

**A REVIEW ESSAY ON DENNIS S. MILETI, THOMAS E. DRABEK and J. EUGENE HAAS,
HUMAN SYSTEMS IN EXTREME ENVIRONMENTS: A SOCIOLOGICAL PERSPECTIVE
(Boulder, Colorado: Institute of Behavioral Science, University of Colorado, 1975), 165 pages.**

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From the top it must be noted that anyone interested in the study of human behavior in disaster and crisis settings should examine this monograph. It is an important work. It offers to do for the field of disaster research what Berelson and Steiner (1964) tried to do for all of human behavior, i.e., present an inventory of findings which represent the accumulated body of knowledge of the discipline. Furthermore, the authors evaluate the adequacy of this knowledge base. Any manuscript that even attempts such a quixotic endeavor deserves a place on the shelf beside, but certainly not instead of, Barton (1963, 1969) and Dynes (1974).

Alright, the book is important, but does it succeed? In limited ways, yes. In other significant ways, no; it presents some problems. Before undertaking a detailed evaluation of the work, however, a brief chapter overview will be presented for those readers who have yet to examine the volume.

The purpose of the book is to answer the question, "What is known about human adaptation and response to natural hazards and disasters?" To attempt this herculean task the authors have reviewed 198 published works in the behavioral science literature concerning

natural disaster response and preparation. Chronologically, the review covers studies published from 1920 (beginning with Price's classic analysis of the Halifax explosion) until July 1, 1973.

The literature review was broad in scope in that findings were collected pertaining to the entire range of disaster activities and system levels, from individuals to inter-societal comparisons. Furthermore, all of the works had to be empirically oriented, though not limited solely to sociology. Material from economics, political science, psychology, and anthropology was included also.

The scope of the literature review was narrowed along three dimensions. First, the review only included studies of geophysical hazards and disasters. Actually, the authors appear to have considered only studies of "accidental" or "natural" events. For example, "man-made disasters" were included only where these appeared to be the result of accident, rather than intent (p. 4). Second, only published works and doctoral dissertations were surveyed. The authors argued that these materials represent the evaluations of persons other than just the author, i.e., they have been "refereed" in varying degrees. Therefore, they claimed to have reviewed the "cream" of the disaster literature (p. 3). All in-house publications and un-

published papers were excluded. Third, the findings had to be empirically based, irrespective of methodology. Purely descriptive, speculative and chronological documents were excluded. Of the material reviewed, the authors have estimated that more than 95 percent of the findings were based upon data taken from a single set of events, and therefore, "there is simply no way of knowing the extent to which those findings can be generalized" (p. 9).

The findings were coded into a 36-cell "knowledge matrix" that developed from cross-tabulating the variables of system level and time. The six system levels included: individual, group, organization, community, society (nation), and international. The time dimensions utilized correspond to the typical pattern of disaster activity: preparedness/adjustment; warning; pre-impact early actions (mobilization); post-impact, short-term actions; relief or restoration; and reconstruction. Although the works of Barton (1969) and Dynes (1974) were not included, a total of 1,399 findings were classified (p. 13). This "knowledge matrix" purportedly is the basis for the literature reviewed in the subsequent chapters.

A quantitative indication of the strength of knowledge in various areas can be obtained by examining the matrix. With respect to system level, we find that 38 percent of the findings classified deal with individual behavior. For the remaining system levels, the following figures were calculated: community, 25 percent; organization, 17 percent; group, 13 percent; societal, 8 percent. We have practically no findings classified as pertaining to international disaster response. When considering time-frames, 38 percent of all findings concern the immediate post-impact period. Twenty-one percent deal with preparedness and adjustment. Findings relevant to the warning process include only 10 percent of the total. The reconstruction phase has been the most widely ignored area for research. Only seven percent of the findings were coded as relating to reconstruction.

On the basis of simply counting coded findings, therefore, it is evident that most research has focused upon the individual system level and the immediate post-impact period. In fact, 12 percent of all the coded findings deal with individual, post-impact short-term action. Furthermore, if we extend the examination slightly beyond that undertaken by the authors, we find that 63 percent of all the findings concern the individual level (irrespective of the time-phase) and/or immediate post-impact behavior (irrespective of the system level). Quantitatively, we know little about societal and international behavior in disaster settings, and very little about reconstruction.

This "knowledge matrix" is presented in the introductory chapter. This expository chapter should be examined closely. In addition to the matrix, major concepts, alternative classification schemes, and methodological techniques are discussed. For example, the authors pose a distinction between the concepts of hazard and disaster; the distinction rests basically upon the time dimension. "Hazard refers to a potential set of events . . . the character and magnitude of hazard may be altered by man's actions . . . (it refers to) how man and his works stand in relation to future extreme geophysical events" (p. 4). In order to narrow the range of literature to be reviewed, the authors have utilized the relatively focused definition of natural disaster offered by Fritz (1961: 655). The term is used to refer to "accidental or uncontrollable events concentrated in time and space, in which a society, or a relatively self-sufficient subdivision of a society, undergoes severe danger, and incurs such losses to its members and physical appurtenances that the social structure is disrupted and the fulfillment of all or some of the essential functions of the society is prevented" (p. 4). Furthermore, the chapter includes a brief, but rather solid, discussion of the concept of "collective stress." As might be expected given the authors' previous writings on organizational stress (1973), the potentialities and problems of the stress concept are adroitly addressed.

Finally, it must be noted that in the introductory chapter the authors inform us implicitly of their view of the importance of this monograph. They compare and contrast it with the two previous, classic attempts to systematically review the literature on nature disasters and collective stress, i.e., those of Barton (1963, 1969) and Dynes (1974). Unlike Barton, the authors have not attempted to “tease out new propositions” or reformulate the findings into integrated theoretical schemes (p. 8). They offer that no attempt has been made to alter levels of abstraction and produce new variables. Unlike Dynes, they have not drawn upon unpublished documents and field notes. Furthermore, they have not limited themselves solely to a discussion of only organizations and communities.

Chapters two through five present the substantive knowledge that has been collected by the authors on the various time periods of the disaster process. The second chapter is entitled “Anticipating Disaster” and concerns the pre-crisis state of social systems. The chapter is organized around various determinants of level of preparedness, however, the major thrust of the presentation is that we know little about these determinants (p. 33). Warning, pre-impact response and mobilization are the topics in chapter three, “Response to the Unlikely.” Relying heavily upon causal modelling, variables related to the evaluation, dissemination, confirmation, and response to warnings are reviewed. Perhaps indicating the magnitude of findings concerning this phase of the disaster process, chapter four, “System Shock: Immediate Responses Following Impact,” is the most extensive chapter in the monograph. Similarly, chapter five, “Restoration and Reconstruction: The Process and Pain of Recovery,” is a rather broad review of the oft-ignored area of long-range recovery.

The final chapter presents a brief, concise critique of the disaster literature and a call for the integration of hazard and disaster research into the broader frameworks of sociological,

economic, geographical, and psychological theory (p. 146). The author offers the hope that middle-range, abstract and interrelated generalizations may be developed. Furthermore, it is proposed that the concept of “system stress,” focusing upon subsystems and varying stress levels, may provide a conceptual tool for such theory development. Throughout the discussion, however, there is a general condemnation of a continuance of what the authors perceive as the atheoretical investigation of disaster behavior.

A bibliography of 198 sources is included, and should prove to be valuable to students in the field. However, the value of the monograph could have been strengthened significantly by the inclusion of an index. The intent of the authors may have been to provide a significant heuristic contribution to the field by identifying theoretical and methodological weaknesses in the literature and offering suggestions for future research. The chief contribution of the monograph, however, appears to be as a reference source; an index for such a volume is a necessity.

Upon finishing the last page, my immediate reaction was similar to that I experienced after seeing the film version of *Catch-22* and waiting for the Comet Kohutek. I approached both of these phenomena with great expectations. I was terribly disappointed. Similarly, my expectations for this work were not met. Perhaps they were unjustly high. However, they were based upon the admiration I have for the authors. Mileti, Drabek, and Haas are three of the most prolific, competent, and respected students of disaster phenomenon. Of course, Mike Nichols is one of the finest film directors. Perhaps only the admirable can disappoint.

Earlier we noted that the book both succeeds and fails. How does a monograph simultaneously accomplish these ends? Before presenting a detailed critique, let us note that this work takes two direct routes. First, the authors actually attempted to answer the question, “What do we know about human

behavior in disaster?" (p. 144). The question is deceptively simple. A successful answer requires an extraordinary effort. Problems of simply determining the parameters of the discipline and developing an appropriate classificatory scheme for the information may prove to be difficult. In addition, separating the wheat from the chaff and bringing a degree of coherence to the divergent findings can be vexing. With respect to these problems, certain parts of this monograph succeed, others fall short. It might be argued that the task is so difficult that it precludes complete success. Let us call the effort a "near-miss."

Second, the book is extremely uneven. With respect to organization, writing style, and depth of treatment there are great qualitative differences that vary by chapter. The book begins slowly, reaches stylistic and analytic quality in chapters four and five, and then offers a brief, predictable conclusion. That primary authorship has been assigned to each chapter in the construction of the monograph is hardly surprising; that chapter authorship is noted in the text is interesting.

Let us examine the basis for the entire endeavor, i.e., the literature reviewed and the "knowledge matrix." While the interdisciplinary nature of the review is laudable, there are some problems in the material selected. First, allowing for the economies to be obtained in drawing tight parameters around the literature, the exclusion of studies on "man-made disasters" and other than "accidental" natural events is not well argued. No sociological or theoretical justification has been given for ignoring these related works. Given the authors' own perceived need to integrate disaster findings with information from other areas, this related literature could have been profitably examined. Certainly studies from the fields of collective behavior, environmental sociology, and macro-level conflict situations are relevant. Second, the authors state that they are only going to examine published works and doctoral dissertations. However, when one examines the

bibliography it appears that certain items do not meet these criteria. In-house publications, such as reports from the University of Chicago and the National Academy of Sciences (excellent though they may be) are included. Furthermore, material from the oft-cited edition of the *American Behavioral Scientist* (1969) is not truly refereed. Basically, the criteria utilized have the effect of excluding the rather extensive material produced by the Disaster Research Center during the past twelve years. This omission is unfortunate. The center has produced the most continuous, extensive examination of organizational and community studies of disaster behavior we have in the literature. The center is certainly not ignored! Sixty-five of the 198 sources cited in the bibliography have been produced by individuals who have been associated with the center. However, the exclusion of center reports presents a distorted answer to the question, "What do we know about human response to disaster?"

With respect to the "knowledge matrix," as a classificatory scheme, it is excellent. The cross classification of system levels and time phases is valuable. Given the development of the field, it is hard to even conjure a better classification. However, how valid and reliable is the "knowledge matrix" as an indicator of the state of the art? Qualitatively, it has little to offer. No information concerning the validity, reliability, utility, or simple importance of the various findings is presented; they are all treated equally in the frequency distribution. Quantitatively, how valid is the matrix? It is hard to say. No information is given as to the specific methodology utilized. How is each system level defined? Are interorganizational relationships elements of the community or organizational levels? What is the international level? Was any attempt made to determine intercoder reliability? How were findings differentiated from simple pronouncements? What criteria were utilized in the selection of findings? Unfortunately, no information is given about these operational problems. Until such information is provided,

we must consider the “knowledge matrix” as at best a rough approximation of the quantitative nature of the findings of human response to disaster.

The most important contribution of the matrix, nonetheless, is to point to gaps in our knowledge. However, the matrix presents a static picture of the nature of the discipline. The authors note that most effort has been expended on the individual level and the immediate post-impact period. However, this represents a picture of what has been. If we extend the analysis slightly beyond that undertaken by the authors, we can obtain a glimpse of “where we are going.”

If one selects arbitrarily 1965 and examines the findings cited in chapters four and five on post-impact behavior, a rather dramatic pattern emerges that indicates the current trends in research. Examination of the matrix reveals that 80 percent of the findings concerning individual post-impact behavior were published *prior* to 1965. Similarly, 69 percent of the group level findings were pre-1965 in origin. However, 71 percent of the findings at the organizational level and 76 percent at the societal level have been produced since 1965. (Interestingly, the community level splits exactly fifty/fifty.) Therefore, it appears as though the field of disaster research currently is in the process of at least quantitatively filling some of the voids in the literature noted by the authors.

The distinction posed in the first chapter between the concepts of hazard and disaster also presents some problems; problems which become evident in chapter two. As defined, “hazard” is a rather messy concept. It is not clear if it refers to an “objective,” geophysical, potential threat, a possible future condition of a social system, or a cultural or social psychological orientation toward threatening agents. The argument presented by the authors on hazard mitigation is heavily physical and ecological in orientation inferring that it is some objective, natural, threatening condition (p. 4). However, it might be all of these, and subtypes

should be explicated. Furthermore, the concept becomes even more vague when one considers the issue of labeling. Simply put, “who, on the bases of what criteria, defines a condition as hazardous?” Potential victims, geophysical experts, and shamans may all be candidates for the role. Also, if potential victims, for example, do not view a geophysical condition as “hazardous” and do not act to mitigate it, is it a hazard? These problems become evident in chapter two. The title is “Anticipating Disaster,” but the author states that the focus will be upon preparedness and adjustments for coping with natural hazards (p. 14). Furthermore, discussing loss and social disruption caused by “creeping hazards” does not clarify the issue (p. 14).

Chapter two is the most disappointing chapter of the monograph. The findings discussed relate to such crisis management dimensions as level of preparedness, planning, prior disaster experience (which includes a critique of the concept of “disaster subculture”), hazard and/or disaster perception, adoption and effectiveness of adjustments, and technological and cultural factors. While the author explicitly claims to examine *all* of the available findings concerning these variables, the impact of the chapter is one of a sparse, disjointed, and diffused collection of odds and ends. Problems of organization, integration and writing style plague the effort; it is a hodgepodge of isolated findings. Additionally, the writing style and organization change abruptly, and rather mysteriously, on page 23.

Indicative of some of the difficulties, we can note that it is not clear at times if certain statements are quotes from other literature or generalizations developed by the author. On page 17 the statement, “A disaster in one locale stimulates for a time serious planning for post-impact response and vulnerability reduction in nearby communities with similar hazard problems,” could either be a generalization based upon findings induced by the authors, or a quote from Kates (1970). Alas, it appears to

be the latter. On page 28 we read that “a large-scale disaster in one locale stimulates for a time the serious consideration of adoption of relevant adjustments in nearby similar hazard locales.” This statement appears as another finding dealing with a different topic and is accorded to Kates. Furthermore, some of the “findings,” such as, “With regard to prevention, the single most important fact lies in training and preparation,” are presented as pronouncements, without elaboration (p. 20). In addition, we should never be left with a “finding” such as “During the flooding of 1953 in England, the country’s governmental structure is said to have affected the organizational readiness of the community” (p. 23). That’s all, folks! No additional information concerning the nature of the influence is provided.

Indicative of the disjointed nature of the chapter, when discussing “planning for post-impact response per se” it is claimed that only the following three observations were located: (1) “Timing is often a pivotal factor in disasters and is important to everyone; yet it is rarely an integral part of disaster planning . . . even the season of the year is significant” (Disaster Research Center, 1968: 11); (2) “Predisaster planning in this country (U.S.A.) relies in general on local agencies” (Raker et al., 1956: 11); and (3) “Urban areas do not have the same kinship structures as do rural areas, and need more public shelters” (Moore et al., 1963: 127), (pp. 17–18). No discussion of these observations is given; this survey purports to be the sum of our knowledge about planning for post-impact response “per se.”

The second chapter also devotes considerable attention to prior disaster experience as a determinant of level of preparedness. The lack of conceptual rigor found in the literature concerning this variable is justifiably noted. In addition, a concise, critical discussion of the concept of “disaster subculture” is presented. However, the section includes contradictory material and arguments. In discussing the functionality of subcultures, the author asks,

“Would a researcher *be likely to find* that some part of a disaster subculture actually increases vulnerability or produces a lower level of overall preparedness than would otherwise be present? *We doubt it.*” (p. 18 emphasis added). However, in the next two pages findings are cited from Parr (1969) and McLuckie (1970) that directly refute this conclusion. Furthermore, substantiation for McLuckie’s finding that prior disaster experience may provide false reference points that lessen the adequacy of response is provided by the author in a discussion of the Rapid City floods (p. 20). The apparent contradictions in this presentation require elaboration and clarification.

It is interesting to note that it is claimed that there are “relatively few” findings concerning this phase of the disaster process (p. 15). However, an examination of the “knowledge matrix” reveals that 21 percent of all the coded findings were classified as dealing with preparedness and adjustment; in fact, it ranks second to the immediate post-impact period in number of findings. Furthermore, over 290 findings were classified in this time frame, however, less than 130 are directly cited in chapter two. What happened to the additional 160 odd findings? Given the author’s expressed intention to summarize *all* of the available findings, what is the basis of this apparent selectivity (p. 14)?

With the aforementioned change in organization and presentation, the chapter improves considerably. The discussion of hazard and disaster perception is good, however, the distinction between hazard perception and hazard knowledge could be clarified. Furthermore, the general directions for future research are interesting, particularly those concerning flood insurance and technological factors. The chapter clearly supports the author’s claim that additional work is needed with respect to this time frame.

The third chapter focuses upon warning and pre-impact mobilization. The discussion of warning is yeomanly. This concise treatment

extends the author's other work on warning. (See Mileti, 1975: 11–22.) The discussion of warning and response as system processes is excellent. A model of a warning system is presented that insightfully combines both structural and processual components. Similarly, other sections, such as that dealing with individual and small group response and the issue of panic, are coherent, well-developed summaries.

With respect to the evaluation and dissemination of warning messages, a causal model is presented. The model includes nine independent or intervening variables that are related explicitly to the major dependent variable, warning, through eleven propositions. The major dependent variable appears to refer to the successful issuance of a warning message and is therefore the output of the evaluation and dissemination subsystem. This definition of warning, however, could be more clearly specified. The model does a serviceable job of integrating diverse findings (pp. 39–42). While one might hope that the contradictions evident in the one paragraph discussion of the relationship between past disaster experience and warning might be clarified (pp. 49–51), the discussion is solid.

When considering pre-impact response, another causal model is developed based upon findings from the literature. This model includes 25 independent or mediating variables and the major dependent variable, i.e., response to warnings (p. 51). From this labyrinth of direct and indirect relationships, the author concludes that the two major predetermining or mediating variables are warning confirmation and warning belief.

In presenting evidence to support this model, however, some discomfiting traits are evident. First, there is a tendency to overgeneralize the singular findings. For example, a single finding from a study that families warned in a certain manner seek to confirm the message through other means, is generalized as follows: "it can be stated that warning source is related to warn-

ing confirmation" (p. 44). Likewise, a single finding that separated families upon receipt of an initial warning are more likely to seek confirmatory information than united families, is the only basis for the proposition that "primary group context is seen as related to warning confirmation" (p. 44). Also, a single empirical observation on Spanish-American families is the source of a generalization on ethnicity (p. 52). Other examples could be given, however let us summarily note that numerous, low-level empirical observations become transformed into high-level, abstract generalizations.

Second, and perhaps more disturbing, the author presents inherently contradictory findings on certain subjects and then, without offering justification, arbitrarily concludes and accepts as valid one of them. For example, race is proposed to be related to warning belief, even though only two findings are cited as being related to this issue, and one of these found no relationship. Similarly, with respect to the relationship between warning source and warning response, one cited finding observed no relationship between the variables, while the other found that persons warned by authorities were more likely to evacuate immediately. Nevertheless, the author concludes that warning source is related to warning response (p. 48).

Communication mode and socioeconomic status are similarly treated. Some methodological, or perhaps theoretical, justification should be given for this arbitrary practice.

Given the orientation of the chapter, the concluding suggestions for future research should not be surprising. First, there is a call for exploratory study of the evaluation-dissemination subsystem. Second, it is proposed that multivariate models of warning response be developed and tested. However, by organizing the chapter around closed-system, causal models, the impact of the chapter is more one of "premature closure."

Chapters four and five can justifiably be discussed together. They are the finest chapters in

the monograph. Both are organized around the knowledge matrix in a clear fashion. They are well written. All of the findings are coded by system level and time phase. Furthermore, and most importantly, the findings are integrated coherently into a series of generalizations. These chapters are valuable summaries of post-impact behavior. I wish I had written them.

Particularly noteworthy in chapter four, "System Shock: Immediate Responses Following Impact," are discussions of panic, altruism, structuring and other individual response behaviors. While one may quarrel with isolated summary statements, such as that panic is likely to occur "when an individual sees his escape routes blocked" (p. 58) — the literature generally concludes that escape routes are still open, but closing, and escape must be made quickly — the overview is excellent. Similarly, the discussions of role conflict and emergent groups are laudatory, though the latter might have benefited by inclusion of the collective behavior literature. The discussion of organizations raises excellent points on the continued, limited utility of employing descriptive labels for organizations and the need to recognize the variability in response required by any single disaster agent (pp. 76–77). Finally, the summary of findings on the community is perhaps the finest I have encountered that maintains the integrity of the system level.

Throughout this chapter, and the following one on restoration and reconstruction, stimulating questions for future research are nicely integrated into the body of findings. Particularly noteworthy in the latter chapter is the discussion of "synthetic organization" (pp. 115–119). Furthermore, the treatment of reconstruction and long-range change processes can be profitably examined.

If the quality attained in these chapters had been found in the others, the monograph would have been very successful. It may be argued that the quality and quantity of our findings dealing with the post-impact period are superior to those of the other time frames and

account for the quality of these chapters. However, organization, integration, and writing style also appear to be factors.

As previously noted, the final summary chapter offers a brief critique of the literature and calls for theoretical development. It is hard to argue with this plea; any discipline can always use new, productive theoretical statements. After completing this review, I am left with the notion that we do know a great deal about human behavior in disaster. The problem is one of integration and theoretical generalization. Perhaps, as the authors note, middle-range theories should be produced. The stress concept does have great potential as a theoretical device for integrating varied findings; but as of now it is little more than a concept. However, there is also another direction that must be pursued, specifically the integration of empirical findings and theoretical concepts from related fields. The authors call for the integration of findings across disciplines. However, even within sociology this development has not occurred to a significant extent. Why greater cross-pollination has not occurred with the areas of collective behavior and human ecology has been a mystery to me. Utilization of emerging theoretical ideas on organizational and structural response to social crisis situations and the ecological complex would appear to be fruitful.

However, the cry for theoretical development and integration has a "hollow-sound" coming at the end of this specific monograph. The authors have chosen to present us with an empirically based classification scheme, have offered not to develop new propositions, and have limited purposefully the literature to be reviewed so as to exclude findings in related theoretical areas. Perhaps in addition to the uneven nature of the work, this is its greatest failing. It is an empirical, quantitative catalog. The authors criticize the field for failing to do what they have chosen not to attempt.

REFERENCES

- American Behavioral Scientist*, Vol. 13, No. 3 (Jan.–Feb.), 1970.
- Barton, Allen H., "Social Organization Under Stress," *Disaster Study no. 17*, Disaster Research Group. Washington: National Academy of Sciences, 1963.
- Barton, Allen H., *Communities in Disaster: A Sociological Analysis of Collective Stress Situations*. Garden City, New York: Doubleday and Company, Inc., 1969.
- Berelson, Bernard and Gary Steiner, *Human Behavior: An Inventory of Scientific Findings*. New York: Harcourt, Brace and World, Inc., 1964.
- Disaster Research Center, "A Prime Time for Disaster; Warning Systems Must Consider a Community's Many Rhythms," *Civil Defense Reporter 1* (Oct., 1968), p. 11.
- Dynes, Russell R., *Organized Behavior in Disaster*. Columbus, Ohio: Disaster Research Center, 1974.
- Fritz, Charles E., "Disaster," in Robert Merton and Robert Nisbet (eds.), *Contemporary Social Problems*. New York: Harcourt, 1961, pp. 651–694.
- Haas, J. Eugene and Thomas E. Drabek, *Complex Organizations: A Sociological Perspective*. New York: The MacMillan Co., 1973.
- Kates, R.W., "Human Adjustment to Earthquake Hazard," in Committee on the Alaska Earthquake of the National Research Council (ed.), *The Great Alaska Earthquake of 1964*. Washington: National Academy of Sciences, 1970.
- McLuckie, Benjamin F., "A Study of Functional Response to Stress in Three Societies," Unpublished doctoral dissertation. Department of Sociology, Columbus: The Ohio State University, 1970.
- Mileti, Dennis S., *Natural Hazard Warning Systems in the United States: A Research Assessment*. Boulder, Colo.: Institute of Behavioral Science, The University of Colorado, 1975.
- Moore, Harry Estill, "Before the Wind: A Study of Response to Hurricane Carla," National Academy of Sciences, National Research Council Disaster Study no. 19. Washington: National Academy of Sciences, 1963.
- Parr, Arnold Richard, "Flood Preparation – 1969: Observations Concerning the Southern Manitoba Spring Flood Preparations," *EMO National Digest 9* (June–July, 1969), pp. 25–27.