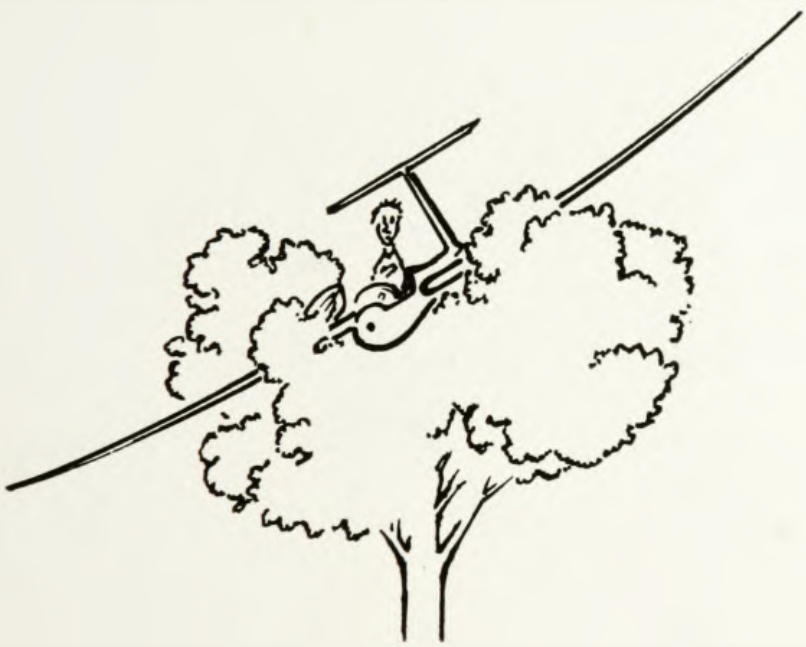
ANTICIPATION • AVOIDANCE • SURVIVAL

ACCIDENTS HAPPEN



ANN WELCH

Why do light aeroplane pilots fly into clouds stuffed with mountains? What causes balloonists to sever high-voltage power cables? How has a yachtsman had his bowsprit run over by a train? According to Ann Welch errors such as these – sometimes resulting in fatalities – cannot be attributed only to carelessness, misapprehension or poor memory; the reason lies deeper. At a time when opportunities for involvement in sports such as diving, flying, mountaineering and sailing are at their greatest, we risk becoming less capable of doing them safely or competently through lack of practice in being responsible for ourselves.

The problems of confusions and mistakes which can arise in leisure activities using sophisticated equipment, such as gliders or scuba gear, are examined. The author goes on to discuss many related aspects ranging from the effects of poor equipment design in light aeroplanes to the disorientating consequences of alien environments, for example being trapped under water or lost in fog. As a sailor, a highly qualified aeroplane pilot and experienced gliding instructor, Ann Welch lays particular emphasis on the role of the instructor as a maker of safety or potential disaster, and on the importance of clear communication.

Numerous true stories – some ludicrous, others hair-raising – illustrate not only what sort of predicaments ordinary, sensible human beings can so easily become involved in, but *how* such situations develop and how people can overcome them.

Accidents Happen is essential reading for all those concerned with safety in sport and is absorbing to read because of the realisation that 'There but for the grace of God go I.'

Illustrated by Piers Bois

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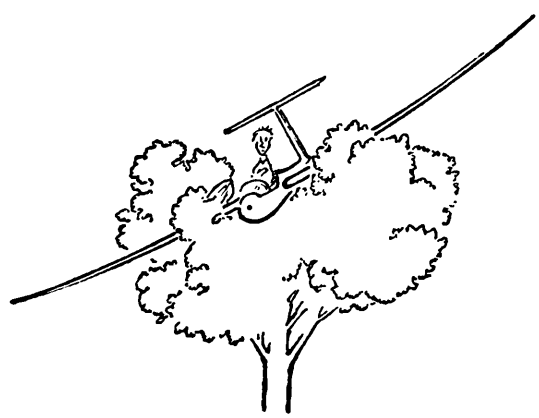

JOHN MURRAY

My son shall learn to sail a boat before he drives a car. In a sailboat he gets power only through his discipline and his ability to meet and master nature. But in the motor car he gets power without discipline and without control.

JOSIAH ROYCE

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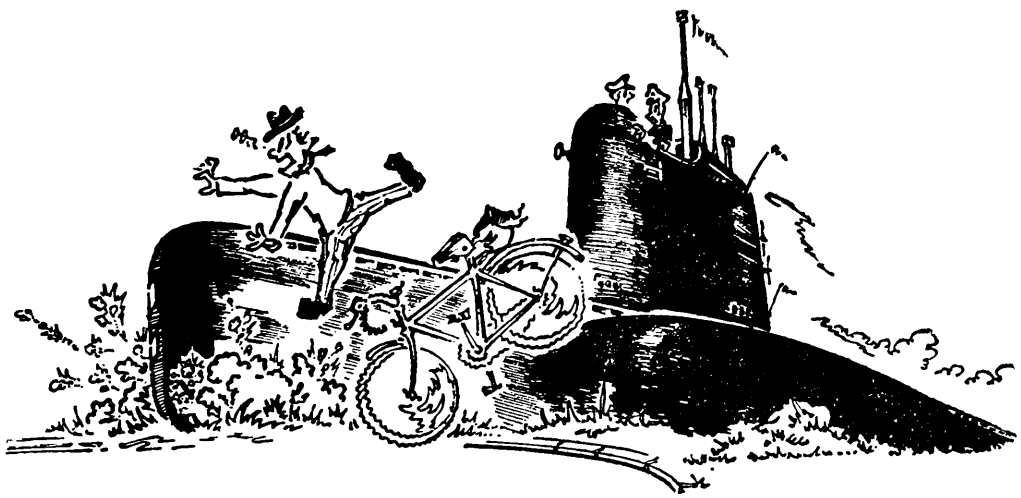
✧ CONTENTS

Part One: Being Human is Trouble

✧ INTRODUCTION

It is quite difficult to invent a new accident; almost every possible confusion has already occurred – a submarine has collided with a cyclist, an aeroplane towing a glider has taken off without a pilot in either aircraft, and a yachtsman has had his bowsprit run over by a train. There is nothing surprising in this because all of us make mistakes most of the time and there are a lot of people in the world all hard at it. Accidents are part of the constant trial-and-error process of living and they result from the fumbles that start with the intrinsic experiments of childhood and continue right through to the forgetfulness or confusion of old age. Along the way the possibilities for disaster are considerable.



Since a book about accidents in general would be endless, these pages are limited largely to the perils and problems arising from such activities as flying, sailing or sub-aqua diving where, in addition to human follies and foibles, there is the often complex operation of sophisticated equipment. In or under the water, on high mountains, or in the air the human not only has to try to avoid making his usual run of everyday mistakes and use his equipment properly, but is also in a hostile environment. He cannot

just stop by the roadside and take a breather. He has to sort out any problems which occur, or which he creates, for himself. Although all these activities are fun and give enormous pleasure, they also impose a harsh discipline which for most of the time may not be apparent. They charge a high price for just the same sort of mistake as forgetting to post a letter, running the car too low on petrol, or putting tea in the coffee pot. Life suddenly changes from one in which small errors are mostly not important into one where they can be vital.

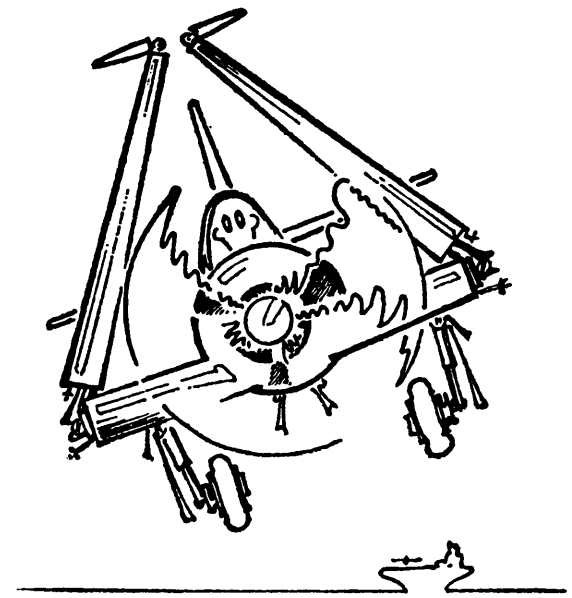
The problem is that most of us live in a regulated and protected world. If something is lost it can be replaced, and is frequently paid for by insurance. If we are ill, even through our own fault, a vast system exists for repairing the damage. Food is available pre-washed, frozen or canned; warmth and water is on tap. Street corners have guardrails to stop us from walking under a car and beach-guards prevent us carelessly drowning ourselves. If we fall over the cliff the vigilant coastguard will pull us up again. If we drift out to sea on a li-lo the R.N.L.I. will fetch us back to the friendly land. All this is very nice and convenient, but it has resulted in a fairly massive loss of those qualities of self-reliance, even of individual responsibility; we have become citizens of the Dependent Society. At a time when the opportunities for involving ourselves in things like flying, diving, sailing and mountaineering are probably at their greatest, we risk becoming less capable of doing them either safely or even competently, because we have become out of practice in being responsible for ourselves. We fail to appreciate that everything that is provided, whether it be a supermarket, regulations and licences, or packaged courses of instruction take something away from our ability to select, or to take decisions; for making up our own minds and working things out – for ourselves. It is easy for the pilot with a valid medical certificate to feel that it is no longer necessary for him to decide for himself whether he is actually fit to fly, and natural for a person completing a dinghy sailing course to feel that he is now 'qualified' when in fact he has been taught only pre-selected aspects of boat operation.

Living in a dependent society offers little incentive either to want, or be forced, to do anything properly. There is no need to

preserve food carefully in the summer to avoid starving in the winter. There is no need to become highly skilled at work because there is the dole. It is only, and it may seem surprising, in the so-called recreational activities, like flying hang gliders or diving, that it becomes apparent that here is something which it is essential to do properly; because the price of failure could be our own neck.

Mistakes and accidents, because they are such a fundamental part of life are sometimes very funny; the discomfiture of others raises great hilarity – the banana skin syndrome. But they may also be expensive, time-wasting and tragic. Obviously, it is desirable that accidents should as far as possible be avoided, at least the inept and unnecessary ones. However, they will never cease, and attempts to prevent them by warnings or regulations are sometimes counter-productive. Over-regulation can produce not only genuine failure to know what the rules are, but reaction against them. Basic rules, such as stopping at red traffic lights, are obviously sensible, are obeyed, and create a safer situation. With over-regulation, as with over-protection, particularly when it also adds to the operating costs, safety declines. Accidents will occur less frequently only if we understand what causes them, particularly those produced by our own human errors, and if responsibility for our actions – and the result of these actions – is carried firmly on our own shoulders. There is no question of turning the clock back; aids, organisation, and services are likely to increase, rather than go away; we need to appreciate that in the ultimate no one is concerned with our neck except ourselves. We need to go about things on the basis that no one will be around to help overcome our problems or dash to the rescue. We need to bring a little nearer the surface those fast disappearing instincts for survival. Having an accident is not really anything to be pleased about, and certainly most of us feel our feathers thoroughly ruffled if we make a nonsense of something. It is easy to blame others, but usually the fault is our own, so we are in the best position to learn from whatever folly it is we have perpetrated – if granted the opportunity.

All the stories in this book are true but it may seem that most involve flying or sailing. This is not because these two activities have the most accidents but because those that do



occur are in general well documented and because the variety of errors that can be made is wide ranging. But it is only the technology that is a bit different from other sports, such as diving, parachuting, mountaineering, or ballooning: the mistakes are the same.

The stories and information in this book have been drawn from many sources, and the most valuable have been the published first-hand accounts of mistakes and confusions written honestly by the victims themselves. My grateful thanks are due to them and to the editors and publishers of the many magazines and handbooks who obviously believe in a practical, common-sense approach to safety, including: *Aerostat, AOPA Pilot, Australian Safety Digest, Climber and Rambler, Coastguard, Flight International, Flight Safety Bulletin, Hang Gliding,* HMSO safety publications, *Lifeboat,* Ogwen Valley Mountain Rescue first-aid publications, *Pilot, Pilot Privé, Practical Boat Owner, Sail, Sailplane and Gliding, Skin Diver, Soaring, Sport Parachutist, Triton, Yachting Monthly, Yachting World, Wings!*

I would also like to thank the following for their great co-operation and help: the Rescue Services of the Royal Navy and the Royal Air Force, H.M. Coastguard, R.N.L.I. Sail Training Association and Fort Bovisand Underwater Centre.

PART ONE

✧ *Being Human is Trouble*

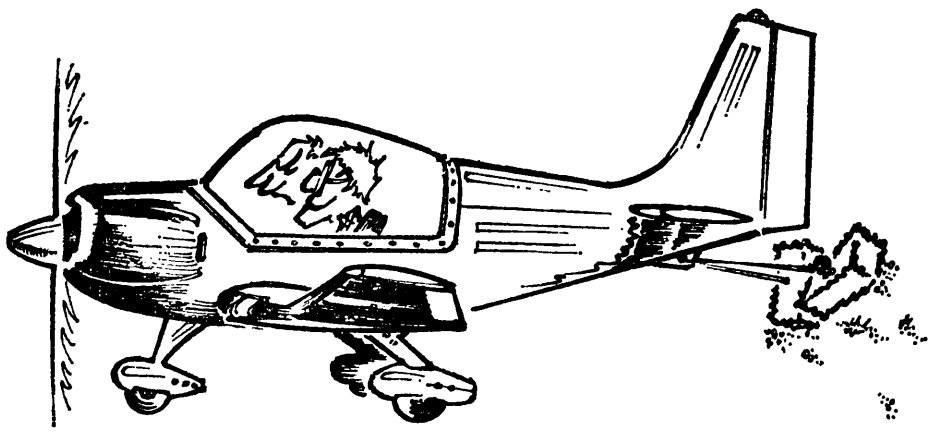
1 ✧ 'PILOT ERROR'

In the early days of flying the machines often went wrong, or fell apart, and such failures caused, and were rightly blamed for, most accidents. As aeroplanes improved and became more reliable accidents were blamed increasingly on 'pilot error'. This term persisted and was a simple way of allocating blame; if the aircraft was not found to be at fault, then the pilot must be – and often was. But 'pilot error' is neither a simple nor a single cause. It is many different causes conveniently lumped together, facets of human character which produce different actions or reactions, with all manner of fascinating confusions along the way. Pilot error includes forgetfulness, carelessness, unawareness or no understanding of the problem, irresponsibility, procrastination, pride, ignorance and straightforward incompetence. In a broad sense it implies that the individual was supposed to know enough to have appreciated that what he was doing was erroneous, and to have some understanding of the risks involved.

Poor Memory

At the top of the list of everyday errors and failings is forgetfulness or poor memory. The reason, too, is simple. There is just too much to have to remember. If one considers the amount of information – input and output, that most people cope with each day – much of it trivial or irrelevant, it is surprising that the average memory copes as well as it does. Support for this overburdened twentieth-century faculty is given at every turn, provided by dictionaries, telephone directories, yellow pages, address books, diaries, conversion tables, shopping lists, time signals and bank statements. But there is still too much that has to be remembered, not least of which are second-order requirements, such as where the shopping list was left. In general forgetting something is inconvenient rather than critical, and most people learn to live with their indifferent memories without too much of a

problem. But flying is unforgiving of forgetfulness, which is why formal pre-flight check-lists have become essential. Most light aeroplanes are quite complex devices in which flaps, power settings, fuel tank selection, pumps, beacons and brakes – air and wheel – all have to be operated correctly, otherwise the flight is inclined to be short on success. Nevertheless, in spite of having a check-list, and having been taught from the beginning to use it, some pilots still forget to carry it out at all, or completely. Recently no less than two pilots took off and flew to another airfield with concrete tie-down blocks weighing over 20 kg still tied to their



tails, one with a neat bow. They had done their cockpit check thoroughly, but did not check the aircraft as a whole. Another pilot took off with the carburettor heat in hot, when it should have been cold, the mixture control in lean instead of rich, plus the whole aircraft being 60 kg overweight – it never got airborne and two people were killed. Cockpit and pre-flight checks are intended to be memory aids, not a substitute for thought or a licence to forget. There are many pilots who have forgotten to raise their undercarriage after take-off, and then before landing gone through the motions of lowering it, only to find on coming to an abrupt stop that their unthinking hand had in fact finally raised it. It is not, of course, only pilots who need some sort of memory aid, even if it is only a three- or four-letter mnemonic which is easily remembered – more people forget to do their checks than forget the check mnemonic itself. Divers leap into the

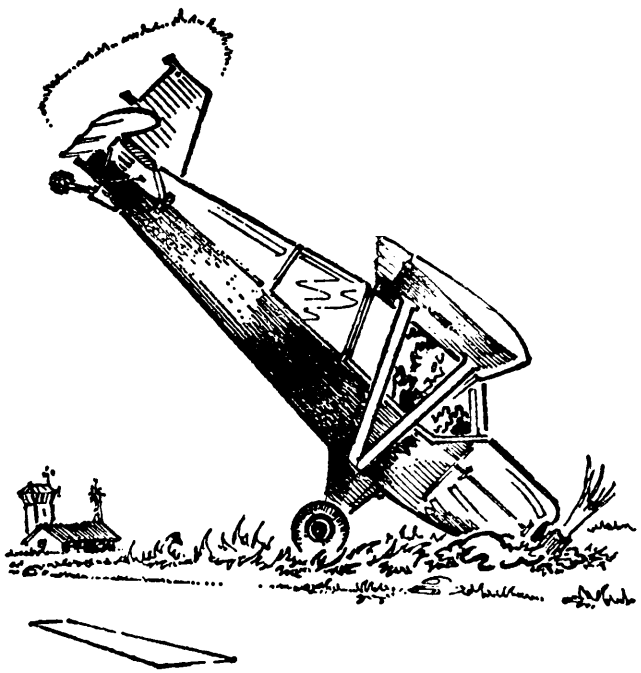
sea with their air turned off and come spluttering to the surface, glider pilots make record flights only to find they had never switched on the barograph, dinghy sailors put their boats in the water without the bungs in, and canoeists have launched into white water without a paddle. So-called mariners who forget to attach their anchor warp to the boat are two a penny. It even happened with a nuclear submarine. But it can become costly, as when a balloonist forgot to remain in the basket until the next passenger had got in to replace his weight; up it went with a faithful helper still hanging on to a rope. He got a damaged back. Hang glider pilots have taken off without remembering to clip their harness on to the aircraft. Some fell too far.

Carelessness

Carelessness, the next highest on the score-sheet, is a near relative of poor memory; but not quite the same thing. Carelessness is failure to appreciate that some action is important, or to think – if any thought is consciously made – that there is no difficulty. The careless person may remember his check-list but fail to do it thoroughly, or even at all. There was one pilot who shared a small Cub aeroplane with a friend, went out one weekday to fly it from their airstrip. He pulled the Cub out of the hangar and in his own words did a walk-round the aircraft followed by the normal pre-flight inspection. Satisfied, he got in, started up, taxied the few yards to the strip and opened the throttle to take off. About 50 yds down the runway the Cub swung off the tarmac and fell on its face in the grass, breaking the propeller. Amazed, the pilot clambered out to look at his poor aeroplane to discover that there was no rudder – it just was not there at all. His partner had taken it home the previous weekend to do a paint job on it and had forgotten – here we go again – to tell him. So much for a *careful* pre-flight inspection.

Another pilot, of a balloon this time, inflated his balloon in order to take his friends for a ride. He failed to check the wind direction or strength or to notice that it was now blowing 12 knots with considerable gusts. The balloon rose but also drifted fast downwind towards some 34,000-volt power cables. The owner applied full burn to attempt to clear the wires but the basket

touched the top wire. Arcing severed the cables holding the basket to the balloon and it fell 60 ft to the ground, killing two out of the three occupants. It was only a simple mistake but carried a savage price. Carelessness of the most minor sort resulted in a man falling into the sea while transferring from his dinghy to a speedboat. The only problem was that the speedboat's 90-hp engine was running, and in falling he knocked it into gear. The



inflatable inshore lifeboat was launched, took the man aboard and then pursued the speedboat as it raced around the harbour in wild circles, trailing its water-ski ropes. The problem was further complicated when on both the occasions that the lifeboat crew tried to return the man to his own boat he fell into the sea again. Twice the I.L.B. had to ram the speedboat to divert it from attacking the pier. Finally with a long boathook borrowed from a fishing boat the gear lever was knocked out of position.

Problem? What Problem?

Unawareness, or no understanding of the problem, lies between carelessness and ignorance. It is an inability to realise the implication of what might happen, or even what is actually happening.

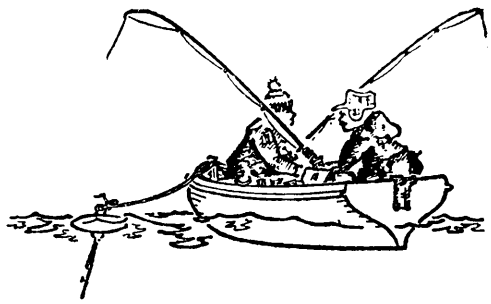
Unawareness may be inherent in some people – they live somewhat remote from actuality – but more usually it is due to ignorance of the subject. It ranges from parents who appear to be quite unaware that their children are drifting out to sea on airbeds, to the pilot who has got himself into weather conditions beyond his ability to cope with, and who is not equipped to know what to do next. Unawareness of this sort is a complex subject and turns up again in the chapter on learning. At the simpler end of the scale plain lack of imagination is a powerful contributor, as when some men were told to open up and clean out a warehouse for future use. The shed was empty, except for an old door lying in the middle of the floor, which the foreman detailed the men to throw out. They picked it up, one at each end and walked off, except that the second man went straight down a 40-ft shaft, which had been protected by the door.

It is easy to ask why anyone should have been suspicious of what might be under the door; nevertheless it is just this sort of awareness, imagination or even curiosity that helps people keep themselves alive.

Not much understanding of the problem was displayed by two youths who took their girlfriends to their boat without warning, so for a start girls were wearing unsuitable clothes. The boys pushed the small motor boat into the calm water with the girls in it, and left them to park the trailer. Quite gently the boat drifted away. The boys shouted for the girls to start the outboard, which was cocked up with the prop out of the water. But the girls did not know how to do it. The boys then shouted for them to throw out the anchor, which they did. But no one had ever attached the warp to the boat. Finally the lifeboat had to be called out to retrieve them. No harm was done, but this sort of unawareness is commonplace.

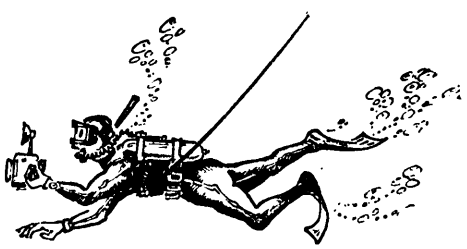
It is sensible general practice now for scuba divers to tow a lightweight float to indicate their whereabouts. One diver, finding that in spite of finning hard he was no longer going forward, surfaced up his line to discover a small boat containing a pair of happy anglers tied up to 'the buoy'.

More expensive was the incident in which the pilot of a light aeroplane was startled by a continuous banging after take-off. Thinking the aeroplane was about to come apart, even though



there was no vibration, he decided to hurriedly force-land in a small field instead of returning to the airfield, even though this was close by. He overshot, went over a bank and through a garden, finally colliding with trees and a lamp-post. Result, one unrepairable aeroplane. Cause? The passenger seat lap-strap had been shut half out of the door and was slapping against the fuselage. Even though strange bangings in aeroplanes can be very frightening, the pilot seemed unable to appreciate that the risks of forced landing were likely to be infinitely greater than the risks attendant on remaining airborne for the 3 or 4 extra minutes needed to return to the airfield.

The thing about forgetfulness and carelessness is that they happen so easily. Forgetfulness may occur because the information never got fully hoisted aboard in the first place – like remembering names from a cocktail party, looking for treasure on an underwater wreck site and forgetting about how much air might be left in the tank, or because the matter was not properly understood – such as leaving a car on a road which becomes covered at high tide. Carelessness may result from not taking a map or chart because you think you know the way, or not bothering to do a pre-flight check because only you fly that aircraft and it was O.K. yesterday.



No Responsibility

Irresponsibility, or no sense of responsibility, occurs mostly with the individual who may never have had to take responsibility, and so is unable to cope if he suddenly finds himself in charge of his own destiny. One student pilot hit power wires on take-off and landed back to inspect for damage; sensible. But he then decided to fly elsewhere for the needed repairs in spite of a friend's advice not to go. Eventually the student pilot agreed to leave the matter until next morning. At 11 p.m. that night a power company rep arrived and noticed an aeroplane with an envelope stuck over a wing-tip hole, burn marks on the propeller and wings, and with the airspeed indicator pitot tube missing. An hour later the sheriff arrived to discover that the pilot had changed his mind and gone. Next morning the wreckage was found.

A helicopter winchman once told me that the thing he liked least about his job was retrieving children who had been unnecessarily drowned. A few days after one such incident he was walking with his wife along the beach when he saw two small children afloat in a toy inflatable. They were close to the shore in calm water, but only a few yards farther out a strong wind over the low cliffs was hitting the water ready to sweep seawards anything such as a plastic dinghy. He felt sufficiently concerned to approach the parents to tell them of the risk. The father told him to get lost. After walking to the end of the beach the winchman and his wife returned to find the children now very close to the windswept water. Again he told the parents of the risk and again was told to mind his own business. Then, in his own words, 'I just saw red and shook that father like my dog would a rat shouting at him to look after his children.' Suddenly white faced, the father went away and did.

Irresponsibility is always at its least attractive when it involves other people, as when a pilot took up his friend for some aerobatics. After several loops, and spirals, the aircraft spun into the ground and the passenger was killed. The aircraft was placarded as non-aerobatic, neither occupant was wearing a parachute, and the pilot was not wearing the glasses required by his licence for the correction of vision. Fortunately, not all cases of such gross

irresponsibility end with disaster. Last year the wash of a big motor cruiser entering a Devon estuary caused the capsize of a canoe containing two children. At least one person on board was observed to have seen what had happened, but the motor crusier was accelerated away. The fact that the children wore life-jackets and were competent at righting their canoe did nothing to excuse such an act.

One of the facets of irresponsibility is the assumption, conscious or otherwise, that someone else will clear up the mess. Returning from a sortie the pilot of a helicopter spotted a capsized racing dinghy a mile out to sea. The pilot expected the boat to be quickly righted by its crew in the normal manner, but when nothing happened he went down to have a look – and took off this two-man dinghy the helmsman, his wife, three children aged between five and eight, and the French *au pair* girl!

Most irresponsible acts contain an element of selfishness or pride. A few are directly caused by drink. But in activities like flying or sailing the majority are certainly unintentional or isolated occurrences, with the person concerned afterwards finding his own behaviour inexplicable. He simply did not know what made him act that way and the lesson is taken to heart.

There are, of course, other failings which come under the 'pilot error' umbrella. Procrastination, or the art of not replacing temporary bodges, and pride; often well demonstrated for all to see by the yacht aground on a sandbank, with its owner brushing away at the seaweedy hull pretending that he meant it.

2 ✧ SINS OF COMMISSION

Quite different from forgetfulness and carelessness are errors in judgement and calculation. They are often perpetrated by conscientious and careful people, who are capable of carrying out whatever it is they are doing, but get something wrong. The glider pilot misjudges the height needed to reach the airfield and grinds to earth one field short, or the diver miscalculates his bottom time and runs himself out of air before getting back to the surface. Misjudgement and miscalculation rarely happen regularly, like forgetfulness, which is why there is often delay before the error is noticed – the person simply is not prepared for the idea that he could make such stupid mistakes. Misjudgement and miscalculation are, of course, an integral part of the process of learning – you can't learn without making mistakes, but after a certain, and often high, standard has been reached the person expects to be able to go on getting it right – but doesn't. Every now and again the experienced car driver misjudges the rate at which he is catching up on the vehicle in front, or the competent sailor, having consulted the tide tables and his watch, miscalculates the time of high water. Of course there have to be reasons; they include familiarity with the exercise, so it may not receive all the attention it should; distraction – chatting to passengers or feeling unwell; misreading data (see transposition errors, p. 78), or being just too clever.

On arriving over an unattended airstrip a crop-spraying pilot saw sheep grazing on the landing area. As the ground crew had obviously not yet arrived to clear them he decided to do this himself by flying low over them. Familiar with the stern discipline of crop spraying there was no problem in doing a low run over some sheep – except he hit them.

In small aeroplanes probably the two most common misjudgements are taking off without using all the available runway; no longer now safe because the wind has changed, and flying in canyons and among mountains without appreciating until too

late that the ground is rising faster than the aeroplane, and there is now no room to turn. Miscalculation in small aircraft is mostly about fuel. With 4,000 hrs under his belt one pilot refuelled his helicopter to the brim for a daylight flight of near maximum range. There should have been enough petrol but in sight of his destination the low fuel warning light came on. Since he was so close he considered he would be able to reach the airfield, so overflew an emergency strip close by. Half a mile short of his goal the engine stopped, and he wrecked the helicopter landing on rough ground. On a cross-country flight the engine of a Cessna died, leaving the pilot suddenly in a silent world. During the emergency landing the aircraft was wrecked. Later the pilot admitted that he must have miscalculated on his times and had flown for 4 hrs 20 min instead of 3 hrs 20 min. He also admitted that the fuel gauges in fact read empty when the engine stopped.

Sometimes Too Late

As has been said the real problem with errors of judgement or calculation is that they are rarely recognised until too late – or nearly too late. The crew of an English yacht returning from foreign ports at night searched the shore for the pair of two red lights marking the entrance. But at such a time there is a lot to do, and while the sails were being handed and stowed and the crew were changing gear, in both senses, for an evening ashore, two fixed red lights were spotted where expected, so the boat was homed in on them. It was dark and not much was expected to be seen other than the town lights twinkling in the distance. Suddenly, from the foredeck came a wild shout of 'Breakers Ahead!' Thoroughly shaken the crew swung the boat around and went to work on the problem; to discover that they had initially misjudged their approach line and then taken the red neon of a fish and chip shop to make up the pair of red lights they had wanted to see.

The First Mistake

Although accidents do happen as the result of single, simple mistakes – skidding off an icy road because you were driving too fast – most calamities result from a build-up of errors, each of

them probably quite small, even relatively unimportant on their own. This is usually because the first simple error or failure is either not recognised, or is not admitted. If it has been spotted – finding the new chart bought for the voyage has been left at home, or is accepted – knowing the altimeter is sticky and needs to be constantly tapped, then these things can be compensated for; the voyage plan is modified so as to buy a chart at another harbour before running off the edge of the home sheet, and the altimeter receives attention when necessary. The margins of safe and sensible operation are the same as they were originally intended to be and are intact, without erosion. It is not important that a mistake has been made. It is the non-recognition or non-admission of the initial error, by supposedly sensible adults, which is the first step on the slippery slide towards disaster.

Piling up the Errors

It was in Australia that a pilot went to collect a friend and some equipment with his Cessna. On arrival he found the man delayed in town so it was not until 15.50 that he filed a flight plan giving ETD of 16.30. He had been given a copy of the forecast, but his flight plan showed no wind calculations. The flight was expected to take only 75 min, arriving at 18.00 hrs, but this gave only 15 min of daylight to spare. When the passenger finally arrived, his equipment turned out to be some pieces of cast steel 200 lb in weight. In order to keep them well forward, and the aircraft c.g. within limits, the pilot placed them under the seats, but did not restrain them in any other way. He had so far made not one error, but *three*. The margin of daylight was inadequate, the steel pieces were free to slide forward and jam the controls, and they could affect the compass. So far our friend appeared not to have recognised or admitted any of them. Loading of the equipment inevitably took longer than expected, but as the pilot had broken his watch, he did not appreciate he was now about to take off later than intended. Only about 20 min after take-off did the pilot realise that the sun was rapidly bowing itself out. Checking his friend's watch he found it was now 17.30, and there was nearly another hour's flying still to do. He realised they had no hope of reaching the destination before dark, and considered returning to

Port Hedland, his starting place. But remembering an embarrassing few moments he had had there earlier in the day, in having landed without clearance, he decided to go on to an alternative airfield that he reckoned he could reach before dark. It was only one mile off the aircraft's track line. A little later, as the sun disappeared the pilot saw what he believed to be the hills to the south of his alternative airfield, and descended from his 6,000 ft, hoping to spot the lights of the town. He then saw that although the hills were correctly to the left of his track, the compass was indicating 150°, which it should not have been. He guessed that the aircraft heading was now 240° and so turned on to what he believed was a southerly heading, but the compass needle remained immovable. Realising that he now did not know where he was, he continued to search for the lights of the town, but when the hills which he was using as his reference, vanished into the gloom the pilot decided he must land. His margins of anything resembling safety had now been eroded to such an extent, that there was only one course left open – a near night landing in rough country, over which he would be likely to have little control of his fortunes. Searching around in the dusk the pilot spotted what seemed to be a large more or less flat area about 2 miles across, so he made a low run across it and reckoned it was not unreasonable, being mostly spinifex and small bushes.

Choosing what seemed to be a suitable run the pilot made a precautionary approach with full flap, power on, at about 40 knots. As he touched down it became apparent that some of the bushes were boulders and almost at once the Cessna hit one, knocking off a wheel. After some 100 ft of bumpy ride the aeroplane turned over on its back, the pieces of steel failing miraculously to clobber either of the occupants, who were delighted to find themselves almost unhurt. Meanwhile the non-arrival of the Cessna caused the usual consternation and at dawn search aircraft went out looking. It was entirely fortuitous that one of them saw a flash of reflected sunlight nearly 50 miles to the north of the place that had been chosen as the alternative airfield, and which the pilot had thought to be just ahead. It was also fortunate that it was in the wet season, so there was drinkable water, because the aircraft carried no survival equipment of any kind.

This little exercise included forgetfulness – that steel could

affect his compass; carelessness – in carrying the steel loose; misjudgement – in starting the flight so late (the first error); miscalculation – timing and navigation; pride – in not taking the more sensible alternative of returning to his starting point. Like a house of cards the errors mounted up until there was no alternative to disaster. But the cardinal error, from which everything accumulated was in taking off for a destination which allowed too little margin of daylight – only 15 min. He should have decided either not to start until the next day, or to have planned to go only to an intermediate airfield. This he could have reached with enough margin to have coped with such things as slightly delayed take-off, or navigational diversions due to getting just a little lost. He did not, so when his inflight problems accumulated he had to try to sort them out in a real hurry before it was totally dark, and in any case had to make an emergency landing with insufficient light to see what the ground was made of.

In case it is felt that flying is a complex matter and that people who do not want to get themselves into such difficulties do not fly, it should be appreciated that the slippery slope which follows any uncorrected initial mistake applies regardless of what is being done. An experienced man in a sailing dinghy gave the tiller to a beginner crew who had never steered a boat before in a fresh wind and choppy sea. This was the first mistake – to hand over control in conditions and on a point of sailing, running with the wind, with which a beginner could not be expected to cope. It was a careless mistake, although easy to understand, and it could have been quickly retrieved by a guiding hand on the tiller or taking the tiller again himself. Neither was done, with the result that the boat shortly afterwards capsized. Neither was wearing a life-jacket, although two were on board lashed out of the way

(mistakes 2 and 3). The bailer was not tied in (mistake 4) and drifted away. The two righted the dinghy and the owner then left it to swim several yards *upwind* to get the bailer (mistake 5) while the windage on the boat drifted it out of reach. The beginner in the swamped dinghy did not know that the only possible way of keeping the boat near the helmsman was to capsize it again. Why should he? Instead he got out a life-jacket, put it on and thought of swimming what was now several hundred yards to his friend with the second life-jacket. It was as well that a passing boat picked up the now exhausted helmsman, as the beginner had put on his life-jacket the wrong way up.

Photo by Christian Gad

Ann Welch started flying aeroplanes in 1934 and gliders in 1937, founding the Surrey Gliding Club and becoming an instructor the following year. She was manager of the British Team at World Gliding Championships from 1948 to 1968, which took her all over the world. In 1961 she gained the British National Women's Goal Record of 325 miles and in 1974 was awarded the Lilienthal Medal. As well as being a gliding instructor, writer, sailor and grandmother, she is President of the British Hang Gliding Association and Honorary President of the FAI International Hang Gliding Commission.

Pilots' Weather
Ann Welch
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Light Aviation

Hang Glider Pilot
Ann Welch and Gerry Breen
'Perhaps the most practical guide yet to this new-old science, written by experienced pilots for beginners and the semi-skilled.'
London *Evening News*

New Soaring Pilot
Ann and Lorne Welch and Frank Irving
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Rescue of a pot-holer at Portland, Dorset, by a cliff-climber and a helicopter winchman (photo. Reg Vincent)