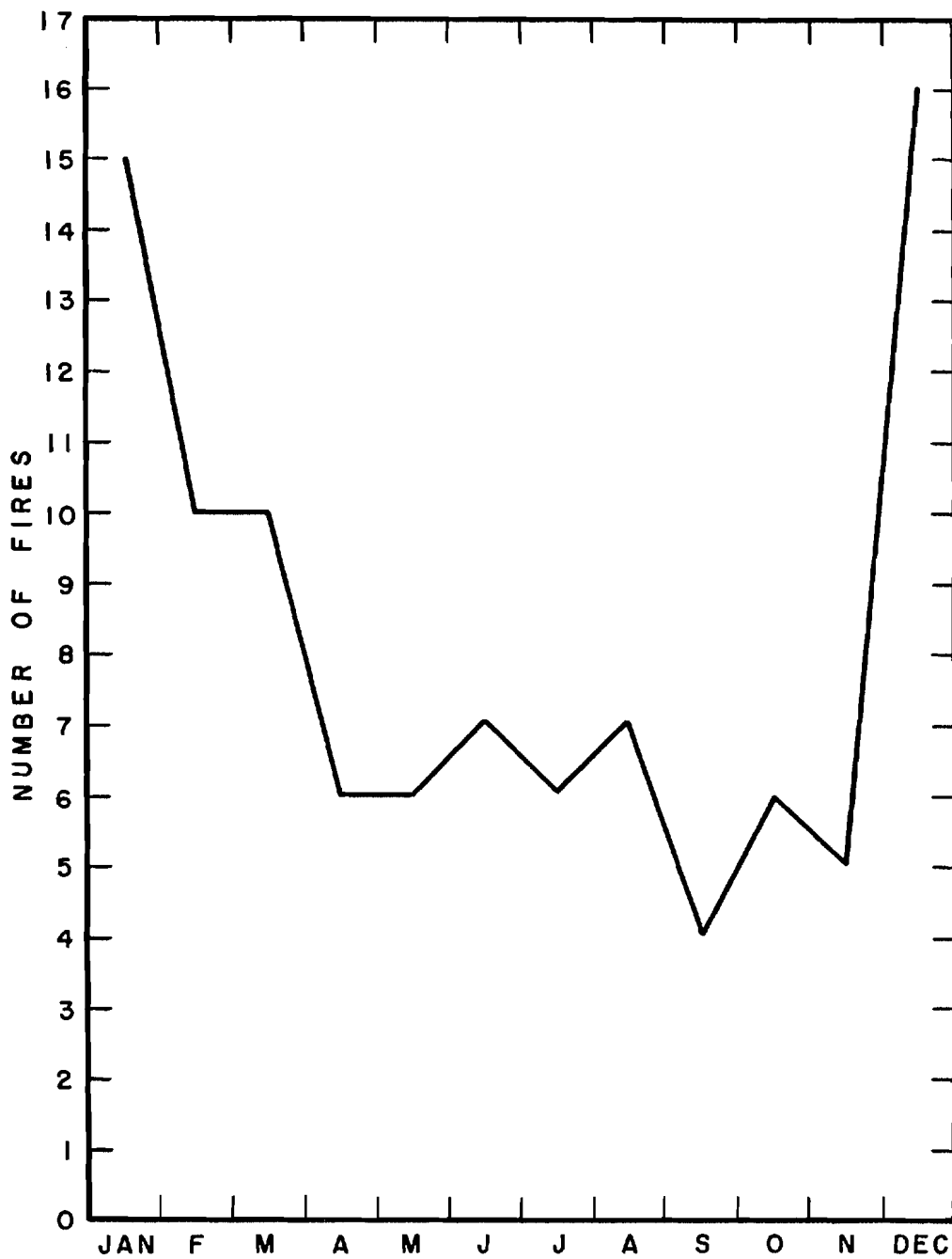


FIGURE A-1
FIRES BY MONTH

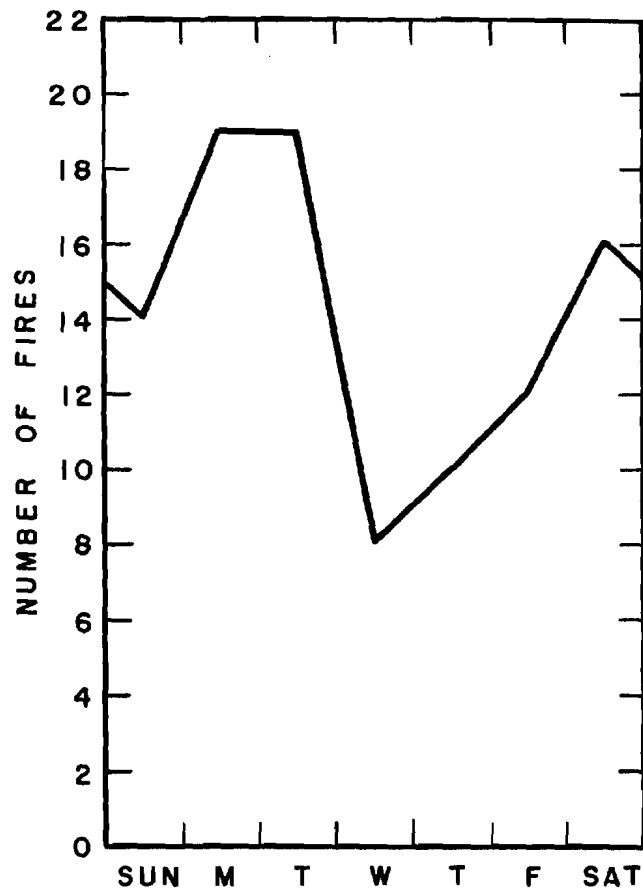


FIGURE A-2
FIRES BY DAY OF WEEK

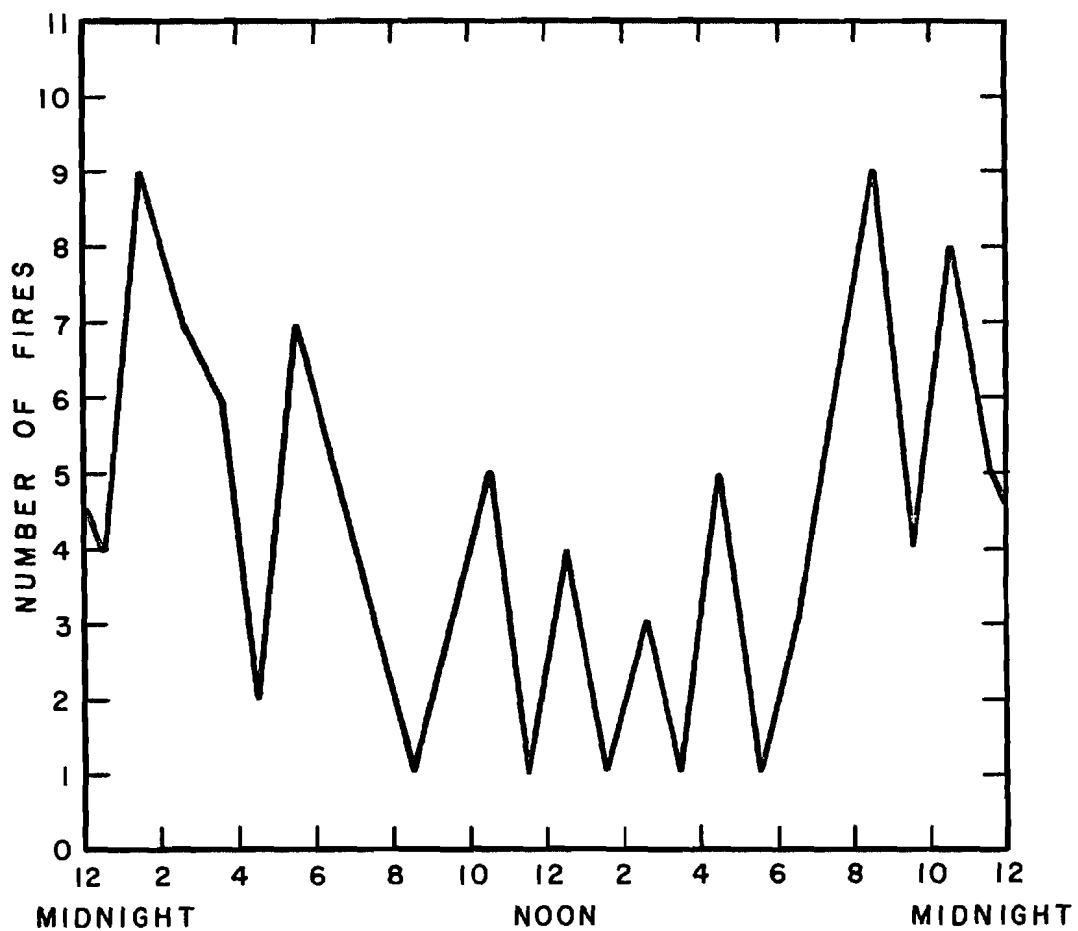


FIGURE A-3
FIRES BY HOUR OF DAY

TABLE NO. A - 1

MISCELLANEOUS DATA

[illegible]

(1) For detailed description of occupancy classification refer to National Building Code of Canada, 1953.

(2) Other includes attic spaces, sheds at rear of building and attached to it, etc.

★ Cause of fire

- | | |
|--|--|
| 1. Smoker's carelessness | 10. Sparks on roofs |
| 2. Stoves, furnaces, boilers and smoke pipes | 11. Exposure fires |
| 3. Electrical wiring and appliances | 12. Spontaneous ignition |
| 4. Defective and overheated chimneys and flues | 13. Incendiarism |
| 5. Matches | 14. Miscellaneous known causes
(explosions, fireworks, friction, hot
frase or metal, steam and hot water
pipes) |
| 6. Petroleum and its products | 15. Unknown. |
| 7. Hot ashes, coals, open fires | |
| 8. Lightning | |
| 9. Lights other than electrical | |

NATIONAL RESEARCH COUNCIL OF CANADA
DIVISION OF BUILDING RESEARCH

ERRATUM

"FIRE INVESTIGATIONS BY THE FIRE
SECTION, 1956"

by

G.W. Shorter and C.G. Burnett
(DBR Internal Report No. 140)

DBR Fire Study No. 8/56, page 8,

estimated loss of fire should be \$1,000,000 not \$100,000,000
as stated.