

DISASTER: EFFECTS ON MENTAL AND PHYSICAL STATE*

WARREN KINSTON and RACHEL ROSSER

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Abstract—Although there is an extensive literature on various aspects of disaster, there has been no comprehensive review of its psychiatric consequences. This article brings together the phenomenological and dynamic descriptions of the immediate and longer term mental effects of disaster as observed in the individual and in groups. Present knowledge on management of these effects is summarized and some conclusions are reached on the implications for future planning of disaster relief services.

"Things can be so bad that to be sane is insane"

Nietzsche

THE GENERAL field of enquiry loosely encompassed by the term "disaster" has not yet found an established position in the psychiatric canon. There seem to be theoretical, practical and emotional reasons for this. A disaster besets the researcher with major practical difficulties. In his review article, Hocking [1] identifies the following theoretical difficulties: the subject overlaps with other disciplines (notably sociology), it challenges the existence of a boundary between illness and health, and it is relatively remote from traditional psychiatric approaches such as organic psychiatry, experimental psychology and psychoanalysis. However these factors alone do not appear to be an adequate explanation for a delay of 17 yr before any systematic or detailed study of the psychological and social effects of the atom-bombing of Hiroshima. Until Lifton's classic study published in 1967 [2] all that was available were a few fragmentary, or exaggeratedly technical, reports, and Lifton noted that often researchers were so struck by the human suffering encountered that they ceased research and dedicated themselves to much needed social welfare programmes.

Equally conspicuous is the omission of psychiatry from the disaster canon. The field has been studied by sociologists, medical workers, administrators and military strategists. It is covered routinely by the media and provides a stimulus for the creative arts. But the extensive literature on disaster planning does not consider psychological understanding and the psychiatric needs of the victims.

The absence of disaster in the psychiatric canon is of theoretical interest. However the absence of psychiatry from the disaster canon reflects a lack of insight which is of practical consequence. This was shown in the Hartford Disaster Exercise [3]. In this project, a simulated major explosion was arranged in cooperation with the Health, Police, Fire and Civil Defence Departments, five hospitals, the Red Cross and Ambulance Association, the University Department of Medicine, the State Department of Health, and the local medical association. The episode was videotaped and the "victims" subsequently interviewed. It was found that the rescue personnel became confused and were disturbed by the sight of massive injuries, and that the victims were unnecessarily handled and placed in uncomfortable, inconvenient and dangerous positions. At no time did anyone stay with a specific victim to give comfort

* The Maudsley Hospital, London, S.E.5, England.

and reassurance. In the 10 yr prior to this there had been only four other well documented and comparable studies and the findings in these were identical. The explanations offered in the article and subsequent *New England Journal of Medicine* editorial [4] were in terms of "poor rescue" and the existence of a "community problem". There was no mention of psychological understanding.

This article is an attempt to use the information in the literature to develop a psychiatric approach to disaster and to suggest its implications for the planning of services. The nomenclature of Tyhurst [5] and Glass [6] is used. A limited number of outstanding psychiatric papers are described in detail and other documented psychological phenomena are mentioned. The long term effects are examined in the context of the phenomena of World War II.

DEFINITION: CLASSIFICATION: DIFFICULTIES

Disaster is defined, for the purposes of this review, as a situation of massive collective stress. The psychological phenomena of disaster are the consequences of the combined individual stress reactions and of reactions to changes in the social milieu. Hence the psychic distress and behavioural disturbance of an individual cannot be fully understood or managed unless they are analyzed as elements in the disruption of the equilibrium of a social system. "When an entire population is reduced to inferior status" for example "the individual's self-respect is damaged in ways not reparable by himself" (Krystal [7]).

As a consequence, hypothetical models may become unmanageably complex (Barton [8]). But in addition there are more practical obstacles to coherent research and understanding. The physical situation of a disaster is rarely one which lends itself to the usual research techniques, the psychological sequelae powerfully affect the observers, there is a great variation in the types of disaster, and they exist in completely different socio-cultural settings. Often the victims resist investigation, and the relief organisations resist investigators.

There is no generally agreed or obviously fundamental taxonomy. Constructs of classification have included: man-made (e.g. bombs), natural (e.g. fire); internal (e.g. tyranny, inflation), external (e.g. war, flood); acute (e.g. earthquake), chronic (e.g. poverty, racialism). Tyhurst [5, 9] provided a classification of the phases of disaster which was extended by Glass [6] and has been accepted by many psychiatric workers (Table 1). These authors define five phases: pre-impact (threat), warning, impact, recoil and post-impact. During the impact phase the stress is physical, maximum, direct, unavoidable; prior to this it develops from the stress of worry and preparation to one of imminent danger, and subsequently secondary stresses due to the nature of the disaster and its effects on persons and property begin to operate. The detailed descriptions of each of these phases is still incomplete, because most studies are varying mixtures of anecdote, description and analysis. As early as 1957 Demerath and Wallace [10] pointed out the absence of a defined disasterology. However despite the subsequent amassing of data, Barton [8] commented in 1969 that most of it was valueless and that researchers still had not developed a set of propositions to test. The diffuseness of the literature has also resulted in important discrepancies remaining undebated.

METHODOLOGY

The methods vary in the number of victims studied, the detail in which they are investigated and the extent to which the information is systematic and quantifiable. They include single case reports, numerous anecdotal studies, some more systematic studies and experimental work. The peculiar methodological problems have been analyzed by Killian [11].

TABLE 1.—THE PHASES OF DISASTER (BASED ON THE CLASSIFICATION OF TYHURST AND GLASS)

Phase	Stress	Duration/time perspective	Psychological phenomena	Social phenomena
Pre-impact (threat)	Of education, worry, preparation etc.	Months–years/future	Denial or over-reaction vs optimal amount of anxiety	“Optimal social stress” Social preparedness
Warning	Imminence of primary stress	Min–hr/present or immediate future	Denial vs protective action	Precautionary activity
Impact	Maximum, direct, unavoidable	Min–hr, months–yr/present (automatic)	12–25 per cent effective, tense, excited, too busy to worry 75 per cent dazed, stunned, bewildered i.e. disaster syndrome (absence of emotion, inhibition of activity, docility, indecision, lack of responsiveness, automatic behaviour + physiological manifestations of fear) 12–25 per cent grossly inappropriate behaviour, anxiety and affective states, hysterical reactions, psychosis	Scope of impact: community to nation Emergency social system: the unorganized immediate response (role definition, role competence) with <i>ad hoc</i> leadership. Family as the basic unit
Recoil	Suspension of primary stress. Secondary stresses due to nature of disaster or self	Depends on individual and disaster/immediate past	Normals (90 per cent) show return of awareness and recall. Dependency, talkativeness, child-like behaviour, emotional release. Search for safety. Unstable group formation. Psychopathic liberation. Special phenomena e.g. staring reaction, counter-disaster syndrome	Convergence behaviour Inventory and rescue Organized reconstructive effort, relief and restoration of services
Post-impact	Derivatives of primary and secondary effects: personal and social	Rest of life/past–present–future	Grief, depression, post-traumatic neuroses Psychosomatic illness Increased physical illness/deaths Altered attitudes Recovery (?)	Permanent reconstruction and long-term recovery. New equilibrium with modifications: alterations in morale, economy, cultural values. Feed-back to threat phase

Disaster: Effects on mental and physical state

Further details in text and bibliography.

(1) *Single cases*

Except for the psychoanalytical literature, there are surprisingly few case studies. One of the earliest scientific reports was that of the surgeon, Jean Baptiste Henry Savigny following the ship-wreck of the *Meduse*, well known from Gericault's painting [12]. Similarly James [13] recorded his reflections on his mental reactions following the San Francisco earthquake of 1906. In his account of his own ship-wreck experience, Lilly [14] reviews other similar personal experiences which led to hallucinations, confusion, paranoia, suicide, murder and cannibalism. Janis [15] used a transcription of the delirious ramblings following rescue to analyse the fantasies and the elements of the unusual mental resilience of a young man who narrowly escaped drowning. Although this experience would not strictly fall within our definition of disaster, information from such a study is important because studies of individuals during the acute phase of massive collective stress are not available.

(2) *Anecdotal accounts*

Anecdotal accounts vary in sophistication. Often they are produced by "experts" who happened to be on the scene at the time [16–25], but sometimes planned studies are reported in anecdotal form [26–31]. The primary result has been an extensive duplication of certain fundamental observations which will be described in the section on Psychological Phenomena. The data is not sufficiently uniform to permit comparisons to be made, but a number of the papers contain interesting and potentially significant details which do not appear in the more systematic studies.

(3) *Systematic studies*

Methods used for systematically collecting information include clinical studies, structured interviews, questionnaires and hard observations of a limited number of parameters.

Clinical studies contribute most of the information on the opportunities for and the effectiveness of psychiatric intervention [32–40].

Lifton's study of the victims of Hiroshima [2] is one of the best examples of structured interviewing. He picked 33 survivors at random from lists kept by the Hiroshima University Research Institute for Nuclear Medicine and Biology plus 42 survivors who were particularly articulate or personally prominent in the A-bomb problem. The interviews were recorded, transcribed, and translated, and they specifically explored the individual's recollection of the original experience and its meaning in the present, residual concerns and fears of all kinds, and the meaning of his identity as a survivor.

Qualitative case studies using interviewing techniques have been extensively used by sociologists. However, Barton [8] reviewing 21,600 interviews of 103 disasters dealt with by organizations such as the National Academy of Science Disaster Research Council, University disaster investigating committees and the National Opinion Research Centre, found that after excluding false alerts, morale surveys, epidemics, small samples etc. he was left with 5,500 interviews of 22 disasters of which 4,000 were quite unsystematic, leaving 1,500 interviews of the Holland Flood and the Arkansas Tornado. The latter study by Fritz and Marks [41] is very frequently quoted. It demonstrates the importance of the question of retrospective falsification since it reports a much lower incidence of transient shock than is usually described and the validity of the figure is not investigated. Other studies using interview techniques provide useful data [42–45].

Questionnaires, in contrast with more or less unstructured interviews, have the advantage that systematic quantifiable information is obtained from a large population. Their disadvantages are that they depend on recall of a traumatic experience weeks after the event. Also they often cover areas in which the questioners are not expert, and this has produced one source of controversy (Quarantelli and Dynes [46]). This technique has been applied to a limited extent by psychologists and sociologists.

Observations using epidemiological methods give a limited amount of reliable information. A few such studies are available such as Bennet's study of the effects of flooding in Bristol on subsequent mortality rates in the affected population [47].

(4) *Experimental studies*

There are three principal experimental methods. Disasters can be simulated, as described by Menczer [3]; however, this method has not been used to study psychological phenomena. The reactions of people in particular stressful situations can be recorded e.g. the observations by Pope and Rogers of the mental state of a group of scientists during an arctic survival experiment, or Ahearn's [49] study of the reactions of large groups experimentally confined in an austere environment. In addition conclusions relevant to disaster may be drawn from many of the results of laboratory experiments on psychological reactions to special stresses such as sensory deprivation or starvation.

(5) *Journalistic accounts*

Editors find that disasters are an inexhaustible source of excitement for their readers. Newspaper accounts often provide particularly detailed information on emotions and attitudes of the victims and rescuers which is unobtainable elsewhere. One of the best recent accounts of cannibalism is probably the Sunday Times report on the Chilean air crash of October 12th, 1972 [50].

CASE STUDIES

We have selected three papers which together define many of the immediate, short term, and longer term psychiatric complications to be expected in a disaster.

The first of these is the major contribution by Cobb and Lindemann (1944) studying the survivors of the fire at the Cocoanut Grove Nightclub [35]. This study was done at the Massachusetts General Hospital where 114 of the casualties were taken. 39 were alive on arrival. The city fire services and the hospital emergency programme were geared up in expectation of air-raids and handled the disaster with exemplary efficiency. The dead were identified immediately and the survivors listed, thus avoiding feelings of confusion, hostility and despair which have been documented when this is not done. The relatives were interviewed by social workers who involved the psychiatrists in the care of those overwhelmed by acute grief. From the relatives the psychiatrists turned to the injured, all of whom they visited on the 8th day. Fourteen of the 32 survivors had neuropsychiatric problems; the commonest problems (50 per cent) were reactions to bereavement, but there were also cases of psychosis, phobic anxiety and complications of carbon monoxide poisoning. It was this work which enabled Lindemann to provide the first detailed description of the phenomenology of acute grief [34]. Cobb and Lindemann drew the following conclusions: (1) Psychiatric problems will be overlooked unless a psychiatrist sees all the victims of a disaster. (2) Severe emotional problems are due to crises in human relationships involving conflict and guilt rather than to the impersonal horror of the disaster itself, hence the nature of the disaster may not be a useful predictor of consequent psychiatric morbidity. (3) A psychiatrist can be useful in three phases, (i) initially during emergency medical care, when confused excited patients have to be removed to quiet surroundings and sedated: in this phase patients are disturbed by the frequent changes of medical and nursing staff and the psychiatrist can provide continuity by developing a relationship with them; (ii) then during convalescence in hospital: psychiatrists can advise on the timing of bad news and can support the patient in adjusting to bereavement, material loss and disability; (iii) finally when the patient returns to the community: psychiatrists can help to reduce prolonged maladjustment and traumatic neurosis. It is striking that despite excellent planning and numerous precautions designed to minimize psychological stress, there was a high incidence of psychiatric illness. Numerous subsequent studies have confirmed that much serious psychiatric morbidity goes undetected by non-psychiatrically trained medical personnel [51, 52].

The second study by Leopold and Dillon [32] described psychiatric disturbances in 36 survivors of a marine explosion in 1957 on the Delaware River.

Initially almost all had features of a post-traumatic neurosis. In the ensuing 4 yr the symptoms became worse, most of the victims requiring psychiatric treatment. Of particular importance to these conclusions was the elimination of compensation as an aetiological factor in prolonged morbidity.

The third study by Popovic and Petrovic [36] described the Skopije earth quake and consisted of observations made by psychiatrists within 24 hr of a major disaster.

Of the population of 200,000, 3,300 were injured and over 1,000 killed. The Institute of Mental Health in Belgrade sent two psychiatrists, a psychiatric social worker and two nurses; they arrived 22 hr after the earthquake and stayed for 5 days. A team of local psychiatrists was organized to tour evacuation camps and a reception centre was established for acutely disturbed patients. They noted that much of the population was in a mild stupor which the team found infectious, that the victims congregated in small unstable groups and that rumours of doom spread. After the initial confusion, severe psychiatric disturbance was rare, and this they attributed to the rapid evacuation of the more disturbed patients, to prompt outside help, and to responsible reporting by the press which minimized the formation of rumours. Depression was prevalent on the 2nd and 3rd days while after-shocks continued. Children who were evacuated to institutions were transiently disturbed.

Although these studies are detailed and relatively comprehensive, and many subsequent papers have confirmed their principal conclusions, they do not explore some areas of practical and theoretical importance. They do not stratify the population at risk: in practice it would be valuable to be able to predict the more vulnerable sections of the community, their different patterns of response and the appropriate management of these. They document the commoner psychiatric phenomena but

omit the less frequent reactions e.g. pseudopsychoses [53] and hysterical reactions [54]. They are written in behavioural and phenomenological terms but it has been necessary to search elsewhere for dynamic understanding of human experience during the various phases of disaster.

PSYCHOLOGICAL PHENOMENA

The literature on the psychological phenomena of the threat, impact, and early aftermath phases was comprehensively reviewed by Wolfenstein [55]. The principal findings in this monograph are summarized here. There is no comparable review of long-term effects. However the effects of some of the exceptional stresses of the Second World War have recently been studied and the war neuroses, concentration camp sequelae, and the Hiroshima A-bomb effects are used in this paper as paradigms for the understanding of long-term consequences of disaster.

Threat

In the threat phase, denial of the potential disaster may be superficial or deep, it may be continuous or intermittent, it may be total, partial or minimal, but it seems to be universal and in that sense is "normal" (Wolfenstein). Persons who get fearful and go to psychiatrists tend to be diagnosed as "neurotic". Lifton [2] would refer to this denial as a "consistent human adaptation". Like any other adaptation it has its advantages and its disadvantages. All responsibility tends to be displaced onto leaders or authorities. The individual feels that he has neither the knowledge nor the means to affect his own destiny. The authorities attempt to use a rational approach as part of the constructive worrying they are paid to do. However, predictions are often so inaccurate that they seem to be based more on fantasy than reality. For example in World War II, expert advisers to the British Government predicted 20,000–50,000 deaths per day from air-raids, whilst in 2 yr the total number was about 45,000; they predicted mass panic which was totally absent; and by contrast they estimated destruction of property at one thirty-fifth of what it was (Schmideberg [56]). Denial continues through the warning phase and sometimes into impact. Acknowledgement of the danger would result in physical inconvenience and psychic distress. During the Hawaiian tsunami (tidal wave) of May 1960, for example, evacuation was minimal [43]. People may openly refuse to fantasy the danger, e.g. on the banks of the Rio Grande festive crowds watched and cheered the rising flood waters [55].

When the danger is admitted emotional attitudes such as faith and distrust become important, because of the difficulties of knowing the efficacy and reality of the precautionary measures taken by the relevant authorities. The authorities are seen as "parents", and the disaster is attributed to the "powers-that-be". Rules of safety thus become equated with rules of obedience e.g. in the blitz people left uncovered windows which the wardens could not see. Superstition and ideas of magical control flourish, e.g. the fear that disaster may be precipitated by thoughts, speech or actions. Fantastic rumours which indicate a change in the way in which life is construed are common: the classic one is that a drug has been put in the wine or water to reduce libido and potency [55].

Impact

In sudden severe disasters, there is an illusion of centrality. For example in a tornado people believe that only their own house has been hit. The myth of personal invulnerability, so powerful in the threat phase, suffers a sudden reversal: the individual is actually encountering death. There then follows a second major shock when the total destruction is appreciated and the expected sources of refuge and aid are absent. Recollections of this period vary greatly but the evidence suggests that individuals swing between feelings of terror and elation, invulnerability and helplessness, catastrophic abandonment and miraculous escape. The subsequent reconstruction of the illusion of immunity depends on whether the disaster is experienced as a "near miss" or "remote miss", and on the actual amount of loss.

Soon after impact victims appear to be "dazed", "stunned" or "bewildered". They show absence of emotion, inhibition of activity, docility, indecisiveness, lack of responsiveness and automatic behaviour, together with the physiological manifestations of autonomic arousal. This is the "disaster syndrome" (Wallace [42]). It has been explained in various ways: as a psychic closing off from further stimuli, as energy being drained to intense internal work, as a response to fantasies like "if I don't react then nothing has happened" or to feelings of helplessness and the impossibility of undoing all the damage. This reaction is the antithesis of the commonly anticipated one of panic. Panic is

conceived as a reaction to the conflict between egotistic and altruistic impulses. In the face of massive death, people have unacceptable feelings such as sadomasochistic excitement, and ideas and wishes such as "rather him than me" (as if there were a competition for survival) and "he can die instead of me" (as if the death of one person assured the life of another). The thought of sacrificing others to survive oneself is common in fantasy (though the action is rare in reality) and produces guilt feelings. Panic only occurs under very specific circumstances which are not the rule in disaster, and a large body of research indicates that human beings under threat of death are not motivated by a simple drive for physical safety [57]. A complicated social situation with a wide variety of attitudes and motivations develops [58].

Recoil

In the recoil phase, the normal response is a slow return of awareness and recall. The victims become dependent, talkative, childlike, form unstable groups and seek safety. Emotional release occurs. Specific patterns of behaviour have been noted. There may be psychopathic liberation including looting, rape and heavy drinking [18]. Wallace [42] has described a "counter-disaster syndrome" of over-conscientiousness, hyperactivity, loss of efficiency and irrational behaviour, e.g. a surgeon abandons sterile technique. The "staring reaction" also occurs in outside observers as well as those involved, and along with "convergence behaviour" may interfere with rescue and relief. It is accompanied by obsessional preoccupations with the personal implication of the event. Following the murder of J. F. Kennedy, the average U.S. adult spent 8 hr per day for the next 4 days at his T.V. or radio, and Janis [15] interprets this as an attempt to work through the cultural damage.

Early aftermath

As the unorganized immediate individual response gives way to the organized social response, it becomes clear that psychological events have to be understood in the context of a social situation within a particular culture at a given historical moment.

Psychological reactions to loss of loved objects and grief reactions always feature significantly and their characteristics have been well described in the literature (Parkes [59]). The expression of these emotional states may be affected by cultural attitudes. Wolfenstein comments, for example, that in the U.S. there is a prohibition against experiencing despair, helplessness and discouragement which conflicts with the victim's need for acknowledgement of his suffering. Feelings of fear and apprehension commonly persist for some time. Usually they are linked to the idea that the disaster will recur; aftershocks of earthquakes are associated with much more conscious fear than the initial major shock. Also new disasters are fantasied and as rumours these fantasies rapidly spread. For a while the world is an unsafe place and people feel anxious about being left alone or separated from their loved ones.

There are extreme emotional difficulties in dealing with death, especially on a massive scale, and attitudes towards the corpses are coloured by fear and guilt. On the one hand authorities deny them importance ("nothing needs to be done" U.N. Disaster Relief Coordinating Committee) and insist on rapid disposal by incineration and mass burial [60]. On the other hand, survivors have difficulty in mourning their relatives unless they "know" of the death by identification of the body: after the earthquake in Naples in 1968 people spent days searching the rubble for corpses [60]. Following any disaster, relief operations are impeded by enquiries about missing people.

The disaster persists as a "tormenting memory". People are apt to find themselves forced to relive it over and over again and, although this is painful, it seems often to be curative in that the feelings of extreme distress associated with the event are gradually extinguished. Repeated discussion often focusses on regrets and recriminations regarding actions taken before or during the event. For a few the distress and fear do not diminish and they "do not get over it"; others avoid any reminder of the experience and may deny actual consequences. The memory is subject to intrapsychic distortion. William James wrote on the 1906 San Francisco earthquake: "I realize now how inevitable were men's earlier mythological versions (of disaster) and how artificial and against the grain of our spontaneous perceiving are the later

habits which science educates us" [13]. He refers to the re-evocation of primitive animistic views of causality in which the disaster is seen as intentional and purposive. People are unable not to ask the reason why, and they invoke God, destiny, fate, or similar substitutes which are endowed with human qualities and a relationship with humanity. Associated with this intense intrapsychic relationship with the powers-that-be are thoughts and feelings about leading a better life or relaxing moral standards, attitudes of defiance, ideas of being punished, and postures of hope or despair. Survival may be seen as a confirmation of immortality, as being protected again, or as evidence of continued victimization.

A disaster also incorporates many situational therapeutic factors [28] and Wolfenstein describes the well-documented phenomenon of the "rise and fall of the post-disaster utopia". To the survivors it is a relief that the threats and dangers have come from the outside and that he can feel blameless; the remedial needs are specific, immediate, obvious and preponderantly physical, and results are quickly seen from attempts to deal with them; danger, loss and suffering are public not private and are immediately present so that there is a liberation from the past and future; and the most damaged families are a support for the remainder ("relative deprivation"). The initial tendency following a disaster is to give without stint and accept without restraint, but this soon becomes replaced by feelings of hostility, greed, independence, suspicion, envy and competition. For example the relief organizations, which give compensation on needs not losses are resented because the individual's experience is proportional to his loss. The problem of anger, blame and hostility is extremely complex as these affects are always evoked and variously displaced, often with damaging consequences. Lacey [27] comments on the hostility of Aberfan directed towards the National Coal Board, Local Authority and Government which hampered recovery efforts, and towards the Tavistock research workers. Wolfenstein gives many examples of the inappropriate handling of these feelings. Reports repeatedly highlight the irrationality with which such irrational matters are handled.

Following massive destruction of a place, people prefer to move back and rebuild. Relatively few move away and those who do so tend to for "neurotic" reasons. This has been seen many times in tornado cities, bombed cities, Hiroshima, and now in Managua which is being rebuilt on the identical site for the third time after total destruction by earthquake. Material reasons do not seem enough to explain this, nor sentimental attachment. The myths which justify remaining on the site include the inevitability of fate, the belief in the random distribution of disasters, and the idea that running away will provoke further disaster. There are also feelings of loyalty and guilt, wishes to undo the damage or to master the event, and defiant refusal to be scared away.

Special groups: children

The first major group of papers emerged from the experiences of the bombardment and the evacuations and parent-child separations during World War II [61-63]. Acute disturbance was found to be common, but transient, if separations did not occur; separations however had lasting effects sometimes. More recently the effects of disaster on children have been described in detail and some predisposing factors have been defined, e.g. Fraser [64]. Children's reactions must be understood within

the context of the family. In the early phases of disaster their reactions are a function of the way in which reality filters down to them and so they mirror their parents' reactions rather than relating directly to the event [65–67]. The most predominant fear at all ages is separation from the parents. If this does not occur, and if the parents cope with the situation, children may show little awareness of danger and minimal anxiety. The “disaster syndrome” in children takes the form of purposeless excitement. Studies of the Vicksburg tornado [37, 45, 68] in which many children died in a matinee cinema performance confirmed the high incidence of manifest regressive and behavioural symptoms and suggested that the slowest rate of emotional recovery occurred when parents created a tense atmosphere in which the episode had to be “forgotten”. Most families could only permit one member to grieve at a time. Parents who were pathologically distant from or demanding of their children became more so at impact and recoil (also 64). In the early aftermath children show compulsive patterns of working over the disaster and associated painful scenes, such as burials, verbally, or in play and dreams, often to the distress of their parents. Post-traumatic fears of recurrence and reactions to reminders of the event are indicative of pathology related to mishandling of the earlier phases. The general conclusion is that children rarely need specialist psychiatric treatment but that they do benefit from an opportunity to ventilate their anxieties to a sympathetic adult. Those most at risk are between 8 and 12 yr, have a previous history of physical or emotional illness, and come from unstable homes.

Special groups: the aged

There are few detailed studies of the behaviour or of the subjective experience of the aged in disaster. The literature has recently been comprehensively reviewed by Friedsam [69], and general aspects are discussed by Townsend [70] and Titmuss [71]. The aged usually receive warnings later than the rest of the population, are less willing to leave their homes, restrict their attention more to immediate family and less to other members of the community and are particularly at risk of physical but not of psychiatric damage, although a brief reaction of agitated depression with confusion is common. In general the old experience a much deeper sense of deprivation than the younger members of the community, this reflecting the real improbability of their being restored to their former state. The aged of low social status experience strong feelings of resignation to yet further unavoidable suffering.

LONG-TERM PSYCHOLOGICAL SEQUELAE

War neuroses

In the 1940's controversy focussed upon whether the acute post-traumatic neurosis of war was determined by a constitutional predisposition, by the trauma itself, or by some combination of these. Brill and Beebe [72] studied 1000 men with acute traumatic neurosis and found that the only factors which correlated with it were low educational level and stress of combat. If units in battle were defeated and cut off, break-down was universal. This was called “battle fatigue” or “combat exhaustion” and it occurred in willing, stable soldiers who had made an efficient adjustment to battle in units of high morale. Swank [73] in his study of combat exhaustion in over 4000 survivors of the Normandy campaign, found that all soldiers became incapacitated after approximately 75 per cent of their companions were killed. Reid [74] found

similar results in studies of bomber crews in the U.K. Acute traumatic neurosis and combat exhaustion are similar stereotyped reactions which involve symptoms of emotional tension (anxiety, insecurity, nightmares, excessive startle responses, phobias), cognitive impairment (apathy, poor memory, preoccupation, retardation, confusion), somatic complaints (chiefly headache, gastrointestinal distress, backache), and rarely, conversion phenomena (ataxia, stuttering, weakness, anesthesia). Swank's account is unusual in noting the polarization of the attitudes of the doctors who tended to assume either that all the soldiers were neurotic, otherwise they would not have broken down, or that they were all stable, otherwise they would have been previously excluded. The treatment regime included rest, sedation, ventilation of anxieties, abreactions, narcosis and rapid return to the front.

The general belief seems to have been that the incidence of acute traumatic neurosis was relatively high compared to that of chronic traumatic neurosis. However, this has not been confirmed by long-term follow-up studies. Lidz [75] studied those involved in the Guadalcanal evacuation and found that every survivor subsequently developed neurotic symptoms in civilian life. Futterman [76], in a study of ex-servicemen 5 yr after the war, found many unsuspected cases of post-traumatic neurosis. Archibald and Tuddenham [77], in a controlled study of a group of victims of acute traumatic neurosis 15 yr after the acute episode found, that 70 per cent suffered from chronic traumatic neurosis, the majority having acquired additional symptoms. One-third were unemployed and one-third were in unstable employment. The relationship between stress and physical illness is well documented and has been shown to be quantifiable. The incidence of organic disease in the affected population would therefore be predicted to alter following disaster, as a long-term effect. In 1954 the U.S.V.A. National Research Council studied mortality rate and illness incidence in 8000 soldiers in the 6 post-war years. They found gross differences; the prisoners of war having a higher morbidity and mortality than combat veterans and those in Japanese camps being more severely affected than those in European camps. This was thought to reflect the relative degrees of stress.

As yet there is no literature available on long-term consequences of brief stress reactions. For example, large numbers of persons suffered acute reactions during the London air-raids for which their only, and apparently effective, treatment was tea and sympathy from the wardens, and these have never been traced and studied. An investigation of psychiatric and physical symptoms in such a group would not exclude more subtle sequelae such as changes in attitudes in patterns of emotional response and in beliefs. All these are related to a person's capacity to lead a constructive life, to have some inner contentment, to be a loving parent and so on. Ernest Jones estimated that only 8 per cent of soldiers who lost a leg developed a "normal" response of resignation and acceptance [78]. Kardiner [79] described chronic traumatic neurosis as an alteration of the concept of self and world and a constriction of the life space. In the literature on survivors of the concentration camps and of the Hiroshima A-bomb mental adaptations are examined in detail.

Nazi concentration camps

The concentration camps caused "trauma beyond the comparable and conceivable" (Eissler [80]). The features of the stress included continuous threats of death and torture, separations and humiliation. All drives except hunger had to be suppressed. Extreme cruelty had to be witnessed and endured, and no expression or altruistic response was permitted. Rules were capricious and contradictory and

coping behaviour was often less important than chance. The reactions of the victims were either apathy (the Mussulmann state) leading to death, or the "camp mentality" characterized by irritability, egotistic behaviour, envy, absorption with food, lack of compassion, absence of sex drive and familiarity with death. There has been only one detailed study of the concentration camps: Kogon's *Der SS Staat* in 1947 [81]. There was very little literature on the victims for over 15 yr after the war and then in the early 1960's studies appeared from Israel, Norway, Germany and the U.S.A. [82-87]. The literature is now extensive.

The typical response has been variously called the concentration-camp syndrome, the post-KZ syndrome, and the survivor syndrome. It consists of emotional tension (anxiety, phobic fears, hypochondriasis, nightmares, insomnia, excessive startle response), cognitive impairment (poor memory, preoccupations, loss of concentration), psychosomatic complaints, heightened vulnerability to stress, chronic depression with guilt and isolation and disturbed sense of self- and body-image. Thus it closely resembles post-traumatic neurosis. The syndrome is chronic, severe and resistant to treatment. Chodoff [88] describes the two sets of attitudes typical of concentration camp survivors following the failure of their post-disaster utopian dreams: either seclusiveness, apathy, helplessness, passivity, fatalism and dependency, or suspicion, hostility, mistrust, cynicism and a quiet bitterness or quarrelsome belligerence.

The aetiology has been extensively investigated, particularly in Norway. One of the more recent reports by Strom [89] described a detailed study of 227 non-Jewish Norwegian survivors of the concentration camps. In only 10 was there evidence of psychiatric illness prior to imprisonment, whereas 223 had symptoms at the time of examination. This could not be attributed to previously operative social or psychological factors. The neuropsychiatric picture was due to both psychological stresses and organic brain damage and the symptoms caused by each of these two factors were found to be separable.

It is widely recognized that these patients avoid treatment: of the 1,000 cases studied by Grauer [90] only 10 were prepared to return for free psychiatric help. Many victims make a paradoxically good overt socio-economic adjustment [91].

Hiroshima

The most detailed study of the internal worlds of long-term post-disaster survivors is that of Lifton in Hiroshima [2]. He described the painful immediacy and intense emotion which accompanied the re-creation of the event by the survivors. This is similar to the responses of survivors of the concentration camps. It was "an indelible imprint of death immersion which has formed the basis of a permanent encounter with death, a fear of annihilation of self and individual identity along with the sense of having virtually experienced the annihilation; the destruction of the non-human environment, of the field or context of one's existence and so of one's being-in-the-world, and replacement of the natural order of living and dying with an unnatural order of death-dominated life." The hibakusha (survivors) suffer a profound emotional disturbance which affects almost all aspects of their life, so profoundly that they seem to have become a different category of being. Lifton emphasized the importance of the concept of the "survivor", one who has come into contact with death in some bodily or psychic fashion and has himself remained alive. The survivor seems to be unable to conclude that it was logical and right for him and not others to survive, and is bound by a conviction that his survival was made possible by others' deaths. Guilt and shame over survival priority developed very rapidly after Hiroshima, and as in concentration camp victims it has been intense and persistent.

The hibakusha seem to be living a life of grief, mourning for family, anonymous dead, and things (houses, streets, personal objects) which are lost symbols of their former self. The dead seem to be always with them. The living identify with the dead and remain preoccupied with the inevitable incompleteness of this process. They fear the dead, need to placate them, and submit to their moral arbitration. Lifton construed the train of thought as: "I was almost dead. . . I should have died. . . I did die or at least am not alive. . . or if I am alive it is impure of me to be so. . . anything which I do which affirms life is also impure and an insult to the dead who alone are pure. . . and by living as if dead, I take the place of the dead and give them life".

The victims are victimized. Although they are eligible for extra benefits, they are discriminated against socially and in business. This is reminiscent of the conflicts that emerge as the post-disaster utopia collapses. The hibakusha crave special care and nurturance, which they then perceive as insincere, humiliating and unacceptable. Consequently they become intensely resentful. They also show survivor paranoia and survivor exclusiveness ("we who have been through it are different") which disturb social integration. The non-hibakusha have attitudes towards the hibakusha similar to those that the hibakusha have towards the dead, i.e. fear and guilt. They are "survivors once removed". This leads to the tendency to cast out the tainted (the hibakusha), and the response of honoring martyrs while resenting survivors.

Formal psychiatric illness is not common. Psychosomatic illnesses are prevalent and hypo-

chondriasis and "neurasthenia" are usual. The hypochondriasis is associated with ideas about cancer and fears of death and dying, and the neurasthenia is manifested by vague complaints such as fatigue, irritability, sensitivity to weather, difficulty in coping, dizziness, malaise and depression.

Lifton suggested a mechanism of mental adaptation to the psychological impact of disaster. Death annihilates at the physical level (bodies, houses) and mastery is required of this death immersion. It also annihilates at the psychological level (friendships, life cohesion). The hibakusha must work firstly to emancipate himself from his bondage to the dead, and secondly to re-establish himself among the living. A process of the formulation of the relationship of the self to the world is necessary for this. Positive formulations involved "non-resistance" which enabled the survivor to absorb the losses and "sacrifice with a sense of special mission" which enabled the survivor to justify the continuation of his life. Negative formulations involved imagery of break-down, revenge, bitterness and continuous strife, which tended to generate more guilt and anxiety. When guilt and anxiety were excessive, they hindered the development of any formulation and this resulted in further difficulties in adjustment.

For many years the experience was relatively intractable as a subject for symbolic transformation in art. The principal factors interfering with the creative response were the guilt and anxiety associated with conflicts between literal and artistic truth, and the resistance of the subject to integration within the wider human framework of death and survival. However with the passage of time, works of art which do seem to encompass the experience have appeared.

MANAGEMENT

There is evidence that specialized psychiatric skills could be useful in all phases of a disaster. However, psychiatrists are rarely called upon and their intervention is actively resisted in the early phases by other helpers and in the late phases by the victims themselves. Although a significant proportion of persons may be disturbed in the acute phase, it is not clear what priority should be assigned to psychiatric help relative to other relief. In the Ancash earthquake psychiatrists were summoned urgently as it became apparent that psychiatric complications were hindering other care [18]. In more developed countries this should be feasible as a routine and in Yugoslavia, for example, the psychological impact of disaster has been considered in planning relief services.

In the acute phase, 10 per cent of the population may be so disturbed as to require specific intervention such as rest, removal from the site, physical restraint, sedation and personal attention. The commoner later complications are grief or depressive reactions, post-traumatic neuroses, and transient emotional disturbances in children. Those most at risk are the bereaved, injured and children separated from their parents. General supportive therapy along simple psychotherapeutic lines is the usual approach and provides at least temporary relief. Apart from the orthodox methods of individual treatment, there is little information on the special problems of treating communities where death, disablement, material loss and bereavement are prevalent. The community response may be therapeutic, aggravating or both.

Barton [8] has produced a model of the factors, individual and collective, that may significantly affect the community response and he suggests that the community as a whole, as well as individuals, must be a target for management. For example it is important to be aware of the significance of the media in both aggravating and ameliorating the individual's psychic distress. An obvious role for psychiatrists would be to set up groups to work through the community's shared experience in a constructive way. Victor Frankl [92, 93] attempted constructive psychological work of this kind within the setting of continual massive psychic assaults in the concentration camps.

Hocking concludes his review by stating: "If extreme stress is prolonged, break-down is universal, once this occurs removal of the stress may result in only a temporary improvement, the individuals are left with an impaired capacity to adapt to everyday life including the physical and psychological stresses of ageing" [1]. It is not clear whether treatment can reduce the amount of disability. A major problem in psychiatric

treatment is firstly, the reluctance of the victim to recognize his need for help, and secondly, the reluctance of the psychiatrist to acknowledge the need.

Krystal [94] showed that the allocation of restitution payments from Germany was a function not of diagnosis or psychosocial state but of the centre in Germany where the case was handled. He found that even when sickness was identified it was rarely treated: 31 of the 697 potential patients received treatment. In Japan, Lifton estimated that 10–20 per cent of the hibakusha are still unregistered, and although political pressure has resulted in gross, and largely gratuitous, extensions of medical benefits to hibakusha, the existence of mental illness as a consequence of the A-bomb is not accepted.

The main source of information on the outcome of the treatment of the chronic complications of severe stress is the literature on the survivors of the concentration camps. The treatment has generally been psychoanalytic and there is controversy about its efficacy.

De Wind [95] claims that massive stress is neither an indication nor a contraindication to therapy. However, he lists many specific difficulties including the formation of a delusional transference, affect lameness and dread of affects, somatization, special countertransference problems, survivor guilt precluding recovery, loss of basic trust, inability to realize that aggressive wishes are not omnipotent, excessive guilt over enjoyment of sado-masochistic gratification, and the use of the experience as a resistance to the resolution of the infantile neurosis. On the basis of 22 cases treated with psychoanalysis and others treated with psychotherapy, he concludes that the pathogenic influences of the experiences may be relieved and once again it can become possible for a victim to take his existence for granted and to feel that the world is a safe place.

A possible beneficial effects of a community response in the long-term has been demonstrated in Israel.

The kibbutz provides a secure psychosocial milieu which probably facilitates integration and self-acceptance with a possibility of new identity formation, and the country has special museums, periodicals, occasions of public mourning and so on. Community efforts of this kind might also minimize the second generation effects which are well documented [96]. The children are psychologically comparable to those whose parents have had massive deprivation in their childhood. This cultural "working through" seems to be both a spontaneous and purposive development in many countries which have been ravaged by civil war. It takes the form of continual reminders of the struggle and reiteration of its value and of the heroism of those who suffered, expressed in the media, arts and public works.

PREVENTION

Primary

The psychological effect of warnings in terms of social action is discussed by Janis [97]. The problem is one of the human capacity for vigilance, and the tendency to become hypervigilant, or, more usually, to adapt. Because of this extensive use of denial, psychiatrists might have a role in alerting the public. Some kinds of disaster are almost completely preventable.

Psychological work must be done to minimize the psychological impact of disaster. There is agreement that a qualified rather than total belief in immunity and the absence of disaster constitutes a favourable condition for withstanding an extreme event. There must be an admission of the possibility of occurrence yet a belief in survival. In admitting the event to consciousness, Janis refers to the work of worrying. Anticipation is a small scale preliminary exposure on the level of imagination and can have an inoculating effect. By rehearsing and familiarizing oneself with the coming event one may reduce the risk of being overwhelmed by the experience.

In the Bengal famines of 1943 and 1971, the notable feature was the refusal of the governments (British and Pakistani, respectively) to do this [21]. However Janis gives examples of the ill-considered and highly charged emotional reactions which develop with the forcible breaking down of denial [98]. Jacobson [25], describing the various individual and interpersonal crises which developed in a large group of passengers confined aboard a sky-jacked plane, commented on the "normal" response of refusal to accept emergency, threat and crisis. She suggested the exploitation of normal life crises

and the use of non-insight oriented encounter groups to provide people with an acquaintance with their own feelings and responses to threat.

Secondary

The most important aspect of psychological care is the social provision of physical care: i.e. physical care *is* psychological care, and this is the prime and essential function of relief organizations. General psychological first-aid should be understood by all responsible personnel involved in disaster relief. It involves fundamentally the establishment of effective human contact with those who are disturbed or upset. The principal requirements are for personnel to accept every victim's right to have his own feelings, to accept the victim's limitations as real, and to accept their own limitations [99].

A variety of social factors which influence psychological recovery have been identified [9]. It is essential that local governmental bodies and relief organizations are aware of these. Separations of loved ones (particularly children from parents) are traumatic and every effort should be made to prevent them. The confusion, anxiety and guilt can be minimized by accelerating the natural processes of reorientation and reidentification; leaders are needed, lists of dead and injured are necessary, the establishment of effective communications and centres of information is important, and the spread of rumours must be halted. Competition between relief organizations must be rapidly dealt with. In addition to the fundamental physical, psychological and social approaches to relief, specialist psychiatric care is required for acutely disturbed victims. Their prompt treatment may be essential for efficient operation of other services, and may have a favourable effect on the long-term prognosis of those affected.

Tertiary

Working through at the individual and group level is an important aspect of the ultimate acceptance of the event and its consequences; and it may also aid in the development of constructive attitudes and efforts. Psychiatric treatment, rehabilitation and general community work may also be needed [7, 79].

PLANNING SERVICES

To outline a plan for an ideal psychiatric disaster relief service, it would be necessary to predict the approximate number of psychiatric casualties of different types and to calculate the amount of psychiatric manpower required at various times after the event to handle this. This involves the following methodological problems. (1) The lack of tools to measure the prevalence of treatable and untreatable psychiatric morbidity in a community. (2) The lack of control groups and "before and after" data for disaster: a disaster is unpredictable and most routinely collected data reflects nosocomial factors which are changed by the crisis rather than true morbidity. (3) Lack of information on the effectiveness of various psychiatric techniques.

Quantitative data is currently available from the various studies described earlier in this paper. The literature on life crises and their relation to mental and physical illness provides models from which further deductions can be made about morbidity following a disaster. A variety of studies [100-105] have compared the number of stressful life events preceding mental illness with that in control groups. Brown *et al.* [100, 101] in an important group of papers have examined the relationship between life events and subsequent mental illness. They conclude that severely threatening events may be formative in depressive illness and may trigger schizophrenic illness, and that depressive illness may also be triggered by milder stresses. Cooper and Sylph [105] suggest that severe life events may cause neurotic illness and milder events may precipitate them. Using the experimental data of these workers, the incidence of depressive illness in a disaster-struck community could increase by

350 per cent and that of unspecified neurotic illness by 1100 per cent. Of the unspecified neurotic illness, 30 per cent would be assumed to be substantially caused by, rather than precipitated by, the disaster. This group at risk might be relatively more difficult to identify. Brown *et al.* wrote "our formulation of the problem is based on the explicit assumption that vulnerability to events varies with the spontaneous onset rate which may be interpreted as the degree of latent psychiatric disturbance" and "nor is it reasonable to reach any sort of final conclusion about the proportion of patients involved in a total environmental effect" (which could be a disaster, for example) "without a complex analysis which takes account of a whole range of other possible social influences". We suggest that their model might be extended to examine data on the psychiatric morbidity following disaster and elaborated to define factors which affect the degree of latent disturbance in an individual which might be useful in identifying those at risk (our reading suggests that age, previous psychiatric history, and ethnic isolation would be important), and the immediate and delayed effects of the total community experience and the type of disaster on the relation between events and illness.

Thus the incidence of illness reaches a maximum shortly after the disaster and is compounded of caused illness, precipitated illness and illness which would have occurred at that time anyway. The incidence then falls slowly to below normal for the population, reflecting the premature occurrence of precipitated illness, and eventually returns to normal. The prevalence will of course persist above normal reflecting the existence of long-term complications. To predict the amount of manpower which can be productively introduced into the area, data is required on the effectiveness of intervention. This urgently needs investigation. Until it is clarified no definite conclusions can be drawn regarding the relative priorities of psychiatric, medical and other relief services in situations of limited resources. We would make the following suggestions for present-day practice:

(1) A psychiatrist should visit all major disaster areas in the first few days after the event and should advise on first aid and on the psychiatric services which are likely to be needed in the immediate and longer term future. This judgement will clearly be related to the normal standards of care available in the area.

(2) A world-wide register of psychiatrists particularly interested and experienced in the various aspects of disaster should be set up. These might advise as expert consultants to regional psychiatric centres.

(3) Teams of psychiatrists and auxiliary personnel should be available for integration with the general relief response in areas where there are no developed psychiatric services.

GENERAL DISCUSSION

Disaster and the concept of disease

Much of the controversy in documenting and in managing the psychiatric sequelae of disaster is a reflection of the confusion between a variety of different models of illness, such as the pathological, the statistical, the sociological and the psychodynamic. This discussion considers some of the consequences of this confusion. A major problem in describing human behaviour in psychiatric terms is its definition as normal or abnormal in the context of a particular model. The study of a disease as a specific entity has been heuristically convenient, but it must also be understood by the clinician as a state of being, a dimension of the person's way of life [106]. Engel and others have used grief as a model for this approach [107, 108].

Responses to stress: psychodynamics

The concept of the continuity of disease process is related to the fact of the continuity of stress. It is not clear exactly what mental processes are involved in sustaining

and dealing with stress, in “coping”, “surviving”, or “getting over it”, nor what are the mental sequelae.

Physical stress and psychic trauma cannot be equated because psychic trauma is not so much determined by the physical intensity of a situation as by the meaning and affects evoked in a particular individual. Any experience which provokes distressing effects (fright, anxiety, shame, physical pain etc.) is potentially traumatic. The essence of the traumatic situation is an experience of helplessness on the part of the ego in the face of the accumulation of such internal excitation [109]. This is universal in infancy, but rare in adulthood; however a disaster can be just such a situation. What is threatening to a particular person depends on the amount of psychic pain and painful affects he can tolerate; with maturity and emotional development this tolerance increases [109, 110].

In children, “developmental studies have demonstrated that trauma may result, not only in the fixation of defences and inhibitions, but also in the disruption of ego capacities and the narrowing of the range of techniques and patterns of behaviour available for dealing with objects and with the environment” [111]. This is closely comparable with Kardiner’s description of the psychopathology of the adult with chronic traumatic neurosis [79].

A distinction may be made between the single massive experience (shock trauma) comparable to the acute disaster, and the accumulation of difficult experiences (strain trauma) comparable to the chronic disaster. In the latter case a variety of accumulating tensions and affective states results in an increasing state of ego strain, and eventually, as the adaptive responses fall, a strain trauma, with the subsequent development of new ego organization to preserve a feeling of safety [112].

Many writers [7, 90, 94] emphasize that the psychopathology during and following prolonged states of disaster is to be understood as a reality-oriented adaptation (albeit to the abnormal reality of the disaster situation) rather than as attempts to benefit from secondary gain, or as defensive regressions to ward off reactivated inner conflicts. Other work [2, 94, 113] suggests that one of the fundamental and more obvious alterations in an adult subjected to severe stress is in his formulation of existence. With increasing age, formulations may take on a negative pessimistic diminishing quality [32, 72, 114].

Classification of responses to stress

Although evidence shows that disaster alters the affects, ideas, attitudes and physical health of those exposed, there is not much literature contributed by organically-oriented psychiatrists. The reactions are often not functionally disabling, somatization and real physical ill health leads the patient to general physicians, and few victims present as psychiatric patients with formal abnormalities in their mental state. By contrast the psychoanalytically-oriented psychiatrists find a plethora of symptoms and often severe pathology. They claim that this discrepancy arises because when the psychiatrist is experienced as unreceptive, emotional catharsis is inhibited, and the patient retires into a defensive isolation and takes up a posture of health. Where psychiatric disturbance is overt and less disputed, it is often difficult to accommodate in existing taxonomies. Roth takes some of the more severe reactions to disaster as examples of syndromes falling outside the traditional division between neurosis and psychosis [53]. The typical stress response known as post-traumatic neurosis, post-KZ syndrome, and combat exhaustion has been relatively clearly delineated but is not recognized in the International Classification of Diseases as a separate diagnostic category. Attempts to assess the psychiatric morbidity in the survivors of concentration camps in traditional nosological terms resulted in the improbable conclusion that the incidence of mental illness in this group is lower than that of a control group [115].

The age of the survivor [2]

Langer [116], in a review of historical studies of the great plagues, postulated the aggregate effects of psychological trauma as the mechanism whereby disaster brings changes in a society or culture (also cf. ref. [117]). Following the Black Death there was an age marked by misery, depression, anxiety and a general sense of impending doom. The plague was a chronic frightening threat about which nothing could be done. However, today we both expect and demand survival; society admits the narcissistic entitlement, the right to survive.

Whether we face the traditional disasters such as natural disaster, economic disaster and disasters involving deprived minorities, or the more modern disasters of overpopulation and environmental pollution, our close contact with them in a world shrunk and made emotionally immediate by television-satellite communication turns us all into both participants and survivors. As such the sequelae of disaster discussed in this paper are relevant to us all.

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