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Survival Psychology

John Leach

SURVIVAL PSYCHOLOGY

Also by John Leach

RUNNING APPLIED PSYCHOLOGY EXPERIMENTS

Survival Psychology

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To all those who

. . . shall go
Always a little further: it may be
Beyond that last blue mountain barr'd with snow
Across that angry or that glimmering sea.

James Elroy Flecker (1884–1915)
The Golden Journey to Samarkand

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Preface

Survival is a very personal thing – it is a very lonely thing. Even amongst others, be they familiar colleagues, nameless refugees or one's guards, the survivor is thrown in upon himself. How he copes psychologically with this situation will determine whether he becomes a survivor or remains a victim. It is one of life's paradoxes that survivorship may often be a joyless and a thankless task.

Over recent years there have been many advances in survival equipment, technology and training both in the military and commercial areas. Yet, despite such advances, people still perish in large numbers, in very little time and often without any known organic cause. Many will die quietly and with little fuss like a flame that chooses to glow no more. Much equipment sold for survival purposes is designed in warm rooms by people who often have little or no working knowledge of how the body performs under threat or in hostile conditions. They are frequently surprised when their products are washed up, still intact and unused, alongside the corpses they were intended to prevent. Some training continues to be based on false premises and assumptions about how the body and brain function. Much of psychological concern has been directed almost exclusively towards understanding and medically treating the aftermath of survival and disasters, as can be witnessed by the recent medical and legal recognition of 'Post-Traumatic Stress Disorder'. Comparatively little effort has been focussed upon understanding and appreciating the psychological functioning of the would-be survivor during the actual period of personal threat, be this war, capsize, air crashes, bombings, incarceration in prisoner-of-war and concentration camps, tornadoes, hurricanes, volcanic eruptions, earthquakes, fires in offices, homes, theatres and so on.

It is psychological functioning *during* survival which this volume seeks to to address. It is intended as a *primer* in survival psychology. This book is written primarily for those in positions where they may be themselves called upon to survive or

to handle victims or to plan for potential victims: military personnel, rescue services, medical and health workers, design engineers, seamen and aircrew, offshore and field workers, explorers and adventurers, disaster and civil defence planners and so on. Wherever possible the author takes a pragmatic approach, bedded in only as much theory as is necessary to appreciate a point and illustrated by various examples each of which tells its own tale. Psychology is the science of behaviour. It is this simple but comprehensive definition which is adopted throughout this book.

Human performance under hostile conditions cannot be explained solely within the realm of psychology. Physiological conditions, such as hunger and thirst, and environmental conditions, such as isolation and crowding, all play their part in destroying a man's being. It is for this reason that physiologically and environmentally associated factors are addressed in this book. It is also said that a person is not a survivor until after he has been rescued. This is not the whole story. The author will argue that a person is not a survivor until he has shown full functional recovery. Anyone who has been physically rescued from a disaster yet still suffers psychologically from its effect to the extent that it interferes in their everyday lives, remains a victim. Although this text is concerned with the psychological rather than the psychiatric consequences of survival it is essential that potential victims and rescuers have a basic acquaintance with the symptoms of a failure to recover and consequently a chapter on Post-Traumatic Stress Disorder is included.

Material from many diverse sources have gone into the writing of this book: from the author's own experiences of hostile environments including desert, Arctic, Polar, above and beneath the waves, high altitudes, caves and military environments as well as a number of formal survival training courses, both military and civilian; from his own field and laboratory-based research work; from the work of other scientific researchers, authors and journalists; from emergency personnel, design engineers, mental health workers, police officers and members of the Armed Forces, and above all from the personal accounts of survivors of both sexes, all ages and different

nationalities who have, over the years, allowed the author to debrief them, formally and informally, for the purposes of gaining a better understanding of the psychology of survival. These survivors have come from fires (large and small), shipwreck (short and long duration), aeroplane crashes (military and civilian), shootings, mountaineering and caving accidents, combat, and former prisoners-of-war and concentration camp inmates.

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JOHN LEACH

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1 Anatomy of a Disaster

We live with disasters every day. We have done so throughout our history. Small misfortunes, medium-sized adversities and overwhelming catastrophes plague mankind. They possess an inevitability which surprisingly perhaps makes them appear commonplace. The recent spate of man-made disasters has only emphasised their ordinariness. Until recently major catastrophes were the stuff of anecdote, legend and mythology: the seven plagues of Egypt, the Great Fire of London in 1666, the Los Angeles earthquake (1906), the sinking of the *Titanic* (1912) and the *Lusitania* (1915), the Great War (1914–18), Nagasaki and Hiroshima (1945), Auschwitz and Dachau (1939–44), the chemical gas leak at Bhopal (1984), the explosion at Chernobyl (1986), the King's Cross underground fire (1987), the war and concentration camps in the former Yugoslavia (1991) and so on. On the face of it such catastrophes appear to comprise an ill-assorted collection of misfortunes which possess neither rhyme nor reason. Their sole common factor perhaps being the degree of misery inflicted on their victims. It is the human element which links these disasters and it can be argued that it is this element alone which qualifies an event as a disaster.

A closer study of the make-up of a disaster will reveal a remarkable degree of consistency between such apparently unrelated events. This consistency lies in the behaviour of people trapped in a situation which threatens their lives. A behaviour which follows a structural pattern, and a pattern which is transferable across different types of disasters: it matters not whether it is the sinking of an ocean liner, a warship or a small fishing smack; a fire in an office block, night-club or family home; a motorway pile-up, aeroplane crash or combat, the same patterns of behaviour continue to recur. These physical, environmental, physiological and psychological facts of survival, are better understood once the architecture or anatomy of a disaster is appreciated.

In recent years studies of disasters have been carried out

in a more systematic and scientific way in an attempt to discover and classify their underlying structure. Two broad approaches have been adopted in these studies: the first has attempted to describe a disaster in terms of its properties, usually along different dimensions such as natural or man-made, duration and geographical range. The second approach has been concerned more with modelling disasters according to their impact on human behaviour before, during and after the event. The first approach is more classificatory or typological in its nature while the second takes a more dynamic view.

STRUCTURED APPROACH

One of the first people to produce a detailed typology of disaster was A.H. Barton in 1969 who described disasters along four dimensions: scope, preparedness, speed of disaster, and duration of impact. The first dimension concerns the 'scope' of its impact. In this system Barton uses the term 'scope' to refer to the geographical impact of an event and includes the extent of damage incurred to both lives and property, both of which carry significant psychological implications. The second dimension refers to the preparedness of the community involved to react and to respond effectively to the consequences of a disaster before, during and after it has occurred. The third dimension is a measure of the speed of onset of the disaster, for example, sudden, gradual or chronic. The final dimension refers to the actual duration of the impact whether it is short and comparatively sharp or of a longer duration and may include repeated episodes. A repeated episode occurs when, for example, two or more earthquakes strike in the same geographic area within twelve or twenty-four hours, or on a smaller scale, when in a motorway pile-up, vehicles continue to plough into one another over a five to ten minute period.

Barton's typology is conveniently laid along four dimensions, but from the psychological point of view these dimen-

sions cannot be kept completely separate. The combined effects of both the speed of onset of a disaster and its duration has important implications for individual and community preparedness and rescue. The slower the onset the more time available for a person or community to take avoiding action, while the longer the impact continues, as in a hurricane rather than an aeroplane crash, the greater is the potential for increased death, damage and injury. The ability and willingness of a group to prepare to meet a disaster is a significant factor in determining both the physical and psychological outcome.

One important dimension missing from Barton's classification is that of natural versus man-made disaster, for example, an earthquake versus a train crash. It has been argued that putting such a dimension as natural versus man-made into a proposed disaster classification may serve only to complicate matters. It cannot be denied, however, that disasters are occurring more frequently as a consequence of human error or negligence, and that these are not likely to decrease in the foreseeable future. There are important implications here for both disaster planning and mental health treatment (see, for example, Green 1982).

This dimension of natural versus man-made disaster has been included in a more recent classification scheme devised by Berren, Beigel and Ghertner in 1980. In this scheme the disaster framework is five dimensional. The first dimension is the type of disaster, that is man-made or natural. The second dimension is duration, that is a sudden versus a slower onset. The third dimension measures the degree of personal impact. The fourth dimension describes the potential which the disaster has for occurrence or reoccurrence and the final dimension concerns control over future impact.

Clearly, there are areas of overlap between the above two typologies. Barton's speed of onset and duration of impact correspond closely to the duration of event and potential for reoccurrence of Berren *et al.* Both schemes also tend to concentrate on the physical properties of the disaster itself.

Recent attempts have been made to classify disasters less by their properties than by the impact they have on people. One such classification was devised in 1981 by Gleser, Green and Winget. This framework is based on a description of psychological and behavioural impairment found in victims following a disaster. This description comprises (1) the degree to which the life of an individual is threatened, (2) the degree of bereavement felt by the individual, (3) the length or prolongation of suffering suffered by a victim, (4) the amount of geographical displacement required, (5) the proportion of a community or group affected and (6) the underlying cause of the disaster, that is whether it is a natural or man-made event. This framework was established by Gleser and her colleagues following a psychiatric study of the victims of the Buffalo Creek disaster. Briefly, the Buffalo Creek disaster occurred in 1972 with the collapse of a dam and accompanying major flooding. There were 125 deaths and 4000 homes were destroyed.

Although the emphasis in this latter framework is more on the effects that the disaster has on people rather than the properties of the disaster *per se*, there are still some overlaps with the classifications of Barton and Berren. It may be argued, for example, that Gleser's dimensions of life threat, bereavement, prolongation of suffering and displacement equate roughly to Berren's degree of personal impact.

While these classifications are certainly helpful in our understanding the general structure of a disaster they do not always fit a specific catastrophe in as snug a fashion as their authors would wish and it has been strongly argued that other dimensions should be included to accommodate the diversity of disasters. It was noticed, for example, that victims of the Buffalo Creek flood showed much higher levels of psychopathology or behavioural aberration compared with the relatively low levels found in the victims of the Xenia tornadoes. The Xenia tornadoes occurred in Ohio (USA) in 1974 and resulted in 33 deaths with a further 10 per cent of the population suffering physical injury. It has been suggested (Tierney and Baisden 1979) that the high level of psychopathology found in the Buffalo Creek

victims was due to the fact that these people greatly outnumbered the non-victims. Consequently, the victims could do little to help themselves or one another and assistance had to come mostly from outside. In the Xenia tornadoes on the other hand, the non-victims significantly outnumbered the victims and were able to give assistance. The suggestion here is that the ratio of victims to non-victims in a disaster should, because it has differing psychological consequences, be classified as a separate dimension.

Furthermore, the use of scope as a single dimension is not always helpful when the individuals involved in a disaster do not make up a specific group or community, or when only one part of a community is involved. This dimension could be further refined to identify disasters as being either central or peripheral to a geographic community. An example of a central type of disaster would be one in which the whole physical and organised structure is affected. This can occur in floods, hurricanes and so on. A peripheral type of disaster would be one in which the victims had come together by chance, such examples would be aeroplane crashes, some types of fire (as in a night-club or theatre) and shipwreck. Such descriptions, however, are rarely straightforward and many real events are neither central or peripheral but rather of an intermediate type. Such a type would be one in which a catastrophe occurs to a group of people within a community, and consequently affects the whole community in some sense (e.g. a coal mine cave-in), but where there are unaffected members of the community and the victims' homes and neighbourhood generally remain undamaged.

In the central type of disaster victims will frequently suffer additional blows by the need for them to be re-located to different surroundings and often to be housed amongst strangers. On the other hand survivors of a peripheral type of disaster are often able to return to their communities where the structure, social and medical support networks are still intact. Consequently, the level of abnormal and disturbed behaviour would be higher in a central type of disaster than in a peripheral type. The scope of a disaster can therefore be described in terms of those areas of a

victim's life which are disrupted. A central disaster can affect a person's access to shelter, financial issues, work, availability of friends, relatives and social agencies. A peripheral disaster may produce suffering, grief, threat to life and so on but the probability of serious, long-term psychiatric consequences is significantly reduced if the central physical and social infra-structure remains intact.

A similar model has been used to portray the spatial component of a disaster highlighting the fact that the level of destruction and injury can vary from total devastation through partial damage to non-affected neighbouring regions. This effect is rather like that of waves which decrease into ripples as they travel over distance.

Although the dimensional approach to classifying disasters is a useful one, there is the danger that in order to make it fit a specific disaster more and more dimensions are introduced until it becomes unworkable and serves more to confuse than to clarify.

DYNAMIC APPROACH

The above descriptions all attempt to classify disasters by their type, that is, by their physical properties. Although this can be useful in attempting to comprehend the nature of disasters, it tends to be limited in its application to the study and understanding of human behaviour under disaster and survival conditions. Consequently, attempts have been made to produce operational models which reflect the progress of a disaster mirrored in human behaviour. These are dynamic, or perhaps more correctly psychodynamic models. Although there exists more than one model of the dynamics of a disaster, the differences between them appear largely to be more of degree and terminology rather than any underlying assumptions or fundamental properties.

One of the first such models was developed by Tyhurst (1951) in which he described the course of a disaster in three overlapping phases. These he termed the *period of*

impact, the *period of recoil,* and the *period of post-trauma.* The period of impact is that phase when disaster strikes: when two ships collide; when part of an aircraft fuselage disintegrates; buildings tremble and begin to collapse; fire and smoke lick beneath doors and across curtains and furniture. It is that phase when a person realises that he is under real threat of death or injury.

During the period of recoil the immediate threat has subsided, however, the victim is far from being safe and secondary threats are present. The survivors have abandoned their sinking ship and have recovered into a life-raft; buildings have ceased collapsing and the ground no longer jerks and lurches while the dust settles slowly. The victim now faces possible fatigue, exhaustion, hunger, thirst, injury and psychological impairment. These secondary stressors mean that the victim is far from safe and that there is a very real chance that he may not yet survive the incident.

The period of post-trauma is that phase which follows rescue. The victim has survived the disaster and both primary and secondary threats have been removed. Although the victim is now physically safe he faces the difficulties of physical and psychological recovery.

Later Glass (1959) extended this model to five phases: (1) the pre-impact period, (2) warning period, (3) impact period, (4) recoil period, and (5) post-impact period. According to Glass the pre-impact period exists whenever there is a high probability that a disaster will occur. This period could last from weeks to months. The warning period is the time when danger is actually imminent. This period usually lasts minutes but may extend to a few hours in duration. The other phases correspond to those of Tyhurst. A more detailed seven stage model was previously introduced by Powell and Rayner (1951) whose stages comprised: (1) warning, (2) threat, (3) impact, (4) inventory, (5) rescue, (6) remedy, and (7) recovery.

These three models match each other very closely. The warning period and threat period of Powell and Rayner's model is equivalent to Glass's pre-impact and warning period while their impact and inventory periods again equate

directly with the periods of impact and recoil described by Tyhurst. Powell and Rayner's last two phases, remedy and recovery, equate to the single period of post-trauma (Tyhurst) or post-impact period (Glass). The main distinction in the third model is the inclusion of a rescue phase which, rather surprisingly, is omitted in the other two models.

For the purpose of considering the psychology of survival, the author has resolved the above typologies into one five-dimensional model. This model provides a clear and robust structure within which survival behaviour can be studied.

The model proposed here comprises:

Pre-impact phase
    threat stage
    warning stage
Impact phase
Recoil phase
Rescue phase
Post-trauma phase.

SUMMARY

1. Threats to life and of physical injury occur all the time. Every person is a potential victim. Not everyone is a potential survivor.
2. Disasters and misadventure come in many guises but they all have one common denominator – the threat to personal survival.
3. Notwithstanding their richness research has shown that disasters possess a pattern, an internal structure with a high degree of consistency. They follow a natural evolution. This pattern has formed the basis for two methods of classification: the structural approach and the dynamic approach.
4. Structural approach. This method describes disasters along different dimensions such as the scope of the impact, the speed of onset of the disaster, how prepared

the community or group was to receive the impact, how long the threat lasted and whether it was natural or man-made. This approach is useful providing the model can be bounded. The danger lies in incorporating too many dimensions in order to force the model to fit a specific disaster. This may make it unwieldy and impossible to use effectively in practice.

5. Dynamic approach. This approach models the natural history of a disaster in terms of its evolutionary effects on human behaviour. Various dynamic models exist but they all bear a functional resemblance to each other. Their differences lie merely in detail. The broad sequence of those models follows from a pre-impact phase, through the physical disaster itself to the post-trauma and recovery phases.
6. The model employed in this book is a dynamic one. This will be used as a framework to study human behaviour under hostile conditions. It will incorporate the following phases: pre-impact, impact, recoil, rescue, and post-trauma.

2 Psychological Responses to a Disaster

In the previous chapter a model was established to enable discussion of human behaviour during a life-threatening event. The elements of this framework comprise the period of *pre-impact* (including threat and warning phases), the period of *impact*, the period of *recoil* and the period of *post-trauma*. It is now possible to map onto this model human responses in extreme situations.

Studies of people caught in disaster or extreme predicament have thrown up two rather remarkable facts. Firstly, psychological responses appear to follow a set pattern. They are not as diverse, discordant or haphazard as may at first seem to be the case. Secondly, this pattern of behaviour is for the most part transferable across different types of disaster, for example, the same psychological pattern has been observed in people in fires in skyscrapers and dance halls, shipwrecks, earthquakes and tornadoes.

PERIOD OF PRE-IMPACT

There are disasters and misfortunes which strike out of the blue leaving no possibility for personal preparation and planning. Other events carry signs of danger before them alerting people to the fact that a calamitous event is highly likely. These signs may be subtle or blatant. This phase is the period of pre-impact during which people come to perceive that there exists a threat or risk to their lives.

There are different intensities of threat and not all warrant permanent watchfulness. Clearly, it is impossible to function normally and to go about one's everyday business if running constantly on full alert. Indeed in many circumstances such behaviour can be considered as

clinically abnormal. However, at any one time there are different levels of threat which precede a disaster and which require different responses. For the purpose of this model the period of pre-impact has been subdivided into two phases: threat and warning. This classification closely follows that of Tyhurst (1951), Glass (1959), and Kinston and Rosser (1974) although it is in contradiction to the model of Powell and Rayner (1951) (see Chapter 1). Powell and Rayner propose that a warning phase precedes the threat phase and they further propose that during the warning phase certain recognisable signals become apparent which can foretell a disaster and which produces feelings of apprehension and anxiety in the individual. During their threat phase all indications are that the danger is imminent. This, however, does not allow for situations of constant threat which can surge or wane depending on circumstances but which are nevertheless continually around us. For example, the threat of nuclear war has been with us since World War II. Geographically and politically the locus of this threat has shifted and its intensity, which became heightened dramatically during the 1962 Cuban missile crisis, has now dropped considerably. It can even be argued that during the Cuban crisis a shift was made from the threat to the warning phase of nuclear warfare. The reformation of the Eastern Bloc and the Warsaw Pact has significantly reduced the threat of nuclear war for most people despite the acquisition of nuclear weapons by Third World countries. Nonetheless, the threat of nuclear war still remains. As another example, consider the blitz of London during the Second World War. Aerial bombing campaigns on cities was a factor which civilians had to face. While these campaigns were employed the threat of an air raid was constantly before the people although they still went about their everyday lives. The warning of an air raid usually came with the sound of an air-raid siren accompanied perhaps by the sound of the bomber engines overhead. During the warning phase people would abort their normal routines and hurry to an air-raid shelter.

This then is the distinction: the threat phase encompasses

and identifies the possibility of a real danger to life or limb. This possibility may be remote but nevertheless it can be identified. The warning phase alerts a person to the fact that danger is now imminent and will strike. Given that many disasters possess an identifiable danger phase before they strike (period of pre-impact) and this phase comprises two distinct but related dimensions (threat and warning) it is worth considering in more detail how people behave under these conditions.

THREAT

Psychologically a threat exists when it is acknowledged that there is a probability of a disaster occurring. In other words, people know that a particularly calamitous event is likely to occur and furthermore that directly or indirectly they will be affected.

During this period of threat people's behaviour is generally characterised by inactivity. Not surprisingly this situation is ineffective as far as taking constructive counter measures and making contingency plans is concerned. This behaviour is further compounded by the pervasive feeling of personal invulnerability which exists.

The most common source of inactivity is denial. People will quite simply ignore the possibility that a particular disaster will ever strike them. This is contrary to what many people would like to believe happens during the threat phase. But consider the common daily occurrence of house fires. Despite all the evidence for such a threat to house and family how many people take adequate or realistic fire precautions in their own home? How many take any fire precautions at all? There are very few.

On Ash Wednesday 1983 bush fires raged in the southern part of Australia in which 72 people died and over 2000 homes were destroyed. A study conducted two years prior to this event in one part of the area devastated by these fires

revealed that, of a list of ten precautions laid down by the County Fire Authority, most people had carried out only one. Only 16 per cent of householders could recall the number of the local fire brigade and few could outline the general fire plan. This study was conducted at a time when the threat of fire was high (Abrahams 1981).

In May 1902 the volcano Mount Pelèe erupted on the French colonial island of Martinique in the Caribbean. The volcano gave many indications that it had become a threat to the island and it was already known that Mount Pelèe was an active volcano. Furthermore, the month previously it began emitting steam and volcanic ash and major rumblings occurred. A few people began to express concern. These were mocked even in the local newspaper. In the following days sulphur fumes began to pervade the island growing denser with each day. The local people were forced to wear wet handkerchiefs and there are reports of horses dying from suffocation. A proportion of the island's population left but many did not, still refusing to see the threat and ridiculing those who had gone. On May 8th the volcano erupted, smothering and burning to death 30 000 people.

In 1963 the Vaiont Dam in the Piave Valley in Northern Italy suffered an explosive overflow of two hundred million cubic metres of water and mud following the collapse of one side of the 2000 metre Mont Toc into the dam basin. The ensuing wave sluiced through eight villages destroying 1189 lives. The dam had been a threat from the beginning of its construction in 1956, through to its completion in 1960. Doubts were expressed about the safety of the dam by experts before it was even completed. In fact, the supply lake was not filled for two years following completion of the dam because of safety fears. The main problem recognised by experts and local villagers alike, was the unsoundness of Mont Toc itself. Landslides, cave-ins, and crackings were commonplace. Everyone knew it was likely to collapse, they were aware of the threat but psychologically chose to do nothing.

The local carpenter, Rodolfo Barzan, had worked on the

dam in its early days: 'The technicians knew that part of Mont Toc would fall into the lake. They were waiting for it from one day to the next . . . for this reason they often shone lights at the sheer face of Mont Toc.'

Gianfranco Trevisan was the local doctor: 'I thought the dam had bust. We were expecting it . . . several big landslides had fallen into the lake from Mont Toc. Every so often the ground at Longarone shook, only a fortnight ago the ground shook'. It is almost suicide by default. Or murder by complacency.

In 1966 in a small town in the Merthyr Valley of Wales an almost 300 metre slag heap moved and slid inexorably into a school, a row of cottages, and a farm. Of the 144 people who died at Aberfan 116 of them were children.

The threat of a possible move or collapse of a slag heap had been known for some time. Tip slides had happened before. In the same valley in 1939 the river Taf was diverted by 200 000 tons of coal slag which moved one-third of a mile. Another slide had previously destroyed part of the Rhonda Valley. Furthermore, the very tip which devastated Aberfan had been reported as having moved twice before, once in 1959 and then again in 1964. Questions had been raised at planning committee meetings about the danger of flooding caused by slurry which could move the tip and destroy the school. A former headmaster repeatedly echoed the threat to the school and village to both the authorities and villagers. These people remained oblivious. Indeed, the owners of the tip and mines, the then National Coal Board had no record of any inspector visiting the Aberfan tip for four years prior to the disaster, despite the fact that this was part of the normal duties of a mines inspector. In short, the threat of another tip slide due to water beneath the slag had been known for years.

On the evening of 6th March 1987 the cross-channel ferry, the *Herald of Free Enterprise*, capsized off Zeebrugge. It had put to sea with its bow doors open and with the resultant loss of 188 lives. Again, the threat of such an incident had been present for some time. The master of the *Herald*'s sister ship, the *Pride of Free Enterprise*, sent a memo to

all officers and boatswains reporting that twice on the Zeebrugge run the ship had sailed with bow and stern doors open, and in October 1983 the *Pride* put to sea with both the bow and stern doors open. The potential for disaster was there. The solution was also there. In June 1985 Captain Blowers wrote a memorandum to the directors of Townsend Ferries suggesting that indicator lights be installed on the bridge to warn the master of open doors. A number of such reminders was sent which received among others the now infamous reply from Mr J.F. Alcindor, a deputy chief superintendent with the company: 'Do they need an indicator to tell them whether the deck storekeeper is awake and sober? My goodness!'

A threat exists, a major threat which could cause death or permanent injury to one, two or several thousand people. This threat has been identified but ignored. Why should this be so? What psychological factors are at work which lead a person to ignore a clear threat to his own life and often to that of his loved ones?

It is known that the assessment of a given threat or risk is a very subjective matter. The evaluation of which often bears little resemblance to actuality. A study by Slovic and Fischoff (1980) found that the public's perception of various types of hazard were often at variance with the actual risk. Not infrequently the perceived risk was much lower than the actual risk. Britten (1983) found at the time that the risk of nuclear war was in reality much higher than people were prepared to acknowledge. The danger sign is that of suspended judgment. This helps to explain the observation that people can acknowledge a threat while behaving as though it does not exist. This condition is known as cognitive dissonance and was originally developed in 1957 by Professor Leon Festinger. Essentially, cognitive dissonance says that under normal circumstances the attitudes of an individual would tend to be consistent with other attitudes held by that individual as well as with that person's overt behaviour. There are occasions, however, when knowledge or attitude and behaviour are not consistent with each other, for example, a person may believe that smoking is harmful yet will continue to smoke. A

person may believe that a dam is dangerous yet continue to live in its shadow; may even know that the land he builds the family home on is in an earthquake zone which has previously claimed many lives.

Festinger's theory says that wherever dissonance occurs a person will seek ways of reducing it to a level which is comfortable, that is, to a level which can be lived with. This may be achieved by revoking the decision entirely, possibly in the light of further hard information although in practice this is not very likely. More commonly a person will actively seek information, firstly to support the attractiveness of their decision (given the threat of flooding they will remain near friends who are in the same position; they will quote statements saying that the river has never risen higher than 2 metres in the past and so on) and secondly to support the unattractiveness of their rejected decision (they would have to move away from friends and relatives, there would be difficulty in obtaining work elsewhere, the move would cause disruption to the children). A prevalent and particularly powerful source of confirming information is other people's behaviour. If in doubt we look to see what other people are doing. If they are going about their ordinary business, apparently unconcerned with any threat, then this will strongly reinforce the decision that all is well after all. Furthermore, the urge to remain with and to follow the group is stronger if the group comprises ones peers, colleagues or workmates. In matters of conflict or indecision there is always a strong compulsion to conform in behaviour.

When conflicting information cannot be satisfactorily resolved a reduction in dissonance can still be achieved by the simple and common expedient of denial. People simply will not accept that a threatened disaster can occur. This condition was recognised as far back as 1955 following major flooding in Holland when the investigators reported that people demonstrated '. . . the psychological inability to accept the possibility of a completely devastating disaster' (Williams 1964). This behaviour is further aggravated by the fact that people will avoid situations where they may come

across information which will call their decision into question and so increase their dissonance and discomfort. They have made up their minds and they certainly do not want to be confused with facts.

There are situations when dissonance cannot be resolved quite so simply, for example, among servicemen who man the triggers of nuclear weapons. Expressions among such operators that they will never be required to fire a nuclear missile are not uncommon. A man can further reduce such conflict by splitting his job from the rest of his life and community. One American nuclear missile operator (using a pseudonym) reports, 'A crew member tries not to think about his ultimate responsibility, which could lead to the killing of millions of people . . . he tends to see his personal life and official life as totally separate: the launch officer becomes schizoid' (Wye 1971).

Finally, there are three other very basic reasons why people will not prepare for a disaster. Firstly, planning and preparation are inconvenient, they demand physical and mental effort from an essentially apathetic population. Secondly, such preparations often have a financial cost. The tendency here is to reverse the situation by taking out insurance cover. This encourages the thinking that people have paid for the preparations thus absolving them from further involvement or commitment. In fact, some drivers feel that having paid their motor insurance they are, therefore, entitled to have an accident. A major problem with insurance is that it can engender helplessness. Another problem is that insurance never covers the human cost. No amount of financial cover will compensate for a drowned, crushed, burnt or smothered child. This is not to say that insurance cover should not be arranged, on the contrary, but it should be but one part of an overall plan of protection, not a substitute for it. Thirdly, there is a folk myth which is still ingrained in many people that to prepare for a disaster is to encourage it. 'Don't even think about it' – for fear that it may come to pass.

WARNING

During the threat phase there exists a possibility of a misfortune striking. It may come or it may not, but the potential is there. The warning phase, on the other hand, is that period before impact when the impending danger becomes all too real. Warning is the threat crystallised. The disaster, and the threat of death and injury, can now be seen. A fire has been spotted in an office block or on board a ship; flood waters are due to hit a village in one or two days; an air-raid siren sounds; the ground gives a minor tremor; the airliner lurches into a dive, and so on. It is now that disaster is seen to be imminent and the consequences are all too clear.

The duration of the warning phase may be less than one minute or it may be as long as one or more days. The psychology of people's reactions during this phase is interesting. In contrast to the previous *threat* phase, which was characterised by *in*activity, the *warning* phase is characterised by *over*-activity. Unfortunately, for the most part, this behaviour is often frenetic and demonstrably non-effective. The towns of Piedras Negras (Mexico) and Eagle Pass (Texas) were almost wiped out in floods when the Rio Grande burst its banks. Over 100 people were killed and 4000 injured in this incident. The point to note here is that over 90 per cent of the populations of both towns had received warnings of the impending flood one or more days beforehand. Only a handful of people had left home. Similarly, in 1960 when a devastating tidal wave struck Hawaii (Tsunami) evacuation was found to be minimal (Lachman *et al.* 1960).

That behaviour in the initial warning period is often inappropriate has been inferred from research by Fritz and Marks (1954) who found that the number of deaths and severe injuries was significantly higher amongst families who were warned less than one minute before a tornado struck than in families who had received either longer warnings or no warnings at all. It is as though there is such an overwhelming drive to do something when danger is suddenly realised, no matter how inappropriate that action may be,

that the victim is unable to comprehend and to think through a coherent plan of action.

Surprisingly, perhaps the most common psychological reaction identified during a warning phase is still denial. Take a fire alarm in an office block. As a rule, the people working in the building do not hear a fire alarm. They may hear a false alarm or even a practice alarm but rarely do they hear a genuine fire alarm. Pauls (1974) found that during a fire drill in a high rise office building only 17 per cent out of 176 occupants interpreted the situation as a genuine fire alarm. Although this was in fact a practice drill, over 90 per cent of the people were unaware of this. Further work by Tong and Canter (1985) gave a close figure of 14 per cent out of 71 people who reported a fire alarm to be an authentic warning. As with the proverbial horse and water, you can give a person a warning but they do not have to believe it. It has already been shown that people are perfectly capable of ignoring a warning right up to the moment of impact. The aftermath of the eruption of Mount Pelèe showed an almost total absence of preparation by its citizens.

How often in our history has denial preceded invasion? The German invasion of the Soviet Union in June 1941 was preceded by many blatant warnings. Military mobilisation, the massing of troops and equipment on the border accompanied by border violations had all clearly and overtly taken place. Churchill had even told Stalin that the Germans were going to invade. Stalin's response was to keep a low profile even to the extent of forbidding any military operations near the border. At Pearl Harbor in 1941 the army and naval commanders chose to disbelieve the warnings they had received about an imminent attack by the Japanese on the grounds that they had already received a series of such reports that year. Neville Chamberlain's journey to Munich in 1938 and his 'Peace in our Time' speech has since become a classic example of denial. More recently, the Egyptian assault across the Suez Canal and the invasion of southern Israel in October 1973, as well as the corresponding invasion of northern Israel by Syria was the consequence of

Israeli denial coupled with self-delusion. All the intelligence indicators (from diplomatic channels, satellites, signals, overt and covert agencies) were present. The forecast was ignored. Denial of attack preceded the invasions of both the Falkland Islands (1982) and Kuwait (1990).

How dramatic do warnings have to be before people will act on them? Consider the following: in Hungerford near Oxford in 1987, Michael Ryan went berserk one afternoon with an automatic weapon leaving 16 people dead. The coroner's court heard how of these people 'Several died because they ignored warnings and walked straight into Ryan's gunfire' (*Daily Telegraph*, 2nd September 1987).

The King's Cross underground fire ignited around 6.30 pm on a November evening in 1987. Thick black smoke enveloped one of the escalators which later erupted into fireballs. In all 31 people died. One woman, Judith Dingley, who saw the smoking escalator, tried to prevent people going on it: 'I stood there with my arms out like Jesus on the cross, saying "Don't go up, there's smoke". But nobody stopped. They just pushed past me and some people glared at me. I stood there for about half a minute with all these people pushing past and then I thought I'm getting out while I can and went towards the platform.' Psychologically a threat will be denied, a warning ignored. It seems to matter little how glaringly obvious the threat is.

As it stands this situation is unsatisfactory. Why should most people ignore warnings? In many cases a warning is no more than an alarm, that is, it serves to alarm people but not to inform. Frequently alarms are not understood and may even be misunderstood or misperceived. An alarm on its own merely alerts. Given that the early stages of danger are characterised by ambiguity and uncertainty it is in this very lack of information that the problem lies. Tong and Canter (1985) found that most people cannot distinguish a fire alarm from other alarms and are, therefore, unable to produce an optimal response to such an alarm. Furthermore, on the initial sounding of an alarm many people are not sure if it is even directed towards them and consequently whether they should respond at all.

To compound matters it has been shown that even if people identify an alarm as a fire alarm and realise that it is directed to them, only between 14 to 17 per cent will accept the alarm as authentic. Approximately one-third of people will actively seek out collateral information before responding. They will only interpret an alarm as authentic if secondary confirming information is received. This information may come from trusted people in authority or from people with pertinent knowledge. It may come from organisations such as the police or emergency services. Commonly, it comes from the context of the alarm. In other words as well as hearing an alarm the person may also see or smell smoke, may hear sirens, and may see other people evacuating the building. This latter is a very powerful cue and in moments of uncertainty there is always a powerful urge to conform to the behaviour of the group.

For a warning to be effective, that is for it to be more than just an alarm, it must contain information. A warning should not only alert people to a danger it must also provide secondary information about the danger such as what form it takes, where is it located, what is expected of the person to whom the alarm is directed, and what courses of action are appropriate. To be effective the warning must be meaningful. Information *per se* may not be appropriate, e.g., flood height and radiation levels are too abstract for most people to comprehend. People can acquire meaning prior to an alarm by the training and drilling of appropriate responses. This issue is discussed later in Chapter 5. The key psychological factor which underlies the effectiveness of training (and hence warning) is belief in its efficiency coupled with a belief in the validity of a warning state. Only then will people even start to be prepared for disasters or emergencies. At present warnings are still only alarms. Very few victims will accept an alarm at its face value and around one-quarter will ignore an alarm altogether. The mortuaries and intensive care units regularly house the consequences of such psychological response: 'I do not believe it – I will not believe it.'

Studies of disasters and survival situations reveal that not

everyone reacts to a warning with ineffective behaviour. Once a warning sounds it is those people, groups and organisations who are unprepared who will begin to search frantically for information as to the best means of avoiding the impact. Amongst the population there will be individuals who are able to face the coming situation with a more or less composed mind. These are the people who have the training or experience in handling such situations. These people are prepared. They are also rare. Most people, evidence suggests, will disassociate themselves from what they perceive as an overwhelmingly threatening situation (denial on a grand scale) while others will sink into hopeless apathy.

Morale can be raised and anxiety reduced if, during this pre-impact stage, people are able to carry out effective preventive tasks. The opposite condition may be seen, that is lowered morale and heightened anxiety, in situations where the pre-impact phase is a particularly long one. In those instances, once all the necessary precautions have been taken, people now have to wait. Nothing is so difficult as waiting without activity. It produces tension. If the waiting is prolonged then it becomes difficult to maintain alertness and performance efficiency declines. Also, the authenticity of the warning may start to be called into question. People may begin to think that the warning was a false alarm. Interestingly, a study by Turner (1983) into extended earthquake warnings in Los Angeles (along the San Andreas Fault) has shown that many of the expected reactions to false alarms did not occur. People did not feel deceived by false alarms, anxiety did not increase, nor was there evidence of any anger being directed towards the authorities who issued the warnings. In fact, earthquake warnings and more general information about earthquakes were listened to more selectively. To those who are psychologically prepared a long warning time enables them to assimilate and assess the implications of the pending disaster, to seek further information, and to take effective preventive action.

PERIOD OF IMPACT

The period of impact may not always be preceded by the period of pre-impact. A disaster may strike so suddenly that it catches people completely unawares. Common examples of this situation will include explosion, train crashes, certain types of shipwreck, fires and so on.

This period of impact commonly lasts from a few seconds to many minutes, rarely does it last for more than one hour although this has been known. In one study for example, a period of impact lasting five hours was reported during an extra tropical cyclone which struck Oregon (USA) on 12th October 1962. The violence of the storm was such that it was impossible to measure the wind speeds as the anemometers had been blown away (Crawshaw 1963).

Whether the impact is expected or not the immediate result is an overwhelming of the senses. Sensory information floods the brain in sights (the flash preceding the shock wave at Hiroshima; the crashing aeroplane '. . . that peeled away from around us.'), sounds ('. . . a horrid noise the flames made'; the noise of a wind-driven bush fire '. . . like two jumbo jets taking off'; the moving tip at Aberfan '. . . it was a sound just like a jet'), touch ('I was smashed against the bulkhead'), smells ('I can still smell that smoke. It was acrid. Greasy'), taste ('I swallowed some of the water. It was foul. Made me wretch'). Indeed so much information strikes the victim that he is unable to process and comprehend it and consequently becomes bewildered and numb. Even those who are constantly being trained to operate under dangerous conditions (such as members of the armed forces, emergency services, and so on) are not immune to the effects of impact. No amount of training will entirely remove the psychological response to the 'crack-bang' of the first round passing close overhead or the psychological disruption caused by artillery or tank shells exploding nearby and especially behind a person's unit.

The behaviour of people suddenly caught in the eye of a catastrophe varies from individual to individual, but across the spectrum there does appear to be an identifiable pat-

tern of responses which is consistent throughout many independent studies of disasters. This pattern can be divided broadly into three bands: In the first band between ten and 20 per cent of people will remain relatively calm during this period of impact. A few indeed will become exceptionally calm and rational, a condition the Americans have termed 'supercool'. These people will be able to collect their thoughts quickly, their awareness of the situation will be intact and their judgment and reasoning abilities will not be impaired to any significant extent. They will be able to assess the situation, make a plan and act upon it. A study of British police officers involved in shooting incidents found that although there was a general build up of tension and anxiety most officers reported that, at the point of greatest danger, they became extremely calm and clear headed (Manolias and Hyatt-Williams 1986). From the other side one former armed robber reported that on entering a bank and ordering the staff and customers to raise their arms he always looked for two people: firstly, the one who raised his arms first – because he had clearly assessed the situation and shown himself to be capable of quick thinking (and therefore a threat to the robber) and secondly, the one who was last to raise his hands because he obviously was not fully aware of what was happening and was, therefore, also a threat (personal communication).

The second and largest band comprises approximately 75 per cent of the population. These people will quite simply be stunned and bewildered. They will find that their reasoning is significantly impaired and that thinking is difficult. They will behave in a reflexive, almost automatic or mechanical manner. Their field of attention becomes very restricted and visually they may suffer 'tunnel vision' or, more correctly, perceptual narrowing. The sense of the passage of time also alters producing a limbo effect which can disrupt and even destroy the carrying out of set plans. These people are unable to express any feelings or emotions and will later report that they completely lacked any such emotional sensations. Physiological reactions also occur. The most frequent being sweating (sometimes profuse), rapid heartbeat,

trembling, weakness, nausea, and, in extreme cases, even vomiting, urination and defaecation.

The third band is made up of between ten to fifteen per cent of the population. These people will tend to show a high degree of inappropriate behaviour, that is behaviour which is not only ineffective in coping with a life-threatening situation but may also be counter-productive and even add to their danger. Behaviour which may be identified within this group includes uncontrolled weeping, confusion, screaming and paralysing anxiety. As the latter name suggests, individuals with paralysing anxiety are seen to be 'frozen to the spot'. A little while ago a fishing vessel capsized and sank in the North Atlantic. The surviving crew reported that one of its members kept clinging to the rudder unable to make any physical movements. He became psychologically frozen. He was the only member of the crew to go down with his ship (Weisaeth 1986).

The most common initial reaction reported amongst groups of survivors during this period of impact is still one of disbelief and denial. Very few people will acknowledge a direct threat of an impending disaster. A number will report that they became disassociated from the situation in which they found themselves and will go on to describe a sense of dream-like reality. During the period of pre-impact denial is represented as 'this will not happen to me'. During the period of impact denial is represented as 'this cannot be happening to me'.

PERIOD OF RECOIL

The period of recoil begins once the initial dangers have been removed, either naturally or by the survivors having made their escape. For example, the earthquake or the hurricane has ceased and the dust is settling around the survivors; the crew have abandoned their stricken ship and have made their way into the liferaft; the carriages of the railway train are no longer crashing, the sounds of grating

metal cease and passengers are no longer being buffeted around. For one second the environment becomes still.

The recoil period typically begins with confusion. There is group and social fragmentation. It is now that people begin slowly to realise the extent of the damage, death and injury which has occurred around them. Within the population there is a gradual return of awareness, reasoning ability, recall and emotional expression. This emotional expression often takes the form of fear, resentment, anxiety and especially anger. Women in particular may show alternate periods of weeping and laughing. If families are involved then people will begin desperately to search for their children and loved ones. One man who believed his daughter lay dead beneath the 1966 Aberfan landslide of coal slag ran three miles to her school and was still digging amongst the debris many hours later. Family bonds almost always override all other ties. There will be a general increase in activity and many people will become temporarily hyperactive. Sometimes problems may occur if there is a conflict between a person's duty and his family, say that of a rescue worker.

Survivors will now need to be with others and indeed they will show an attitude of dependency which is almost childlike in its observation and expression. This phase of dependency, although very obvious to begin with, is quite transient and will usually last no more than a day or two. Survivors will begin seeking out others and forming groups but it is important to realise that these groups are very loose and unstable. People will move from one group to another almost like very young children in a school playground. The dilemma here is that survivors have a need to form a strong and stable group but the initiative for this must come from outside. Survivors by themselves are unable to achieve this.

As well as seeking out other people, many survivors will attempt to find temporary shelter in places such as other people's homes (those of friends and relatives where possible), as well as shops and hotels, and even an ambulance will provide shelter. It is often during this period, that is whilst being evacuated or driven away from the disaster, that survivors will burst into tears and have a good cry. They will also

have a need to talk about their experience. The survivors of the *Andrea Doria* sinking were reported to have a '. . . compulsive need to tell the story again and again, with identical detail and emphasis' (Friedman and Linn 1957). Returning PoWs from the Gulf War mention their overwhelming need to talk: to talk and try to explain. Survivors also need to express themselves, and often to simply become angry with someone. This anger is usually irrational. For example, the victims may ventilate their anger verbally and physically on the rescue workers themselves. Rescuers may find themselves targets of resentment and betrayal (Lacey 1972). Some survivors who are found to be initially unresponsive may suddenly become very dependent as a consequence of an act of comfort and aid shown to them by another. Victims, not unnaturally, want to be looked after. They want to be given something, e.g., a blanket, a cup of tea, or similar item of comfort. The importance of these acts of giving and comfort does not appear to be related to the actual kind of aid given but rather to the psychological effect of being cared for.

Yet once again the most common reaction during this period is denial, an attitude that 'this cannot be true, it cannot be happening'. Many victims will become withdrawn and will be seen wandering around in aimless fashion. Denial will frequently be followed by apathy. The study of flooding of the Kansas River in which approximately 10 000 people were made homeless, found that the most common psychological reaction amongst the victims was apathy (Menninger 1951). This was also found during the Bristol floods in 1968 (Bennet 1970). This reaction was coupled with a tendency of the victims to be overly concerned with very minor things, for example, the baby not having a clean nightgown; that they could not have their dog with them in the shelter, and suchlike inconsequentials. The period of recoil suffered by most victims is often shortened by rescuers when they are deployed into the disaster area.

The extent of the psychological effects of the impact and recoil periods on people will, of course, vary depending on the size of the disaster and the training and preparation of

the people involved. There will, however, be some form of recoil reaction even amongst those best able to cope. During the Falklands War a small group of servicemen were suddenly landed on the islands during a 'cold, wet and miserable' winter. They had insufficient equipment, tools and rations for the conditions. A sergeant reported that '. . . all ranks were quick to respond to the instruction on digging in and building a shelter *once the initial shock of being "dumped" ashore had worn off,* and maintained a proper level of morale from then on' (personal communication, author's italics).

PERIOD OF POST-TRAUMA

This is the period when survivors attempt to rebuild their lives. It is now that they become fully aware of what has occurred to them during the impact phase. During recent years more research has been undertaken into this area of disaster psychology and survivorship than in any other. It is during this phase that the psychological reactions of those who have survived a disaster or traumatic event resemble closely the symptoms known to the medical profession, particularly to those working in mental health (see Chapter 7 for a more detailed discussion of post-trauma). The symptoms will now appear to be more psychiatric in nature than psychological. The more common symptoms seen will include: recurrent dreaming about the catastrophe, anxiety, depression, and psychosomatic disorders. This is hardly unexpected given that disasters often strike suddenly, most without warning, and may leave its victims without family, friends, possessions, homes and jobs. The occurrence of emotional problems including phobias are also common. Subsequent fear and apprehension may be heightened by the event which suggests that in certain circumstances experience does not lead to better coping. A debriefing of a police officer involved in his second firearms incident reports: '[The second incident] convinced him that the expe-

rience gained earlier would help him to cope better but when he heard the sound of the gunshot strong feelings of fear returned. He thought "Not again" and wanted to look for cover' (Manolias and Hyatt-Williams 1986).

This issue of experience, coping and consolidation of training is not an easy one to resolve.

SUMMARY

1. Human response to a disaster or threat is remarkably consistent. Behaviour appears to follow a pattern and this pattern is transferable across events.
2. The most frequent psychological response encountered under threat is denial. The most common action is inactivity.
3. During the pre-impact period denial and inactivity prepare people well for the roles of victim and corpse.
4. During the period of impact ten to twenty per cent of the population will remain relatively calm. They will be able to think, make decisions and act. Approximately 75 per cent will be stunned and bewildered. They will not be able to think effectively and will act in a semi-automatic, almost mechanical, manner. The remaining 10–15 per cent of a population will show a high degree of uncontrolled and inappropriate behaviour.
5. During the period of recoil survivors will slowly regain their awareness, reasoning and memory. There will be a child-like dependency on other people, social fragmentation and much emotional expression.
6. During the period of post-trauma survivors will attempt to rebuild their lives. It is during this phase that acute psychological dysfunction may develop into a more chronic psychiatric disorder. Common accompanying symptoms will include recurrent dreaming of the event, anxiety, depression and psychosomatic disorders. Many survivors will show a full functional recovery. Some will take a much longer time to recover and a few will never fully recover at all.

3 Individual Reactions

The previous chapter described the behaviour of groups of people in a disaster. As this disaster progresses their behaviour will change and evolve through identifiable stages. Many psychological reactions will be common to many people, some but to a few. Some victims will pass quickly through those stages rapidly regaining their effectiveness while others may take a long time to respond. It has been observed that during extreme life-threatening situations certain behavioural responses are more common than others and these individual reactions are discussed below.

PANIC

Contrary to much popular belief, and despite what the tabloids would infer, panic is not a common reaction to a disaster. On those occasions when panic does occur it is often seen in enclosed areas where the obvious escape routes are closing down, where there is a space or time limit on survival, for example, in a fire in a hotel, office block, or ship or where people are trapped in a confined space which is flooding such as a coal mine or a cave. Mass panic may be seen in a group of people who, while trying to flee from a threatening situation, find their escape routes blocked or restricted. Consequently, it is very rare for panic to be seen in people caught in a disaster in an outside area.

Panic is a form of behaviour in which judgment and reasoning deteriorate so far as to often result in self-destructive behaviour. People in a state of panic lose all judgment and discretion. They are unable to attend to or understand any communication or direction and will 'lock-on' to one particular escape route which they have identified, surging towards this while remaining oblivious to other exits or escape routes.

There are frequently problems in defining the word 'panic'. It is a short-hand term and often used interchangeably with 'confusion.' Essentially, however, there are four elements which characterise panic. These are:

1. There is a time or space restriction on escape. The resources and means of escape are scarce and dwindling and the demand for them is increasing.
2. People will become aggressively concerned for their own survival and any altruism is destroyed.
3. The behaviour shown by the individual in response to the circumstances is irrational or illogical.
4. The behaviour shown is highly contagious and waves of panic can be seen to spread out like ripples across the surface of a lake. This contagion is particularly rife if it is sparked by someone in authority or with some social prestige.

In 1903 the Iroquois Theatre in Chicago caught fire. The theatre itself was little damaged but when a few people panicked a stampede occurred for the exit which resulted in the deaths of 602 people. One of the important points of this example is that the enquiry found that there were nine other perfectly functioning exits from the theatre – most of these were unused (Beach 1967, Robinson 1959). Again in 1942 when the famous Coconut Grove nightclub caught fire in Boston 491 people were killed when panic broke out. Most of the victims were trampled to death, 200 bodies being found behind one revolving door and another 100 bodies behind a door that would only open inwards (Faxon 1943). Panic has also been observed among passengers of a sinking ship which resulted in their attempting to storm already overcrowded lifeboats while completely ignoring other boats nearby which were almost empty (Drayer *et al.* 1954). In 1986, when an engine room blast and fire flared through the cruise liner *Emerald Seas* injuring 17 people, observers reported a panicky stampede as almost 1000 passengers fled to the life-rafts. 'People were trampling each other. Children and old ladies were being shoved aside',

reported one witness (*The Times*, lst August 1986). Also in 1986 a total of 78 people were killed when panic swept through crowds at two Indian shrines. In the first instance, 47 people were crushed to death in a mass panic at a crowded festival at Hardwar on the Ganges. The other incident occurred at Ayodhya (Uttra Pradesh) when 31 people were crushed or suffocated to death during a stampede by pilgrims in darkness. Most of the dead were women but there were also children. The senior police superintendent explained the circumstances as follow: 'Some of the pilgrims climbed onto a sandy hillock that slipped and collapsed under their weight. They crashed down onto the others, crushing some of them, and this started the panic.' Most of the victims were suffocated but some died of head injuries.

A salutary account of the consequences of panic is given by the US Airforce. They describe a pilot who, after baling out, became fouled:

> His parachute caught in the tree, and he found himself suspended about five feet above the ground . . . one leg strap was released while he balanced in this aerial position and he immediately slipped toward the ground. In doing so, his left leg caught in the webbing and he was suspended by one leg with his head down. Unfortunately, the pilot's head touched an ant hill and biting ants immediately swarmed over him. Apparently, in desperation the flyer pulled his gun and fired five rounds into the webbing holding his foot. When he did not succeed in breaking the harness by shooting at it he placed the last shot in his head and thus took his own life. It was obvious from the discoverers report that if the pilot had even tried to turn around or to swing himself from his inverted position, he could have reached either the aerial roots or the lattice trunk of the tree. With these branches, he should have been able to pull himself from the harness . . . the fact that his head was in a nest of stinging ants only added to his panic, which led to the action that took his life.

At three o'clock on Christmas Day 1981 off the coast of Canada a fire broke out on board the merchant ship MV *Hudson Transport.* In the confusion that followed the starboard life-raft was opened on deck and after some mishandling and abuse it was eventually launched. Twelve men entered the raft designed to hold eight. Intermittent hissing of escaping air or gas could be heard, and it was assumed that the life-raft had a leak and was deflating. The night was pitch black and the lights on board the ship had gone out a short time before. They were sitting in freezing water.

One of the seamen in the raft reported later that the ship's dayman abruptly decided to exit the life-raft and upon informing the other occupants of his decision simply dived right through the opening of the raft and into the water. He was never seen again and the seaman reported that this action was the immediate precursor to the contagious panic which followed and which resulted in the loss of a further five lives. All this occurred despite the fact that the ship's Master seemingly never ordered the ship to be abandoned, nor did he authorise the boarding of the life–raft; in fact, he tried to stop one crew member from jumping into it (personal communication).

While examples of panic can be found they are still relatively rare. There is now little doubt that far less panic occurred on the *Herald of Free Enterprise* when she capsized in 1987 off Zeebrugge with the loss of 38 crew and 160 passengers than was originally suggested. Although reports from the ship's carpenter stated that when he and the assistant boatswain began smashing windows to free people they found what he described as '. . . considerable confusion and panic among the passengers' (*The Times*, 29th April 1987). In fact, many of the crew and passengers assisted with rescuing other victims, some to the eventual cost of their own lives: Lance Corporal Gary Thomas died after spending over 2 hours in the freezing water helping women, children and old people into life-jackets.

In May 1982 during the Falklands War, the British vessel *Atlantic Conveyor* was struck by an airborne Exocet missile. This resulted in a fire below decks producing a heavy pall of

thick black smoke which rapidly filled the ship. As the fire swept out of control the captain ordered the ship to be abandoned and the crew to the liferafts. One survivor reports that: 'There was little sign of panic and a fairly orderly exit was achieved in spite of the explosions that could be heard within the ship and occasionally bursting through the ship's side. It became dark at this time' (personal communication). From the above statement there appears to have been very little sign of panic during the exit but some signs were noticed amongst men who were in the water. Another survivor reports: 'The main thing to do on entering the water above all else, is do not panic. Too many men panicked on entering the water and some are dead now.'

Panic is contagious but fortunately so is calmness and control. Betty Tootell was on board a Jumbo 747 flying from Kuala Lumpur to Perth when all four engines failed: 'After the initial flurry on the plane – not panic, that's too strong a word – people said goodbye to each other, put their arms around one another. Some sat sobbing quietly, some appeared not to have noticed what was happening. My heart was thumping like mad, but although people say panic is infectious it was calm that seemed to have spread' (*The Times*, 19th August 1985).

Calm can also be established by a leader who may emerge unexpectedly from within the midst of a disaster. These leaders are capable of supporting calm by communicating relevant information to the group. Interestingly, many of these leaders do not normally have a leadership role in their everyday life, but come to the fore for the moment of the disaster, afterwards retiring to their normal way of life not infrequently without anyone knowing their name or who they are.

In summary, therefore, panic behaviour may be triggered by a situation which is perceived by a person as being life-threatening whether or not it really is, coupled with the realisation that escape routes are limited. They may be limited in space or time or both and people perceive that their own chances of escape are reduced as the situation develops.

Finally, it would seem that the tendency of a person to panic depends very much on their previous background. If they have been trained and have learned to cope with such hazards as fires in buildings or shops, shipwreck and sea survival, road traffic accidents and so on, then the likelihood of panic developing is very much reduced.

PARALYSING ANXIETY

There are occasions when anxiety in a life threatening situation becomes so overwhelming that it induces a form of paralysis. This condition of being 'frozen to the spot' can be considered as a form of panic. Certainly a freezing action or a paralysis is grossly ineffective and will often lead to self-destruction.

A little while ago a fishing vessel capsized and sank in the North Atlantic, the surviving crew reported that one of its members kept clinging to the rudder, apparently unable to make any rational physical movement. The crew were unable to move him. He went down with the ship. One of the survivors of the *Herald of Free Enterprise,* Corporal Peter Williamson, described at the inquest how a young man paralysed with fear and cold stopped on a ladder which was the only escape route. Corporal Williamson described the man as obviously being in shock and terrified. 'He clung on for about ten minutes without moving. I tried shouting at him, to him, I tried to encourage him to get moving, but he just hung there. I could not reach him. I was about six feet away, so I got someone nearer to knock him off. He was knocked off the ladder and disappeared into the water. I never saw him again after that.' In another incident, involving a fire in a residential building, a young man was found apparently frozen outside his room with his key in the door while smoke billowed along the corridor. He was spotted in this state by two friends who quickly and easily bundled him to safety (personal communication). The critical words here are 'apparently frozen'. For although he was

seen to be immobile amidst danger, debriefing by the author highlighted certain distinctions between this and the form of rigour shown in the cases above of the fisherman and ferry victims. Further analyses and debriefings strongly suggest that there are two basic forms of freezing behaviour which the author terms *deadlock* and *livelock.* These terms are borrowed from computing science and information theory. Deadlock refers to the first type of behaviour in which the victim's muscles show intense rigour (even violent assault may not move them), and an apparent cessation of mental processing. Livelock produces in the victim a muscular tension which is within normal range and although mental processing is occurring it is not being converted into action. This seems to be because the thinking process is engaged in a decision dilemma. In the case of the man in the smoke filled block it was found that, on realising that there was a fire, he had vacated his room then turned round and locked the door (because that is what he always did). He then thought that the fire brigade would want to check his room and they would be forced to waste valuable time breaking down a locked door to an empty room. So, he unlocked it. Whereupon he recalled that the room had to be kept locked for security and safety reasons. So he relocked it. All the time the conflict between security and a desire to assist the firemen continued to spin in his brain without resolution. Whichever decision he would choose, he would be wrong. The observable end result was the same as for deadlock – complete immobility in the face of danger.

PERCEPTUAL DISTORTION

Perceptual distortion is included here because although it is only indirectly observable by people other than the victims themselves, it is a common psychological reaction in situations of high stress or information load. The most frequently reported form of perceptual distortion is perceptual narrow-

ing which occurs in vision and is often (and incorrectly) called 'tunnel vision'.

During a cave diving incident, film-maker, Leo Dickenson describes this form of perceptual narrowing. 'I got tunnel vision: the pencil beam of light which illuminated about six to ten feet ahead of me seemed to lessen. I thought the light represented my life and when I couldn't see anything but blackness that would be it.' A survey of British police officers who had been involved in shooting incidents found that 60 per cent reported perceptual distortion including narrowing (Manolias and Hyatt-Williams 1986). One said that everything except the gunman seemed to disappear, while another reported after the incident that he did not realise that a bus had been standing next to the patrol car. A police officer on duty during the fire at the Bradford Football stadium went to the rescue of a man who had become engulfed in flames. All he could see was the man at the end of a long tunnel. This officer was unaware that during the rescue his own hair had caught alight and he, in turn, had to be helped by his colleagues. A Jew in hiding during the Second World War noticed his perception changing when he was caught up in a Gestapo raid. The objects and field he was looking at shrunk and moved rapidly into the distance becoming small and faraway (Bahnson 1964). He referred to this effect as 'reversed zoom', borrowing from photographic language, but it is unmistakably perceptual narrowing.

Perceptual narrowing appears to be a manifestation of a restriction of attention. There is a narrowing of awareness coupled with an intensification on only one task. While this intensification enables a person to better concentrate on the selected task there is no guarantee that the task so selected is the most appropriate one in the circumstances. Furthermore, this one task can overwhelm the victim blocking out other, perhaps vital, information needed for effective functioning and limiting the number of alternative responses available to the victim. This means that severe limitations are set on the solving of problems.

Dr Alan Baddeley FRS (Director of the Applied Psychol-

ogy Unit, Cambridge) has studied performance in dangerous environments and has reported that, '. . . one way in which danger affects performance is through its influence on the subject's breadth of attention. A dangerous situation will tend to increase the level of arousal which, in turn, will focus the subject's attention more narrowly on those aspects of the situation he considers most important' (Baddeley 1972). Interestingly, perceptual narrowing has been induced chemically by the following drugs: adrenalin, methamphetamine and amyl-nitrite (Callaway and Dembo 1958). These agents are related to the activation of the sympathetic nervous system which is known traditionally as the 'flight-or-flight' response. Evidence also suggests that perceptual narrowing occurs during orgasm.

Perceptual distortion can affect other senses particularly with respect to time and space. An officer, who was a passenger on board a military aircraft which crashed recently, reports time slowing down during impact (personal communication). Furthermore, there was no time agreement amongst the survivors during debriefing. Those whose life has been under direct threat frequently report the sensation of time slowing down often accompanied by a clarity of thinking and feeling of detachment. Survivors describe events as '. . . being like a slow motion film', or of events happening in stages. Others have reported time distortion producing a limbo effect.

Distances and objects can also alter. One police officer who found himself facing a criminal's shotgun reported the barrel as looking like a 'pair of binoculars'. Another officer scaled a 15-foot fence which seemed only waist high at the time. Others have described themselves as being much further away from a gunman than has been shown to be the case afterwards (Manlioas and Hyatt-Williams 1986).

Other senses seem to be similarly affected although the evidence is patchy. Certainly, survivors have reported not hearing loud noises such as explosions or gunshots and few recall any sense of smell at the time including one person who was soaked in petrol following a major crash but smelled nothing (personal communication). All those changes in

perception are fascinating key-holes into the psychology of survival but they are little understood at present.

DENIAL

There is very little doubt that the most commonly observed reaction shown by people before, during and immediately following a disaster is that of disbelief and denial. A feeling that '. . . this cannot be happening to me. It cannot be real.' A Norwegian group have applied the very descriptive term 'incredulity response' to this behaviour (Wright 1982). Betty Tootell, who was on the Boeing 747 when the engines failed described above, reported: 'I was sitting with my mother at the rear of the plane. My first reaction was total disbelief. It couldn't be happening to us.' Another passenger involved in an air-crash said at first she thought it was just a bad landing and it took a while for the reality to sink in, in fact not until she felt the wind on her face (personal communication). Again, at the recent indiscriminate shootings at Whitley Bay (1989) the husband of one victim who was injured reported 'I just couldn't believe what was happening.' While yet another victim of the shooting who was injured reported 'I just didn't believe what was happening. The blast threw me against a wall.' Civilian demonstrators at an American university campus and public squares in China and Poland who were present when the militia of their respective countries opened fire all say the same thing: 'We thought they were firing blanks.'

A classic example of denial is given by Claus Bahnson (1964) who noticed the reaction of people on April 9th 1940 when Hitler overran Denmark. Hundreds of German *Luftwaffe* bombers swarmed in the air over Copenhagen:

> Subsequent to expressions of amazement, a complete denial of the seriousness of the situation became apparent. Although the war had been at our doorstep for many months, they stated that this could only be a

> realistic exercise of our own air force or that of a friendly neighbour, in spite of the fact that Denmark had very few aeroplanes and that England would certainly not send the Royal Air Force cruising over Copenhagen for no good reason. Other interpretations were that the aeroplanes were surely on their way to some other target despite their persistent circling over our heads, or that the pilots must have mistaken our city for another target, and so forth. This immediate denial of the threat, even with the aeroplanes in plain sight was a persistent reaction among most people in the house, on the street, and even downtown.

In 1992 when the Serbian forces attacked the Bosnian town of Prijedor and the inhabitants were rounded up, the civilians could not believe that their houses were being ransacked. It was reported that the neighbours kept reassuring each other that it was only the army on exercise.

Denial is most frequently encountered by the general public in everyday life when the fire alarm suddenly rings in an office building or a factory or a school. The most common reaction is one of annoyance, after all this can only be a practice drill, can't it? During one fire alarm at a British university one group of faculty members actually locked themselves in their room and pretended that they were not there. A response which can have serious consequences. In 1956 the Swedish liner *Stockholm* was in collision with the Italian liner *Andrea Doria* a few miles off Nantucket Island. Another liner the *Ile de France* was in the vicinity and went to the rescue . Several of the passengers of the *Ile de France* were awakened by the sound of lifeboats being lowered to pick up the survivors. They promptly rolled over and went back to sleep with the thought, 'This is only a drill and is of no concern to me.' One man who expressed this aloud was only reluctantly prevailed upon to get up by his wife who insisted that drills do not take place at 2 am.

Denial may take many forms. It can be a simple straightforward rejection of the event: 'This cannot be happening.' Denial may comprise a state of psychological disassociation

which is often described by the survivors as a sense of dream-like unreality. Balz, who observed the Tokyo earthquake of 1891, reported 'I stood there and regarded all the dreadful happenings around me with the same cold attention with which one follows an absorbing physical experiment' (Edwards 1976). An observer at the Messina earthquake in Sicily reported: 'Men recounted how they had lost wife, mother, brothers, sisters, children and all their possessions, with no apparent concern. They told their tales of woe as if they themselves had been disinterested spectators of another's loss.'

This numbness in denial is echoed time and again in the victims of major disasters, and this contrasts sharply with the behaviour of victims in the more routine types of emergency and accident dealt with on a daily basis by the medical profession. In this latter instance the casualties are often aware of what is going on, frequently excited, and often crying. The contrast in behaviour between victims of a disaster and the victims of more mundane accidents was noted by a nurse treating the casualties of a hurricane in America:

> He told us – he said I've lost five of my children. I saw them drown. He was shocked and stunned. When his wife came in he was delighted to see her, then he did break down a little bit and she did too, but absolutely no screaming, nothing like that. When you usually see something of any consequence, an accident, something like that, a bad car accident, at least in my experience, and they are not too badly hurt, I mean they are still very much aware of what's going on, they're crying and they're quite hysterical. Sometimes they're pretty upset. We didn't have any of that at all, they were very calm, I couldn't get over it . . . you couldn't help but feel sorry for them and upset when they told you they'd lost a child or something like. It's very heartbreaking to hear them tell you something like that (Rayner 1958).

Denial can also appear as a form of perceptual distortion. In such cases the information which is impinging on our

senses (sight, sound, smell, touch, taste) is incorrectly processed to give a false result or conclusion. When the *Andrea Doria* went down, some passengers on the *Ile de France* misinterpreted the sounds of misery they heard outside their portholes from the rescued survivors, as sounds of festivities and merriment. One man who heard voices outside his cabin arose and saw several lifeboats in the water containing people wearing orange lifejackets. In the glare of the ship's floodlights these lifejackets had to his mind a festive quality. Again the sounds of misery appeared to him as sounds of gaiety and laughter and that the whole affair seemed to him '. . . like a carnival in Venice.' He apparently returned to his bed muttering that this was carrying the Frenchman's love of fun a little too far and that one should not cavort so noisily in the middle of the night (Friedman and Lynn 1957).

When the *Titanic* went down the clamour of voices sounded to one survivor in boat 9 like 100 000 fans at a British football cup final. Another survivor said it seemed like the high-pitched hum of locusts on a mid-summer night in the woods at his home in Pennsylvania. When the floods swept through Canvey Island in the Thames estuary a man who was trying to sleep remarked that: 'I woke up and heard what I thought was rain dripping down the chimney then I reached down for my pipe and my hand went straight into the water.'

Denial can be further reinforced by false conclusions drawn from past experiences, for example, 'the river never got higher than that before', 'this building has been here for 75 years and we've never had a fire in it yet'. People will also readily conform to the behaviour of their fellows, especially if it reinforces their own disbelief and denial of the situation: 'No one else is doing anything about it'. When the Kansas river burst and it appeared that the town of Topeka would be flooded, it was found that most of the population simply refused to believe that the flood could hit them. Many argued that it just could not come anywhere near the previous severe flood of 1903. The result was that the inhabitants would not move themselves or their belongings away

from their houses. Many piled their furniture up in the centre of the room despite the warning that the flood water would destroy the furniture if it was left at that level. The consequences of this denial soon became obvious and many people had to be rescued from their first-storey windows. Of 10 000 homeless people almost 3000 had to be rescued by boat. Some even had to be forcibly evicted by the police. Many who had time to remove at least some personal belongings failed to do so – and a large number of the refugees had no clothes except those they were wearing at the time.

Denial can also be seen during the recoil period. Following the cyclone in Oregon in 1962 when the storm had abated, neighbours were seen visiting each other. They were visiting, however, not so much to help each other but rather to evaluate each other's damage. This evaluation took the form of comparisons. People concentrated on seeking out and finding people worse off than themselves so they could tell themselves how easy they had come out of it all. They could convince themselves that they had not really been hurt.

During this Oregon cyclone another form of denial or disassociation was observed, namely that of 'intellectualisation'. One married couple, for example, became involved in a serious argument over whether the pieces of debris blowing past their window came from the neighbour's roof or his fence. The nature of this material became the focal point of the discussion. Their real feelings only surfaced when their neighbours house finally collapsed, whereupon they ceased arguing and ran for shelter in their cellar.

Whatever form denial takes it has one major consequence: denial prevents people from planning to survive.

DEPRESSED REACTION AND APATHY (HYPOACTIVITY)

Unless the condition of denial can be overcome it can lead all too quickly to a 'depressed reaction'. A common manifes-

tation of which is apathy. Depressed reaction is not to be confused with depression which is a psychiatric or medical condition rather than a psychological dysfunction. It may more conveniently be viewed as hypoactivity.

Immediately following a disaster, that is in the period of recoil, a significant number of people will show a depressed reaction. They will act for a time as though they were numb. They will sit amongst chaos and debris. Their gaze will be vacant and when spoken to they may not reply at all or they may do so with a simple shrug of their shoulders and possibly a word or two. This condition is most commonly and clearly seen amongst victims in life-rafts or boats. These people are unaware of the situation and are unable to help themselves. Apathy and a depressed reaction were the most common factors found amongst prisoners-of-war in Japanese camps during World War II. This apathy and hypoactivity existed even though morale (confidence in eventual victory) was high. Following the bombings of Hiroshima and Nagasaki the survivors were found to be apathetic and withdrawn. This condition the Japanese have called *burabura* or 'do-nothing sickness'.

Such a condition may commonly last for minutes or hours. Sometimes it can last for days. It is often interpreted as apathy. Menninger found during the Topeka flood that the most common reaction amongst people in their shelters was one of apathy. He also noticed varying degrees of confusion and mild bewilderment. Following a series of earthquakes in Greece in the early 1950s Drayer and his colleagues reported that many survivors were found doing nothing, even though the tools for reconstruction work were at hand in their communities. Following the earthquakes in Italy in 1980 survivors were unable to fend for themselves for days on end. They were not able to protect themselves from common dangers such as cold. Many did not bother even to eat.

Passivity breeds apathy as the great polar explorer Roald Amundsen discovered after joining the Belgian Antarctic expedition as a young man aboard the ship *Belgica.* The venture was intended as a summer scientific cruise but when

the *Belgica* became encased in polar ice the expedition inadvertently took the record for the first to overwinter in the Antarctic. During the long polar night the crew were gripped with ennui. This showed itself as passivity and apathy which led to resignation and psychological disintegration. Three seamen went insane and the mental health of at least two senior expedition members gave cause for concern.

A few years later Sir Ernest Shackleton, who was well aware of what occurred aboard the *Belgica* became concerned that ennui and consequent dissidence might occur when his own ship *Endurance* became trapped in the polar ice (Huntford 1985). The choice for Shackleton was clear: psychological disintegration or domination. He imposed strict routines on such things as meal times and ordered gatherings in the wardroom after dinner to enforce social interaction and to combat possible psychological disintegration of the individual and the group. Shackleton won.

Extremes of apathy have been noticed frequently in prisons, prisoner-of-war camps, and concentration camps. One survivor of Auschwitz (Heimler 1963) has stated that the feelings of apathy and detachment he felt in the camp still fill him with horror. His apathy degenerated and he reports that at night he sucked his thumb with saliva smeared over his face.

In practical terms apathy produces a loss of initiative even for the most simple of tasks such as washing. Leaders and rescue workers will find it difficult to obtain volunteers. A further major problem with this type of reaction is that it can leave the person wide open to the onset of hypothermia, which produces similar outward signs and a vicious and possibly fatal circle may be established.

HYPERACTIVITY

A small but significant number of individuals will show a maladaptive response to their situation by becoming hyper-

active. Hyperactivity is characterised by an intense but undirected liveliness; an apparent briskness about their behaviour. Their behaviour gives the impression of purposefulness but this is misleading. Invariably their actions are inefficient and inappropriate. They are easily prone to distraction and will flit about from job to job, and from task to task. They are full of chatter, ideas and suggestions which often prove worthless, and they tend to make inappropriate suggestions. They have a confidence in their own abilities which is both unreal and unwarranted. They are frequently intolerant of ideas other than their own. One crew member of an aeroplane crash in the Arctic was agitated, kept crawling over his companions and periodically removed his gloves. He continued to suggest that they should leave the crash site (their source of shelter and location) and walk across the snow and ice to seek help, while presumably leaving the non-mobile casualties behind to fend for themselves. He was dissuaded but it required a deal of effort from the other functioning survivors (personal communication).

People who are hyperactive can be dangerous and should certainly be considered so. Because of their intolerance for other people's ideas they may form the basis for opposition to other, often more sensible, proposals. Also, because of the impression they exude of purposeful activity, they may frequently be mistaken for competent leaders and gratefully followed by those who are still numbed and confused. These bewildered victims are highly suggestible and very dependent on others. In 1963 the passenger liner *Lakonia* caught fire while cruising in the Atlantic. It soon began sinking. Among the confused passengers emerged a woman claiming to be a nurse. She darted amongst the passengers instructing each and everyone she could reach to remove as much of their clothing as possible before jumping into the sea, and once in the water to begin moving as vigorously as possible to generate warmth in their bodies. This is, of course, the opposite to what should be done. There is little doubt that this woman's behaviour contributed to the 113 deaths from exposure which occurred among the passengers.

Hyperactivity may strike suddenly in the early stages of a disaster although it is more frequently observed in people who are just emerging from a state of depressed reaction. For a brief while they seem to overcompensate for their previous inactivity.

Following an attack on shipping in the North Atlantic during World War II nearly 300 men were rescued from open boats after 52 hours. The Royal Naval surgeon on board the rescuing ship described the survivors behaviour as follows: 'Everyone was in excellent spirits but this amounted in several cases to a mild hysteria, as shown by a temporary excitement and garrulousness.' It is frequently found that on the point of rescue the survivors' mental state is one of relief coupled with excitement, elation and agitation.

The reported garrulousness or urge to talk is a common characteristic of hyperactivity often noticeable following rescue. One victim of a recent disaster with fatalities said that for a while after rescue she just '. . . wanted to talk and tell everything' (personal communication). When Flight Lieutenants John Peters and Adrian Nicholl were released from captivity after their aircraft was shot down during the Gulf War they found the same need to tell everything. Flight Lieutenant Nicholl said, while on the RAF VC10 flight back to Britain, that '. . . you wanted to talk.' Referring to his pilot and fellow PoW, John Peters, he recounted, 'One of the Red Cross guys came up to me and he said, "John, you've got to have a word with your pilot. He's done nothing but talk for ten hours – from Baghdad to Jordan." And you did. You wanted to talk, to tell people what had happened and get it out your system.' (*The Wogan Show* 1990).

STEREOTYPICAL BEHAVIOUR

When people are suddenly caught in a crisis or emergency or even when they are merely surprised or startled, they frequently respond by falling back on well-learned behav-

iour patterns no matter how inappropriate these may be to the prevailing circumstances. They perform without reflection. One of the finest examples of this pre-learned conditioning concerns a young woman bank clerk in Norway. One day the bank was entered by an armed robber who walked up to the woman's position behind the counter, pulled a gun on her and demanded money. The woman was momentarily so surprised that she could only respond the way she always had: she pointed to her left and said 'Cash? Next desk'. The gunman, it appears, was equally taken aback and fled empty-handed (Holen 1986). The US Coastguard has found that, 'It's not uncommon for someone [in trouble] to grab a flare gun and fire off two or three flares before they realise no one is out there' (Sisson 1988). This again is behaviour initiated without reflection.

Such repetitions of well-learnt behaviour have been frequently observed in people during emergencies. It appears that a person's repertoire of appropriate behavioural responses to an emergency is dramatically reduced, severely limiting the degree of behavioural flexibility. In extreme cases the person may become locked into a stereotypical response thus repeating the same error again and again. During the early 1970s in offshore diving operations there was a tendency for diving teams to be made up from different nationalities. The diving companies turned away from this approach when it was discovered that divers who found themselves in difficulties, and sometimes became just mildly anxious, would begin speaking rapidly in their native tongue, a language which was often not spoken by the diving supervisor. This response compounded the difficulties and dangers. It has been noted that a person's first reaction before leaving an office during a fire alarm is to tidy their desk (assuming, of course, that the person normally tidied their desk). In Germany during the Second World War many Jewish families on the point of arrest, and knowing full well the consequences, stayed to clean and tidy their houses.

Stereotypical behaviour is inseparable from denial. Claus Bahnson (1964), observing the reactions of his countrymen

on the day Germany invaded Denmark, noted the difficulty people had in changing their normal behaviour despite the seriousness of the threat: 'People persevered with their everyday tasks as if nothing were happening and were quite resistant to changing their routines. When German soldiers appeared in the street, they were first described as "Danish soldiers in German uniforms on exercise"; then they became "friendly soldiers in transit", and only at the very last, after the accumulation of a full day's impressions, was the original set given up and the much more unpleasant and realistic one accepted – and then still with severe doubts.' In this instance most people did modify their behaviour, but only in small steps and with increasing disbelief.

IRRATIONAL BEHAVIOUR

Irrational behaviour refers to those activities which people carry out in times of stress which are inappropriate. They may simply be ineffective and the person performs useless activities, or the actions may be irrational to the point of self-destruction.

One woman in the midst of a vehicle pile-up on a motorway was found to have removed her suitcases from the back of her car and was lining them up in a neat row on the motorway, while all around her was chaos and injury. Hill walkers and mountaineers in the crucial stages of hypothermia have been known to remove their clothes thus increasing their exposure (a symptom known as 'paradoxical undressing'). In 1985 the Polish ship *Busko Zdroj* foundered in Nordic waters. Most of the survival equipment was broken or inadequate and out of a crew of 24 seamen only the radio officer survived. He reported that the desperate crew did little more than sing religious anthems (*The Times*, 14th September 1985).

Sometimes other people become caught up in another's irrationality. During the sinking of the *Titanic* a passenger, one Mrs Dickinson-Bishop, left behind £7000 worth of

jewellery but she sent her husband back to their cabin to fetch her muff (Lord 1955).

ANGER

Anger, aggression and hostility amongst victims is universal. The most common characteristic of such anger, however, is that it is irrational.

Crawshaw (1963) observed in his examination of the Oregon cyclone that once fear had subsided anger followed very quickly. Immediately following this disaster one married couple, who had never had a serious argument before, actually came to blows with one another. The interesting point in this instance is that this family escaped both injury and damage from the storm itself. The husband later remarked 'It's too bad we didn't have a tree down, or part of the roof off, since we would have gone outside and been able to do something, instead of just sitting inside the next day, looking at each other until we blew up'.

The irrationality of the victim's anger is such that even the would-be rescuers and medical staff can come under verbal and physical attack. During the blitz in World War II, air-raid victims blamed Churchill, Hitler, the Royal Air Force, the *Luftwaffe* and even the local air-raid warden for causing the destruction which had recently laid waste their environment (Janis 1951).

GUILT

Feelings of guilt are almost universal amongst survivors. Although frequently associated with the period of post-trauma guilt may also be reported in victims during the period of recoil. Many will blame themselves for the disaster believing that their past life, actions and mistakes have brought them to becoming a victim. Guilt has occurred amongst survivors

of shipwreck, fire, tornado, oil-rig disasters and even amongst victims of hijacking and hostage taking. Many former prisoners-of-war have shown strong feelings of guilt and blamed themselves commonly for not having done enough to help their fellow prisoners. Similar feelings of guilt have been found amongst survivors of Nazi concentration camps and the atomic bomb attacks on Hiroshima and Nagasaki (Hocking 1970).

That a person should feel guilty about having survived is paradoxical. It tends to make a mockery of the folk view that one of our greatest animal instincts is that of self-preservation. Feeling guilty about surviving a disastrous event is, on that basis, rather incongruous and this incongruity can add to a person's bewilderment and confusion. The roots and expression of guilt can take many forms: some people will feel guilty about not having done enough for others no matter how impractical or unrealistic such attempts may have been; some may feel guilty at having survived while others more 'deserving' have died. Some feel guilty at simply having survived at all. Displaced guilt may also occur where a person will blame himself quite irrationally for bringing about the disaster. For example, a ship's engineer blamed the sinking of his ship on the fact that he had argued with his wife just before leaving to join his vessel.

PSYCHOLOGICAL BREAKDOWN

The ultimate psychological problem facing anyone in an extreme situation is complete disintegration. Once the stage of psychological disintegration is reached death is often not far away. Such personal disintegration is usually preceded by apathy followed by despair. This condition should not be confused with a 'mental breakdown' which is a medically identified psychiatric condition. The Americans descriptively, but rather unhelpfully from the scientific point of view, refer to this state as 'give-up-itis'. The initial symptoms of

psychological breakdown include the development of irritability, disturbance of sleep and mild startle reaction. This is followed by social withdrawal, loss of interest, apprehension, general psychomotor retardation and confusion (Bartemeier *et al.* 1964).

Psychological breakdown can occur to individuals or to groups. It can follow on insidiously from apathy or despair or it can arrive suddenly, usually triggered by a particular event such as a rescue ship or helicopter which has failed to spot the victims but which has in turn been observed by them. At times such as these a strong leader is required to keep the group functional. People may die actively by committing suicide or passively. The latter case has been commonly noted in prisoner of war camps, particularly the more extreme types. Major Gene Lam was a US Army doctor who was held in a Korean PoW camp. He frequently noticed such conditions in some of his fellow captives: 'There were symptoms you could assess without being able to describe them: a listlessness, a look, turning from reality. When their symptoms appeared in various degrees and varying combinations, you could estimate very closely how long a particular man you come to know well would cling to life. Another doctor and I had a running bet on life expectancy. Even though I made money on the deal I hope never to have to face such a situation again.'

Cohen (1988) in Auschwitz '. . . found a few times (we slept at the time four prisoners in each berth), one or two men lying dead by my side in the morning. The evening before I had observed nothing in those people to show that their end was near.' Prisoners in Andersonville, the US Confederate PoW camp, called this process *being exchanged.* Others also report people dying suddenly and quietly in their sleep or at roll-call. Some victims, it was observed, would take longer to die, disintegrating slowly and coming to death '. . . like the gradual going out of candle flame'.

Mary Lindell (alias 'Marie-Claire') who organised the chain along which escaping Allied airmen and soldiers returned to Britain, was betrayed by French collaborators and sent to Ravensbrück, the infamous concentration camp for women.

With her went some of her fellow comrades including two, Yvonne and Reine. Within the first two weeks Mary Lindell '. . . noticed that a mood of silent resignation had overtaken Yvonne. [. . .] Reine, a most beautiful woman, was already descending to the depths of despair.' Later, when Mary returned to the accommodation block after herself having been taken ill, '. . . she found that her friend had given up and died, although she had no organic illness' (Wynne 1961). A Jewish physician in Auschwitz often found a '. . . gradual disintegration of personality, including loss of the capacity for rational reasoning, of the system of values, and sometimes even of moral inhibitions. It was possible to get into such a state as a result of disease or of the gradual exhaustion of reserves, but the condition sometimes seemed to be of largely psychic origin. In many cases death followed merely if somebody ceased clinging actively to life – that is, if life ceased to interest him and he gave up hope' (Radil-Weiss 1983).

During World War II victims in life-rafts were reported by survivors to have died quietly and men were said to have died from despair (McCance *et al.* 1956). A former recent chief of search and rescue in the US Coastguard observed that 'Some people will just die. That's a little hard to believe, but I've seen any number of cases where a person will die in the first five hours and others will last several days.' A newly qualified physician who was involved in an air crash and awaiting rescue described one passenger: 'On the next roll call he didn't answer and my first thought was he had left to get help but when I was about to repeat the name, [J] called over, "[W], don't, it's no use". I was shocked and confused for a moment, but finished the roll call. That scared me. I wondered if it was going to be this: one by one people would stop answering roll call. I found out after that not everyone was aware that [A] had died. This was approximately five hours before rescue' (personal communication).

Dying is simple. One survivor of the sinking of the *City of Benares* following a torpedo attack in the Second World War was left clinging to a life-raft in the water. He watched as the four other passengers with him gradually died. '. . . I

had no thought people could die so easily. Their heads just fell back, the light seemed to go from their eyes, and it was all over . . .'. The functional distinction between the two forms of passive dying (sudden and gradual) remains a mystery. Nonetheless, the ability people possess to die gently, and often suddenly, through no organic cause is a very real one.

Sometimes death may be actively pursued by the victim. In simple terms they attempt suicide. Again, another survivor of the *City of Benares* sinking reported '. . . hour after hour passed and I had almost given up hope. I even said to Sonia, "Darling I think we will take off our lifebelts and go to sleep in the water" but Sonia said "No, don't do that yet. I am sure we will be picked up."' In another incident a close observer describes two American girls on the verge of disintegration: 'They were at their last gasp, ready to take the plunge into death, in fact, already bending over it – fascinated.' Coastguards have rescued people who have clearly removed their life jackets in an attempt to drown. Arne Nicolaysen, a 25-year old Norwegian deckhand found himself overboard on Christmas Eve 1955. He had been in the water for a full day and various ships had passed him by unnoticed. As night closed around him he became dispirited and repeatedly tried to drown himself by letting himself sink and gulping down seawater. He failed and was rescued the following evening. A comprehensive study of shipwreck victims during the war years of 1940–44 observed a '. . . tendency to commit suicide' (McCance *et al.* 1956).

After twelve days adrift in a life-raft in 1972 Lucien Schiltz and Catherine Plenz became physically weakened and began to disintegrate psychologically. After several ships had passed them close by they decided that survival was altogether too difficult. They decided to drink all their remaining water ration in one go and then to make a quick end of it. Before they could act they were spotted by a cargo vessel and rescued (Robin 1981).

Sometimes passive and active death can be observed in the same situation. In 1940 the *Anglo-Saxon* was torpedoed.

Seven men under the command of First Officer Denny took to a lifeboat. After a few days one man died of wounds. He had asked that his water ration be given to someone whose need was greater than his and at 8 o'clock the following morning '. . . he died in silence, discreetly as it were. The rest stared incredulously at him. So soon, just like that!' Denny was a tower of strength to his men who were all physically weakened until the sixteenth day. He turned to his men:

> 'I'm going overboard', he said, 'who's coming with me?'
> 'Me', answered the Engineer.

Two men survived the sixty-six day ordeal. One wonders how many empty life-rafts found on the seas today can tell a similar tale.

Disaster victims have also committed suicide immediately after being rescued, some in hospitals. Indeed, it appears that victims have actually asked rescue workers and hospital staff to aid them in their suicide attempt (*The Times*, 6th January 1986).

SUMMARY

In the face of danger people will tend to show one or more of the following reactions:

1. Panic, which is rare but can occur where there is a perceived time or space limit on survival such as in a building fire or the flooding of a ship or mine.
2. Paralysing anxiety which is often known as 'freezing to the spot'. There appears to be two forms of paralysing anxiety; deadlock, in which muscle tension and rigidity is pronounced while thinking seems to have ceased, and livelock, in which muscle tension is low (within normal limits) but cognitive processing has become circular and the victim is unable to break out of this thought process.

Both forms result in the victim being rendered immobile in the face of danger.

3. Perceptual distortion is more common than generally appreciated with 'tunnel vision' or perceptual narrowing being frequently experienced by people under threat.
4. Denial is the most commonly reported behaviour shown by people before, during and immediately after a disaster. Denial may take the form of a simple refusal to believe that the event is happening, stereotypical behaviour, perceptual distortion or 'intellectualisation'. It is frequently reinforced by previous experience. Denial prevents people from planning to survive.
5. Hypoactivity tends to be manifested as a depressed reaction and apathy. It is compounded by denial. Hypoactivity is most frequently seen during the recoil phase. People showing this behaviour will not look after themselves and are at risk from secondary dangers such as dehydration, hypothermia and so on. They will lose initiative for even simple actions like eating and washing.
6. Hyperactivity is an intense but undirected liveliness. People who become hyperactive are dangerous because they give a misleading impression of purposefulness and leadership which those who are stunned and bewildered will follow. Their actions are frequently inefficient and inappropriate and their ideas worthless. Hyperactivity may be seen immediately after the event in a few people, but most victims will show temporary hyperactivity during their recovery from a depressed reaction and apathy. Minor hyperactivity is noticeable shortly after rescue.
7. Stereotypical behaviour is a form of denial. Victims do without reflection. They fall back on previously well-learned behavioural patterns no matter how inappropriate these are to the circumstances.
8. Irrational behaviour may occasionally be observed. This is behaviour which is peculiarly inappropriate to the situation. It may simply be ineffective or it may be irrational to the point of self-destruction.

9. Anger is a universal reaction amongst victims. It is characterised by being irrational and even rescue workers have come under verbal and physical attack.
10. Guilt is frequently reported in survivors during post-trauma but may also be encountered during the period of recoil.
11. Psychological breakdown is the most desperate problem facing a victim. It is characterised initially by irritability, sleep disturbance, mild startle reaction, social withdrawal, loss of interest, apprehension, general psychomotor retardation and confusion. The ultimate consequence of psychological disintegration is death. Death may occur passively ('give-up-it-is') or actively (suicide).

4 Associated Factors in Survival

> You didn't have facilities to take a bath, sometimes you had your clothing on for three or four weeks at a time, and in the colder weather you never took your shoes off . . . Sleeping on the ground constantly, rain or shine . . . sometimes in the middle of the night when shells were coming in and you were cold and wet you shivered so badly you never thought you would stop . . . You were very, very tired when you were moving up in the middle of the night to – you never knew where you were . . . You were hungry because you didn't have hot food. A lot of times we didn't even have a pack, they were too cumbersome, so we just stuck things in our pockets. – *Ed Lackman, US machine-gunner WW II.*

Although the emphasis in this book is on survival *psychology* it is impossible to disentangle completely a person's behaviour from their physiology. The physical traumas, privations and deficiencies which can undermine the body's strength and efficiency all have psychological consequences. In everyday life fatigue, hunger, thirst, loss of sleep and so on will each affect a person's behaviour. Ordinarily these incidents are infrequent and mild but in the survival context they are commonplace. Their effects are more extreme and their consequences for behaviour more critical. These factors play too important a role in the psychology of survival to be ignored so the more common ones will be discussed below.

FATIGUE

Victims, survivors and rescuers will all experience fatigue, many to the point of exhaustion. Fatigue and exhaustion are most frequently encountered during the period of recoil

although they are likely to be present right from the beginning. Fatigue is a common enough occurrence following physical or mental effort. We experience it ourselves every day in its minor forms but most of us recover quickly following a good night's sleep. It is worth mentioning at this point that although sleep and fatigue are interrelated, the lack of sleep has consequences which are sufficiently different from fatigue to warrant a separate discussion which is reserved for the next section.

Survivors report that they are constantly surprised by fatigue. Its onset is insidious, its effects rapid, frequently devastating and it often catches the victim completely unawares. An officer who survived the sinking of the *Atlantic Conveyor* during the Falklands conflict remarked on his surprise at finding just how quickly fatigue overcame everyone: 'Exhaustion set in rapidly, surprisingly so, and it proved difficult to organise the pile of survivors on the floor of the life-raft' (personal communication).

A crew member of a freighter which sank off Iceland in 1986 reported how three of the eight crewmen who scrambled aboard the ship's torn and leaking life-raft died, as exhausted, they could no longer hold themselves upright in the freezing waist deep water (*The Times*, 29th December 1986).

The assistant purser on the *Herald of Free Enterprise* remarked: 'Seeing [a friend] dead in the water shocked me to the core, and suddenly that was enough, I felt I could do no more. My strength had gone, and I felt totally drained mentally and physically' (Homewood and White 1989).

Fatigue, especially overwhelming fatigue, can place people in extreme danger. The greatest risk occurs when victims succumb while still under threat. Sometimes people, while falsely believing themselves to be safe, willingly surrender to the embrace of exhaustion. This is described by another officer on the *Atlantic Conveyor* who reported: '. . . there was a tremendous temptation to believe that once on board the life-raft, the ordeal was over. This led to great difficulties in organising the survivors; combining this with exhaustion – bursts of organising attempts were made by

several of us but these failed after 5–10 minutes, each followed by a period of lassitude' (personal communication).

This false feeling of safety was further emphasised by an NCO survivor of the same incident: 'The next thing to set in was relief that they had escaped. However, we weren't out of it all. Once you believe that you are safe, you lose the will to survive because you think you have survived.' It is very clear from other observations that many people succumb and die once the pressure is taken off them to survive. They wrongly believe that because the immediate pressure has been relieved then they have survived.

Another officer describing the same incident reports: 'Once in the life-rafts many of the survivors were overcome by exhaustion, hypothermia and shock and could do nothing else but lie in the centre floor area. It appears that no amount of ordering, pleading or even physical force would induce them to move over and sit against the buoyancy chambers. The majority of the survivors fell asleep soon after boarding the life-rafts and it is important to remember all had completed a hard day's work at the time of the abandonment' (personal communication).

That last point about having completed a hard day's work is relevant but one should be wary about overstating its role. After all, when all is said and done one is still talking about raw survival.

The general debilitating effects of fatigue have been effectively demonstrated in field experiments such as the one conducted in 1974 by a joint Danish–Norwegian team. This study involved six men 'abandoning' a naval ship and spending 5 days and nights under observation on board a life-raft. During the first 24 hours the weather was not good, blowing force 5–6, but these were experienced seamen. Nonetheless their behaviour deteriorated quickly even under monitored experimental conditions: 'The conversations during the first 24 hours gave a general impression of severe exhaustion followed by stupor, for all of them. They hardly talked to each other. No one takes the leadership, and even the task of making a watch rotation cannot be done. One waits for volunteers to come forward' (Jensen and Madsen

1974). Following 'rescue' at the end of the experiment the observers noted 'General exhaustion consumes the remaining strength . . .'

This was an experimental study but the observed patterns of exhaustion and descriptions of behaviour show identical correspondence with those observed in genuine survival episodes. During the Second World War medical personnel describe survivors of sinkings showing severe psychological fatigue ('mental collapse') immediately following rescue.

On reflection it is not surprising that exhaustion should follow closely on an escape from a potentially life destroying situation. The physical activity involved will often be explosive and violent. There will be an injection of adrenalin into the person's system enabling a surge of energy to overcome otherwise quite daunting obstacles. One British police officer who became involved in a shooting incident readily scaled a 15 ft (4.6 m) wall with little apparent difficulty (Manolias and Hyatt-Williams 1986).

Frantic running, climbing, swimming and other strenuous exertions may persist for several minutes at a stretch. A single minute is a very long time during which to operate at such intense capacity. Rescuers will work day and night without rest to uncover victims especially if the victims belong to their own family. Still people are caught completely unawares by the extent of fatigue and the rapidity with which it overtakes them.

Psychologically, fatigue can become a vicious circle. Even a moderate amount will reduce mental and physical efficiency. This reduction can, in turn, result in behaviour which serves to increase fatigue and blunt the edge on survival.

> By nightfall, we were completely bushed . . . we decided to wrap ourselves in the 'chute instead of making a shelter. We were too tired even to build a fire. We just cut some pine boughs, rolled ourselves in the nylon and went to sleep . . . and so, of course, it rained, and not lightly. We stood it until we were soaked, and then we struggled out and made a shelter. Since it was pitch dark, we didn't get the sags out of the canopy, so the

> water didn't all run off. Just a hell of a lot of it came through. Our hip and leg joints ached as though we had acute rheumatism. Being wet and cold accentuated the pain. We changed positions every 10 minutes, after gritting our teeth to stay put that long (Rastellini 1985).

We have for the most part been considering fatigue to the point of exhaustion. It is not necessary for such an extreme state to be reached before human performance becomes impaired. Fatigue is commonplace and its consequences are readily seen so it is not surprising perhaps that fatigue has been under scientific investigation for many years with the initial impetus coming from the establishment in England of the Industrial Fatigue Research Board during the First World War. Unfortunately, the findings from many studies are still not clear and the experimental research has been plagued with difficulties. The resultant concepts, theories and models of fatigue are generally weak, and their predictive value poor. Despite the numerous experimental studies carried out few have been successful in identifying the underlying nature of fatigue.

One of the major problems confronting fatigue research is establishing a definition of fatigue which can support a suitable method of measurement. An individual knows when he feels tired, weary, or lethargic but it is a condition which is extremely difficult to monitor externally. A frequent experimental method has been to have people continue at a task considered to be fatiguing over time and to perform a second task at discreet intervals. This second task is designed to provide quantifiable and hence measurable data to the experimenter. It is commonly assumed that performance on the second task would decrease as fatigue sets in. In practice this rarely happens. In one study a group of people operated without rest in an aircraft flight simulator, breaking off occasionally to perform a manual tracking task on an experimental test piece which was able to measure their performance quantitatively. Some of these simulated flight sessions continued non-stop for as long as 56 hours and

participants are reported to have become so weak that they had to be physically carried to the test piece. Still, their performance on the test apparatus was well within normal limits (Chiles 1955). In more recent studies it was found that people exercising to exhaustion on a stationary exercise bicycle showed no decrement in their visual processing capacity (Bard and Fleury 1978).

Other studies of fatigue using aircraft simulators have shown an apparent decline in performance with increasing fatigue (e.g. Bartlett 1943, Davis 1948). However, a closer examination of the data show that whereas performance did deteriorate rapidly on some tasks, with errors increasing steadily over time, other tasks showed a sharp increase in errors which then decreased and still other tasks did not show any impairment at all. Of particular interest to this study was the observation that the behaviour of some of the pilots began to change as fatigue increased. The pilots became either more irritable, annoyed and violent in their actions and language, or they became more withdrawn and inert.

Irritability is a common characteristic of fatigue and is a frequent and pervasive cost of prolonged effort. It is often a hidden cost. People are known to be able to survive hard days at work coupled with frustrating commuting home in overcrowded trains or snarled-up traffic with surprisingly little irritation but the pay-off comes in the evening with the family. It has been suggested that the reason for the high percentage of murders being domestic could be related to displaced irritability.

Further factors which complicate the fatigue picture are those of anxiety and fear. There are times when a drop in performance can be due to anxiety as well as fatigue. In the simulator experiments described above it has been pointed out that failure to meet certain standards of performance can cause anxiety in the volunteers which in turn worsens their performance. Fear itself is known to wear a person down physically. During the Great War, General Marshall noticed men almost collapsing with fatigue after an 18 kilometre march towards the front in France. Marshall knew

that his men had previously carried the same packs successfully on 32 kilometre marches under a hot sun – but that was in training. Later, marching away from the front, his men covered 52 kilometres in a single day. The move away from the war zone had banished his men's fear and with this fear had gone their fatigue.

Fatigue can arrive suddenly and overwhelmingly or it can gradually insinuate itself into the fibre of the victim. Enforced cramped conditions induces fatigue over time as does constant motion and violent battering, conditions which are all too frequently encountered in life-rafts. Harold Dixon was the pilot of a US navy torpedo bomber which ditched into the Pacific Ocean in 1942 after losing its way in an electrical storm. Dixon and his two crew members made it into their 8 ft × 4 ft (2.4 m × 1.2 m) inflatable raft. Dixon describes the conditions as follows:

> One of our first discoveries was that it was almost impossible to sleep. To convince yourself of this, just try stretching yourself out on your back with your legs tucked under you – we had no room to stretch ours out. Then get a strong man to keep on tapping you on the head and shoulders with a board. If he gratifies your wish with a couple of taps every three seconds, he will just about reproduce the repeated impact of waves hammering the bottom of the raft. At the same time ask someone else to throw a bucket of cold water over you at regular intervals. Then, for the sound effects of this reconstruction, get a few empty tipper trucks to drive round and round you. After 34 days of this regime, you may find it the least bit boring.

Fatigue, therefore, is a condition which is commonplace but notoriously difficult to define. The term fatigue is a useful label but explains nothing. Indeed, as long ago as 1921 it was proposed by Muscio that the term 'fatigue' be abandoned. Fatigue is a complex physiological and psychological process, the mechanism of which is not yet fully understood. It cannot be defined in terms of biologically or

environmentally fatiguing conditions and it is impossible to predict with any degree of accuracy how a person's performance will be affected (if at all) by exposure to a particular set of biologically and psychologically demanding conditions. It seems that fatigue is a more subtle condition than it at first appears and that a key factor in its effect is some degree of cumulative build up of fatigue so that complete rest and recovery is impossible to achieve between exposures to fatiguing conditions (McFarland 1971, Cameron 1973). This inability to achieve full rest and recovery is a classic complaint of victims thrust into survival situations. The power of fatigue to undermine an individual's performance to the extent where it is at best ineffective and at worst counter productive is one which has long been grossly underestimated.

Finally, the practical effects of fatigue in the field have been described by a polar explorer and a mountaineer. Firstly, the polar explorer Wally Herbert:

> we were faced with three choices of meat, all in a meat bar, all you had to do was put it in the pot and boil it up; you had a curry stew, a lamb stew, a beef stew – they were essentially the same, in fact, and didn't even taste very different, but the choice that you had to make between those three was insufferable, and almost impossible to take. You got to the tent, you were tired, you didn't want to have to make a choice; really all you wanted was to be handed a plate of food, or to actually cook it and hand it over to your mate, if it was your turn, because of the fatigue level.

Very similar reactions have been expressed by the climber and mountaineer Mo Anthoine:

> Making a cup of tea at twenty-five thousand feet can be a two hour job: you have to get out of your warm sleeping bag in the dark, in horrible conditions, chip off ice and put it into the pot with your bare hands. It's all so much effort that you say, 'Sod it, I won't bother.'

> And its easy to say, 'Sod it' to all the hundred and one little jobs that you have to do on a trip – basic things, like keeping your sleeping bag dry. But if you don't do them you start to go downhill both physically and mentally (Alvarez 1989).

SLEEP

Sleep as a behavioural activity is not fully understood. It is known that at a very basic level sleep is essential for survival and adequate amounts of all types of sleep are required to support mental and physical health. Different stages of sleep have been identified and catalogued and the effects of sleep loss have been systematically studied.

Under normal conditions a person will move from relaxed wakefulness into sleep while passing through a period of drowsiness. Scientists recognise two basic phases of sleep: slow wave sleep and paradoxical sleep. The brain produces electrical waves which can be measured by an EEG or electroencephalogram. These waves are known to change during sleep. Relaxation produces an alpha wave with a rhythm of around 10 Hz which decreases in wave amplitude as the person becomes drowsy. Physically the head may droop, attention and alertness decrease and eyelids begin to close. At the start of stage 1 of slow wave sleep the waves reduce in frequency and amplitude, and gaps appear which are filled with delta and theta waves (0.5–4 and 4–8 Hz). This is the initial part of sleep, characterised by a decrease in awareness of the environment, but from which the person can be easily awakened. It is light sleep. True sleep begins in stage 2 where the alpha waves disappear and are replaced by an apparent jumble of waves of greater amplitudes. When in stages 3 and 4 it is difficult for a person to be awakened. If he is awakened he will not report dreaming. Delta and theta waves characterise stages 3 and 4. The deepest level of sleep is known as paradoxical sleep because, although this is the deepest layer, the EEG pattern resembles that of a person

who is awake. This is the phase of greatest relaxation and the most difficult from which to be awakened. Each session of paradoxical sleep lasts approximately 10 minutes and occurs every 60–90 minutes. People awakened from paradoxical sleep report that they have been dreaming about 90 per cent of the time.

Two aspects of sleep are of particular concern to the victim: sleep loss and sleep disturbance. Both conditions are heavily interwoven and both are reported continually by survivors.

Sleep disturbance is not uncommon in everyday life. Early morning starts for long distance meetings and late returns, shift working and watch keeping duties, early arrivals at airports for flights to countries complicated by different time zones, nights continually fragmented by the arrival of a new baby, a new environment (the so-called 'first night' effect) and other such like causes are known to many people. For the most part healthy people will quickly recover from such disturbances with few ill effects except for an increase in general irritability. In unusual environments and in survival situations a person is rarely blessed with such opportunity for early recovery. A further complicating factor is that sleep deprivation produces impairments in performance not only through a simple want of rest but also through the disruption of a person's diurnal rhythms. It is worth considering these rhythms in slightly more detail to better place sleep in context.

Everyone contains an internal clock which regulates their various bodily cycles including sleep. Studies have shown that this clock does not match precisely the accepted daily cycle of 24 hours. These studies have commonly involved isolating an individual in continuous light or darkness in bunkers or caves, denying them any information about time and allowing them to establish their own sleep/waking cycles. In one experiment a French caver spent 53 days alone in a cave below the Maritime Alps at a depth of 114 metres (Siffre 1965). His cycle increased to almost 24.5 hours. Another Frenchman later spent 174 days at 70 metres in a cave with the result that he adopted a rhythm of 32

hours of wakefulness and 14 of sleep which he kept up for 48 days. During this period his other biological rhythms became out of phase before settling into a more or less normal rhythm (Oleron *et al.* 1972). Studies carried out in bunkers in which over 200 individuals have now been tested have shown that most people settle down to a 25-hour day thus losing one day for every 3.5 weeks (Wever 1979).

There is evidence to suggest that the body possesses at least two biological 'clocks' (sleep/waking and body temperature) and that difficulties arise when these are thrown out of phase. This condition is known as internal desynchronisation and happens in about 30 per cent of people in bunker experiments. Internal clocks are set or reset by time cues known as *zeitgebers* (or 'time givers'). These zeitgebers may be physical (such as the light/dark cycle of night and day) or social (such as meal-times, clock-times, etc.). These cues will act upon the biological clocks to either bring the body cycle into adjustment or conversely to discourage any such readjustment.

Sleep disturbances and changes in sleep patterns (shown by decreasing slow wave sleep) have been reported frequently amongst men wintering in polar regions (see for example Taylor 1960, Shurley *et al.* 1970, Patterson 1975, Araki 1980, Rivolier *et al.* 1988). It should be mentioned, however, that not all studies have found such sleep disturbances (Buguet *et al.* 1986). Other factors can affect sleep quality and quantity as well as light/dark cycles. Common amongst these are high altitudes, fatigue, heat and cold and isolation. On the whole, and despite the various difficulties, sleep will overcome most disturbance and settle into a routine of its own if allowed. An expedition to Greenland reported that its members settled into an average of 7.9 hours of sleep (Lewis and Masterton 1957) while members of an Antarctic expedition established an average of 6.9 hours (Rivolier *et al.* 1988). There can, however, be other problems. One party which overwintered in Antarctica found that 60 per cent had difficulty in getting off to sleep or staying asleep (Strange and Klein 1973).

The evidence so far suggests that in an otherwise healthy

individual changes in environment, physical or social conditions which affect his biological 'clocks' will produce sleep disturbance. This should, however, be a temporary discomfort and a regular sleep pattern can be re-established within one week. Victims who find themselves forced to fight for survival are rarely so fortunate. Many will be prevented from sleeping by the pain and discomfort of their conditions. Some will actively have to fight against sleep, forcing themselves to stay awake knowing that if they do succumb they will perish. In the everyday raw reality of survival basic discomfort should not be underestimated. Steven Callahan in his life-raft described a continual discomfort: 'I have a dozen or two open sores, about a quarter inch across, clustered on my hips and ankles. My cushion and sleeping bag, when dry, are encrusted with salt, which grinds into my wounds'.

On the 25th January 1883 Howard Blackburn, a 25-year-old fisherman, was working on board the schooner *Grace L. Fears* off Newfoundland. He and a colleague, Tom Welch, put off from the schooner in a dory to increase their catch. In the afternoon three miles from their ship a North West wind picked up and turned into a blizzard. They rowed frantically without effect then dropped a grapple anchor but this had little effect against the current. Their boat grew heavy with ice and they spent the night baling. The following morning they tried to row for Newfoundland which lay over 100 miles to the west. Blackburn, while rigging a sea-anchor, lost his gloves over the side. Realising that his hands were also lost he grasped the oars and tightened his fingers around their ice clad wood. He waited for 20 minutes until his hands had frozen into two hook-like stumps which meant that he could still row. During the following night Welch became delirious before drifting into sleep. He died before morning. Blackburn went a further three nights without sleep trying to snatch periods of rest without falling asleep and freezing to death. The weather improved and he again began to row. Two days later he made shore and spent the night in a deserted cabin forcing himself once again not to sleep, knowing that to do so was immediate death. The following day he got back into his dory and began rowing. In

an extra effort to fight off sleep he forced himself to row during the whole night. After seven days from the beginning of his ordeal, seven days without food, water or sleep, he reached the fishing village of Little River. He survived, albeit with the loss of his fingers, thumbs and the front part of his right foot.

In 1928 Franz Romer, a sea-going captain of the Hamburg America Line put to sea in a klepper canoe similar to the Eskimo kayak. After eleven days with constant vigilance over a threatening sea he found that the lack of sleep made him depressed. During the three months that he later spent at sea in his canoe he had to force himself to sleep with one eye open. He later reports how he even gradually became conditioned to just dropping off for a few seconds which separated the dangerous waves which so often threatened him (Robin 1981).

It is possible to survive reasonably well without sleep for up to five days although there will be a drop in personal efficiency and minor hallucinations have been reported after 50 hours of enforced wakefulness (Williams *et al.* 1962). After 100 hours of waking different biochemical processes come into play to provide energy and fuel for the body to continue functioning. The existence of this additional or emergency system suggests that the normal biochemical sources of bodily energy are becoming exhausted. In people who have been required to remain awake for over 100 hours various psychological changes have been noted. Personality and rational behaviour begin to disintegrate. Perception becomes disorganised and potent hallucinations are common, often accompanied by paranoia. In at least two studies the experimenters were physically attacked by the participants. In a classic example an American disc jockey, Peter Tripp, remained awake for eight days as part of a charity fund-raising exercise. During this time he was studied by both psychologists and medical doctors. After 120 hours of sleep loss he ran from the room when he thought he saw flames coming from a desk drawer. After 150 hours he became unsure about who or where he was and continually saw a 'Dracula'

image on a clock face. At the end of the exercise he believed the doctor examining him to be an undertaker coming to bury him alive and tried to escape naked into the street (Williams *et al.* 1962).

There are two interesting factors about this study. Firstly, despite occasions of extreme disorientation Peter Tripp still managed to conduct his radio show between 5 and 8 pm each evening handling recordings, discussions and advertising so competently that his radio audience was unaware of his condition during the rest of the day. Sleepiness and the accompanying psychological symptoms came to him in waves. These waves are more pronounced at night during normal sleeping hours and can be overcome with effort when it is possible to push into a phase of reasonably normal functioning. These waves of sleepiness come very suddenly but if they can be controlled the feeling of tiredness will soon pass and the person will find himself again wide awake. As the duration of sleep deprivation increases the periods between waves of sleepiness will become shorter. These waves are cyclical and can be controlled and overcome with effort.

Secondly, at the end of eight days Peter Tripp had only 13 hours sleep, this was significantly less than the amount he had lost yet he appeared to show a full recovery. Other studies of men kept awake for over 200 hours showed that they achieved full functional recovery with around 12 hours sleep. Much restorative benefit can be obtained from catnaps and a survivor should learn to grab snatches of sleep at a moment's notice.

Tasks which are most prone to impairment by lack of sleep are the dull, routine, repetitive or monotonous types, especially if they are of long duration. Short tasks, that is those of less than 30 minutes duration are not usually affected. Unexpectedly perhaps, tasks involving decision-making or calculations and higher-order thinking tend to be impaired far less at first even if they continue for an hour or two. The jobs most at risk are the observational or look-out type which require a person to monitor a changeless environment for a faint or unexpected signal. This has clear implications for survival duties such as watch keeping and

escape and evasion. Performance on these tasks can be further confounded by perceptual illusions which are common with sleep loss. People without sleep will see imaginary objects and hear and speak to imaginary people. One common hallucination is seeing cobwebs everywhere (Tripp saw cobwebs in his shoes after 50 hours of sleep deprivation) while another common tactile illusion is the feeling of having a very tight band around one's head.

Illusions will come very quickly if sleep loss is compounded with fatigue as well as monotony. This was observed by members of a British commando unit during training for a canoe raid on enemy shipping at Bordeaux in 1942. They would train at sea in their canoes all day and night.

> Perhaps more serious was that on these lone, dark expeditions, when complete silence was the rule and no sound could be heard but the drip of your paddle or the slap of waves on the boat's hull, the mind was apt to become dazed and even to entertain hallucinations [. . .] These hallucinations often took strange forms, but the commonest were for men to see lighthouses, large ships, railway bridges or big buildings suddenly before them, though the conscious intellect knew that there was nothing but water all around. On one occasion Hasler [the Commanding Officer], while acting as No. 2 at night, imagined that his No. 1, instead of paddling, was reading a large, illuminated newspaper and he actually began to reprimand the man before he came to his senses.

On another training exercise one canoe lost formation altogether with the others and finished up miles outside the exercise area. 'His excuse was that he was following Hasler at a distance, until he saw Hasler's canoe get up and fly away. He then realised that he had been chasing a seagull' (Phillips 1957).

Today sleep deprivation and a punishing physical regime are part of many military training schedules. One young officer describes his time towards the end of the 'Hell Week'

phase of his selection for the American SEALs Naval Special Forces:

> After [the previous exercise] we rowed down to the mudflats, had [rations] at midnight, and rowed back. The row back was the most unsettling time of the entire hell week because by this time we were hallucinating from lack of sleep. People thought they were in the surf zone instead of in the bay, they thought they saw the San Diego Ferry off-loading cars directly in front of them, and threw the paddles out of the boat thinking they were snakes. When we arrived back at the UDT [Underwater Demolition Team] training area Friday morning, I swore that it had snowed in the bay (Young 1990).

Of the various psychological processes which are prone to disorganisation by lack of sleep the most susceptible is self-perception. Man is notoriously inept at monitoring his own condition. Many survivors report that tiredness came upon them but was not recognised. Furthermore, people will underestimate, sometimes quite seriously, their own level of impairment.

Given the extreme and rapid disorganisation which occurs through enforced sleep loss and the quick onset of paranoid symptoms, hallucinations and loss of personal control, it is perhaps not surprising that sleep deprivation is a favoured tool of interrogators across the world. Sleep deprivation is essentially a simple and effective means of turning an ordinary man into a psycho-pathological case relatively quickly – and of course, it leaves no marks.

HYPOTHERMIA

Cold kills. It has a long history of killing and will continue to do so. Cold can kill quickly within a few short minutes or it can suck away at life, insidiously gnawing at a person's vital

heat. Whichever way it selects to kill, it will do so surely and without favour.

Hypothermia is the term given to the condition which arises when the amount of body heat being lost to the environment exceeds that being produced within the body. In practice hypothermia refers to a victim's condition rather than to a specific body temperature. The normal temperature of the human body lies within the range 36–38°C (97–100°F) and the normal temperature of 37°C (98.6°F) is accepted by convention as the average. Body temperature can vary within the range 1.0–1.7°C (2–3°F) during any 24-hour period. Consequently, the crucial factor in survival is how well the body can maintain its core temperature within this range. The condition of hypothermia may arise due to a failure to provide the body with adequate thermal insulation, insufficient food supply or a combination of both. The most common initiator of hypothermia is accidental exposure such as that frequently found during shipwreck, aeroplane crashes, expeditions, military and underwater operations as well as certain types of sporting activity such as hill walking, canoeing, skiing, sailing and so on. It should be emphasised that the threat lies not in the activity itself but in the risk of accidental exposure. This, in turn, may come about through one of five causes succinctly cited by Bligh (1988); misfortune, miscalculation, misplaced confidence, logistic failure and individual pathophysiological susceptibility. Although in theory these causes appear distinct and clear-cut, in practice, they can often overlap and perhaps confuse. Bligh quotes the example of long-distance skiers who may be unwilling to carry the additional thermal insulation required to keep them within the temperature range for thermal survival while active. They rely instead for safety on their perceived certainty of reaching the next shelter before resting. Should an accident or other circumstance befall them, which results in a period of delay away from the shelter, then the skier may be unable to match heat loss with heat production and hypothermia will inevitably occur. It is difficult at times to decide whether such an occurrence is a misadventure, a misfortune or a miscalculation or whether

it is a calculated risk in which the possibility of disaster was known and accepted?

It is man's intellectual capacity which keeps him comfortable in extremes of cold such as that found underwater or in the high Arctic rather than any fundamental modification in his anatomy or physiology. The Inuit people survive happily in the Arctic due primarily to the way they design their shelters and clothing and the way they adapt their behaviour. Strip an Eskimo and he will shiver as any European. It is psychological dysfunction (or a failure of intellectual capacity) which underlies many instances of hypothermia. It is a failure to anticipate and to plan adequately for such situations which is the main cause of death and injury by cold. Any mountain, fell or cave rescue team will recount instances of such a failure to anticipate circumstances.

Physiological research into hypothermia began in earnest following World War II when it was realised that most servicemen lost at sea during the conflict did not die through drowning but through immersion in cold seas such as the North Atlantic and Baltic. Through this research the pattern of physiological and behavioural symptoms of hypothermia were soon established. It was also found that the effects of cold can be aggravated by other factors such as air speed, humidity, acclimatisation and clothing.

When considering symptoms it is important to remember that in areas where environment affects the body it is very difficult to separate the physiological from psychological functions. Cold exposure produces various biological changes, most notably, the blood vessels in the limbs and skin begin to close down (peripheral vasoconstriction) which reduces blood flow and heat loss thus protecting the vital core temperature. Piloerection (the raising of body hairs) occurs trapping air close to the skin which can reduce heat loss, although the efficacy of this biological response to combating heat loss has recently been called into question (Edholm 1978). Shivering follows and is a behavioural response known to all. Its purpose is to generate internal body heat through physical activity but again its effectiveness is paradoxical. Not everyone is prone to shivering. On entering cold water

at 15°C some people will be found to begin shivering violently almost at once while others scarcely at all (Rivolier *et al.* 1988). The degree of shivering is dependent on body fluid and fat. The fatter a person is the greater the insulation and protection for the core temperature. Thinner people are more prone to shivering than fatter people. Interestingly, it is the act of shivering rather than the cold itself which causes discomfort. Various studies have shown that it is the reduction in shivering and a tolerance for reduced core temperatures which allow a person to be comfortable and this comfort in turn supports mental concentration and psychological effectiveness (Le Blanc 1956). Members of the Australian Antarctic Expedition developed an increased tolerance for cold with non-shivering ways of generating heat (Budd 1973) and other studies have reported that voluntary physical exercise can reduce discomfort independently of any effect on core temperature (Marcus and Redman 1978). Here there is a paradox within a paradox for although decreased sensitivity to cold reduces shivering and increases comfort the accompanying lowering of the shivering threshold can subtly induce hypothermia and lead to a condition of hypothermic drift. Another form of behaviour which frequently accompanies shivering is huddling. Huddling can reduce the amount of body surface area open to convection by as much as 50 per cent. Unfortunately, shivering, especially at a peak rate cannot be sustained indefinitely and after a while shivering is replaced by muscular rigidity. In extreme cases once muscular rigidity has set in heart failure can follow. The latter usually happening once core temperatures fall below 25°C (77°F). If the cold exposure is sudden and severe (as for example during immersion following shipwreck) then the victim will show a rapid rise in heart rate accompanied by severe hyperventilation producing deep involuntary gasps. Such uncontrolled inhalations naturally have serious consequences for victims in water and must increase the chances of drowning. This hyperventilation will produce in the body a sharp increase in oxygen consumption.

Sweating is a compounding factor, the effects of which are frequently underestimated. The problem occurs when

the activity giving rise to sweating ceases yet the sweat remains to fulfil its function of increasing the rate of body cooling. People commonly at risk from this response are hill walkers, mountaineers, marathon runners, fell runners, cross country skiers and suchlike.

Our approach to operating in extreme climates is often psychologically determined. It has been remarked elsewhere that although we are able to function well and even to obtain enjoyment from ski slopes and saunas we would be decidedly unhappy about carrying out normal working activities under these conditions. Furthermore, the change from one environment to another can have a carry-over effect. A study into acclimatisation for Antarctic operations found that when people moved from a cool (34°C) to a warm (40°C) bath they experienced an immediate fall in heart rate accompanied by a profound feeling of well being. Some people reported that they continued to feel comfortable and pleasantly cool for some time afterwards even in the heat of an Australian summer.

On a broader level of behaviour cold can produce within an individual impaired consciousness, anxiety (possibly due to a poor vasodilatation response), low morale, impaired memory, lack of self control and even paranoia. The consequence of many of these factors is an impaired conscious awareness of cold. The victim fails to realise that his body temperature is becoming dangerously low even to the extent where his life may be seriously endangered. In extreme cases the victim may show 'paradoxical undressing' where, despite being hypothermic, he will complain of being too warm and start to remove his clothing. All this, of course, calls into question the very basic assumption that we are truly designed for survival. It appears that once the physiological foundations are attacked they quickly pull down the psychological superstructure even though a simple device (such as a cognitive override) could save the whole architecture. See Figure 4.1.

Most people first complain of feeling cold in their hands and feet and there is little doubt that fine manual tasks are the first to suffer as tactile sensitivity, dexterity and grip

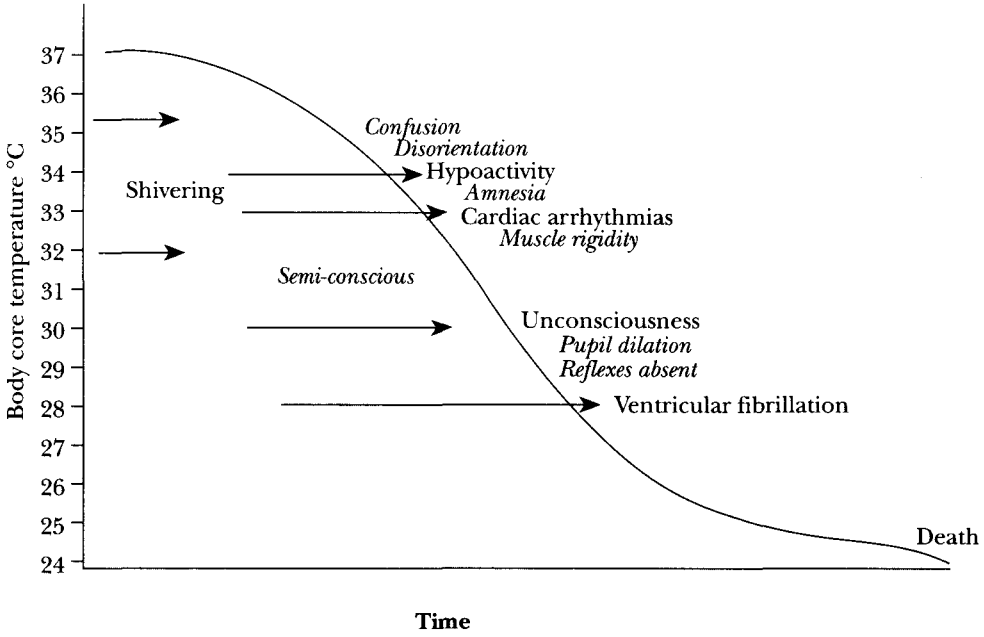

Figure 4.1 Psychological and physiological aspects of hypothermia

strength decrease with low temperatures. It is important to realise, however, that the decrease in performance with cold is not a linear function. That is, performance does not fall away gradually and a person can maintain normal functioning until a critical hand-skin temperature is reached whereupon performance rapidly drops away . This impairment in performance refers only to the body extremities because if the body surface is cold there is little impairment in manual performance providing the hands are kept warm (Veghte 1961). It is a general rule that while severe cooling of the body surface will produce some impairment in performance it will not be as much as would occur if the hands alone were cooled (Lockhart 1968).

Performance drop as a consequence of finger numbness is an important but not isolated factor. Performance may also decrease because cold attacks the central processing system of the brain. Evidence for such central effects of cold was found by Poulton and his colleagues in 1965 during a field study in the Antarctic. They found that performance on a watch-keeping task on the bridge of a ship in winter when mouth temperatures fell to 35.6°C (96.2°F) decreased significantly. No such impairment was found for similarly dressed officers in temperate regions.

Many studies showing impairment due to central effects of cold have mostly involved people being totally immersed in cold water. Similar results have also been obtained from partial immersion and this again has important consequences for survival. The types of impairment found under partial immersion have affected the ability to estimate time (Baddeley 1966), attention and short-term memory (Bowen 1968) and general mental coherence (Beckman 1964, Keatinge 1969). It must be noted that some studies while finding motor decrements did not find any significant cognitive decrements (e.g. Stang and Wiener 1970, Vaughn and Mavor 1922). It is to be expected that at some stage between impairment of fine manual performance and coma there will be an important effect upon the central processing capacity of the brain. The precise nature and timing of this effect is not understood.

Is it possible to acclimatise to cold? The general view is that a certain limited degree of acclimatisation is possible, however, once again the evidence is not entirely conclusive. Boutelier *et al.* (1982) and Tipton (1986) found that cold baths were effective in developing an acclimatisation to cold whereas Rivolier *et al.* (1988) found that a series of cold baths was not very effective at all. Acclimatisation is a learning process and like any other form of learning it is not entirely forgotten. One important finding which needs further research is that milder cold stimulation but for longer duration appears to be more effective in producing acclimatisation to cold than more severe and sharper exposures. Again, acclimatisation appears to present itself as a reduction in shivering rather than as any form of organic change. The Bushmen of the Kalahari Desert and the Aborigines of Central Australia both endure cold overnight temperatures but unlike unacclimatised Europeans in the same conditions, they do not appear to shiver and indeed seem to sleep quite soundly (Le Blanc 1975). Le Blanc (1956) had previously found a similar reduction in shivering amongst a group of Canadian soldiers who had acclimatised to a cold environment. Although much tolerance to cold appears to be due to behavioural adaptation the Inuit Eskimos do show a much greater tolerance for cold work with their hands which seems to be due to a genetically determined increase in blood flow to their hands and fingers.

Cold, like sleep deprivation, is a method often employed to deliberately weaken people, particularly captives prior to interrogation or as a brutal attempt at behaviour modification. Prisoners will be stripped and placed in cold cells without any means of protection. Forcing prisoners to parade for long periods in the cold is a common practice. In the Ravensbrück concentration camp morning began at 3 am with *Appell* which involved the women prisoners parading in rows five deep each woman with her hands on the shoulders of the one in front to ensure a straight line. There in the cold dawn they would stand, often in the snow and rain, for three hours. Thousands of these women perished while being forced to work on the construction of an ad-

vanced fighter airstrip at Königsberg on the Baltic. They performed heavy manual labour during the semi-arctic winter dressed only in summer clothes and receiving only watery soup for sustenance. In the Korean prisoner-of-war camps men would be compelled to stand to attention in the mid-winter snows, sometimes for up to 30 hours at a time. A particularly brutal torture involved the PoWs being marched barefoot to the Yabu River in 20° of frost. While they paraded on the ice, buckets of water would be poured over their feet. There they were forced to remain, frozen fast, for several hours.

HYPERTHERMIA

Hyperthermia is the term given to heat illness which arises when the body is unable to dissipate the excess heat it has generated. The body can increase its heat gain by internal metabolism, by the external environment and by ingesting hot food and drink. In cold conditions additional heat can be generated by shivering. Heat is lost from the body mostly through the skin although a small amount is lost through the lungs. Heat may be lost through convection by cool air passing over the skin (hence the danger of windchill), conduction by sitting or lying on cold ground, radiation and evaporation. By far the most effective mechanism of heat loss is that of evaporation through sweating. In fact, sweating is the only means available for the body to reduce its temperature when the surrounding environmental temperature is higher than that of the body. Under this condition the body will actually gain heat through conduction, convection and radiation. Consequently, sweating must compensate for all these. Sweat is a dilute solution of salt (sodium chloride) and serves to remove heat when the body converts it into vapour. Most of the heat rises from the body and it takes approximately 580 calories to evaporate 1 cubic centimetre of sweat. One calorie is the amount of heat required to raise the temperature of 1 gram of water by 1°C. Consequently, it

is only when sweat is evaporating that it is working as a cooling agent. Sweat which simply runs off the body is not fulfilling its function. Water lost each day through sweating may be anything from none to 12 litres. The evaporation of 12 litres of sweat is the equivalent of 7000 kilocalories of heat and distance running can generate up to 1000 kilocalories per hour. During the battle with Egypt, Israeli soldiers in the Sinai Desert were required to drink 10 litres of water per day to compensate for sweat loss.

Clearly, heat affects performance. The precise relationship between heat and performance, however, is not easy to establish. Two of the main difficulties are the lack of suitable objective testing methods and the wide variation in subjective assessment between individuals. These difficulties run throughout the behavioural spectrum from the basic nut-and-bolt level of ergonomics through higher order cognitive functioning to the more diffuse level of social behaviour. Clearly identifiable patterns of behaviour only become established in the extreme case of heat stress which results in exhaustion and heat stroke.

The consequences of heat stress for social behaviour have long been a source of speculation. Raised environmental temperatures resulting in heat stress have been held to account for aggression, hysteria and apathy (Wyndham 1970). They have also been claimed to underlie urban and prison riots. The most frequently cited example of these being the violence which flared in American cities during the long hot summers of the 1960s and particularly in 1967. The State Riot Commission (US) of 1968 on urban riots found that in all but one instance the prevalent outdoor temperature had been at least 27°C (80°F). Furthermore, a study by Goranson and King (1970) found that the temperature was elevated by 3°C (relative to a control year) for 3 days prior to the outbreak of riots. Conditions of confinement and humidity such as that found in prisons seemed to aggravate the problem. The police have long since known that there exists a correlation between elevated temperatures and increased crime (Sells and Will 1971) and certainly the murder rate in New York City seems to vary with the temperature.

Increased environmental temperature does not need to be extreme to affect social behaviour. Pub landlords are well aware how heat exposes the short-tempers in customers, shown by increased rudeness and a tendency for them to slam their money on the counter. Here the problem can be compounded because alcohol itself is known to increase aggression (e.g. Taylor and Gammon 1975). In England the hot weather of summer 1989 resulted in an increase in the number of victims of violence, including shootings and stabbings, being admitted to Guy's Hospital in London. This behaviour is mirrored linguistically: tempers flare or rage, arguments become heated, people lose their cool and quickly reach boiling point and resentment simmers.

The relationship between heat and social behaviour is not as straightforward as previous studies may suggest. Indeed, it is a very complex issue. Even the relationship between heat and aggression is not as simple as one might at first suppose. Studies, have found, for example, that heat does increase aggression in non-angry people but that it reduces aggression in people who are already angry (Baron and Bell 1975). More recent studies have shown that it is the variance in violence which increases with raised temperature, rather than the violence itself (Bell and Fusco 1989). It is argued that the combination of anger and heat results in a condition which is so severely uncomfortable as to trigger lethargy or apathy (Baron and Bell 1976). Lethargy is a common response to heat which is discomforting without necessarily being stressful. Many people will report feeling lethargic, and their level of arousal decreases, once heat rises beyond a comfortable range. Herein lies one of the difficulties of heat research namely that it is virtually impossible to disengage the effects of heat from the effects of discomfort.

Tying variations in human performance to changes in heat even within the normal range of body temperature is fraught with difficulties. One study showed that performance on a calculation test improved or decreased with the rise and fall of body heat in the normal range of rectal temperatures (Colquhoun 1970). A study of moderate heat

stress (20°C–29°C) on 17-year-olds found a reduction in sentence comprehension at intermediate temperatures, a slowing of performance at a multiplication task with increase in temperature (in male subjects) and a peaking of performance of recognition memory at 26°C. Another study also found improved performance on several mental tasks for a heat exposure of three hours following which performance deteriorated (Fine and Kobrick 1978). Other research has found that heat can improve performance initially (on say a reaction time task) but that performance falls away shortly afterwards. A study involving performance in a simulated cockpit found that heat had no effect on two tracking tasks yet improved performance on a third (Nunneley *et al.* 1979). During low level flights over deserts pilots report a lower G-tolerance, coupled with increased general fatigue, compared with flights over temperate terrain. Other studies looking at the effects of heat on cognitive performance frequently show neither improvement nor decrement (e.g. Givoni and Rim 1962, Edholm 1963). Experimental studies have even found no significant impairment with higher order mental performance of a combination of heat and humidity (Fine *et al.* 1960).

Much of the difficulty with this research lies with interrelationships. A person can be classified along certain specific parameters with little difficulty. A similar exercise can be done for both the task and the environment. The problem arises when studying the various and clearly complex relationships between these three factors. It is not the man himself nor the environment which is important but man's reaction to it. Clearly heat effects have important implications for the military and particularly where forces are moved rapidly to tropical or desert regions from temperate or even polar climes. One study which investigated the effects of heat on military skills of British soldiers found significant impairment in performance on map reading ability and the strip and assembly of the SA80 rifle in unacclimatised soldiers within 24 hours of arrival in Cyprus in July. Improvement was found with acclimatisation within three weeks. Heat had no effects on visual search ability,

spatial relations or manual dexterity tasks (Steele-Mortimer and Leach, in preparation).

Many of the experimental findings for heat effects within the normal range of temperatures appear somewhat confusing and the prediction of performance under heat is complicated. However, once heat passes beyond the normal range of temperatures then its effects on the body become extreme and symptoms are more readily identifiable. Heat illness or hyperthermia can be caused not only by excessive exertion (e.g. in marathon runners) but even by moderate exercise in climates which are particularly hot or humid. People can be predisposed to heat illness by fatigue or lack of sleep.

Hyperthermia can range from the uncomfortable to the fatal. Heat-stroke or (sunstroke) is the more severe form of heat exhaustion. Although, clinically, heat exhaustion and heat-stroke tend to be described separately it should be remembered that they are both facets of the same process. A key contributor to heat exhaustion is dehydration which, when the peripheral blood vessels expand to increase heat loss, result in a reduced blood flow to the brain. Coupled with this is an increase in heart rate which, when it exceeds 160–180 beats per minute, does not provide enough time between beats to completely fill the heart. This means that even less blood is able to reach the brain. As a consequence the victim will feel faint and may even lose consciousness briefly. Headache, nausea and vomiting are common complaints as are dizziness and restlessness. Under these circumstances it is necessary to seek shelter and rest and to take in plenty of fluids, especially those containing salt. It has been reported that reduced G-tolerance (gravity) amongst pilots arises more as a consequence of dehydration than from heat alone (Nunneley and Stribley 1979). Furthermore it must be emphasised that acclimatisation to heat does not protect the individual from dehydration.

Heat-stroke can prove fatal and its seriousness as a medical emergency is equivalent to that of a heart attack. Even if death is avoided permanent disability may occur. Heat-stroke attacks suddenly and it is the psychological symptoms which

show first. These symptoms include gross impairment in mental performance, general confusion and headaches. Irrational behaviour is commonly seen. Motor unco-ordination, staggering, delirium and unconsciousness can also occur commonly followed by convulsions. A common characteristic of heat-stroke is dry skin particularly among the younger victims. This is a consequence of a breakdown in the temperature regulating mechanism within that part of the brain known as the anterior hypothalamus. If the condition continues then further complications may occur such as liver and kidney failure, internal ulcerations and heart and brain damage. An increase in heart attacks is commonly found during heat-waves because of the increase in demand placed on the cardiovascular system.

In the event of heat-stroke the victim should be placed in shade, their clothing removed and they should if possible be covered with cool wet clothes. Immersion in cold water can also help but *not* icy water. Icy water will constrict blood vessels thus making heat loss even more difficult and may even cause tissue damage. Fluids, preferably containing salt, should be given.

Acclimatisation to heat is predominantly a physiological process requiring several days to become established and is frequently accompanied by changes in behaviour and diet. With prolonged exposure acclimatisation can be achieved within 4–7 days. Following this period, sweat production is increased while skin temperature and heart rate decreases. It is possible to increase sweat production through physical activity and in optimum heat physical exercise will be required for acclimatisation. Also acclimatisation itself seems to lower the threshold at which sweating starts. Rapid acclimatisation to heat is an important practical issue for amongst others the armed forces and rescue organisations who can be required to move rapidly into a hot environment and who need to function effectively as soon as possible. While prior acclimatisation can be achieved it has not been found possible to acclimatise adequately for a normal 6–8 hour shift in less than 4 hours per day and in less than 8–9 days (Wyndham *et al.* 1973).

HUNGER

In short-term survival hunger is more of a distraction than a serious threat to life. People who are otherwise healthy will be able to cope with two, three, or more days of food deprivation without serious physical or physiological debilitation. Certainly, lack of food does not make for an emergency in the early stages. After a few days, however, food ceases to be a distraction and becomes an obsession. All other factors become subordinate or are forgotten. Food and the lack of food comes to dominate dreams and conversation. Starving prisoners in concentration camps were known to 'dine out' together and repeatedly swap favourite recipes. A mountaineering expedition in the Himalaya describes a game which developed by the fourth week in which, during a moment of silence, one or other member of the team would gaze into space and say 'Steak and kidney pie with cream potatoes and broccoli' or something similar. This remark would raise a chorus of oaths from his fellow team members and frequently a missile or two would be hurled at the culprit. The renowned Norwegian explorer, Dr Fridtjof Nansen, describes how during his famous expedition around the North Pole in the deliberately ice-bound ship *Fram*, he and his companion Johansen: '. . . longed for a change in the uniformity of our diet! If only we could have had a little sugar and farinaceous food, in addition to all the excellent meat we had, we could have lived like princes. Our thoughts dwelt longingly on great platters full of cakes, not to mention bread and potatoes . . . would they have potatoes on board [the pick-up vessel]? Would they have fresh bread?' (Nansen 1898).

There are some hungry people who will deliberately refrain from these activities considering them to be an indulgent weakness which serves only to torment the very victims themselves. After a period of severe food obsession people may be seen to rebel against such indulgence and sometimes behaviour can break down entirely. A diary of the 1902 Chogo-Ri (K2) Expedition contains the following entry: 'Perfectly good friends became ready to kill each other

over a lump of sugar. I won't say that I couldn't have stood the Baltoro Glacier in the absence of Milton and the rest, but it is at least the case that Pfannl went actually mad, and Wesseley brooded on food to the point of stealing it.'

Steven Callahan shipwrecked in his life-raft reported, 'Food dreams become more real than ever. Sometimes I can smell the food; once I even tasted a dream. But it is always without substance.' On the other hand Edith Bone during her period in solitary confinement remarks 'I did not eat at all during the nine days I spent down there, and found that I was not hungry. I experienced instead a strange lightness of the body and clarity of thought.'

Hunger is a distraction but starvation is serious. Starvation reduces people to the level of animals, it is debilitating and it does kill. The view from a prisoner in one internment camp was described as follows: 'The main thing was to get something to eat and drink. When food was brought in, an excitement ensued which one can otherwise observe only among animals' (Bondy 1943). The impression from a prisoner inside Auschwitz at rations:

> If there were not enough [bowls], I could hardly restrain my impatience enough to wait until another man had gulped down his soup. Without cleaning the [bowl] I would receive my ration with trembling hands. What suspense would come over me, when the soup was being ladled out of a 'good' kettle: Would I be in time for my ration? How happy I felt when I was, and when I had much substance (potatoes, macaroni) in my portion. With what violence the room seniors and room attendants would beat the thronging prisoners, to make them fall in line and wait their turn. Whenever [remaining food] was being doled out the prisoners behaved like animals, which in these circumstances cannot be regarded as otherwise their normal.

Life was no better in the women's camp at Ravensbrück '. . . without a strong police escort food could not have been moved around. The women were starving and, like wild

beasts, would attack and if necessary kill for food' (Wynne 1961).

For the Westerner, starvation will usually be met in remote areas following a disaster such as the downing of an air-liner or shipwreck or (and this is still a very serious consideration) following capture and imprisonment as hostage or prisoner of war. Under these conditions an utter lack of food still rarely occurs but the meagre amounts issued can be expected to be well below that required to sustain a healthy existence. The victim can expect to face a condition of malnourishment and semi-starvation. Certainly in prison camps there will be a big difference between the stated food supply and the actual food supply. In other words, between what is down on the books as arriving at the camp and what actually finds its way into the prisoner's bowl. In a prisoner-of-war camp or a concentration camp nothing leaks like food. It is quite common for guards and other prisoners (especially those with special privileges and access such as cooks) to organise things for their own benefit. It was observed that the administrator of the Sakato Japanese prisoner-of-war camp syphoned off supplies of rice and dried fish from the prisoners' allowance. This act not only reduced the actual amount of food reaching the PoWs but also made their diet unbalanced by its almost complete lack of protein. Along with the reduction in food came a steady increase in the physical workload expected from the prisoner. These conditions and this behaviour are the norm. It is to be expected that the physical workload demanded of captives in labour camps will exceed the calorific and nutritional intake. Various 'organisational' activities can be guaranteed to take place. It is reported that in the concentration camp Neuengamme, the privileged prisoners in the kitchen and crematorium cooperated in selling their meat supply to civilians while feeding the prisoners on corpses. This practice only came to light when a prisoner found a human jaw in his soup (Rousset 1946).

During the period of impact and the initial stages of recoil following a disaster the victim will find that he loses his appetite. Food will not interest him. Later, but still dur-

ing the early stages of food deprivation, hunger will return. Again it will be primarily a distraction and the victim will feel pangs of hunger which after two days will begin to gnaw quite deeply. These feelings of hunger will come in waves. After a further three days the lack of food will start to become an obsession and thoughts of food a sole occupation. After his fifth day in a life-raft Steven Callahan reports: 'My mind creates fantasies of food and drink and turns continually back to [his sunken yacht], to the pounds of fruits, nuts and vegetables and the gallons of water within her.' And later: 'There is a great emptiness in my stomach, a cramped incessant yearning. It visits me each night in my dreams. Fantasies of hot-fudge sundaes with numerous varieties of ice-cream dance through my head. Last night I nearly got to taste hot buttered wholewheat biscuits, but they were snatched away from me when I woke up. And how many hours have I spent on [the yacht], collecting the dried fruit, the fruit juices, the nuts? Hunger is a witch from whom there is no escape. Her spells conjure these visions of food and deepen the pain.'

Later body weight will begin to fall away. Stored fat will be used up first followed by a reduction in muscle and internal organs. Psychologically victims will show apathy, depression, irritability, emotional instability and impairment in concentration and memory. Eventually even bone marrow will start to reduce. All dispensable organs will degrade to their minimum level of functioning diverting desperately needed resources to the vital organs which are the last to be affected: brain, heart and kidneys. Once these organs start to diminish then death quickly follows.

Further malnutrition will lead to reduced bulk in the victim and a loss of body weight of 20–50 per cent is common. Survivors of prisoner-of-war, labour and concentration camps have been recorded as weighing as little as 30–40 kilograms (66–88 lb). This compares with 63–69 kilograms (139–153 lb) in the average male and 53–60 kilograms (116–131 lb) in the average female. Dr Mollison (1946) visited the concentration camp Bergen Belsen four weeks after liberation and reported that he was unable to use his stethoscope

on the survivors as it bridged the space between two ribs and would not be made to touch the skin.

During the emaciated stage the eyes become sunken, the cheek bones project, the skin thins and oedema (bruising) is common. Victims begin uncannily to resemble each other. It is difficult to tell them apart, they become like '. . . walking skeletons aged and hideous, keeping on their feet as though by a miracle' (Lingens-Reiner 1948). A captured airman describes the Japanese prisoners-of-war he saw as '. . . skin and bone, unshaven and with long, matted hair. They were half naked . . .' He later reports that: 'The fare provided for the prisoners is below existence level. It is only a starvation diet, consisting of a small quantity of rice together with a handful of bean sprouts or some other vegetable per diem.' (Garrett 1988). During the American Civil War unionist PoW, Robert H. Kellog was sent to the Confederates notorious Andersonville prisoner-of-war camp. His description is graphic:

> As we entered the place a spectacle met our eyes that almost froze our blood with horror, and made our hearts fail within us. Before us were forms that had once been active and alert, stalwart men now nothing but walking skeletons covered with filth and vermin. Many of our men, in the heat and intensity of their feeling, exclaimed with earnestness, 'Can this be Hell? God protect us' (Keegan and Holmes 1985).

Their rations were one and a half pints of coarse corn meal, two ounces of bacon and a little salt per man per day. Kellog reports that: 'The policy of the confederate authorities respecting us seemed to be to unfit as many as possible for future service; and, to secure the object more speedily, they cut down the rations to half the usual quantity . . .' (ibid.).

Later, rations became even more difficult to obtain with vegetables running out completely and difficulties in apportioning food for want of adequate vessels. French prisoners held at Porchester Prison in England during the 1800s were

treated no better: 'The prisoners are reduced to a state of dreadful meagerness. A great number of them have the appearance of walking skeletons.' Captain Bligh and eighteen men were abandoned in mid-Pacific in a 23 ft (7 m) open boat in 1789 following the famous mutiny on board his ship *Bounty*. In forty-one days they crossed 3000 miles to reach Timor. Bligh describes the landfall '. . . A painter might have delineated the two groups of figures, which, at the time, presented themselves to each other; an indifferent spectator would have been at a loss which most to admire, the eyes of famine sparkling at immediate relief, or the horror of our preservers, at the sight of so many spectres, whose ghastly countenances, if the cause had been unknown would not so much have excited pity, as terror. Our bodies were nothing but bone and skin, our limbs full of sores, and we were clothed in rags.'

Concomitant symptoms include a drop in pulse rate and blood pressure. A pulse rate of 40–50 and even below is not uncommon and the most frequently recorded blood pressure in Belsen was 91/60. Former prisoners-of-war were found in Switzerland to have a mean blood pressure of 80–110 mmHg. Body temperature will also drop. An experimental study at the University of Minnesota into semi-starvation revealed that hungry subjects often complained of cold, even during the hot July weather and their rectal temperatures were frequently recorded around 34–35°C (93.2–95°F) (Keys *et al.* 1946). These Minnesota studies identified other various behavioural changes related to semi-starvation. Tiredness and weakness were coupled with an inability to carry out physical tasks. The participants showed a dislike to being touched or caressed in any way and emotional responses such as fear, love, shame and so on became dulled. They became apathetic and resigned while patience and self control were diminished. Their sense of humour quickly disappeared.

After 13 days adrift and having eaten only 1.4 kg (3 lb) of food Steven Callahan reports: 'My movements are slower, more fatiguing. The fat is gone. Now my muscles feed on themselves. Visions of food snap at me like whips. I feel little

else.' Dr Cohen in Auschwitz reports that: 'I found that in order to mount a short flight of steps, I had to lift my legs with my hands, and that even speaking tired me.'

As starvation increases so does the incidence of psychiatric illness. An increase in both frequency and severity of mental disturbance was observed in Japanese prison camps. Psychopaths became more unmanageable and many schizophrenics died. Acute confusion and psychotic symptoms including hallucinations and hyperactivity were seen amongst a number of prisoners. It should be noted, however, that these incidents were not constant across all people and different symptoms have been observed in people from different countries suggesting that their behaviour, even under such extreme conditions, can be culturally determined.

Food and extra nourishment can be acquired in quite subtle ways. Food in camps is never apportioned equally and those in a position to do so will obtain the larger helping. Dr Cohen reports that at times he was required to administer soup to patients and prisoners in Auschwitz:

> Before distributing the soup the room senior always stirred it horizontally, so that the 'thick' stayed at the bottom. I always took care to have only of the 'thick', and moreover, as room physician, I was entitled to an extra portion. The others were given the 'thin.' The argument that I was more valuable than the others, which I used to salve my conscience, was of course beside the point. If positions had been reversed I should not have acted differently.

A woman prisoner reported how she, '. . . would remain close to those who were too far gone and to weak to eat their meagre rations of ersatz, coffee or soup, and instead of pressing them to eat so that they might exist, I would eagerly take it from them and wolf it down if they gave the slightest evidence that the effort for them was too great' (Bloch 1947).

While some people would openly scavenge for food others, especially the newcomers, found that overcoming food

aversion and adjusting to the discomfort of prison or camp life more than they could tolerate. The US Airforce cite a man who reported: 'Some men would almost starve before eating the food. There was a soup made of lamb's head with the lamb's eyes floating around in it . . . when there was a new prisoner, I would try to find a seat next to him so I could eat the food he refused' (Rastellini 1985). A prisoner-of-war in a Japanese camp (later General Wainwright) reported that, 'If a man received a bean in his soup, and another did not, it made for hard feeling. This must be hard to imagine but it is true.' Allied officers who were prisoners of war often found it impossible to abide by their refusal to work for the Japanese when promised an extra ration of rice. These opportunities could be actively sought. W.J. Hodson, a member of the Royal Air Force captured in Java and held as a Japanese PoW reports that, 'He might unload a ship, or work in a plantation, or dig air-raid shelters. You could build bamboo huts, dig holes, fill in holes, cut jungle down to make roads – you might do anything. But you were always keeping an eye open for food. A good PoW was also a good scrounger – there was no doubt about that' (Garrett 1981). The rewards for toeing the party line were better rations, medical attention and a degree of consideration. On the other hand the Koreans developed a policy of deliberate denial of food and medicine as a form of punishment. Major Gene M. Lam a United States Army doctor imprisoned in a Korean prisoner-of-war camp readily identified the importance of food to survival in these camps. He makes the following important observations:

> *Regardless of what it is eat it*: One basic principle of survival medicine is to eat. After you have been down a few hours, you get hungry. If you can, find something edible and eat it. If you are captured, someone soon will bring in a bucket of slop and, after your stomach has flipped from the sight and smell of it, you say, 'I can't (or won't) eat that stuff.' You'd better eat it because that's all you'll get and it may get progressively fouler and skimpier. Here 'will' comes in. Say to your-

self, 'I'll eat everything they give me and the nourishment will help me to get through.' You must eat everything you can get – issued rations, things you can steal, things you procure from the environment. We ate dogs, cats, rats, weeds, maggots. For a while we got only ground field corn, boiled for half hour. It is tasteless but it will keep you alive. In fact, we were living it up when we got that corn mash. Most PoWs in Korea ate dog but it was hard to do. Dogs are a delicacy in that area and we weren't issued luxury items, but once in a while a stray would be shanghaid. The town we were in had a stray cat. Pussy didn't wander long. It was quite delicious, rather like squirrel. It helps not to be able to identify a strange dish the first time it's served but after the first time, the ingredients don't really bother. It was difficult to down rats but they were edible. I strongly recommend cooking them because raw they can carry several diseases. Snakes, of course, are eaten the world over and some varieties are delicious. Just chop off the head, skin the rest, cook, then eat what's left. Even poisonous varieties are edible. Maggots are something else. Once we were issued rotten fish loaded with maggots. Our English cook protested and wanted to scrape them off. Afraid that some of the fish would be lost, I insisted that he cook fish, maggots and all. We ate the results, which were really quite good. In May 1951, every PoW in camp was swollen like a balloon from severe beriberi [vitamin B1 deficiency]. Since spring, weeds were beginning to appear, we figured we could boil them as a cure, but there wasn't a weed in camp. However, some of us were taken almost daily to a river for wood and other supplies. The criterion for success soon became not how much wood but how many weeds we could bring back. We didn't know what kinds of weeds they were, but we picked them, boiled them and ate them. Our beriberi disappeared. You will be revolted by food given you as a PoW, but if you miss one meal as a prisoner it will take you weeks to regain your lost strength. You can't afford to miss a single bite when

you are on a bare subsistence diet. If you are going to live, eat. If you plan to escape, you must have the strength to do it.

Extreme hunger overpowers, behaviour and morals disintegrate and people can be driven down to the level of animals. Prostitution was observed in those concentration camps containing women prisoners such as Bergen Belsen, Auschwitz and Theresienstadt (ghetto). Women would sell their bodies to camp 'prominents' or Kapos for '. . . a piece of bread or sausage, a little sugar or margarine . . .' (Herzberg 1946). Some prostitution systems appear to have been very well organised. One 'work' operation in Auschwitz was ostensibly established for lawn decoration in which prisoners would be taken to a nearby meadow to cut bricks of sod. This operation was in fact a grandiose, camouflaged prostitution scheme designed by the prisoner functionaries with the participation of some of the SS in which women prisoners were brought to the same meadow (Radil-Weiss 1983). It also appears that in some camps male prostitution may similarly have occurred although the evidence suggests that this was confined to a very small number of individuals.

In extremis food will be stolen and people may be murdered both for the food they possess and the meat their corpse can provide. Cannibalism, or more correctly anthropophagy, has existed under extreme conditions even into our own time. The Czech physician Blahu observed cannibalism on a transport train arriving at Dachau: 'On one transport which arrived in 1942 I found evidence of cannibalism. The living persons had eaten the flesh from the dead bodies.' Possibly the most famous recent incident is that of the aeroplane crash in the South American Andes in 1972. The airliner crashed into the mountains at 11 500 ft (3500 m) leaving 17 dead and 28 people stranded. Some of the survivors soon succumbed and perished. A few days later a further eight were killed in an avalanche. Discussions about eating the flesh of their comrades occurred after only four days and it should be remembered that most of the passengers were members of the same rugby club who were

travelling with their friends and relatives. Not unnaturally, there were at first many qualms but in the end all took part, although some held out for longer than others. These latter weakened rapidly until they too accepted the human meat. No one suffered any serious nutritional deficiency.

It is surprising how quickly thoughts of cannibalism can surface. Also in 1972 Lucien Schiltz (25) and Catherine Plessz (19) abandoned their yacht in the Mediterranean which they mistakenly believed was about to sink and risked themselves in an inflatable life-raft. They drifted for 12 days before being rescued. Towards the latter stage of their privations they each let the idea of cannibalism roam in their imaginations, continually assessing how much was left to eat of the other.

The Polar explorer, Peter Freuchen, recounts meeting in Greenland a woman, Atakutaluk, who had been in a party of 13 people which had set out across Baffin Land on a trading venture. They were driving north using sledges and dogs when a spell of mild weather descended upon them. They were awakened from their sleep by the rooves of their igloos caving in. To keep their food and sledges away from the dogs the provisions had been left overnight on piles of snow but these too had thawed out and their victuals eaten by the animals.

> It is impossible to travel during the winter without a sledge, and they happened to be in a bad hunting district, so they had to kill their dogs and eat them. They then devoured their skin clothing, and some of them died of starvation. Those left resorted to cannibalism.
>
> The next spring, by chance, our good friend Patloq, the philosopher, passed by with his wife. He saw a half demolished igloo and drew closer to examine it. On the ledge inside he saw two horrible looking hags – Atakutaluk and another woman. Neither could walk, and both had great difficulty in speaking. Patloq enquired about the rest of their party.

> 'We don't know,' the women answered, but indicated with their thumbs a snow pile back of the igloo. There Patloq discovered human bones.
> 'Inutorpisee? Did you eat people?'
> 'We don't know,' they answered.
> Patloq could tell by the appearance of the bones that they had been gnawed and split for the marrow, which I am told, is like the marrow of bear bones.
> It was difficult to make the women eat anything. When a person is almost starved to death it is painful to eat. They were finally induced to try some meat, and then it was almost impossible to keep them from gorging themselves. Half a day after one has first eaten, the craving for food sets in with such intensity that only a strong willed person can resist it. The other woman could not do so. And she died three days later in terrible agony. But Atakutaluk resisted her impulses, ate only a little at first, and lived to relate the experience (Freuchen 1936).

Among those Atakutaluk had eaten were her husband and three children.

There is a natural psychological revulsion to eating human flesh. If this barrier can be overcome the victim may well survive only to find himself facing further psychological problems following rescue. These problems are often of a moral or religious nature. Certainly it became clear that a significant number of the survivors of the Andean aeroplane crash suffered considerable qualms about what they had done, even though shortly afterwards it was accepted as being morally justified by the Roman Catholic Church. If it can be accepted, justified or in cases rationalised, then the act of enforced cannibalism can be accommodated with little or no psychological dysfunction. When Freuchen first met Atakutaluk she was well dressed, merry and full of jokes. She herself told Freuchen her own story but when she saw that it distressed him she said: 'Look here, Pita, don't let your face be narrow for this. I got a new husband, and I got with him three new children. They are all named after the

dead ones that only served to keep me alive so they could be reborn' (ibid.).

People do recover from starvation but how long this process takes depends on the severity of the condition. The following post-rescue recovery times have been found to apply in most cases of starvation: medium levels of malnutrition require approximately 4–8 weeks for recovery while severe starvation can take 6–8 months. Recovery at the cellular level can take even longer. Psychological recovery, however, may take even longer with survivors of starvation showing apathy, depression and a preoccupation with issues of food and personal security (Raphael 1986).

THIRST

Whereas victims can survive for long periods on little or no food, survival time without water is limited to a few days at most and frequently less in arid conditions such as those found in many deserts. Thirst is a very real problem in survival and its effects are acute and insidious. Without water it is impossible to maintain the body's water balance which under normal circumstances is kept constant. The body weight comprises 70 per cent water (around 45 litres) and a reduction in this volume results in dehydration. Water can be gained by the body by direct ingestion (a glass of water), by food with a high water content (sometimes as high as 95 per cent in some fruits) and by the oxidation of hydrogen in the food which can produce up to 500 ml of water. The average daily intake of water by these means is around 3 litres (Green 1972). Water is lost in urine, through breathing, through the skin (excessive loss may occur in sweating) and in faeces which is a major factor contributing to death through excessive diarrhoea and dysentery. Water can also be lost from the body through bleeding, vomiting and crying. With the onset of dehydration urine output will be reduced but not stopped because of the overriding need

to remove waste products and toxins from the body. The normal volume of urine passed is 1.5 litres per day which may be reduced to a minimum of 300 ml.

Dehydration is a common companion of mountaineers and others at high altitudes due to an increase in fluid loss from the body. It has been stated that most climbers above 18 000 ft (5500 m) are dehydrated to some extent and that the behavioural symptoms of depression, lethargy, nausea and intellectual changes frequently found at extreme altitudes can be due as much to dehydration as to altitude sickness (Wilkerson 1985). Nausea in particular can lead to a dehydration chain being established. People who feel sick (for instance in a tumbling life-raft at extreme altitude or following shock) will lose their sensation of thirst. At the very least it will be dulled. The feeling of thirst is itself not a reliable indicator of lack of body fluid and people must still force themselves to drink. There are situations where victims cannot imbibe large quantities of water but even a few small swallows every 15–20 minutes can increase body fluids significantly.

Severe thirst overpowers all other feelings and its condition is distressing in the extreme. Psychologically thirsty people tend to be agitated and may talk incessantly until their mouth becomes too dry for further speech. Irritability, tension and restlessness have been reported after 54 hours without water but under otherwise controlled conditions. Other behavioural symptoms include delusions, visual hallucinations and irrational behaviour although some of these symptoms may be due to salt imbalance as well as to direct water loss.

The adult male possesses approximately 5 litres of blood reservoir. A person who loses 1 litre of fluid from this reservoir will begin to feel tired. After a loss of 3 litres it becomes difficult to perform tasks well. After 4 litres it is difficult to continue. Such a loss can occur even after only 1–2 hours wearing full protective gear in high humidity (Goldman 1988). Loss of water can be expressed as a percentage of body weight as shown in Table 4.1.

Table 4.1 Water loss as a percentage of body weight (after Belding 1970)

Weight loss (kg)	*Level of dehydration (% of 70 kg body weight)*	*Degrees of distress*
2	3%	Slight physiological upset
3.5	5%	Real risk of dehydration and heat exhaustion
5	7%	Dangerous – hallucinations may occur, etc.
7	10%	Very dangerous – high risk of heat stroke, total incapacitation likely

Impairment in performance is exacerbated if water loss is caused by heavy physical exercise rather than simply by heat exposure. Dehydration has also been found to lower G-tolerance in aircrews of fighter aircraft as well as increasing the variability of their response to heat (Nunneley and Stribley 1979). The implications of these findings for aircrews, especially those flying over deserts is readily apparent. Equally important is the finding that acclimatisation to heat does not appear to protect a person from the effects of dehydration. Thirst and dehydration are commonly known in the desert but they can also occur in polar regions when low temperatures freeze all available liquids. If they continue then the succous membrane lining the tongue and the roof of the mouth swells intensely before cracking and becoming ulcerated.

Probably the most frequent example of severe thirst today is that still encountered amongst victims of shipwreck. Here victims are continually surrounded by non-potable water and are themselves frequently soaked. In 1859 the shipwrecked survivors of the *Admella* were picked up after seven

days and nights without food or water and continually soaked in spray. A rescuer describes them thus: '. . . Oh God of Heaven! What a sight! Eighteen men and one woman in the last stage of existence! Prominent nostrils, blood-shot eyes, mouths parched dry, with their tongues cleaving to their palates; their eyes black and swollen, forms half-clothed with brine-soaked tattered rags, limbs bleached and horribly swollen; with the maniac chuckle and the husky half-audible cry of "Take all I've got, but give me drink."'

Those cast adrift have tried many things to assuage the ravages of thirst. Victims will suck stones, buttons, coins, seaweed, gum and other items. They will rinse their mouth with seawater, but can find themselves swallowing the fluid uncontrollably. Others will attempt to avoid this swallowing by sniffing seawater into the nostrils. Later unrelieved thirst will drive people to drink fluids which they would otherwise find abhorrent. Perspiration may be tried, but sweating will generally be very slight or absent. Urine seems to be drunk more frequently, even today, than official records (and instructions) admit to. The survivors of the *Medusa* (1816) cooled urine in little tin cups and, '. . . in reality, it had not a disagreeable taste', and '. . . the urine of some of us was more agreeable than that of others'. Blood has also been drunk extracted from seabirds and animals, from dead companions and indeed from the living. Mariners' compasses have been broken open and the spirit inside drunk. One shipwrecked survivor during the Second World War drank the fluid inside the giant blisters which were raised on his skin by the tropical sun. Despite the hundreds of observations which have been made there appears to be no thorough scientific investigation into the physiological and psychological consequences of drinking urine and blood.

It is still the case that the most common fluid drunk is seawater. Many victims usually succumb to this after the third day of their ordeal. Medical reports following the Second World War attribute death through drinking seawater as the second most common cause after cold (Critchley 1943, McCance *et al.* 1956). A study of the survi-

vors of 23 sinkings described the reactions that drinking seawater had on their companions: Twenty survivors stated that drinking seawater was the cause of death in their companions; fourteen reported that it produced delirium and madness and in six cases those who drank seawater subsequently jumped overboard and were drowned (McCance *et al.* 1956).

Delirium is frequently described following imbibing seawater, especially in dehydrated victims. The commonly painted picture is one of an immediate slaking of thirst but quickly followed by a more aggravated sensation which demands even more water to quench it. The victim then becomes withdrawn, hypoactive and apathetic gazing with a fixed and glassy expression. The condition of the lips, mouth and tongue becomes worse and the breath becomes offensively malodorous. The onset of delirium occurs within one to two hours. It is usually quiet at first later becoming violent and unrestrained. Consciousness gradually decreases along with a change in the colour of the face and froth appearing at the corners of the lips. Death is usually noisy and many accounts report the victim going over the side. This is not always the case, however, and a few die quietly, their death sometimes unnoticed by those around them. Interestingly, vomiting does not normally occur.

In a specific example two American Red Cross nurses, who were adrift for 19 days in a small life-raft, observed a 17-year-old boy who began to drink seawater surreptitiously after the third day. They report that he became dazed and 'peculiar' and afterwards delirious before becoming comatose in which condition he remained for 72 hours before dying on the fifteenth day. He developed a strange, bloated appearance, with bright, cherry-red lips, a heavily coated tongue and cold, clammy skin. His jaws were tightly clenched and he would not accept any nourishment.

The official view is that seawater should never be drunk. There are authorities who are very adamant on this point. But this is firstly, to deny the extreme nature of a survival environment and secondly, that people have drunk seawater and survived. Indeed, Dr Alain Bombard spent 65 days at sea

in a small inflatable drinking seawater from the first day of his trip from Las Palmas to Barbados in 1952. Others have argued for seawater to be mixed with freshwater or other fluids. Previous attempts have included mixing seawater with brandy, vinegar and pigs' blood. Other attempts have included mixing it with flour and biscuits. It is not possible to go into discussion of such an involved subject in a volume such as this but one cannot help but feel that a completely fresh investigation into this topic, uncluttered by preconceptions, is now due.

Some relief from thirst has been claimed by immersing the body in seawater or by tightly wrapping soaked clothes around the survivors. Immersion in the sea has its risks: compounding hypothermia in colder climes and attacks by sharks and other animals in warmer climes. There is also the real danger of fatigue and exhaustion overcoming the victim so he is unable to climb back on board. On the other hand there have been many claims through history for the efficacy of wearing soaked cloth. One early account is that of second mate John Mackay on board the *Juno* in 1795 bound for Madras from Rangoon. In a storm the ship submerged leaving the survivors clinging to the masts and rigging. On the fourth day, still hanging in the rigging, Mackay relates that:

> Although the deprivations I felt, among them thirst, were very distressing, they did not reach the violent extremes the stories had led me to expect. I remember having read in Captain Inglefield's account that his shipmates in his life-raft wrapped themselves completely in blankets soaked in seawater and that the pores of the skin absorbed the water and left the salt on the surface. I tried this expedient out as best I could by dipping in the sea from time to time a flannel vest I was wearing next to my skin. Several of my companions who followed my example were also refreshed, and I am sure this trick saved our lives.

Even in our own century Captain Foster, Master of the

SS *Trevessa* (1923) became firmly convinced in the relief from thirst obtained through wet applications and seawater bathing. Still there appears little scientific evidence to suggest that the skin is capable of absorbing water beyond the most superficial layers.

Interwoven with dehydration is salt depletion which, although easy to prevent providing adequate supplies of salt are available, is difficult to cure once it becomes established. The body can adapt quite readily to a lowered salt balance (salt depletion dehydration) and it will take this new depleted balance as the norm with the result that any extra salt taken to counteract the problem may simply be excreted as superfluous. Salt depletion is a problem which occurs through continual exposure to heat stress especially if this occurs on a daily basis. Salt depletion can be exacerbated by vomiting, diarrhoea, excessive sweating and urination. It may be prevented by providing regular salt intake from the very early days.

The most common mineral salt is sodium chloride (NaCl) which is frequently ingested in food. The body requirement for sodium chloride under normal conditions is less than 1 gram per day and the average intake is between 10–15 grams. That which is not used is excreted. Fruit and vegetables are very rich in sodium particularly sodium citrate and tartrate. Other mineral salts include potassium (lack of which can lead to a drop in performance due to muscle weakness); phosphorous which is needed to provide muscle energy and is found in milk, egg yolks, liver and pancreas; magnesium which is well stored in the bone and a lack of which results in tremor, muscle twitching, convulsions and delirium while excess magnesium can produce drowsiness and even coma. Iodine is needed for the formation of haemoglobin in the blood and its deficiency leads to swelling of the thyroid gland (goitre). Iodine is present in seafood and crops grown near to the sea (but may be absent from areas remote from the sea) and is found in most other foods (meat, fruit and vegetables) with the exception of milk. Zinc is needed in the formation of many of the body's enzymes and a deficiency retards the healing of wounds.

Finally, the effects of thirst and dehydration compounded by heat can be given by the medical description of a man who was discovered sometime after having been lost in the Arizona Desert, shortly after the turn of this century:

> [He was found] . . . stark naked; his formerly full-muscled legs were shrunken and scrawny; his ribs ridged and like those of a starveling horse; his habitually plethoric abdomen was drawn in almost against his vertebral column; his lips had disappeared as if amputated, leaving low edges of blackened tissue; his teeth and gums projected like those of a skinned animal, but the flesh was black and dry as a hank of leather; his nose was shrunken and half its length, the nostril lining showing black; his eyes were set in a winkless stare, with surrounding skin so contracted as to expose the conjunctiva, itself black as the gums; his face was dark as a negro; and his skin generally turned a ghastly purplish yet ashen grey, with great livid blotches and streaks; his lower legs and feet with forearms and hands, were torn and scratched by contact with thorns and sharp dry leather, without trace of blood or serum; his joints and bones stood out like those of a wasted sickling, though the skin clung to them in a way suggesting shrunken rawhide used in repairing a broken wheel . . . We found him deaf to all but loud sounds, and so blind as to distinguish nothing save light and dark. The mucous membrane lining mouth and throat was shrivelled, cracked and blackened, and his tongue shrunken to a mere bunch of black integument. His respiration was slow, spasmodic, and accompanied by a deep guttural moaning or roaring . . . His extremities were cold as the surrounding air; no pulsation could be detected at wrists, and there was apparently little if any circulation beyond the knees and elbows; the heart beat was slow, irregular, fluttering and almost ceasing in the longer intervals between the stertorous breathings. The victim was, of course, unable to articulate or to swallow (McGee 1906).

ISOLATION

Social isolation can suck at the soul. It can bring a man to his knees in a surprisingly short time, quicker indeed than many physical or physiological factors. We take social interaction with family, friends and colleagues as a matter of course. We take it for granted. But when it is denied bizarre symptoms can occur. Fur trappers in North America recognise the phenomenon of 'cabin fever' and the psychological problems it entails. Steve Callahan in his life-raft remarked, 'I need more than food and drink. I need to feel the company of other human spirits.' A person may find himself alone in a life-raft, in a war zone, in a car caught in a snowdrift, in prison and many other places. While it is true that some people will seek out lonely places and find them very rewarding and beneficial, others do not. Many, indeed, can only see themselves through other people, remove these people and the victim loses his own identity. His social anchoring points have gone. Alain Bombard identified the distinction in a self imposed exile in a life-raft: 'I had begun to understand the difference between solitude and isolation.' David Lewis while circumnavigating Antarctica remarked:

> I was not in the least lonely. This solitude was a different thing altogether from the lonely emptiness you suffer in a strange city where, knowing no one, you are surrounded by uncaring men and women, all supported by their own human ties. I for one am not particularly self-sufficient – I am peculiarly susceptible to loneliness among crowds. The sea, or for that matter, the desert or the mountains are companionable – or at least they are neutral once you have learnt to respect their ways (Lewis 1975).

Conversely, Jackie Mann, one of the western hostages held in Beirut, being surrounded by guards was never alone but reports that he had never felt so isolated or lonely in his life.

People have found themselves isolated at sea, in caves, in prison cells and so on. The psychological consequences of such isolation are quite consistent, common symptoms including visual and auditory hallucinations and memory impairment. One member of the 1947 Oxford University Expedition to Iceland had volunteered to remain alone on an ice-cap for three days while the rest of the team recovered a sick colleague to base. When the rest of the party returned amongst thick fog their yells at first received no reply. When a reply was forthcoming and quite nearby their lone companion said that as he had spent most of the previous night yelling in reply to non-existent calls, he had thought that their calls were just a trick of the imagination. While spending 60 days in a cave Michel Siffre reported that the space and rock of the cabin roof appeared to blend together. He also lost his sense of colour confusing green with blue.

While isolation seems to produce an impairment in memory a closer examination of the evidence suggests rather that memory capacity has been redeployed. Prisoners in long term isolation have composed and memorised prodigious amounts of verse and composition. Dr Edith Bone in seven years solitary confinement used to make up verse (which she called 'doggerel') and which she would recite every day until there was too much of it. Also in her mind she would walk around streets of the cities she had lived in before and would visit, in her fancy, friends both alive and dead, 'So that there was no lack of human companionship, even if it was only in my imagination.' Dr Bone then embarked on an inventory of her language vocabulary. To assist her in this auditing she made an abacus from black prison bread and straw:

> What I had tried to do was to take an inventory of my vocabulary in the six languages I speak fluently but I failed because I always lost count so long as I had only my fingers to reckon on. Now, with my fine six row abacus, I did better. Here, too, there were, of course, problems to be solved. How to avoid repetitions? The answer was: strict alphabetical order. This brought a

> fresh problem: what to do with the words I remembered after passing their proper place in the alphabetical order. There was no answer to this one, except to leave them out and later to start afresh from A. This I did three times and found in the end that I had enumerated 27 369 English words. That satisfied me, and I went on to German, French and the rest.

Dr Bone further added to this by taking other inventories of birds, plants, dogs, wines, characters in Dickens, Balzac, Tolstoi, Stendahl, Dostoyevski and Thackeray. On the topic of memory it is interesting to note Dr Bone's comment on the latter inventory that: 'I found, by the way, that Dickens, of whom I had read less than I had of several other authors, must be the greatest creator of characters, because I could remember more than 400, even before I had pencil and paper to help me, although I counted only those of whom I could also remember in which novel they appeared and what they were like.'

During his time as a hostage in Beirut Jackie Mann forced himself to remember everything around him and is surprised that he can recall so many details of his cell. Another hostage, Terry Waite, who spent four years in solitary confinement wrote a novel in his mind. Starting on a Friday night he dictated to himself, continuing all day Saturday and finishing late on Sunday. Terry Waite played other mind-games such as planning to sail single-handed around the world. He would work through lists of provisions, books, equipment and everything else needed for the voyage. At other times he would carry out mental arithmetic involving very complicated items, memorising long strings of numbers. Sometimes a single problem would last two days.

Isolation in the form of solitary confinement is an often used punishment. Not only is such confinement known to produce discomfort in many people but it also makes them more suggestible, an attribute seized upon by interrogators the world over. Certainly, isolation has been used as a precursor to 'brain washing'. In the Korean PoW camps isolation would be combined with other discomforts. Some PoWs

in solitary confinement were required to stand to attention from 4.30 am to 11.00 pm. Then when they tried to sleep they were continually woken by the guards. They were denied clothing, bedding, washing facilities, food and water, even in mid-winter. One soldier was refused water for 11 days '. . . to help with your reflections'. In one camp prisoners would be held in wooden boxes measuring 5 ft × 3 ft × 2 ft (1.5 m × 0.9 m × 0.6 m). One private in the Gloucestershire Regiment was held in one of these boxes for six months (Garrett 1988).

Tedious lectures and form filling bolstered the attempts at modifying behaviour. Questions such as 'Say why the triumph of World Socialism is inevitable' were commonplace. One officer who remarked that the questions were not worth the paper they were written on was promptly placed in solitary confinement – not only did he make a hostile remark but he also slandered the Chinese paper-making industry.

One man who spent time in enforced natural isolation was August Courtauld. A 26-year-old explorer, he decided to remain on a Greenland ice-cap to continue weather observations during worsening conditions. He remained there during five months from December 1930 to May 1931. Courtauld lived in a double layered tent, the entrance to which, after three months, became blocked with snow. Despite the privations, despite running out of tobacco (for which he substituted tea) and despite the shortage of food and fuel which ran out just as he was rescued, Courtauld seems to have suffered no ill effects either physically or mentally and continued his adventurous life both as an explorer and as a Royal Naval officer during the Second World War.

During his isolation Courtauld appears to have been able to come to grips with both himself and his environment:

> The complete silence all round seemed to urge one to keep in tune with it by being silent one's self. After a time I got over this, and used to get a great satisfaction out of a sort of singing. All the time I was not sleeping, and while the light lasted, I used to read or draw plans

of boats, dinners, meteorological instruments and other things (Courtauld 1935).

Despite the fact that conditions and circumstances were turning against him Courtauld became increasingly convinced of his rescue. As the months passed he, '. . . felt more and more certain of its arrival. By the time I was snowed in, I had no doubts on the matter, which was a great comfort to my mind' (ibid.). Incidentally, notice his remark about drawing 'dinners', a clear sign of undernourishment and his records show he was down to 1/2 lb (0.25 kg) of rations per day.

Others do not adapt quite so well to such isolation as was observed during the 1985 Soviet *Salyut 7* space mission when one astronaut, Vladimir Vasyutin, began showing signs of psychological disturbance following two months in space. A fellow astronaut described him as being a 'bundle of nerves' and there was general cause for concern. Vasyutin was returned to earth within three days, diagnosed as being mentally unstable and detained in hospital (Miles and Booth 1988).

As well as social isolation there are cases of sensory isolation, that is where the surrounding environment is unpatterned and all sensations are more or less constant. Such conditions can occur naturally and have been reported by pilots (especially high altitude pilots some of whom have claimed to lose contact with both the earth and their own bodies), divers and people caught in blizzards and fog. Long-distance lorry drivers driving over straight monotonous motorways report seeing rodents the size of their trucks. Unpatterned sensations arise in those artificial environments which prevail under sensory deprivation studies. In the latter situation goggles, blindfolds, hoods, ear muffs or ear-phones, padding, constant silence, white noise, continual light or dark and other constraints are deliberately maintained to reduce as much as possible the stimulation normally striking on a person's senses.

Both natural and artificial sensory deprivation environments can produce a quite overwhelming feeling of unreality in those caught in the midst of it. This 'unreality' is

frequently expressed as a strong feeling of detachment, of being at one remove from the rest of the world. This is sometimes known as a 'breakaway effect'. This sensation of detachment and unreality was experienced by the author following a 12 hour perceptual deprivation study. This experiment involved floating entirely submerged in a tank of warm water. The breathing apparatus incorporated a translucent face-plate providing unpatterned light and embedded ear-phones through which was played continual 'white noise'. White noise is a mixture of all the auditory wavelengths and sounds rather like a severe form of bacon sizzling in a frying-pan. Although some of the cognitive tests employed during this experiment showed minimal reduction in performance the affective state, that of a feeling of unreality, was very pronounced. The daily world seemed distanced, divorced, as though one were simply looking on a play. This condition lasted for three days. Interestingly, the reversion was not sudden but rather involved a gradual meshing of the real world with the 'unreal' perception. On the last day the final stages of meshing, the clicking together like a mechanism of a clock, was itself distinctly observable.

Various studies of isolated groups such as people manning Arctic or Antarctic bases, Canadian outposts, astronauts and divers living in underwater habitats have continually found evidence of psychological dysfunction including sleep disturbance, boredom, restlessness, anxiety, anger, depression, headaches, irritability, a loss of the sense of time and space and generally impaired concentration. Naturally, not everyone is affected equally and some adapt well to their surroundings. It has been found that men who do adjust well to these conditions are those who for the most part come from small towns. It has been argued (Radloff and Helmreich 1968) that such men adapt more readily to these conditions because they are used to living in close and intimate contact with a number of other people and have not had the chance to lose themselves in the anonymity of a large city. Furthermore, they argue that men from such a background would be more used to having their every move subjected to close scrutiny and evaluation. Whatever the

underlying reason they found that men from small towns not only adapted better to living in isolated groups, and were more sociable, but they also performed their tasks better and more effectively and carried out more jobs. Conversely it has been found that men who came from cities, and who were interested in city activities, adjusted poorly to Arctic environments (Stunkel, Tye and Yankey 1952).

The important point to note here is that the significance of these findings must lie in training. Demographically the size of population a person is born into or raised in is independent of the personality characteristics with which he is born. The child or adolescent is learning to adapt to his environment. This learning ability can also extend into military service which can be considered as an extreme form of a 'small town'. Members of the armed services are better able on the whole to tolerate conditions of isolation and enforcement within isolated groups than non-Service people and in these days few of the intake into the services are from rural and small town areas.

CROWDING

'In summer, the heat was so intense, and the overcrowding so abominable, that the prisoners, six at a time, took it in turns to stand beside the windows for brief gulps of fresh air.'

Two can easily become a crowd, especially if the pair are unable to separate to seek either solitude or comfort with others. Crowding is to be expected in certain types of survival situation. This can be illustrated by the following lifeboat voyage of twenty-three days:

> One of the greatest discomforts was the overcrowding; they arranged that one man only should lie down in turn for a measured hour. Only very brief snatches of sleep were possible. They tried to cool themselves by pouring sea-water over their heads, soaking their cloth-

> ing with water, or by bathing in the sea. All became covered from head to foot with sores, which aggravated their distress as they jostled or leaned against each other. At first they were cheery, confident and talkative. Later they grew more silent and conversation became a matter of effort (Critchley 1943).

Crowding is considered intuitively to refer to a significant density of population. It is further believed that such density will lead to pathological problems. In congested cities, for example, crowding has been proposed to account for, among other things, juvenile delinquency, lower age mortality, increased disease (with concomitant stress), alcoholism, suicide and crime. Field and laboratory studies of animals (from rats to deer) have found that when the population increases beyond the capacity which can be supported by the territory then many begin to die. Interestingly these animals die rarely from lack of resources but from diseases such as kidney failure, perforated ulcers and chronic heart disease. The correspondence of such ailments with the human condition has not gone unnoticed by stress researchers. There are difficulties with this view, however, as high density alone does not appear to lead to stress or maladjustment. Hong Kong for example is the most crowded city in the world with some tenements four to six times as crowded as the densest cities in America and Europe yet its incidence of disease is relatively low with mortality rates less than 60 per cent that of the United States, referral for psychiatric illness less than 10 per cent and a murder and manslaughter rate of only 16 per cent. Similar findings have been found for Tokyo which is another high density city where maladjustment and anti-social behaviour are rare. Many studies have now failed to find a clear relationship between crime, maladjustment and mortality with crowding (Freedman, Heshka and Levy 1975).

Yet it is still the case that people complain of crowding and that this can lead to discomfort and psychological difficulties. People are willing to attribute these difficulties to crowding even when the density of the population is low. A

common experience is that of a person withdrawing into himself to escape from other people.

A group of research scientists on an Antarctic expedition showed decreasing morale and one person turned back after only 20 days. The members of the team lived in pairs in polar tents. These pairings were changed around every fortnight. For the most part many pairs seemed to get on well with only the usual grumbling which is the stuff of such groups both civilian and military. However, a few people requested the changeover times to be brought forward. Later it was reported that people began to withdraw into themselves. Personal withdrawal is common in such circumstances. It is as though a person is trying to avoid crowding by curling up within their own personal space. The victim appears to weave about himself a psychological cocoon. Behaviour now disintegrates. Roger Banks was a meteorologist on an Antarctic expedition. His ship called at an isolated Antarctic station and his crew were surprised that no one had come out to greet them, not even a dinghy had put out to meet the ship. As the crew went ashore and entered the base hut Banks reports:

> The atmosphere of the place was utterly forlorn and with no people bursting out of the hut to come and meet us in the usual way. Only when we opened the front door of the hut and crawled down the long corridor did doors start opening and faces begin to appear. We didn't know them. They were all pale and sickly-looking in a way scarcely credible to us in our ruddy good health. As we talked, we gradually took in their unkempt appearance. The airless smell of the hut made itself felt and, as we looked around, we discovered in the different rooms little animal dens where, as base life had broken down and they had become no longer on speaking terms with each other, each man had retired to make himself a little corner in the wreck of his personality (Banks 1962).

Similarly people are thrown together in mountaineering

ventures. A member of a 1976 Himalayan expedition which ended with fatalities describes a not uncommon experience of such trips:

> Himalayan climbers have to learn to exist in a four-by-seven-by-four-foot space: noise, smells, flapping tent walls, bumping each other, cold, and darkness all contribute to personality changes. If the problem isn't solved, the climb can end early or feuds develop. Despite the hours a climber endures alone at the end of a rope, he or she craves the peaceful, relaxing solitude once in camp (Roskelley 1987).

Attempts have been made to study experimentally the effects of crowding under laboratory conditions. Some of the more basic investigations involved confining large numbers of people into small rooms for short periods of time. Stress was particularly noticeable in dense groups where the participants could not avoid touching each other and especially where they could not avoid eye contact. There is a greater feeling of personal discomfort under these conditions and people will become frustrated more readily. These discomforts decline significantly if the density of crowding is so reduced that physical contact, and especially eye contact, can be avoided.

The main problem which leads to stress and discomfort appears to be not so much the physical cramping of people but rather the enforced and unwanted interaction with others. Various studies have shown that both physiological and psychological stress factors are higher amongst prison inmates sharing a cell than among those in a single cell. More crowded prisons also show higher mortality rates, incidence of psychiatric commitment and blood pressure among their inmates than among those in less crowded prisons. Furthermore, it has been found that distress can be reduced and crowding can be both accepted and exploited if the individual has control over his immediate environment or can perceive that such personal control exists. A high degree of perceived control can have positive effects. In one study five

married couples from the American Volunteer Peace Corps shared a single room which measured 30 ft × 30 ft (10 m × 10 m) for 12 weeks. This group was compared with a similar group of Peace Corps volunteers who were accommodated in hotels. In this instance the crowded couples showed no sign of any adverse effects and even while acknowledging the existence of environmental discomfort showed high levels of cooperation with each other and with their spouses and were chosen as social leaders by other member of the Peace Corps. It should be noted that the people who took part in this study were all volunteers and saw it as a challenge. They were able, therefore, to exercise a high degree of control over their decisions (MacDonald and Oden 1973).

The tendency to withdrawal has been observed under experimental conditions. In one study 18 U.S. Navy men were isolated in pairs in a 12 ft × 12 ft (3.7 × 3.7m) room for 10 days. These pairs, or *isolates*, were compared with 18 seamen who were also grouped in pairs but who lived in naval barracks and had access to the base mess and recreational facilities. The investigators found that over the days members of the isolated groups gradually withdrew from one another. Although the amount of time spent asleep remained constant there was a significant decline in mutual activities over the 10 days and a corresponding increase in territorial behaviour and time spent alone. Solitary and withdrawal behaviour increased by approximately one-and-a-half times amongst isolated groups. There was no comparable increase in similar behaviour amongst the non-isolated pairs (Altman and Haythorn 1967).

It is, however, an over simplification to state that men in isolation will withdraw from each other. Other behavioural factors pervade this type of environment, for example, isolated pairs who both scored high on psychological tests of dominance and dogmatism produced exceptionally high levels of territorial behaviour which was found to be competitive and even volatile. The only two groups of isolates who failed to complete the 10 day stay both scored high on these characteristics. On the other hand group members

whose personalities were incompatible on their need for affiliation also showed a high level of territoriality but there was marked social withdrawal. These pairs were prepared and able to tolerate each other – at a distance.

Another study confined people in groups of two or three inside a specially designed 'deep isolation' laboratory at the Naval Medical Research Institute at Bethesda in the USA. The study was conducted as part of a programme into the behaviour of crews in long-term missions such as would be found in underwater habitats or space stations. In such missions a degree of crowded confinement would be expected and this was simulated in the cramped conditions which each two or three-man group had to endure for 21 days. The participants for the study were naval personnel. All the groups were crowded with one half being deliberately more crowded (75 cubic feet) than the other half (100 cubic feet). In simulating these conditions the researchers imposed lengthy portions of unoccupied time. The men had few duties to carry out, little recreational material was available and the only daily specified item was a task and/or questionnaire session.

All groups showed a low but heightened level of stress during confinement which for most groups peaked at around day five of the 21 days. There was another but lesser surge on day 13. Irritability and annoyance, with both other people and with objects, changed little during confinement but was moderate to high to begin with. Hostility towards partners was surprisingly high by the first afternoon of the study. Greater state-anxiety was found amongst the two-man groups than the three-man groups. Least state-anxiety was found amongst the less crowded three-man groups. This was found especially to be the case for three-man groups with a senior ranking leader while the most state-anxiety was found amongst the two-man groups with senior ranking leaders.

From these studies the authors conclude that the most effective group is a three-man (rather than two-man) team with senior leadership. In all groups confinement was stressful and hostility and annoyance was higher compared to a baseline of non-confinement. In the incompatible groups

(determined by personality assessments) this hostility was directed against their partners albeit covertly, while in the compatible groups it was directed against the environment and objects such as toilet facilities, temperature and humidity.

Clearly, crowding on its own is not a major factor in discomfort, rather it is the interaction of crowding with other factors and social behaviour. Men who are crowded and incompatible with one another will withdraw, their behaviour will become more territorial and volatile. However, similarly crowded men who are compatible will spend more time together in recreational activities and will find their crowdedness to be of little or no threat. The key factor appears to be *personal control.* The more control people have over their decisions, actions and environment the better able they are to tolerate even excessive conditions of crowdedness. Coupled with personal control goes self-discipline. Roger Banks (1962) overwintering in the Antarctic with colleagues that he only met on the way out reports:

> It's not a flattering admission, but, as anyone who has been imprisoned would agree, the veneer of civilised behaviour peels off with humiliating speed in such circumstances.
>
> The checks imposed by people and an ordinary environment did not exist in the Antarctic. There were no friendly props to help us keep our balance and we had yet to find it in ourselves.
>
> Just as happiness can be completely transcendent, dislike, unchecked, can turn to obsessive hatred, or depression can result in melancholia. Nothing to alleviate your state of mind can come from the outside: you can count on no help from the others in this Antarctic experience, as they are up against the same thing themselves. The only discipline is self-discipline and there is no balance for you if you cannot achieve it in yourself.

POSTSCRIPT

All the above factors associated with psychological survival still have relevance today. It has been disclosed that all the Royal Air Force aircrew detained as prisoners-of-war in Iraq during the Gulf War (1990) were held in solitary confinement in cells measuring about 10 ft × 7 ft (3 m × 2 m). They were deprived of sleep and what little they could snatch was taken beneath cold blankets on a chilly concrete floor. All lost weight including one pilot whose weight fell from 11 stone (70 kg) to 8.5 stone (54 kg) in just three weeks. All this followed hard on the shock of being shot down, parachuting into desert, capture and routine torture, brutality and interrogation.

In 1992 victims from Serbian run prison and concentration camps in North West Bosnia showed that nothing had changed. Former prisoners report the daily spectre of casual death and violence, of roads to the camp lined with the bodies of men, women and children who had been shot or whose throat had been cut. Two prisoners describe being crammed into a small room with 100 others, 'There was no room for all of us to sit or even crouch. We took turns. For half-an-hour we would squash together so five or six could rest. Then they would get up and others would take a turn' (Miles 1992). No food or water was given for three days and attempts were made to gather raindrops at the window. Following this they were released once a day to feed on soup and bread. Beatings, interrogation, torture and executions followed. The emaciated and tortured victims filmed by the ITN at Trnopolje showed that deliberate starvation still exists in the Western world.

SUMMARY

The study of the behaviour of survivors and victims is rarely confined to the psychology of threat. Often during the recoil period other environmental factors will conspire to at-

tack the psychological core of the would-be survivor. Those factors most commonly encountered are summarised below:

1. *Fatigue* along with exhaustion are almost universal complaints of any survivor. It is difficult to monitor one's condition and many survivors report that they were taken by surprise when suddenly they were overcome by fatigue. The risk is that fatigue can leave a victim open to secondary threats such as hypothermia.
2. *Sleep loss* and sleep disturbance both weaken survivors. The mechanism and function of sleep are still not fully understood but lack of it can produce disorganised perception, including hallucinations, impaired performance and disintegration of personality including paranoia.
3. *Hypothermia* continues to kill. Cooling of the body's core temperature quickly produces shivering, confusion and disorientation in the victim followed by impairment in manual performance, amnesia, hypoactivity, muscle rigidity and unconsciousness. Once coma is reached death is rarely far away.
4. *Hyperthermia* refers to heat illness which arises when the body is unable to dissipate excess heat. The psychological effects of heat have not been fully resolved. There is a received view that raised temperatures produce aggression, hysteria, apathy and general lethargy but even these effects are not simply correlated and a more subtle interaction seems to be taking place. What is not in dispute is that when heat illness becomes heat stroke it can kill very quickly.
5. *Hunger* in short-term survival is a distraction. In long-term survival it becomes a serious threat. In most cases survivors will not starve straight away but will become undernourished producing weight loss, drops in pulse rate and blood pressure, susceptibility to cold, tiredness, weakness and difficulty in carrying out simple physical tasks. There is a dislike to being touched and a dulling of emotional expression coupled with apathy and resignation. If food appears people will fight like animals for it.

6. *Thirst* attacks quickly through both dehydration and salt imbalance. Thirsty people will become agitated until their mouth is too dry for speech. They will become irritable, tense and restless with later symptoms being delusions, visual hallucinations and irrational behaviour.
7. *Isolation*, though a purely psychological factor, can be devastating. People normally need the company of other humans. Deprive them of this and they show changes in perception, including visual and auditory hallucinations and impairment in memory and reasoning ability. Personal withdrawal and psychological disintegration may follow.
8. *Crowding* can cause discomfort and psychological difficulties and it has been proposed to account for such behaviour as juvenile delinquency, stress related diseases, alcoholism, suicide and crime. The relationship between these and crowding, however, is not clear. The main factor appears to be whether or not the victim has control over his condition. If not, then withdrawal, aggression, territoriality and psychological disintegration can quickly occur. If control is possible then even excessive overcrowding can be tolerated.

5 Coping Behaviour and Psychological First Aid

A person who is aware of what to expect and of the possible reactions that he will meet when misadventure strikes is well underway to surviving. Knowing what to do under disaster conditions will increase the chances of survival for both the individual and for other victims. Clearly a person will often find himself in a position where he is unable to control much, if any, of the events evolving rapidly around him but this situation rarely continues for long and it is essential that the victim takes some control over his own situation. In other words, the victim should cease being a victim. He should refuse to accept the label 'victim' which nature and his fellow humans will combine to stick on him. The purpose of psychological first-aid is to minimise maladaptive responses and so increase the number of survivors. Most psychological dysfunction is transient and should be treated as quickly as possible and as close to the site as possible.

Studies of disasters and debriefings of survivors have identified certain behaviour and actions which can assist the victim in surviving and these will be considered below. It is as well to remember that a victim is not a survivor until after he is rescued.

PERIOD OF PRE-IMPACT

Training and Knowledge

It has been shown many times that people who are properly briefed, trained, drilled and with a knowledge of what to expect in a survival situation will show a higher degree of

effectiveness should such a situation arise (e.g. Glass 1959, Cohen 1988). Preplanning and training help to develop group cohesiveness. They let the victim know that he is not on his own and puts social pressure on the individual to perform effectively for the sake of the group or community. Training also removes that fear which occurs through lack of knowledge while repeated drilling enables the person to function effectively at an automatic level. It is at this 'automatic' level of response that most people will be functioning, particularly during the crucial period of impact. It has been noted that the route most commonly taken by people in their everyday life (for example, in their daily work or during training sessions) is the most likely route to be chosen when they become evacuees during an emergency. This experience, coupled with other impact factors such as perceptual narrowing will determine which escape route is selected.

It is not enough to simply go through the actions during training, there must also be adequate and relevant follow-up information. People who work in office blocks and other large buildings frequently use a lift to reach their own floor. As they do this day in and day out it quickly becomes a dominant response, one that they are most familiar with and, in the event of say, a fire, these people will tend to leave by this same route. When they do so they will frequently be met by disabled lifts and signs saying: *In the Event of a Fire Do Not Use the Lift* without any further information on what they should actually do. Occasionally, there will be accompanying signs saying *Use the Stairs* but again without any information on where the stairs are located. The effects of missing or ambiguous information can be even more acute in hotels, nightclubs and other such places which people tend to visit only in passing.

Familiarity with the use and handling of survival equipment is also essential during training. This equipment need not be elaborate but few people have experienced opening even ordinary fire doors. Unfamiliarity with equipment stops people using it. Victims have been recovered from life rafts with a survival box (containing flares, rations, first-aid kit

and so on) unopened and the necessary contents unused (personal communication). Fire extinguishers have been left intact during a fire because the people on the spot did not know how to use the equipment, and indeed, have even been frightened of using it. A crashed and injured airman did not use the flares he was carrying because he had not been trained in their use and this extended the search for him by several hours (personal communication).

Regular training exercises also serve to establish two other important factors: leadership and communication. Lack of leadership in a survival situation can be fatal. Most people in a disaster will desperately seek out leaders, they will want to be told and shown what to do. During training, leaders can be identified and their structure established beforehand. The role of leadership will be considered in more detail below.

Communications are essential for survival and it is important that they are maintained or re-established quickly. Victims need accurate, reliable and authoritative information, and a functional communications system can be laid down during training. An effective communications system is essential to dispel and destroy rumours. Rumours increase confusion, cause tension and spawn more rumours.

Formal training courses are not the only way of importing survival information, much useful instruction can be achieved through more informal methods. After the Hilton Hotel fire in Las Vegas, a woman survivor reported that she had been trapped in the hallway and was unable to see the floor because of the denseness of the smoke. She recalled a television information announcement (relayed by the actor Dick Van Dyke) which said that under such circumstances she should crawl low in the smoke. She did and survived. She also saved her companion who was near to panic because she did not know what to do in a fire (Keating 1982). Far more use can be made of such public announcements in radio, television, newspapers and magazines.

A major problem in any proposed training programme is the overcoming within the population of denial that such training is necessary in the first place. Most people do not

train in first-aid because they do not accept that they will ever need to use such skills. Fire drills are considered a nuisance and an interference to the general populous, not an opportunity to confirm and rehearse their escape and rescue procedures. It is this denial and lack of training which leads to fatalities and crippling injuries.

PERIOD OF IMPACT

Few people will be able to exercise much control over events during the actual period of impact, save for those precautions which have been taken during preparation and training. The majority will operate in a semi-automatic manner and will produce stereotypical responses. Prior preparation, training and experience should ensure that those responses lead to safety.

PERIOD OF RECOIL

It is during this period of recoil that the victim begins to regain some control over events. If you are the victim then the first thing to do is to take stock of yourself. Are you physically injured? Can you apply adequate first-aid? Medical first-aid is of paramount importance. It appears that most people who die from injuries and physical trauma will do so within the first three hours of being struck. First-aid is what it says: it is the aid which is given first to enable a person to survive before being passed back to professional and technical support. Incidentally, if it is at all possible, a casualty should be allocated a 'supporter'. This is someone who remains with the casualty throughout the incident and follows them all the way through their ordeal including evacuation and even as far as the doors to the operating theatre. It has been found many times that victims of serious incidents (including aeroplane crashes and shootings) have

been unable to recall anything of the incident except the comfort they received from one person who stayed with them. This comfort is a tremendous psychological booster and should not be underrated. It is appreciated that it is not always possible to spare someone for such duties, but there have been many occasions when it has been possible but has not been done. One serious point to 'supporters': there are different levels of unconsciousness and there are times when 'unconscious' patients can hear what is being said about them.

Next, take stock of your psychological condition. What state are you in? Are you functioning adequately enough to rescue yourself and perhaps others? Look to yourself and check your own limitations. In disasters it is common for people to become overwhelmed by the event and the scale of the tragedy. The shock of much personal and environmental desolation, of ruins, bodies, multiple injuries and dismemberment can swamp the survivor. Even in small groups, for example in life-rafts, the shock and surprise of the accident can flood the survivor's system. Even professional emergency people can be affected, for example, the doctor for the Sheffield Wednesday Football Club who was present at the Hillsborough football stadium disaster in which 95 Liverpool supporters died, told the enquiry that he had difficulty in choosing which victims to assist first. He said that when choosing which spectators to treat first, he judged how blue the victims had gone and their age. The younger they were the better their chance of recovery (*The Times*, 21st June 1989). Five days after the Battle of Gettysburg ambulances were still bringing in casualties to the overworked surgeons. They had to decide who to work on and who to leave. Those who were rejected were laid in a long row in a nearby little wood. There, grunting and twitching, their lives gradually left them. More recently a U.S. Navy doctor reported how the triage system (the term for selecting those who could be left to live, who should be left to die and who should be attended to) broke down. Each doctor went among the prone bodies choosing '. . . who to work on, who could be saved, who could wait, and who would be a waste of precious

time'. So many things may clamour for an individual's attention that he ends up simply doing nothing. Others may respond by carrying out a seemingly appropriate task which turns out to be counter-productive. One nurse on duty during a disaster said that at times she felt '. . . like a chicken with its head cut off running around . . . I think you try to do too much, you have three or four doctors asking for something at the same time, and then you would find yourself trying to do all of them at once, you would automatically start for one thing, then pick up another and you would forget what you were doing before.' And another nurse, '. . . they came so fast, I remember saying to someone, will it never stop, will they never stop coming'.

Following another major disaster a nurse said that although she had been trained in everything she needed to know to treat the injured, this had all been taught separately, one at a time. She had not been taught to cope with everything occurring at once, and this she felt to be a major problem.

The successful survivors first look to their own defences. They realise that they cannot be all things to all men. They will automatically disassociate their emotions and feelings from their reason. This process has been called 'splitting' in psychology and seems to be essential for adequate functioning under such traumatic conditions. Sometimes this splitting can take people by surprise and they wonder why they feel nothing and how they can be so cold and clinical amongst such devastation. Splitting behaviour is characteristic of the 10 to 25 per cent who remain relatively calm throughout the catastrophe.

If the situation is perceived as being overwhelming the victim will be psychologically crushed. The danger lies in the urge to do too much, which leads to a hyperactive condition and the result that little, if anything, constructive is achieved while much damage may be wrought to both the individual and other victims. Debriefings of survivors show repeatedly that they possess the capacity to break down the event they are faced with into small, manageable tasks. They then set priorities for tasks and tackle them in order. Whether they

are looking after themselves or others they take the same approach.

In 1985 the climber Joe Simpson fell down a crevasse while climbing in the South American Andes. He was given up for dead. Joe managed to extricate himself and a broken leg from the crevasse and began to crawl back to base camp. As well as dragging a broken leg he also suffered with frost bitten hands which made progress along the glacier painfully (literally) slow. He reported: 'Eventually, I got into a system by which I just looked ahead and spotted something and I thought, "that's where I am going for" and I thought no further ahead than that. I did this for the whole rest of the time. It wasn't until literally the last few hours that I even thought about camp as something that I would reach.' It was a 10 kilometre crawl to base camp.

The person who can grasp the problem before him and break it down into simple, ordered and manageable chunks is paving the way for their survival and rescue. Each step, each chunk must be as simple as possible. Identifying and decomposing the task is only the first step, the next is action. Simple directed action is the key to regaining normal psychological functioning.

Consider now what can be done for other victims. The primary concern, of course, is medical first-aid. There exist some excellent manuals on first-aid and consequently this topic will not be considered further in this volume. It is worth emphasising however, that when applying medical first-aid or attempting to rescue the victim, you know what you are doing. There are few things more psychologically disturbing to a casualty than to be faced with a display of incompetence or ineptitude on behalf of his would-be rescuer.

When you reach your casualties you will encounter a diverse range of reactions and your response must be flexible and sympathetic. Firstly, you will need to assess their psychological condition. Many will show 'normal' patterns of behaviour for the circumstances and they should come through most of their difficulties within a reasonable time. In a large-scale devastation you will have to assume that most

people will recover themselves shortly after the impact phase has cleared. You will not have much choice in this matter. It will soon become apparent which victims are psychologically disabled and which are coming through naturally. Generally, psychological first-aid is for those who are not recovering or for those who are not coming through quickly enough, for example, in a life-raft where the victims are at risk of hypothermia which can quickly prove fatal. The survivors of the *Andrea Doria* sinking showed typical behaviour for the circumstances. It is described by two doctors on the rescue ship as follows: 'The survivors presented themselves for the most part as an amorphous mass of people tending to act passively and compliantly. They displayed psychomotor retardation, flattening of affect, somnolence and, in some instances, amnesia for data of personal identification' (Friedman and Linn 1957).

Once having identified those who are in clear need of assistance next try to distinguish between those who are showing normal psychological dysfunction and those presenting gross abnormal, violent or psychiatric symptoms. You must remember that for the most part what you are witnessing in a victim will not be a mental or psychiatric disorder, such as neurosis or psychosis, and consequently the victim should not be approached in that way. Those in clear need of psychiatric help should be identified, segregated but ideally kept with supporters, and the rescue authorities should be notified as soon as possible.

Psychological first-aid, like medical first-aid, is in essence a series of simple actions and procedures. In many cases it is common sense. Unfortunately, common sense is frequently the first casualty of disaster. The primary objective in treating a psychological casualty is to produce a response. Often any response will suffice. People who are overwhelmed, who show a depressed reaction, appearing apathetic and dazed, can all too easily collapse in on themselves leading inexorably to psychological disintegration.

How should one handle a victim who is not coming through the period of recoil? Often, a few words and some simple gestures of encouragement will work sufficiently to draw

the victim through this period and will begin to make them aware of their situation. At all costs avoid the 'Come on, buck your ideas up' approach. Again, watch yourself as it is all too easy to feel resentment, anger and hostility towards victims, after all physical wounds can be seen, psychological disability can not. Do not ridicule casualties and do not tell them how they should feel. The victim's world has collapsed, often physically as well as psychologically. He will not want to be feeling as he does at that moment. Indeed the victim will often expect to be functioning normally almost immediately. It is a shock to him to find that he cannot do so. Let the casualty know you want to help, but do not try to explore the person's background or disposition. Keep your words few and your gestures simple. Just enough to establish contact. If at all possible give the victim reassurance, but do not lie. If it is medically permissible provide hot drinks (e.g. soup, tea), blankets and so on. Apart from their intrinsic value such items are powerful psychological tokens.

A person's identity is critical to their well being and people will go to great lengths to retain or regain it. To this end the production of an identification list is essential. Have the person give, and write down, their name, address, nationality and next of kin. On the face of it this may appear to be a rather pointless bureaucratic exercise and surely the last thing that is wanted under such traumatic conditions is paperwork. But consider what you are doing: firstly, you are encouraging the casualty to produce a response, you are trying to elicit some action. Secondly, you are helping the victim to re-establish his personal identity and to overcome amnesia for personal items. Thirdly, it is reassuring to the casualty to be recognised as an individual. Fourthly, victims find relief in talking to someone even very briefly. Fifthly, identification lists are a powerful tool for reuniting families which have been broken up by the impact. In the case of the sinking of the *Andrea Doria* some families took several days to be reunited following delays in making such lists. Finally, in foreign areas people become stateless and can lose any sense of belonging. Identification lists can help to overcome such

feelings of alienation. This sense of psychological identity and belonging is so strong that people have been known to risk life and injury to salvage their passport from a sinking ship while totally neglecting other valuables. An identification list is a simple enough device but a very powerful one. It is also an invaluable aid to the rescue services and health organisations. A person's name is intrinsically linked with their personality and their identity, and it is no coincidence that in the concentration camps one of the first actions that the Germans undertook was to remove the name, age, residence and occupation of their prisoners in an attempt to destroy their identity and to turn each one into a cypher. Names were taken away and numbers were issued in their stead. 'Because he no longer had a name, but had become a number, the prisoner belonged to the huge army of the nameless who peopled the concentration camp. The prisoner was summoned by his number and then reported with the words: "Number – reports present." Who the man behind the number was, what and how he was, was a matter of complete indifference. It did not even matter whether he was dead or alive' (Cohen 1988).

If the victim is physically capable then he should be encouraged to do something. Once overt action is elicited then the initial debilitating behaviour will change and will do so sometimes with surprising rapidity. Put the victim to small tasks which require neither responsibility nor initiative, for example, moving rubble, gathering material for shelter, salvaging blankets and so on, in other words, simple directed tasks which can be done almost automatically. These tasks should also have a purpose. Avoid giving tasks which the casualty cannot do as this will only serve to reinforce his disability.

As well as information needed for identification you should also try to identify any specific skills, jobs, and abilities which the victim may possess. Ask about their occupations and hobbies. Manual, clerical and nursing skills are all important and can be put to good use. Try to use these skills as quickly as possible but think about what you are doing beforehand. Putting people to action as soon as you can is not

only beneficial to the victim but will also help you to overcome a major problem found during the recoil period, namely, a general reluctance of the population to do anything at all. You will find it increasingly difficult to find volunteers. During the major floods in Topeka which displaced 10 000 people, it was remarked with much curiosity that there was very often difficulty in finding volunteers among the victims and refugees to help fill sandbags, pass sandbags at the dyke, man the kitchens, wash the dishes and suchlike tasks (Menninger 1952). Yet you will need these people not only for voluntary tasks but also for supporting others.

It was observed during the Danish sea survival experiments that one of the men in the life-raft, who was the hardest hit by seasickness seemed to brighten up when he was activated by doing a job, the success of which depended on himself. Such actions will rouse most people who are in a depressed or hypoactive condition in a relatively short time, both individually and as a group. If you succeed in bringing a few people through the period of recoil others will follow, and if you are seen to do so then many more victims will be amenable to your suggestions.

Naturally, different types of abnormal behaviour will require different approaches. Panic, for example, must be stamped out immediately because it carries the real risk of contagion. Here you may need assistance. The person who is in a panic or on the verge of panic should be restrained and controlled but avoid violence or assault. Sharp physical actions may disrupt the person's behaviour temporarily but, unfortunately, they can also stimulate it further. After all, a frightened person has enough to cope with, without finding himself suddenly being assaulted by a stranger. There is also the danger that such actions may ignite panic in others who are just bordering on self-control.

There may also be a few victims who show hyperactive behaviour and these can be very difficult to control. These people want, and indeed need, physical action. Consequently, they can be readily put to activities such as debris clearance. Unfortunately, they will need supervising until they regain

their normal level of behaviour. People who are hyperactive can be very disruptive and even destructive because many of the other victims will mistakenly perceive them as being leaders, which they most definitely are not. A person who is hyperactive will quickly blame all authority for their condition and will be the first to look for scapegoats. Do not fall into the trap of arguing with someone who is hyperactive or discussing their views, simply point out the urgent tasks which need doing and leave the responsibilities and recriminations until later. Should the hyperactive victim not pay any attention to you, which is quite likely, then you may find it necessary to restrain him forcibly. As with the panic victim you should avoid violence or assault. On no account should hyperactive people be ignored. They have the potential to be very dangerous. It is also very likely that you will see milder forms of hyperactivity in victims who are coming out of a depressed reaction and who temporarily overshoot their normal behaviour before regaining their composure.

You may find that despite all your efforts at psychological first-aid a few casualties will fail to come through the recoil period and will remain unresponsive and apathetic or will begin to show signs of irrational behaviour and psychological breakdown. In common parlance those people who fail to respond are usually described as being 'in shock'. These victims will need to be brought under supervised care as soon as possible. You will also have to arrange for their basic survival needs to be met, such as medical first-aid, shelter, warmth, water and food. If at all possible do not leave injured and frightened people alone. Be aware also that people who are in shock may become psychologically and emotionally isolated within a group.

CHILDREN

Children present a special group within a disaster not least because of the emotional effect they can have on a would-be

rescuer. One experienced police officer involved in a major body recovery operation reported how he was coping well with the task in hand until he suddenly came across the body of a girl aged about four or five years, whereupon he just 'cracked-up' (personal communication).

Generally, young children up to about eight years-old will mirror the responses of their parents, particularly during the period of impact. If the parents are seen to be scared so will the children. If the parents behave calmly the children will be calm. Curiously, if the parents are absent most children seem to show no fear. During the sinking of the *Herald of Free Enterprise* one of the ship's officers found a boy about two years-old alone on the capsized hull looking towards the shore lights of Zeebrugge. The officer grabbed the child, picked him up and hugged him. Amid all the horror and confusion the child pointed at the lights of Zeebrugge and said, 'Look at the pretty lights' (Homewood and White 1989). During the Oregon cyclone one 6-year-old girl was found working unconcernedly in her backyard flower garden despite the trees crashing down around her, while a boy of seven walked into the storm to check on the condition of his school. Neither showed any signs of fear, they just appeared to be inconvenienced (Crawshaw 1963).

Children of 10 to 13 years tend to show excitement at what is happening around them and are sometimes even given to exclamations of joy at the sight of, for example, buildings collapsing. Remarks such as 'Cool, the roof is blowing away' have been previously reported by children in a disaster (Crawshaw 1963). Again, children will show no fear or anxiety and will even attempt to go into the heart of the disaster area. Children over 13 years may often experience fear at the event. One schoolboy who witnessed the Aberfan slide in which he saw two friends killed reports 'It was like a dream and I was very scared.'

For the psychological first-aider there are two important points as far as children are concerned. Firstly, it is important to be seen to be calm by the child. A child can sense fear and will react accordingly. Secondly, wherever possible keep children and parents together. Parents will,

of course, show a very deep and immediate concern for their children. Do not split up families. The evidence repeatedly shows that children can experience major psychological disturbance when removed from their families especially if it is for the first time. Children buried in rubble after repeated bombings of London during World War II showed no particular signs of disturbance if they were in the care of a parent, but quite severe disturbances were found in children who had been separated (Freud and Burlingham 1945).

This need to keep families together brings into question the principle common in western culture of 'women and children first'. There is a very strong argument for ensuring that at least one parent (even if it is the father) remains with the child or children. The Israelis applied a similar principle during the Arab-Israeli war of 1948 when they insisted that one parent must remain with the children if the other was assigned to combat or other hazardous duties (Friedmann and Linn 1957).

Children who have become separated, or whose parents are killed or incapacitated by injury, will be shocked and frightened, and can be numbed and dazed just like adults. One nurse dealing with children during a disaster says: 'Well, it was the children. They didn't cry. Just stared at you – all the blood drained from their faces. That was terrible. I think the children, whether they were hurt badly or not, were just frightened to death almost. I can't remember one child who was crying' (Rayner 1958).

ELDERLY

Elderly people will tend to be more confused than the younger groups. They will also be more attached to their home and will be very reluctant to leave it, even if warned that it will be destroyed. This was observed during the Oregon cyclone (Crawshaw 1963) and during the Tsunomi Wave which struck Hawaii in 1960 (Lachman *et al.* 1961).

LEADERSHIP

Any text on psychological first-aid must consider the role of leadership. In a disaster the need for leadership is critical. A few leaders do come quickly to the fore, often emerging from surprising sources, and will frequently disappear without trace once the crisis is over. Designated leaders such as civic mayors, as but one example, do not always function effectively as leaders in a crisis. Although effective leadership in a disaster is rare, anecdotal accounts of emergent leaders are legion. A few examples will be given below.

When the city of Winnipeg was flooded five or six leaders emerged in different parts of the city. These people simply took over crucial management roles in the handling of the disaster. One man in particular took charge behind the scenes and began directing activity in the centre of the city. It was necessary at one stage to construct a dyke around St. Boniface which has been described at the time as sitting like a '. . . sort of saucer in the middle of the river'. Manual efforts at building the dyke, although spurred with urgency and enthusiasm, were making little progress (Tyhurst 1958). This man located a telephone and began ordering heavy-duty earth moving equipment from all parts of Manitoba. This equipment arrived and five hours later a circumferential dyke had been constructed. He ordered the equipment with scant regard to who was to pay for it or even how it would be returned. This man took on a responsibility which no one else appeared willing to take. It is worth noting at this stage that the man concerned was by profession a civil engineering contractor. The bearing this point has on emergent leadership will become clearer later on.

In another part of Winnipeg a clerk in the Grain Exchange took over. He was a former army officer and immediately began organising convoys to take workers to the dykes. These convoys were organised in a regular fashion complete with outriders. It is interesting to see that this form of quasi-military system was accepted by the general population as long as they could see a need for it. Once the major difficulties had been overcome the man relinquished

his leadership and returned to his civilian job. These and the leaders who emerged during this flood have since disappeared almost completely.

During the recoil phase of the tragic Aberfan landslide disaster in Wales in 1966 a team of 22 men arrived led by a Territorial Army sergeant. At the time the crowd control and traffic congestion had become major problems. The sergeant, Ron McCarthy, promptly set about establishing a traffic control organisation which succeeded in keeping vehicles moving around the village on a one-way system. This traffic control system was set up entirely on his own initiative.

During the Coconut Grove fire a passing motorist stopped, grabbed a tool from another vehicle and broke his way into the building through a window. He succeeded in rescuing five women.

A classic example of emergent leadership concerns a 16-year-old boy who worked as a messenger in a Canadian department store in which a fire broke out killing thirteen people. The boy, who was not noted for being particularly outstanding before, grouped together a large number of people and led them to rescue through the store roof.

On the capsized Zeebrugge ferry there are a number of recorded instances of leadership and bravery. One amongst them was Andrew Parker who made a human bridge by stretching himself across a gap filled with water at a temperature of 3°C. Mr Parker is six foot three inches tall and about twenty frightened passengers climbed over him to safety, an act for which he was awarded the George Medal.

A superb example of the leverage of leadership in survival is found following the sinking of *West I,* a 176-foot fishing vessel, 600 miles north-east of Hawaii. The eight-man crew aboard the *West I* split into two life-rafts, which were tethered together and remained so during the voyage. The day following the sinking the Chief Mate, Thomas Jacobsen, took a small damaged aluminium skiff, jury-rigged a makeshift sail, and armed with a compass and sextant, set out for Hawaii for help.

Meanwhile, the men on board the two life-rafts, still teth-

ered only 30 metres apart, went their separate psychological ways. One raft came immediately under the firm leadership of the third mate, Douglas Hamilton. In the other raft, which contained the ship's captain, leadership appeared to be stillborn. Hamilton insisted that each person stand a watch both day and night and decided when flares would be fired. Food was rationed, inventoried and issued to each man publicly. The same system applied to water. The raft was mopped regularly to keep it as dry as possible to prevent saltwater sores developing. This was in contrast to their sister raft, the crew of which failed to carry out these procedures, and who sank quickly into despair. Instead of discipline there was disintegration.

Two weeks after the sinking of the *West I* they were rescued by a Naval vessel. It was noted that the crew of Hamilton's raft were able to physically climb the boarding ladder while those in the other raft had to be brought on board in litters. The captain died the day before rescue.

It is important to realise that both rafts started off about equal in type of craft, food and water. Also they remained within 30 metres of each other at all times. Such a contrast could not be given greater relief.

And the chief mate, Jacobsen? He fetched up on the Hawaiian Island of Niihau 17 days after the sinking. He was in good physical and mental shape – and still had some of his water left. He had said to his shipmates, 'I'll see you in Hawaii', and they believed him (Sisson 1988).

It is understandably very difficult to carry out studies of emergent leaders. No one is sure who will grab the cloak of leadership until the event strikes, and afterwards they tend to melt away. Nonetheless, a couple of very interesting facts have been thrown up: firstly, whether a person emerges as a spontaneous leader or not depends far less on their individual personality than on the skills and training they possess. This is why the civil engineer in Winnipeg, was able to order earth moving equipment from all over Manitoba. The young lad who led people to safety on the roof of the department store said that he had been in the habit of climbing onto the roof anyway. The army officer was able to organise

convoys of trucks along military lines. The man who smashed his way into the Coconut Grove nightclub was at the time serving in the US Navy – he had previously been a fireman.

In a report of the capsize of a small cargo vessel off Tasmania in 1973 it was mentioned that the Chief Officer became the acknowledged leader amongst the survivors in the life-raft which drifted for nine days. This was due to the fact that, '. . . he was the principal decision maker and demonstrated his technical ability to be so, in relation to winds, current and the use of survival apparatus' (Henderson and Bostock 1977).

The second point of interest to arise is that the style of leadership tends to change as the natural history of the disaster evolves. Frequently the individual leaders will themselves change over with others. They will retire into the background while someone else emerges to take charge. In most cases this change over will be achieved without any acrimony and indeed often without the leaders concerned being aware that their roles have been swapped. Perhaps more importantly this swapping in style is readily accepted by the rest of the survivors and may even be demanded by them.

The initial leader will usually be authoritarian, he will be decisive and will lead by example. The later type of leader will be one who can appreciate and react to the social needs and dynamics of the group, one who can show empathy with the other survivors, who will work with the rest and will organise and minimise differences amongst the group.

Curiously the main difference between the two types of leader is that the second type is characterised by perseverance. The second, social, leaders can persevere often in the face of overwhelming conditions while the initial leader may often be unable to keep going. In 1940 the *Anglo-Saxon* was torpedoed. As has previously been mentioned seven men under the command of First Officer Denny took to the lifeboat. Denny was a tower of strength to his men who were all physically weakened until the sixteenth day, when he turned to his men and said, 'I'm going overboard. Who's coming with me?' He then stepped over the side.

This transference of tacit leadership and the clear demonstration of quiet perseverance in hostile conditions has been remarked on elsewhere. A most illuminating comment was made by Captain Scott in describing life in the Antarctic, he remarked: 'So the "Gods" dwindle and the humble supplant them' (Seaver 1963).

While in the Antarctic it is worth mentioning Sir Ernest Shackleton, a rare man who was capable of both types of leadership. He was clearly a dominant character capable of decisive initial leadership while possessing an incredible degree of perseverance in the face of some really atrocious conditions, and who managed to save all his men, who retained implicit faith in him, after being stranded in the Antarctic ice. Incidentally, his family motto is *Fortitudine Vincimus* (by endurance we conquer).

To many people the initial type of leadership is redolent of military organisation and at first sight this may not appear to be a practical system for a civilian population and certainly not for a country which does not have a conscripted national service. Evidence suggests, however, that an authoritarian military style of organisation is not only acceptable but may even be welcomed in the initial stages of a disaster – but only providing the population can see a need for it. If they cannot see the point of such a style the people will not accept it. Perversely perhaps there is a dependency by the general population on uniformed groups during the first stages of a disaster. A 'uniform' might be no more than an armband. These groups are looked to for authority, information and direction but later can become scapegoats by the same population.

The rejection of a military or quasi-military style of organisation after the impact and initial recoil phase has implications for the military itself. After all, it is frequently the armed forces who are first deployed as rescuers into the eye of a major catastrophe. It is, of course, possible for an army to impose a military leadership on the civilian population but it will only work in the most extreme circumstances. To be fully effective army units must identify and work alongside the civilian leaders. They must also be aware that the

normal roles of civilian leaders will often have changed or even have disappeared completely during the disaster. Failure to appreciate and act on this can lead to some ludicrous situations. One case has been reported in which an army unit went into a disaster area and set up its own organisation. The community leaders would meet frequently with the brigadier and his staff, they would plan, issue directives and submit daily reports for control at the headquarters. In the meantime the civilian society were doing something entirely different (Tyhurst 1958).

It has been mentioned that victims will look to 'uniforms' for guidance and consequently some people may have leadership thrust upon them. They may stand out through their social role or occupation such as that of doctor, fireman, nurse, police officer and even traffic warden. These people may be considered as 'symbolic' leaders because, with the possible exception of police officers who are trained in civilian control at accidents, many do not appreciate the influence for leadership which they possess. The principles of leadership in disasters should be an integral part of the institutional and professional training of such people.

RESCUE TRAUMA

People who are administering medical or psychological first-aid, who are helping victims of an accident or disaster are not immune from the effects of trauma despite the heroic image of unshakeable self-reliance which others come to expect. Whether these helpers are themselves victims helping on the spot or professional rescue workers sent in from outside, they will not completely escape the psychological effects of the situation. These effects can come upon different people in different ways and at different times. Many will face some psychological problems once the event is over and this will normally occur during the period of post-trauma. Post-traumatic stress disorder will be discussed in more detail in Chapter 7. At this stage consideration will

be given to these psychological reactions which can arise at the time of rescue and with human salvage.

Victims can easily become dependent on a medical or psychological first-aider during a crisis. They see him as a leader, someone who can help and organise them. However, this leader will often be dependent on only himself despite the fact that his needs (for shelter, security, warmth and so on) will be no less than those of the other victims. He has taken on a role in which he is expected to function as though no crisis was present. The rescuer is expected to be self-sufficient and although the time when he is active might be relatively short it will also be critical.

Various physical and psychological blows can assail the rescuer and this is why emphasis was laid on looking to yourself and to your own defences before taking on the larger task of assisting others. The would-be survivor and rescuer can be swamped by the screams of injured casualties, the mutilated, torn and dismembered bodies especially of children and babies, and the smell of gore, vomit and excrement. Feelings of exhaustion, weakness, pain, perhaps also of cold and thirst will claw at your own body for attention. Above all, the feelings of hopelessness when a victim you have strived to save dies and the sensation of being overwhelmed by the sheer scale and futility of it all.

The very sight of a dead body can itself have a significant impact, especially today where death is sanitised and removed as far as possible from the normal affairs of modern society. The psychological responses to death and the dead vary from person to person but the most frequent reactions are anxiety, perhaps dread, sometimes a morbid fascination and occasionally a 'panic-attack' usually from the fear of the unknown. Many people will show a revulsion to a dead body from fear of contamination no matter how fresh the body actually is. Some people believe that a cadaver retains some form of sensibility and they will even go out of their way not to offend it. Faced with corpses, especially if it is for the first time, a few will adopt defensive patterns of behaviour: they may start telling weak jokes, become hostile, indifferent or detached. Bodies, even whole ones, take on different forms

in death. Some are calm and seem to be merely sleeping while others are contorted, grimacing, even snarling as though they have fought right up to the last. Again it is the bodies of children which produce the greatest shock. There can also be an unbidden tendency to rationalise individual deaths: this one must be in his 60s or 70s, he's had a good run, and so on.

Familiarity with injury and death lessens its impact. Doctors, nurses, firemen and other professional rescue workers lose their feelings of anxiety and of being uncomfortable with death with the increasing exposure and experience which their job brings. It can even become quite mundane as Alexandre Bellot de Kerfarre, a commissariat during the Napoleonic War describes: 'Not only was the hospital full of corpses, but so were the streets and a number of the houses . . . On my own I took away one hundred-and-twenty-eight, which had been serving as pillows to the sick and were several days old.'

But the impact of death is not lessened, and it may even be increased, if the rescuer knows the victim personally. This familiarity with the dead does not appear to alter the individual's response to their own death.

In a survival situation the pressure is on to function rapidly and the survivor can succumb to tension and urgency. He feels a compulsion to do something and this may often cause him to leap into action without proper or logical planning. Even experienced professional rescue workers and medical staff can fall foul of this trap which is often accompanied by 'task narrowing' or a failure to appreciate the whole picture. This drive to be active carries its own consequences. While being active can be a great psychological and emotional boost to your own recovery (after all one of the main factors in psychological first-aid is to elicit action in the victims) severe repercussions can arise if this need for action is thwarted. For example, after much effort, tension and anxiety a person may discover that his services are no longer needed or at least not needed at that particular moment. There may follow a period of enforced inactivity the consequences of which can be difficult to control and

may cause severe problems. These may occur because the person suddenly feels that he is personally not wanted, that his skills are of no use and then an opportunity exists for him to become more aware of his own condition, of the exhaustion, pain and shock which has been restrained just below the surface. During the Topeka floodings radio announcements were made calling for volunteers. These were supported by roving vehicles with loud hailers also calling for volunteers with the result that many more people turned up than could be usefully employed. Not unnaturally perhaps, they took offence when told that they were not wanted after all (Menninger 1952). One passenger aboard the liner *Ile de France* which went to the rescue of passengers following the collision and sinking of the *Andrea Doria* reported how he felt anger and bitter disappointment when told that his services were not needed. This particular passenger was a doctor (Friedman and Linn 1957). One nurse on duty during a tornado described her reactions to enforced inactivity as follow: '. . . I felt very frustrated and hemmed-in because I felt I needed to be out doing something and they kept telling us to stay in'. On the other side another nurse reported trying to cope with an influx of volunteers: 'They wanted to help, and probably could have helped, but you didn't have time to tell them what to do. I think a lot of their help could have been used and they were willing, but you just didn't have time to tell them' (Rayner 1958). It is likely that much difficulty arises because people at the focal point are unable to appreciate the overall picture. Enforced inactivity and the rejection of would-be helpers is common in emergencies but is a problem that is little recognised.

Everyone involved in rescue work, professional or volunteer, has a limit within which they can function but beyond which they cease to operate effectively and may begin to disintegrate psychologically. This limit has been called the Rescue Trauma Threshold (Nydam 1983). When this threshold is breached, when the intensity of the rescue operation becomes overwhelming, then psychological dysfunction is most likely to occur in the would-be rescuer. This disintegration can be exacerbated if the person is dealing with victims

who are members of his family or are close friends. Typical symptoms which occur include irritability, anger and verbal outbursts, crying, nausea, vomiting and irrational behaviour or general apathy. At this stage the rescue worker has himself become a victim and requires psychological first-aid and, if at all possible, should be removed from the scene of the disaster. The level at which the rescue trauma threshold is breached varies from individual to individual and within an individual from day to day. There is also another very important facet of rescue trauma and one which is little appreciated, namely, that it is accumulative. It can attack a person insidiously over a period of time, wearing him down by a long series of minor traumas and experiences.

An *aide-mémoire* for psychological first aid is given in the Appendix.

SUMMARY

1. There are various ways in which the chances for personal survival may be increased. People who are trained or experienced in survival know what to expect and are much better able to cope with the adverse circumstances. Most importantly such training enables them to overcome an inherent denial that the disaster will not arise in the first place and to encourage the survivor to plan, prepare and act before the event strikes.
2. In the midst of a disaster look first to your own defences – medical and psychological. Try to grasp the overall picture and not just one small part of it. Develop a plan for survival, keep it simple and break it down into a series of manageable sub-tasks.
3. When dealing with other victims be prepared to meet a variety of reactions. Identify those who are going through a 'normal' psychological response and will come through of their own accord and those who are not recovering and are thereby at risk. Your responses should be flexible and sympathetic. Aim to give each victim back his

personal identity as soon as possible and try to elicit a response from them. Wherever possible put the victim first to small sensible tasks that require little thought and no initiative. This will not only help to bring him through the recoil period but will also increase your pool of workers.

4. As far as practical, children must always be kept physically in contact with at least one parent. The elderly will also need special handling as they will show more confusion and a greater reluctance to leave their homes and belongings.
5. You may find that you have to shoulder the role of leader to the other victims. It is important to remember that the type of leadership required will change as the disaster evolves. Adopt the style most appropriate to the particular phase e.g. authoritarian or social leader. Two key features of a successful leader are the technical skills and training he possesses and the ability to persevere. Be aware that leadership may be thrust upon you by the nature of your position, knowledge, occupation or even the clothes you are wearing at the time.
6. As a rescue worker you are also subject to intense physical and psychological demands. Monitor your own condition sensibly and regularly. Obtain specialist assistance if required. Above all, do not allow yourself to become another psychological casualty.

6 Long-Term Survival

Long-term survival is a lonely state. It is a very personal struggle, and no-one can take this burden from the victim. Today many survivors are fortunate enough never to experience this as they are rescued in a comparatively short time. Sometimes help is no more than minutes away, sometimes hours may pass, and sometimes days, although this is rare except in some major disasters such as earthquakes, tornadoes or war. First-aid, be it medical or psychological, is designed to sustain the life of a casualty long enough for him to be evacuated to professional and technological assistance. It is to support this short-term, acute first-aid intervention that most training courses are designed and this is as it should be. There are occasions, however, when an individual or group of individuals find themselves trapped in a long-term survival situation. This can arise from large-scale natural disasters such as hurricanes, flooding, earthquakes, shipwreck, certain war conditions, kidnapping and hostage taking, incarceration in prisoner-of-war and concentration camps, nuclear devastation (civil accident or military intent), entrapment in caves or mines, airline crashes in remote regions, and many others.

On the face of it the difference between chronic long-term survival and the more acute short-term event is a matter of degree. Clearly, someone who survives four years in a prisoner-of-war or concentration camp has demonstrated long-term survival, but what about a few hours in a life-raft? One survivor of a sinking reported, 'Had rescue been prolonged, the number of survivors would certainly have been reduced' (personal communication). Consider shipwreck again; some survivors may drift in a lifeboat or raft for a couple of hours, for three or four days, or for 38 days (Robertson family), 66 days (crew of the *Anglo Saxon*), 76 days (Steven Callahan), 117 days (Maurice and Maralyn Bailey). Time adrift may be further complicated: the crew of the *Southern Star* spent nine days afloat in a rubber raft

before reaching land. Three of the crew then spent a further 4 days walking before finding help. Hostages, particularly in the Middle East, have been held for months and even years. Expeditions are still known to deteriorate into a long-term physical and psychological fight for survival. Prisoner-of-war camps still exist throughout the world. Where lies the crossover point from short to long-term survival? The evidence suggests to the author that long-term psychological survival may begin after three days. The reasons for this are discussed below.

In considering the factors which play a role in long-term survival one must occasionally leave the science of psychology and enter more the realm of philosophy. This is necessary to understand the basic principles of survival which by their nature are rarely amenable to experimental investigation. People who have survived long periods of duress have a tale to tell, and from their knowledge and experience one attempts to distil and describe the basic principles.

In its initial stages the evolution of a long-term threat is no different psychologically from any other catastrophe. The victim will pass through the normal phases of pre-impact, impact and recoil. However, instead of being rescued he will remain in a no-man's land of continuing threat and will be denied the period of recovery and post-trauma. Many people will perish. They will either die or go insane. If one word could sum up success at long-term survival it is *adaptation.* Indeed long-term survival is one continual struggle to adapt to a changed and threatening environment. The victim seeks to establish a new behavioural fitness between himself and his new environment. Those who perish are frequently observed to be those who are unable to mould themselves psychologically to their new conditions. For this reason the author refers to this phase as the *period of adaptation,* this in turn is followed by a phase which the author calls the *period of consolidation.* How do people survive long periods of duress? What keeps a man going despite all the odds against him? Debriefings of survivors have shown that they share a few common but seemingly critical characteristics.

Before a victim begins his period of adaptation he will have to pass through the periods of impact and recoil. The evidence is strong that the way a victim reacts to these periods will determine his chances of living or dying at a later period. It seems intuitively reasonable that those who are cool and calm during the period of impact, and can formulate and carry out a plan, have a better chance of surviving than those who are hostile, bewildered or otherwise psychologically impaired. This idea that a person's responses during the period of impact can predict success at future survival is supported by many debriefings and accounts, among them one from a former prisoner of the Nazi concentration camps. On entering a camp for the first time with other Jewish prisoners, she remarks, 'This initial shock acted, from the beginning, as a principle of selection between those who were, virtually, fit for survival, and those who were not' (Bluhm 1948).

Similarly, the longer a person takes to come through the recoil phase the less their chances of finally surviving. Victims who are in a depressed reaction or are apathetic will pay no attention to their new and hostile environment just at the time when they need to do so most of all. This is a failure to adapt in the very early stages of survival. It is at this stage that the normal physical needs will have to be met such as first-aid and hygiene, shelter, water, warmth and food. These essentials can only be obtained if the individual can respond appropriately to his new surroundings. A person in a state of apathy or bewilderment will make little or no effort to meet these essential requirements even if the raw materials are available. In prisoner or hostage situations where medicine, food and water will usually be supplied, albeit rationed, they can still be deliberately withheld, usually as a punishment, if the victim does not *behave in a manner considered appropriate by his captors.* For most survivors who have come through the recoil period, depression will set in after the basic physical needs for survival have been met. It is vital that these needs are met as quickly and as thoroughly as possible. There is no escape from this.

To have any hope of surviving psychologically for long

periods of time the victim must come to terms with both himself and his environment. Unresolved conflicts of life and death can cause major problems. Anyone who has a genuine and realistic belief in himself and his abilities is well under way to surviving. This belief is not an illusion but will have been forged during the person's previous history and development and through their training and experiences of similar conditions. A loss of belief in oneself and one's abilities to cope can be observed in everyday life. It is not uncommon, for example, for a person to be promoted to a position to which they feel unjustified. They feel they are not good enough to hold their particular job no matter how well others may think they are doing. They start to believe they are a fraud. This situation occurs at all levels of promotion and there is at least one organisation which runs a successful service counselling senior executives, including managing directors, who feel personally inadequate to the job that they have taken on (personal communication). As well as a belief in oneself and one's abilities there are other factors which are common to survivors and which can determine the difference between surviving or perishing. These factors are considered below.

PURPOSE

Finding a purpose to one's existence is an excellent aid to survival. One concentration camp survivor reported that he appointed himself '. . . a writer without pen who registers everything so that one day he can tell the world what he has seen on behalf of the millions who can no longer speak or write' (Heimler 1963). It is not necessary for a purpose to be such a profound one, providing it is clear. It is surprising the large numbers of survivors who come through their ordeal with a message for loved ones from their friends who have perished, and with the thought that they must get this message through at all costs. The Mate of the *Anglo Saxon* gave his signet ring to Widdicomb in the lifeboat with the mes-

sage, 'Give it to my mother if you come through.' The Mate then committed suicide by stepping over the side and drowning. Widdicomb was one of only two eventual survivors.

Although there appears to be no figures available it is interesting to note that as a group doctors and nurses seem to have a greater chance of surviving prisoner-of-war camps and similar institutions than many others. These include, among many others, Doctors Cohen and Frankl, and the trained nurse and British agent Mary Lindell in the Nazi concentration camps; Major Gene Lam in the Korean prisoner-of-war camps and Haing S. Ngor in the Khmer Rouge concentration camp (of the 'Killing Fields' infamy). There are various reasons for this apparent success. Doctors and nurses are familiar with death and suffering to a significantly greater extent than the general public and their training and experience enables them to cope *practically* with such situations. More importantly, however, is that by virtue of their medical skills, they have a ready task, a mission even, given to them. This type of mission, this degree of purpose, so essential for survival is rarely given ready-made to other people under the same circumstances. Other people will have to seek out their own purpose. The very fact of being a doctor or a nurse does not automatically confer invulnerability (Cohen recalls another physician, who was with him in Auschwitz, who was unable to adapt to his new environment and quickly perished), but they frequently have little difficulty in finding a purpose to help them exist.

Establishing a definite purpose to one's existence strengthens survival. It is something to aim for. But simply identifying a purpose is not enough, it must be coupled with *tasking*. That is, the breaking down of the person's aim or purpose into simple tasks so that life can be handled one step at a time. Not only does survival start to become manageable but the act of planning itself also brings relief. A survivor of an air crash said, 'It felt good to plan and to help rescuers' (personal communication). One important factor is that planning counters aimlessness. Bombard, aboard his inflatable, drifted psychologically after both his radio and watch failed, 'It became impossible to determine with any certainty what

progress I was making [and this] incident brought home to me how much the aimlessness of doing what I pleased, of not deciding in advance how to occupy my day, was beginning to weigh upon me. I decided to work out a strict timetable of activity. I am convinced that in such circumstances it is essential for the castaway to remain master of events, rather than be content merely to react to them. In order to get away from the constant and unrelieved proximity of the sea, I decided to adopt the peasant's habit of getting up and going to bed with the sun' (Bombard 1953).

Climbing in the Karakoram in 1977 the mountaineer Doug Scott broke both his ankles after slipping from a sheet of water-ice and swinging away on the end of a rope before smashing into the opposite gully face. At that time, Scott and his three companions were living in snow-holes and ice-caves nine thousand feet vertically above base camp. Apart from the abseiling Scott had to move everywhere on his knees. Their rations were almost exhausted. Scott reported, 'There was only one way for me to tackle a big, complex problem like that, and that was one day at a time, keeping the broad idea hovering around in my mind that I'd got to get to Base Camp, but each day thinking no further than that day's objective, confident that if each day's climbing was completely executed then the whole problem would eventually be solved' (Alvarez 1988).

Some tasks will be mundane, routine and even tedious but they will be essential all the same, for example, maintaining as far as possible clean health and hygiene, making continual repairs and improvements to shelters, clothing and equipment, developing and practising new skills, developing and refining plans. Callahan in his life-raft reported that, 'Dreams, ideas and plans not only are an escape, they give me purpose, a reason to hang on' (Callahan 1986)

Although the survivor needs to establish a serious underlying purpose to his existence, not all tasks need to be severe: one survivor made himself a rudimentary set of golf clubs and wooden balls with which to occupy himself (personal communication), while another who was in hiding reported 'Not knowing what to do I decided to kill all the

bugs. There were a lot of spiders, the big ones that do not hurt humans, so I killed the flies and gave them to the spiders to eat' (Rastellini 1985).

To break a purpose down into tasks requires an ability and an inclination to plan. And herein lies another difficulty. The need for planning is crystal clear in acute, short-term crises. This need to plan is not always so clear in long-term situations where the threat to survival rolls on monotonously day after day. This is because planning automatically implies a future, and this future is frequently in doubt. Frankl (1947) referring to his experience in a concentration camp remarks: '. . . any human being who cannot see the end of a [provisional] form of existence, is unable to live toward an aim. He can no longer, like a human being in normal life, make plans for the future.'

This does not hold for all cases, even in death camps, as Cohen (1988) has pointed out. Some prisoners did indeed make plans for the future despite the fact that everyone in a concentration camp knew that they were unlikely to survive. The critical factor which determined planning seems to have been whether or not the prisoner's nearest relatives were still alive. This factor applied particularly to the non-Jewish prisoners, but it also held for those Jews whose next of kin were still alive (either in a concentration camp or in hiding) or who had married non-Jews. This attachment to one's nearest and dearest is a recurring feature in survival and is discussed in further detail below.

The ability to plan for the future implies hope. Hope means that the person implicitly accepts that the situation he or she is suffering is only temporary and that the future is for the better. This view must be accepted in the face of much contrary information. When Jackie Mann was first taken hostage in Beirut he continued to believe that his incarceration would be both temporary and short-lived. If he had known it to be otherwise, as he points out, he would have given up hope there and then. Cohen recalls how he made a 'date' with a woman prisoner in Auschwitz for after the liberation. He alone survived.

During their ordeal in the life-raft the crew of the *Southern*

Star reported that much of their talk centred around their hopes. It also seems that their ideas of hope were frequently spoken aloud while their feelings of despair were usually kept to themselves. One survivor said 'I just couldn't believe we couldn't go on. That was all about it' (Henderson and Bostock 1977). In the Japanese PoW camps the Allied prisoners would collect and believe the wildest rumours because the greatest morale builder of all was hope of an early release.

The course of hope during long-term survival seems to follow a 'U'-shaped curve. Initially, hope is strong at the beginning of an ordeal but weakens substantially if relief does not arrive after an acceptable period of time. What counts as an acceptable period seems to vary from person to person. This is the critical phase. Jean-Paul Kauffmann, a journalist kidnapped in the Middle East, went through a loss of hope when his kidnappers were forced to move on following the Syrian forces occupation of Beirut in 1987. He was bandaged up and put in a crude coffin in the back of a lorry; 'The smell of gas and petrol was suffocating. They told me: "If you continue to cry out you will be killed." And I replied: "Kill me, kill me, it's all the same to me" (*Sunday Times*, 8 December 1991). A survivor of a recent air-crash reports one victim who also gave up hope: 'At one point one [person] began wailing "Shoot me, shoot me! I can't take it any more." Others responded with "We haven't got a gun. Think about your wife and daughter at home." "I don't care. They wouldn't want me like this. Just shoot me"' (personal communication). Bettelheim observed that among concentration camp prisoners there was a rapid and significant increase in mortality as hope waned. Once hope corrodes, life is abandoned. This is a frighteningly simple process. Hope feeds the struggle to keep going. It was again observed in concentration camps that once hope was given up '. . . then death came by itself' (Tas 1951). A Gulf War prisoner-of-war said, '. . . you can certainly never lose hope because otherwise you wouldn't survive the situation.'

After a time the survivor, and it will be the *survivor*, passes through the nadir of hope, through its greatest depression

where it may be almost extinguished, but as he adapts to his new situation, and can see himself adapting, hope is rekindled. It is at this stage that the survivor finds a purpose to his existence, that he can see a future and may well begin to plan. Planning need not be rigid and some will accept a future while adopting a more, 'well, let's wait and see' approach. Once this phase has been achieved then adaptation to survival is nearly complete. This is not to say that hope, once rekindled, remains a constant burning light. It does not, it will tend to fluctuate as a person's mood fluctuates. Steven Callahan on day 15 in his life-raft reports that, 'My mood follows the sun. The light of each day makes me optimistic that I might last another forty. But the darkness of each night makes me realise that, if any one thing goes wrong, I will not survive' (Callahan 1986).

ATTACHMENT

It has been previously mentioned that the key factor determining whether or not prisoners in a concentration camp planned for the future, was the continuing existence of their family and relatives. This attachment to principal loved ones, such as wives, children, husbands, mothers, girlfriends and so on, to the extent where they preoccupy a person's thoughts is commonly reported by people under sustained physical threat. These thoughts of family relations and friends usually come unbidden and are frequently very stark, clear and powerful.

Steven Callahan daydreams in his life-raft about his mother whose, '. . . words haunt me' (Callahan 1986). All the survivors of the *Southern Star* found themselves preoccupied with thoughts of their nearest and dearest and they all said that they found these thoughts sustaining. A comment echoed by everyone was, 'I just kept thinking about my wife and family – that was all I had to live for.' Another reported, 'Every night I could see my wife's face. Every time I closed my eyes I could see my wife there.' A third reported that

while paddling the life-raft he would recite the names of his children one after the other like a litany. Critchley (1943) in studying shipwreck survivors claims that some of the most frequently heard phrases were, 'Thoughts of my home kept me going'; 'I remembered my wife and children and this seemed to give me strength'; 'Had I been single I'd not have survived.' A British prisoner-of-war in Iraq during the Gulf War reported he managed to keep going principally by thinking of his wife and children. In *extremis*, most notably in battle, men who are dying have been heard to call for their mothers. During a casualty evacuation following an attack in Vietnam, Marine Sergeant Ron Kovic reported 'Men are screaming all around me . . . "Please help," they scream. Oh Jesus, like little children now, not like marines, not like the posters . . . "Mother!" screams a man without a face. "Oh I don't want to die!" screams a young boy, cupping his intestines with his hands. "Oh please, Oh no, Oh God, Oh help! Mother!" he screams again' (Keegan and Holmes 1985). Major General Frank Richardson, who saw active service with the Royal Army Medical Corps, has repeatedly heard men dying in battle call upon their mothers. In fact, he claims to have heard them do so in five different languages.

It is claimed that such attachment is a true coping behaviour. The strong social bond between the victim and his kin provides a powerful motivational force for reunion and hence survival. Strong attachment in disasters is very common and it has been frequently observed how members of a family will not rest until they have found each other (Bowlby 1973).

PRAYER

Prayer springs readily to the minds and lips in times of distress. Even those who have not prayed before, or who do not profess a religious belief, catch themselves praying. As one famous maxim puts it, 'There are no atheists in foxholes.' It is not the intention of this section to explore the

nature and substance of prayer itself, but rather to discuss its frequent occurrence in times of stress. Praying as a behaviour has been reported too many times for it to be ignored and praying is important even if the nature of prayer itself is not understood.

An American survey conducted during World War II found that soldiers with combat experience regarded prayer as a very important source of support, while three-quarters believed combat and army experience had increased their faith in God (Keegan and Holmes 1985). One US soldier said, after being caught in an ambush in Vietnam in 1966, 'We all asked the help of the Lord that night', while three crewmen of a reconnaissance aircraft, which ditched in the Pacific in 1942, reported that adversity brought back to their minds their childhood prayers. Many such 'prayers' are straightforward pleas of fear and anguish. In Vietnam Sergeant Ron Kovic recalls men screaming all around him 'Oh God, get me out of here!'

Of the seven crew who eventually survived the sinking of the *Southern Star* six reported praying, although the investigation which followed showed that in fact nine of the initial 10-man crew prayed. A typical example was demonstrated by one man who said to himself on several occasions, 'Oh God, get me out of this.' He said afterwards 'I didn't know a prayer – I sort of talked to Him in more or less as many words as I could remember out of a prayer and filled the rest up with my own.'

Another crew member prayed under pressure as follows: 'I said . . . "If you get me out of this lot, I'll play ball"'. Steven Callahan reports the promise he made in his life-raft with hunger, thirst, aching loneliness and fear for company, '. . . that if only I am let out of this mess, I'll surely be good from now on.' This form of bargaining with the Almighty occurs frequently. Clearly such bargains are not always struck and their significance has been questioned by, among others, Apsley Cherry-Garrard of Scott's Antarctic expedition: 'Man says "I trust in God" and immediately a crevasse opens and swallows him up' (Seaver 1963). Far less frequent is the approach adopted by T.E. Lawrence (of Arabia). After a

rather horrendous period in the Arabian desert he said, 'God! If you give me another night like that I'll go over to the other camp.' Following which utterance he reportedly led his Arabs to victory.

Many people will adopt tokens, that is physical articles which they endow with the power to keep them safe and well. These may be called lucky charms but often the person may not be consciously aware that a particular object has taken on such a significance for them. John Steinbeck, working as a war correspondent in the Mediterranean, observed this very behaviour: 'It would seem that in times of great danger and emotional tumult a man has to reach outside himself for help and comfort, and has to have some supra-personal symbol to hold to. It can be anything at all, an umbrella handle or a religious symbol, but he has to have it' (Keegan and Holmes 1985).

Prayer is forced spontaneously to the surface when a person is under duress. The act of prayer can be considered, albeit rather prosaically, as a form of adaptive behaviour that aids a person's survival by reducing anxiety and keeping hope alive. Prayer certainly does this and some would argue that it does much more, however, a metaphysical analysis of prayer is beyond the scope of this book.

Finally, the use of prayer as a coping mechanism when under threat or duress, but not at other times, was noted by Corporal Mathew Bishop who was one of Marlborough's men during the Napoleonic wars:

> God and a Soldier Men alike adore
> When at the brink of Danger, not before;
> The Danger past, alike are both requited,
> God is forgot and the brave Soldier slighted.

PERSONAL CHARACTER

Character used here is a rather nebulous term which refers to an individual's moral being or inner strength. It is one of

those qualities which is both impossible to define and clearly observable. There is little doubt that in times of stress, particularly when under prolonged duress, some people are able to draw upon an inner reserve of energy to help them through the more psychologically crippling phases. This character is commonly referred to as 'spirituality'. It is a spirituality which is found equally amongst agnostics and atheists as amongst those of a religious persuasion. Unfortunately, the term spirituality carries certain metaphysical overtones which are currently beyond our understanding. The fabric of this underlying personal strength still remains a mystery, but its manifestation, much like a spiritual 'second wind,' has been remarked on with something akin to awe by those unable to fully comprehend the privations and tortures which survivors have conquered. Equally, the lack of a personal inner support has been frequently observed: the flamboyant person who is the heart and soul of the party, apparently able to take on all comers, yet who is seen to disintegrate completely under sometimes quite minor stress. Captain Robert Scott noticed this readjustment of values on his expeditions to the Antarctic. In a letter written from his hut at Cape Evans he explains: 'Under ordinary conditions it is so easy to carry a point with a little bounce; self-assertion is a mask which covers many a weakness. As a rule we have neither the time nor the desire to look beneath it, and so it is that commonly we accept people on their own valuation. Here the outward show is nothing, it is the inward purpose that counts. So the 'Gods' dwindle and the humble supplant them. Pretence is useless.'

It is indisputable that the ability to call upon some inner personal reserve is a key factor in long-term survival. Writers who survived the concentration camps appear unanimous that it was of the greatest importance to survival that a prisoner had some spiritual life (Cohen 1988). Although it was described in different terms, the concept of spiritual life included morality, knowledge, emotion, intellect, character, religion, and so on. This could also involve allegiance to a particular Regiment or Naval tradition. It should be remembered that Nazi concentration camps contained Christians,

communists, gypsies, humanists, agnostics, atheists, Allied agents, PoWs and others as well as Jews, but one Jewish survivor has remarked tellingly:

> Generally speaking, we see in the camp that anyone in whose life there are certain religious bonds (using the term in its most comprehensive sense, so as to include the devotion to a political system or a humanist view of life), manages to recover the most quickly, after the initial stupor. It is therefore no mere accident that the convinced Christians as well as the communists, who would seem to be their psychological opposites, should have shown the greatest power of resistance in camps, and even managed to set up certain forms of anti-fascist organisation (De Wind 1946).

Cohen further remarks that any form of spiritual life had another advantage in that when a prisoner was unable to bear any more of the reality of life in a concentration camp he would escape into his inner life, '. . . and that cannot easily be overestimated – an escape into the regions of the mind which the SS were unable to corrupt.' Richard Lovelace's famous 17th-century poem still holds true today:

> Stone Walls do not a Prison make
> Nor Iron bars a Cage;
> Minds innocent and quiet take
> That for an hermitage.

Those prisoners who had little inner strength would try to escape from their reality by living in the past. Unfortunately, it was noticed that those who dwelt in the past had their resistance severely weakened, a consequence of which was that they found it increasingly difficult to adapt to life in the concentration camp. Some prisoners such as habitual criminals had a past that was not very attractive anyway, and these people had great difficulty in adapting and of course surviving.

An investigation of psychosis (subsequently termed 'in-

ternment psychosis') among 305 refugees interned in a camp in Switzerland further highlights the efficacy of an inner character for long-term survival and possibly sheds some light on how it functions. In this study it was found that those people (the majority) who broke down into aggression and apathy were those who had lived directly and almost purely for their own circumstances, for their own being: 'Man pledged to his milieu.' Remember this was a Swiss refugee camp not a German concentration camp, so life itself was not under physical threat. Those who remained psychologically healthy were those who had lived for something other than themselves and their immediacy. This was the man who had lived even to the '. . . deepest roots of his being' (Pfister 1947). These people were few in number. Internment psychosis was rare amongst prisoners who lived for a personal or spiritual ideal.

Personal spirituality functions in a deceptively simple way. When a person who has lived for themselves and their immediacy is thrown into a new and frightening environment, be it a prison camp or a life-raft, a mountain range or a war zone, they become uprooted and disorientated. They have learnt their former life too well and cannot adapt to the change in circumstances. Their world has sunk and they along with it. On the other hand, those people who possess a personal ideal will take it with them, wherever they go, and wherever they happen to find themselves. They are able to put down roots and to anchor their own personalities. They can live comfortably within themselves no matter where they be. They can never be entirely uprooted. Their idea and their ideal are bound up within them and they are not tied to their everyday existence. It seems to matter little whether this personal ideal is based on a religious, intellectual, military or even political idea. If it exists it is sufficient to draw strength from.

This personal character possesses another distinct advantage in long-term survival. It enables one to command a quiet superiority over the enforced circumstances. It is important to note that this superiority is not an aggressive dominance. Such aggressiveness is the classic weakness of

hostility and is a step towards psychological breakdown and even under some circumstances to death. Rather, it is a superiority of spirit which refuses to allow one to succumb to circumstances, be they natural or man-made. In a study of 547 Jewish women survivors it was found that a large percentage of them considered themselves as '. . . superior to the guards and to those responsible for their detention' (Bloch 1947). Dr Bone in solitary confinement referring to her captors speaks of, '. . . a battle I had to fight with these very inferior people' (Bone 1960). Jackie Mann said that his Beirut guards seemed like little boys, and laughing at them kept up his morale and helped him psychologically.

HUMOUR

A sense of humour has been shown repeatedly to be an invaluable aid to survival. At first sight it may seem incongruous that a person under constant threat should have any opportunity for the luxury of humour. This is not so. Humour is not a luxury, it is a vital organ for survival. Under threat humour is the first behaviour to be lost and the last to return. It is an ability to see the funny side of one's own predicament and misery and to gain humour (but not malice) from the discomfiture of others. This type of humour is particularly well honed amongst the Armed Forces and it is not for nothing that soldiers describe a person on the point of psychological breakdown as having a 'sense of humour failure.' Humour is characterised by an indifference towards life, a deliberate ignoring of the seriousness of a situation, a half playful assumption that all is normal and that consequently normal standards still obtain.

Steven Callahan helped to ease the tension of struggling alone in a life-raft with humour and cynical jokes. A number of fish called Dorados had been shadowing his life-raft for some days. On the 11th day adrift he wrote on a notepad which served as a log: 'The Dorados remain, beautiful, alluring. I asked one to marry me. But her parents will not hear

of it. I am not colourful enough. Imagine, bigotry even here! However, they also point out that I do not have a very bright future. It is a reasonable objection.'

Humour is crucially important in the long term even when all around is tragic. A sense of humour maintains morale and acts as a relief but it must be recognised and worked at. Frankl (1947) succinctly summed up the role of humour when he said, 'Humour is a weapon of the mind in the struggle for its preservation.' Humour is about the finest means a person has for attaining an aloofness to the situation, to become superior to the enforced and threatening environment even if it is only for a few seconds. Major Gene Lam describes how, as a prisoner of war in Korea, his fellow inmates developed the art of stealing. They would steal anything. On one occasion his captors had a 50-foot long pole lying on the ground ready to be raised as a flag pole. They stole it, cut it up, and burnt it. 'One [prisoner of war] got 30 days solitary for it but, after all somebody had to be punished and the antic was well worth it.'

Another PoW was severely reprimanded and at some length, by the camp commandant for stealing items. On returning to his billet he was quizzed by his fellow PoWs. He explained that he had stood stiffly to attention while he was being berated by the Chinese commander, 'He was so hot about it, that he impressed me, in fact, I think I ought to take back his watch and pen that I just lifted.'

Major Lam also reports how in a camp known as Death Valley

> we stole a complete building. The communists had let us build a little hospital, had given us two 55-gallon drums for a stove, but wouldn't give us any wood for it. Nearby there was a wooden building, with mud and plaster on the outside. Over a period of two weeks we surreptitiously took board after board from that building until only the thin plaster shell remained. One night we finally knocked that down, removing the last boards and every piece of straw. The Chinese didn't realise the building was gone for two weeks, and by

> then we had burned the evidence in the hospital stove. I was called in for questioning as to what had happened to the people's building. I could only reply that there was no such building. When they looked at the place where the building had been, there was only a bare spot. How could they accuse us of stealing a building? It was too ridiculous!'

Major Lam reported that such antics, '. . . had us laughing for weeks and such laughter kept us alive.'

In reading such accounts it can be all too easy to fall victim to the idea that such camps were not all that bad after all and that one's captors are rather stupid creatures. This is not so. While these prisoners went around stealing flagpoles and buildings, their friends and comrades were continually dying around them, and if pushed too far some camps would respond with torture and execution as punishments. In order to appreciate this further, two factors must be considered. Firstly, although the above antics might appear frivolous, and in some instances they were, there was a more serious underlying intent to their purpose. The prisoners-of-war saw themselves as part of a mission, and this was their contribution to the war effort. They established an active 'front' within the camp to harass the enemy and they speak with pride of the fact that their camp had two guards per prisoner while most others had but one guard for every two prisoners. 'A small contribution to the war effort? Perhaps, but it gave us a sense of accomplishment and it did tie up a number of Chinese.' This is clearly linked to the establishment of a mission or purpose which is again crucial to survival. In this instance the mission operated at both the personal and group level.

The second important factor is the *Reality Principle.* This refers to the ability to determine how far one can go before excessive pain and punishment become the consequences. The task of avoiding pain is equally as important as that of gaining pleasure and knowing just how far one can go can be critical for survival or at least for ensuring a reasonably painless existence, while still accomplishing the task that

one has set oneself. Some people cannot do this, they either overreact or their behaviour is inappropriate to the circumstances. They are certainly unable to cope with the situation and frequently die or are killed quite early on. Humour is almost always observed among those individuals who have adapted most totally to their environment, in other words the true long-term survivors.

This section will finish with two further examples, each illuminating in their own way. The first is from the philosopher and mathematician, Bertrand Russell, who was imprisoned for a time during the Great War. He recalls, 'One time, when I was reading Strachey's *Eminent Victorians*, I laughed so loud that the warder came round to stop me, saying I must remember that prison was a place of punishment.'

The second: 'Incredible as it may seem, . . . laughter was often heard in the [concentration] camps' (Kautsky 1949).

ACTIVE-PASSIVENESS

All successful long-term survivors seem to possess one uncommon ability. This ability is little understood, at least in the Western world, yet seems universal among survivors. It is the ability to accept the situation one is in but without giving in to it. It is the ability either to be active or to be passive coupled with the knowledge of when to be so. It is important to note here that activity and passivity are not distinct characteristics but facets of one behaviour. It is an *active-passiveness*. If only one characteristic predominates then the victim is going to have a hard time of it. Complete passiveness leads to subjection, apathy and usually death. An inability to accept one's condition leads to frustration, anger and irrational behaviour again often followed by death. The hostage Jackie Mann would be awake for 15–16 hours a day and the hardest thing for him to master was the coping with nothing to do.

The key factor here is *knowing* when to be active and when

to be passive and the realisation that passivity is itself a deliberate and 'active' act. Jackie Mann understood that the Arabs have a tremendous capacity for waiting and that his kidnappers would not accept Western impatience. He resolved to adopt the Arab stance of waiting. There is a strength in passivity. It is a psychological sacrifice to circumstances and like all true sacrifices it is a positive act. In 1977 the Argentine newspaper editor, Jacabo Timerman, was repeatedly tortured at the hands of the authorities:

> I realised that, instinctively, I'd developed an attitude of absolute passivity. Some fought against being carried to the torture tables; others begged not to be tortured; others insulted their torturers. I represented sheer passivity. Because my eyes were blindfolded, I was led by the hand. And I went. The silence was part of the terror. Yet I did not utter a word. I was told to undress. And I did so, passively. I was told, when I sat on a bed, to lie down. And, passively, I did so. This passivity, I believe, preserved a great deal of energy and left me with all my strength to stand the torture. I felt I was becoming vegetable, casting aside all logical emotions and sensations – fear, hatred, vengeance – for any emotion or sensation meant wasting [useful] energy . . . (Timerman 1931).

Dr Edith Bone, who was held in solitary confinement for nearly seven years by the Hungarian authorities during the 1950s, also found the strength of passivity. At one stage, already physically weakened, the light in her cell was kept on and her door was banged loudly every half hour. She realised that the purpose of these actions was to make her move. Her response was to remain immobile and impassive.

> Apparently, this attitude of mind, this immobility, made them uneasy. The sergeants and sergeant majors who were on duty there were not ordinary prison service officers but secret policemen; nevertheless, they were not allowed to come into my cell, except with an officer

> of commissioned rank. They must have reported, 'The prisoner doesn't move,' because presently a sub-lieutenant came in and spoke to me. I did not answer. He came and shook me by the shoulder, but I did not respond and went quite limp. He stood by my bed for a while and then went away, but after this they stopped banging on the door. They just came and switched on the light, looked in, and went away again about every hour (Bone 1960).

Similarly, Timerman: '. . . during those long days of solitary confinement. More than once I was brusquely awakened by someone shouting: "Think. Don't sleep, think." But I refused to think. I behaved as if my mind were occupied with infinite diverse tasks. Concrete, specific tasks, chores.'

Ruth First was held in solitary confinement in a South African jail in 1963 under the then 90-day detention law. She reports, 'Bath over, it was the start of a new day, another day of torpid inactivity. Lying in bed at night could be excused as a retreat from inactivity. Lying in bed by day had to be an activity in itself, and each hour spent lying flat on my back or leaning against the propped pillow was an exercise in trying to cajole a state of resigned semi-consciousness out of myself' (First 1988).

Dr Bone realising that her scheme had worked decided to take things a stage further with an enforced passivity:

> In short, I decided to refrain from absolutely everything except lying on my bed and sleeping. This I carried out quite thoroughly. I did not eat, I did not answer when I was spoken to, I did not move when the sergeant brought in a broom in the morning, and I did not do any of the other chores either. I found that for some mysterious reason my behaviour alarmed my guards . . .

It is essential to realise that the strength here lies not only in the ability to remain passive, but also knowing when to be

so. Clearly, had Dr Bone carried out this behaviour in a concentration camp she would have perished extremely quickly. This is the Reality Principle.

Behind this active-passiveness lies another ability. This is the ability to live in the present and only in the present.

Edith Bone: 'Altogether I was not particularly unhappy or impatient, but led a sort of vegetative existence, resolutely putting out of my mind all thoughts either of my wrongs or my future prospects. It was a sort of self-defence against a drawing of conclusions too painful to be contemplated.'

Jacabo Timerman: 'In that solitary universe of the tortured, any attempt to relate to reality was an immense, painful effort leading to nothing.'

This ability to live in the present is a powerful psychological weapon. In captivity it can be used to neutralise two of the most important tools given to captors: *threats* and *promises.* A person who lives entirely in the present has no past and no future. Without a past or future threats and promises have no meaning. This technique has been found to be used by several inmates who were awaiting execution in the Sing Sing prison death house. Two psychiatrists who studied these prisoners found several cases who were, '. . . so immersed in the present moment as to be virtually insulated from any significant emotional relatedness with their past or future. Thus, they do not have to deny anxiety since they do not experience it' (Bluestone and McGahee 1962). When Jackie Mann realised that his incarceration was not going to be temporary he had to adjust himself mentally to the future months and years. At this stage he realised that he had to live in the present, however unpalatable, and take each day as it came. He speaks of the future becoming frozen.

ADAPTATION AND CONSOLIDATION

The underlying foundations of long-term survival are adaptation and consolidation. Physically, physiologically and

psychologically the survivor changes to fit his new environment or he remains a victim and goes under. The histories of survivors is testimony to this process. Once the period of recoil is past and there is little or no sign of immediate rescue, then the period of adaptation commences. Before adaptation begins certain conditions must be met. The individual must survive both the periods of impact and recoil and previous experience or training will be important. These periods of impact and recoil will already have told against a number of victims.

It has been shown above that a survivor's adjustment to a strange and threatening environment can be eased by the possession of certain qualities. The ability to establish a purpose or mission, an inner strength of character, leadership, attachment to loved ones, a sense of humour, and the ability to remain quietly superior to one's circumstances.

Establishing a purpose to one's existence provides a goal. The ability to stand back and plan, to be able to break the goal into tasks, makes this goal practicable. This tasking lays the groundwork for personal adaptation. An inner strength supports the victim. When the personality is ripped away there has to be a core remaining to carry the person through. This inner character is self-supporting and if a person can carry all his support within him then it matters little what the external environment comprises. Leadership implies some control over events even if this control is manifested as passivity. Leadership may germinate from an idea or ideal, perhaps a religious or political conviction. Perhaps allegiance to a Regiment or tradition. Leadership during the stage of adaptation is primarily self-leadership. Attachment to loved ones provides a motivation to survive and encourages planning for the future. A sense of humour maintains morale and supports the feeling of superiority and aloofness over adverse circumstances.

During the period of adaptation there is a slight initial decomposition of a victim's psychology. There is a breaking of the links of his previously learned behaviour. Once broken, the survivor's behaviour can be adapted and rebuilt to better fit the new environment. Initially, there is a natural

reluctance to believe that the old environment has been torn away during the period of impact and consequently denial, crying, anger and weakness are frequent reactions. The period of recoil follows which is a further breakdown in the psychological bonds shown by despair, grief, depression and so on. Only once the victim is through this period can new survival behaviours be developed.

This period of adaptation involves a psychological reconstruction of the victim to develop a behaviour which can better fit his new environment. Once an initial adaptation has been achieved a period of consolidation follows in which this new environment, no matter how threatening it may still be, is perceived by the survivor as the *normal* one. There is an important distinction to be recognised here. While the survivor sees his new environment as his *real* life he still acknowledges another life as his *definitive* one. It is an acceptance of his condition as it is at present. It is a resignation without giving up. It is survival by surrender (Bluhm 1948). The classic characteristic of the period of consolidation is that the survivor regains his identity. He becomes someone again. He is able to give himself more to other people and signs of altruism appear. Humour reasserts itself.

Because the survivor has adapted to his new existence the world outside is now seen as strange and dream-like. It does not take much to produce this impression as many army recruits the world over experience such feelings on re-entering civilian life following just a few weeks of initial intensive basic training. The moment the victim accepts his new world as both real and natural he becomes a long-term survivor. He sees the new life as the link between the old life he knows and the life yet to come. A classic example of this process of adaptation and consolidation is given by Maurice and Maralyn Bailey in their description of being shipwrecked and adrift for 117 days. A Korean fishing vessel was sailing within one-half mile of the couple. Maralyn began signalling. Maurice told her to stop waving and to save her strength. He remarks: 'Let it go on, I thought, this is our world now on the sea, amongst the birds and the turtles and the fish' (Bailey 1973).

There are, of course, instances where the survivors' new existence is perceived not only as their real life but also as their definitive one. That is, they have adapted so well that they do not want to return to their previous existence but wish to remain in the one they have found. This condition is frequently known by its colloquialism of 'going bush'. Even in concentration camps it was known for some prisoners to have adapted and consolidated their behaviour so well that for them camp life became their definitive life. This was observed particularly amongst those prisoners who were formerly criminals. Many of these criminals had even managed to achieve various forms of high office within the camp and were very reluctant to leave.

This process of consolidation helps to explain one paradox frequently observed among people who have successfully endured, suffered and survived conditions of long-term threat, namely, that they have the greatest difficulty in integrating back into society following eventual rescue. This condition was also noticed amongst many survivors and combatants who returned home following US action in Vietnam. It appears that behaviour can undergo one significant adaptation to altered circumstances in much the same way as a person can change their accent naturally only once in their lives. Those who have consolidated well, find they have to relearn their old life. They have to re-adapt and consolidate anew, and this is more difficult.

The prime age for adaptation and long-term survival appears to be between twenty-five and thirty-five years. Most people over thirty-five will be losing their peak for raw physical survival. Even tribal peoples raised on the edge of nature rarely live beyond forty years of age. Those under twenty-five suffer because they have not yet learned to conserve their energies. They have difficulty pacing themselves for the long haul of survival and consequently burn themselves out in the beginning. A key characteristic of long-term survivors is active-passiveness, and passivity does not come naturally to youth.

Those people who do succeed in adapting well to a new environment appear to do so within about three weeks. Those who have not consolidated their behaviour after three

months seem unlikely to do so and will have a very hard time of surviving at all.

WILL TO SURVIVE

The expression 'will to survive' is frequently spoken with reference to individual survival. Unfortunately it tends to be used with little thought to its meaning. It has become a throwaway expression, a label which possesses a circular self-fulfilling argument: how did these people survive such appalling conditions when so many others perished? They had the *will to survive.* It will be appreciated that while this successfully explains things away it tells us virtually nothing about the underlying behavioural process of human survival. In fact, the phrase *will to survive* can be readily exchanged with the word *magic* with no loss to our understanding of the process.

Many survival manuals, especially of the military type, readily emphasise the importance of the will to survive and insist it must be developed and maintained under all conditions while simultaneously declining to explain how such development and maintenance can be achieved. Examples include such statements as: 'Maintain the will to survive', 'There is nothing more important to survival than the will to live and resist.', 'The will to survive is the most important factor' (US Army field manuals). '. . . tools and training are not enough without a will to survive' (US Air Force manual). '. . . physical condition . . . knowledge . . . equipment . . . and most important of all the will to survive' (McGee 1978). This refrain is still echoed in post-rescue reports. Two survivors of the *Atlantic Conveyor* sinking report: 'Generally, the losses were those who were either unfit or who just lost the will to survive' (personal communication).

The concept of a 'will to survive' existing as a discreet entity, which an individual either possesses or does not possess, appears doubtful. Nonetheless, it is clearly observable that some individuals do survive horrendous disasters, and they do appear to show a well-developed faculty for surviv-

ing. However, it is not easy to distinguish, under normal circumstances, those who will survive and those who will perish, hence the frequent exclamations of surprise at those 'unlikely' people who survive a catastrophe, and the equal bewilderment at those hitherto invincible types who succumb.

At this stage it is more useful to identify and to decompose those observable factors underlying survival and to seek their source in human development. The key psychological factors found in survivors have been described both in this chapter (establishing a mission, tasking, attachment, prayer, personal character, humour, active-passiveness, adaptation and consolidation) and in earlier chapters (training and preparation). In a survival situation these factors all come to the aid of the victim but they will not work in isolation. They must be integrated one with another and it is perhaps this degree of integration which is being observed and labelled as the *will to survive.* That is, the greater the fusion within an individual of these factors the greater is his chance for survival and it is this fusion which reflects the will to survive. Furthermore, this integration must become pseudo-instinctive. It must, when called upon, produce behaviour which is second-nature to the victim. This is essential because thinking and reasoning will already have become hostages to the disaster.

Such behaviour has to be learned early and it seems that many survivors have developed the techniques and basic skills for survival in childhood or early adulthood. They have exercised and developed their coping skills and it is clear that if the mind is preset for such emergencies then their coming is not a disabling shock. It is acknowledged that those prisoners who had a good idea of what to expect in a concentration camp, found the reality did not overwhelm them when they entered, unlike those who went in completely unaware. This is important because accepting reality entails overcoming denial. Too many prisoners repressed their awareness of what conditions would be like in a camp and denied the truth of what would happen to them. It was observed that these people perished quickly. If the reality

and possibility of a disaster striking is faced realistically then behaviour will adjust accordingly. There is a tendency to dismiss the strength of experience gained in childhood and young adulthood too lightly. Steven Callahan who survived 76 days alone in a life-raft in the Pacific, dismisses perhaps rather easily his childhood recollection of a hurricane sweeping through Massachusetts which destroyed a tree house which he and his brother had built. Following this incident he '. . . put five dollars, a jackknife, fishing reel, and associated paraphernalia into a box and secreted it in my desk drawer. If disaster struck, I would be ready. If anyone survived, it would be me. Such are the immortal fantasies of youth.' Later, on day 36 of his ordeal, he recounts, 'Mountain climbing, camping, Boy Scouts, boatbuilding, sailing, and design, and my family's continued encouragement to confront life head on have all given me enough skill to "seastead" on this tiny, floating island. I am getting there. So far it is a tale of miracles.' While acknowledging to some extent the role that his previous training played in his survival, Callahan does not give it as much credit as it perhaps deserves.

On the matter of early training for survival it is worth recalling that the familiar Outward Bound courses were originally established in Britain, by Dr Kurt Hahn in 1941, after it was discovered that many young merchant marine seamen were dying in the seas, while many older seamen survived. The idea behind the Outward Bound was to enable the young seamen to realise that they had undiscovered strengths in the face of shipwreck and sea survival.

Many survivors had previously developed practical skills which enabled them to better cope with the situation in which they suddenly found themselves. A carpenter who happens to be an amateur sailor would make a more realistic assessment of building a raft than would, for example, an accountant who was an amateur stamp collector. He would also be far more confident in the soundness of his decision. Leaders arise during the periods of impact and recoil frequently through the specialised knowledge and practical skills they possess rather than for any other reason.

SUMMARY

1. From a psychological perspective long-term survival involves a process of adaptation followed by a process of consolidation.
2. During the period of adaptation the victim will still tend to be numb and will react in an almost mechanical manner. His behaviour, however, will be such as to enforce self preservation. A major relearning process takes place during this period of adaptation where the victim firstly unlearns his previous behaviour pattern and subsequently learns new patterns which fit more closely the new environment. This process can take up to three weeks. If a person's behaviour has not adapted by then his chances of surviving further are much reduced.
3. The period of consolidation follows that of adaptation. This period of consolidation is characterised by a return to the victim of his identity. He again becomes somebody. Humour and altruism reappear and the survivor accepts his new conditions as being his *real life* while acknowledging another *definitive life* to which he is trying to return. He considers this period to be a phase linking his past to an as yet unknown but better future. Consolidation should occur within three months.
4. In extreme cases the consolidation is so complete that a survivor's new-found existence becomes not only his real life but also his definitive life. Colloquially he has 'gone bush'. Once rescued these people have great difficulty in readjusting to their old society and may reject it altogether.
5. Behaviour which appears to aid long-term survival includes: establishing a personal mission or purpose as quickly as possible, attachment, prayer, character, humour, active-passiveness, adaptation and consolidation. The seeds for personal long-term survival are sown early in a person's life and they need to be nurtured into a pattern of coping and survival behaviour.

7 Recovery and Post-Trauma

There are many paradoxes in survival. One is the simple fact that the very act of surviving may itself be a thankless and joyless task. The psychological and especially psychiatric consequences for the survivor following rescue can be profound. They are frequently painful in the extreme. It is common to find that, instead of showing increasing recovery, those who are rescued often show increased distress with signs of anxiety, sleep disturbance, guilt, diminished interest, social and personal withdrawal. This situation is not only paradoxical it calls into question our whole capacity and purpose for surviving.

This text is not intended to cover the psychiatric aspects of survival; however, an overview of post-traumatic stress disorder in survivors following rescue will provide a clearer appreciation of the full topic of survival.

POST-TRAUMATIC STRESS DISORDER

The official recognition of psychiatric distress following a disaster came about only in 1978. Although other syndromes had previously been described based on morbidity (e.g. bereavement syndrome, survivor syndrome, camp psychosis, gross stress reaction, traumatic war neurosis, etc.) a systematic definition of post-traumatic stress disorder (PTSD) as a psychiatric illness has now been officially recognised under the Diagnostic and Statistical Manual or DSM-III (American Psychiatric Association 1978). When discussing post-traumatic stress disorder it is important to realise that not everyone involved in a life-threatening situation will suffer from this syndrome and certainly many will not show the severe chronic psychiatric symptoms which would require admission to hospital. There are even a few, albeit a very few who find the experience of deprivation, struggle and survival to

be a quite positive event in their lives and, while not wishing to repeat the incident, come out of it psychologically stronger and personally clearer in their behaviour and purpose. Far too many people, however, do suffer severe psychiatric disturbance following disaster and while PTSD has only recently been officially acknowledged its symptoms have been around for centuries.

For the victim to be classified as having post-traumatic stress disorder there must be present demonstrable and well defined attributes. According to DSM-III these include:

1. That the symptoms follow a stressful event which would be expected to evoke symptoms of distress in almost anyone.
2. The victim re-experiences the traumatic event through
   (a) recurrent dreams
   (b) intrusive recollections
   (c) behaviour and feelings as if the event were actually re-occurring.
3. The individual's response to the outside world becomes numbed. This psychological numbness begins some time after the traumatic event and is characterised by
   (a) feelings of detachment from others
   (b) decrease in interest in significant activities
   (c) constriction of affective (emotional) responses.
4. The presence of at least two of the following symptoms providing they were not present in the victim previously.
   (a) hyperalertness or exaggerated startle response
   (b) sleep disturbance
   (c) guilt about surviving
   (d) impairment in memory or loss of concentration
   (e) avoidance of activities that arouse recollections of the event
   (f) intensification of the symptoms by events that resemble or symbolise the original traumatic event.

Some of the above symptoms are likely to be found in varying degrees following misadventure. Only when the symptoms persist, show resistance to recovery and impair the

survivor's ability to function in his everyday life does the victim become classified as suffering from post-traumatic stress disorder. The commonness of the symptoms, whether or not they become permanent and debilitating, suggests two forms of post-traumatic stress syndrome: psychological and psychiatric or acute and chronic. Prognosis and recovery is good for acute PTSD but poor for chronic PTSD. Unfortunately, victims with problems will usually present themselves late, often when they are desperate. If the help available is institutional in form then few will select it anyway (Perry and Lindell 1978). Many victims will look within themselves first and then seek help from family and colleagues. They will tend to reject help from outside and especially if it is imported (Zarle *et al.* 1974). Many people will be blatantly suspicious of outside help (Chamberlain 1980). Consequently, immediate response programmes should be set up by indigenous members of the community.

Historically, post-traumatic stress disorder has been with us for centuries. During 1348–1350 the bubonic plague or Black Death swept through Europe destroying one third of the entire population. The disease was so lethal that most people died within 1–5 days of contracting the plague. This was by any estimate a massive human disaster. An analysis of the daily records of the time (births, deaths, wages, taxes, production etc.) reveal a time of '. . . economic chaos, social unrest, high prices, profiteering, depraved morals, lack of production, industrial indolence, frenetic gaiety, wild expenditure, luxury, debauchery, social and religious hysteria, greed, avarice, maladministration, decay of manners' (Tuchman 1978). Interestingly, these same characteristics were identified as also occurring during and immediately after the First World War.

The records of the day during the Plague present a picture of a people who were apathetic, pessimistic and who had lost their initiative even for protecting food supplies: ripe wheat was left uncut and cattle were allowed to stray. Also consistent with post-traumatic stress disorder were the feelings of detachment from others and the emotional or

affective constriction: '. . . there was burying without sorrow and wedding without friendschippe' (ibid.).

It is equally interesting to find that, following the Great Fire of London in 1666, Samuel Pepys (who was present throughout) recorded in his diary signs of personal anxiety, sleep disturbance and nightmares about the Fire. He reports '. . . and did sleep pretty well; but still, both sleeping and waking, had fear of fire in my heart, that I took little rest.'

Six months later on 18th February 1667 he reports: 'I did within these six days see smoke still remaining of the late fire in the city; and it is strange to think how to this very day I cannot sleep a-night without great terrors of fire; and this very night could not sleep till almost two in the morning through thoughts of fire.'

Pepys also showed an intensification of symptoms following another fire alarm: 'While we were sitting in the morning at the office, we were frighted with news of fire at Sir W. Batten's by [a] chimney taking fire; and it put me into much fear and trouble, but with a great many hands and pains it was soon stopped' (Daly 1983). A similar intensification of symptoms was found in recent times two days after the sinking of the MV *Atlantic Conveyor* during the Falklands War one of the surviving officers reported:

> One aspect of the situation which was not appreciated at the time by myself was shock, some two days after the incident, another raid warning was declared. The effects on survivors, while not disastrous, was remarkable, with severe nervous reactions and very white faces. Based on this reaction, the decision to withdraw the survivors from the war zone, if temporarily, was totally correct (personal communication).

Again, a British police officer who had faced one armed criminal described his feelings following a second similar incident which, as it turned out, came to nothing. This officer was convinced that the experience he had gained earlier would help him to cope better but when he heard

the sound of the gunshot, strong feelings of fear returned. He suddenly thought, '. . . not again' and wanted to look for cover.

With the repatriation of PoWs following World War II, army psychiatrists were able to warn that, 'Most of the returned prisoners will be suffering from minor mental abnormality' and that they would '. . . find difficulties in resocialisation and reintegration in the community'. It is, however, only in recent years that studies of psychiatric disorder following warfare and major disaster have become documented with the frequency and scientific and methodological rigour which is necessary for its understanding. One of the most thoroughly studied disasters was that of the Buffalo Creek Flood in West Virginia in 1972 when an artificial dam collapsed following several days of rain. A surge of water swept down the creek destroying several mining villages, killing 125 individuals and rendering almost 5000 people homeless. Psychological studies during the next three years showed that no one who survived did so unscathed.

The symptoms shown by the surviving population match closely the post-traumatic stress disorder as described in DSM-III. The survivors showed persistent intense fear and anxiety 13 months after the flood. They had vivid memories, dreams and nightmares of the flood itself or of other gruesome forms of death. Some became phobic about changes in the weather and saw their environment as generally threatening and lethal. Many were preoccupied with thoughts of dead relatives and felt guilt at their own survival. Over two years after the flood impact there was still evidence of despair, apathy, aimlessness, depression and a constricted living pattern amongst survivors. People complained of memory lapses, general lethargy, unresponsiveness and confusion about details and events since the disaster. Social and interpersonal relations had become impaired (Chamberlain 1980, Lifton and Olson 1976).

A longitudinal study of psychological dysfunction was carried out following the 1978 cyclone disaster in Sri Lanka. The cyclone first hit Sri Lanka at 9.00 pm with cyclonic winds reaching 110 mph and lasted for about two-and-a-half

hours. This was followed by a lull of about 30 minutes during which time the population began to move about checking their losses and generally seeking and receiving consolation. Then the second wave of cyclonic winds struck blowing in the opposite direction and with greater velocity for five hours. It was this phase that resulted in most damage being sustained. The cyclone resulted in 889 deaths, 91 per cent being within the first 24 hours. Injuries went into thousands and more than 100 000 people were made homeless.

In this investigation 496 individuals were studied in nine villages. These villages were clustered in three zones: zone I representing severe damage, zone II moderate damage and zone III least damage. It should be noted that while hospital records showed an increase in admissions for trauma there was no significant increase in psychiatric admissions. In zone I psychological dysfunction was found to be two to four times higher than in villages in the less affected zones II and III. The majority of people studied presented with symptoms such as anxiety, depression and phobia. Phobia was judged as an excessive avoidance behaviour. Passiveness and hallucinations (commonly of high frequency whistling sounds) were reported in 13 per cent of the population. Twenty-three per cent showed apathy, aimless wandering or motionless behaviour. Fifteen per cent expressed ideas of suicide and there were eight actual reported suicides in the first two months following the cyclone. These included a 30-year-old male schoolteacher who had apparently recovered from the loss of his wife and child only to hang himself 10 days later after reports of his brother's death reached him and a fisherman who killed himself after discovering the bodies of his wife and infant buried in the seashore. Only one suicide victim was a woman. Many reported changes in attitude and lifestyle with a tendency to become more religious, concerned and attached to their families, although 23 per cent also reported withdrawal from social life. At the end of four weeks the study found a diminishing in anxiety and distress from 70 per cent of the affected population to 46 per cent.

In Victoria and South Australia on February 16th 1983, following years of severe drought, a fire destroyed bush,

grass, pasture, orchard, forest and national park across an area of 2804 square kilometres. Seventy-two people died along with 335 000 sheep and 10 000 cattle. The psychiatric follow-ups of this disaster have been substantial. These studies have assessed victims within days of the incident and up to 12 months later. Significant levels of post-traumatic morbidity were found in one study of 1515 victims one year after the fire in which approximately 40 per cent presented with impairment equivalent to psychiatric disorder. There was a 300 per cent increase in mental illness and a 200 per cent increase in psychosomatic symptoms (Clayer 1984). Attendance at General Practitioners with patients showing anxiety, depression, minor infections and emotional difficulties was higher than in previous years despite reduced populations. Common manifestations during the first few weeks included indigestion, nausea, vomiting, diarrhoea, sweats, palpitations, headache, back and chest pain, sleeplessness, tiredness, exhaustion and fainting. Valent (1984) also reports that dermatitis and duodenal ulcers flared up; colds were numerous and the number of domestic and motor car accidents increased – 'One distressed man had three motor crashes in the two weeks after the fire. Some crashes were serious.'

Other medical practitioners received a number of people who commonly presented with symptoms of non-specific emotional distress. McFarlane (1984) describes these people as not being psychiatrically ill, rather '. . . they are demoralised and looking for emotional support'. McFarlane (1987) also identifies sleep disorders as common and interestingly noted that 25 per cent of the 469 firemen who tackled the conflagration still suffered sleep disturbance four months after the bush fire.

In March 1987 the *Herald of Free Enterprise* sank with the loss of 188 crew and passengers. Janet Johnston, a senior social worker became involved in counselling the survivors of the disaster which led to the formation of the Herald Assistance Unit for the Kent Social Services Department. In South East Kent, Johnston and her team worked predominantly with the 38 crew widows and the 42 crew survivors,

their families and supporters. Overall, she estimated that the number of people affected by the disaster was around 10 000 (Johnston 1990). Johnston identified the most frequent feelings and symptoms encountered amongst the survivors as:

> *Fear.* They were afraid of being alone, of breaking down or losing control, or of damaging themselves.
> *Helplessness.* They had a feeling of helplessness, some for the first time in their lives.
> *Sadness.* They felt sad for the loss of life, the loss of the ship and the many other losses. This feeling was coupled with a sense of longing for all that had gone before.
> *Guilt.* They felt guilty at being better off than others, and of not having done more, at not being injured, and again, guilt at having survived at all.
> *Shame.* They were ashamed for being seen to be weak, for not acting as they would wish to act, for being emotional and needing others.
> *Anger.* They were angry at the senselessness of it all, of the injustice, and they became intolerant of incompetence.

As well as the above psychological symptoms, these survivors also showed bodily reactions including tiredness, sleeplessness, bad dreams, loss of concentration, dizziness, palpitations, difficulty in breathing, nausea, diarrhoea, muscular tension and loss of interest in sex (Johnston 1990a, 1990b).

It is one thing to look dispassionately at post-trauma from the scientific and medical views but what is it like from the inside? It is not the intention to belabour any particular point but a few personal accounts should explain far better than any scientific treatise how it feels to have survived a disaster and what those who will yet experience one will expect to go through.

These are from police officers who had been involved in shooting incidents:

'Disturbed sleep. Was not aware of having nightmares but his wife said he was tossing and turning all night. Feelings of anxiety. There were also symptoms and feelings of withdrawal.'
'Has never been the same since. Suffered flashbacks, anxiety and depression. Was withdrawn and had bouts of crying. Generally tried to keep things to himself and did not want to discuss them.'
'Shock set in within 24 hours. He found it difficult to sleep for some time. Relived experience in recurring dreams. Kept waking in the night. He lost his appetite and consequently weight.'
'Worry and sorrow. Suffered from nightmares about shooting incidents in general and from sleep loss for years following the incident . . . he deliberately distanced himself from his wife and family and from his colleagues . . . from being very extrovert he became extremely withdrawn and wanted to avoid conversation with colleagues' (Manolias and Hyatt-Williams 1986).

Stephen Homewood, the assistant purser on the *Herald of Free Enterprise*, describes his feelings in the days, weeks and months following the ship sinking: 'In the early days after the *Herald* tragedy I had bad nightmares. They all concerned – not surprisingly I suppose – water, always masses of rushing water.' His irritability increased and his anger would out at the nearest thing to him, 'I would fly off the handle at the simplest thing, and Anne would be the one I would have a go at. I felt that, like everyone else, she did not understand what I'd been through' (Homewood and White 1989).

His psychiatric well being deteriorated sharply and he began '. . . seeing the faces of the dead on the bodies of the living. I was seeing the names of the dead written where the names of the living had been put down.' At one stage he had the sensation that other people could read his mind without ever seeing or hearing him. These reports are extreme especially in someone of previous psychological stability but fortunately he undertook counselling and support through the Herald Assistance Unit and psychiatric inter-

vention through the South East Kent Health Authority. His loss of interest and concentration is revealed in a psychiatric report in October 1987, seven months after the sinking, produced by Dr Peter Storey:

> He is much more apathetic than he used to be, and finds it difficult to settle down and help at home, but this is improving . . . he had previously been a man who enjoyed active involvement in home maintenance, and so on, but he found it difficult to concentrate on this, and he has become relatively apathetic about it, as about other hobbies and interests.

Stephen Homewood was far from being alone in either his reactions or the severity of his reactions. He quotes a senior social worker at the Herald Assistance Unit, Janet Johnston, and reported her findings that: 'One survivor can still feel today his wet socks on his feet . . . gentle men became violent; aggressive men became apathetic.' She talked of symptoms such as attacks of panic, palpitations, loss of appetite, nightmares and muscle pains. She spoke of careers being blighted, personalities changed.

During the Bradford football stadium fire PC David Brittan was seen on television by millions as he attempted to rescue a man who was having difficulty getting over a wall while the back of his clothing was alight. During the rescue David Brittan's own hair burst into flames and he became a casualty himself:

> I was in hospital altogether for 19 days. I don't think any psychological effects showed themselves for about eight or nine weeks, when something happened then that affected me very badly. I was coming on duty when I got a 'phone call to say the gentleman I'd rescued had just died. I'd got to know him, I'd visited him in hospital and met his family: but for all their tremendous efforts the hospital hadn't in the end been able to save him. I sat down and I cried and I cried, not for me but for him and his family (Parker 1986).

RESCUERS AS VICTIMS

It is too easy to become blind to the rescuers. It is far too easy for the rescuers to become blind to themselves. When this happens then rescuers too become victims. This problem can be compounded because an emergency worker who does not see himself as the type of person who needs professional help will not seek it no matter how readily available it is (O'Brien 1979).

A senior nurse on duty during the Hungerford shootings found herself mentally replaying everything that had happened, she reviewed all the actions she took, all the decisions she made with resultant insomnia. Two days after the incident she found herself still replaying the shootings, still hyperactive and insomniac. She found herself tense and irritable, she '. . . needed a good cry, but was unable to do so.' On the fourth day following the incident someone asked if she was okay whereupon she finally 'broke down'. This in itself appears to have brought some relief which was further helped by counselling and debriefing sessions. Functional recovery was not immediate and she admitted to being unable to operate effectively for some time afterwards. Once this nurse found herself unable to cope with a shotgun injury which arrived at the hospital following an armed robbery. These difficulties appear to have lasted about eight days (Fawcett 1990).

This nurse also noticed that her nursing colleagues on duty during the Hungerford shooting showed symptoms similar to her own. Everyone experienced insomnia and most showed signs of hyperactivity. There was an initial period of euphoria which lasted for several days before crashing into a depression which lasted several weeks. This was accompanied by irritability and an unfocussed anger which welled up and exploded.

Similarly, a senior nurse who dealt with the downing of the Air India jet off the coast of Ireland with the loss of 329 lives found that tiredness and hunger overcame herself and her team but that it was not recognised by them at the time and the group had eventually to be ordered to the dining

room and to eat. It was then, when their condition was finally recognised, that some relief seems to have settled on the group as shown by her comment '. . . and we ate and talked and laughed' (Wall 1990). In recent years the realisation that rescue, recovery and support personnel which include medical, nursing, police, mountain, cave and sea rescue, fire services and auxiliary teams, are also prone to post-traumatic stress disorder, has prompted some formal investigations. One of the first key studies to look at rescue personnel followed the Granville Rail Disaster in Australia when a derailed train crashed into a bridge stanchion bringing down a massive concrete slab which crushed the train carriages and killed 83 people. Studies of the 95 workers involved in the rail disaster revealed the following experiences as being most stressful to them: feelings of helplessness, the magnitude of the disaster in terms of the numbers of dead and injured, the unexpectedness of the event, the sight and smell of dead bodies, the anguish of relatives, the suffering of the injured and the need to work under extreme pressure (Raphael 1990).

On September 25th 1978 a Cessna light aircraft and a PSA 727 jet liner collided over San Diego, California (USA) killing all 135 airline passengers, both Cessna passengers plus seven people on the ground. Over the following two months 27 members of the rescue and medical services who attended the disaster received counselling focusing on their role in the disaster and their reactions to it. As with other large tragedies these rescue personnel found that memories of the incident would surface piecemeal to be relived and reworked. They suffered loss of sleep and nightmares, marked apathy or hyperactivity, anxiety, fatigue, social withdrawal and physical complaints such as muscle tension, headaches, and digestive disorders. There was a tendency to over indulge in such activities as eating, drinking and smoking. The counselling sessions lasted between six to eight weeks following which all but two were able to return to work (O'Brien 1979).

It does not require a major disaster for emergency personnel to find themselves showing psychological discomfort.

Notifying a person of the sudden and unexpected death of a spouse, child or other relative is not a minor task but it is one which falls routinely to police officers. A study into death notifications by police officers (Brewer 1990) found that the bereaved upon being notified by the officer passes through the phases of crying, denial and withdrawal. The most difficult phase for police officers to confront is that of crying although it appears that nurses can handle this part much more easily. It is expected that the bereaved should show such symptoms of shock and grief, however, these symptoms also appeared in the police officers themselves. The study found that after informing a person of a bereavement 30 per cent of officers suffered sleep disturbance 15 per cent were prone to crying and 10 per cent showed anger, shock and an inability to remove the experience from their mind. Interestingly, most anxiety and shock was experienced by the officers on receipt of the death notification tasking message but that this frequently went unnoticed. Death notifications are frequent occurrences and yet police-officers were found to still suffer stress following the second and more death notifications. The job does not become easier.

The concept of a personal threshold to the amount of trauma that an individual can tolerate is not a new one. Simple observation shows an apparent threshold at which rescue work begins to overwhelm a person. It is argued that each person has a trauma threshold which is not fixed but which is open to influence by many factors. A few of the more powerful influences which can lower this threshold include divorce, death of parent, child or spouse and personal religious conflict. If the intensity of the rescue work exceeds this threshold then psychological breakdown begins. This breakdown is characterised by verbal outbursts, nausea, vomiting, crying, irritability, irrational behaviour and symptoms of general distress or apathy (Nydam 1983). Such behaviour has been previously observed in England during World War II in veteran rescue workers and fire wardens who had repeatedly undergone severe bombing raids (Glass 1959). A similar condition, known as the 'Old Sergeants Syndrome,' was first reported in 1949 by military

psychiatrists who were treating patients for psychiatric disturbance following prolonged combat operations (Sobel 1949). These psychiatrists noticed that the most striking cases presented were amongst previously well motivated and efficient non-commissioned officers with much combat experience and excellent fighting records. In one study a group of over 100 such soldiers were seen by psychiatrists from March to November 1944. Many had fought through both the Tunisian and Italian campaigns with excellent records. Their officers regarded them as the backbone of their unit and they were amongst the best and most effective of the trained and disciplined infantry soldiers. Many had received citations, awards and medals for outstanding combat and devotion to duty. Nonetheless, at some point the individual personal threshold of these men was breached. They began to show a high degree of anxiety, depression, self recrimination (e.g. for leaving his unit), sweating and trembling. Contrary to their previous behaviour they found themselves being the first into a foxhole and the last out. They lost the ability to make quick decisions involving the lives of others, their ability to handle responsibility was eroded and along with it went their self confidence. Their efficiency diminished to the point where they sometimes became a liability to their unit (one previously excellent staff sergeant left secret papers strewn around his command post which were picked up by a British patrol). Despite these problems the men showed no loss of motivation and would try to pursue their duties and responsibilities often desperately trying to continue with operations they were no longer capable of handling. They possessed a fear of letting their comrades down and in a few cases the men requested their own demotion because they felt guilty at holding a rank while unable to carry its responsibility.

Even after these men had been evacuated to war posts their motivation persisted but so did their loss of efficiency and self confidence. Men who had previously been in command of 30 to 160 men were now willing to perform simple tasks. They no longer wished to handle men and truck driving became a popular and frequently requested job.

One case may be presented to demonstrate this type of effect. This concerns a 28-year-old staff sergeant who had served for 48 months, of which 25 had been overseas, and who had seen a total of 280 days of combat. He had been wounded twice, including once in hand-to-hand fighting at Cassino. He reported that he had become excessively nervous after the breakthrough from the Anzio beachhead.

> 'When I lost 11 men in one day, that was the beginning. I lost the medics and had to take care of them myself. I didn't have no aid bag, no bandage; it was a pretty rough job. It makes me feel pretty sad to lose all those guys at once.' Asked why he had continued in combat, he said: 'I carried on as best I could manage because I thought I could make it. I was always able to take it, but the captain told me to go back and see the battalion medics. I was just nervous and couldn't handle my job. Every time I would get under shellfire I had 40 men to control, and my place wasn't in the rear of the platoon. I just couldn't do it. I asked a month-and-a-half ago and a month ago to turn in my stripes, but they said I'd been a good man and they didn't want to take them away.' During his combat career this sergeant had had five platoon leaders, eight company commanders, five battalion commanders, and a threefold turnover in squad leaders (Sobel 1949).

This build-up in anxiety and decline in performance is progressive and insidious. One staff sergeant described his condition thus: 'I can't put any definite time on when I felt myself slipping; it is like a flower that grows.' In otherwise healthy men who had withstood combat personal disintegration stemmed from prolonged responsibility. Given that these problems arose from a situational reaction, one of the most effective treatments was found to be reassignment away from the immediate battle front but close enough for them to feel that they were actually supporting their colleagues in the combat zone. More recent work has shown a strong correlation between the number of psychiatric casualties and the

numbers wounded in action; between combat stress disorder and the severity of the stress induced. The longer the time spent in combat and the greater the number of comrades killed or severely injured, the greater the incidence of psychiatric disturbance (Romo and Schneider 1982). Such disturbance can continue long after the cessation of hostilities. Frye and Stockton (1982) found 43 per cent of otherwise successful Vietnam veterans to be suffering from moderate to severe PTSD 10 years after combat. Two of the more common factors leading to the onset of PTSD in these men were firstly, the high incidence of combat and secondly, on their return the lack of help and understanding from their wives, parents and families.

Interestingly, a feeling of helplessness in the soldier during operations also seems to be a key contributor to stress disorder following warfare. In the case of Vietnam veterans this feeling of helplessness was ascribed to the type of warfare being conducted, a jungle operation with a high level of unpredictability and uncertainty. Similar effects have been found amongst United Nations peace keeping forces who, although faced with the risk and likelihood of combat, frequently find themselves unable to retaliate (Weisaeth and Sund 1982).

THE OTHER SIDE OF SURVIVORSHIP

Post-traumatic stress disorder is currently of major medical, scientific and legal interest. Consequently, there is a tendency to believe, because of its common interest, that PTSD is also commonplace; that anyone who suffers a disaster will become a victim to chronic post-traumatic stress disorder. This is not always so and it may help to show the other side.

Essentially, the other view says that while acute psychological disturbance occurs in the short term (up to a few weeks following the disaster) the longer chronic reactions are infrequent and are usually a consequence of a variety of

factors of which the disaster impact is but one. It is argued that long-term psychiatric disturbance is overstated. This view was originally proposed by Fritz and Marks (1954) and has received support from other studies of various disasters (e.g. Drayer 1957, Quarantelli and Dynes 1977, Drabek and Key 1976, Sterling *et al.* 1977). It has been further argued that much of the post-trauma morbidity found in various studies may well have been present before the disaster and that this would not have been detected by post-hoc studies. In other words if a person is psychologically unstable before a disaster he will certainly be so after a disaster. Even this latter point is not so clear cut as it at first appears. Perry and Lindell (1978) report that a few investigators have even found some previously classified 'unstable' individuals (particularly those diagnosed as senile) who have briefly demonstrated 'stable' behaviour (usually task orientated helping activities) during a disaster. Perry and Lindell emphasise that this finding has not been consistently reported and in each case the individual quickly reverts to a mentally ill state. They acknowledge this as an interesting anomaly, yet it is but one among many paradoxes in survival.

If, as suggested above, chronic PTSD may not be as commonplace as currently thought, and that some mentally ill individuals show a short term recovery during disaster, then just how far can this approach be taken? Is there evidence that disasters, or perhaps more accurately survivorship, may actually prove beneficial to some people? The evidence for such beneficial effects, while not overwhelming, is enough for them to be considered seriously.

In 1973 a cargo ship was wrecked off south west Tasmania casting seven survivors out of a crew of 10 adrift in a small rubber raft. Following nine days at sea they landed and spent another four days in dense bush before being found by a logging contractor on the 13th day. A psychiatric follow up study after 12–24 months following the shipwreck revealed that while five survivors showed symptoms consistent with post-traumatic stress disorder one survivor had taken on increased personal responsibilities with which he was coping well. This survivor showed himself to be psychologi-

cally healthy while yet another claimed to have actually benefited from the experience. He saw himself as being more resourceful and as having gained more enjoyment from his marriage and parenthood as a consequence (Henderson and Bostock 1977).

Former soldiers will smile at their recollection of combat and insist that their time in uniform was (usually in retrospect) of positive benefit to them. One former British prisoner of war has remarked that: '. . . the experience of being a PoW did me a lot of good, for I believe that many things fell into place. I certainly was a far better solicitor after the war than I was before it. I think it gave you a far better understanding of people. You began to accept the fact that they could make mistakes with the best motives in the world' (Garrett 1988). A former British Special Forces soldier with much combat experience and former PoW described his time in uniform as '. . . the best days of my life' (personal communication).

Survivors of concentration camps have shown strengthened personal and survival skills and have made good socio-economic recovery on release (Thompson 1985). Radil-Weiss, who survived Auschwitz, claimed that the experience had strengthened him and had proved to be of personal benefit.

Herein lies yet another paradox in survivorship. Some people will come out of disasters in better condition than when they went in.

SUMMARY

1. Surviving can be a thankless task. It is not uncommon for survivors to show severe distress following rescue with difficulty in readjusting to everyday life.
2. Many survivors will show symptoms of short-term distress as they come to terms with what they have suffered. A few will show long-term psychiatric disturbance often requiring medical intervention. This chronic distress has

now been officially recognised as post-traumatic stress disorder.

3. Rescuers are also susceptible to post-traumatic stress disorder. There appears to be a personal trauma threshold beyond which the rescuer is overwhelmed and becomes himself a victim. The breaching of this trauma threshold may be sudden and explosive or progressive and insidious.
4. A few survivors may actually find their experience to be personally beneficial. They show themselves to be psychologically healthy following the disaster and frequently report that their personal and working lives have improved, their sense of purpose has strengthened and they have a much clearer perspective on their own lives.

Appendix

AIDE-MEMOIRE: PSYCHOLOGICAL FIRST AID (for full details refer to Chapter 5)

1. Look to **SELF**
   a. Be aware of own condition (functional, stunned, hyperactive, confused etc.)
   b. Seek to grasp overall picture of disaster
   c. Do not become overwhelmed
   d. Establish purpose and prioritise tasks (survival pattern)

2. Look to **OTHERS** ('psychological triage')
   a. Functional – use these to support survival pattern.
   b. Non-functional – dangerous to self – assist these to pull through.
   c. Non-functional – dangerous to others (those in need of psychiatric help) – assist, restrain, monitor.

3. Bring self and others through recoil (post-impact) period as quickly as possible. This is critical for survival.

   a. **Pass 1** – establish roll call/identification and injury list.
      (1) *civilian* – name, address, nationality, date-of-birth, next-of-kin.
      (2) *military* – name, rank, number, date-of-birth, next-of-kin.

   b. **Pass 2** – identify skills, trades, knowledge, hobbies etc. of use to situation. People will not volunteer information, you must extract it.

   c. **Pass 3** – have victims **ACT** to support survival. Give simple *directed* tasks which do not require initiative or responsibility.

4. Establish communications/information link.

5. If possible have someone 'sit' each badly injured casualty. This is a tremendous comfort and morale booster for the victim.

6. Children
   a. Always appear calm in front of children.
   b. NEVER separate families.

7. Look to **SELF**
   a. Post-traumatic stress disorder.
   b. Rescue trauma

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