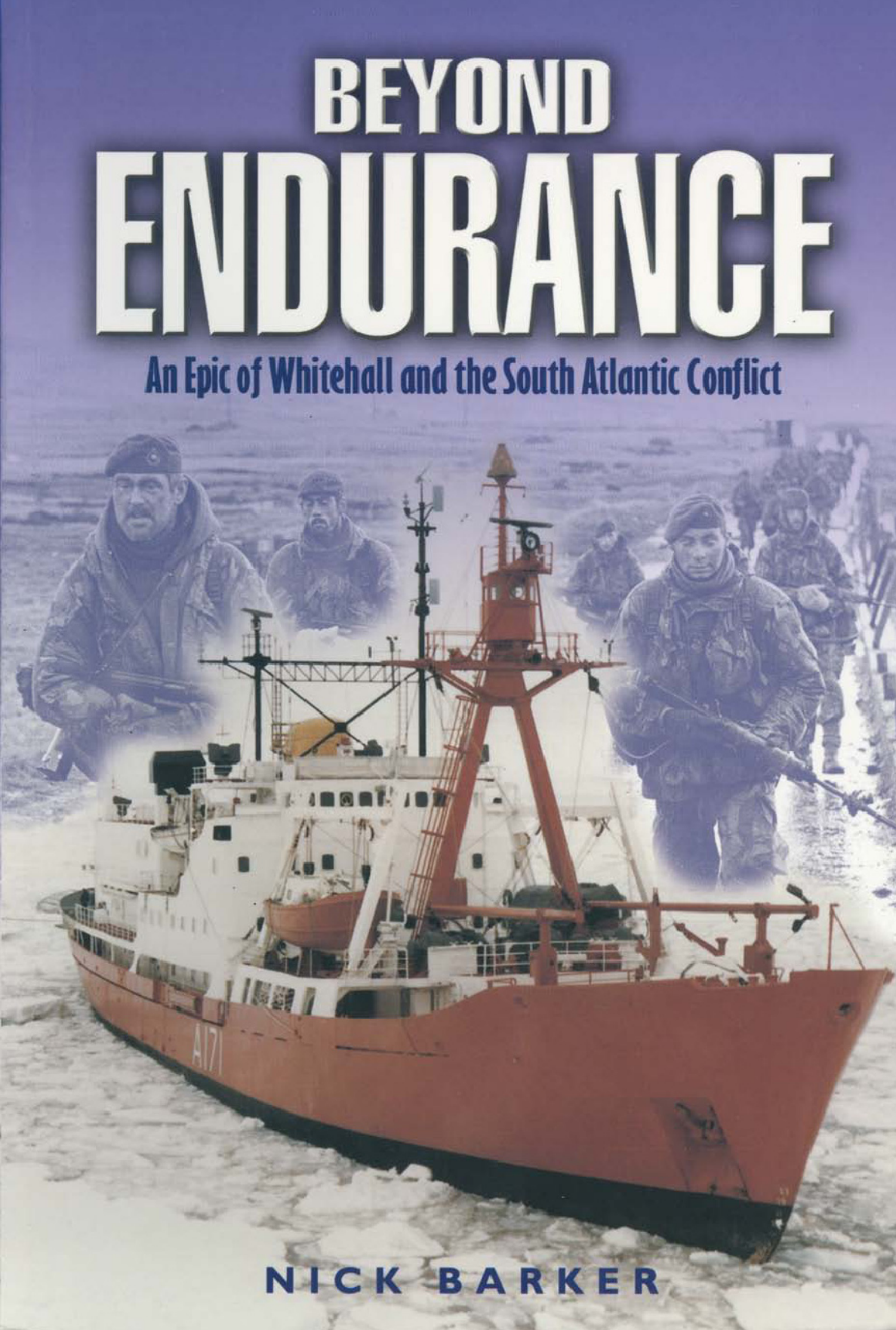
BEYOND ENDURANCE

An Epic of Whitehall and the South Atlantic Conflict



NICK BARKER

BEYOND *ENDURANCE*

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An Epic of Whitehall and the South Atlantic

by

NICHOLAS BARKER

with a foreword by
SIR REX HUNT CMG

LEO COOPER

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TO THE *RED PLUM*
AND ALL THOSE WHO
SERVED IN HER AND SUPPORTED HER

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ACKNOWLEDGEMENTS AND AUTHOR'S NOTE

Much of this story was recorded on cassette. Had it not been for the wordsmith skills of Clive Kristen I am not sure how much shape and coherence would have emerged. Clive has been my Navigating Officer in charting the course of this book. His ingenuity and writing experience have helped to keep me, for the most part, clear of the rocks. It has been a fascinating voyage for both of us. I am also indebted to Maureen Ann Kristen for her technical and word-processing skills without which it would not have been possible to maintain momentum and revise a manuscript within a reasonable time framework.

The book was originally intended to be more autobiography than history, but I was persuaded by my publishers to tell the story of *Endurance* first and leave the rest of my life story for a possible later volume. In this book I endeavour to explain how we stumbled into an unnecessary war against a friendly nation. I had a duty to perform which always came before any personal feelings I had about incompetence in Whitehall and elsewhere. I accept that my interpretation of events in London and Buenos Aires may conflict with the received version of history or the views of some senior officials, civil and military, of the day. I hope that this core part of my narrative will be read as the informed account of a Naval Officer who was at the sharp end of events. It should be added that I have always taken a keen interest in geo-politics and have been regularly baffled by far-reaching political and diplomatic manoeuvres and recommendations that all too often have disastrous consequences. As

likely as not this has been manifest through over-intelligent indecision.

To make sense of my commentary on internationally significant events, which may still have far-reaching consequences, the reader should know something of the whole man, warts and all. I am not a natural rebel, far from it. There have, however, been a number of occasions during my Naval life when I believed that principle required me to stand my ground. Fourteen years after the Falklands Conflict there is no rancour or bitterness, merely the intent to put the record straight. My account is to my mind both fair and truthful. Readers will judge this for themselves.

For this opportunity to put the record straight I am deeply grateful to my publisher, Leo Cooper. I know Leo views this volume as the final part of his 'Falklands jigsaw'. That being the case, his patience in waiting for its completion is immeasurable. I must also express my gratitude to Tom Hartman for his editorial skill and advice, and to Ewen Southby-Tailyour for his help with the illustrations.

I am equally grateful to members of the South West Atlantic Group, and particularly to Lords Buxton, Callaghan and Hill-Norton. I must also express my deepest thanks to the Hon Alexandra Bergel (Ship's sponsor to the *Endurance*), Sir Vivian Fuchs, Commander Ranken and the late Admiral Irving. There are many others, too numerous to mention by name, who fought the campaign to save HMS *Endurance* and to secure her replacement. They are, to my mind, the unsung heroes of this story.

I must also note my thanks to the Macadam family, who have been invaluable in their support and their enlightened views of government policy both in the UK and Argentina. They helped considerably in providing me with a unique and broad-based perspective.

But a sailor's view of the world is, almost by definition, different. After almost 40 years in the service I have nothing but admiration for the men of the Royal Navy and Royal Marines. The Naval Officer is now better educated and better qualified to represent his country in the remotest corners of the world. He works cheerfully within a framework of ever-increasing

constraints and cutbacks, takes the constant acceleration of technology in his stride and rarely complains when his view of the world is ignored by an officialdom cocooned in isolation and ignorance.

I sincerely thank Sir Rex Hunt for providing the foreword to this book and by making my task much easier by completing his own account *My Falkland Days* some time ago. Many thanks also to Roger Perkins for his advice and permission to loot sections of his excellent book *Operation Paraquat*, and to Andrew Lockett, Neil Munroe and David Wells, co-authors of *Season of Conflict*.

I have cherished memories of the late Lord Shackleton, who was a constant source of both advice and inspiration, and the late Lady Buxton whose writing provided a most refreshing view of life on board *Endurance*. Both these wonderful people did much to shape the content of these pages.

Lord Buxton has been another esteemed source of advice and encouragement for which I am enormously grateful. I also wish to record my thanks to my agent, Peter Knight, his assistant Ann King-Hall and my own former secretary Hilda Knowles. Each of them has taken an interest in this project that goes far beyond the call of duty.

Finally I thank my wife, Jennifer, for her support and common sense, my children for many ideas and contributions, and my former wife, Elizabeth, for her compassion to the families of the ship's company.

NB
October, 1996

FOREWORD

BY SIR REX HUNT CMG
FORMER GOVERNOR OF THE FALKLAND ISLANDS

Forewords are usually written after reading the book, but I wrote the following in 1982 when Nick Barker was in mid-career in the Royal Navy with a fine record behind him and glittering prospects ahead. Nevertheless, it is I think a fitting introduction to the autobiography of a truly courageous and outstanding man.

* * *

I am writing this in the guest cabin of HMS *Endurance*. The Argentines have surrendered and we are steaming along the East Falklands coastline from Stanley where twenty-one British ships now lie peacefully at anchor, to Fitzroy, where *Sir Galahad* was mortally hit and *Sir Tristram* severely damaged by Argentine bombs a few weeks ago.

I last sat here in December, 1981, on a memorable trip to South Georgia, recalling with my wife happy memories of previous voyages on board *Endurance*. There were carefree incidents like snowballing on the upper deck as we nudged our way through the spectacular Le Maire Channel; the Chief Bosun's Mate dressed up as one of Shackleton's men off Elephant Island; skiing on Deception Island; stuck in the ice off James Ross Island; drinking beer with the Senior Ratings. But that was another world. So much has taken place since then.

On 12 December, 1981, the night after our arrival at St Andrew's Bay, I trapped my finger in the cabin door and lost a nail. In less time than it took to grow a new one the Argentines occupied the Falkland Islands and South Georgia, the British

assembled a task force and transported it 8000 miles across the ocean, recaptured South Georgia, landed at San Carlos, marched across East Falkland, recaptured Stanley and sent over 10,000 Argentines packing.

This fine ship – which was about to be cast aside by the Ministry of Defence – put paid to an Argentine submarine, knocked down two helicopters, damaged a corvette and took the surrender of the garrisons at South Georgia and Southern Thule. Not bad for an 'unarmed' merchantman on her last trip!

I was, of course, delighted that HMS *Endurance* earned a reprieve. I can, however, understand that some people might think that her Captain went to inordinate lengths to guarantee her continued commission. Something less than engineering a full scale Argentine invasion might have served to prove his point! But one has to admit that, like everything else about *Endurance*, it was done with great style. And, unlike her illustrious predecessor, she survived to tell the tale. The Captain of the *Santa Fe* apparently had the opportunity to determine otherwise and perhaps for sentimental reasons decided not to deliver the *coup de grâce*.

The man whose name is synonymous with the first *Endurance*, Sir Ernest Shackleton, died on board the *Quest* in Grytviken Harbour on 5 January, 1922. His 'Number One', Commander Frank Wild, described how they took him to the hospital and placed him in a room they had shared seven years before. The next day they carried 'The Boss' to the little church situated at the foot of snow-covered mountains. There they said goodbye 'to a great explorer, a great leader and a good comrade'.

'The Boss' whose name will now be forever associated with the second *Endurance* is Nick Barker. Although there is no longer the opportunity to win the first of Wild's accolades I imagine his Number One, Mike Green, would confirm the other two. Come to think of it, I'm not sure that Nick does not qualify for all three, for I remember exploring uncharted seas off James Ross Island and being filled with admiration at the coolness on the bridge as the seabed suddenly shoaled from 40 to 9 metres. The only people having kittens were myself and the television team – landlubbers all and lacking in *sang froid* and the Nelson

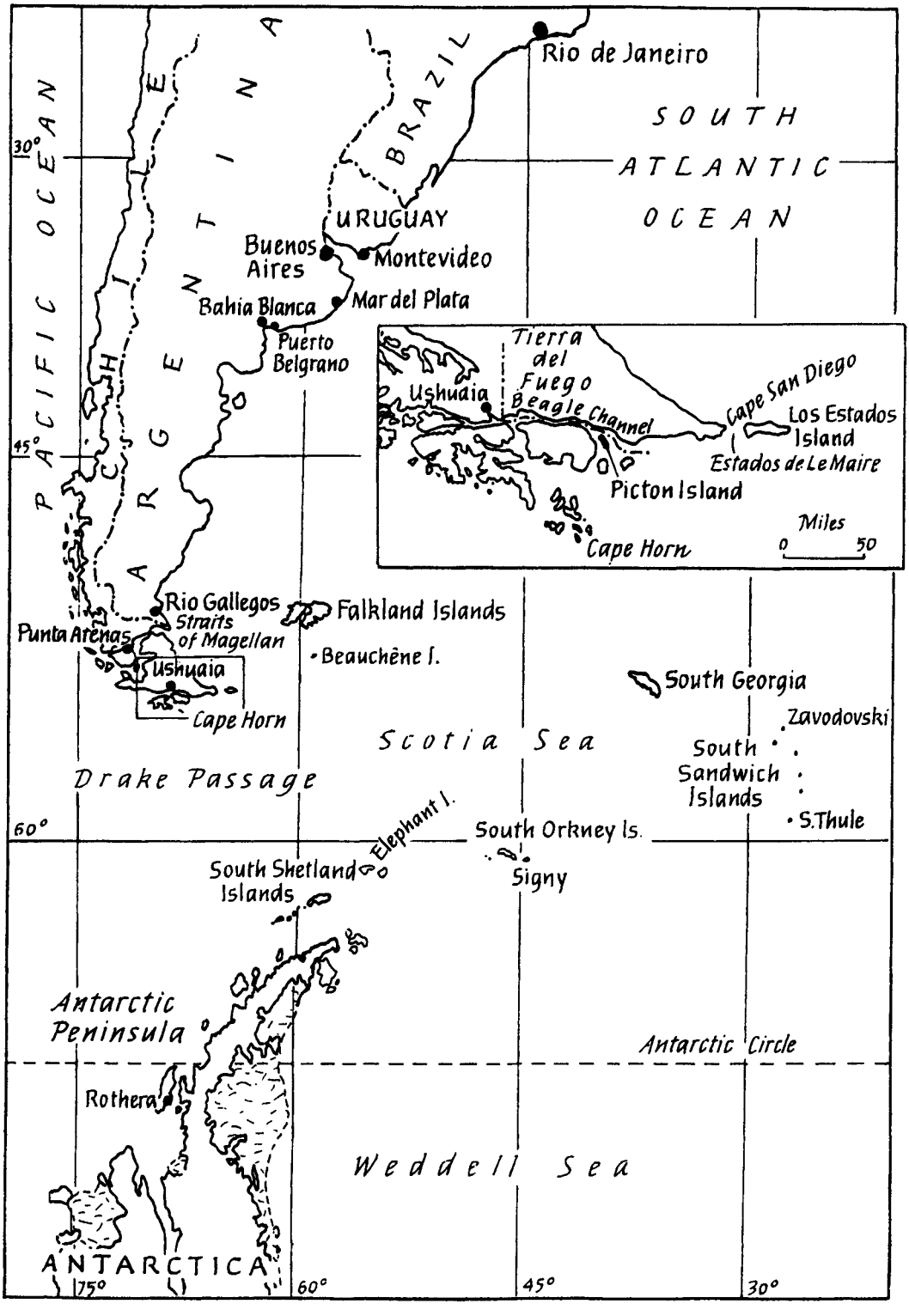
Touch. All I could think of was Bill Stephens, the Marine Engineering Officer, who explained that he had to stop the engine before putting it into reverse. So, with *Endurance* the days of exploration are not over.

I shall never forget the anxiety we felt for *Endurance* during those days at the end of March, 1982. We knew the Argentine fleet was at sea; we did not know where. We did however know that *Endurance* was heading west towards us from South Georgia. We dearly longed to see her return, of course, but with hindsight I am heartily glad she did not make it. Another day and she would have been there. I do not think she would have stopped the invasion but she would have tried and would almost certainly have been sunk with considerable loss of life.

As it was, she returned to South Georgia and thus began what must have been one of the strangest hide and seek games in military history. We all have reason to be grateful to Nick Barker, not only for successfully conducting the campaign to save his ship from the Whitehall axe, but also from the Argentine Navy. Thanks to him *Endurance* endures.

Wild said of Shackleton: 'Of his hardihood and extraordinary powers of endurance, his buoyant powers of optimism when things seemed hopeless, and his unflinching courage in the face of danger I have no need to speak.'

If Wild had been alive today I am sure he would say the same about 'The Boss' of the second *Endurance*. I salute Captain Barker and all who sailed with him.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BRAZIL
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SOUTH ATLANTIC OCEAN
URUGUAY
Buenos Aires
Montevideo
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Mar del Plata
Puerto Belgrano
30°
45°
Tierra del Fuego
Ushuaia
Beagle Channel
Cape San Diego
Los Estados Island
Estados de Le Maire
Picton Island
Cape Horn
Miles
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Rio Gallegos
Falkland Islands
Straits of Magellan
Punta Arenas
Beauchêne I.
Ushuaia
Cape Horn
South Georgia
Zavodovski
Scotia Sea
South Sandwich Islands
Drake Passage
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Elephant I.
South Orkney Is.
Signy
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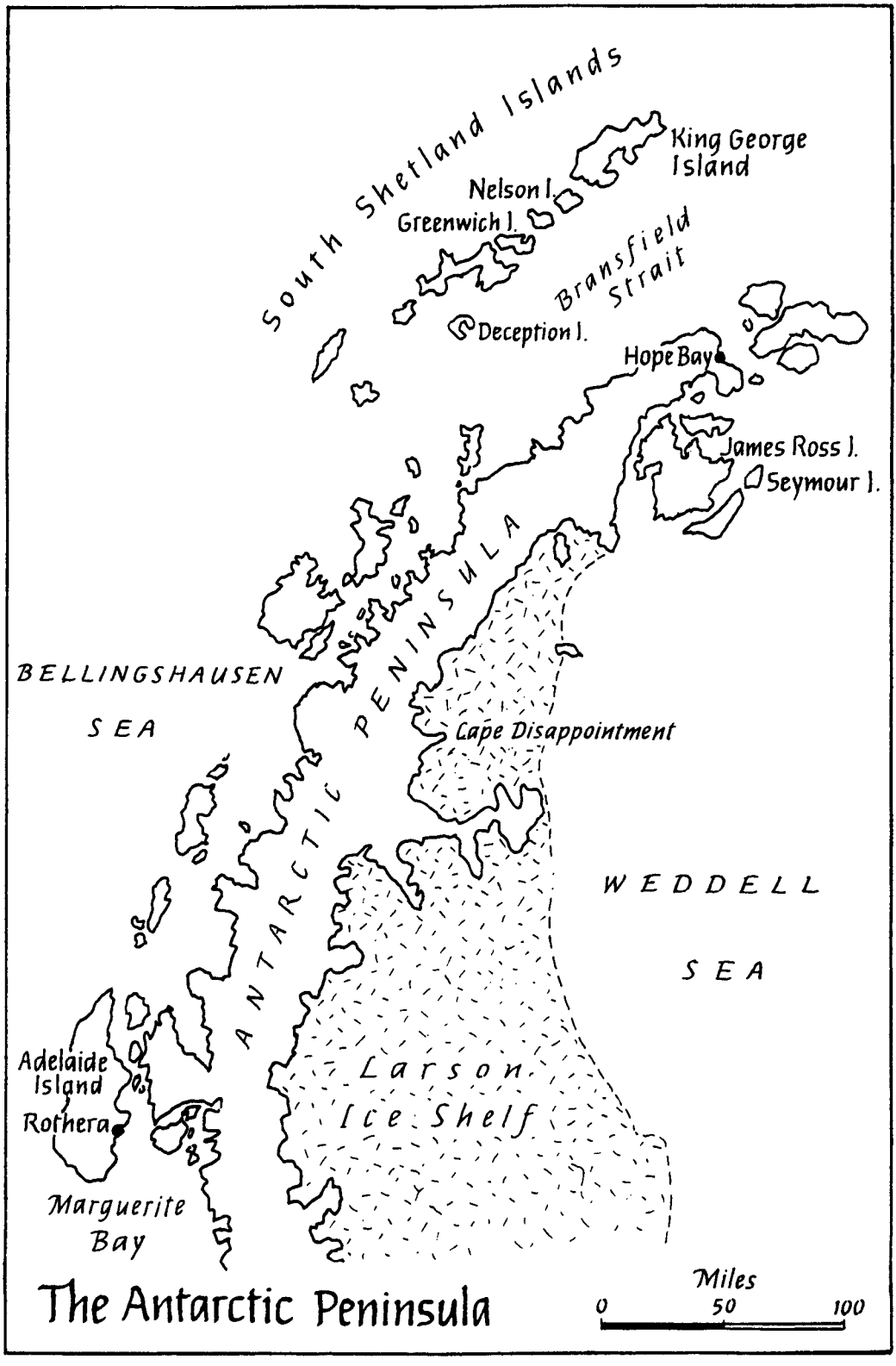
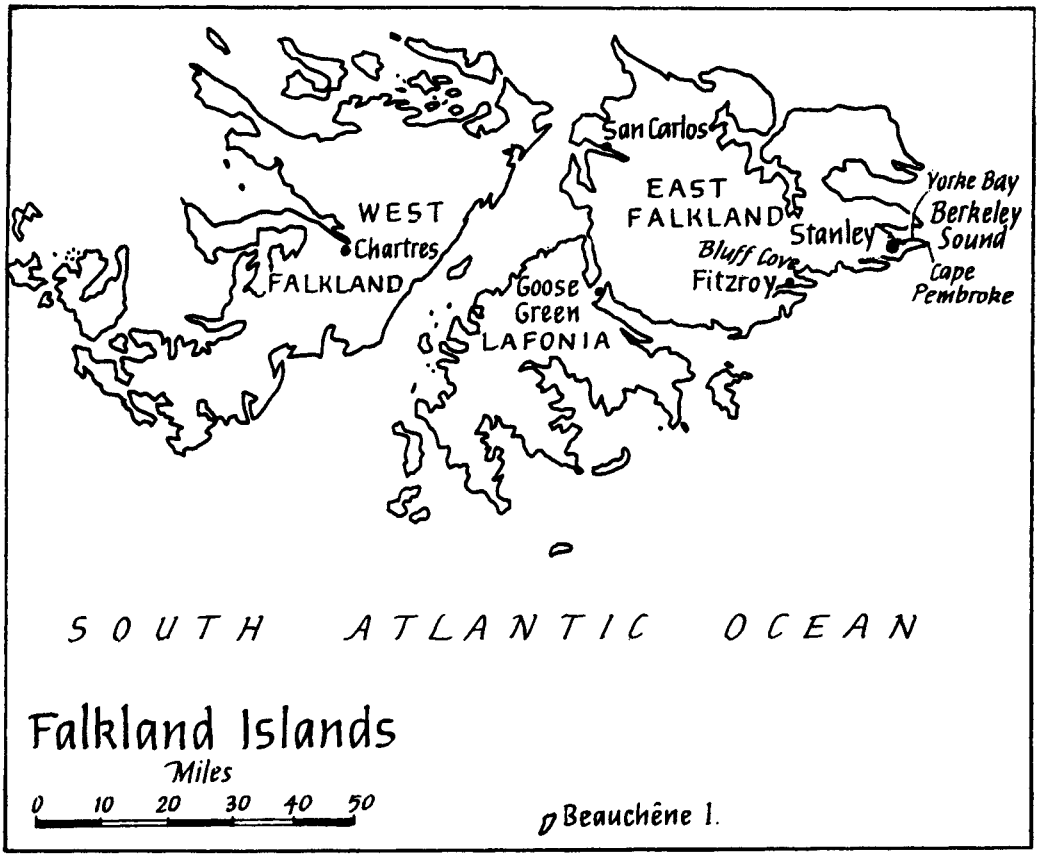


The Antarctic Peninsula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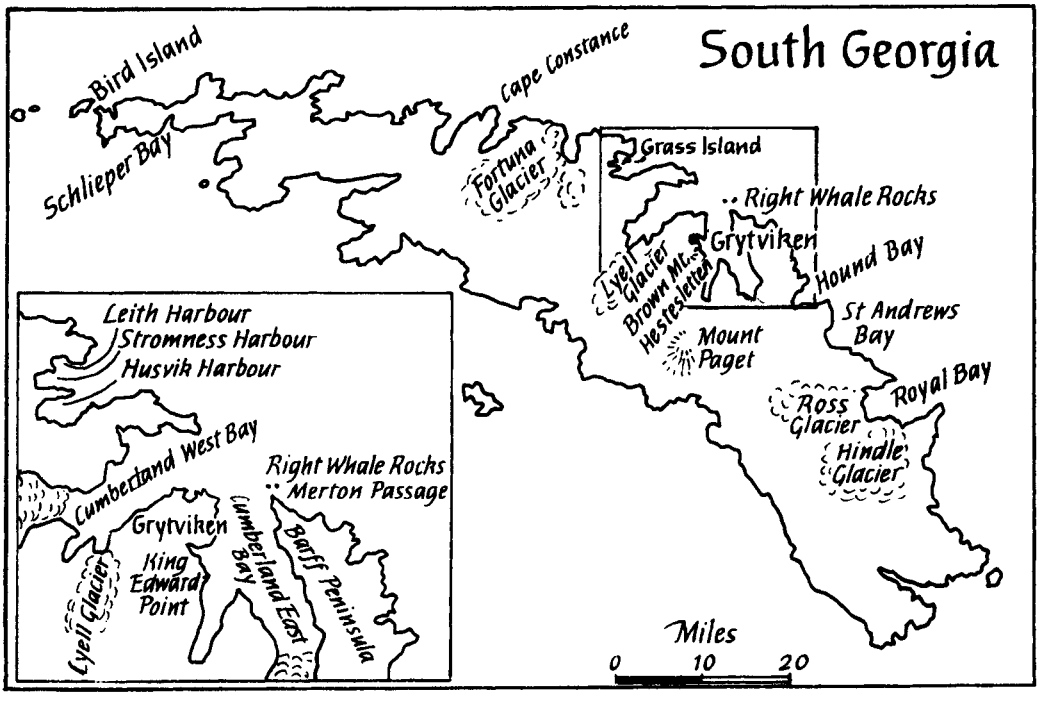
South Georgia
Bird Island
Schlieper Bay
Cape Constance
Fortuna Glacier
Grass Island
Right Whale Rocks
Grytviken
Lyell Glacier
Brown Mt.
Hestesletten
Hound Bay
St Andrews Bay
Mount Paget
Royal Bay
Ross Glacier
Hindle Glacier
Leith Harbour
Stromness Harbour
Husvik Harbour
Cumberland West Bay
Right Whale Rocks
Merton Passage
Grytviken
King Edward Point
Lyell Glacier
Cumberland East Bay
Barff Peninsula
Miles
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INTRODUCTION

1 April, 1982

It was a chill early morning. The sea was rough and the ship was heading westwards in a force ten gale. We were all accustomed to the violent pitching and rolling motion, but this time it felt much worse. The foul weather, the danger presented by the enemy and the political situation in which we found ourselves combined to create a nausea of frustration. The situation was as dark as the day. We had to work out a practical plan as soon as possible.

Commanding a ship can be a lonely business. When things are going well there is nothing more satisfying. I had been fortunate enough to command a number of ships, but never before had I felt so alone or betrayed.

'This is the worst day of my life,' I wrote in my diary. Why had the MOD not listened to my warnings? Why hadn't the government repeated the strategy of 1977 and sent a small deterrent force to the South Atlantic? It had worked then. Why not now?

The Argentine amphibious force had landed on the Falklands beaches near Port Stanley. It was highly likely that another landing would take place on South Georgia, 400 miles away. HMS *Endurance* was half way between the two areas, heading towards the Falklands. Our ship stood alone as the only British presence in the South Atlantic. this was the culmination of years of political bungling, diplomatic misunderstanding and disastrous intelligence assessment.

I gathered together my tactical team. There was Francis Ponsonby, a former submarine Captain, who by fortunate coincidence was on board with a team making a film about the Royal Navy in the Antarctic. I was also able to turn to Bill Hurst, my senior and much trusted Navigating Officer, and to Tony Ellerbeck, our courageous Flight Commander. Unhappily we were without Mike Green, my second-in-command. Mike had been struck down with peritonitis a month earlier in South America. Despite Mike's absence I felt we had a strong, sensible and mature command team. From their reaction I knew I reflected the mood of the moment.

'There must be something we can do to zap these bastards,' I said.

Looking round the communications office I read the determination on their faces. Such was the urgency of the moment it was easy to ignore the chatter of radio sets and teleprinters, and the kaleidoscope of lights and displays. The signals had been pouring in. When Port Stanley went off air we thought of our ship's Naval survey team we had recently left there. The last communication had them shredding documents in Government House, accompanied by the distant rattle of machine-gun fire. We knew there were sixty or so marines dug in defensively. The 'last resort' was the small detachment around Government House. Faced by the first invasion wave of 2000 Argentines, they kept the flag flying for hours longer than expected.

The British Antarctic Survey radio confirmed the fall of Stanley. Ham radio operators from the UK told of the great victory claimed by the Argentines. Our covert helicopter over South Georgia had confirmed the worst. Our options were limited. We had left our Royal Marines on the ground in South Georgia. We were threatened by an Argentine group of two frigates, two destroyers, a submarine and a support tanker. The Argentine Group Commander, Cesar Trombetta, had invited us to surrender South Georgia. We told him to 'get stuffed'. Further communications were ignored, but it would have been difficult to place a bet on our survival as things stood. Further breaks in radio silence could seal our fate. Despite all this, the mood of my

command team echoed my own. We had to do something positive.

The obvious target was the tanker. Was it worth trying to ram it with the ice-breaking bow before turning east and down sea for South Georgia to support our Royal Marine Detachment? Here was something positive. I felt better. A plan was beginning to form. If nothing else we could leave the Argentine groups of ships without fuel. Without their 'filling station' these gas guzzlers could find themselves in a perilous situation drifting towards South Georgia. Then we could attack with our short-range helicopter-launched guided missiles. The alternative was a probably suicidal attempt to enter the harbour at Port Stanley in the vain hope of deterring an already committed amphibious operation.

There is irony in remembering that this was to be the final commission of the *Endurance*. John Nott, the Secretary of State for Defence, had included the ship in a package of swingeing defence cuts which included the sale of the aircraft carrier HMS *Invincible*. He had charted a course for maritime diplomacy that was depressingly similar to the one set by government for national industries and services. He was deaf, not only to the advice of the First Sea Lord, Sir Henry Leach, but also to Lord Shackleton, perhaps the most acknowledged expert on the South Atlantic. More surprisingly, perhaps, he had refused to heed the warning delivered by a group of more than 300 peers and MPs (led by Lords Shackleton, Buxton, Callaghan and Hill-Norton) who believed that the withdrawal of HMS *Endurance* would precipitate military action by Argentina. The firm impression was that the Government didn't give a damn about the South Atlantic until political necessity forced their hand. Now they had to do something. And afterwards, when it was all over, there was a greater irony. This little war became Margaret Thatcher's finest hour.

When it came to talking to the media I was as firmly muzzled as a pit bull terrier with his MOD minder leading him round the show ring. There would be no hint of controversy, and no leaks to the press. The message was loud and depressingly clear: 'You may have been right, Captain Barker, but on no account are

you to say so.' There was a General Election looming in mid-1983. No one, particularly Government and military service officials, were to undermine Mrs Thatcher's reputation as a war leader.

The subsequent enquiry was like the débris of a paint factory explosion. There was little of substance left, and that which did survive was whitewashed. This was not the fault of enquiry chairman Lord Franks, an academic of integrity. But the intention was always to clear the government. This much I had suspected then. Later I had it confirmed personally by a member of the Board of the Enquiry.

Sadly these were the politics of the 1980s. Dog eat dog: an 'enterprise culture' becoming a contract culture with its noose growing ever tighter around the neck of community spirit. Arrogance and rudeness replaced courtesy and integrity. The message was loud and clear – 'Look after Number One'. This brought out the least attractive aspects of the British character. Greed and self-interest came first: the weakest could go to the wall. One immediate and obvious symptom of the new establishment was the way that political mistakes were covered up at almost any cost. The British model of 'firm but fair' was replaced by a dictatorial arrogance. An early casualty of this approach was defence policy.

John Nott was a hatchet man appointed to sort out any 'old buffers' still prepared to stand their ground. He had the advantage of being able to rely on powerful political allies and the Civil Service. None of them had much respect for the intellect of senior serving officers. The mission was to stop inter-service rivalry and massively to cut the cost of procurement. This policy led directly to the bloody nose we received when the Argentines invaded the Falklands.

Did we learn from our mistakes? I don't think so. Every year the axe falls more heavily and Whitehall continues to bungle. The Prime Minister is poorly advised, and government departments are put through the mangle as never before. The theory is that if you reorganize and restructure regularly enough things will eventually get better. This is a smokescreen. Changes that do not address fundamental management and commitments

first – purposeful channels of communication and a thorough understanding of what is expected of each department and individual within it – are doomed. Sometimes it feels as if we are all invited to take part in a massive game of Musical Chairs: every time the music stops, some poor bastard is out on his ear. Perhaps this begins to explain why our confidence and self-respect as a nation is often low, and why our standing in the world continues to decline at a pace that few would have thought possible a generation ago.

I probably feel these things strongly because I have a real sense of pride in my country and pride in my service. I'm not a political animal in any formal sense. I have never been associated with a political party. But from my upbringing and later experiences I've formed an unshakeable belief that given the opportunity (and the right kind of leadership) we do things very well. There are still roots of excellence everywhere and we have young men and women of ability and commitment. But it's not enough. We need leaders of vision and integrity. We should encourage initiative. We should not be frightened to shout down those who constantly say, 'Better not'. Above all, we should have courage and we should care. All these qualities can be found in our history and traditions. And what happened in the Falklands in 1982 was proof that these foundations of British character still exist.

I was promoted to Captain RN in December, 1979, and appointed to command HMS *Endurance* in May, 1980. I had just completed two years with the Ministry of Defence and had already enjoyed a number of sea-going commands. *Endurance* was considered to be a special appointment. Certainly it was unlike any other command. It was considered necessary to be briefed by the appropriate departments of the Foreign and Commonwealth Office. There were also briefings from the British Antarctic Survey and Scott Polar Research Institute at Cambridge. Finally there were the 'normal' military courses which are an integral part of any Naval sea command.

Ironically, just a few months before the *Endurance* appointment, I joined the Maritime Tactical School for a special study period where we considered defence aspects of a Task Force at

sea. One of our main recommendations was 'Air Early Warning' for the fleet. The demise of the carriers *Ark Royal* and *Eagle* meant that we had lost the fixed-wing Gannet aircraft, our tactical eye in the sky. The Harriers and helicopters that were to play such an important part in the Falklands Conflict were not fitted with Air Early Warning equipment. This meant that the British taskforce had to rely solely on shipborne radar which could only detect an incoming raid up to 200 miles. In tactical terms this could be described as a Local Warning System. Sadly, it proved largely ineffective as the enemy aircraft often approached close to the surface of the sea below radar cover. The recommendations of the Maritime Tactical School were digested by the appropriate departments in both the MOD and by the Commander in Chief's staff at Northwood. No action was taken. We also expressed reservations about the reliability of the Air Defence Missile, the Sea Dart System, though there was genuine enthusiasm about the short-range Sea Wolf because of its speed and accuracy.

It's easy to be wise after the event, but when the British Task Force was put to the test these observations proved to be prophetic. Again, with the benefit of hindsight, it is fair to claim that the Task Force performed admirably despite these major deficiencies in our armoury.

At least some lessons have been learned. Some Sea King helicopters were later fitted with Air Early Warning Radar and the Sea Dart System has been upgraded. It's also true to say that satellite surveillance and the shipborne intelligence systems have improved almost beyond recognition. But why did it take a war and the associated loss of life to convince our moguls that the Navy should be provided with the fundamental tools of the trade?

I had been invited to join a most exclusive club. My officers and ship's company were not much different from those of the Shackleton era, or any of those courageous ships' companies in the 1939–45 War. What we saw once again was Britain at her best in a backs-to-the-wall situation.

It's an odd thing. Here is a story about party political arrogance, ill-judged frugality in government departments and

the incompetence of mandarins in the corridors of power. But it is also a tale of extraordinary loyalty to Queen and Country and a highly professional fighting service. And, for my money, the officers and men of the *Endurance* matched up to the highest traditions of the Royal Navy.

Chapter 1

SOUTH ATLANTIC BRIEFING

Until the Conflict I think it is true to say that very few British people knew where the islands were, or indeed that they were British. Those who had heard of the Falklands most frequently placed the island group somewhere off the west coast of Scotland.

I had already seen for myself that Argentina was a nation of great culture and a proud historical tradition, and, even under the Junta, was probably one of Britain's closest allies outside the Commonwealth. The Conflict of 1982 focused attention on a neglected and little understood, part of the world. Until that time British politicians had taken what they would certainly have claimed to be a firm stand on behalf of the Falkland islanders. Significantly, however, they had avoided any decision over sovereignty. In part this was to avoid damaging relations with Argentina, or worse still causing provocation, but it was never clear what the Argentines would do if provoked.

The Falkland question is one aspect of a much larger problem – the political and economic future of the South Atlantic region. The economic potential of the area, has always been promising and since the Conflict it has lived up to the most optimistic forecasts.

My preparations before joining HMS *Endurance* in 1980 had filled me with enthusiasm. I was longing to get south and work in that extraordinary environment. But no preparation, however thorough, can adequately prepare for the magic of the Antarctic. It can be never less than a privilege to catch a scent of the

pioneering exploits of men like Amundsen, Scott, Shackleton, Fuchs, and Hempleman-Adams. There were the modern luminaries too, many of whom I have had the privilege to come to know. Stephen Venables, Monica Kristianson and Ranulph Fiennes continued a tradition of Antarctic heroism. And, there is a marvellous heroic link through the late Lord Shackleton, and his father, Sir Ernest.

Sharing a similar wealth of experience, and a deep understanding of wild life of the region is Lord Buxton, the former head of Anglia Television and the Independent Television Authority. I was also greatly influenced by Dr Richard Laws, the Director of the British Antarctic Survey, Dr John Heap, who led the Polar Department at the FCO, and Robin Fearn who was responsible for South America and the Falklands at the Foreign and Commonwealth Office.

Charles Swithinbank and the late Nigel Bonner at the British Atlantic Survey were instrumental in helping me to understand the scientific ambitions of British exploration. They also passed on their unquenchable thirst for further knowledge. This has stood me in good stead ever since.

The wild places of the world all have their special magic. During two sea-going commissions in the Middle East I had come to learn something of the Bedouins and nomads of those vast desert tracts. That was during the 60s, and it seemed to me that they were much the better for having assimilated little of 'modern civilisation.'

But the Antarctic is the wildest and most beautiful desert on earth. There are no nomadic tribes and no disease. In the Antarctic there are very different environmental hazards – from wind, sea, ice and intense cold.

But there is life there aplenty – untamed and, for the most part, unexploited. Here too a permanent 'deep freeze' creates unexpected problems. Garbage, for instance, survives for years and so must be burnt. Climatic changes are more sudden than anywhere else within my experience, and when the weather seriously misbehaves sea conditions in the South Atlantic are probably more severe than anywhere else on earth.

The four and a half million square miles of the Antarctic are

uniquely isolated. Much of the rock surface beneath the ice is below sea level, so the sheer volume of frozen water is almost unimaginable. One calculation suggests that if the ice cap should melt the mean sea level around our planet would rise by 100 metres. For me that figure is perhaps the best possible illustration of the threat of global warming.

'Endurance' is a symbolic name. The first *Endurance* – of Sir Ernest Shackleton's expedition of 1914–16 – was marooned and crushed in the Weddell Sea. But Shackleton's complete company survived after he and five others battled 800 miles from Elephant Island to South Georgia to find assistance. Shackleton had been a member of Scott's 1901 expedition, but this was his finest hour. In the darkest days of 1982 we were very short of food and pursued by the Argentine Navy in weather that was perfectly bloody. I called for that 'extra little bit of British grit.' The Ernest Shackleton story was all the inspiration we needed.

I also came to understand the wider role of the Navy in the Antarctic. Indeed the name of the ship itself provided some pointers. The first *Endurance* had been bought by Shackleton for the purpose of exploration. Soon enough the name became synonymous with bravery and leadership, and, quite literally, endurance. I began to understand what a privilege it was to follow this tradition.

Dr John Heap's Foreign Office briefing was meticulous. The US-brokered 1961 Antarctic Treaty was one of the few that actually worked. 'British Antarctica' had no more recognition than the territorial claims of Chile and Argentina. The continent was in effect a No Man's Land where national sovereignty did not apply. In theory this meant there should be no political dimension other than the co-operation of the various national organizations in the interest of science. In theory too the exchange of information could be more complete, or at least more open, than in any other situation in the world. And to a very large extent that level of co-operation did exist. When unfettered by political directives, scientists are the first to recognize that vested interests are well served through co-operation.

Atmospheric science was also a well-established discipline in

our Antarctic bases. It was the British Antarctic Survey who 'discovered' the hole in the ozone layer in the early 1980s. As the climatic and meteorological impact began to be calculated there was a bandwagon of publicity. One impact of this, following the Conflict, was that quite a large grant was given to the Antarctic Survey. Until that time research funding had been sparse. That momentum has been sustained. Increasing concern about global warming, skin cancer, and other problems associated with ozone holes, means that there is now a multinational dimension and commitment to Antarctic atmospheric research.

Antarctica has a considerable impact on climatic conditions throughout the world. It is often argued that an understanding of the world's weather could properly begin with the cold continent. There is earth science evidence (the Gondwana Theory) which suggests that the geological provinces of the southern continents could be matched across the intervening oceans, providing evidence of the former conjunction of these land masses. One example of this is the way the Andes extend geologically into the Antarctic peninsula. The inevitable geophysical conclusion of this is that Antarctica must hold vast mineral wealth. Statistically this is likely to be equivalent to the total of mineral resources already found in the Andes, South Africa, India and Australia. It was calculated by the US Geological Survey that over 900 economic mineral deposits exist on the continent, although only twenty-one of these are likely to occur in ice free areas. Similarly the hydrocarbon deposits, already discovered in southern continents, are likely to be mirrored in Antarctica. Known resources include large quantities of mineral ores, particularly iron and copper. Gold and silver have also been discovered, and the coal deposits are enormous.

The Antarctic Treaty created a moratorium on mineral exploitation. Intensified exploration would have a major impact on the environment, so consequently the full extent of the South Atlantic's natural resources remain largely a matter of speculation.

The potential of icebergs as a source of water is also well known. Ice forms 98 per cent of the earth's fresh water resources.

Antarctica contains 90 per cent of the world's ice, and therefore 88 per cent of the world's fresh water. The annual iceberg production by ice shelves and glaciers fringing the continent is vast. Although it is considered impractical to tow icebergs to continents in the southern hemisphere, it is possible, even plausible, that ice could become an economic resource for water and energy.

It is equally well known that active and dormant volcanoes are associated with sulphur deposits. There is considerable fumarolic activity in the South Sandwich Islands. As yet there has been no study made of the quantity of available sulphur.

Within the South-West Atlantic the main life resources could be categorized as whales, seals, birds, fish, krill and squid. The harvesting of whales began a century ago, peaked in the mid-1930s, then diminished. Seal stocks were not seriously reduced during the early part of this century, and are not exploited today. Penguins were taken for oil on some islands but there is little likelihood of future exploitation.

Krill, a prawn-like plankton, is the cornerstone of the ecosystem. The squid industry has already progressed from just a few ships to large fleets from Spain, the Far East and Argentina. Fishing has been heavy in some areas, with krill fished experimentally since the early 1960s. More recently the Russians and Japanese have been harvesting krill on a limited commercial basis. In 1980 the squid had hardly been exploited, but catches have risen steadily. In Lord Shackleton's second (1992) report it was noted that Antarctic krill appeared to be the world's biggest known source of animal protein. 15 per cent of krill weight is protein, a similar value to fillet steak.

The Antarctic Survey had at the time completed a number of studies which estimated the potential annual sustainable yield at between 100 and 150 million tonnes. A very substantial proportion of this appears to occur within a 200-mile band between South Georgia and the Antarctic Peninsula. The swarms contain about 500 individuals per cubic foot of water. This density makes them look from the air like a red oil slick. Catching krill, as we found in *Endurance*, was relatively simple. The major difficulty is in avoiding crushing them as the catch is hauled onto

the deck. Krill looks and tastes like prawn, but once caught must be processed within four hours. They cannot simply be frozen because digestive enzymes within the krill work at very low temperatures. This means first boiling, then removing the shells. The shelf life of krill processed in this way is three to four months. To make harvesting economic the quantities taken must be large, and the sale and distribution swift. The remoteness of the fishing grounds mitigate against this, but the developing demand (particularly in the Far East and Spain) makes it likely that the days of large-scale harvesting are not far away.

Commercial exploitation of Antarctic fish is a relatively recent activity. Notofinia probably makes up about three quarters of the coastal catch. Sample scoops include eels and sea-snails, rat-tailed fish, cod-like specimens and skate. These once existed in larger quantities off South Georgia and the South Sandwich Islands, but were largely fished out by the former Eastern Block countries. There are still reasonable stocks of blue whiting and Patagonian hake.

But since 1982 it is the squid industry that has brought a measure of prosperity to the Falklands. Until recent years the prospect of the Argentines exploiting these fisheries was very small. They are not a nation of great fish eaters, and most of the stock demand is taken from the River Plate and northern coastal areas of Argentina. But the market is such that the Argentines do now fish for squid outside the 150 mile (latterly 200 mile) Falkland zone. They also follow the available data on squid stocks and take an active part in international discussions on stocking levels.

An additional resource for the future may be the larger algae. It is possible to extract the Giant Seaweed (kelp) and to produce a wide range of products used mainly in the food, drink, textile, rubber and paper industries. However, synthetic substitutes have in many cases been so efficient that the alginate industry has not prospered. But the position could change. One company has approached the Falklands Islands Government on the subject of seaweed harvesting. It is estimated that this business could be worth £40,000 a year.

But even the limited data available in 1980 made it clear that the live resources were plentiful in the area around the islands and this gave considerable scope for the improvement of the Falklands economy. These prospects are being investigated. But, at the time of the Conflict, the total GNP of the Falklands was less than £4 million a year. The islands were simply not tooled up for the job. They did not have the right kind of fishing vessels, shore facilities, or the necessary air and sea connections. With the exploitation of the fin fish industry, and revenue from squid fishing licences, the islands' income had risen to more than £30 million by 1985. Through this burgeoning of offshore activity, not anticipated even by the Shackleton reports, the political and strategic value of the islands has become considerably enhanced.

There had also been some difference of opinion in the past among the islanders themselves about what the thrust of development strategy should be. In general terms the expatriate British were against further exploitation; Falkland islanders of longer standing believed some development was essential for the survival of the islands' economy. Lord Shackleton believed that development should begin with those island-based projects that had the most potential. Later initiatives, such as exploiting living resources and hydrocarbons offshore, could use the islands as a resources base.

During the last 15 years Antarctica has become targeted by the tourist industry, to the extent that ships from Argentina and Australia travel to areas that are navigationally unsafe. Charts, very much part of the rôle of HMS *Endurance*, remain few and far between. Surveys are made around large tabular icebergs, but if the iceberg is firmly aground the survey will not be completed until the iceberg breaks up or moves. It is not rare for ships to become impaled on rock pinnacles. The mapping of the area is of paramount importance for the safety of tourist vessels and the supply ships which support research.

A significant level of Falklands tourism began with an awareness created by the Conflict. In 1980 onshore tourist facilities amounted to one hotel and one guest house. The small cruise ships, *World Discoverer* and *World Explorer*, called fairly