

## GALE MEMORIAL LECTURE

# Survival\*

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IT is a great pleasure and honour for me to give the fourteenth Gale Memorial Lecture. I can think of no better title for my talk tonight than 'Survival' for by creating this Memorial Lecture you have ensured Arthur Gale's survival in a way I am sure he would have appreciated. I would even like to think that wherever he is tonight he will know that we remember him as a pioneer in postgraduate medical education and a great friend and helper of your Royal College and especially the South-west England Faculty. I believe he would be pleased with the advances made in general practice in recent years and the maturity already achieved by the Royal College of General Practitioners.

We also have an interest tonight in the *Mayflower* and the Pilgrim Fathers; for Plymouth, particularly in this Mayflower Anniversary Year, claims a special association with this adventure. I take a certain personal pride however in the fact that the adventure actually started in the early fifteen nineties a few miles from my own home town of Sheffield in the Manor House of Scrooby where William Brewster and a few friends founded the movement which became the Pilgrim Fathers who were truly the ancestors of the United States of America. In 1607 they found things becoming rather hot in Yorkshire and slipped over to Holland. This was the most perilous part of their travels. They were caught in a severe storm in the North Sea and were driven hither and thither with neither sight of sun, moon or stars for 14 days, not knowing where they were. When the frightened sailors believed the ship to be sinking the Pilgrims fell on their knees and prayed with such faith and fervour that the ship weathered the storm. They reached Amsterdam where they held a solemn service of humiliation and thanksgiving for their deliverance. Prayer in storms at sea comes easy and is a great comfort.

They had a tough time in Holland and finally left in the *Speedwell* to pick up *Mayflower* in Southampton. The *Speedwell* was a leaky ship and after putting into Dartmouth and Plymouth for repairs was finally abandoned and returned to London. The Pilgrim Fathers finally left Plymouth on Wednesday 6 September 1620 in the *Mayflower*. It was an uneventful crossing but 350 years ago this very night these good people were at sea.

Their real problem of survival began when they set foot in Plymouth USA on 11 November the same year. But here I would like to leave the Pilgrims and, as this is a medical occasion, devote the rest of my time to the more practical problems of survival. But first a footnote: Every year in Quakertown, Pennsylvania a service of remembrance is held for the Pilgrim Fathers. Recently the service was interrupted by a very old lady who shouted: 'Year in year out we have given thanks for the courage of the Pilgrim Fathers who battled with the elements, fought the Indians, faced starvation, suffered sickness and stood up bravely to all adversity—but we ain't never heard tell of the Pilgrim Mothers who bravely put up with all these same things—and with the Pilgrim Fathers too'. Survival is more than just staying alive in adverse conditions. It is learning to live in a potentially hostile environment with happiness and personal achievement.

\*Being the fourteenth Gale Memorial Lecture delivered before the South-west England Faculty in October 1970 in the postgraduate medical centre, Plymouth.

The highly mechanized, fast moving unsettled environment in which we find ourselves today is indeed a hostile one though full of opportunity and promise. If we are to come to terms with it we should learn from the adventures of those before us who faced adversity with courage and imagination. It is appropriate tonight that we should look at those who have faced the hazards of the sea. Much can be learnt from the stories of shipwreck.

The sea is like a woman—unpredictable, sometimes gentle, comforting and quiet, sometimes aggressive, violent and overwhelming.

Of the many goods accounts of shipwreck perhaps that of the *Medusa* is most harrowing. Following the defeat of Napoleon she was commissioned, with the approval of generous victors, to repatriate the French colony of Senegal in 1816. The captain had with him a mistress and large supply of wine; with these he retired to his cabin leaving the ship in charge of a philanthropic passenger who claimed to be an experienced navigator, though he had never gone to sea. There were on board 400 'souls', including the colony's new governor and staff, soldiers and craftsmen with their families as well as the crew. The ship ran aground on a sand bank in calm weather off the West African coast. It would have been easy to lighten and refloat her but the soldiers refused to throw ammunition overboard, the governor his stores and the captain his wine. They spent days arguing and drinking until a storm arose and the ship began to break up. The captain with his girl and a few sailors, the governor and staff and a few officers went off safely to the shore in the ship's boats, half empty, leaving 163 on board. They built a raft 65 ft. x 23 ft., left 17 drunks on board and set off with no charts, no food, hardly any water but several casks of wine and brandy. On the first night 20 drowned, on the second they all got drunk and fought until only 67 were left who became mad with thirst and hunger and finally set about eating the corpses which lay on the raft. On the seventh day only 27 were alive and they decided there was only enough wine left for 15 so they threw the weakest 12 overboard to the sharks. These 15 lived another 13 days before being picked up. Meanwhile back in the grounded *Medusa* only three of the 17 drunks remained alive when found. Two died in the rescue vessel and the third was murdered before he could tell his story.

By complete contrast is the loss of the *Birkenhead*, a British troop-ship, off South Africa in 1852. She was taking much needed reinforcements to the Kaffir war and had 600 souls on board including 20 women and children. In cutting a corner to save time she ran on to a rocky reef, broke in two and sank in 25 minutes. The captain—Captain Salmon—took complete charge. The horses were driven overboard to prevent them running wild, which satisfied the waiting sharks. It was on this occasion a captain first gave the classic command 'Women and children first'. They got away safely with 60 key persons and crew in the only three remaining boats. Meanwhile the soldiers had 'fallen in' on the deck with drums playing. They remained in their ranks until the boats were out of reach for fear that if allowed in the water they might overcrowd them. Once they were well clear the order was given 'every man for himself'. Two hundred and ten swam safely ashore.

Time does not allow me to give details of the many harrowing tales of survival where, in small groups, one after another died while the survivors lived on the corpses—in some not even waiting for death, but killing their dying comrades, drinking the warm blood and drying the flesh in the sun. (Perhaps there is little difference between using the flesh of a newly dead person to stay alive and the accepted practice of organ transplant). There are records too of hallucinatory figures beckoning castaways—often successfully—to join them in the water—the effects of blistering heat, freezing cold, violent storms, festering wounds, thirst, starvation, sharks and murder. But all this horror is enlightened by acts of unselfish heroism, rewarding discipline and leadership, the comfort of prayer and companionship and above all the will to stay alive.

The above two shipwrecks demonstrate the need for training, experience, discipline and planning and show the hazards of alcohol, greed, starvation and thirst. Let us select a few more recent examples and see what they teach.

The *Titanic* struck an iceberg in 1912 on a calm clear night. She sank quite slowly but there was some panic. Only 712 got away in the boats. Though there were life jackets for all, 1,500 bodies were picked up two hours later. All had died, not of drowning but of cold, of hypothermia.

More recently in 1963 the *Lakonia* caught fire and 113 persons died. The abandoning took place too quickly, for the most experienced seamen were busy fighting the fire leaving the welfare of passengers to frightened stewards. Of 58 post-mortem examinations only 11 showed exposure and drowning alone, 48 had head and neck injuries from jumping from a height into the water wearing the rather solid life jacket round the neck.

The one survivor from the trawler *Rose Cleveland*, not very long ago, owes his life to his experience, good training, the use of an inflatable rubber raft and adequate survival clothing.

The young trainees who drowned in Plymouth harbour a few years ago, when their whaler over-turned in a squall, died because they were not wearing life jackets. Francis Chichester and Alec Rose sailed single handed round the world because they were experienced, mature and had calculated and prepared for the hazards ahead. The sad end of Donald Crowhurst was, I believe, due to the effect of continued loneliness and conscience affecting his mind with fatigue and possible hallucinations in his final hours.

Disasters at sea still occur. Lloyds register shows that each year between 500 and 600 ships are sunk with a loss of 2,000 lives. Of these 45 per cent are due to errors in navigation, 16 per cent to fire and only 8 per cent from storm. Of the total sinkings 30 per cent are fishing vessels.

If we look at the hazards as they occur we are first faced with injury caused by the actual accident, the impact of collision, listing and motion of the vessel and the dangerous procedure of abandoning ship either into a rubber raft, solid life boat or the sea itself.

In the water the immediate threat is drowning from which the life jacket gives some immunity. It should be inflatable and well fitted to prevent damage to the neck on impact with water. It should support an unconscious person face upwards.

In northern waters cold can kill in minutes and a lightly clad person might not survive more than an hour in the waters of the English Channel. Attempting to swim, except for fat persons, only increases heat loss by bringing more blood to the surface. It is best to relax and hope to be picked up. When threatened with ship-wreck ample warm clothing is just as important as the life jacket.

In the tropical and subtropical waters where the temperature exceeds 70° F as we know from a recent example, a man may fall overboard and remain alive for 12 hours or more. Sharks here, however, are a major cause of death. Little can be done to deter them. Repellants are of unproven value. It is better to face them and hope to scare them off.

The next problem is survival in the raft or life boat. The inflatable rubber raft with its canopy gives the best protection from the environment but its motion is somewhat uncomfortable. Rigid boats give a better chance of reaching shore, but with today's improved search organizations and communications, it is wiser to stay at the site of the disaster.

Thirst is the major problem. Without water death will occur within a week. At least a pint a day is needed to maintain life depending on the climate. It is the most important single requirement for survival and usually carried in tins. De-salting tablets are available but costly and Solar Stills are temperamental. Sea water must never be

drunk nor used to eke out the fresh water ration. Food is less important and survivors can manage for six weeks or more before they need to start eating one another!

It is in the exposed rafts and open boats that survivors may really suffer. There may be overcrowding and injury from the start. Days may be intolerably hot and nights freezing cold and survivors at all times harassed by drenching spray and irritating salt. Skin lesions are frequent; fatigue and sleeplessness produce hallucinations, morale cracks and unless there is mature leadership, violence and suicide are common.

Experience and study, particularly during years of war, have greatly improved safety at sea and produced guide-lines to survival in other adverse media. Survival is in essence the ability to overcome the hazards of the environment and one does not need to explore the jungles, the mountains, the seas or outer space to find them. Our everyday life has its share and we need to ensure that ourselves and our successors are equipped to face them. I believe we are in a position to look at the factors involved and would suggest a formula for 'survival' (S) where those factors which may help or hinder survival are (C), 'chance' and (E), 'environment'. Others which would improve the possibility of survival are 'training' (t) in any particular skill, 'maturity' (m), and 'safety precautions' (s). Consideration should also be given to those factors which prejudice survival such as 'accident proneness' (p), 'risk acceptance' (r) and 'personal physical factors' (f), thus:

$$S = CE \frac{tms}{prf}$$

In any specific situation the relevant value of the various factors can be assessed or measured. Chance as a purely random happening, is beyond human control and must be accepted as the basis of all physical and biological evolution and indeed it plays a vital part in the survival of any one of us. The environment may be natural or man-made and our success depends on our physiological adaptation to it or our skill in its control. No one would question the value of training or the true worth of maturity which includes morale. Safety precautions we would accept with reservations as measures applied with moderation and never advocated as alternatives to care and skill. Accident proneness we see as an exaggeration of the natural anxiety, the alerting mechanism which helps us to face the stressful situation. It is a form of mental illness, an anxiety state, associated with inadequate adjustment to reality and common in members of the broken home and those subject to sorrow, anger and frustration. Risk acceptance is a vital factor of great personal significance. We all know what risks men and women will take when faced with hunger or threat to life. Even in every day existence risks are taken for fortune, fame or fun and the value of many safety devices is lost if the accepted risk remains the same. Human factors, as distinct from accident proneness, include those temporary disabilities which reduce alertness and efficiency such as alcohol, hangover, drugs, illness, fatigue and hunger.

Such an equation might form the basis of an education programme from a very early age and calls for joint action by teachers and doctors in a campaign to improve our chances of survival.

If there is a 'medium' in the house—will she convey our greetings to Dr Gale and our wish that his memory will long survive in these Memorial Lectures, and finally let us take a trip back 350 years in time to wish the *Mayflower* and all who sail in her God Speed. Their survival in our hearts and history books is well assured.

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