MANAGEMENT OF HUMAN BEHAVIOUR IN DISASTER

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PREFACE

This book was written at the request of the Department of National Health and Welfare. It is directed primarily to those citizens who are responsible for dealing with disasters or emergency situations in our society. This is a broad audience, covering civic officials and government representatives, educational and community leaders, as well as members of those protective, service, health and welfare agencies whom we ordinarily expect to help in emergencies—such as medical personnel, firemen, the police, the Armed Forces, the clergy, the voluntary agencies and welfare organizations. The objective is to provide readers with reliable information about what happens in a disaster, how people behave, the kinds of problem that arise, how problems can be managed, and how planning and preparation can reduce casualties and suffering on the one hand and facilitate recovery on the other. The rationale is that if we know what to expect in an emergency, we will experience fewer surprises and less shock, and we can plan and prepare for the situation.

The material for this book has been drawn from a large number of investigations of natural disasters, of the bombing of cities in World War II, and of the nuclear explosions over Hiroshima and Nagasaki in 1945. Human behaviour is sufficiently consistent in such different emergencies that we can predict, broadly speaking, how people will react in extreme situations. This fact enables us to formulate a number of general findings together with the lessons they suggest. On the other hand, the details of behaviour and problems generally vary with particular circumstances. This means that precise prediction requires detailed knowledge of the special conditions in which behaviour occurs. Because such detailed foreknowledge is seldom available, and because there is still much to learn about human behaviour under stress, we would not be justified in spelling out prescriptions for the management of human behaviour in disaster. Thus the approach has been to describe people's reactions, to discuss the different principles and conditions which underly particular kinds of behaviour, and to offer guidelines for dealing with problems. This leaves the necessary room for experience and judgement in the utilization of the information.

This book is based on the work, research and ideas of many others, especially the social scientists who have done systematic studies of human behaviour in energency situations. I would like to acknowledge my general debt to these dedicated men and women.

A number of colleagues in the social sciences have contributed directly to the conception, content and style of this work. Craig M. Mooney of the Department of National Health and Welfare was generous with counsel and encouragement from the book's inception and offered invaluable suggestions after reading an early draft. I am greatly indebted for the advice and assistance of three men who were colleagues in the investigation and reporting of the Springhill mine disaster, George W. Baker of the National Science Foundation, Rex A. Lucas of Toronto University, and Robert J. Weil of Dalhousie University. William H. Gaddes of Victoria University and Ernest G. Poser of McGill University read the manuscript from the point of view of the behavioural scientist who has not specialized in disaster studies. They offered valuable suggestions, which have contributed to the style and clarity of the presentation. F.C.R. Chalke, the Chairman and Members of the Defence Research Board Panel on Psychiatric Research read the manuscript and contributed suggestions that were particularly useful for improving the organization of the material. I was also

fortunate to have readers who are actively engaged in emergency measures work. Gordon Grant of the Emergency Measures Organization for Nova Scotia, Herbert B. Kunde of the United States Office of Civil Defence, G.G. Pirie of the Federal Emergency Welfare Services for the Atlantic Provinces, and E.J. Vickery of the Emergency Measures Organization for Halifax, all contributed frank and pertinent observations and suggestions. Few books come to completion without the efforts of some man behind the scenes. David Kubryk of the Federal Emergency Health Services played the role in this case; he was patient and forebearing, he offered words of encouragement, and he kept the goal and deadlines ever before me. Finally, I am indebted to my wife, Maxine, for her very positive support and encouragement throughout the endeavour.

H.D. Beach Ph. D.

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INTRODUCTION

Summary

Canada has suffered a considerable number of disaster, from floods, fires, hurricanes, major transport crashes, and explosions, to an earthquake that changed the course of a river; accidents take the lives of thousands of Canadians each year and cause millions of dollars worth of damage; and Canada is becoming more vulnerable as the population increases and becomes concentrated in cities– several of which are in areas susceptible to earthquakes. It is important to face the possibility of emergencies, including nuclear disasters, because an emergency prepared for ceases to be an emergency. Recent studies of disaster have dispelled a number of misconceptions about how people behave in extreme emergencies: panic and irrational behaviour are rare in disasters, looting is a minor problem in most disasters, survivors are not reduced to a helpless and dependent mass, survivors seldom think only of their own welfare, and disasters do not produce mental illness. Although a disaster produces social chaos and much suffering, fear, and anguish, the survivors usually demonstrate a great capacity for endurance, mutual aid, and recovery.

Disaster Strikes

On the morning of December 6, 1917, the city of Halifax was devasted by the greatest explosion in history to that time. Some 225 tons of high explosives in a ship in the harbour blew up. Three hundred acres were leveled, over 2,000 people were killed, 6,000 were injured, 200 were blinded, and 10,000 were rendered homeless—out of a population of 50,000.

It was like a small atomic explosion. Suddenly and without warning a giant mass of flames shot high in the air and a tornado-like blast wave which uprooted trees, snapped poles, stopped trains, threw cars and people about like chips, collapsed houses, and filled the air with flying debris and glass. Within minutes the whole area seemed to break into flames as innumerable fires started up. The explosion created a tidal wave six feet in depth, which swept over the piers and embankments into streets, drowning nearly 200 people. To add to the catastrophe, freezing rain, thunderstorms, two blizzards with 17 inches of snow, and zero weather descended on the prostrate city in the four days following the explosion.

The social system which cares for the usual needs and crises in a community's life, such as accidents, deaths, fires, traffic problems, and the provision of supplies and utilities, was completely disrupted in Halifax. Some of the key people for such emergencies were killed—the Fire Chief and his deputy were killed by the explosion. The disaster created a great overload of emergency needs and problems and there were not nearly enough doctors, nurses, medical supplies, food, clothing, shelter and transport. Moreover, the widespread destruction, the complete disruption of communications, and the extreme urgency of all problems made for utter disorganization.

Under such conditions it might have been expected that people would 'panic', go to pieces, and behave in a very disorganized and irrational manner. However, as in nearly all disasters, most of the people kept their heads. A city comptroller assumed command of the fire brigade and the city firemen remained at their posts. Survivors freed themselves from smashed buildings and piles of rubble, they rescued and cared for the injured, they sought out and cared for their families, and they took on various tasks throughout the emergency period. Indeed, most of the people behaved in a heroic manner, with an exhibition of hard work, sacrifice, and incredible endurance. People who were themselves seriously injured worked with the others. There were many instances of men who worked for five days without a break. The general mood and practice was one of helpfulness and mutual aid. Cafes served luncheons without charge, drugstores handed out medical supplies, businesses released their clerks to assist in rescue and relief work, and relief poured in by road, rail, and sea. As an illustration of the spirit of helpfulness which prevailed, nearly one thousand offers for the adoption of orphaned children were received.

As in many other disasters, the Army and the Police were the first organizations to move in and provide a skeleton social system to carry out emergency tasks of rescue, care and treatment, transportation, protection of property, and of distribution of food, clothing, and other supplies. They were soon joined by the local Red Cross, the Salvation Army, a quickly formed Citizen's Relief Committee, and other groups. However, for the first few days the efforts of these groups were relatively uncoordinated and inefficient. The Boston unit of the American of the

American Red Cross, with its history of experience with disasters, moved in and initiated the establishment of an adequate headquarters and an overall plan of organization. Assisted by the Public Safety Committee of Massachusetts, this resulted in an immediate increase in coordination and efficiency.

The personal behaviour and experiences of the survivors of the Halifax explosion illustrate some of the ways in which people react to disaster. At first there was widespread shock among the survivors. They were stunned and overwhelmed by the catastrophe; their facial expression was that of blank immobility, sometimes lined with terror; they appeared to be in a daze as they freed themselves from the ruins and helped others; they showed little or no reaction to the pain of their own injuries; there was very little weeping or crying, and they showed little emotional reaction to the scenes of destruction and suffering about them; they talked very little with one another, but went about the job of helping others in a routine and almost stunned manner, communicating with nods and silent gestures; and some lost the ability to recognize friends and even family members. Nevertheless, a large proportion of the survivors behaved in a relatively rational manner, and worked efficiently and untiringly through the emergency period.

When, one hour after the explosion, the news, or a rumour, was spread that another explosion was likely in the Navy-Yard, the survivors turned and headed southward to the open spaces. Some carried children or bundles of things which they picked up as they fled, many were scantly clad, some in their night dresses, a few stark naked with their bodies blackened with soot and grime. The City was emptied in minutes. When soldiers reported that the danger of a second explosion had passed, many of the survivors moved back into the City to continue search, rescue, and salvage operations.

When the immediate danger had passed, a number of cases of looting were observed. Beer was taken from the shattered breweries; the pockets of a few victims were rifled; articles of clothing were taken. Some days after the explosion, another kind of anti-social behaviour developed, namely, profiteering.

> Landlords raised their rents upon people in no position to bear it....Plumbers refused to hold their union rules in abeyance and work one minute beyond the regular eight hours unless they received their extra rates for overtime; and the bricklayers assumed a dog-in-the-manger attitude and refused to allow the plasterers to help in the repair of chimneys....Truckmen charged exorbitant prices for the transferring of goods and baggage. Merchants boosted prices. A small shopkeeper asked a little starving child 30¢ for a loaf of bread.

When the main shock had worn off and the dead were buried, the survivors began to exibit annoyance and hostility. They resented the professional business-like efficiency and detached attitude of the social service groups which were handling survivor needs; they objected to the card catalogues, forms to be filled out, and to being treated as "cases". There was a great

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1From *Catastrophe and Social Change*, by S.H. Prince, New York: Columbia University Press, 1920. p. 51. Used by permission.

clamour for the fixing of responsibility for arresting the culprits. German residents of the City were immediately suspected and placed under arrest.

As usually happens after such a terrifying and stressful experience, many of the survivors were anxious and fearful for some time after the explosion: they were jumpy and sensitive to sudden noises and lights; some experienced emotional upsets; and the population was generally apprehensive – on at least two occasions schools were emptied of pupils whem rumours of new dangers were circulated.

In spite of the numbers killed, the great destruction, and the widespread suffering, Halifax survived. On the whole, the behaviour of the victims was a credit to the toughness and moral character of the people. And relatively few of the survivors suffered long-term psychological effects.

Vulnerability to Disaster

The Halifax explosion was the most devastating disaster to strike a Canadian community. It happened a long time ago, and most Canadians probably have not heard of it. Indeed, we are inclined to think of disasters as things which happen to other people in other countries, in the United States or in Japan for instance. This attitude is part of the general tendency among people to think that calamity will not strike them: "I won't get lung cancer", "I won't drown," "My heart is sound," "I won't have a car accident," In some respects such a feeling and attitude is praiseworthy and may be important for retaining peace of mind and efficiency in every day living. However, it is also to avoid facing facts and real possibilities. It is to avoid taking responsibility for oneself, for one's children, and for one's community. It is rather like believing that the training of firemen for the emergency of fires is not worth the effort. In fact, facing the possibility squarely, knowing what to expect, and having a number of alternative courses of action in mind gives much more comfort than trying to ignore the possible dangers. Moreover, it will often make it possible to prevent an accident, to prevent some of damaging features of disasters, and to manage disaster problems in a way to reduce their effects and hasten recovery.

Canada has experienced a considerable number of disasters, and is becoming more and more vulnerable to them. Explosions in the coal mines of Springhill in 1891 and 1956 took 164 lives. An underground "bump" or shifting of the rock strata in the Springhill mine in 1958 killed 75 men, resulting in closure of the mine and loss of jobs for 1,000 men. The Red River Flood in 1950 forced over 160,000 people to evacuate their homes, did untold damage, and cost over $22,000,000 for flood control and relief. The V.E. day riots in Halifax in 1945 constituted an extreme emergency situation, resulting in two deaths, hundreds of injuries, and $2,000,000 in damage. Although Canada has been relatively free from hurricane winds, their effects sometimes reached into this country, as when Hurricane Hazel killed 81, directly affected 5,455 others, and caused over $24,000,000 damage in Ontario in 1954. The earthquake which struck Cornwall, Ontario, in 1844 caused $2,000,000 worth of damage. And there have been innumerable disasters and emergencies of lesser extent: since 1959 provincial or local emergency measures organizations have participated in the handling of 120 natural disasters from coast to coast, involving fires, floods. explosions, blizzards, and major transport crashes. In addition, accidents took the

lives of 10,564 Canadians during 1964—and accidents assuredly qualify as emergency situations. Indeed, death by accidents were outnumbered only by those due to diseases of the heart, circulatory system, and cancer.

Although Canada has suffered more disasters and emergencies than is generally realized, this country has been fortunate compared to many others. In the United States there are between 200 and 500 tornadoes and from 3 to 5 hurricanes a year, resulting in over 300 deaths and about $200,000,000 damage per year. Floods cause about 80 deaths a year and $500,000,000 in damage. Lesser emergencies and accidents account for several million injuries annually, plus untold damage costs.

The United States is probably more susceptible to major disasters because of its special geography, weather, and concentrations of populations. However, authorities agree that Canada is rapidly becoming more vulnerable. The population is increasing and becoming more concentrated in particular areas; individual and community survival and welfare are becoming more dependent on complex technical means of communication and transportation; the individual's means of handling a variety of crises are being reduced with increased job specialization; the maintenance of law and order are less a function of informal social controls and are more dependent on complex and interlocking systems of legislation and authority; and even medical services are becoming specialized to the point where they may be ill prepared to handle the emergencies involved in a major disaster.

Few Canadians have died or suffered loss in earthquakes. However, six of them have occured in Canada in the last 50 years. A major earthquake, about as big as the 1964 tremor in Alaska, levelled the forests around Three Rivers, Quebec, in 1963, permanently diverting the Saint Maurice River below Shawinigan Falls. It was fortunate that there was no concentration of population in the area at the time. But the danger is not past. Indeed seismologists today have designated most of Quebec Province, including Montreal Island, as Zone 3, that is as susceptible to the most severe earthquake conditions. Five major cities are in zones which are prone to earthquakes: Victoria, Vancouver, Ottawa, Montreal and Quebec. Very few people in Canada are aware of and prepared for such possible emergencies. Even in the elementary physical matter of building construction, only a few structures like Place Ville Marie in Montreal are reinforced in a way that would enable them to weather earthquakes; most buildings where large numbers of people typically congregate, like department stores, hotels, and apartments are vulnerable because of their non-reinforced masonry walls. Thus large sections of our population are vulnerable to natural disasters and become more vulnerable by the day.

Another kind of emergency to which Canada has become vulnerable is that from nuclear explosions .To ignore this possibility is either to turn away from the facts much as a child averts its gaze when confronted with a reprimand, or it is to assume we know that it is hopeless and that there is nothing we can do about it. But do we know there is nothing we can do? How can we face our children, and our neighbors, if we have not done all that could be done? This is not to support this or that foreign policy, nor to accept the inevitability of war and nuclear disasters. It is, rather, to face the fact of this possibility, just as we face the fact of the possibility of other emergencies like fire, car accidents, and sudden illness. It is to find out what happens

in minor and in major disasters, to learn how people react and behave, and to be prepared to handle the emergency problems that arise. Man has survived great and small disasters through a long history, and he will survive disasters in the future. The important question is, how can he better face and handle the emergencies that he is likely to meet.

Misconceptions about Disaster

Many popular beliefs about human behaviour in disaster are contrary to fact and may be dangerously misleading. It could well add to the disaster if we were to accept such false notions and prepare to act in terms of them. For instance, a common belief is that people panic and stampede when a disaster strikes. Believing this, we might tend to interpret the seemingly aimless movement of people in a disaster as panic, and might act to stop or redirect their movement. This could precipitate trouble. However, if we realize, correctly, that the survivors are going about the business of search and rescue, albeit without social coordination, we will the better take part in and seek to coordinate this essential first step in recovery. To take another illustration, if officials and organizations believe, in error, that disaster leads to panic, they may hesitate to issue orders to evacuate, or they may train and prepare their resources for handling panic—while neglecting preparation for more important problems. Thus it is important to discredit and correct the misconceptions and myths which have been built up and perpetuated by news stories, fiction, folklore and speculation. Some 150 systematic studies of disasters in the last 15 years, together with intensive studies of civilians under air atack in Worlk War II, have provided facts which question and discredit these myths. Some of the main findings are summarized below.

(1) Contrary to common belief, mass panic, that is, headlong and terror-striken flight, is a very rare occurrence in disasters. Panic occurs under very special circumstances, namely, when a group perceives or believes that the danger is *increasing rapidly* and that the few remaining *escape routes* are being *blocked or closed.* The belief about *increasing danger* and *closing exits* is often a function of misinterpretation of cues, or of rumour. Knowledge of the special conditions which produce panic can enable leaders and appropriately located individuals to anticipate and prevent this kind of mass reaction. This is extremely important because if the conditions for panic do exist and it starts, the consequences may be doubly disastrous.

(2) Looting is a relatively minor problem in most disasters. In actual fact, what can be lost through looting following a major disaster is inconsequential compared to losses from the physical destruction. People have sometimes reported that they "thought" there was looting, but only a few cases have been verified. As with panic, looting tends to occur under special circumstances: when there is *a real or threatened shortage* of food and other supplies; when there is *no continuing danger* from the disaster event, when the devastated *area has been evacuated,* and when *outsiders converge* on the disaster area. Apparently some of what passes for looting is actually souvenir hunting and is not systematic, general, and exploitive in character. More often, survivors of a disaster are preoccupied with their immediate problems and have little time or inclination to think of looting. Indeed, in some instances individuals with criminal records have taken part in search and rescue operations

with no evidence of looting being reported. On the other hand, if the conditions noted above are expected, measures to prevent looting should be taken.

(3) There are very few instances of a breakdown of moral codes. Shock and the urgency of immediate problems apparently overshadow and inhibit any tendency toward sexual licence, aggression, and such forms of anti-social behaviour.

(4) Populations which have been struck by a disaster are not a dazed helpless mass. On the contrary, though they be suffering from shock and even injury, they help themselves and indeed perform much of the rescue work. For example, in the first half hour after the White County, Arkansas, tornado, one-third of the survivors were engaging in search, rescue and emergency relief activities (Form and Nosow, 1958). In other cases, nearly all of the search and rescue activity has been carried out by the survivors themselves.

(5) Disaster victims are seldom reduced to the level of thinking only of their personal survival. Indeed, family responsibilities come to the fore in emergencies, and most people are inclined to respond to the needs of others for help.

(6) Disaster-striken people generally do not exhibit outbursts of hysteria, screaming and weeping. There are usually a few cases, but they are the exception and can usually be handled without too much difficulty.

(7) While social organization tends to break down because of the disruption of communications, transport, lines of authority, and because of the urgent concern of survivors for their families, friends and neighbours, an emergency social system is established fairly rapidly. For a time following a disaster there is a tendency for individual and selfish needs to give way to compassion and group needs, and for pride in group accomplishment to develop.

(8) Emotional and physical reactions are fairly widespread following a disaster, but they tend to be temporary. Thus many people will experience one or more of such things as jumpiness, fatigue, feelings of weakness, poor appetite, difficulty in sleeping, and so on; however such feelings usually pass off within a few days.

(9) There is no clear evidence that disasters produce an increase in neurosis, psychosis, and such mental illnesses.

(10) Children generally do not cause special problems in disasters, especially if they are not separated from their parents. Their behaviour and emotional reactions are largely determined by the manner in which their parents and those about them react to the situation.

(11) Studies of disaster, war, and confinement support the old Swedish saying that a person can stand three times more than he thought he could, five times more than his wife believed he could, and ten times more than his mother imagined he could. It has been found time and again that in times of stress people can endure much more hardship, deprivation, undernourishment and shock than they had ever thought possible.

If there is one generalization that does apply to the behaviour of most people is disaster, it is that although they experience shock, fear, and feelings of inadequacy, they tend to behave in a reasonably rational manner and to handle the immediate problems with a good sense of responsibility. This is illustrated in the following quotation from an interview with one of the survivors of the Flint-Beecher tornado:

> We had just finished dinner. My wife was washing the dishes and I started to take a nap. I had just started to doze off when my wife said, 'Hey, Tom, com'n over here and look at the cloud.' She sounded kind of scared. As I was getting up I heard a terrible roar. I knew it was a tornado. I'd liven in the South. I grabbed my wife and we rushed for the basement.
>
> When it was over I looked out and had a lonesome feeling. All the houses around me were gone. Then I saw the Barkers coming out of their house, which was really a wreck. If it wasn't for my wife I would have started running, I was so scared.
>
> The three Barker children, Albert, Nancy, Mary, and Mrs. Barker were coming out of their house. I went to look for a flashlight, found it and ran over to look at them. I saw they were all right.
>
> The Jordans, other neighbours across the street, were screaming. They have three little kids. I ran across to help them. Wires were down and sparks were coming out of the wires.
>
> Irene (Mrs. Jordan) screamed, "Grandma is still in there", just as Grandma Jordan came out dripping with blood. They all came over to our house. I helped Grandma.
>
> Across the street Leonard Brown was screaming. He was Jo Ryan's boy friend. It's funny, the first thing he said to me was, 'Who are you, identify yourself.' I think he thought that an atomic bomb had hit, and that I was one of the enemy.
>
> Leonard Brown kept hollering for Jo. I knew Jo was dead 'cause I'd seen her first thing, but I said I'd look for her....
>
> We saw a headlight, and then a car stopped. I asked the man to take Mr. Ryan and Leonard to the Hospital. The man said, I'm too scared.' I said, "Mister, you're no more scared than I am." He helped me put the mattress Leonard had been lying on in the trunk....
>
> My wife and I were beginning to get worried about our daughter. We stopped the first ambulance that went by and told the driver to tell our daughter that we were all right. She works at the hospital where she's a nurse. Word never did get to her. She had already left the hospital to come home....

Davey Ryan, who was 12, got over here. Where he came from and how he got here I'll never know. My daughter had come home and she took special charge of Davey. His sister Jo was dead and his folks were in the hospital....

Then the three of us walked up and down the street to see that no one took any of neighbors' things[2].

The above quotation illustrates how a good many people feel and behave amidst the confusion, urgency, and dangers which prevail after a disaster strikes. There was no panic, because the conditions of *increasing danger and closing exits* did not exist. Suddenly surrounded by a shattered environment, the man had a strange feeling of being alone and was frightened. However, concern for his wife steadied him. The power of family ties was manifested again when he sought to inform his daughter of his welfare, when his daughter came home, and when 12-year old Davey Ryan sought out his family. Leonard Brown was so shattered by the impact that he apparently misinterpreted it as a bombing attack. Survivors actively sought out one another and gave whatever assistance they could; they helped friends and neighbours first, and only later turned their attention to the protection of property. The man with a car expressed feelings of fear and helplessness, but responded to the concrete direction of the respondent. Finally, this man undoubtedly responded particularly well because he had previous experience with tornadoes; he was able to react quickly to a brief warning, to adjust quickly and appropriately to his shattered environment and the urgent problems which he faced.

Prevention and Management of Problems in Disasters

An emergency prepared for ceases to be an emergency. If we know what problems and behaviours to expect, there will be few surprises that will throw us and produce shock. If we have thought out and practised appropriate courses of action, we are ready to deal with emergency problems more effectively. Having knowledge of what to expect and what to do, we will feel anxious, apprehensive, and helpless. Such knowledge will reduce the emotional shock, the casualties, and the problems of recovery after disaster. That this is a general truth had been shown with patients who are about to undergo major surgery: those who before the operation were realistic about the risks and consequences and who had discussed these freely with someone, had a better chance of recovery (Janis, 1958). In another study (Schwartz and Winogard, 1954) it was found that when soldiers who were about to participate in atomic bomb tests were given thorough and detailed lectures about the effects of atomic weapons, they experienced much less anxiety. Studies of cities bombed in World War II and of natural disasters make it clear that deaths and injuries can be greatly reduced when people take appropriate protective measures. Although London was severely damaged by bombing, the number of deaths was not many more than occur in automobile accidents in the United States in a single year.

While it is true that we are becoming more vulnerable to disasters in several important respects, it is also true that our knowledge and resources for handling disasters have been

[2]From Community in Disaster, by W.H. Form and S. Nosow. New York: Harper & Row, 1958. pp. 3-6. Used by permission.

greatly increased. This was well illustrated in the case of Hurricane Carla's sweep over south-eastern United States. It was 350 miles in diameter, the eye was 30 miles across, winds ranged up to 300 miles per hour at the centre, and it packed 90 times as much energy as Russia's 50-megaton nuclear bomb. Texas had experienced hurricanes before, and a well-prepared system of warnings and plans for evacuation had been drawn up. The hurricane paused for 48 hours over the Gulf of Mexico before moving inland so that people had adequate warning. Emergency plans were activated by the Civil Defence, Federal, State, and local Governments, the Red Cross, radio, television, newspapers, and other organizations and agencies that might have emergency functions. About one-quarter of a million people were evacuated, to places as distant as 400 miles. The ranchers of Louisiana, having learned a lesson from a previous hurricane, herded an estimated 150,000 cattle to safety and lost only a few. In all, the hurricane killed 40 people and 50,000 cattle, and did one-half a billion dollars worth of damage. However, it was estimated that about 100,000 people would have died had the area not been evacuated. This was a disaster for which they were prepared.

Suggested Readings

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