Paper #1

Lessons Learned or Lessons Forgotten

The Canadian Disaster Experience

by

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The classic Canadian study of hazards is Hewitt and Burton's book *The Hazardousness of a Place*, describing the hazard history around London, Ontario.[i] London is occasionally hit by floods and other emergencies.[ii] But, in retrospect, the most striking hazard that London had experienced is ice storms. Until January, 1998, when ice on trees, power and telephone lines left scores of communities in a state of emergency[iii], Canadians – including those in government and emergency agencies -- did not accept how serious a hazard ice storms can present. They had not learned – in fact probably have still not learned – the lessons from history.

As Hewitt and Burton imply, the first key lesson about Canadian mass emergencies is that they are often predictable. Earthquakes occur over faults, floods along rivers. Tsunamis affect coastal areas: in 1929, one struck Newfoundland; in 1964, one hit British Columbia after the Alaska earthquake. Sometimes small areas face particular threats. Hail storms frequently strike around Calgary and Medicine Hat: on September 7, 1991, hail smashed in windows and dented car roofs and led to 116,000 insurance claims.[iv]

It is not possible to predict *precisely* when or where something will happen. The Miramichi earthquakes centered near Plaster Rock, New Brunswick occurred at a previously unknown fault.[v] Yet though Hurricane Hazel caught Toronto by surprise, there was a forecast and though the 1998 ice storm was far more devastating than anticipated, Environment Canada did provide accurate weather data.[*] In short, as the natural hazard's map published by Natural Resources Canada shows, it is possible to identify where there have been and most likely to be hazardous events.[vi]

One reason prediction is easy is because many hazardous events repeat themselves. The Red and St. John and Peace rivers flood continually. This leads to a flood subculture that makes it difficult to alert persons about an abnormal flood threat. In a study in Ste-Agathe and St.-Adolph, Manitoba hit by the 1997 Red River flood, Enarson and Scanlon found:

> Most were born and reared in or near these two towns; flood stories were part of their family history. "Elders" consulted by newcomers normalized flooding and discouraged what they considered excessive preparation (e.g. moving possessions up from the basement, putting furniture in storage, evacuating on demand).[vii]

Rod Kueneman had a similar finding in 1973:

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* The concern showed up clearly in one forecast issued just as the storm began to have a major impact: the forecaster advised persons to pray for ordinary rain:

> A series of disturbances approaching from the south will bring us episodes of freezing rain one after the other. By Thursday morning, 15 to 20 millimetres of freezing rain is expected to have fallen. Thursday night into Friday remains to be seen. Pray for plain rain.

As forecast, freezing rain started early Wednesday morning and continued, with occasional breaks, for the next 40 hours. The last little bit from that second storm fell just before Thursday midnight. The request for a prayer indicated that the forecasters knew – though they weren't absolutely certain – that there was likely to be more freezing rain on Friday, January 9th. The forecaster said that was a, "tough call". The following day – the day the state of emergency was declared – Environment Canada forecast more freezing rain in parts of the Region then changed that to a forecast of freezing rain. In fact there were six more hours of freezing rain on Friday, January 9th. Over a six-day period, there had been 63 hours and 42 minutes of freezing rain.

> As often happens, when the people…were warned of extensive flooding, they refused to evacuate themselves and they did not move their animals to higher ground. Relying on previous experience, they did not think they would be in any greater difficulty than they normally were…. As a result…evacuation was generally carried out on a last minute basis. The effects of this were quite serious in the area of cattle evacuation.[viii]

Both studies build on research as early as 1965[ix]. A detailed discussion of disaster subculture appears in *Disasters Theory and Research*.[x]

In the past decade, something else has emerged – that environmental hazards often lead to toxic problems. After Showalter and Myers showed that environmental incidents in the United States cause toxic spills,[xi] an informal review suggested the same is true for Canada. There were 14 spills caused by the Edmonton tornado. There were agricultural chemicals swept up by the flood in the Pemberton Valley in British Columbia. The 1985 Gander air crash led to aviation gasoline flowing into Gander Lake, source of the town's water supply, leading to a response by public works, the Canadian Coast Guard and the Atlantic Petroleum Agency.[xii] Solis and Hightower raise the issue in relation to debris:

> The amount of debris generated by some disasters was equivalent in volume to years, if not decades of normal solid waste production… Thus, landfill capacities were overwhelmed; roads were damaged by trucks hauling debris; dust produced by clearance operations annoyed the population for several months; tons of waste were burned; and some disposal sites were established without adequate environmental consideration (including the disposal of hazardous wastes). The financial and environmental costs were devastating.[xiii]

This was in fact one of the problems faced in the wake of the 1998 ice storm but, once again, because of the lack of attention to research, it came as a surprise.

Research on Canadian Disasters

But it's not only the type of disaster and probable location that can be predicted. It's possible to predict how individuals, groups and organizations will behave during untoward events. That's because there is significant Canadian literature about disaster, ranging from Prince's pioneer study of the 1917 Halifax explosion to scores studies produced by the Emergency Communications Research Unit (ECRU) at Carleton University.

This includes studies of floods, snow emergencies[xiv], forest fires[xv], tornadoes[xvi], a mudslide, an ocean storm[xvii]. It examines everything from panic to the role of media[xviii]. There are studies of gender and of convergence, or over response. There is a look at how volunteers from Massachusetts influenced emergency response in Canada[xix] at evacuations and warnings. There is a review of fire departments in a disaster[xx], of the police role in evacuations[xxi] of a hospital fire.[xxii] There is a history of Canadian emergency planning.[xxiii] We know a great deal about what happens when disaster strikes.

However, Canada's population is small and scattered across one of the world's largest countries. In addition, Canada is not normally subjected to events that cause enormous destruction and loss of life. Therefore, Canadians believe wrongly – "It can't happen here!" That makes it tempting for Canadian governments to ignore planning and be caught short when events occur.[xxiv] Therefore, though there is sufficient Canadian experience and research to show how individuals, groups and organizations deal with disaster – and to predict future behaviour – and though these lessons are well documented and clear, they are often not applied. Even though the future threatens to bring more serious incidents, the evidence is that we will not be better prepared.

While the focus is on environmental emergencies lessons are often transferable from one type of disaster or another. After the 1917 explosion, Halifax had nearly 2,000 bodies.[*] It handled these quickly and efficiently because of experience with bodies from *Titanic.* The morgue for *Titanic* was used again, the man who managed the morgue in 1917 was the son of the man who did that job in 1912. Dealing with bodies at this level is very different from dealing even a few hundred bodies, especially if those are in one location, as after an air crash. But that lesson from Halifax was not documented until 1998 and is still not generally accepted[xxv] though it applies directly to mass death in environmental emergencies such as Kobe. Similarly, the parallels between the Halifax explosion [caused by a shipping collision], the 1974 Darwin Cyclone [Cyclone Tracy] and the 1995 Kobe earthquake led the author to examine response to seaport disasters. The finding was that while seaports are exposed to disasters, they could benefit from an ocean-based response because while roadways and rail lines must be repaired the sea repairs itself.[xxvi] The lessons had been there for a century but had been ignored.

Defining a Mass Emergency

The term "mass emergency" is used because a first lesson from research is that there is a vast difference among accidents, disasters and catastrophes. These differing events create different problems and call for different response.[xxvii] The ice storm showed most planning ignores this: instead planning is based on the idea that disasters and catastrophes are simply large accidents.[xxviii]

Accidents are usually at a specific, small geographic area. They are rarely the result of environmental hazards. The plane crashes at Gander, Dryden and Fredericton were accidents as was the train wreck at Hinton, Alberta. While all caused injury and loss of life, none threatened a community and all were handled, for the most part, by established emergency agencies. While many accidents result from human or technical failure, environmental conditions may play a role. Canada's worst maritime disaster was the sinking of the *Empress of Ireland* in the Gulf of the St. Lawrence on April 25, 1914. She sank 14 minutes after a collision when a sudden, thick fog eliminated visibility.[xxix] Weather was also the cause of three US destroyers running into Newfoundland during World War II[xxx] (costing 243 American sailors their lives) and there were weather problems – a force six gale and mist – when Steamship Tanker Arrow ran aground in Chedabucto Bay in 1970, creating a major oil spill.[xxxi]

[*] Canada has had no mass death situations of this magnitude as a result of an environmental emergency though this would be true elsewhere but, as the article shows, the data from Halifax is directly relevant to the situation after the most recent earthquake in Kobe, Japan.

In contrast to accidents, disasters may cover a wide area, pose a continuing threat and are usually, initially, responded to by survivors. The 1987 Edmonton tornado disaster ravaged the entire East Side of the city and part of neighbouring Strathcona County. There was no "site" and no possibility of site control. That is very different from an air crash or train wreck. A catastrophe is different again. It targets among other things the community's ability to respond. The only Canadian example is the Halifax explosion, which has become part of Canadian folklore though many lessons it could have taught us have been ignored.[xxxii] But many environmental events are catastrophes, Hurricane Andrew the most recent example. A major earthquake at Vancouver could easily be a catastrophe, especially if the dykes liquefied at Richmond and bridges collapsed.

An accident is managed mostly by emergency agencies. They control the site – and there *is* a site – identify the problems that need attention – fires, toxic spills, injuries – and look after them. Firefighters deal with fires and toxic spills and heavy rescue, ambulance with the injured, police with site and traffic control and overall investigation. In disasters and catastrophes – as opposed to accidents – the victims are the first responders. They do the initial search and rescue, make the initial medical decisions, decide where to take the injured and do so themselves. At the Evergreen Mobile Home Park in Edmonton, the bulk of the injured was moved to nearby medical centres by private vehicles driven by survivors before the first emergency personnel arrived. By the time emergency agencies became fully involved, it was not known what had already been done. The survivors had left.[xxxiii]

Because in disasters and catastrophes the initial response by survivors changes the situation, emergency agencies must rethink their approach to planning and response. For example, because initial medical transport is done in private vehicles, triage (sorting of the injured) must take place at medical centres. Equally important, hospital staff will have to remove injured persons from cars, something they don't normally do. It would make more sense if some of those trained to do this – firefighters and ambulance personnel – responded to hospitals, rather then to impact areas.

In short, one problem in official response to disasters is that this response is made as if the event were an accident. Yet, as Scanlon and Hiscott show, the informal response follows patterns and Emergency Medical Service (EMS) personnel do get involved early enough and in enough ways to alter the system – if they understand it:

> The report is on one incident; so its findings are tentative; but they are dramatic. They show – as others have suggested – that victims play a key role in response, as do others – friends, neighbours, police, firefighters and – more than has been realized EMS personnel. They suggest EMS works differently from the way those in the system envisage; they also suggest that there is a system that may be more manageable than has been suggested.[xxxiv]

These authors suggest that early arrivals at nearby hospitals – usually the least injured – be sent to hospitals further away, leaving the nearest hospitals free to handle the more seriously injured, who arrive later. They also show that with a proper EMS system this could have been possible in Edmonton:

> One finding from Edmonton was that police did make some decisions about where victims were sent. But police were not part of the EMS system.[xxxv]

Partly because they were not aware of the overall hospital situation police ended up sending the victims to the hospitals that had already received the most casualties.

The fact that an incident causes injury and death does not make it a disaster and few or no injuries and no deaths does not make it an accident. The 1998 ice disaster caused few injuries and deaths yet disrupted scores of communities. In contrast, many accidents cause massive loss of life without threatening communities: air crashes, usually at or near airports, are often handled entirely by emergency personnel.[xxxvi] The important thing – in terms of the nature of response – is not whether there are injured or dead but whether the incident is an accident or disaster.

It can be difficult to determine whether an event is an accident, disaster or catastrophe. The Swissair crash off Peggy's Cover scattered debris over the ocean and required a massive and sustained response. Yet it *was* an accident. It did not threaten to or impact on a community or pose a continuing threat. In contrast, the tire fire disaster in Southern Ontario – where 14 million used rubber tires burned for 18 days – was in one location but it forced the evacuation of nearby residents, the shutdown of one school, created toxic problems for farmers and threatened to force evacuation of Hagersville downwind. By the way, it was wind direction that helped determine whether the tire fire would force further evacuations. It was rain that determined if emissions from Chernobyl would hit a particular area in Europe.

Myths About Human Behaviour

Although the reality of disaster is well documented, emergency plans are not adjusted to this reality. The plan for the Regional Municipality of Ottawa Carleton prior to the ice storm assumed that an emergency would be at one or two specific sites and foresaw an Emergency Site Manager "in command and control of all operations at the site" and a restricted area around the site. It assigned the police responsibility for "traffic control to facilitate the movement of emergency vehicles and restrict access to essential emergency personnel". The Region adapted well to the differing conditions of the ice storm,[xxxvii] but the plan is typical.

Why aren't plans adjusted to reality? One answer is that although individuals perform well in mass emergencies – they can look around and see what needs to be done vicinity -- organizations are not so effective. It is difficult for them to know what is going on – in widespread disasters and catastrophes with communications in disarray and transportation routes often blocked, it takes time to gather accurate information. There is also too much to do with limited resources. But there are also problems because officials tend to believe and act on myth.[*]

The first myth – one that has led organizations to hold back warnings -- is that individuals will not be able to cope with accurate warning messages and that panic will occur. In fact, panic does not occur in threatening situations. A study by Rick Ponting of explosions in two Canadian chemical plants showed no panic.[xxxviii] Even when panic appears to have occurred – such as at

[*] For a detailed account of disaster myths see: T. J. Scanlon ((1992) *Disaster Preparedness: Some Myths and Misconceptions* Easingwold: The Emergency Planning College

football stadiums – careful study shows a great deal of helping behaviour. The concern about panic is especially relevant to weather warnings. The first discussion in Canada came 44 years ago when Tyhurst argued against too much warning too soon – stressing that information must be accurate:

> Previous information and planning can…be unfavourable if delivered at intervals in a startling or alarmist fashion or if they deal in generalities without concrete references as to what should be done…. Again, an information program, if not concrete, matter-of-fact and action oriented, may serve to 'sensitize " the public rather than inform it. This may lead gradually to a chronic and explosive state of anxious anticipation which is simply triggered by the disaster.[xxxix]

Scholars worry not about panic but about "absence of panic", the reluctance of persons to believe the explicit warnings. Continual attempts to warn Toronto about Hurricane Hazel were largely ignored. Similarly, staff at the Edmonton trailer park laughed at a man who told them a tornado had hit the city. They said tornadoes do not happen in Edmonton. Yet 25 years earlier Low and McKay in *The Tornadoes of Western Canada* noted:

> …tornadoes do occur on the Canadian prairies, and much more frequently than is commonly supposed. Due to rather sparse settlement…they frequently pass unnoticed, leaving as their mark only a shattered barn on some outlying farm, or a swath of uprooted, twisted trees cut through woodland. It is only when one of these vicious storms strikes through a town or village – such as Kamsack in 1944, or Vita in 1955, that Canadians are shocked to realize that they are not immune.[xl]

They could have added the 1912 Regina tornado, the worst until Edmonton.[xli]

When scholars feel that a myth is no longer a concern something soon dispels that feeling. For example, in May 1987, forest fires destroyed two communities in Northern China. When the fire threatened a third, town, community leaders convinced that a warning would cause panic were still reluctant to act. When a warning was issued at 11 p.m., most residents were in bed. Wen the fire struck 10 minutes later, 25 persons died.[xlii]

The fear of panic is not the only reason warnings are held back. Kueneman and Ross found that there were warnings from Detroit but not Toronto when a tornado struck Windsor, Ontario in 1974. Because Canadians ignored the US warnings – which tend to be frequent – they were not prepared for the deadly impact.[xliii] There were similar problems when a tornado struck Regina in 1979. The warning was issued half an hour after impact.[xliv]

The second myth is that victims will be dazed and confused and in shock, unable to take care of themselves and other survivors. This is why emergency agencies focus on search and rescue and why rescue teams are rushed in to assist after destructive events and explains the emphasis on evacuation. Even in the most destructive events, survivors do the search and rescue: after the Mexico City earthquake, local people did 99 per cent of the rescue work. Even in Tangshan, China in 1976, when an earthquake led to a quarter of a million deaths, many survived because they took immediate protective action:

> Some people…crawled out of the debris, on their own, and went on to rescue others. They were the backbone of the rescue teams. It was to their credit that 80 per cent of those buried under the debris were rescued.[xlv]

Evacuations are appropriate when there is a significant threat – as was the case south of Winnipeg in 1998. They are also appropriate when a threat continues – as at the Mississauga train derailment. They are not appropriate when the danger has passed and victims wish to start rebuilding their shattered lives. Even in a nuclear emergency it may be better for persons to stay protected at home than to travel, quite possibly along with an emission. (One reason for the deaths in Bhopal was that victims ran in the direction of the release.)

The third myth is that emergencies result in lawlessness and that police and other personnel prevent looting. The fact is that crime rates tend to fall in the wake of disaster. That was shown in Mississauga after the train derailment and during the ice storm. In both places there were few thefts or other crime. Similarly, there was just one theft of damaged property in Peace River after the 1992 flood by someone who had a criminal record.[xlvi] There are two reasons this myth persists. One is that disasters are seen as similar to riots. The other is that any crime during a disaster is labelled looting.

The fourth myth is called role abandonment. It is the perception that emergency personnel will abandon their responsibilities and attend to their families. Emergency personnel who are with their families will remain with them until they are looked after. There is *no* evidence those on duty will leave their posts. Dynes and Quarantelli report:

> In our experience over the years, in over 100 disasters and in the course of interviewing over 2,500 different organizational officials, we found that role conflict was not a serious problem, which creates a significant loss of manpower.... In fact, we had difficulty in finding any illustrations of the phenomena, let alone documenting the pervasiveness of it.[xlvii]

Research after the 1985 Mexico City earthquake support this:

> Likewise there were no role conflicts that behaviourally led officials to abandon or fail to assume their work responsibilities. Those on duty at the time of the earthquake, such as at the metro system, remained at work although they felt concern about their family members and co-workers. The psychological concern about others did not lead them to leave their jobs. Those who were not at their jobs at the time of the impact, as in the Red Cross, usually thought immediately they would be needed at their place of work, and proceeded to go there as best they could. There was not much delay in getting to work locations. Thus, whatever role conflict existed, it was resolved in favor of their organizational role.[xlviii]

The myths survive partly because of media reports:

> …officials will not issue warnings because of a fear that will cause panic. Emergency personnel and volunteers respond in such large numbers they sometimes become part of the problem. Police say the victims can't cope and order evacuations even if there is no continuing threat. Police also use badly needed resources to prevent looting. The media often

> report inaccurately or leaving things out by taking what E. L. Quarantelli…calls a "command post" view of disaster response.[xlix] Instead of focusing on what people do well and on the problems [of] organizations, the media stress " the negative about individual behavior…focus on the positive about organizational behavior.'[l]

After reviewing the broadcasts of the main radio station in Prince Edward County after a 1977 snow emergency, Scanlon and Taylor reported:

> ...most of what the public was told was what the OPP [Ontario Provincial Police] wanted them to hear. Radio, on the whole, did not chase its own stories…. There was no information, for example, about fuel deliveries. There was no information about just why the phones were acting up…. And there was no indication of how people could reach CBers or snowmobilers if they wanted emergency help…. Missing are the stories about dairy farmers and the orchard operators. Missing, too, are most of the stories about neighbourly help. And missing are the specific stories of the losses to industry.[li]

Other Misunderstandings

There are other misunderstandings that plague emergency planning and response. One is that there is no awareness that official response alone can cause congestion. That was hinted at in Fritz and Mathewson's monograph *Convergence Behavior in Disasters: A Problem in Social Control*[lii] but not fully documented until ECRU's study of the Ontario tire fire. That study showed that convergence may occur at more than one point and may come in waves. It also showed that the overload of personnel, material and information could be enormous.[liii] During the 1998 ice storm, information flowing to Ontario's provincial operations centre almost overwhelmed that centre.

Another concern is that heads of emergency agencies dislike for politicians and leave them out of planning and response. Yet research shows that effective planning is more likely if the elected head of government has been involved in that process. The elected head will become a key player in the response whether or not he or she has been in on the planning.[liv] Given this the reluctance of emergency officials to involve elected persons and the reluctance of elected officials to get involved in exercizes needs to be overcome.

There is also evidence that mitigation efforts may have untoward effects. The floodway helped save Winnipeg from flooding. But south of Winnipeg and in other areas dykes have been a mixed blessing. In Ste-Agathe, Manitoba, and Pemberton, British Columbia, floodwaters came from an unexpected direction and dykes prevented it from moving on.[lv] Mitigation efforts can encourage persons to take risks – for example, build on flood plains – increasing the impact of major incidents. Hewitt and Burton warn:

> …emergency plans must take account not only of the problem of the very rare disaster, but of the reluctance of the population to recognize its existence even when it is in progress.[lvi]

Until very recently, emergency organizations were headed by and staffed with males. Women were non-players. Thus, the belief that women should be relocated during a disaster, leaving men

to deal with the problems, whether these involve building dykes to head off a flood threat or protecting homes during a threatening forest fire. When a mudslide struck Port Alice, British Columbia, in 1975, the Royal Canadian Mounted Police (RCMP) corporal ordered women and children should be evacuated first. Women were told to leave whether or not they had families or skills needed by the partially evacuated town.

> Women -- particularly the more educated women -- objected very strongly to the chauvinistic character of the evacuation. Women in responsible positions -- the municipal staff -- objected so strongly that they finally stayed behind.[lvii]

A study after the 1997 Red River floods showed that there are significant differences between male and female experience before, during and after a disaster and that these are not understood. One finding was that women were more likely to believe accurate warnings and urge action that would have had positive results.[lviii]

It may be that changing lifestyle patterns will invalidate current research findings. In a lecture at the Australian Emergency Management Institute, Scanlon questioned:

> Who should stay and who should report to duty when one parent is a police officer and the other a nurse? Who should stay and who should report to work when one spouse is a civil engineer and another is a firefighter? What about when one is a chemist (with knowledge of hazardous chemicals) and the other a teacher (and an incident occurs while children are at school)?[lix]

Both the Darwin (Australia) Cyclone and the Canadian ice storm indicate that key emergency personnel may not be the traditional police, fire, and ambulance. In Australia, the first need was for persons to drive heavy equipment and clear the blocked roads. After the ice storm, the key responders were those who restored downed power and telephone lines:

> Is the current situation -- that sees individuals put emergency duties ahead of family needs -- valid? Does it make sense, given the relative importance of family and emergency agencies, especially in the early stages of disaster response? Is it possible we have it all backwards?
>
> Planning involves looking ahead. It is time to examine how the changing nature of the family may affect emergency responsibilities. One way to start would be to have traditional emergency agencies survey their staff to see how many are single parents and how many have spouses with emergency responsibilities. The next step would be to examine those with problems or conflicts then work out some solutions: perhaps writing these persons out of emergency plans, perhaps working out child care arrangements, perhaps meeting with other emergency agencies to discuss priorities. The individuals surveyed could also look at the organizations they deal with regularly -- schools, churches, sports groups, interest groups. They could pressure these organizations to develop their own plans. A school plan, for example, would have to concern itself not just with children but with the conflicting pressures that might face teachers.[lx]

Another approach may be to try and educate persons about disaster. Disaster response needs to be taught in schools and where families meet, home and school meetings and at churches. This

may lead to innovative ideas. One problem in disasters is that when emergency agencies finally arrive in impact areas they don't know who has been moved or who was away at time of impact. Effective search and rescue is hampered by inadequate information. When seniors asked what they could do in an emergency, it was suggested they could track whom in their immediate neighbourhood and note who was moved during the initial response. They could provide this information to emergency personnel.

The hunger for learning and the willingness to act is at its maximum in the aftermath of an incident. The American children's program *Sesame Street* defines this period as a "teachable moment". It would be helpful if emergency planners were ready to exploit these opportunities when an incident hits a community or is widely reported. A tornado anywhere can be used as a reminder that tornadoes do hit Canada. Over the past half century, for example, Ontario had destructive tornadoes hit Sarnia, Windsor, Sudbury, Woodstock and Barrie. Education may also be timed in advance of seasonal threats.[lxi] For example, much of the country has occasional snow emergencies. Singer and Green describe the storm that struck Southwestern Ontario in January 1971:

> Winds of 100 miles per hour (161 kilometres) hurled across Lake Huron, visibility diminished to eight feet (2.4 metres) with temperatures as low as 15 below zero (-26 Celsius)…. The streets soon became totally unusable for vehicular traffic, with hundreds of cars stranded and abandoned on London's major streets…. Thousands of school children were stranded were as long as two days in area schools…. The premier of the province himself [John Robarts] was stranded at a highway station on Highway 401 for 25 hours.[lxii]

Canadians forget events like this when they make fun of Toronto's snow storms and the city's decision to ask for military assistance to clear up the mess.

There is another lesson. The world of emergencies is changing and some problems are now hitting not just one community but a number of communities at the same time Incidents in one jurisdiction impact others downwind, down current or down stream. Scores of incidents that have crossed borders. As this is being written, the eastern sky is darkened by smoke from forest fires in Alberta.

Time will bring changes in the type of events that occur and their impact. Once the threat of large loss of life in a single incident was tied to ocean travel. Now it is tied to air travel. More significant as more and more Canadians live in large urban centres the possibility that an incident will have major impact grows. If the Edmonton tornado had occurred 50 years earlier it would been unnoticed. In another half century the same event would cause greater destruction. Changing life styles alter the ability to cope. Rural residents used to have resources to sustain themselves in isolation. Now most are commuters, confident that they can get needed resources in minutes by driving to a nearby store.[lxiii] [lxiv] Rural residents have also become accustomed to electrification: one problem during the ice storm was the inability of farmers to milk their cows, a problem addressed, in part, by the Canadian Army:

> In one instance, the [the Army] assisted a dairy farmer who, because of the power outage, had not been able to milk his herd. An officer found two soldiers raised on farms and they milked the cows by hand.[lxv]

Another concern is the persistent belief that somehow new developments in technology will solve problems. The cell or mobile phone was hailed as the answer to crisis communications. Yet it failed continually in the United Kingdom and in Canada. The ice storm showed that it might be impossible to assess failures except by direct personal observation. This was true for traffic lights, gas, telephones and electric power. In all these cases, the computerized telemetry systems failed.[lxvi]

> There seems to be a belief – it was certainly reflected in the driving forces behind the creation of the IDNDR – that technology provides the solution to our problems. The best way to counter that belief is to show that the way our ancestors dealt with catastrophic events was, for the most part, very little different from the way we deal with them and that there is little evidence things will be different in the future.[lxvii]

The Future

The biggest concern is that there is little evidence that we are learning from experience. As Hewitt and Burton point out, despite the threat of floods we keep expanding construction along river valleys. Despite the earthquake threat, we keep expanding construction in Vancouver and in neighbouring Richmond. When events do occur, the response is to restore rather than innovate. After the ice storm, power lines were again placed overhead, ready for the next such storm. There were no plans to take advantage of the storm by restoring lines underground.

Thus the main conclusion from a review of the Canadian disaster experience is that the future will offer more of the same – as well as new experiences -- and that things will be worse rather than better. Even though the lessons from the past are clear, it does not appear that we have learned them. The Canadian disaster story is one of lessons learned and lessons promptly forgotten. We have the experience. We have documented that experience and noted the lessons that it should teach us. But we have put aside or forgotten what we have learned:

> If we look…from the present to the future, it is very clear things are going to get worse. We are going to be faced with more and worse disasters in the future no matter how much disaster preparedness and personnel could have or could improve. The future, insofar as disasters are concerned, is certain to produce not only quantitatively more disasters but qualitatively worse kinds of disasters than we presently have or have had in the past.

Those words are from a paper by one of the world's leading disaster scholars, Henry Quarantelli. He called his paper "More and Worse Disasters in the Future".[lxviii]

Despite these alarming trends, governments are spending less rather than more on emergency planning and response. The federal government once concealed its civil defence plans from the provinces but later adjusted until it was providing assistance for both war and peace contingencies.[lxix] But it and most provinces have cut back substantially. Some once well-staffed emergency organizations are now literally remnants of their former selves.

Since there is an amazing amount of untapped material on past disasters[lxx], one step in the right direction may be to spend more time appraising past events and documenting their lessons. One example is the superb study of the response in Saskatchewan to the 1918 influenza epidemic.[lxxi] During the past century, we dramatically changed the way we travel, the way we communicate and the way we manage organizations and store data. But we have created many new threats to human survival including increasingly complex and dangerous chemicals and we have started to concentrate our populations in cities so large that a future earthquake or meteor could kill millions.

Yet history suggests that the way we deal with the problems created by disaster is not changing that much. A close look at Kobe in 1995 bears a remarkable resemblance to San Francisco in 1906 and Halifax in 1917. In all three communities, there were major fires and difficulty in fighting them and enormous problems in transportation and communication. In Kobe and San Francisco there were serious problems in obtaining water. A quote by George Santayana deserves to be on the wall of every disaster researcher and disaster planner: "Those who cannot

remember history are condemned to repeat it."[lxxii] A French expression says it more simply and equally well: "Plus c'est change, plus c'est le meme chose".

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[ii] Singer, Benjamin D. and Lyndsay Green (1972) *The Social Functions of Radio in a Community Emergency* Toronto: Copp Clark

[iii] Scanlon, Joseph (1998) *Ice Storm 1998 Sharing the Lessons Learned* Ottawa: regional Municipality of Ottawa-Carleton

[iv] ------ (1996) "Natural Hazards" Ottawa: Natural Resources Canada

[v] Scanlon, Joseph with Kim Dixon and Scott McClellan (1982) *The Miramichi Earthquakes: The Media Respond to an Invisible Emergency* Ottawa: Emergency Communications Research Unit

[vi] "Natural Hazards" *op. cit.*

[vii] Enarson, Elaine and Joseph Scanlon (1999) "Gender Patterns in Flood Evacuations: A Case Study in Canada's Red River Valley" *Applied Behavioral Science Review* Vol. 7 No. 2 p. 107

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