PART IV. CONCLUSIONS

In this section we discuss three topics.

First, we discuss ten general research themes of our findings, five having to do with organizational and five with individual behavior.

Second, we compare the behavioral similarities and differences observed in Mexico CIty with what research findings have reported elsewhere, but especially in the United States. In the more detailed examination of six major response differences we discuss what factors might be involved by taking into account the relevant literature.

Third, we conclude with some methodological and conceptual implications from our work for future research. Especially addressed are such issues as the significance of small numbers, an agent specific versus a generic approach, whether a disaster or catastrophe is being studied, the usefulness of studies in metropolitan areas in the future, and the advantages and disadvantages of cross-societal studies.

Chapter 9

GENERAL THEMES AND IMPLICATIONS

In the previous chapters, we presented a number of specific observations about individual and organizational behaviors in the Mexican earthquake and its aftermath. In this chapter we set forth ten general conclusions or themes that cut across a number of our particular empirical findings. Organizational behavior is first highlighted, then the behavior of individuals is discussed. In the process some implications are noted.

Organizational Behavior

We will discuss that:

(1) the organizational response was decentralized;
(2) organizational resources were not problematical;
(3) the dominant organizational behavior was emergent;
(4) organizational personnel carried out their occupational roles; and,
(5) there was organizational change as a result of the disaster.

1. The initial organized emergency response was massive, complex and decentralized; although limited overall coordination only slowly developed, the decentralized groups functioned relatively effectively.

Researchers have long noted that much of the disaster planning literature as well as actual planning uses a "command and control" model. This assumes that organizational responses in disasters need to be centralized with decision making at the top in formally authoritative positions (see Dynes, 1990). On the other hand, researchers have also long noted that the actual management of the emergency time period in disasters very rarely follow such a model. Instead organized responses in disasters tend to involve coordination much more than control since decision making is pluralistic and decentralized at lower levels of organizations (Dynes and Quarantelli, 1977: 24). It is believed that:

> the structural conditions of the emergency period makes for uncertainty, diversity, decreased formalization and decentralization (Dynes and Aguirre, 1979: 73).

Clearly in Mexico what we found was the second model. Through the first three days of the emergency period, the organizational

response was dominated by a substantial amount of independent actions. With the withdrawal of the military from a lead role, it required about three days for the DDF to assume legitimacy and create some coordination of the activities and for the CME to become operational. During this initial period, hundreds of public and private groups handled relatively well many problems in the areas of search and rescue, sheltering, casualty care, and the restoration of services. However, there was no overall coordination of this massive response, contrary to some outside organization views that "the Government's response was rapid and co-ordinated" (United Nations Economic Commission, 1985: 6).

For the remainder of the two weeks following the earthquake, this pattern was modified in degree, but not in kind. Thus, the DDF assumed a more coordinative role, and the nightly meetings of the CME were critical in the organizational taking on of tasks and the sharing of information at the highest levels of the metropolitan structure. However, a "command and control" structure was never imposed, there was not a top down centralized system of decision making and operations. Illustrative of this is that no central EOC staffed around the clock was ever set up. The DDF served more as a "broker", that is, as a small, social entity that identified problem areas, provided information, located resources, and facilitated contacts between different groups. What came into being was what earlier researchers have called an "emergent resource" model of operation (Dynes, 1983). An inherently decentralized response pattern remained, although there were pockets of segmental coordination occurring among some organizations working at the same tasks.

While the general research literature assumes that a decentralized response is typical in disasters, there are some writings that suggest a possible qualification for what might happen in highly centralized societies, especially in developing countries. For example, McLuckie (1975: 8) hypothesizes that in more centralized societies, emergency management will be dominated by a few positions that are high in political organizations in the system. Anderson (1969b) suggests that there is a tendency for military organizations to assume a larger role in disaster response in centralized and developing countries. Others, such as Clifford (1956), have also observed an increase in centralization in organized response activities in disasters outside of the United States; in fact, he was reporting on a flood along the Rio Grande River and an hurricane disaster in Tampico, Mexico. But he also did report that there was a tendency for Mexican disaster victims to rely more heavily upon family and relatives and to be less responsive to officials than victims in the United States. Kennedy (1982) also, after looking at the organizational activity and the military describes a rather centralized and from the top down operation in a 1965 earthquake in Chile.

Why then did a decentralized response occur in the Mexico City earthquake? A number of factors are relevant. First, the demands created by the earthquake were extensive. There was major damage to the infrastructures and resources of many governmental agencies. This was unlike many disasters where the key organizations are directly untouched and remain available to be mobilized and used in whatever way is necessary. Furthermore, while the earthquake effects were diffuse throughout the metropolitan area, the physical damage and destruction was concentrated in certain neighborhoods, blocks and streets, all of which fostered immediate action on the part of local, independently operating groups.

Second, the nature of the disaster precluded the implementation of the military plan, DN-3 which formally provided for centralized control. Therefore, the response of almost all organizations was not guided by any overall planning and exercising or by a similar earlier experience. Authority and coordinative action, like most other aspects of the response, had to be improvised. At the system wide level, even a semblance of coordination took time; in this case, approximately three days. While intraorganizational coordination among autonomously responding groups was easier to achieve, this did not occur in all groups.

Third, and most important of all, the pattern of relationships that emerged after the earthquake was consistent with everyday patterns within the **DDF** and Mexico City. During routine times, public organizations and agencies within the city operate informally with considerable autonomy; there is at the operational level, a decentralized system. It is of interest to note that when coordination of action did occur among agencies, such as that among federal, state and district agencies working to repair the water system and supply emergency water, it was often among those who had similar contacts during normal times. We will return to this general point later, noting our initial incorrect assumption as researchers that Mexico City was highly centralized and our later discovery that while there may have been some official or formal centralization, at the operational level there is considerable decentralization on an everyday basis.

A practical implication of our general finding is that when officials are faced with a massive disaster that seriously disrupts lifelines, directly impacts responding groups, and is diffuse in its impact, a considerable period of decentralized organizational action should be anticipated. The most useful type of planning therefore would be attempts to develop a degree of self-sufficiency among potentially responding units and formulating measures to facilitate coordinating this initial response through time. What some disaster planning agencies such as **BAREPP** in the area around San Francisco and **SCEPP** in Los Angeles are attempting to develop for managing major earthquakes in California would seem to be on the right track.

There are several implications from a theoretical point of view. For one, the decentralized response in the earthquake is supportive of the principle of continuity frequently discussed in the disaster literature (e.g. Quarantelli and Dynes, 1977). This is the idea that what is in place before a disaster will continue during a disaster. However, what our study in Mexico suggests is that it is necessary at times to go beyond the surface. Superficially looked at, the everyday formal governmental structure in Mexico City might appear to be a top down, centralized system; looked at more closely especially from an operational point of view, even the normal system was rather decentralized. Other observers of the Mexican earthquake have also initially missed this point (e.g., the statement is made in Update, 1985: p.1 that "the Mexico City's government is highly centralized").

Another theoretical implication, at least for study purposes, is that there may be in certain disasters a relationship between the degree of centralization of a system and the degree of centralization of the organized response. Our observations in the earthquake do not deny that there could be centralized responses in disasters in centralized systems; Mexico City did not have a centralized system. We need to go now beyond asserting that organized disaster responses are either centralized or not centralized to specifying especially the social structural conditions which are conducive to one or the other response pattern appearing. While we think a case can be made that most emergency time organized responses in disasters will necessarily tend to be relatively decentralized, it is not improbable, given the principle of continuity, that in centralized systems there will be some carryover from everyday patterns (and there is some implications of this in McLuckie's study of national level responses to disasters in Italy, Japan and the United States; see, 1977).

Finally, what this study also implies is that we need to obtain a better picture than we have of "loosely coupled organizational systems", the label as we indicated earlier Weick (1976) applies to such social organizational arrangements as we found in Mexico City. There would seem to be, at least logically, the possibility of different kinds of loosely coupled systems---there might be autonomy along a variety of different social dimensions. If so, then the consequences for disaster planning and disaster response might differ.

2. Organizational resources needed to cope with the disaster were not problematical, but there were difficulties in their quick and integrated use.

A disaster frequently conjures up images of massive damage and destruction of people and things. In fact, there is a frequent tendency to define disasters in terms of casualties and/or physical damages (Britton, 1987 points out this is especially so by nonsociologists; for a very recent example see Keller, Wilson and

Kara-Zaitri, 1990) although more sophisticated conceptualizations tend to stress social vulnerabilities, social disruption and disaster occasioned needs/capabilities imbalances (see Pelanda, 1982; Quarantelli, 1985d, 1987b; Drabek, 1987b; Kreps, 1989: 32). However, damage to people and things sometimes do occur on a large scale and often to some degree in most, although not all disasters. Therefore, one presumed consequence of such a happening would be a presumed lack of resources to cope with post disaster needs and demands.

As we have indicated, it is clear that in Mexico City, except in very isolated instances, there was not an absence of organizational resources in the aftermath of the earthquake. That is, for most purposes or activities of organizations, they had the personnel, material, equipment, goods, etc. that they needed. There were a few exceptions, for example, heavy duty equipment for the later search and rescue effort attempts in collapsed high rise buildings (Olson and Olson, 1987; Martin, 1989). But our study found little evidence that organizations generally suffered from lack of needed resources.

There are several explanations of this. When all the casualties and physical damages are added together, they constitute a minor fraction of all the people and things in Mexico City at the time of the earthquake. This can be seen even when losses in specialized matters are considered; for example, a number of physicians and nurses as well as hospital facilities were lost, but the huge size of the everyday health system which survived allowed it to cope adequately with disaster generated medical needs.

In addition, there was, as there always is in such occasions, a massive convergence of people and things to the disaster site. From within the areas of the capital city undamaged by the earthquake, from other areas in Mexico, and from outside the country there came a flood of aid in every conceivable form that more than compensated for whatever losses in resources were suffered.

Now there were serious problems with respect to the use of personnel and goods in coping with the disaster. But the difficulties were not in the absence of, but rather in the quick and integrated use of, the available resources. (we leave aside here the separate problem of unsuitable aid, such as some of the medical supplies that arrived). As we documented earlier, there were often delays and slowness in getting and using resources where they were needed, both within and between organizations. Also, as we have repeatedly illustrated, there was considerable lack of integration in using resources (ranging all the way from volunteer personnel searching over and over again particular sites while other locations received no systematic attention, to the relative absence of vehicles for taking dead bodes to the morgue when hundreds of ambulances went unused for that purpose).

These observations are consistent with the research literature (Drabek, 1986). In most disasters there is no quantitative lack of resources, be these people or things. But there often is slowness in getting such resources to where they are most needed. In part, this is because there is almost always serious difficulties in initial assessments of what resources are needed and where, a factor that is compounded the more the disaster impact is spatially diffuse, as to some extent was true of the earthquake in Mexico City.

Also, there typically is mass convergence of helpers and help, often by people and groups unfamiliar to one another working in an unfamiliar and confused setting. Furthermore, when organizations are involved in responding to a disaster, both their intra and interorganizational communication becomes problematical, especially in the absence of prior planning (Quarantelli, 1985c). Then, too, many groups will improvise in a variety of ways. Finally, widespread decentralized decision making often occurs in organizations coping with disaster demands. All of these conditions occurred in the response to the earthquake; all hindered and retarded an overall or integrated use of available resources.

From a practical viewpoint, Mexico City again illustrates that certain response happenings are to be expected. Using available resources will be more of a problem than having to find new ones. Convergence, while helpful along some lines, often creates a resource overloaded situation. Quick decentralized decision making at lower levels of organizations, again very functional for effective on-the-scene responses, makes an integrated use of resources difficult. These are all issues which can be addressed and ameliorated by planning the management of a disaster which is different from preparing for a disaster; planning is not managing and different principles are involved as disaster researchers have pointed out (Quarantelli, 1985c).

At a more theoretical level, Mexico City illustrates again that there tends to be certain almost universal features of organizational activities and problems that are inherent in the very social nature of disasters. If so, there is some sort of balance necessary between prior planning and dependency on improvisation in a disaster response. This is a point recently strongly made by Kreps:

> Our general argument is that effective emergency management requires both improvisation and preparedness. Absent the former, emergency management loses flexibility in the face of changing conditions. Absent the latter, emergency management loses clarity in meeting essential disaster related demands. Equally important, improvisation and

> preparedness go hand in hand. One need never worry that preparedness will become so rigid as to decrease the ability to improvise. Quite the opposite, the very effort to prepare, even if is only modest, increases the ability to improvise (1990: 10).

At present researchers do not know the best balance, but the disaster in Mexico City suggests the question ought to be more seriously examined in theoretical studies than it has been up to the present time.

3. The emergency time organizational response was dominated by the activities of extending and emergent organizations and characterized by much emergent behavior.

A useful typology of organized response to disasters was developed in the early days of DRC (see Quarantelli, 1966; Dynes and Quarantelli, 1968; for derivable propositions from the typology see Stallings, 1978). According to this typology, there are four types of organizations that respond in disasters.

First, there are established organizations who engage in their regular tasks and utilize their normal structures. These are often emergency oriented groups such as police and fire departments (although even such organizations may show a different form depending on the response to a particular disaster; see Wenger, Quarantelli and Dynes, 1986). Second, expanding organizations are those groups that undertake traditional tasks, but undergo an alteration and expansion of their normal structures to do so. American Red Cross chapters and some social welfare agencies are examples of collectivities that often change in this direction in disasters. Third, extending organizations maintain their normal day-to-day internal structure, but perform nonregular or nontraditional tasks during a disaster. For example, a construction company may become involved in building demolition and debris clearance. Finally, emergent groups are organized collectivities that did not exist before the disaster. They are social entities that undertake new tasks and develop a new structure to guide their activities, e.g. an informal search and rescue team or an ad hoc coordinating committee.

In fact, a constant refrain in the disaster literature since it started to appear in the late 1950s is that disasters are characterized by "emergent" phenomena. As Drabek (1987a) has recently noted that label covers a variety of different social activities and different theoretical issues. Quarantelli (1984a), using DRC studies of organizations, for example, has drawn a distinction between emergent groups (where there is some new social collectivity) and emergent behavior (where there is no new social entity but only new social actions).

In the Mexico City earthquake, the leading roles were played by extending organizations and emergent groups, and to a somewhat lesser extent, expanding organizations. At the highest levels of authority within both the federal and district jurisdictions, new and emergent groups came into being to handle the problems of coordination of activity. At the level of operations, extending organizations appeared as the petroleum company, subway and transportation units, certain governmental departments, private businesses and lifeline agencies undertook nontraditional tasks for themselves such as undertaking search and rescue, caring for casualties, sheltering and feeding victims. Some major social institutions, such as the Red Cross became expanding organizations.

In addition, new informal groups of citizen volunteers and organizational representatives emerged to handle various disaster generated problems. Also particularly noticeable was the emergence of work brigades in many of the organizations. These, since they came out of the framework of traditional existing organizations, (most in fact bureaucracies) and were peopled by known co-workers, were not quite emergent groups, but more than emergent behavior. But in any case they were organized emergent phenomena.

Established organizations of course did not disappear. But it is interesting to note that organizations that maintained their usual structures and functions, such as the military and the police, played a limited role in the emergency time response. They undertook primarily traditional tasks for these groups, namely security and traffic control.

This extensive pattern of emergent behaviors, emergent groups and extending organizations was the result of a lack of prior disaster planning and the massive demands created by the earthquake which substantially exceeded the traditional, emergency response capabilities of the community. Suddenly a crisis situation existed due to an inadequate precrisis management structure and mechanisms. The inappropriateness of operationalizing DN-3 and giving overall responsibility to the Army (an established organization) created a void of established response mechanisms. Under these conditions, new emergent and extending activities developed to meet the pressing needs of the impacted community. Similar patterns have been observed in other disaster settings (Drabek, 1986: 154-157, 160-162).

It is of interest to note that some researchers have argued that the magnitude of a disaster can be gauged by the extent to which emergent and extending organizations become involved in the response pattern. Simply put, the more the response is dominated by these types of organizations, the more severe the disaster (Dynes, 1974; Quarantelli, 1987b: 25). If this proposition is correct, then it can be concluded that the earthquake in Mexico City was of great magnitude, not just in regard to its physical destruction, but with also with regard to its social disruption.

There are some important implications from the varied types of collective response that our study found. Among other things, the observed pattern suggests that prior planning must emphasize the need for groups at times of disasters to be able to improvise, to do things they normally do not do, and/or to do them in organized ways that are not usual for the organization. Traditional and established ways of doing things by usual social arrangements will not always work; the demands and needs especially in the emergency period of a major disaster often require something different of an emergent nature. In some cases what is required is even a new group doing new things, what we have called emergent groups.

From a more theoretical perspective, there are several implications about our general observation of emergence. In part, the Mexican earthquake shows that even in the absence of planning, the demands of extreme situations will force social alterations in the responses of relevant organizations. While this may be true, it does not follow that it has to be completely left up to spontaneous emergence. Good preparedness planning can anticipate much of what might be required and proceed accordingly. Not everything can be planned for, but many problems can be anticipated ahead of time which will allow a better organized response when the need arises. However, we need a more complete understanding than we now have of what should be given priority in preparedness, those aspects which can best be anticipated and those which perhaps might be more situationally contingent and less conducive to prior planning. Theoretical and empirical work on this matter is needed.

The observations in Mexico City, particularly of the work brigades, also emphasize a theme in prior research studies, that is, the need for a theory of emergent phenomena. The existing literature allows us to characterize the phenomena as emergent and see it as one type of group response (Stallings and Quarantelli, 1985). But a theory of emergence is needed for as Drabek has written:

> Even a cursory reading or empirical or theoretical statements pertaining to emergent structures highlights a wide variety of problems...only a modest degree of consensus exists regarding most of them...Three issues illustrate the more critical of these: 1) what is emergence? 2) what emerges? and 3) what bounds emergent structures?...Theoretical models must be constructed that address five issues: 1) origin, 2) structure, 3) stability, 4) termination, and 5) cross-system interaction (1987a: 260, 274).

4. Even in the absence of much group disaster planning, key organizational personnel did their jobs; there was no behavioral role conflict.

In the face of a sudden and unexpected highly stressful situation, as is typical of such disasters as earthquakes, it is conceivable that organizational personnel might not react too well in the immediate emergency time period (see Drabek, 1985). They could be in a state of psychological shock. They might abandon or not assume their work role in favor of other social roles, such as giving priority to helping their own family members. Or they might attempt inappropriate behavior given the needs of the new situation (such as adhering to traditional expectations of what they usually do, for example, a police officer giving a ticket for double parking in a debris clogged street). These are common beliefs and also suggested as probable reactions by some students of disasters. However, the bulk of disaster research indicates the opposite; namely, officials are not psychologically incapacitated, they give priority to their job responsibilities, and they innovate if usual occupational patterns are not meaningful in the emergency time period.

What did we find in Mexico City? Our study was not focused on organizational officials per se and interviews were conducted almost exclusively with occupants of high or relatively high level occupational roles. But in order to understand organizational behavior we had to find out what key officials themselves did. So indirectly we did obtain a picture of how top level officials personally reacted in the earthquake (we do not have an equivalent picture of middle and lower levels officials and staffs so our observation are not applicable to them).

We found that organizational officials, just as much as individual citizens, generally did not passively wait for orders or directions. In fact, it is possible to say that many of them were proactive rather than just reactive. They started to consider what effects the earthquake might have had on the operations of their organizations and what actions the group needed to undertake. Often, as we illustrated earlier, they moved to trying to assess damages and otherwise obtaining information relevant to their organization. Basically key officials were not psychologically frozen or stunned by what was essentially a very unexpected event.

Likewise, there were no role conflicts that behaviorally 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 as we illustrated in several quotations, they felt concern about family members or coworkers. The psychological concern about others did not lead them to leave their jobs. Those who were not at their jobs at the time of 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 as 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.