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**JOURNAL**

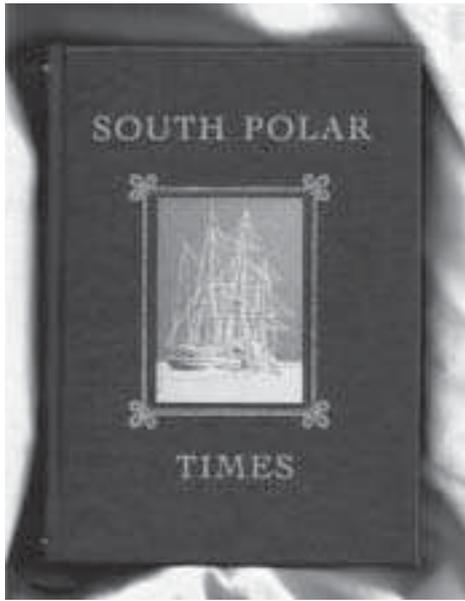
**Number Five**

*Antarctic Exploration*



*Sir Ernest Shackleton*

**OCTOBER 2010**



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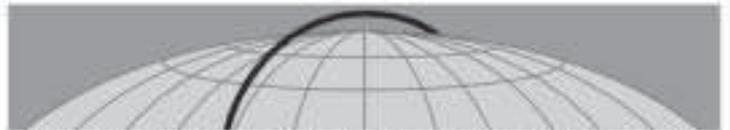
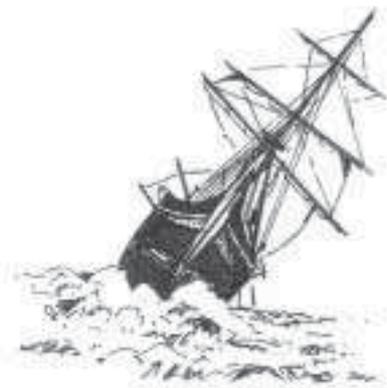
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# The James Caird Society Journal – Number Five

## October 2010

The time has come to put pen to paper (so-to-speak) and produce another *JCS Journal*. I hope you enjoy it as much as I have enjoyed preparing it. Again, I am indebted to and encouraged by all those who have provided (as usual) some really interesting articles. The Recession has resulted in only a few sponsors stepping forward this time – I am extremely grateful for their support (please see their box adverts for more details). Following the publication of *JCS Journal Number Three* and *Number Four* many members were very generous both in terms of positive feedback and voluntary donations to help defray publication costs. Thank you and please keep it up! I believe the *Journal* plays an important role in the Society's life. Certainly, it is helping to attract some new members and, I trust, helps us all to know a little more about the history of polar exploration.

As you will all know by now, the *Journal* aims to complement the 'newsy' content of the Society's *Newsletter*. Thanks are due to Margaret Slythe, the former *Newsletter* editor, who has steered it forward and upwards over a considerable period of time. I congratulate the new editor(s) of the *Newsletter*. Its 'reborn' format is both professional and interesting. The *Journal's* purpose is to educate and stimulate discussion on polar matters, in general. Above all, it seeks to honour and illumine the legacy of Sir Ernest. I hope this latest issue achieves that.

I have invited Stephen Haddelsey (author of *Born Adventurer: The Life of Frank Bickerton* and *Ice Captain: The Life of J.R. Stenhouse* (see [www.thehistorypress.co.uk](http://www.thehistorypress.co.uk))) to describe the process of researching and writing about polar men and to share in some of his discoveries. In his own words, he hopes 'to whet but not sate appetites'. I do commend Stephen's books (I reviewed the Bickerton book in *Number Four* and my review of the Stenhouse book can be found in this issue).

Robert Stephenson has written an article about 'Shackleton in Boston'. This is a fascinating and well-researched insight into Shackleton's American lecture tour in 1910, following the *Nimrod* expedition. At the beginning of Sir Ernest's tour, very little real interest seemed to be shown by the American public. As one telegram on 29<sup>th</sup> March 1910 to a Harvard professor bleakly and cryptically put it, 'We are greatly concerned at small sale tickets Shackleton lecture Thursday evening mortifying failure will result unless something doing quick'. This was, of course, in stark contrast to the euphoria experienced back in Great Britain.

I suspect few of us know much about the Ross-Crozier Antarctic Expedition 1839-43! From the Shackleton perspective the 'Heroic Age' (say, 1892 – 1922?) is, of course, paramount. However, in order to broaden our understanding of its seminal events I have invited Michael Smith to enlighten us on the activities of the masters of the ships *Erebus* and *Terror*. It is a fascinating and important read. Of course, the volcanic landmarks on Ross Island which bear these ships' names are very much part of Heroic Age folklore.

For those keen to learn more about the natural history of pack-ice in the Weddell Sea look no further than J.M. Wordie's own Report tendered in December 1920 to and published in June 1921 by the Royal Society (Edinburgh) (Vol 52, Part 4 (no.31)). The observations were made during the journey and drift of S.Y. *Endurance* between December 1914 and January 1915. For a period of six weeks, states the geologist, '(the ship) successfully bored her way through pack-ice of every description'. It is exciting always to read original material (albeit often edited and abridged by the authors for popular consumption).

Many people will be familiar with Bob Headland's *Chronology of Antarctic Exploration*. The latest incarnation was published in 2009 by Bernard Quaritch Ltd, London. I asked Bob for the background of his latest work and for his definition of the 'Heroic Age'. In addition, I suggested he might provide JCS members with a synopsis of the principal expeditions during that time. He agreed - with the tongue-in cheek provision that we would 'plug' his book. I am happy to oblige and, of course, the extract printed in *Number Five* is no substitute for the handsome tome itself!

Shane Murphy can only be described as a polar 'nutter'. His enthusiasm for things Shackleton is tireless. In particular, Shane has an abiding interest in the photography of Frank Hurley whose legacy is assured by his *Endurance* images. Some of these images have appeared in previous editions of the *Journal*. In 2000, Shane produced a remarkable book-on - CD called *Shackleton's Photographer*. This covers the period 12<sup>th</sup> October 1914 to 16<sup>th</sup> October 1917 and contains 'photographs of scenes and diary extracts of incidents in connection with happenings to the Weddell Sea Party'. Of especial import to JCS members is the fact that the CD also includes Frank Worsley's verbatim *James Caird* journal (take a look at [www.frankhurley.org](http://www.frankhurley.org)). I asked Shane to write an article about the *Endurance* photographs. In it he shares some thoughts and, interestingly, highlights various diary and other references to briefly illustrate Hurley's work. Of course, many of the photographer's superlative images can now be seen on the SPRI website - [www.spri.cam.ac.uk](http://www.spri.cam.ac.uk) (follow the links to the picture library). In his article, Shane Murphy mentions other internet links of interest.

I received a kind letter from Michael Gilkes FRCS, FRCOphth, FRGS following the publication of *JCS Journal Number Four* in October 2008. Michael was the Station Medical Officer (Leith Harbour, South Georgia) and Ship's Surgeon on *Southern Harvester* during 1946 & 1947. Amongst other things, he is a founder of the Friends of SPRI and founder member of the JCS. I couldn't resist the temptation to ask him to write a piece for the *JCS Journal*. I am sure you will find his contribution stimulating and rather surprising too. Although your editor is a member of the South Georgia Association, alas, he is yet to set foot on that beautiful island. I hope to do so sometime soon. It is fitting that Sir Ernest's final resting place and 'home' is featured in *Number Five*.

Later in this issue six excellent new publications are reviewed. However, there can be no substitute for purchasing these beautifully- produced books, so start saving now! Regina Daly has written a helpful explanation as to how her book *The Shackleton Letters; Behind the Scenes of the 'Nimrod' Expedition* came to be written.

Letters to the Editor have rolled into 'the office'. Most have been kind comments about the *Journal* for which I am most grateful and encouraged. A few have been helpful observations on polar issues (Mr Ken Hill on the subject of Walter How and Mr Olaf Swarbrick on the subject of two earlier voyages of discovery to the Antarctic in 1421/2 and 1820/21). Perhaps more significantly, there is a robust defence by Julian Bickersteth (Managing Director, International Conservation Services, Sydney, Australia) and Nigel Watson (Executive Director, Antarctic Heritage Trust (NZ) in response to Nigel Sitwell's critique of the work of the AHT(NZ) at Cape Royds.

In conclusion, I hope you find this issue a good read and educationally worthwhile. That is my hope and the intention of the *JCS Journal*. Again, I offer sincere thanks to our advertisers. If anyone knows of an individual or institution that might like to be the 'headline' sponsor of *Number Six* please contact your editor at [stevescottfawcett@gmail.com](mailto:stevescottfawcett@gmail.com) (or ring 01263 515808).

Stephen Scott-Fawcett FRGS  
April 2010

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- Ross-Crozier Antarctic Expedition (1839 – 43) *by Michael Smith* (an account of the southern journeys of Erebus and Terror in the mid- 19<sup>th</sup> century and their place as precursors to the 'Heroic Age').
- Shackleton Antarctic Expedition 1914-1917: The Natural History of Pack Ice as observed in the Weddell Sea: *by J.M.Wordie MA FGS* (a detailed report communicated on the author's behalf by Prof J.W.Gregory FRS to The Royal Society, Edinburgh and published by the latter on June 21<sup>st</sup> 1921 in its Journal (Volume 52, Part 4 (No.31)).
- A Chronology of Antarctic Exploration/Principal Expeditions during the 'Heroic Age' *by Robert (Bob) Headland* (an overview of polar exploration together with an edited extract focusing on Antarctic expeditions between 1892 and 1922).
- The Endurance Photographs *by Shane Murphy* (some thoughts on the Endurance photographs and related evidence giving a glimpse of 'how and why' these fabulous images came into being).
- It Ain't Necessarily So; South Georgia Loose Ends *by Michael Gilkes FRCS FRCOphth FRGS* (some South Georgia-cum-Shackleton myths exposed).

## *Book Reviews and Authors' Notes:*

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## *Letters to the Editor*



*The James Caird Society Journal* is edited by

Stephen Scott-Fawcett MA(Cantab), FRICS, FRGS, Apartment 6, Sutherland House, Overstrand Road, Cromer, Norfolk, NR27 0AQ , United Kingdom. Please note that this is the editor's **new address with immediate effect**.

Articles, reviews and correspondence for publication should be sent to the editor, on paper, to the above address. Alternatively, they should be sent by **email to stevescottfawcett@googlemail.com** Please note that this is a new email address with immediate effect (the old address – sdfsurveyor@btopenworld.com is defunct).

Please note that the views expressed in the *Journal* do not represent an official view or stance of either the Society or its committee.

Copyright of all articles, essays and reviews is vested in the authors.

Once again I am indebted to Mrs Grace Turzig (Walter How's niece) for illustrating this edition of the *Journal*. Walter would be very proud of her portrait of The Boss on the front cover and her numerous evocative pen and ink 'thumbnail' sketches – a talent obviously passed down the generations.

The full-length portrait photographs of Shackleton are from the Olive Edis Collection (Cromer Museum, Norfolk). Olive had a thriving studio in Sheringham at the time Sir Ernest and Lady Shackleton were resident in the seaside town between June 1910 and May 1911.

The dinner menu (part) displayed on the insides of the main cover are reproduced by kind permission of its owner, Mr William Parish.

The images reproduced in 'Adventures in Antarctic Biography' were provided by the author. The origins of the portrait of Frank Bickerton and the photograph of John Stenhouse are unknown.

The modern photographs appearing in Robert Stephenson's article, 'Shackleton(s) in Boston' were taken by him. The newspaper caricature was scanned by the author from the original. The newspaper *Family Image* was provided by David. M. Wilson. The Shackleton Programme was a scan provided the author from the archives of the Harvard Travellers Club, as is the HTC logo. The image of the Hotel Touraine was taken from the internet at <http://www.booktown.com>

Where it can be established, the ownership of the images included in Michael Smith's essay 'Ross-Crozier Antarctic Expedition, 1839-43' is shown in the caption. In any event, all the images are taken from the author's book *Captain Francis Crozier – Last Man Standing?* [ The Collins Press, 2006].

Wordie's paper presented in The Royal Society's (Edinburgh) *Journal* (June 1921) is believed to be outside copyright legislation. If not, the editor apologises unreservedly to those concerned. He has chosen to include the information in this edition of the *Journal* on the grounds that the paper contains much of great interest to the polar historian and, in particular, to those who revere the scientists and the invaluable work they undertook during the *Endurance* Expedition, often in the most difficult of circumstances.

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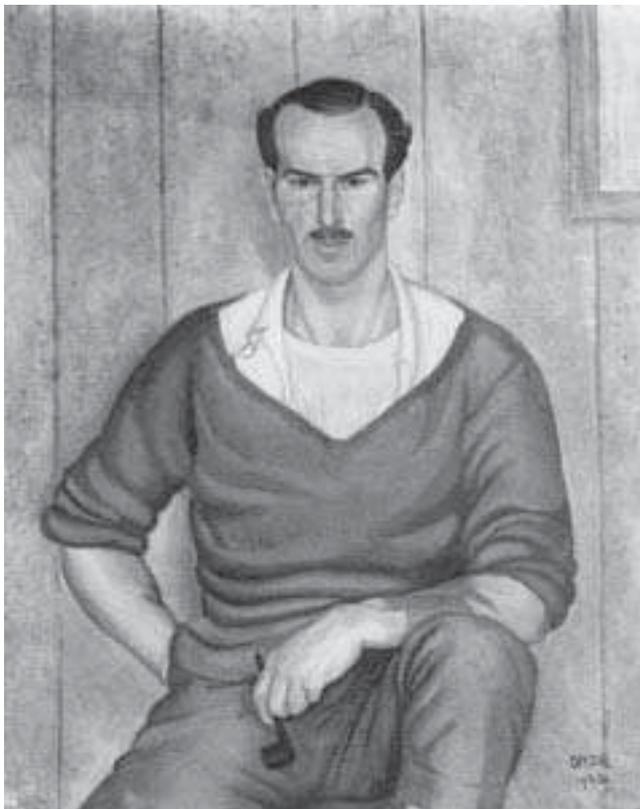
# Adventures in Antarctic Biography

By

STEPHEN HADDELEY

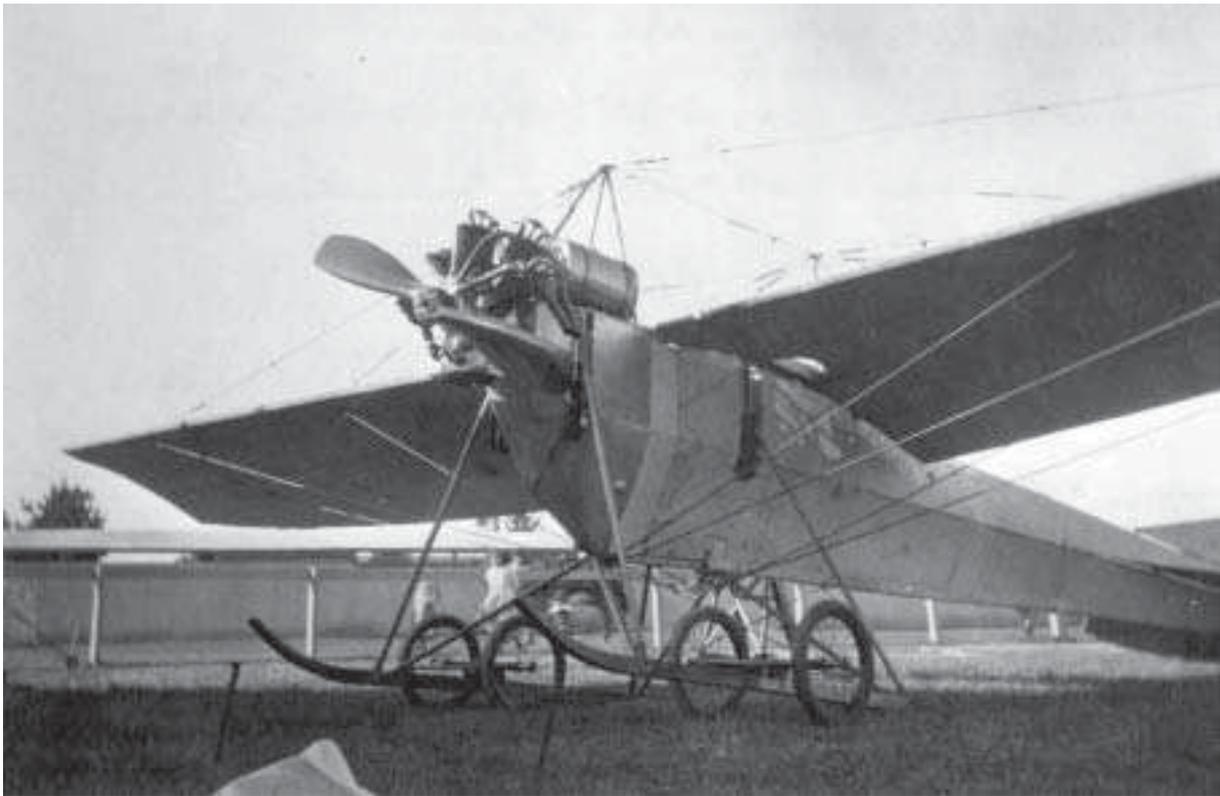
Soldiers and sailors, geographers and geologists, submariners and poets, balloonists and churchmen flocked to Antarctica during the Heroic Age of polar exploration. In a remarkable era and among extraordinary men, perhaps no one better represented this eclectic band than Frank Bickerton, the mechanical engineer on Sir Douglas Mawson's Australasian Antarctic Expedition (AAE) of 1911-14, and J.R. Stenhouse, chief officer and later master of the Steam Yacht *Aurora* during Shackleton's Imperial Trans-Antarctic Expedition.

So far as Bickerton and the AAE are concerned, it is a sad fact that, even today, the immense achievements of Mawson's expedition are very little known in Britain, despite the nation's continuing love affair with all things polar. That Bickerton should have been forgotten is regrettable but not, perhaps, surprising; but that Mawson, one of the most successful of all Heroic Age leaders, should be almost equally obscure is little short of a travesty. And the contribution made to this collective memory loss by nationalism cannot be underestimated. Just as Roald Amundsen's nationality led the British press to disparage his polar triumph, Mawson's considerable achievements, while celebrated upon his return to civilisation, were quickly forgotten: partly because his expedition's return in 1914 rapidly faded into insignificance when compared with events upon the wider world stage, but also, partly, because the expedition was avowedly Australian rather than British in its inspiration. And yet, although Australian by adoption, Mawson was born in Yorkshire, while J.K. Davis, the expedition ship's captain, most of her crew, and twenty per cent of the men making up the land parties were British. In terms of its appeal to the popular imagination, the expedition could also boast tragedy and heroism in equal measure and the story did not suffer in the telling, with Mawson's official account, *The Home of the Blizzard*, surely ranking as one of the finest of all contemporary expedition narratives.



Portrait of Frank Bickerton painted by his friend, Cuthbert Orde, in 1922

The challenge of telling Frank Bickerton's story thus became inseparable from recounting the story of the AAE as a whole – and doing it in a manner which might capture the imaginations of an audience largely, if not wholly, unfamiliar with the expedition's history. Naturally, *The Home of the Blizzard* must serve as the backbone of any retelling – but, as with any contemporary source, it must also be treated with a degree of healthy scepticism. While Mawson and his co-writer, the expedition surgeon, Archie McLean, no doubt wished to provide a detailed and accurate account of the expedition, inevitably there would be episodes that they might wish either to subordinate or exclude. Only through the examination of materials such as the diaries and letters of the expeditionaries could such episodes be identified and appraised. One such incident, in particular, bore directly upon Bickerton and upon his role in the expedition: the



*Photograph (1911) of the Vickers aircraft at Adelaide before its disastrous crash.*

disastrous crash of the expedition's Vickers REP monoplane on 5 October 1911 at Adelaide's Cheltenham Racecourse. Upon reading Mawson's official account, one might be forgiven for assuming that his aim had always been to use the monoplane as a 'wingless air-tractor-sledge' designed to assist the men in hauling supplies across the ice plateau. In reality, Mawson's own correspondence makes it absolutely clear that the machine had always been intended for service as an aeroplane – the first in Antarctica – and that its uses would include survey work and, potentially, search and rescue. The letters of his men further reveal that their leader originally intended that a number of them should be trained as pilots-cum-aerial navigators. The crash, which injured both the pilot, Hugh Watkins, and his passenger, Frank Wild, put paid to all such aspirations and Mawson was forced to make a virtue of necessity by instructing Bickerton to repair the Vickers as best he could and to prepare it for ground-hauling. He also understood that such a debacle at the very outset of his expedition could, if not handled effectively, make his whole endeavour seem risible in the eyes of the Press. And so, in order to save face and with the well-being of the expedition as a whole very much in mind – a carefully edited version of an embarrassing truth entered the official annals of the AAE.

This was not the only occasion upon which Mawson proved somewhat economical with the truth. *The Home of the Blizzard* gives the distinct impression that the expedition passed off with hardly a cross word between the expedition members and that they endured the truly appalling conditions at Cape Denison with exemplary stoicism and serenity. In reality, at times, the discord within the hut paralleled that of the elements without. During the AAE's first year, the average wind-speed was 50mph, with gusts often in excess of 200mph. Such conditions meant that the expeditionaries found themselves incarcerated inside the wooden walls of their main hut for far longer periods than any other contemporary expedition; indeed the conditions were so extreme that many of the men found it practically impossible to stand upright on any but the calmest days, reducing them to moving about on all-fours or even slithering around on their stomachs. Such conditions inevitably frayed tempers, particularly among young, fit men who had expected to spend the majority of their time sledging into the unexplored interior of the Antarctic continent. Again, it is only through reading the diaries

of men like Bickerton, Cecil Madigan and Archie McLean that the true circumstances of the expedition can be appreciated.

Fortunately, because the expeditionaries were expected, and in some cases required, to keep diaries, the biographer is often blessed by a variety of sources. As leader of the Western Sledging Party which, between 3 December 1912 and 18 January 1913, conducted a detailed survey of 160 miles of territory to the west of the main base at Cape Denison, Bickerton's responsibilities included the writing of a journal. Although the original document, scribbled in pencil as gale-force winds buffeted his tent, has long-since disappeared, two contemporary versions of it survive and are kept in the archives of the Scott Polar Research Institute. Both were typed on the machine which accompanied the expedition – the first being a word-for-word transcript of the original diary; the second being an abbreviated version which subsequently formed the basis for the official account of the Western Party's endeavours as included in *The Home of the Blizzard*. Naturally, the two versions of Bickerton's sledging journal formed the basis for my account of his experiences on the AAE and their usefulness was reinforced by the fact that Bickerton did not confine himself to his sledging experiences, instead devoting a considerable amount of time to describing his experiments with the modified aeroplane. During my research into Bickerton's career, I was fortunate enough to unearth two other documents in his own hand – both of which shed important light on the expedition and both of which, miracle of miracles, had lain completely undisturbed and forgotten for the best part of a century.

The first of these documents was a letter, written by Bickerton to his sister on 31 January 1913, shortly after he learned that, because Mawson had failed to return from his own Far Eastern Sledging journey, he and five companions would be obliged to stay in Antarctica for a second, unplanned, year in order to form a 'relief party'. 'It is', Bickerton groaned, 'a rotten game & a rotten place but nevertheless has to be done by someone'. The discovery of this letter, written with all the raw emotion of barely suppressed disappointment and frustration, and hidden in the bottom of a dusty suitcase pulled from an attic, formed one of those truly magical moments which biographers dream of but so seldom experience.

The discovery of the second document was no less serendipitous. In 1927, during a flying visit to London from his snow-clad log-cabin in the backwoods of Newfoundland, Bickerton agreed to make a broadcast for the newly-formed BBC. Naturally enough, he chose for his subject his Antarctic experiences. The resulting broadcast, made on 17 March, bears all the hallmarks of having been carefully crafted to suit the likely tastes of its intended audience, being witty, self-deprecating, fast-paced and full of the kind of incident so beloved of armchair explorers. Having discovered a reference to Bickerton's talk in the listings of the *Radio Times*, I contacted the BBC archives to ask whether there might be a recording of the broadcast: 'Highly unlikely,' came the dispiriting reply. 'Might there be, then, a transcript of the broadcast?' That, I was told by a helpful archivist, was equally unlikely – but she'd have a look. Little more than an hour later, I received a call from the same archivist, now almost as excited as myself: to everyone's utter amazement, a typescript of the broadcast, Bickerton's own, had been filed and survived – untouched and unread, in all probability, since the explorer handed it to the BBC producer in March 1927.

The discovery of such wonderful primary source material, never previously used, is the stuff of life to the biographer – but the work required to unearth it is often colossal. Frank Bickerton spent his life travelling the world: a rolling stone hardly ever gathering any moss, and at his death in 1954, his family continued to move from place to place, with possessions often being lost, destroyed or simply dispensed with. Therefore, in order to locate the materials essential to tell Bickerton's full story – his treasure-hunting expedition to Cocos Island with Aeneas Mackintosh; his work with Shackleton on the 'wingless aeroplanes' for the *Endurance* Expedition; his service as an observer and fighter pilot with the RFC during the First World War; his exploration of Africa with Frank Wild and James McIlroy; his work with Captain

Victor Campbell of the *Terra Nova* in Newfoundland; his journey from Cape Town to Cairo by train, plane and automobile in the early thirties; and his relationships with the novelists Stella Benson and Vita Sackville-West – it became essential to trawl through a host of archives, both public and private. The end result, however, the fleshing-out of what might best be described as a previously disarticulated and incomplete biographical skeleton, gives a very real and lasting satisfaction.

If the huge effort of tracing and collating the required materials for a biography of Frank Bickerton represents one end of the biographical spectrum, then the comparative accessibility of material relating to Bickerton's close friend, J.R. Stenhouse, just as surely represents the other. When he was killed by enemy action during service with the Royal Navy in 1941, it might have been expected that much of Stenhouse's story would have been lost with the same degree of finality as his body was lost, pulled down beneath the surface of the Red Sea with the wreckage of his ship. But Stenhouse's wife had now lost two husbands without being left the comfort of a marked grave to act as the pivot for her grief – her first husband had been that tempestuous Scot, Aeneas Mackintosh, whose body had never been recovered from the waters of McMurdo Sound. Now, perhaps to establish some kind of memorial to her second lost husband, Gladys determined to maintain an archive of his papers, including diaries, letters, photographs, maps and drawings. This decision to preserve as much as she could of her husband's extraordinary life, has resulted in the survival of what must be one of the most comprehensive records of any Heroic Age explorer in existence. The archive is not, of course, without holes but it does present the biographer or polar historian with an immensely rich treasure house to explore.

In terms of the Imperial Trans-Antarctic Expedition, my particular good fortune was to be allowed, through the generosity of Stenhouse's family, to study the original water-stained journals of both Stenhouse and Mackintosh. Although photocopies of both journals have been deposited at SPRI, these photocopies do not tell the full story. Just as Douglas Mawson decided to 'censor' the history of the AAE, so too did Stenhouse edit his journals. In the extraordinarily tense and febrile atmosphere predominating on board the *Aurora* during her 10 month drift among the pack ice between May 1915 and February 1916, the temperamental and volatile Stenhouse often resorted to his diary in order to give vent to his pent-up feelings. Sometimes he recorded his aggravation at the eccentricities of particular crewmen, and occasionally he interspersed his predominating feelings of anxiety for the fate of the Ross Sea Party with expressions of their comparative good fortune – their having meaningful and physically exhausting work to undertake comparing favourably with the prevailing lassitude and boredom of life on board a helpless and drifting ship. Stenhouse's diaries are punctuated by such explosions of suppressed wrath and frustration but, when he handed over his diaries to Shackleton for the preparation of the official account, *South*, he carefully excised all such entries – usually by pasting pieces of blank paper over the controversial passages. Only by handling the original journals, by being able to identify the disguised passages and to hold them to the light, is it possible to read the unexpurgated version – allowing insights into Stenhouse's thoughts and feelings which are not available to those working from copies.

The commonly held picture of Stenhouse is that of a hearty, courageous and skilled mariner of the 'salt of the earth' mould. In reality, he was an altogether more complex and, indeed, more difficult individual. The hints within his ITAE journals of a darker side to his nature are reinforced by an examination of his period as master of Captain Scott's *Discovery* during the National Oceanographic Expedition of 1925-27 – the longest and most important oceanographic survey since the *Challenger* Expedition of 1872-76. During the expedition, an initial disparity of interests and character between Stenhouse and the chief scientific officer, Dr Stanley Kemp, eventually turned into outright hostility and an antagonism so pronounced that it came close to destroying the expedition altogether. Only by reading the official correspondence and minutes of the *Discovery* Committee (held by the National Oceanography Centre and by SPRI) is it possible to appreciate the violence of the discord on board ship and



*J.R. Stenhouse on the Bridge of RRS Discovery, 1926*

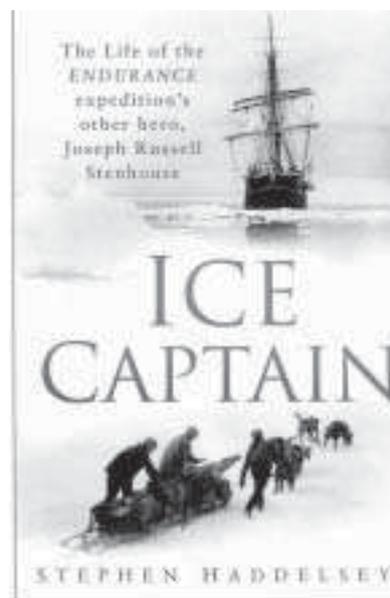
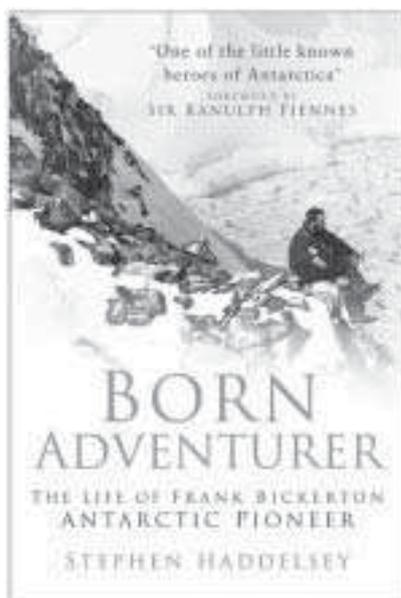
the contribution made to that discord by what the expedition surgeon, Dr E.H. Marshall, described as Stenhouse's pathological behaviour. But, of course, in a period when the psychological effects of extended subjection to shell fire and extreme stress were only just beginning to be appreciated, it is hardly surprising that Stenhouse's malaise, a combination of deep-rooted depression and the unavoidable effects of over a decade of supreme responsibility and gruelling physical and mental activity, should not be fully understood.

Of those mysteries left unresolved by the Stenhouse family papers, perhaps the greatest was that surrounding the circumstances of his death. That he had been killed while serving with the Royal Navy in the Red Sea during the Second World War was certain; but beyond those few bald facts, little was known. The discovery of one contemporary source might have enabled me to end my book with confidence; the discovery of two such sources, however, inevitably introduced doubt and ambiguity – because, as is so often the case with contemporary sources, they contained fundamental contradictions. Commander Edward Ellsberg, a US Navy salvage officer, arrived at the erstwhile Italian naval base at Massawa shortly after Stenhouse's death. In his memoir, *Under the Red Sea Sun*, Ellsberg claimed that Stenhouse and most of his crew had been killed when he deliberately chose to take his ship outside the waterways confirmed as safe and into waters known to be mined by the Italians. If true, then this claim was tantamount to an accusation of wilful negligence – a charge that would have resulted in a court martial, had Stenhouse survived. A brief account written by Stenhouse's friend, Lieutenant John Cutten, however, disagreed in some key particulars. Although Cutten confirmed that Stenhouse had been killed by an enemy mine, he claimed that his friend and mentor had been a passenger on the ship in question, and therefore not responsible for the ship's movements. He also stated that Stenhouse had been the only casualty. But neither of these reports had been written by people who had actually witnessed the event and without at least one eye-witness account to rely upon the exact circumstances of Stenhouse's death would remain uncertain, and my book without a proper conclusion.

As is so often the case for those writing biographies of historical Britons, it was that incomparable source of contemporary documentation, the National Archives at Kew, that finally ended the speculation. In this instance, the answers were to be found in the dog-eared and well-hidden Admiralty minutes of a Board of Inquiry into the loss of His Majesty's Tug *Taikoo* on 12 September 1941. These minutes, which include the word-for-word transcripts of interviews with the survivors, revealed precisely how Stenhouse, the survivor of so many near-misses – during his time as a Merchant Navy officer on the great sailing ships; as an Antarctic explorer; as a highly decorated U-boat hunter; and as a combatant during the Allied intervention in North Russia – had finally met his fate. Every biographer should thank God for the National Archives – and thank God, too, for that bureaucratic imperative which still insists upon the taking of such copious minutes.

The advent of the First World War meant that Frank Bickerton and Joe Stenhouse never journeyed together to the Antarctic: Bickerton's determination to join his friend, Aeneas Mackintosh, in the Ross Sea being overturned by a more pressing need to serve his country on, and eventually over, the Western Front. But despite this missed opportunity, or lucky escape, Bickerton and Stenhouse eventually became good friends, their friendship cemented by a love of the Antarctic, which formed the linchpin of both their careers, and by a shared restlessness of spirit. Besides certain, non-Antarctic, parallels in their lives – both men dug for pirate gold on Robert Louis Stevenson's *Treasure Island* and they worked together on the British film *The Mutiny of the Elsinore* – in personality and in their careers, the two men varied enormously. And, while it was their friendship and their mutual experiences and predilections which led me to write both of their biographies, it was often in their differences that the most pleasure and excitement was to be experienced. As their biographer, I can only hope that the readers of both books will share something of both the joy and the thrill which researching and writing about two such extraordinary men entailed.

Stephen Haddelsey is the author of *Born Adventurer: The Life of Frank Bickerton, Antarctic Pioneer* and *Ice Captain: The Life of J.R. Stenhouse*. Both books are published by The History Press ([www.thehistorypress.co.uk](http://www.thehistorypress.co.uk))



*Recent books written by Stephen Haddelsey and reviewed in the JCS*

# SHACKLETON(S) IN BOSTON

by

Robert B. Stephenson, FRGS

An unsettling telegram was received by Harvard Professor William Morris Davis on March 29, 1910, from Robert Ely, director of the Civic Forum in New York:

“We are greatly concerned at small sale tickets Shackleton lecture Thursday evening mortifying failure will result unless something doing quick.”

ERNEST SHACKLETON arrived back in Britain following the Nimrod expedition on the 12th of June 1909. Once *The Heart of the Antarctic* was published, at the end of October 1909, he set out on an ambitious series of lecture tours to help pay off the debts of the expedition (and, as some thought, perhaps raise a little for the next one). Hugh Robert Mill records that “...it was to include lectures at one hundred and twenty-three different places in Europe and America.”<sup>1</sup> During November and December there were fifty lectures in England, Scotland and Ireland. In January of 1910 he was off to the continent giving sixteen lectures in 22 days in Italy, Austria, Hungary, Germany and Russia.<sup>2</sup> On returning to London he was off again lecturing throughout the land for seven weeks. Finally, on March 19, 1910, he and Emily boarded the *Lusitania* and were on their way to America. A mere seven days later they found themselves in Washington, D.C., and the American tour began.

President Taft received the Shackletons at the White House on the afternoon of March 26th, and that evening Sir Ernest spoke before a crowd of 5,000 at the National Geographic Society and was presented with its Hubbard Gold Medal by President Taft. “Great and hearty” audiences were addressed in Philadelphia and New York. On March 29th, in the latter city, there was a ‘welcome’ by the Explorers Club at the Hotel Astor, and in the evening Carnegie Hall was filled with prominent citizens who had come to see the young hero of the south. He was introduced by Commander Robert E. Peary who had been at the North Pole less than a year before. The next day he was feted by the Transportation Club at a dinner at the Hotel Manhattan. Later that evening, off to Boston.

Advertisements had been appearing in the Boston papers for days leading up to Shackleton’s public lecture—the second American one—scheduled for Thursday, March 31st. The venue was to be Symphony Hall, then and still today the home of the Boston Symphony Orchestra. Tickets were priced from 50 cents to two dollars. The notice screamed in large type “SHACKLETON The British Antarctic Explorer FARTHEST SOUTH 111 miles from the South Pole. Illustrated by Cinematograph Pictures.”<sup>3</sup>

William Morris Davis was Professor of Physical Geography at Harvard. He was sometimes referred to as the Father of American Geography. Hugh Robert Mill described him as “...small, dark, alert and wiry. He was a hard man, with a stern, logical mind, and he aroused great opposition by his dogmatic presentation of theory and his unusual and rather uncouth terminology. But he had depths of cryptic humour, as he told impossible tales in a mirthless voice and with impressive face.”<sup>4</sup>

Davis was also the main force behind the founding in 1902 of the Harvard Travellers Club and served as its first president. When he heard of Shackleton’s intended stop in Boston he must have seen an opportunity for the club to be hospitable to the explorer. Davis enlisted the aid of fellow club member—and Secretary of the Peary Arctic Club—Herbert L. Bridgeman of Brooklyn asking him to slip Shackleton an invitation when he disembarked the *Lusitania* in New York.

Bridgeman responded on March 7th saying that

“Mr. Ely [of the Civic Forum, acting as Shackleton’s lecture agent] is exceedingly reluctant to forward any scheme which places Shackleton in touch with the public ‘without money and without price.’ You can readily understand that the too liberal parading of the lions through the streets is likely to diminish the gate receipts, though there must be, of course, somewhere a middle ground in case of a man so justly eminent as Shackleton.”

Either Mr Bridgeman contacted Mr Ely or Professor Davis did so directly. In any event and for whatever reasons, Mr Ely proved receptive to the club’s overtures because he wrote Davis on March 12th assuring him that something might be arranged: “He [Shackleton] would be delighted, I am sure, to accept a luncheon in his honor on that day or a reception in the early afternoon.”

On the 15th, Davis wrote Ely who in turn responded the next day: “I will transmit this invitation direct to him but I am in a position to formally accept it on his behalf...It is not necessary to raise the question with him regarding a ‘few remarks’; he is always ready to do this and will expect to be called upon at a luncheon in his honor. I am assuming that the Travellers Club is composed only of men and there is therefore no question of Lady Shackleton’s presence.”<sup>5</sup>

On the 19th, Davis again wrote Ely proposing certain arrangements. On the 22nd, Ely wrote back:

“In reply I am glad to say that the arrangements you propose seem to me admirable in every respect, namely, the luncheon of the Travellers Club to Shackleton at the Harvard Union, followed by a greeting after the luncheon from a company of students. You are safe in making this announcement in the college papers and otherwise. Shackleton was always pleased to address students at the universities in Great Britain and on the continent and I am sure he would like nothing better than this.

The auto ride seems also an excellent plan, I have just accepted for both Sir Ernest and Lady Shackleton the invitation of Mr and Mrs T. J. Bowlker of 282 Beacon St., for dinner just prior to the lecture in Symphony Hall. They ought to have, I suppose, some time to rest in the afternoon.”

Ely also remarked that “Lady Shackleton will be most happy to accept Mrs Lowell’s very kind invitation for luncheon on Thursday, March 31st.” (Abbott Lawrence Lowell was president of Harvard.)



*The Hotel Touraine (1897)*

Once the arrangements were made Professor Davis jumped to and sent out handwritten invitations for the special lunch to selected Club members. Apparently the need for speed resulted in at least one error: “So far from your misspelling of Shackleton’s name being a thing for me to excuse I am deeply obliged to you,” wrote Thomas N. Perkins. This was thankfully corrected in the printed version that was dated March 23rd.

On that same date Professor Davis received an invitation “...to be present, as the guest of the Club, at the supper to be given in honor of Sir Ernest Shackleton, at the Algonquin Club.” This was on the letterhead of The Victorian Club which no longer exists and of which little is known.<sup>6</sup> So far Shackleton was booked for three meals: a Travellers Club luncheon, a dinner before his lecture and a supper following.

The Shackletons arrived in Boston early on Thursday morning, March 31st—they had taken the midnight train from New York—and were accompanied on the journey by George T. Coppins, a member of The Victorian Club “under whose auspices” Shackleton was speaking in Boston. A reception committee from the club welcomed the arriving party at South Station and it was whisked away in “a big Thomas automobile” to the Hotel Touraine, at the corner of Boylston and Tremont Streets. The Shackletons had breakfast, after which the explorer spent some time with the local newspaper reporters. The remainder of the morning saw Ernest and Emily receiving visitors at the hotel.

A little before noon, the Shackletons were driven from downtown Boston, across the Charles River to Cambridge and the Harvard Union<sup>7</sup> on Quincy Street.

Emily was welcomed by Mrs Lowell and Ernest was escorted to the luncheon held by the Travellers Club in the Trophy Room of the Union. The meal was “...served at one o’clock, prompt” with each member allowed one guest. The cost: \$1.50. About eighty attended but no details survive as to the conversation, the menu or any remarks that Shackleton surely made. The only attendees that are certain are Shackleton and Professor Davis, who no doubt presided, President Lowell of Harvard (who proposed the health of Shackleton), President Maclaurin of M.I.T., and—based in part on notes of acceptance in the Club archives—Arthur T. Cabot, T. J. Bowlker, J. G. Thorp, Henry P. Walcott, T. W. Thorndike, Joseph Warren, J. D. Greene (Secretary of the Harvard Corporation) and C. F. Adams 2d (Harvard Treasurer)<sup>8</sup>, not an undistinguished assemblage by Boston standards.

At 2:30 the meeting was adjourned and Club members and their guests then descended with Shackleton to the

“...big room...which was packed with waiting undergraduates. They were standing around the walls, seated on the window-sills, hanging over the balconies—over 1200 of them [The *Boston Journal* set the number at 2,000]. As Shackleton entered, he was cheered to the echo. With him on the platform were President Lowell and Professor Davis. Professor Davis introduced him, after which G. P. Gardner [a member of the Executive Committee of the Student Council] waved his arms violently and brought out a Harvard yell for the explorer which made him grin sheepishly.

Shackleton told them a few incidents of his life in the Antarctic which made them roar with laughter—particularly the account of how they ate the last pony meat. ‘It was gamey meat,’ said Sir Ernest. ‘In fact, it was very high. The pony had been dead two months.’”<sup>9</sup>

Upon leaving the Union the Shackletons and some of Emily’s friends “went directly to President Lowell’s home, across the street from the Union. Mrs. Lowell served tea, and several of the members of the faculty and their wives were present.”<sup>10</sup>

The Shackletons were then driven to the Oakley Country Club—which still exists—in neighboring Watertown, for afternoon tea and a rest. In a letter to Professor Davis, Travellers Club member J. G. Thorp offered “...to put his car at your service” and “...to call for the ladies.”

The next event for the Shackletons on that busy Thursday was a dinner at the home of T. J. Bowlker



*The Harvard Union today.*

at 282 Beacon Street in Boston's Back Bay. (The house, at the corner of Exeter Street, was replaced in 1939 by a large apartment block.) Bowlker was not a member of the Travellers Club so what his connection, if any, to the Shackletons is unknown. (The explanation might stem from his wife, Catherine Lowell Roosevelt, being the sister of President Lowell of Harvard.) Mr Bowlker did attend the luncheon but he may have been included merely because Professor Davis had been included among Bowlker's dinner guests. President Lowell was at Shackleton's lecture and surely he would have been at his sister's dinner party beforehand. Who else was at the dinner and what might have transpired in way of conversation remain unknown.

The lecture at Symphony Hall, perhaps a mile from the Bowlker residence, was due to begin at 8:15. What next we know is that the Shackletons were escorted "...by mounted members of the British Military and Naval Veterans' Association" to the venue, along presumably with the dinner guests. Professor Davis no doubt was in the procession as he had earlier been invited by Albert Flint of The Victorian Club to serve "...as a member of an Honorary Committee...to meet Lieutenant Shackleton, informally, at Symphony Hall shortly before 8 p.m." President Maclaurin of M.I.T., who would welcome Shackleton at Symphony Hall, and officers of The Victorian Club were almost certainly at the dinner and in the procession.

Mr M. Graeme Haughton, President of The Victorian Club, introduced the speaker and Dr Maclaurin gave an 'Address of Welcome.' In this he "...said there is much talk about the uselessness of polar exploration, but the value of exploration could not be told until it was tried. He hoped that since the American flag had been planted at the North Pole, the British flag might float over the South Pole."<sup>11</sup>

Judging from the newspapers that appeared the next day, Shackleton wowed 'em. They all reported a "large audience." (Symphony Hall presently accommodates 2,625 in the same leather-bound seats that were in use in Shackleton's time.)

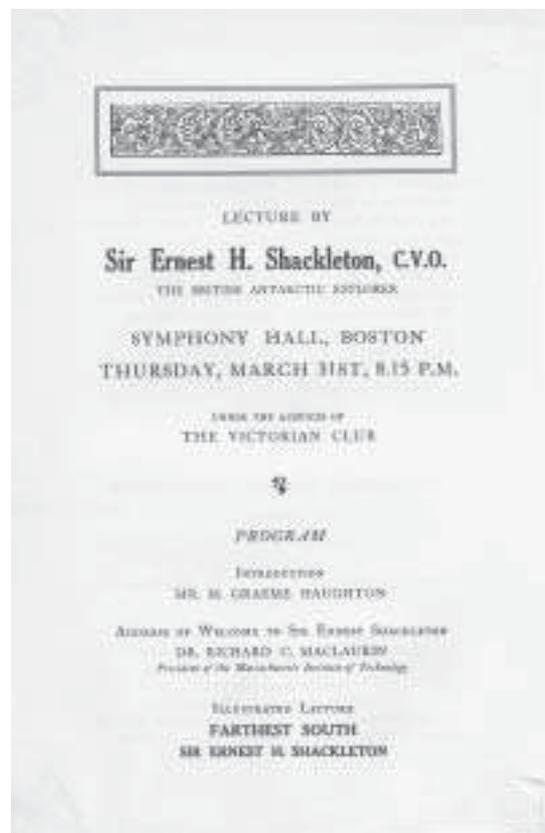
From The Boston *Globe*:

"Sir Ernest H. Shackleton got a splendid reception in Symphony hall last evening... His frank, genial, almost boyish manner caught everybody, but it was the evident manly strength and courage behind it all that made the deepest impression.

The gleams of humor in his dramatic narrative and the good nature that shone through his words brought the audience very close to him.



*Symphony Hall today.*



*The programme for Shackleton's lecture.*

There is no doubt but he is the kind of stuff of which heroes is made.

He has a “sangfroid” that is positively amazing when it is recalled what he has done and what he undertook to do and the awful sufferings himself and his companions endured during that trip of 1500 miles from the ship to within about 89 miles of the south pole, and even more awful return trip when hunger stalked with the party for about two months before they found the Nimrod.”<sup>12</sup>

The *Boston Evening Transcript* had this to say:

“Sir Ernest H. Shackleton, the British explorer of the Antarctic regions, gave a thrilling account of his dash toward the South Pole, before a large audience at Symphony Hall, last night. It was not an oratorical address, just a plain narrative, told with humor and naivete, but it was listened to with the closest attention and was frequently punctuated with applause. The recital of the sufferings of the party in a trip of fifteen hundred miles from their ship to within about one hundred miles of the Pole, brought his audience into intimate relations. Cinematograph pictures and stereopticon views added to the interest of the lecture.”<sup>13</sup>

The headline of the *Boston Post’s* account read ‘HOT TIME IN OLD TOWN FOR SOUTH POLE HERO.’ It went on to describe Shackleton as

“... a young man. He is tall, and his build conveys the impression of immense strength. His jaw is square, his clean-shaven face tanned, and his smile is whimsical and boyish. In general appearance he strongly resembles the much abused Gibson man.”<sup>14</sup>

Not to be outdone, the *Boston Herald* observed that

“Sir Ernest is apparently about 36 years old, with the look of a student, black eyes and hair, a ruddy complexion, firm grip and affable manner. He has the lithe build of an athlete and looks entirely fit.”<sup>15</sup>

The *Boston Journal* announced “GREAT AUDIENCE” and “BRITISH EXPLORER RECEIVED WITH WARM-HEARTED HOSPITALITY” and described Shackleton as a



*The Algonquin Club, the site of the supper.*

“perfect figure of robust health... Such a man would thrill a football coach, for Sir Ernest has a pair of shoulders and a square, determined chin that would make even a Yale rush line tremble. He never wears an overcoat in this climate, and in explaining why says that he never had a cold in his life and does not wish to get one.”<sup>16</sup>

Earlier in the day Shackleton had commented to the *Journal* reporter that

“I think the Scott expedition will gain the goal,” the explorer declared with a shade of British pride in his tone. “You see, Scott will have one of the best equipped expedition that ever started on such a mission—ice motors, Siberian ponies, which are the only practical bit of animal life to consider in such a country, and my trail to follow. At my stopping point he will be within less than a hundred miles from the pole. He is a man of both courage and luck, and I can’t figure how he’ll fail... Incidentally, the reporter had a most interesting chat with Lady Shackleton. ‘No,



The sketch of Shackleton by Haydon Jones that accompanied the article that appeared in the *Boston Herald* on April 1, 1910.



From the *Boston Journal* of April 1, 1910.

she was not a suffragist, though she believed in some phases of the cause. The adjustment of some of the laws regarding women in England would settle the whole affair, I believe,' she said. 'I do not think the majority of women wish to vote.'<sup>17</sup>

The evening was not over yet. Following the lecture, Shackleton and probably most of those mentioned above, repaired to the Algonquin Club on Commonwealth Avenue for a supper given by The Victorian Club. We know that Professor Davis was present; the Harvard Travellers Club archive has the letter inviting him and enclosing "...herewith a ticket for your use." Emily may very well have been included but possibly not. (The *Boston Transcript*, in laying out Shackleton's schedule, reported that "Following the lecture he will be the guest at a dinner at the Algonquin Club, at which many prominent Boston *men* are expected to be present."<sup>18</sup> [emphasis added]) Sir Ernest was no doubt called upon for some after supper remarks.

So Thursday, March 31, 1910, had been a busy day and evening for the Shackletons, probably not unlike many of their other days and nights on the lecture circuit: Arrival early in the morning; breakfast; meeting the press; receiving visitors; a luncheon; talking with the students; a drive, tea and a rest; dinner at a private home; a lecture; supper afterwards; all interspersed with a 'few remarks;' and presumably a late 'good night.'

So all appeared to go well and Symphony Hall was full or nearly so.<sup>19</sup> But two days before, Professor Davis had received that telegram from the very nervous and concerned Robert Ely predicting a "mortifying failure" due to low ticket sales. What had happened to turn the tide? Who knows: Davis probably did what he could to deliver the Harvard and Cambridge communities. Perhaps the advertising paid off. Or possibly the stirring newspaper accounts of Shackleton's talk at Carnegie Hall on the 29th resulted in a last minute surge of sales.

So what did the Shackletons think of Boston on what may have been their one and only visit? One newspaper account included some rather peculiar exchanges.

"Boston," said Sir Ernest to a *Post* reporter yesterday as he prepared to step into a waiting automobile and hurry away to a dinner whose chief base was not somewhat ancient pony meat. "Boston is a good city, and I like it. I like America as a whole, and particularly I like Boston. There is something about the city—a certain kind of—that is to say, a somewhat intimate—oh, well, I like it."

When the *Post* reporter caught up with him again, he had eaten his dinner and made a speech, and was just preparing to go to another dinner. "Since I spoke to you last," said Sir Ernest, "I have not changed my mind. Boston is most hospitable. I like it, I like its manners and customs and people and buildings and colleges and traditions and audiences and dinners. I like everything about Boston."<sup>20</sup>

Although Boston was deemed a success, the same couldn't be said for the continuation of the tour. Mill describes what followed:

"But then the tide suddenly fell; the smaller towns of New England in which it was arranged that he lecture made no response. For a night or two he spoke to empty benches, and then discovered that the ground had not been prepared by the lecture agents. There had been almost no advertising; he arrived in one town in the same train as the posters announcing his lecture, which should have been adorning the walls for a week before."<sup>21</sup>

The tour continued for several more months, in the United States and Canada, sometimes fraught with problems and at other times, with great success.

By summer the Shackletons were back in Britain and recuperating at their rented house in Sheringham, Norfolk.

## SHACKLETONS AND THE HARVARD TRAVELLERS CLUB

### *A Postscript*

SIR ERNEST was not the only Shackleton to have an association with the Harvard Travellers Club.

Edward Shackleton, later Lord Shackleton, was at the Harvard Club<sup>22</sup> on December 6, 1937, to speak on the 1934-35 Oxford University Ellesmere Land Expedition. The Club's announcement noted that the meeting would be in the @sculapian Room at 8:15 and that the charge for dinner would be "\$2.00 per person, including cocktails."<sup>23</sup> It also added that "Mr Shackleton is the son of the late Sir Ernest Shackleton of Antarctic fame..." but no mention was made of the Club luncheon for the speaker's father at the Harvard Union. The Minute Book of the Club did record that

"His pictures, colored and black and white, movies and stills, were excellent, and his accompanying talk first class. Both by his remarks and selection of illustrations he made the Arctic alive and real in contrast to the rather cold, drab picture which a lecturer on this part of the world often presents to an audience. As often happens some of the most interesting remarks of the evening were made by the speaker to questions after the talk, before the meeting broke up. Comment heard afterwards was very favorable."

The Harvard Travellers Club celebrated its hundredth birthday in 2002. In the Club's most recent YEAR BOOK the event is described:

"Among the grandest and best attended meetings in recent years was the Centennial dinner held 100 years to the day after the first meeting of the Club in 1902: November 15, 2002. The speaker was Jonathan Shackleton continuing a Shackleton connection stretching back to Lord Shackleton and to his father, Sir Ernest Shackleton..."

Jonathan spoke of his famous cousin, Sir Ernest, and of Lord Shackleton, and of his own travels in Antarctica, which continue to this day. In the audience was Jonathan's wife, Daphne, and his brother Charlie. All have travelled in Antarctica.

A fourth Shackleton spoke—albeit briefly—at the 763rd meeting of the Club on February 8, 2005. David Shackleton, son of Jonathan and Daphne, and then working in Boston, was the guest of the writer and was put on the spot to rise at the dinner table and give Shackleton greetings to those assembled.

Perhaps a fifth Shackleton is in the wings, waiting to make an appearance in Boston.

## HARVARD TRAVELLERS CLUB AND THE POLAR REGIONS

### *A Second Postscript*

SIR ERNEST SHACKLETON wasn't the only polar traveller to appear before the Harvard Travellers Club. Herewith, others arranged chronologically by meeting number. (Some Alaskan and Canadian talks not included.)

\*Club members.

COMMANDER ROBERT E. PEARY, 3rd Meeting, February 27, 1903. *Field Work of the Peary Arctic Club*.

VILHJALMUR STEFANSSON\*, 16th Meeting, January 27, 1905. *The Summer of 1904 in Iceland*. 38th Meeting December 20, 1907. *Winter Life of the Eskimo*. 79th Meeting, November 29, 1912. *An Arctic Exploration*. 353rd Meeting, December 8, 1953. *Greenland, 1953*.

DR. OTTO NORDENSKJÖLD, 22nd Meeting, January 13, 1906. *An Account of his Antarctic Expedition, 1901-04*.

ANTHONY FIALA, 27th Meeting, April 27, 1906. *Two years in the Arctic Regions*.

BRIGADIER-GENERAL ADOLPHUS W. GREELY, 52nd Meeting, April 30, 1909. *Scenes of the New Siberia*.

CAPTAIN ROBERT A. BARTLETT\*, 59th Meeting, February 11, 1910. *On the Peary Expedition to the North Pole*. 73rd Meeting, January 26, 1912. *Seal Fishing about Newfoundland*. 98th Meeting February 3, 1915. *The Drift of the Carluk during the Arctic Night, the Loss of the Ship, and the Rescue of the Men from a Point 60 Miles North of Herald Island to Wrangell Island—and the Walk to Siberia*. 162nd Meeting, December 13, 1926. *Hunting Hair Seals off Newfoundland*.

CAPTAIN ROALD AMUNDSEN, Special Meeting, January 21, 1913. (This was held at the Harvard Union and was probably a luncheon much like the one given for Shackleton. Amundsen lectured that evening at Boston's Tremont Temple.)

DR. GEORGE P. HOWE\*, Special Meeting, February 14, 1913. *Resume of Capt. Scott's South Pole expedition*.

SAMUEL MIXTER\*, 108th Meeting, February 25, 1916. *A Winter in the Arctic*.

DR. ROBERT CUSHMAN MURPHY, 110th Meeting, April 28, 1916. *A Visit to South Georgia, with an Account of a Visit to the Penguin Rookeries*. 416th Meeting, November 14, 1961. *Operation Deep Freeze (U. S. Government Antarctic Expedition)*.

JOHN HEARD, JR.\*, 127th Meeting, March 18, 1921. *Whaling off the Northern Coast of Alaska*.

SIR HUBERT WILKINS, 191st Meeting, May 16, 1930. *Notes on a Proposed Trip under the Polar Ice by Submarine*.

EDWARD E. GOODALE\*, FREDERICK CROCKETT\* AND NORMAN VAUGHAN\*, 192nd Meeting, October 28, 1930, *Experiences with the Byrd Expedition to the South Pole*.

MAJOR L. T. BURWASH, 198th Meeting, April 11, 1931. *Canada's Arctic Coastline from MacKenzie River to Labrador and the Franklin Expedition*.

DR. ALEXANDER FORBES\*, 202nd Meeting, December 15, 1931. *An Aerial Photographic Survey of the Northern Coast of Labrador*.

EDWARD P. BECKWITH\*, 210th Meeting, November 22, 1932. *Cosmic Ray Observations in Alaska*.

JOHN K. HOWARD\*, 222nd Meeting, February 20, 1934. *Northern Iceland and Northeastern Greenland*.

WALTER A. WOOD, JR.\*, 226th Meeting, October 23, 1934, *The Fiord Region of Eastern Greenland*. 317th Meeting, April 12, 1949. *Project Snow Cornice*.

H. BRADFORD WASHBURN, JR.\*, 235th Meeting, November 26, 1935. *Aerial Adventures in the Yukon, and a winter crossing, on foot, of the St. Elias Range to Yakutat Bay*. 263rd Meeting, April 11, 1939. *Ascent of Mt. St. Agnes in the Chugach Range, Alaska*. 272nd Meeting, May 14, 1940. *Alaskan Glacier Studies*. 292nd Meeting, February 26, 1946. *Army Air Force Work near Mt. McKinley, Alaska*. 311th Meeting, October 5, 1948. *The White Tower Expedition to Mount McKinley*. 335th Meeting, October 16, 1951. *Ascent of Mt. McKinley from the Southwest*. 360th Meeting, November 16, 1954. *First Ascent of the South Buttress of Mt. McKinley*. 377th Meeting, December 11, 1956. *Mt. McKinley Cook Controversy*.

RICHARD S. RUSSELL, 236th Meeting, December 17, 1935. *Personal Experiences with the Second Byrd Antarctic Expedition*.

H. E. AMBASSADOR ALEXANDER TROYANOVSKY, 249th Meeting, May 18, 1937. *Exploration in the Soviet Arctic*, followed by the film "Heroes of the Arctic," the record of the Chelyuskin Expedition.

EDWARD SHACKLETON, 252nd Meeting, December 6, 1937. *Oxford University Ellesmere Land Expedition, 1934-1935*.

WILLIAM R. LATADY\*, 312th Meeting, November 9, 1948. *The Ronne Antarctic Research Expedition*.

TERRIS MOORE\*, 318th Meeting, May 25, 1949. *Flight to Little Diomedede Island, Bering Strait*.

E. FRED ROOTS, 347th Meeting, February 17, 1953. *The Norwegian-British-Swedish Antarctic Expedition to Queen Maude Land, 1949-1952*.

EDWARD E. GOODALE\*, 348th Meeting, March 17, 1953. *The Weather Bureau's Arctic Project*.

COMMANDER DONALD B. MACMILLAN\*, 350th Meeting, May 19, 1953. *North Far North*.

LAURENCE M. GOULD, 388th Meeting, March 11, 1958. *IGY in the Antarctic*.

HENRY S. FRANCIS, JR.\*, 399th Meeting, October 13, 1959. *IGY in Antarctica*. 502nd Meeting, May 16, 1972. *The Antarctic*.

H. ADAMS CARTER\*, 414th Meeting, May 16, 1961. *Milton Mt. McKinley Range Expedition*.

JOHN P. TURTLE\*, 427th Meeting, February 19, 1963. *A Year in Antarctica*.

WILLIAM O. FIELD\*, 434th Meeting, January 21, 1964. *Our Changing Glaciers (in Alaska, Canadian Rockies, Swiss Alps, New Zealand and Antarctica)*. 524th Meeting, March 18, 1975. *Glacier Studies in Southern Alaska*. 599th Meeting, October 2, 1984. *Alaska: A Sixty-Year Perspective*.

DR. KAYE EVERETT, 446th Meeting, May 18, 1965. *Alaska and Greenland—Soil Conditions and Geology*.

JOHN H. ROSS\*, 446th Meeting, May 18, 1965. *Cod Fishing in Bering Sea*.

LEANDER STROSCHNIG, 454th Meeting, May 17, 1966. *The Polar Plateau Station in Antarctica*.

JOHN C. BOYD\*, 463rd Meeting, October 17, 1967. *The Penguins of Cape Crozier, Ross Island, Antarctica*.

DR. SAMUEL C. SILVERSTEIN\*, 465th Meeting, December 12, 1967. *Climbing Antarctica's Highest Mountains*.

DR. DAVID E. LEITH\*, 476th Meeting, March 18, 1969. *A Study of Diving Mammals of the Bering Sea*.

THOMAS D. CABOT\*, 481st Meeting, December 9, 1969. *A Summer Trip to Iceland and Greenland*.

MICHAEL WYNN-WILSON\*, 485th Meeting, April 21, 1970. *The Antarctic Cruise of M. S. Lindblad Explorer.*

WALTER H. KILHAM, JR.\*, 498th Meeting, January 11, 1972. *Inuvik, Banks Island, and Old Crow, in the Canadian Arctic.*

DENNIS C. McALLISTER\*, 518th Meeting, May 28, 1974. *A Ski Trip Across the Greenland Icecap.*

JAMES L. MADDEN\*, 534th Meeting, May 25, 1976. *A Cruise to Northwest Greenland.*

DR. STEVEN B. YOUNG, 536th Meeting, November 9, 1976. *The Kerguelen Archipelago: A Voyage to the Loneliest Islands in the World.*

NEIL GOODWIN\*, 539th Meeting, February 15, 1977. *Filming the Migration of Wolves and Caribou in the Canadian Arctic.*

ROBERT F. PERKINS, JR.\*, 546th Meeting, January 17, 1978. *Canadian Tundra Canoe Trip from the Great Slave Lake to the Polar Sea.* 626th Meeting, January 19, 1988. *The A, B, C's of Nature: 72 Days Alone in the Arctic.*

NED GILLETTE, 552nd Meeting, November 7, 1978. *The High Arctic of Ellesmere Island.*

PROFESSOR ELMER HARP, JR., 570th Meeting, January 20, 1981. *Archaeological Exploration of the Be1cher Islands.*

DR. URSULA B. MARVIN, 605th Meeting, April 16, 1985. *Antarctica and Meteorites.*

PETER C. ALDEN\*, 630th Meeting, May 24, 1988. *The Southern Andes, Falklands and Antarctica.* 785th Meeting, December 11, 2007. *Climate Change, Ice Bears and Inuit in the High Canadian Arctic Archipelago.*

DR. JAMES R. ABEL, 637th Meeting, April 18, 1989. *The Arctic Barrens Expeditions: A 1972-1988 Retrospective.*

NORMAN VAUGHAN\*, Special Meeting, May 4, 1992. *Informal Remarks on his upcoming Mt Vaughan Expedition.*

ROBERT B. STEPHENSON\* AND JOHN H. ROSS\*, 662nd Meeting, May 26, 1992. *Antarctica: Two Perspectives.*

GEORGE P. BATES\*, 667th Meeting, February 9, 1993. *Ellesmere Island, Canada.*

DR. WARREN M. ZAPOL\*, 669th Meeting, April 13, 1993. *The Weddell Seal: A Diving Virtuoso.*

DR. ROBERT H. EATHER, 677th Meeting, April 12, 1994. *Majestic Lights: The Aurora in Science, History and the Arts.*

DR. GEOFFREY E. CLARK\*, 691st Meeting, February 13, 1996. *The Greely Expedition: Disaster On the Ice.* 772nd Meeting, March 14, 2006. *Adventures in Arctic Film Making: The 1881 Greely Expedition.*

JOHN B. STURROCK\*, 692nd Meeting, March 12, 1996. *An Antarctic Adventure.*

NORMAN D. VAUGHAN\*, 696th Meeting, November 12, 1996. *Dogs on Ice: Adventure and Exploration in the Antarctic.*

DR. JAMES J. MCCARTHY\*, 697th Meeting, December 10, 1996. *Traveling Comfortably: In the footsteps of Polar Explorers.*

KEN BURES\*, 707th Meeting, February 10, 1998. *Kayaking in Northeast Greenland.*

ALVAH AND DIANA SIMON, 708th Meeting, March 10, 1998. *Into the Arctic Arena: Frozen into Crushing Ice.*

PAUL MAYEWSKI, 722nd Meeting, January 11, 2000. *Core Research: Unlocking the Secrets of the Ice.*

ROBERT B. STEPHENSON\*, 723rd Meeting, February 8, 2000. *Exploring the Antarctic Peninsula and South Georgia.*

ARTHUR WHITE\*, 723rd Meeting, February 8, 2000. *East Greenland: Geological Investigations by Zodiac*.

LUCIA DELEIRIS\*, 732nd Meeting, March 13, 2001. *Penguins and Seals: Sketching in the Antarctic*.

MADELON C.Z. BURES\*, 739th Meeting, February 12, 2002. *The Eskimos of Ammassalik*.

JONATHAN SHACKLETON, 744th Meeting, November 15, 2002. *Shackleton Returns! The Antarctic, Ireland, the Shackletons and One Hundred Years of the Harvard Travellers Club*.

NILS BONDE-HENRIKSEN\*, 747th Meeting, February 11, 2003. *Backpacking across Baffin Island, Auyquittuq National Park Reserve, Nunavut, Canada*.

LOREN M. WOOD\*, 763rd Meeting, February 8, 2005. *Traversing Mt. McKinley*.

NATHANIEL S. COOLIDGE\*, 779th Meeting, February 13, 2007. *White Water Canoeing in the Arctic (Baffin Island)*

WAYNE PETERSEN, 794th Meeting, January 13, 2009. *Svalbard—An Arctic Naturalist's Paradise*.

*Note:* Admiral Richard Evelyn Byrd, certainly America's best known Antarctic explorer, never spoke to the Club and was never a member. Efforts to put this right were many but to no avail. He lived conveniently at 9 Brimmer Street in Boston and was well known to many members but for whatever reason, was not to be persuaded.

## NOTES

Accounts of Shackleton's visit to Boston appeared in the *Boston Globe*, *Herald*, *Post*, *Journal* and *Evening Transcript*. The *Harvard Crimson* also covered his visit. Quoted material not otherwise cited is from the Harvard Travellers Club archives.

<sup>1</sup> Hugh Robert Mill, *The Life of Sir Ernest Shackleton* (London: Heinemann, 1923), p. 167.

<sup>2</sup> *Ibid.*, p. 169.

<sup>3</sup> The advertisement in the *Boston Evening Transcript* that appeared the day before the lecture dropped the mileage down to 97. The *Boston Globe* report of the lecture gives the figure of 89 miles and, later, as "within 80 miles of the south pole." The *Boston Herald* came up with yet another measurement: "Explorer Planted Queen's Flag Within 111 miles of His Goal."

<sup>4</sup> Hugh Robert Mill, *An Autobiography* (London: Longmans, Green and Co., 1951), p. 90.

<sup>5</sup> He assumed correctly, though since 1983 the Club has had both men and women members.

<sup>6</sup> The address given in the invitation is 614 Barristers Hall, probably Mr Flint's business address. The *Boston Directory* of 1905 gives the address as 60 State Street, again surely a business address. It was not listed in the *Official Club List of Boston* (1907). The organizing meeting of the Club was held on November 16, 1897 at 553 Boylston Street. The Constitution of the Club notes "The objects of the Club are: The consideration and discussion of questions affecting the British Empire; the dissemination of information in regard thereto; and the promotion of social intercourse among its members." The Club issued several publications, speeches mostly. It apparently did not have a lengthy life.

<sup>7</sup> This colonial revival building dating from 1900 was designed by McKim, Mead & White and "made possible by the gift of Mr Henry Lee Higginson." The building was much altered in the late 20th century and is now the Barker Center. An early photograph shows a large room hung with chandeliers fabricated from what appear to be elk antlers. Perhaps this was the Trophy Room where the luncheon was held.

<sup>8</sup> The minutes of the Harvard Travellers Club are quite thorough and complete as to the nearly 800 regular meetings but special gatherings such as this one were seldom recorded in any formal way. Higginson is best known as the founder of the Boston Symphony Orchestra. He was in the audience at Shackleton's lecture that evening.

<sup>9</sup> *Boston Post*, April 1, 1910.

<sup>10</sup> *Boston Journal*, April 1, 1910.

<sup>11</sup> *Boston Evening Transcript*, April 1, 1910.

<sup>12</sup> *Boston Globe*, April 1, 1910.

<sup>13</sup> *Boston Evening Transcript*, April 1, 1910.

<sup>14</sup> *Boston Post*, April 1, 1910. "The "Gibson Man," equally as handsome and self-assured as the Gibson Girl, provided her perfect partner. The Gibson Girl and the Gibson Man in some ways represent the "Barbie and Ken" dolls of the early 1900s as icons of popular Culture.' ([www.eyewitnesstohistory.com/gibson.htm](http://www.eyewitnesstohistory.com/gibson.htm))

<sup>15</sup> *Boston Herald*, April 1, 1910.

<sup>16</sup> *Boston Journal*, March 31, 1910.

<sup>17</sup> *Ibid.*

<sup>18</sup> *Boston Evening Transcript*, March 31, 1910.

<sup>19</sup> Hugh Robert Mill records that "At Boston there was appreciation and a large hall, but it was not full for Tetrizzini was singing, not this time in his honour, as a rival at the Opera House." (Mill, *Life*, p. 173). As all the reports mentioned a "large audience" it's not unreasonable to assume that if not full Symphony Hall was close to full.

<sup>20</sup> *Boston Post*, April 1, 1910.

<sup>21</sup> Mill, *Life*, p. 173-74.

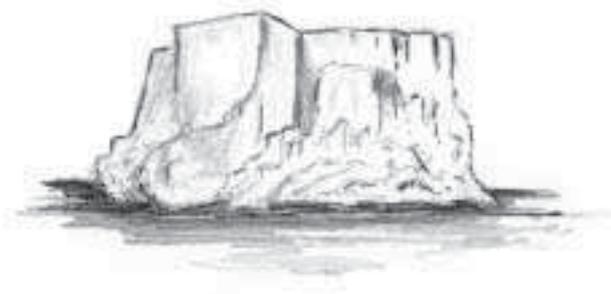
<sup>22</sup> The Harvard Club stands just west of Massachusetts Avenue at 374 Commonwealth Avenue. Its large new clubhouse opened in 1913 so just missed hosting Sir Ernest when he paid his visit to Boston. Its first president was Henry Lee Higginson, who also founded the Boston Symphony Orchestra and was at Sir Ernest's talk on March 31, 1910.

<sup>23</sup> The charge in 2009 is \$55 although without the benefit of cocktails (which are available but not without cost).

## ACKNOWLEDGEMENTS

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*About the author:*

Robert B. Stephenson, a long time member of the *James Caird Society*, lives in Jaffrey, New Hampshire, and is the founder and coordinator of *The Antarctic Circle*, "a forum and resource on historical, literary, bibliographical, artistic and cultural aspects of Antarctica and the South Polar regions." He served as president of the Harvard Travellers Club from 1991-93 and is its archivist and the editor of its *Year Book*.



# Ross-Crozier Antarctic Expedition, 1839-43

By  
Michael Smith

Dusk was falling on the evening of September 30, 1839 as two heavily-laden ships, *Erebus* and *Terror*, slipped quietly into the English Channel at the start of their long journey towards the virtually unknown continent of Antarctica. It was a modest, almost unnoticed send-off for what became the greatest voyage of maritime discovery of the 19th century and which paved the way to Antarctica for the celebrated 20th century explorers of the heroic age, including Roald Amundsen, Douglas Mawson, Robert Scott and Ernest Shackleton.

The expedition, which was led by two outstanding seafarers and explorers of the day - Captain James Clark Ross in *Erebus* and his deputy, Commander Francis Crozier in *Terror* - was gone for four years and widely applauded as the last great expedition of its type carried out entirely under sail. Between 1839 and 1843, the expedition made the first penetration of the Antarctic pack ice in the Ross Sea area, charted thousands of miles of new seas and coastline and named a host of geographic landmarks which today are familiar to all enthusiasts of Antarctic exploration.

The most notable discoveries of the expedition included the Ross Sea, Ross Island and Mount Erebus, most southerly volcano on earth. Victoria Land was named after the new Queen and the Great Icy Barrier - modified to the Ice Barrier during the heroic age and officially renamed the Ross Ice Shelf in 1950s - was so called because it represented a barrier to *Erebus* and *Terror* sailing freely to their goal of the South Magnetic Pole. McMurdo Sound, the inlet where *Discovery* was berthed between 1902 and 1904 and where Shackleton and Scott would build their base camps at Cape Royds and Cape Evans, was named after Archibald McMurdo, the 27 years old naval Lieutenant on *Terror*. Cape Crozier, the windswept point on the east side of Ross Island which was immortalised by Apsley Cherry-Garrard in *The Worst Journey in the World*, was named after the expedition's second in command and is today famous as an important penguin colony.

Other notable features were Mount Sabine after fellow explorer and magnetics expert, Edward Sabine, Cape Bird after Lt Edward Bird on *Erebus* and Beaufort Island after Admiral Sir Francis Beaufort, the Admiralty Hydrographer and the man who devised the Beaufort Scale. The naval and scientific establishment was remembered with a host of mountains named after other prominent individuals from the Admiralty, Royal Society and British Association and the impressive 8,900-ft Mount Melbourne was named after the Prime Minister of the day. Cape Adare, the most northerly headland at the entrance to the Ross Sea, was named after Viscount Adare, the MP and close friend of Ross. It was at Cape Adare in 1895, that Henryk Bull's expedition made the first formally recorded landing on the Antarctic Continent, though it is highly probable that sealers and whalers had made numerous unrecorded landings on the Antarctic Peninsula at least 70 years earlier. Snow Hill and Paulet islands on the Antarctic Peninsula, which were to feature as possible refuges for the castaways on Shackleton's *Endurance* expedition in 1915 and 1916, were also discovered by Ross and Crozier when they toured the region in 1843.

Among Ross's more judicious decisions was to name the ice-covered Coulman Island in the Ross Sea after Thomas Coulman, the man whose daughter he was planning to marry. The small island's most southerly point was named Cape Ann after the woman herself. Unfortunately, the Parry Mountains, which were "sighted" at a considerable distance by the explorers, were found to be a mirage when the terrain came under closer inspection 60 years later during the *Discovery* expedition.

The expedition, Britain's first concerted attempt to unlock the secrets of the Antarctic, was conceived in the late 1830s largely to help fill in the gaps which existed in the earth's magnetic readings, particularly in the southern hemisphere. But the early whaling voyages had brought back hints that the Antarctic seas offered tempting commercial opportunities and there were concerns that other nations would move into the area unless Britain acted quickly. It was also decided that the expedition should attempt to locate the South Magnetic Pole and proceedings were given added urgency in 1837 by word that American naval lieutenant, Charles Wilkes and French admiral, Jules Sebastian-Cesar Dumont d'Urville were taking ships south with the intention of reaching the Magnetic Pole.

Ross and Crozier were the outstanding choices to lead the expedition. Ross, who joined the navy a few days before his 12th birthday, was the most experienced Arctic explorer of the age after travelling on seven voyages to the ice between 1818 and 1836 and spending more than a dozen seasons in high latitudes. He was also a leading authority on terrestrial magnetism and in 1831 successfully located the North Magnetic Pole during a harrowing 4 year expedition to the Arctic with his uncle, Sir John Ross. Shortly after returning he conducted the first systematic magnetic survey of the British Isles. Once called the most handsome man in the navy, the 39-years old Ross was a charismatic figure and a strong leader with a streak of vanity and a breezy self-assurance. Shortly before sailing to the Antarctic on *Erebus*, James Clark Ross was offered a knighthood, which he rejected. But his prospective father-in-law, Thomas Coulman, only gave Ross permission to marry to his daughter Ann on condition that the prolonged Antarctic expedition was to be Ross's last. It was a promise he was forced to break.

Ross had an enviable choice of naval officers with great experience of the ice when he came to selecting the expedition's second-in-command and captain of *Terror*. Following the end of the Napoleonic Wars in 1815, Britain had embarked on series of Arctic expeditions which had sought to solve the enduring mysteries of the North West Passage and the North Pole. It was an expansive, adventurous era of discovery lasting more than 20 years which produced a dynasty of celebrated explorers such as John Franklin, Edward Parry and John Richardson.



James Clark Ross, the most accomplished Polar explorer of the 19th century and leader of the 1839-43 Antarctic expedition. (National Maritime Museum)

But when Ross came to choose his No 2 for the journey to the Antarctic he picked the Irish-born officer, Francis Rawdon Moira Crozier.

Crozier, his best friend, had first met Ross in 1821 when the two young naval lieutenants sailed on Parry's second voyage to find the North West Passage. By 1839 Crozier was 43 years old, he had experienced four challenging Arctic expeditions and twice over-wintered above the Arctic Circle. Crozier was a quiet, unfussy character who had earned a reputation as a highly capable and dependable officer with much expertise in the fields of magnetism and astronomy. It was a measure of Ross's high regard for the man from Banbridge, County Down that the task of fitting out and provisioning *Erebus* and *Terror* was left entirely in Crozier's capable hands. Although he was never given the same recognition as Ross, Franklin and many others, Crozier was highly regarded by fellow naval officers and the

scientific community. He would later be elected a Fellow of the Royal Society, sponsored by prominent men such as the astronomer Sir John Herschel, the First Lord of the Admiralty, Sir George Cockburn and the powerful civil servant, Sir John Barrow, who as Second Secretary at the Admiralty was the driving force behind the country's Arctic activities after 1815. But alone among the acclaimed explorers of the age – Back, Franklin, Parry, Richardson and James and John Ross – Crozier never received a knighthood.

Also on board was a man destined to be one of the most distinguished scientists of the Victorian age. Joseph Dalton Hooker, a friend of Charles Darwin, was only 22 when he sailed on *Erebus* and later emerged as the 19th century's most accomplished naturalist, director of the Royal Botanic Gardens at Kew and the father figure of botany. But because there was no requirement for scientists on the expedition, Hooker sailed under the nominal title of Assistant Surgeon. Hooker proved to be the last great link between the post-Napoleonic age of Polar exploration and the heroic age, living long enough into the 20th century to advise Captain Scott on the perils of the Antarctic before *Discovery* sailed south in the summer of 1901. It was Hooker who memorably described the Weddell Sea, where Shackleton's *Endurance* came to grief in 1915, as "repellent".



*Francis Rawdon Moira Crozier, the Irishman who captained Terror during the Antarctic voyage died on the disastrous Franklin expedition to the North West Passage. (National Maritime Museum)*

*Erebus* and *Terror*, like their commanders, were the ideal choices for the expedition. The ships were three-masted bomb vessels, reinforced to withstand the powerful recoil of its 3-ton mortars and boasting capacious holds and a shallow draught which was considered ideal for working in icy waters. Each deck was doubled-planked and heavy duty oak beams were fitted to reinforce the hull, which was also sheathed in a double layer of copper. Both ships, however, would be reliant solely on sail, even though the navy at the time was already embracing the new age of steam-powered engines. Indeed, the Admiralty's advisor on adopting steam power was Sir Edward Parry, the Arctic veteran and the man who introduced Ross and Crozier to Polar exploration.

*Erebus* was something of an unknown quantity. Built at Pembroke in 1826, the 372-ton vessel had spent only two years at sea by the time the Antarctic beckoned in 1839 and was given a faintly sinister name for a vessel poised to make a long journey into unknown waters. In some Greek legends, Erebus was the region where the dead had to pass shortly after death. In contrast, the 325-ton *Terror* had a stronger pedigree. The ship was built at Topsham on the Exe estuary in Devon in 1813, had run aground in 1828 and had somehow survived George Back's unsuccessful Arctic expedition in 1836 which ended with a badly-leaking *Terror* beached on the north west shore of Ireland after a desperate battle with Atlantic storms. *Erebus* and *Terror*, each with a complement of 64 men, took supplies for three years, even though the expedition planned many landfalls to build observatories and take copious scientific readings. Supplies for the journey included 6 tons of tinned meat, 7 tons of pickled cabbage, lemons, carrots and other vegetables and a small flock of sheep.

Driving south the ships ran into their first gale after only three days and eventually reached St Helena in the South Atlantic in January 1840 where an observatory was erected near to the house where Napoleon had lived in exile. By May 1840 the expedition was berthed at the isolated Kerguelen Islands in the Indian Ocean where strong gales blew for 45 of the 68 days the party spent completing their tasks. The next port of call was Hobart, on Van Diemen's Land (renamed Tasmania in 1855), the penal colony where Sir John Franklin, another old Arctic hand, was Governor. Only a few years later, Franklin and Crozier would be reunited on *Erebus* and *Terror* during the disastrous 1845 North West Passage expedition, where all 129 men perished. Under Franklin's watchful eye a squad of 200 convicts built a new observatory called Rossbank and Ross and Crozier, somewhat reluctantly, became local celebrities as the free islanders revelled in the presence of their illustrious visitors. Before long they were known on the busy social circuit as the Two Captains.



*Three of the most experienced explorers of the age gathered in Hobart, Tasmania to build a magnetic observatory. Left-to-right, Sir John Franklin, Francis Crozier and James Clark Ross. (Tasmanian Museum and Art Gallery)*

The expedition sailed south from Hobart in November 1840, with Ross sticking to the 170° meridian in his eagerness to avoid the areas where d'Urville and Wilkes might be operating. The Antarctic Circle was crossed on New Year's Day 1841, which prompted hearty celebrations among the crew and the unhappy sight of Billy, the expedition's pet goat, staggering around the deck under the influence of too much port. Extra clothing was handed out and shortly after *Erebus* and *Terror* ran into dense pack ice.

Moving cautiously at times and occasionally using the brute force of ramming the ice, the blunt-nosed ships edged forward with Ross and Crozier anxiously seeking open leads and a route out of the labyrinth. The opening days of January saw the ships struggling against a daunting mixture of swirling fog, gales and intimidating icebergs that towered above their masts. Rough seas often forced the ships to seek shelter behind the colossal tabular icebergs and any hopes of retreat were diminished as the ice closed together behind them. Muskets were fired and bells rung when the vessels sometimes lost sight of each other in the gloomy fog. When reunited, an undaunted Crozier and Ross went across to visit each other's ship to celebrate Twelfth Night with a glass of cherry brandy.

By January 9 a strong breeze had shifted the fog and by noon the ships unexpectedly found themselves in open, ice-free waters. Using only sail, *Erebus* and *Terror* had penetrated the pack of the Ross Sea area for the first time in a great feat of seamanship to rank alongside the achievements of Vasco da Gama, Ferdinand Magellan and James Cook. Shortly after his

historic trek to the South Pole in 1911, Roald Amundsen wrote a glowing tribute to Ross, Crozier and the seamen of *Erebus* and *Terror*: “Few people of the present day are capable of rightly appreciating this heroic deed, this brilliant proof of human courage and energy. With two ponderous craft – regular ‘tubs’ according to our ideas – these men sailed right into the heart of the pack, which all previous polar explorers had regarded as certain death. It is not merely difficult to grasp this; it is impossible – to us, who with a motion of the hand can set the screw going and wriggle out of the first difficulty we encounter. These men were heroes – heroes in the highest sense of the word.” (1)

In a mood of euphoria, some hoped *Erebus* and *Terror* could now sail unhindered to the South Magnetic Pole or even to the South Pole itself. But only two days later the cry of “Land” demolished this hope and put an end Ross’s ambition of becoming the discoverer of the earth’s two magnetic poles. Mountains and snow-covered land came into sight as they pressed further south into what is now the Ross Sea. Although thick ice and heavy seas made it impossible to get a shore party onto the mainland, the expedition managed the next best thing. On January 12, 1841 Ross and Crozier stepped onto a small island for a modest and hasty ceremony to claim possession for the Empire, the first newly acquired possession of the Victoria age. The island, which is barely two miles long and lies about five miles off the coast of Victoria Land at 71°52′22″ South 171°12′22″ East, was given the appropriate name of Possession Island. Watched by a host of bemused penguins, Ross and Crozier stood knee-deep in guano to toast their discovery with an “excellent sherry” and left the Empire’s newest and most bleak outpost after a brief stay of just 25 minutes.



*Erebus and Terror surveying the first sight of Mt Erebus, the world’s most southerly volcano, in 1841 (source unknown)*

Days later they calculated that the ships had surpassed the furthest south of James Weddell (74°15′S) in 1823, where extra grog was handed out. Soon the expedition encountered a new island which was initially called High Island and later re-named as Ross Island by Scott. What struck them about High Island was the extraordinary sight of an active volcano, the 12,450 ft smoking beacon which was named Mount Erebus. A nearby extinct volcano was named Mt Terror and Hooker spoke of the party’s “total insignificance and helplessness” when compared with the two imposing peaks which humans were seeing for the first time.

An even more astonishing sight greeted the men as the ships drove east past the island, a vast perpendicular wall of ice which towered over their mastheads and stretched up to around 200ft in places. Ross named it the Great Icy Barrier because, quite literally, the ice was a barrier which prevented *Erebus* and *Terror* from sailing direct to the South Magnetic Pole. “We might with equal chance of success try to sail through the Cliffs of Dover,” Ross lamented. It meant that his ambition to stand at the Magnetic Pole was ended.

However, Ross was already knew that both Wilkes and d'Urville had failed with their attempts to reach the Magnetic Pole and he now calculated, with some accuracy, that it was probably situated about 160 miles into the interior of Victoria Land at 75° 30' S 154° SE. More than six decades later in 1909, Edgeworth David, Alastair Mackay and Douglas Mawson from Shackleton's *Nimrod* expedition became the first to stand at the South Magnetic Pole, though the "wandering pole" was discovered to be about 230 miles further north than Ross had calculated.

*Erebus* and *Terror* ran eastwards alongside the Barrier for mile after mile, each day hoping to find a course to the south and marvelling at the sights, including the first ever glimpse of an Emperor Penguin. After travelling about 250 miles, the ships reached 78° 4'S, their furthest south of the season. With no sign of an end to the Barrier and the season closing in, they retraced their path back to Ross Island and were greeted by a spectacular display of pyrotechnics from Mt Erebus. After a brief stay at the newly-named McMurdo Bay in late February, the ships headed north and reached Hobart in early April 1841. They had been gone for more than four months, penetrated the pack under sail, discovered hundreds of miles of new territory and travelled further south than anyone before. The only major disappointment was the failure to reach the South Magnetic Pole.

Refreshed and re-fitted, *Erebus* and *Terror* sailed south again on November 23, 1841, hoping to resume their journey in the area left behind only nine months earlier. But the pack was a tougher enemy this time, trapping the ships for 47 days while the party endured a ferocious battering from high winds and the punishing swell. One hurricane ripped the rudders from both vessels and Crozier had to flood *Terror* to a depth of 2ft when a potentially disastrous fire broke out below decks. It was noticeably colder than the previous year and it was noted that the build-up of ice was so great that the 1 inch ropes now measured 12 inches in diameter. A fish, wrenched from the sea by a large wave, was instantly frozen against *Terror's* side but the ship's cat moved quickest to snatch the prize before the naturalist on board could examine the unfortunate fish.

The pack did not free the ships until mid-February, leaving little time for fresh exploration. However, the Barrier was reached towards the end of the month and a new "furthest south" of 78° 10'S was established. Towards the end of the Barrier, the land swerved to the north and once more the ships ran into impenetrable pack. Fearing that their route to the north might get closed off, Ross gave the order to retreat to the Falkland Islands for winter refuge.

The run north was uneventful until mid-March when a jumble of icebergs, one estimated to be standing 200ft out of the water, suddenly loomed out of the darkness and threatened to collide with the ships. Ross hastily ordered *Erebus* to slow down by taking in topsails but Crozier in *Terror* was still running on full sail unaware of the imminent danger. Ross turned away sharply and ran directly into the path of the faster-moving *Terror*. The ships collided with a sickening crunch, knocking everyone off their feet and entangling the two riggings together. *Erebus* suffered badly, with the bowsprit, foretopmast and other smaller spars ripped away. At one point, *Terror's* keel was exposed as the vessel was carried to the top of a huge wave and threatened to crash on top of the stricken *Erebus*.



James Clark Ross

Luckily, the knot of riggings became disentangled and the quick-thinking Crozier saw his chance. Spotting a dark space between the two icebergs, he gambled that it was an opening and calmly steered *Terror* between the mountainous obstacles like threading a needle. The gap, one officer commented, was "not twice the breadth of the ship" and Crozier later confessed that he had no idea how *Terror* had escaped. Once through the gap, Crozier lit a



*The dramatic collision between Erebus and Terror amidst icebergs in the Southern Ocean (Source unknown)*

blue lamp as a beacon for Ross, who skilfully brought the badly crippled *Erebus* through an hour later.

Running repairs allowed the ships to reach the Falklands by early April, 1842, where the news was mixed. After his assured performance in the Southern Ocean it was appropriate to discover that Crozier had been promoted to the rank of Captain after 31 years of distinguished naval service. By contrast, Ross and Crozier found the Falklands in a state of near anarchy, with barely enough food available to feed the population of 75 and law and order close to breaking down just nine years after Britain had annexed the islands. Organised farming had virtually collapsed and instead of replenishing their own provisions, the weary travellers were forced to dip into their own supplies to feed the wretched community. In spite of the appalling state of affairs, Ross elected to spend the winter on the islands, mainly to repair his ships but also safe in the knowledge that none of the sailors, who were growing increasingly restless after so long at sea, would jump ship in such a desolate spot. The Falklands, he concluded, a “rather retrograding” place.

The five months spent on the Falkland Islands was the expedition’s low point. Many felt that, after three years away, the expedition had been forgotten in England and their fears were compounded by news that the mails from home had not arrived. The strain was evident as morale fell, the officers quarrelled among themselves and drunkenness among the seamen became a problem. To add to the strain, Ross fell out with the island’s young and inexperienced Governor, Richard Moody.

However, Ross and Crozier took time away from overseeing the repair of *Erebus* and *Terror* to help Governor Moody locate a new capital for the islands with suitable harbour facilities. It was a choice between Port William in Jackson Harbour where the deep water was more favourable or the existing site in Port Louis. Ross and Crozier knew that suitable anchorage facilities would be vital to keep the island’s supply lines open and Port William was duly chosen. It was later renamed Port Stanley after the Colonial Secretary and today two streets running alongside Stanley Harbour bear the names, Crozier Place and Ross Road.

There were few regrets when *Erebus* and *Terror* left the Falklands in September 1842, heading for Cape Horn and a third voyage south. The aim was to sail as far south as possible down the 55th meridian and add to the discoveries of James Weddell 20 years earlier in the seas which now bears his name. After a brief return to the Falklands, Christmas was celebrated amidst the South Shetland Islands and ships skirted the Antarctic Peninsula, where they

named Snow Hill Island and Paulet Island among a flurry of new discoveries. Ross and Crozier went ashore on the tiny Cockburn Island, which is barely a mile in diameter, to claim the territory for the Crown.

However Ross and Crozier soon discovered that the pack was even more dense than on the Ross Sea side of the Continent and *Erebus* and *Terror* were quickly stuck fast in the northern reaches of the King George IV Sea (later renamed the Weddell Sea). For almost six weeks the ships dodged and weaved in a constant battle with the ice, always hoping to find an open lane to the south. The pack finally released them on February 4 at a disappointing latitude of 65°S which left Ross voicing his frustration that Weddell had found open seas a good 10° further south in 1823. Even then, Weddell had seen open water to the south but had sensibly turned back because of the lateness of the season.

The ships entered the King George IV (Weddell Sea) further east than Weddell and it was down the same eastern channels that Shackleton, more than 70 years later, would take *Endurance* on his epic voyage in 1914-15. Once again, the ships met pack at 65°S 15'W and it was decided that the ships could go no further. *Erebus* and *Terror* turned east but the relentless ice blocked any hopes of significant progress south. On March 5, 1843 the ships were confronted by an impassable barrier of ice stretching from east to west and all hopes of making further progress that season had disappeared. Hooker described the journey as one of "constant gales, fog and snow storms" and at 71°S 30'W the third leg of their momentous voyage, the most disappointing of the three legs, was at an end. Barely 50 miles across the horizon – unknown to Ross and Crozier – was the coastline of Dronning Maud Land, an area on the Antarctic that would remain undiscovered for another 90 years.

*Erebus* and *Terror* turned north, crossing the Antarctic Circle for the last time during the second week of March bound for the South African port of Simon's Town. But the ships ran into another fearsome storm, perhaps the worst they had experienced during their long journey, as the Antarctic said a brutal farewell to the expedition. Men stayed on deck throughout the night on constant alert for potentially dangerous icebergs and nothing the expedition had experienced in the previous three years matched the ferocity of their final storm. "They were nights of grog and hot coffee, for the orders to splice the main brace were

many and imperative if the crew were to be kept up to the strain on their nerves and muscles," Hooker recalled. (2)



*Erebus and Terror had to steer between two huge icebergs to avoid a disastrous collision*  
(Source unknown)

Simon's Town was reached on April 4, 1843 where the exhausted men began to recover from their ordeal. After almost four years at sea, the strain of the journey was apparent to all. At a party for the expedition, a woman observed that Ross and Crozier's hands trembled so much they could hardly hold a glass. "One night in the Antarctic did this for both of us," Ross explained. (3) Another curiosity for the well-wishers was that the men who had spent so long in cold conditions found it difficult to cope with the South African heat.

*Erebus* and *Terror* spent a month recuperating in the pleasant surroundings of Simon's Town, quietly refitting the ships. But the peace was broken when a wicked rumour spread that Ross was contemplating another year in the ice, though fortunately this proved false and the ships finally

left South Africa to return home on April 30. By early September *Erebus* and *Terror* were anchored off the Kentish port of Folkestone and the expedition formally drew to a close on September 23, 1843 – almost four years to the day that the ships had sailed.

The long voyage of *Erebus* and *Terror*, the last great expedition made solely under sail, is rightly hailed as the most outstanding maritime journey of the 19th century and the journey which made it possible for the great deeds of men like Amundsen, Scott and Shackleton in the 20th century. It was a comprehensive triumph of navigation, discovery and scientific endeavour which produced the first successful navigation of the pack in the Ross Sea area, found vast tracts of new territory and produced a mass of scientific data on the region's waters, geology, botany and magnetism which was so extensive that the final work was not published until



Francis Rawdon Moira Crozier

25 years after the expedition's return. Only the failure to locate the South Magnetic Pole can be considered disappointing, but the expedition was not geared to undertake a major overland trek into Antarctica and it would be extremely harsh to consider this a major failure. Another triumph was the surprisingly low mortality rate among the 128 men who set out in 1839. Only three of Ross's sailors on *Erebus* died during the four year expedition and Crozier did not lose a single man on *Terror*, though two officers were invalided home, including Lt McMurdo.

Unfortunately, the expedition did not capture the public's imagination in the way that the earlier voyages of Parry or Franklin had popularised Polar exploration. Four years away from the public gaze without regular communication was probably too long, Ross's book on the expedition did not materialise for another four years and to many people, the Antarctic was far too remote or hostile to be considered worthwhile. Only the whalers and sealers saw riches in the frozen waters. Towards the end of the 1840s any public interest in exploration was focused entirely on the Arctic where fears were growing about the long overdue Franklin expedition which had not been seen since entering the ice in 1845.

Ross married Ann Coulman within six weeks of returning from the Antarctic, with Crozier his best man. Ross, understandably weary after 25 years of Polar exploration, settled down at his home in Buckinghamshire, finally accepted a knighthood and began the laborious task of writing a book about the voyage. But the promise to retire from exploration was set aside in 1848 when Ross, under pressure from the Admiralty, took *Enterprise* and *Investigator* to the Arctic in search of the missing Franklin expedition, which included his friend, Crozier. He returned empty-handed in 1849 and never went back to the ice. Sir James Clark Ross, the most experienced and accomplished Polar explorer of the 19th century, died in 1862, a few days before his 62nd birthday.

Crozier, who struggled to cope after Antarctica, joined Sir John Franklin in 1845 when the tried and tested *Erebus* and *Terror* were sent in a renewed search for the North West Passage. Crozier, the perennial No 2, sailed as second in command in the faint hoping of impressing Sophy Cracroft, Franklin's niece with whom he had fallen in love when *Erebus* and *Terror* stopped at Hobart in 1840-41. But Sophy Cracroft, a close confidante of Lady Jane Franklin, rejected Crozier's marriage proposals because she had no wish to be a sailor's wife. "She liked the man, but not the sailor," Jane Franklin once confided. (4) Franklin was dead by 1847 and *Erebus* and *Terror* irretrievably trapped in the ice off the coast of King William Island. Crozier, for the first time in his life, was in charge of an expedition and he led over 100 men in the desperate attempt to escape from the ice by marching overland to the hunting grounds. None survived. Men fell down and died in the tracks, although some Inuit accounts indicated that Crozier, by now in his early 50s, was among the last to die.

Antarctica was left mostly untouched for 50 years after the departure of *Erebus* and *Terror* in 1843. *Pagoda* under Lt Thomas Moore made a brief foray into southerly waters in 1845 and in 1874 the *Challenger* under Captain George Nares became the first steamship to cross the Antarctic Circle as part of a mammoth four-year global journey which travelled a total of 70,000 miles. By 1892 whalers from Dundee began scouring the outer reaches of the Weddell Sea and Antarctic Peninsula in response to Ross's earlier reports of much wildlife in the area. The year 1895 saw the effective start of the heroic age when a party from the *Antarctic* made the first recorded landing outside the peninsula and International Geographical Congress meeting in London identified the Antarctic as a major target for exploration.

Over the following three decades, the Antarctic would create legends in men such as Sir Ernest Shackleton, Robert Scott, Douglas Mawson and Roald Amundsen. But the men who opened the door to the Antarctic for the more famous figures of the heroic age were James Clark Ross, Francis Crozier and the seamen of *Erebus* and *Terror* on their outstanding voyage to the Antarctic between 1839 and 1843.

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- (1) Roald Amundsen, *The South Pole*, p12
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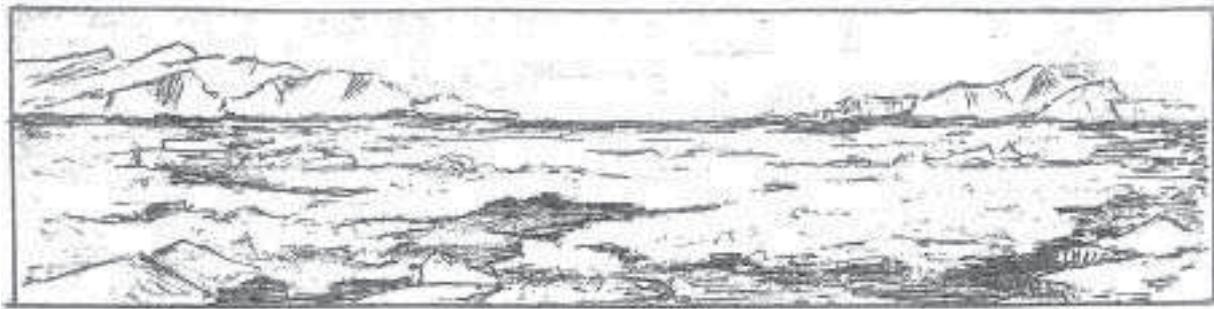
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Michael Smith has written widely about the history of Polar exploration. He has also contributed to numerous TV and radio programmes and lectured extensively on the subject. His books include a biography of Sir Ernest Shackleton written for children, *Shackleton: The Boss* (Collins Press, 2004).

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## Shackleton Antarctic Expedition, 1914-1917:

The Natural History of Pack-ice as observed in the Weddell Sea. By J. M. Wordie, M.A.. F.G.S. Communicated by Professor J. W. Gregory, F.R.S.

### I. Introduction

The opportunities for observation were afforded by the voyage and subsequent drift of the S.Y. *Endurance*. During December 1914 and January 1915 for a period of six weeks she successfully bored her way through pack-ice of every description - drift-ice, open-pack, and very frequently even close-pack. Continually fighting, she penetrated from  $59^{\circ}$  to  $72^{\circ}$  S. lat., and finally reached the lead water off Coats Land on the latter parallel. As the crow flies, therefore, she was navigated through ice for nearly 800 geographical miles on this voyage; her actual course among the ice-fields and floes was computed to exceed 2000 miles, an achievement without parallel in the Antarctic. The principle adopted was to keep to the east, where presumably there is less pack than in the west; if the *Endurance* experience is a normal one, however, the meridian of  $20^{\circ}$  W. long., which was followed, is certainly not far enough east.

The exploration of Coats Land and the discovery of Caird Coast followed, until the ship was finally beset on January 19, 1915. From that date until October 1915 she drifted northwards and westwards round the Weddell Sea at an average rate of four sea-miles per day. till finally crushed and abandoned on October 27. Thereafter the crew tried to sledge to land; or, camped on the ice, drifted from the position where the ship was wrecked ( $69^{\circ}$  S. lat.) through a further seven degrees of latitude. So passed a second summer in the ice; and it was not till April 1916 that boats could be launched and escape effected, through the fringe of the pack, to Elephant Island.

These seventeen months of close association in some form or other with pack-ice have led to an opportunity of studying its origin and decay, and some of the laws governing its behaviour, which has never before been afforded to a British expedition in the Antarctic. The conclusions thus obtained, particularly as regards the westerly drift will, it is hoped, be of use to all future Antarctic navigators.

From comparative study it appears as if the sea-ice cycle round the North Pole is much the same as in the South-spread, however, over a longer period and influenced by much higher summer temperatures. The Arctic ice, however, has never been subjected to quite the same methods of observation, and it is therefore better to regard this paper as the natural history, not of pack-ice in general, but of Weddell Sea pack-ice.\*

*Historical* - Previous to 1820 the idea seems to have prevailed that no ice formed at sea. Daikes Barrington and Higgins, for instance, tried to reconcile the reports (now known to be erroneous) of whalers, that all ice found at sea was fit to drink, with the fact that sea-water frozen in the laboratory was fairly salt; they maintained, accordingly, that "no considerable

\* In the forthcoming Ice Memoir of the Scott Antarctic Expedition, 1910-1913, Mr Priestley proposes to give an account of the Ross Sea fast-ice and pack-ice.

congelation ever takes place in the sea," and that the floating ice observed in high latitudes is land-derived. In 1820, however, Scoresby, with the experience of many whaling voyages behind him, published what appears to be the earliest scientific account of the Arctic pack-ice by the actual observer himself. He demonstrated for the first time that ice could form on the sea far from land, and also showed how this ice might sometimes be fresh enough for drinking purposes. The mistake made in the next four decades was to imagine that freshness was the rule - a misconception which persisted till Walker, who accompanied M'Clintock as surgeon on the Fox, published his results in 1860. References to ice in the Franklin Search Expeditions are of course numerous, but very seldom reliable; and practically none of the writers except Rae take account of the physical and chemical side of the subject. Rae in later life read a short paper on some of his observations to the Physical Society, and made Guthrie sufficiently interested to make further experiments.

When in the seventies interest became once more directed to the Arctic, a good deal more attention than formerly was paid to the natural history of sea-ice. Both Payer and his associate Weyprecht published clear and direct accounts of what they saw. On the Nares Expedition, however, ideas on sea-ice became again somewhat confused; the term "palaeocrystic," for instance, was introduced to include "floebergs" and heavy floes. Nares himself thought floebergs were due to direct freezing of sea-water; but Moss, and later Greely, realised that they were due to accumulated snowfall; and many years later Peary actually found them forming from glaciers on the north coast of Greenland. The "palaeocrystic floes," on the other hand, are now regarded as simply hummocky-pack and heavy floes; later travellers over the Polar Sea, however, have done little to advance knowledge in this respect.

In more recent years Pettersson, Drygalski, and Hamberg have made considerable additions on the physical side. Pettersson's results especially call for mention, for, if accepted, they are of extreme importance; Buchanan and others, however, have taken exception to his work. It now remains for someone to test in nature what Pettersson found in the laboratory.

Slowly, piece by piece, the Arctic pack has come to be known, but a great deal still requires to be done. A useful summary of present-day views is given in Krummel's *Handbuch der Ozeanographie*. The Antarctic pack, however, has never had the same attention paid to it. Fricker made a short compilation in 1893; but more important, as it was the record of actual observation, was Arctowski's memoir in the *Belgica* Results. Scott, Ferrar, Gourdon, Priestley, David, Mawson, and others have all in turn contributed additional knowledge. Not through them, but in spite of their accounts, an impression seems, however, to prevail that Antarctic pack is of very different nature from Arctic; to this the strongest exception must be taken. Wrong ideas on sea-ice have never been short-lived; it is to be hoped, therefore, that the case of Arctic and Antarctic pack will not be prejudged till more is known about them both.

*Terminology* - No new terms are introduced, beyond those suggested for the various types of cracks originating in the ice. The old terminology, used by the Arctic whalers, had a natural and practical origin, and is therefore followed as closely as possible. As there has been a slight tendency, however, for some recent Antarctic voyagers to alter the original use of a word, a restatement of some of the terms has become necessary; and a short glossary is therefore conveniently inserted here.

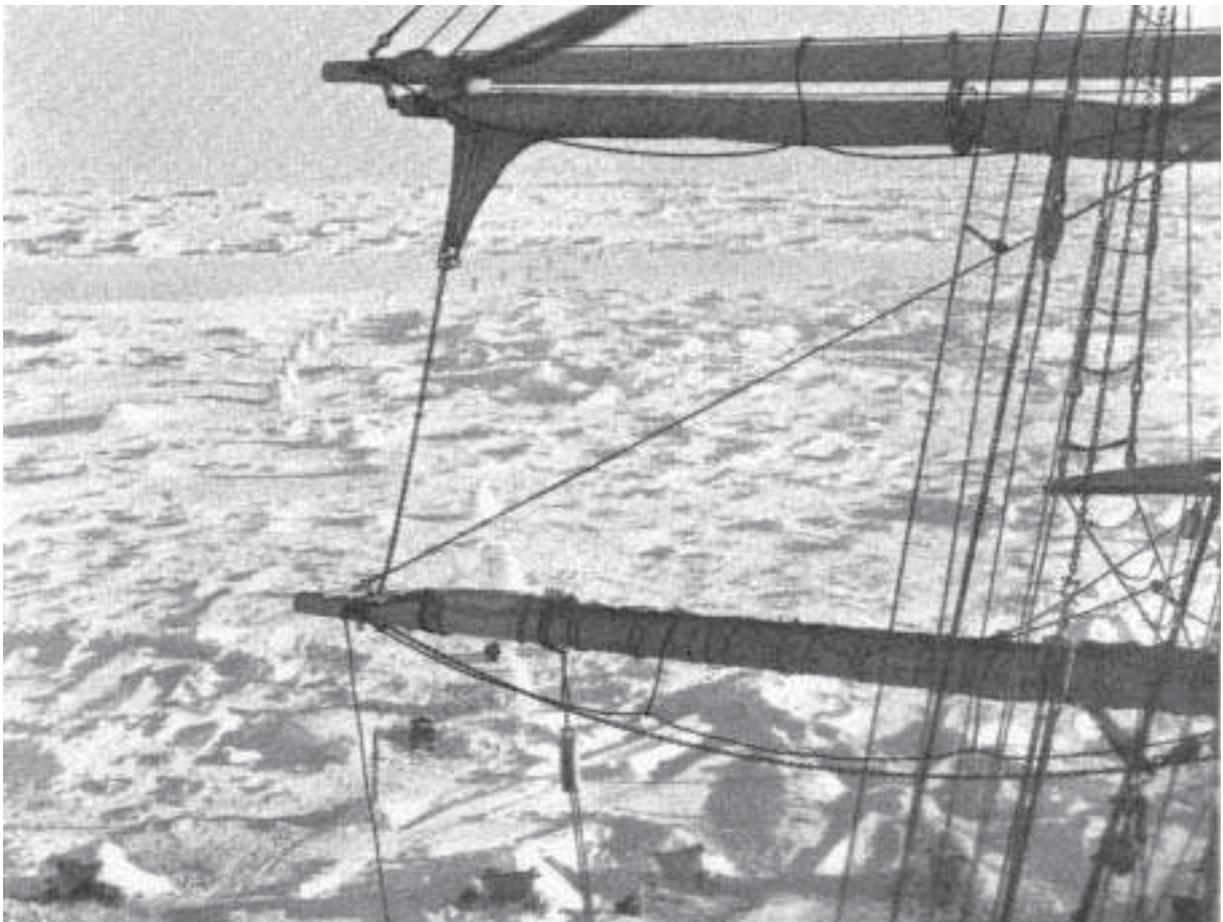
The best of all previous glossaries is, of course that of Scoresby, who was whaler before becoming scientist. A much fuller, and at the same time the most recent, list of terms is that of Markham and Mill in the Antarctic Manual, 1901; most of their definitions cannot be bettered, but in others some slight modification seems desirable, since, after all, it is the navigators and sailors themselves who must have the last say. Where possible, however, the actual phrases of Scoresby or of Mill are used here.

*Slush or Sludge* - The initial stages in the freezing of sea-water, when its consistency is gluey or soupy. The term is also occasionally used for brash-ice still further broken down.

*Pancake-ice* - Small floes of new ice, approximately circular, and with raised rims.



*Field-Ice. A field of hummocky pack reaching to the horizon.*



*Field-Ice. Mainly hummocky pack; in the middle distance a forzen lead of young-ice.*

*Young-ice* - All unhummocked ice, no matter of what age or thickness, which has platy structure and fibrous appearance when broken. Ice of this nature was formerly known in the Arctic as "bay-ice," but the term, unfortunately, has also been largely used in the Antarctic for "fast-ice," and for exceptionally heavy hummocky floes. With two such opposite meanings, "bay-ice" is therefore no longer of use for descriptive purposes.

*Fast-ice* - Sea-ice which remains fast in the position of growth throughout the winter, and sometimes even during the ensuing summer. It may therefore attain a thickness considerably above the average. Other names for this type of ice are "land-ice" (Payer and Mill), "Schelfeis" (Drygalski), "shore-ice" (Nansen), "bay-ice" (Shackleton and David), and "coast-ice." If it is thought necessary to employ a special name for fast-ice when it breaks adrift, "land-floes" is the most suitable; but generally it can be simply spoken of as heavy floes.

*Floe* - An area of ice, other than fast-ice, whose limits are within sight. The surface of a floe may be level or hummocked, and in size it may vary from "pancakes" on the one hand to "fields" on the other. "Light floes" are between 1 and 2 feet in thickness; floes thicker than this are termed "heavy." The latter, however, often owe their thickness to hummocking, and in the Antarctic at any rate are usually covered with fairly deep snow.

*Field* - An area of ice of such extent that its limits cannot be seen from the masthead.

*Crack* - Any fracture or rift in sea-ice.

*Lead or Lane* - A navigable passage through pack-ice. Leads may form either by the widening of a crack or by a general loosening of the floes. (On the Endurance voyage it was customary to speak of the former as leads even when covered with young-ice.)

*Pool* - Any enclosed water-area in the pack other than a lead or lane. Pools may be of any size: those called "polynia" by Admiral Wrangel were so large as to give rise to the belief in an open polar sea.

*Frost-smoke* - The fog-like clouds which appear over newly formed leads and pools, owing to the contact of the colder air with the relatively warm sea-water.

*Water-sky* - The dark streak on the sky due to the reflection of leads or pools or the open sea.

*Ice-blink* - The white or yellowish-white glare on the sky produced by the reflection of large areas of sea-ice. The antithesis of water-sky.

*Hummocking* - The processes of pressure formation whereby level young-ice becomes broken and built up into hummocky-pack. "Tenting," "rafting," and "raftering" are terms in use to describe different phases of the process.

*Hummocky-floes* - Floes composed wholly or partly of recemented pressure-ice. They have also been described as "old pack," "screwed pack" (David), "Scholleneis" (German writers), and sometimes simply "pack-ice." In contrast to young-ice, the structure is no longer invariably platy or fibrous, but is generally spotted and granular. There is less salt present, and the ice may appear almost translucent.

*The Pack* - Term used in a wide sense to include any area of sea-ice, other than fast-ice, no matter what form it takes or how disposed. The French term is "banquise de derive."

*Close-pack-ice* - Pack composed of floes mostly in contact.\*

*Open-pack-ice* - The floes for the most part do not touch.\*

*Drift-ice* - Loose, very open pack, where water preponderates over ice.\* The floes are usually smaller than in close- or open-pack, being, in fact, the result of the first stage in the breaking down of the ice.

\* Drift-ice is so open that ships can go full speed through it, and hardly ever need to change direction. In open-pack, on the contrary, the speed is slow and changes of course continually necessary. In close-pack a sailing-ship's course is generally completely checked, while steamers can only progress by repeatedly charging the ice.

*Brash* - Small fragments and rounded nodules: the wreck of other kinds of ice.

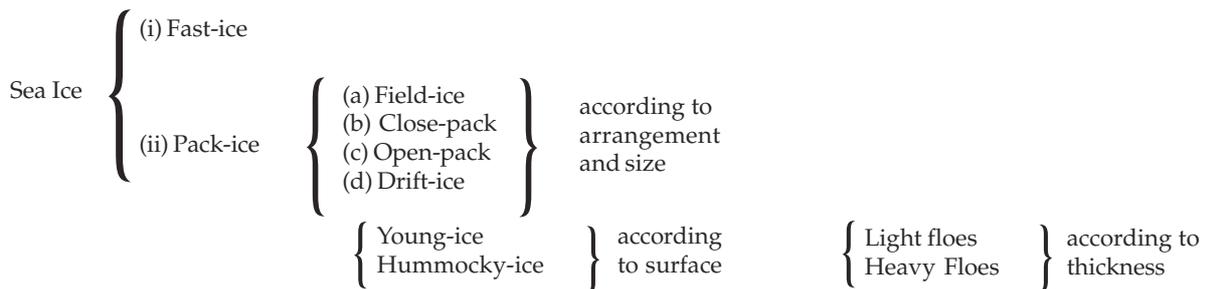
*Bergy-bits* - Medium-sized pieces of glacier ice or of hummocky-pack washed clear of snow. (Typical bergy-bits have been described as being "about the size of a cottage.")

*Growlers* - Smaller pieces of ice than the above, appearing greenish in colour because barely showing above water-level.

*Rotten-ice* - Floes which have become much honeycombed in the course of melting.

The above list is by no means exhaustive. There are many other terms of less importance, some of them being quite local, and many now obsolete. "Sea-bar," "sailing-ice," "tongue," and "calf" seem to have gone out of use almost altogether. Drift-ice may collect into "streams" and "patches." The pack edge may protrude as a "point," or recede to form a "bight" or "bay," etc., etc. Local terms are particularly numerous in Newfoundland, but are seldom found in print. Certain terms peculiar to navigation in pack-ice should also be mentioned: "sallying," for instance, describes how a crew rolls a ship by dashing across from side to side in unison; a ship gets "nipped" or "beset" when open-pack closes up round her and stops all progress; and "boring" and "slewing" describe different ways of working through close-pack.

It will be gathered from the above definitions that sea-ice in the first instance is divided into (i) fast-ice and (ii) pack-ice. The latter is further subdivided, according to the arrangement and size of the floes, into (a) field-ice, (b) close-pack, (c) open-pack, and (d) drift-ice. The floes themselves in all four subdivisions may be of young-ice or of hummocky-ice, and light or heavy according to thickness. A chart of ice-conditions should first of all distinguish fast-ice and the above four subdivisions, and then, if necessary, specify the nature of the floes.\*



## II. Early stages.

*Formation* - In the Weddell Sea, formation of new sea-ice took place both in rough water and in smooth; and the resulting structure differed accordingly. One had to distinguish, therefore, between young-ice formed in calm water, and ice formed on a ruffled sea. The former condition was found to be much the commoner; the latter was only noticed as a consequence of the very strongest blizzards, when the pack was completely broken up and rearranged. At no time during the voyage of the Endurance was the open sea seen to freeze over except in a dead calm; though in higher latitudes there should be no reason against a rough open sea freezing. The general rule, however, seemed to be for young-ice to form in the ever-opening pools and leads among older ice, as the latter offered protection by damping down any swell.

(1) Growth of young-ice in still water was studied very frequently in the leads, lanes, and pools which were continually forming at all times of the year. In 1915, when in lat. 77° S., young-ice was noticed for the first time on February 6, and a week later all leads began to

\* The Danish Meteorological Institute has for many years been publishing an annual chart of this nature for the ice in the Arctic. The naming, however, is slightly different from that adopted here. Six types of ice are distinguished, namely, "unbroken polar ice (i.e. fast-ice); land-floe; great ice-fields; tight pack; open ice; bay-ice and brash." Certain of these names are no longer suitable in English. It will be noticed that four of the types depend on the arrangement of the floes, but two (land-floe and bay-ice), whose usefulness on the chart is open to doubt, on the nature and thickness of the floe itself.

freeze almost as soon as formed. This went on until October, when for new leads to freeze became unusual; the ship's position was then in lat. 69° 30' S. Water-skies were noted as being numerous on October 9 ; and on the 11th young-ice freshly formed on a pool had melted. In 1916, owing to the N.N.W. drift of the ice-floes on which various camps were situated, observations were made in much lower latitudes; young-ice did not start forming that year until the first week of March, and then only in a cold snap, the latitude at the time being 64° S.

The ideal opportunity for observing the first stages of ice-formation was such as was found on May 2, 1915. On that date a crack, formed in heavy hummocky pack, opened to a lead, and from a distance was seen to be giving off abundant frost-smoke. By reason of the crack having formed in heavy pack of composite origin, the bounding walls were seldom perpendicular; occasional tongues of ice jutted out into the water at various depths, and by reflecting up the light showed the intervening water filled with freely floating small platy crystals of ice about the size of a finger-nail. They had not yet arranged themselves or coalesced in any way, but seemed to fill the water for a depth of some feet. The water above such a jutting ice-tongue was probably chilled to a much greater depth than farther out in the lead, being bounded both below and on one side by ice, and above by the cold air; and this might account for the number of shimmering crystals in the water. As the crystals became more definite, they rose to the surface, and one could almost see them arranging themselves on to the film growing out from the edge of the lead. Such a fringe of young-ice was generally referred to as "black-ice"; the blackness, however, was largely due to contrast with the surrounding snow-covered floes. As a general rule it had a smooth but slightly damp upper surface formed of platy ice-crystals (as already described) set horizontally. This is a feature first noted by Ferrar, and applies only to the uppermost  $\frac{1}{4}$  -  $\frac{1}{2}$  inch; the vertical arrangement of the plates and grouping into bundles below the upper layer and throughout the rest of the ice have been noticed by all observers, and described and figured in detail, particularly by Drygalski. This is the structure often referred to as platy or fibrous.

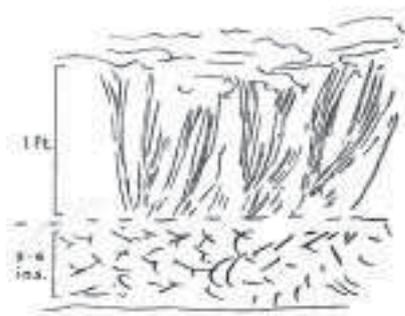


Fig 1

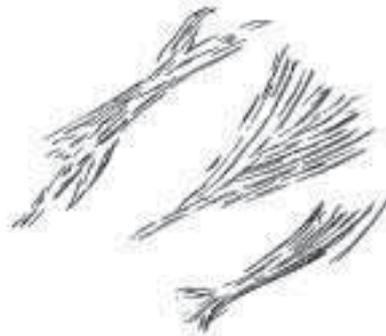


Fig 2

To the impression, however, given by Ferrar, that the upper layer is always formed of horizontally arranged plates, exception must be taken. A note of April 19 says "that from the edge of the old-ice thin narrow wedges (finger-like) extend out into the black-ice; these wedges have their apex against the old-ice and broaden as they go outwards, often reaching a length of 6 inches. They appear even darker than the surrounding black-ice, and the reason seems to be this: that they are made up almost entirely of plates set vertically." In the spaces between the wedges, however, the plates at the surface were set horizontally, reflected up the light a little, and did not appear so dark, therefore, as the wedges. Similar structures were frequently observed, and are apparently always to be expected where the water is bounded by a wall of old-ice at much lower temperature, from whose edge the young sheet can grow out. On May 2 a sketch was made of such a thin sheet in active process of growth (figs. 1 and 2).

Three bands, characterised by separate structures, were distinguishable. First of all, an irregular network 5 to 6 inches broad ran along the immediate edge of the old floe; then came a strip about 1 foot broad of radiating black wedges separated from each other by lighter interspaces;

and still farther out was a third strip made up of an irregular mass of plates not yet systematically arranged on to the wedges. The second figure shows how irregular the wedges are, both in shape and in relative arrangement, and how the term "wedge" is simply one of convenience.

In the wedges the ice-plates are arranged vertically, or in an almost vertical position; in the interspaces horizontally arranged plates shade downwards into a vertical series, and this latter position becomes the rule for further increase in thickness.

Ice-flowers were a common feature whenever newly formed cracks and leads froze over in winter ; they were at their best when the temperature was below zero. They never remained perfect very long, however, for the clusters were generally rimed over in about twenty-four hours; or, since very low temperatures were rarely of long duration in 1915, a certain amount of remelting soon took place.

When ice-flowers were not present, young newly formed ice was always more or less soft and damp on the upper surface, owing to the temperature being generally higher than was conducive to their formation. On such a surface brine-bubbles were numerous, and were apparently potential nuclei for ice-flowers. Observations made on these bubbles in the end of May showed that, from originally being small and somewhat elliptical, they grew to be nearly an inch in length. In the "wedges" the axis of the bubble ran parallel with the length of the wedge; but in the interspaces, and where there was no guiding structure such as the wedge, the direction of the bubbles was quite fortuitous. Those which reached nearly an inch in length had been under observation for a week, when a fall of snow effectively prevented further investigation. Perhaps the earliest stage of the bubbles are the minute white specks such as were noticed on May 2 in black wedges of ice not twenty-four hours old. Elsewhere, and at different times, both the small rudimentary white specks and the undoubted brine-bubbles were often seen. It seemed pretty certain, indeed, that it only required a sudden drop in temperature for an ice-flower to form round such a bubble as nucleus.

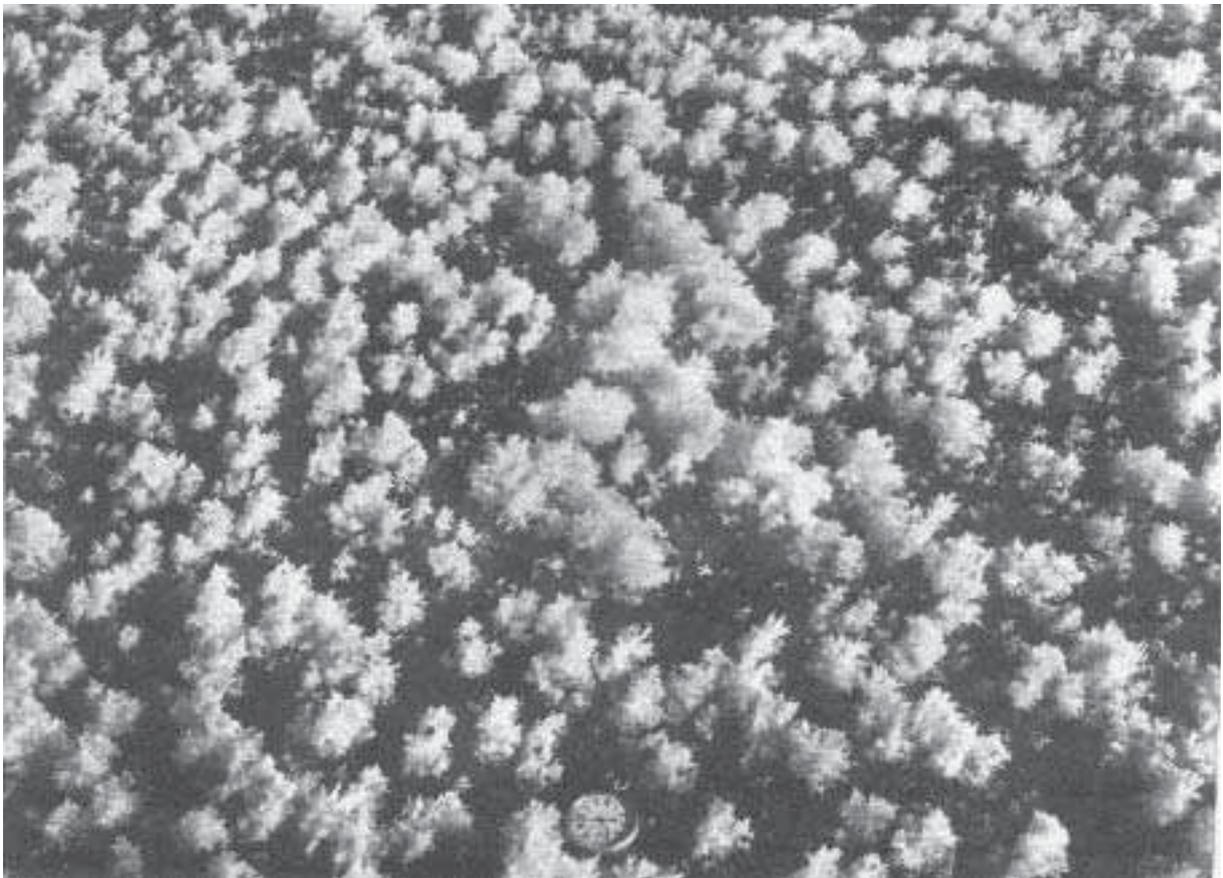
The ice-flowers were only salt at the base, the distal crystal points being simply rime. Their irregular distribution, however, over a sheet of young-ice requires some explanation. A possible one is afforded by the way in which young-ice on a lead crystallises outward from the sides, and so takes different lengths of time to form, the resulting salt-content therefore being a variable one.

What has been described above either as "black-ice" a day or two old, or more generally as "young-ice," is simply what the Arctic whalers called "bay-ice." As ice formed in bays was always level, they also came to apply the term to undisturbed ice whether formed in bays or on the open sea. Scoresby says: "Bay-ice is that which is newly formed on the sea and consists of two kinds, common bay-ice and pancake-ice; the former occurring in smooth extensive sheets, and the latter in small circular pieces with raised edges." "Bay-ice may be said to extend from the first pellicle of ice up to a foot in thickness." Payer, Bruce, and J. K. Davis use the term in its original and proper sense. In most of the Antarctic expeditions of the last twenty years, however, the name has unfortunately been used literally for ice formed in bays; in the Ross Sea, ice of this nature is sometimes almost a miniature tabular berg. The latter, so-called "bay-ice," will be referred to here as fast-ice, or land-floes where adrift; and, to prevent confusion, "young-ice" will be always used to denote the old whalers' "bay-ice."

(2) Opportunities for seeing young-ice forming on a rough sea were of rare occurrence. One such, however, took place on July 15, when a blizzard opened a lead near the ship 300 yards in breadth. Crystallisation started almost immediately, and was materially helped on by the amount of blizzard - driven snow which had already formed a slush on the water surface. "It was like a rough frozen sea, for the slush had been rippled as it froze. In one place the slush had crystallised in circular patches - a type of pancake-ice." The wind and the motion of the water rounded off these minute pancakes in the usual way; "and in one case they had been rafted on to one another so as to appear apposed when viewed in section."



*Pressure Ridge. Hummocking of young-ice; in foreground, still younger ice covered by ice-flowers.*



*Ice-Flowers. Detail of crystals.*

Without going further into detail, it may be stated that "pancake-ice" is the result of the sea freezing while rippled by the wind or disturbed by swell; on the contrary, "black-ice" (with its frequent accompaniment of "ice-flowers") is confined to still water. The term "pancake-ice" has a very definite and precise meaning; of all the terms used to describe ice, it is the one least liable to misconstruction. It would be well, nevertheless, to emphasise that, though outwardly the same, ice-pancakes may originate in two ways. Generally they form during the building up of young-ice, when wind and swell roughen the sea and prevent any widespread sheet being preserved. As such they range in size from 2 to 3 inches in diameter to floes 2 to 3 yards across, capable of supporting a sleeping seal. The other and the rarer type occurs during the decay of sea-ice, for the floes may then be broken into small areas and assume the form of pancakes; frequently, too, snow and slush, by the wearing down of the floes in summer or from the capsize of an iceberg, collect in patches and by a to-and-fro motion behave like young-ice and form similar small pancakes.

*Horizontal Banding.* - A feature of young-ice, if it grew to any thickness, was the frequent presence of horizontal banding. Though previously noticed by David and Priestley, this banded structure has never been closely examined and thoroughly explained. A block of young-ice of this nature was investigated in detail during the winter, and gave the following results :-

	Cl percent	Spec. Grav.
1½cm white opaque ice .....	.274	.894
1½cm blue translucent ice .....	.238	.918
3cm white opaque ice .....	.212	.893
Thin blue translucent band (followed below by alternating narrow bands).	.207	.918

The Cl figures show that the difference between the two kinds of ice was not one of salinity; it is improbable, therefore, that it depends on the rate of freezing. The actual difference was one of density, the white bands being the lighter. David and Priestley say the cause is similar to what occurs in lake-ice, where during pauses in crystallisation large quantities of gas rise from decaying organic matter on the lake-bottom to the under surface of the ice. Some further explanation, however, appears necessary.

*Plasticity.* - The most striking physical character of young-ice is its plasticity. Pancake-ice, however, and ice formed from slush were never so plastic as black-ice, and this presumably was the result of their not being so salt. Pettersson contends that plasticity is a peculiarity connected with the expanding properties of sea-ice down to about -20°C. All varieties of ice are more or less plastic at their melting-point, but in the case of sea-ice, he says, the wide range of the eutectic points for the different salts in it virtually means that it has already partially begun to melt at -20°C, and is therefore plastic from there up to the melting-point of the ice proper (-1.8° C.).

*Chlorine Percentage.* - The saltiness of young-ice must depend partly on the rate at which it freezes; and possibly at this stage, when it is only 2 to 3 inches thick, the chlorine percentage may be an index to the total amount of included salt. The methods on the Endurance, however, allowed of the amount of chlorine only being determined. In young-ice about 2½ inches thick, it was on different occasions found to be present in the proportion of 7.23, 7.69, and 8.5 grms. per thousand. On the one occasion on which sea-water, over which ice was forming, was tested, the former contained 19.46 per thousand Cl, as against presumably 7 to 8 per thousand in the young-ice.\*

\* These figures were determined by Mr James, physicist to the Expedition, using what under the circumstances is the most convenient method, namely titration with silver nitrate. Unfortunately, no experiments were made to determine the specific gravity of ice as young as the above. The figures for specific gravity discussed later on were all got from ice over -1 feet thick, where the chlorine content only averaged about 2 to 3 per thousand, and was sometimes even less.

### III. The Ice in Motion.

Along the Antarctic coasts the rule seems to be for the sea-ice to be at all times liable to break up and drift away to the north and west. To this, however, there are two exceptions: firstly, where the configuration of the land is such as to shelter the ice from the prevailing winds, thus preventing disruption in winter, and sometimes even in summer; and secondly, where there are obstructions of the nature, for instance, of stranded bergs, which hold up the ice both in summer and in winter. The Weddell Sea fully bore out the general rule. At two places only is the ice at present known to be stationary; one of these is off Leopold Coast, where a chain of stranded bergs a little distance out from the land effectively anchors a long strip of ice and prevents it being continually subject to the restless motion of the pack; the other is on the coast of Graham Land between Koss Island and Joinville Peninsula, where, to judge by floss's narrative and Nordenskjöld's descriptions sixty years later, the ice very seldom breaks out. The former appears to be a case of fast-ice, and may possibly be a type of what drygalski calls "Schelfeis." Whatever the naming of this ice may be (it is best called "fast-ice" when anchored, "land-floes" or simply "heavy pack" when adrift), emphasis must be laid on its occurrence being merely a temporary interruption of the normal sea-ice cycle. Should such an interruption, however, persist so as to verge on permanency, then an important new feature is produced, namely a barrier (or, as Nordenskjöld and others now call it, "shelf-ice"). Direct freezing from sea-water ceases, but the ice-mass continues to grow by the addition above of successive layers of snow, which in due course become névé. When the Weddell Sea becomes fully known, several barriers will probably appear on the map. Here reference need only be made to the one found by Nordenskjöld in the north-east portion of the sea, namely along the Oscar Coast of Graham Land. In his own descriptions it is referred to as a "low ice-terrace"; but its height (30 metres) and the origin which he adopts for it make it quite comparable with the Great Ross Barrier; and it has therefore been proposed to call it in future the Nordenskjöld Barrier.

Where the ice is not in motion, therefore, fast-ice is developed, and, in extreme cases, barriers or shelf-ice. These are the exceptions; the rule is for sea-ice to be continually drifting: Bound up with the drift are the two related phenomena of cracks and pressure.

*Formation of Cracks.* - Cracks were partly the effect of the ice being in motion, but they were much more often the immediate factor allowing movement. There was always a tendency (which will be explained later) for an ice-field, whether of young-ice or of hummocky-pack, to have cracks formed across it. The smaller areas so formed then shifted their relative positions under the driving influence of the wind. Then either wide leads and lanes were formed, or, on the other hand, ice-rafting or even heavy pressure resulted. So it comes about that, although the formation of cracks gives rise to leads and lanes and therefore makes the pack navigable, yet these very openings may themselves enable pressure and hummocking to begin, with consequent danger and difficulty to a ship attempting the pack.

All cracks were a relief from strain, but the ultimate causes of the strain were very different, and in some cases unknown. In the Weddell Sea it was convenient to group the stresses as :-

- (i) Sudden differences of temperature - contraction cracks,
- (ii) Unequal loading - stress or strain cracks,
- (iii) Pressure.

The treatment of cracks of the last category will be deferred till pressure comes to be considered. Elsewhere in the Antarctic and in the Arctic similar types of crack appear to be the rule.

(i) Owing to the heavy autumnal snowfalls experienced by the Endurance in 1915, the underlying ice was almost everywhere protected from the effects of sudden changes of temperature. Though some cracks, therefore, were possibly temperature cracks, they were never proved as such; and in the Weddell Sea, at any rate, they are not considered important.

Elsewhere in the Antarctic they apparently do occur, and in the Arctic, according to Weyprecht, their occurrence is extremely common. Since their formation, however, except at very low temperatures, has been called in question by Pettersson, a detailed case must be mentioned. Priestley and David describe how in the Ross Sea a crack formed with a fall of temperature from  $-16^{\circ}\text{C}.$  to  $-29^{\circ}\text{C}.$ , and then opened and closed according as the temperature fell or rose. With the final rise of temperature to  $-18^{\circ}\text{C}.$  the young ice which had formed in the open water of the crack was overthrust a distance of 5 feet 6 inches. The importance of knowing the actual temperature comes in, in view of the remarkable conclusions arrived at experimentally by Pettersson; for he illustrates by means of curves how, instead of being contracted by a fall of temperature, the volume of sea-ice increases down to  $-20^{\circ}\text{C}.$  Between  $-4.4^{\circ}\text{C}.$  and  $-6.4^{\circ}\text{C}.$ , for instance, the ice he experimented with (comparable to frozen water of the open ocean) expanded its volume 0.002957. Figures such as these, he says, are only comparable to the changes of volume effected in a gaseous body. According to Pettersson, therefore, sudden falls of temperature down to  $-20^{\circ}\text{C}.$  will not contract but will bend the ice upward and rupture it in that way. Many contraction cracks, however, such as that of Priestley and David, are claimed at higher temperatures than  $-20^{\circ}\text{C}.$ , and field experience, therefore, is so much at variance with laboratory experiment that the question must be left an open one.\* In any case, detailed descriptions of other temperature cracks are desirable, and Pettersson's experimental methods certainly want confirming.

(ii) For the second and by far the most important and commonest type of crack it has been hard to find an entirely suitable name, and, though the term "strain crack" has finally been adopted, it is realised that it is not an exact term, as all cracks are a relief from strain.

That the ice and its overlying load of snow were seldom in a state of equilibrium was a commonplace during all observations. The effect, for instance, of the irregular distribution of the snow-covering was always very noticeable, for there were even some places where the ice-surface was entirely below water. Consequently it is next to impossible to determine the specific gravity of sea-ice from the proportion above and below water-level; even in places bare of snow there must still be stresses of some sort. This seems obvious, and yet the specific gravity of sea-ice, as given in Krummel's *Handbuch der Ozeanographie*, is based on just such unsuitable measurements as these made by Makaroff.

Weyprecht gives a good instance to show how a patchwork field of pack-ice is always in a state of strain. He postulates the case of a floe 2 metres thick being divided by a crack, where young-ice immediately starts forming. It will soon be 1 metre thick, and by then the proportion above water should be 0.2 metre (taking -4:1 as the average proportion of submerged ice); but the thicker, earlier-formed ice bordering the crack has only increased perhaps one-tenth of this amount, and consequently in its case only a further 0.02 metre should emerge. So at the junction either the younger ice is held down below its proper level, or the older ice is buoyed up. In any case, there is a stress of some sort along the line of contact.

Sea-ice when newly formed is extremely plastic and can conform to such stresses as these; but as it ages it becomes much harder and less bendable, so that finally it must reach that state of strain at which it only requires some slight impulse to break it. In most cases this impulse will be the wind, though occasions must occur when the ice cracks simply because it has passed the breaking strain.

Proof of tension in a floe before it cracked was forthcoming in many ways: the ice-surface on one side of a freshly formed crack might immediately take a different level from that on the other side; the two sides might be displaced laterally; or, again, the opposite sides of a crack might open out at once to a breadth of some inches, to become stationary at that distance for a considerable time.

\* This discrepancy was pointed out to Mr Priestley in May 1919, who till then did not know of Pettersson's work. Although without access to his notes, he was most emphatic in saying that contraction cracks were possible with a fall of temperature not reaching so low as  $-20^{\circ}\text{C}.$  ( $-4^{\circ}\text{F}.$ ).

A special case of strain cracks, and one easily realised, occurs when a swell from the open sea runs under a wide ice-field. Over the trough of the wave, a thick ice-floe must be entirely unsupported; a crack parallel to the wave-front may result; when more than one such crack occurs, they will of course be parallel to each other. A case in point occurred on March 30, 1916. Whether when more than two in number they will be at equal distances apart is open to doubt; should it be so, the interval from crack to crack may possibly be half the wave-length. During the Endurance drift, never more than a couple of parallel cracks, originated beyond all doubt by a swell, were seen. This was probably due to the fact that, by the time the floes drifted into the region of swells from the open sea, they were already much reduced in size by the formation of ordinary strain cracks.

There were cases during the winter, however, when series of cracks formed whose relationship was so nearly parallel as to make one inclined to invoke the agency of a swell running under the pack from open water. The best of these cases was a series of four cracks (one of which ultimately developed into a lead) which opened on March 17, 1915 (fig. 3). Seven miles to the south-east there was open water on March 11, and beyond that open water as far as could be seen, perhaps even as far as Coats Land, thirty miles farther on. A swell was therefore well within the bounds of possibility. The cracks were not parallel, however, but seemed to form a fan-shaped group. This suggests another explanation, namely torsion. If so, they belong to the third class of cracks, those due to heavy pressure. The detailed treatment of the latter, however, is best deferred until the phenomena of pressure have been discussed.

As a yet further case of specialised strain cracks, tide-cracks should be at least mentioned. The drift of the Endurance was never near enough the coast to enable them to be studied, but from published descriptions tide-cracks appear to be a perfectly normal result of strain.

*Pressure.* - When a moving ice-field became cut up by cracks running in different directions and many of them of considerable width, each floe as it was formed tended to travel at a different rate from that of the parent ice-field. A stretch of sea-ice was never a simple formation, but rather a great conglomeration of sheets of young-ice and of floes which had survived the previous summer; consequently, each of the new areas detached from it had its own peculiarities of thickness, depth of snow, extent, and so on. As was shown above, it was these very peculiarities which produced the strains; and these in turn caused the cracks. They were also partly the cause of the different rates at which individual floes, formed from the break-up of an ice-field, travelled under the never-ceasing impulse of wind and current.

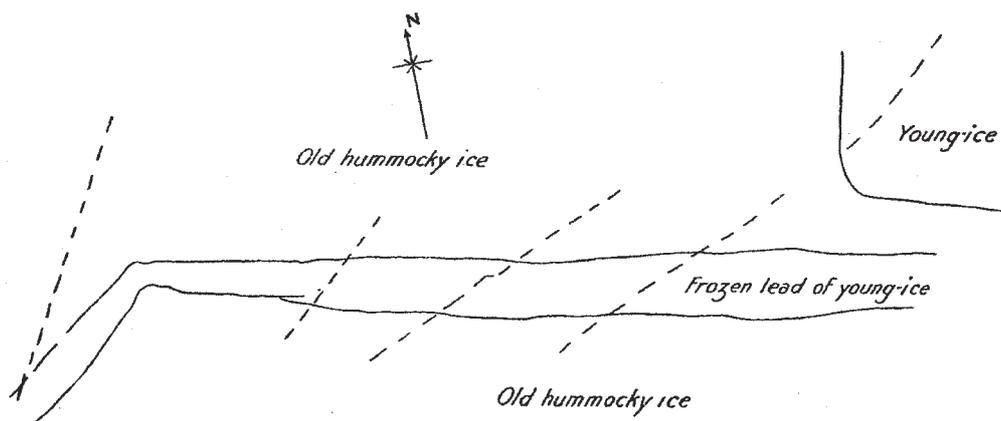


Fig. 4.

The main cause, however, of the different rates of travel was not so much the size and depth of the floes as the nature of their surface. Every hummock, in fact, acted as a sail, and the rate of movement therefore depended to a certain extent on the amount of hummocking in proportion to the area and weight of the floe. A legacy of previous pressure, these hummocks in turn became the cause of still further pressures. When two floes were moving at different rates, either the distance between them increased and a lead or lane passable for ships was

formed, or the interval between floes decreased, one so to speak overtaking the other, and then the result, if there was sufficient momentum, was pressure in some form or other.

Very often there was first opening and then closing of the space between two floes. Take an imaginary case, namely an area which has been almost stationary: when movement starts the bigger floes will take some time to reach their proper speed; but, on the other hand, they will go on travelling after smaller floes have stopped moving. In the early stages, therefore, the big heavy floe will be attacked by smaller floes overtaking it; in the latter stages it itself will be the attacker of other smaller floes ahead; by reason of its size and weight it is pretty sure to take the upper hand whatever happens. Light pressure only may result, but, even so, it will only still further complicate the floe surface and create possibilities of yet further differences in speed.

Besides the forward motion imparted by the wind, there was also a swinging or turning tendency in almost every floe; this was either an effort to trim themselves to the wind, or the result of pressure from another floe; but, as the floes were continually hindered by each other, and the wind was not necessarily constant in direction, this swinging habit seemed to have no end. The process was of course more easily seen and realised when the pack was loose. For instance, on April 6, 1916, the floe on which the Endurance party was camped swung as much as 180° in one night; the ice at the time was described as being fairly open and travelling fast; but it was still open-pack, not drift-ice. When the ice was closer, the actual swinging was not so obvious, but the effects were greater; and one saw the type of pack produced which is so dangerous to sail through, and which the navigator calls "screwing pack."

The screwing or shearing habit resulted in pressure being located mainly at the jutting corners of floes. By one or other of the methods to be described, a hummock was formed of loose ice-blocks mixed up with a certain amount of snow; when movement ceased it settled downwards and became covered with falling and drifting snow, and in the end it would simply appear as a trifling inequality on the ice-surface, no bigger than a haycock.

Pressure worked in three ways:-

- (a) Bending;
- (b) Tenting;
- (c) Rafting.

These are the old terms given by early whalers and Arctic explorers, and are practically self-explanatory. Collectively, or when not particularised, the term generally used is "hummocking." Taken as a whole, hummocking resembled fairly closely the experiments which geologists make to illustrate mountain-building.

(a) Bending was characteristic of thin and very plastic ice. The most impressive result of this nature was the formation, in March 1915, of an arch 3 feet high and 8 feet span, formed of young-ice about 8 inches thick.

(b) Tenting was, on the other hand, confined to heavy floes, which being thicker and less plastic were on that account less bendable; the ice swelled up, a crack formed perpendicular to the direction of the pressure, and a tent-like structure resulted. Other radiating cracks were usually developed; and, if movement continued, the blocks so formed were soon piled up into a pressure ridge.

(c) Rafting was the commonest of all the processes, and followed automatically when either of the other two methods already mentioned was carried to an extreme. Moreover, when rafting was going on, there was often a good deal of bending and tenting also taking place. In very thin ice, for instance, a process of rafting was developed in conjunction with bending, and gave a somewhat peculiar appearance to young newly-frozen leads, namely a series of lines at or nearly at right angles to the edge of the lead. This was due to the young-ice closing up when not more than 1 to 2 inches thick; the two sheets dovetailed into one another, like

moving the fingers of one hand over those of the other, in such a way that the little finger of the right hand is above the little finger of the left, the third finger below, the middle above, the first below, and so on. The vertical grain of young-ice allowed of the process going on to a considerable distance, and in this way two sheets of young-ice might dovetail to a depth of 5 to 10 yards.

This was rafting at its very simplest. A slightly more advanced stage occurred where the screwing tendency brought jutting corner against corner, and forced one floe to override the other. Most impressive of all, however, was the formation of a great pressure ridge. Whether the work of a few hours, or a matter of days, it was the most forceful and exciting incident of life on the pack. One case is worth describing in detail: namely the occurrences in July 1915, which lasted for nearly a fortnight and exhibited in that time all possible types of "hummocking."

About 300 yards forward of the ship's bows a lead had formed in February 1915, and when frozen over with level young-ice had been found on that account the most convenient place on which to train the dog teams. By the latter half of March, however, a number of cracks had already formed across this lead (fig. 3), and their closing had led to a certain amount of light pressure. It was not, however, till July 14 and 15, as a result of a strong S.W. blizzard, that the topography ahead changed to any great extent. On these dates the floes broke up and rearranged themselves; and in one case a small berg moved half a mile from its former position and swung round through 90 degrees. The result was that the ice-topography, with the exception of the 300 yards immediately ahead, was completely changed. It now consisted of islands of old pack-ice set among young-ice of two to three days' growth, the latter with a rough, uneven surface due to the overlapping of small pancakes. Pressure at this time, it should be noted, did not involve the older floes. For the next few days the ice was very restless, and the small berg already mentioned moved back very nearly to its former position relative to the ship, and at the same time swung a further 90 degrees.

The ice immediately surrounding the ship was in its component parts at least over a year old; as floes and brash it had been the cause of the ship's being beset in January 1915, and it was cemented at that time into what may be termed an "ice-conglomerate." Its age and structure made it less liable to crack than young-ice, there being no vertical lines of weakness, so that a ship enclosed in such a position had all the appearance of security. Across this old ice to the frozen lead ahead a track ran from the ship for a distance of 300 yards, and was marked by cairns of ice-blocks, or pylons, as they were called.

On the 22nd of July heavy pressure was taking place beyond the farthest of these pylons, and it led to the destruction of a couple of places where the ice had been till then a subject of weekly investigation. The impact of the pressure caused a crack the same afternoon in the old-ice round the ship - a "shock crack," which ran parallel to and roughly 40 yards distant from the pylon road. On the 23rd pressure still went on, and a ridge was formed built up of the youngest ice. The old-ice, however, and the 3 feet thick young-ice formed since February had not begun to raft, though some more shock cracks were developed in both. On the 24th the pressure ridge had advanced another 10 yards over, but not involving, the 3 feet thick ice of February.

It was not, however, till the next day that the thicker ice, both that formed in February and that surviving from 1914, became involved. The already mentioned pressure ridge dating from the 22nd began an irresistible advance over the old-ice, weighing it down and breaking it up by means of "weight cracks." Though it was not really necessary, one almost felt impelled to walk fast or even to run in order to avoid the advancing pressure. On the 26th there was a respite, and any further movement took the form of shearing. Matters, in fact, remained quiet until the end of the month.

On the 1st of August, however, there being a strong S.S.W. blizzard blowing, new and unexpected developments took place. Not only did a crack form athwartships, running out

at right angles to the ship on either beam, but a shock crack due to renewal of the July pressure started only 10 yards away on the starboard side. Working immediately set in along the latter crack, and blocks of ice 4 and 5 feet thick were soon involved in the pressure. The ship broke out of her ice-berth, and so rapidly did the shearing develop to starboard that it gave her the appearance of sailing over the top of the ice-floes. When in the afternoon things became quieter, the ship, instead of being safely bedded in an old conglomerate floe and 300 yards from the February lead ahead, found herself right in the middle of broken-up and unstable ice, where trouble might always occur.

This, however, was the end of the disturbances in the immediate neighbourhood, and the ship was once more frozen in, this time among a maze of hummocks and pressure ridges.

The tendency in the next two months was for the pack to become looser, and unfrozen pools and lanes were not infrequent in October. On October 15, by means of one of these lanes, the ship moved to a new position 400 yards away, and was secured in a narrow lead not much more than the width of her beam. All would have been well had she not been warped round into a transverse crack four days later, for this move left her at the meeting-point of three floes. When pressure began again, instead of rising with it, she was twisted by the working of the three floes and developed a bad leak at the stern-post on October 24. No longer buoyant, she was now unable to weather such pressures as formerly would have given little trouble, and finally on October 27 she was abandoned, the bottom torn out of her and the water flush with the upper deck. She remained thus for a month, and it was not till November 21 that she finally sank under water.

A word may be said about height of pressure ridges, since there has always been a tendency to exaggerate this feature. During these fifteen months in the Weddell Sea it was quite exceptional for any ridges to be as much as 15 to 20 feet high; those of July and August 1915 were only 12 to 14 feet in height. On one occasion about three miles from the ship a hummock was found 25 to 30 feet high, built up entirely of blocks of sea-ice; it was not, however, part of a pressure ridge, but was simply an isolated hummock due probably to the encounter of two jutting corners. Again in March 1916, a thick slab of sea-ice was tilted up so that the upper edge was 25 feet above water-level; in this case at any rate it certainly was a jutting floe corner which had had to give way during screwing movement.

Accounts from the North have given the impression of extremely high pressure ridges in the Arctic seas. All these accounts, where reliable, are found to be based on phenomena seen north of Baffin Bay and Robeson Channel, where the land offers considerable obstruction to the drifting ice, and possibly causes higher ridges than on the open sea. Nansen, on the contrary, definitely states that on the drift of the *Fram* across the North Polar Basin itself the highest hummock was 30 feet, and comparatively few exceeded 20 feet.

Should pressure ice, therefore, be met with in the South whose average is above 20 feet or even above 15 feet, it must point to the existence of land obstructing the free drift of the ice. A case in point was the belt of heavy hummocky-ice found by the *Endurance* on her southward voyage stretching from 70° S. 15° W. to 71° S. 22° W.; the floes were so close and heavy that it took six days to find a passage through. This very heavy ice was regarded as pointing to a deep embayment some-where east of Coats Land, or at least to a very large ice-tongue protruding from the coast and so checking the westerly drift.

Pressure ridges were highest and most prominent when newly formed. They almost immediately sank to a position of equilibrium, as required by the specific gravity of the ice, the ratio of ice below to that above water being either 4 to 1 or 5 to 1. Possibly, as Weyprecht suggests, the supporting floes and pieces, which at least in the upper two-thirds were dry before the hummocking, when driven below became waterlogged and so lost some of their buoyancy. Whatever the cause, the ridges certainly were less prominent in a few days, and soon lost their rawness and angularity by getting drifted over with snow.

Formation of Cracks by Pressure.—Two kinds were definitely established :—

- (a) Weight or hinge cracks.
- (b) Shock or concussion cracks.

Possibly there was a third, namely :—

- (c) Torsion cracks.

(a) Ice of advanced age was no longer plastic and did not bend, therefore, under the weight of a heavy pressure ridge piled on top of it, as it might once have done. The result, if the breaking strain was reached, was a longitudinal crack in front of the pressure, the ice being pressed down in much the same way that a door opens on its hinge (fig. 4). At the same time a number of radial cracks were developed; and the ice in front of the pressure was thus broken up beforehand into blocks of suitable size for further hummocking. Between a pressure ridge and a weight crack of this nature the surface of the ice was often below the level of the sea; the pool formed, however, was apparently concentrated brine rather than sea-water.

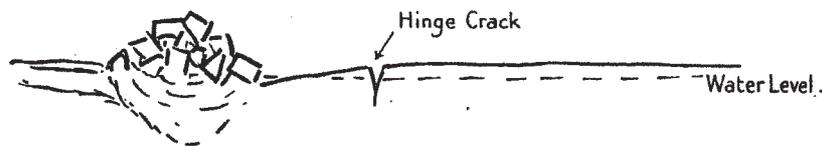


Fig. 4.

(b) The shock or concussion crack, like the smaller radial cracks mentioned above, was also transverse to the advancing pressure ridge. It is sufficient to state that cracks of this nature were seen to form on many occasions, and that the proximate cause was the impinging of one moving floe on to another relatively inert. Probably the development of the crack was made easier by the passive floe being already in a state of tension.

(c) All the above types of crack, whether due to outside causes (i.e. pressure) or to causes in the floe itself (e.g. stresses), were actually observed and are beyond all question. Torsion cracks are, however, more hypothetical. They have been discussed by Arctowski and Hobbs in an attempt to explain leads taking the form in ground-plan of a chain of pools. Citing Daubree's well-known experiment on the production of two sets of cracks at or nearly at right angles, Arctowski makes the claim that the same thing may occur in an ice-mass relatively passive. On opening, a zigzag lead would result (fig. 5); and as it opens farther there would in the ideal case be a chain of diamond-shaped areas; but, as the effect in nature can hardly be as perfect as this, it resolves itself (so it is claimed) into a chain of pools. On one occasion a sketch was made of some opening cracks in the neighbourhood of the Endurance which seemed to be a case in-point (fig. 6). The whole matter, however, requires further observation, for other explanations are possible. Chains of pools, in fact, can be very easily accounted for by shearing and screwing.

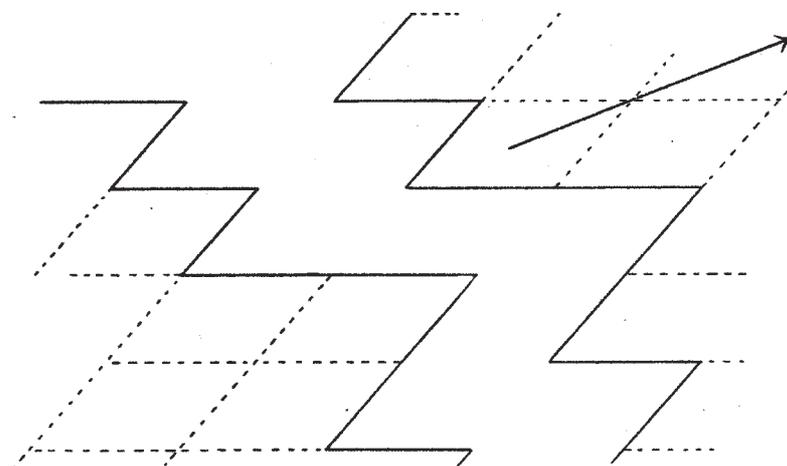


Fig. 5.

*Effect of Wind on the Drift.* - During 1915 a drift indicator was set up on the floe about 50 yards from the ship; it was in no sense a current meter, but was an approximation to a drift meter, as it was ultimately possible to deduce the speed of the drift from the rapidity or otherwise with which the indicator reacted. It consisted of iron piping about 9 feet in length set inside a slightly shorter length of ship's rail. The latter was firmly fixed in the floe and was

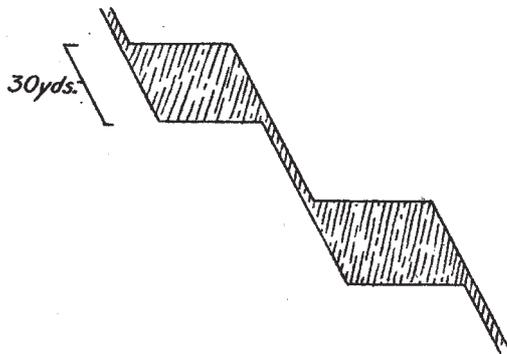


Fig. 6.

filled with a mixture of salt and petroleum, so that there was very little chance of the inner piping becoming fast frozen. A vane had been fixed to the lower end of the piping, and an arrow-head at the upper end, in the same vertical plane as the vane. The arrow accordingly always pointed in the direction in which the floe was travelling.\* Commander Worsley made several observations daily, and at each observation rotated the arrow and the vane to 90°; he then waited until they swung back, and the time which this took gave him a measure of the rate of drift. The result of these

observations was to show that the floes always travelled with the wind, but slightly to the left. The velocity, however, did not depend entirely on the strength of the wind; it was influenced in great measure by the presence or absence of open water in the direction to which the ice was being taken, no matter how far off this open water might be.

M'Clintock and later Nansen have discussed the right-hand deflection in the Arctic. One case may be quoted to show the extent of the left-hand component in the Antarctic (fig. 7). From January 16 till January 22, 1916, a fierce blizzard blew for six days from S.W. by S. Despite this the floe on which the camp was situated drifted N. by E., i.e. two points more to the left than the wind. This was no doubt an extreme case; but it is worth noting that the trend of the Graham Land coast immediately to the west did not make things any easier for ice to move to the left. The track of the ice-drift was influenced by three factors in all:- (a) the wind; (b) a left-hand component due to the earth's rotation; and (c) a true current. The unsolved problem is the amount and direction of the last factor in the Weddell Sea. Nansen's method might, however, be used, namely:- To lay off on squared paper lines representing the wind's direction and force at each observation (i.e. every four hours), the length of each line being proportional to the strength of the wind. When this is done an irregular track should result (not unlike the drift of the ice) which may cross itself at certain points. At these points, accordingly, the wind resultant for the period in question should be nil; the left-hand component should also be neutralised; and the distance, therefore, which the ship has travelled in the interval, as determined by observations, should be entirely due to the true current. The third factor should therefore be kept in mind when examining the drift chart of the *Endurance*. At first sight it looks as if wind were the only agent responsible, but it should not be forgotten that a true current, not determined as yet and perhaps only of limited extent, is quite within the bounds of possibility.

So far as drift control by wind went, it was possibly the result simply of 'long-shore winds. When one studies in this connection the *Deutschland* and *Endurance* tracks wherever they are near known coasts, it will be seen that the ships' tracks and the

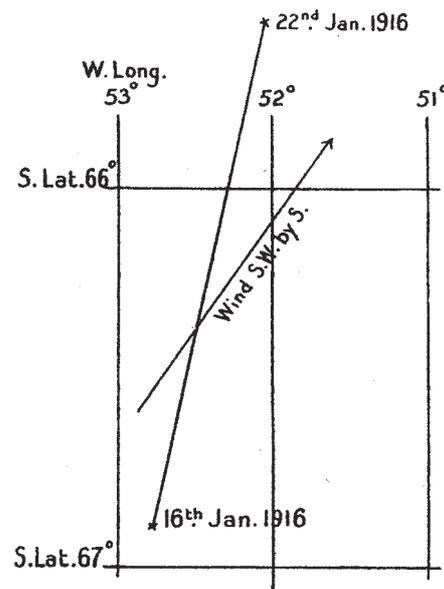


Fig. 7.

\* Cf. E. H. Shackleton, *Heart of the Antarctic*, vol. ii, p. 413.

coast adjoining are approximately parallel. The abrupt change in the general direction of the two courses between 72° and 74° S. lat. may mean, therefore, that the coast of the unknown land to the south-west also shows a similar change in direction. It also makes it improbable that there is any strait separating Graham Land from the rest of Antarctica.

*Westerly Antarctic Drift.* - The most striking feature of the Deutschland drift, apart from the kink mentioned above, is the equally abrupt easterly deflection in 65° S., where the ice looks, indeed, as if it had come under the influence of the westerly winds. This would be an unusually high latitude in which to meet the westerlies, and it is probable that there is some other reason for the behaviour here; for after a time the general direction of the Deutschland drift again becomes northerly. Taken as a whole, the winds met with off the Antarctic coasts are south-easterly, with the result that the ice-pack moves towards the west. It has taken years for this fact to be properly appreciated; early circumnavigators, such as Biscoe for instance, believed that the westerlies still prevailed far south, and sailed eastwards, not knowing how much they would have gained by adopting the exactly opposite course in high latitudes. The westerly drift round the Antarctic is well known to-day, and it is obvious that the course of future explorations will be very markedly influenced by this knowledge. It means, for instance, that the eastern borders of such seas as the Weddell Sea are free from ice, at least towards the end of the season, while on the west side the reverse is more likely. This makes it improbable, therefore, that the east coast of Graham Land will ever be charted from the sea, for it is unlikely that any ship will venture down the west side of the Weddell Sea, or having crept down Coats Land will risk penetrating farther north-west along the Wilhelm Barrier, with the ever-threatening possibility of being jammed against the land by pack from the east.

Graham Land obstructs the westerly drift; that and the low average wind-velocity in the Weddell Sea compared with the Koss Sea are the causes of the unusual congestion of ice which generally prevails in the former area. The Endurance tried to make its southing between 15° and 20° W. long., but from 60° onwards there was a continual struggle with the pack. There must, however, be an eastern limit to this ice congestion; possibly a ship sailing south along the Greenwich meridian may meet with no ice there even in January. One cannot say probably, for there is also the likelihood of a considerable indentation (and nourishing ground, therefore, for ice) into the continent between 15° E. and 15° W. long. The reason for supposing the existence of such a sea has already been referred to, namely the finding by the Endurance<sup>TM</sup> 70° to 71° S. lat., 15° to 20° W. long., of a line of impenetrable hummocky pack heavier than anything encountered elsewhere, even off Graham Land. One felt compelled to think that it could only be due to the westerly drift piling up the ice either against a great ice-tongue (e.g. Termination Ice-Tongue in 100° E. long.) or along a N.-S. coast obstructing the normal drift. Bellingshausen's discovery of land in 69° S. lat., 16° E. long., marks the eastern limit of this possible indentation. A ship working westwards from Enderby Land would be taking the most suitable course for entering this presumed sea.

*Position of the Pack-Ice Edge.* - The course of future exploration is bound to be influenced to a great extent by the results of the voyage of the Endurance, for much that was formerly mere supposition in regard to the ice is now accomplished fact. It would also be most useful, therefore, if the average edge of the pack in the Weddell Sea could be determined from the records of all who have previously visited this region, and a chart drawn like that published annually for the Arctic by the Danish Meteorological Institute. An attempt was made to do so, but achieved only moderate success. The time does not seem suitable for it yet. In the first place, there are hardly enough observations available, and such as there are, are for the most part valueless, owing to the observer seldom specifying in detail what type of ice he saw. For the present not much can be done to amplify the various pack-edges set down on the chart accompanying Mill's Siege of the South Pole beyond adding the Filchner and Shackleton conditions. Such a map to be useful should, of course, have the day and month as well as the year inserted, as the edge is continually moving northwards. The only data as to the rate of this movement are supplied by the Deutschland, which drifted 6 sea-miles a day, and the Endurance, nearer the coast, which averaged 4 sea-miles a day.

#### IV. Changes in the Ice.

From its very beginning the history of the pack-ice was one of continual, unceasing change. The field itself was never at rest. Driven by wind and current, it was cracked the one day, and compressed the next. Outwardly, therefore, it finally appeared very different from the original sheet of young-ice, which consisted either of black-ice covered with ice-flowers or of cemented pancakes. Its surface became a maze of hummocks and pressure ridges, for the most part drifted over with snow. These were the outward signs of change due to its being in motion; but inwardly the ice had also become very different, independently of whether it moved or not. It had altered in chemical constitution, in density, structure, hardness, elasticity, and so on. These changes, it should be noted, varied greatly according as the portion of ice examined was still floating in the water, or had been hummocked so as to lie above sea-level.

*Growth in Thickness.* - The rate at which undisturbed ice grew depended largely on whether there was a heavy snow-covering or not. Hence it could come about, and did, that the earliest-formed ice in the winter of 1915 was not necessarily the thickest at the close of the year. Observations on the thickness were made at several different points, but ultimately these became destroyed one by one, so that by October there was only one small area of 1915 ice whose entire history was definitely known. The final measurements for thickness were made here, and gave the result that by October 13 ice which started forming on February 6 was now 145 cm. (= 4 ft. 9 in.) thick. This ice started forming in and about 77° S. lat.; and on October 13 the position was 69° 20' S. lat. Owing to the abandonment of the ship a fortnight later, this was the last measurement possible at this locality. It is more than probable, however, that the ice continued to increase in thickness until possibly the end of December, but certainly no later than this date. On plotting out the different measurements and continuing the diagrammatic curve so got in keeping with the composite curve of past observers, an additional 3 inches can be assumed. The maximum thickness of one-year ice in the Weddell Sea (except fast-ice in high latitudes) is therefore taken as 5 feet. Anything thicker than that is regarded with certainty either as having been rafted at some time or other, or as being the result of two winters' freezing. Both these winters may have been spent as drifting pack-ice, or for the first of them the ice may have been held fast in some sheltered bay.

*Summary Table of Rate of Growth.*

Locality.	Date. 1915.	Thickness.	
		Inches.	Centimetres.
D	14th February	0	0
	16th February	6	15·25
	3rd March	12	30·5
	13th March	15	38·1
	6th April	21	53·4
	1st June	37·5	95·25
	6th July	40·35	102·5
F	6th February	0	0
	9th August	...	115
	7th September	...	136
	13th October	57	145
			} Small amount of snow- covering.
L	5th October	...	130
	10th October	...	131
	21st October	...	141
			} Same floe as F, but deeper snow-covering.

Certain floes, however, whose thickness was due entirely to freezing, exceeded 5 feet. Some of these were measured while still afloat, others immediately after being hummocked. A selection is given below of those of most interest, and from some of which important conclusions were drawn.

*Diatoms.* - In the summer countless diatoms made their appearance on the surface of the water, on the edges of the ice, and along its under surface; they inserted themselves between the plates and lived actually in the body of the ice itself. This may have been simply an effort to get to the light. At the end of summer, accordingly, a good number were entangled and

*Table of exceptionally Thick Floes due to Freezing.*

Date of Observation.	Thickness.	Remarks.
8th August 1915	145 cm.	Pressure ridge beside ship. The ice in which the ship was beset in January-February 1915. (80 cm. formed in 1914; 65 cm. formed in 1915, as proved by diatom layer.)
5th and 12th September 1915	7½ ft.	Part of a hummock. Diatoms were present only in the lowest part; presumed, therefore, to have formed almost entirely in 1914, and to have grown a few inches only in 1915.
8th December 1915	9-10 ft.	A slab in a hummock, not very far distant from the last locality.
31st December 1915	7 ft.	"Ocean Camp" floe.
7th February 1916	6 ft.	"Patience Camp" floe.
19th March 1916	6 ft. (approx.)	Portion of hummock nearly 25 ft. in height. Upper part made up of 2-3 ft. of "spotted ice" with diatoms at base, lower of 1-3 ft. of "fibrous ice" with current summer's diatoms at base.
30th March 1916	8 ft. 4 in.	"Patience Camp" floe. Less snow presumably than where measured on 7th February. Vertical lines pronounced from the very top downwards, i.e. all fibrous ice.

became frozen into the ice, and so gave it a yellow colour. This discoloured band, therefore, marked the interval between two winter periods of freezing, and could be used as an index to the age of the floe. The piece of ice, for instance, noted on March 19 had two diatom layers; the second and lower was formed in summer 1915-16; the upper presumably in 1914-15; accordingly the uppermost (i.e. oldest) portion of the ice must have commenced freezing in winter 1914 at latest.

*Change in Structure.* - It had been well known to whalers for a long period that old hummocked ice could be used for drinking purposes; but this was knowledge which had apparently been lost, for the Discovery in 1901 melted snow for this purpose. It is an important point, however, in a ship's economy to realise the freshness of hummocked ice, as snow requires nearly double the amount of heat that ice does to produce a given quantity of water. The ice which was suitable for this purpose was very different in appearance from freshly formed young-ice with fibrous structure.\* It had become clear, almost transparent, had a conchoidal fracture, might almost be called blue in colour, and had a slightly spotted look. Though quite suitable for drinking, it was not entirely fresh; tested with silver nitrate, the solution always became cloudy, showing that some chlorine at least was still present. All the water used for chemical experiments on board the Endurance had to be distilled on this account.

This type of ice was apparently that examined by Drygalski near the Gauss winter quarters in 1903, and by him called "Blaueis." He attributes the changes to the influence of wind and evaporation (i.e. ablation), basing his contention on the smoothed and rounded nature of the ice. That the latter appearance is due to ablation is certainly true, but that the change in structure is due to the same cause is unproved. The long imprisonment of the Endurance gave the opportunity for showing that the structural change was due to the high summer temperatures; it might partly take place in ice still afloat (i.e. not hummocked), but it reached its fullest development when the ice had been subjected to a summer's temperatures as a hummock above the water level.

About half the ice in the Weddell Sea was of this "spotted" nature (Drygalski's "Blaueis"). That the change was not due to wind follows from the fact that ablation, however important it may have been round the Gauss winter quarters, is nowhere known to be at all effective in the Weddell Sea. That it may play a part nearer the coast than the position of the Endurance is quite possible, but, so far as the measurements of ablation went, the results round the ship were nil. These measurements took the form of a marked stake embedded in the ice of some

\* Called "fibrous" for convenience; young-ice is not really fibrous but platy in structure; the edges of the plates, however, give it a fibrous appearance.



"We can't go back! Firstly, we've only just got here, and secondly, I told you it was going to be freezing!"



"They really rub in the fact that they were first."



prominent hummock. One such was set up on May 21, 1915, and when examined for the last time on September 4, as on previous visits, it was found still crusted, like the ice around, by rime 1 inch thick. This was the rule everywhere throughout the winter.

In the summer, conditions were not quite the same, and changes did occur, but they were directly the outcome of the sun's heat. This was the very season during which quantitative measurements would have been of most value ; but such were of course quite impossible after the ship was crushed in October 1915. The summer changes are therefore the result of comparative observation, and quantitative tests are still required.

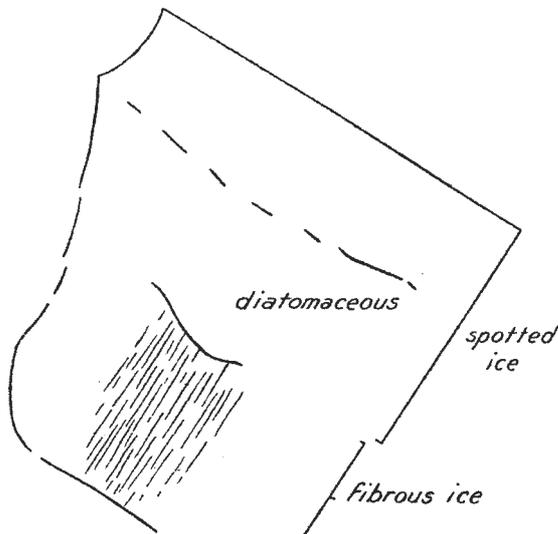


Fig. 8.

That the change from fibrous ice (i.e. striated ice showing vertical lines) to spotted ice can take place in hummocks is not new; the details of what takes place have been set down very clearly by Hamberg. They amount to this: that the ice, when subjected to a temperature at and about the melting-point, loses some of the liquid salt inclusions, their place being taken apparently by air-bubbles; the ice then ceases to show its pronouncedly striated or fibrous appearance and becomes bubbly and almost granular. Traces, however, of the vertical lines can still be seen on very close examination and are a convincing proof of what has taken place. What had not been settled by Hamberg was the length of time necessary to effect this

change. The length of life of the Weddell Sea floes being known, it can be definitely asserted now that the change can be effected in one summer.

One can also go further than this and say that the change may also commence while the floe is still in the water. In this connection the thick floes examined on August 8, 1915, and March 19, 1916, were of considerable value for what they told.

That examined on August 8, 1915, which is roughly sketched in fig. 8, was raised up into a pressure hummock on August 1 ; previously it formed part of an old floe which had lain ahead of the ship since very early in February 1915, and which was formed at that time by the cementing together of brash and ice pieces (dating from 1914) during the north-east blizzards of the latter part of January 1915. The upper portion, just over 80 cm. in thickness, was spotted ice, and of this amount the bottom half was discoloured by diatoms. It was separated by a sharp line from 65 cm. of fibrous ice. From this specimen the following conclusions were drawn:-

- (1) The sharp line indicated a break in the freezing process during the summer 1914-15, and separated ice formed in 1915 from that formed the previous year.
- (2) The presence of diatoms showed that the ice was afloat in summer 1914-15.
- (3) It also showed that the ice must have been very loose to allow of these minute plants penetrating 40 cm. into the ice.
- (4) This in turn pointed to a temperature at or about the freezing point— just what was required to produce the structural change from fibrous to spotted.

The block examined on March 19, 1916, had been tilted up into a hummock a couple of days earlier. Its upper 2-3 feet consisted of spotted ice, in its lower portion discoloured by diatoms. The variation in thickness may have been partly due to summer melting in 1914-15; it resulted, at any rate, in an uneven boundary between the upper portion and the lower 1-3 feet of ice; the latter was also slightly spotted, but with the fibrous structure not yet entirely obliterated;

in turn its lower layers also were strongly discoloured -by diatoms. This was an important find, for it showed the effects by March of the summer heat of 1915-16; the change had already begun, but was not so far advanced as to obliterate entirely the fibrous structure. The arrival of diatoms seems to be the sign that the change is beginning.

The earliest date on which the structural change was definitely known to have commenced was on December 30, 1915. On that date a visit was made to one of the numerous areas of brownish-looking flat ice (the brown appearance was connected with a very thin snow-covering) and an attempt made to bore through the floe. Merely by working with the point of an ice-axe, it was soon possible, despite the water oozing up in the first few inches, to reach down 2 feet 6 inches. At one time it would have been impossible to have reached even a depth of 6 inches without excavating with a pick and shovel. The ice now was soft right through and through; and the whole ice-thickness must, therefore, have been practically at the melting-point.

On the same date, however, it should be noted that a floe with a 3-foot snow-covering was not so far advanced; for in this case it was only possible to work down a few inches with the point of the ice-axe. The snow-covering was now retarding rise of temperature, just as once it retarded freezing; this was evidence, therefore, of how the almost universal thick snow-covering on Weddell Sea floes worked towards prolonging their life.

*Physical Changes* - The fracture and hardness of spotted ice are very different from the same physical properties in fibrous ice. This was to be expected, and does not call for detailed mention.

Experiments were made from time to time to determine the specific gravity of the various types of sea-ice, and to discover especially if there was any relation between specific gravity and the amount of chlorine present. On the whole the results were not as satisfactory as they might have been, and, under the circumstances, were of course incomplete. There is good ground, however, for supposing that something may eventually be gained from them. The method used was that recommended by Mr James, who himself made a good many of the determinations. The sample of ice was first of all weighed in air, in a temperature which varied from  $-4^{\circ}$  to  $-12^{\circ}\text{C}$ . (and which of course was not quite the same as that to which the ice had been exposed in situ); it was then weighed in paraffin whose specific gravity and coefficient of expansion were known ; and the result calculated accordingly.

In a previous paper it was stated that the specific gravities of fibrous ice (i.e. ice showing vertical striae) clustered round 0.92, whilst those of comparatively pure spotted ice were nearer 0.91. This was a somewhat hasty conclusion to draw from the results. At the time Dr Otto Pettersson's paper "On the Properties of Water and Ice" had not come to notice. The very numerous references to contraction cracks in Polar literature made it appear that sea-ice below its freezing-point behaved like pure ice, and contracted on cooling - the exact opposite to Pettersson's conclusions. Inasmuch, therefore, as the determinations of specific gravity were made with the ice varying in temperature from  $-4^{\circ}$  to  $-12^{\circ}\text{C}$ ., the possible expansion according to Pettersson would be nearly 2 per cent, and all figures have, therefore, had to be re-examined. What has been done is to plot the specific gravity against the temperature of the ice at the time it was weighed. The result for fibrous ice shows a grouping of the values along lines which are perhaps comparable to Pettersson's curve. In the case of spotted ice, however, there are many serious discrepancies; but as this type contained considerably less salt than fibrous ice, it is quite natural to expect that its coefficient of expansion approximates rather to that of pure ice than to that of young-ice.

Leaving aside spotted ice, and considering only the platy or fibrous type, our measurements showed that its specific gravity was 0.92 at  $-4^{\circ}\text{C}$ . And 0.915 at  $-15^{\circ}\text{C}$ . The amount of chlorine present was about 3 per cent. These figures indicate the same order of things as Pettersson puts forward, but of a very different magnitude. Between  $-4.4^{\circ}$  and  $-6.4^{\circ}\text{C}$ . he found an expansion of 0.002957 (i.e. more than three times the Endurance result) for ice of a kind

which seems to be the same as the ice spoken of here as fibrous. The method used in the *Endurance*, however, was not sufficiently exact to merit more weight being attached to the results got by it than to Dr Pettersson's made in the laboratory. Even if they could be, any discrepancy could be easily explained by the fact that practically no two pieces of ice are identical. Spotted ice has probably a lower specific gravity than fibrous ice, but the *Endurance* figures at any rate do not prove an invariable difference. They do prove, however, that Krummel's statement that sea-ice has a specific gravity of 0.92 in the Arctic and 0.95 in the Antarctic is quite untrue.

*Chemical Changes.* - The amount of chlorine present in the various ice-types was directly determined by titration with silver nitrate, Mr James being responsible for the actual measurement. Results are given not as total salinities but in grammes Cl per 1000 c.c. of melted ice. This is made necessary by the fact that the amount of salt present relative to chlorine cannot be deduced by formula, as it can in the case of sea-water, but must vary, to what extent being at present unknown. To have determined the total salinity was quite out of the question on a non-oceanographical expedition.

The results showed that:-

- (1) The amount of chlorine initially enclosed (presumably in the form of brine) depended probably on the rate of growth - in other words, on the temperature at the time of formation.
- (2) Ice in the position of growth (i.e. unhummocked) slowly became fresher by losing its chlorine.
- (3) The chlorine was removed downwards and was not, as previously imagined, mainly pressed out on the surface. How fast this took place was not quite clear.
- (4) The loss of chlorine in winter was probably slow compared with that which took place in summer.
- (5) For ice to become drinkable, it required to be hummocked and exposed to a summer's high temperatures.

The most important data were obtained from three vertical pits put down in ice whose history was known and had been recorded. Those of September 7 and October 13, 1915, were put down in ice which commenced freezing and had gone on doing so uninterruptedly since February 6; samples of ice were taken every 20 cm., and examined for structure, salinity, and specific gravity. Those on September 7 showed invariably fibrous structure; those on October 13 (in ice of exactly the same history, the pit being only a couple of yards away), showed fibrous structure only in the lower two-thirds, for in the upper third there was also a tendency towards being spotted, which became very pronounced in the topmost sample. These series have been plotted diagrammatically, chlorine content increasing towards the right, and depth in the water downwards from the top of the page (fig. 9).

The third series, that of September 14, was collected from ice of a totally different history; the upper layers, formed in the winter of 1914, were spotted in structure and discoloured by diatoms; the middle portion was spotted, but vertical lines appeared on a sample being melted; and the bottom layers were pronouncedly fibrous and were in fact simply young-ice. The spotted ice formed in 1914 or earlier is often referred to as old-ice; unlike young-ice, it had experienced high summer temperatures.

The two series in young-ice show how even in five weeks there has been a distinct freshening of the ice; in the case of the saltier layer (25 cm. down) the loss in chlorine amounts to 25 per cent. Layers less salt have not freshened in the same proportion. The curve has become smoother, and it looks on that account as if finally the amount of chlorine were going to be equally distributed through the ice, except perhaps in the very bottom layers where the ice is but newly formed.

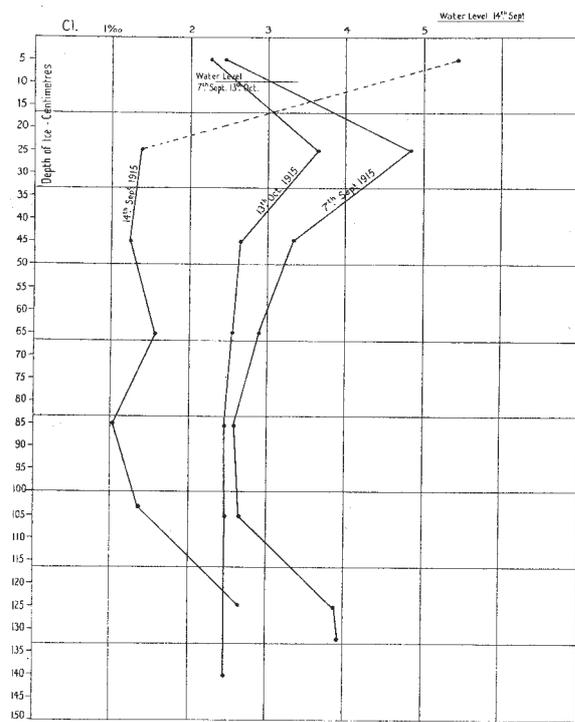


Fig. 9.

hummocked, the ice became fresh enough even for drinking purposes. That a little chlorine, however, was still present even then was proved by titration with silver nitrate.

## V. Decay.

To the rule that Arctic and Antarctic pack are much the same there appears to be one noteworthy exception. In the matter of decay, sea-ice in the Antarctic, by all accounts, behaves very differently from that in the Arctic. It was a very rare thing, for instance, to see bare ice in the Weddell Sea, and when it did occur it was owing to the ice having formed late in spring and never having had an opportunity of getting covered by much snow. In no case was a pool of fresh water due to natural causes seen on the ice; salt pools certainly were seen, but they were all due to seepage of water into depressions caused by the weight of pressure ridges. Fresh-water pools, formed on camp sites owing to the amount of soot lying around on the snow, may be set aside as unnatural. Under exceptional conditions, however, fresh pools do occur in the Antarctic; Nordenskjöld mentions having found them on the ice near Snow Hill Island, but gives no details; and they also occur in the Ross Sea in places where there is a good deal of dust scattered about over the ice.

In the Arctic affairs are very different, and melting of the snow to form fresh-water pools and lakes is extremely common, particularly in the American Arctic Archipelago. Nansen and Weyprecht both mention them as occurring in the neighbourhood of Franz Josef Land; the latter cites melting of the ice on the upper surface as the rule, and even maintains that this process may go on while the ice is still increasing by freezing on the lower surface. The evidence for this, however, was based on observations of the ice at the ship's stern, in the very place where abnormal conditions would be expected; practically no weight, therefore, can be given to Weyprecht's statement that ice in northern latitudes melts about 1 metre on the surface each year.

Experience in the Weddell Sea makes it certain that there, at any rate, surface melting as a factor did not count. It must be regarded as abnormal. Except in summer there was no ablation, and even then it only affected the snow covering and not the ice beneath. The snow became granular and almost moist-

The series in old-ice shows a freshening of the same order, but much more advanced. The very high chlorine percentage in the sample near the surface seems out of place: it is explained, however, by the upper surface of the ice at this point having been below water level, owing to its heavy load of snow; for in such cases salt water always seeped in laterally from the nearest crack and caused the upper layers of old spotted ice like this to appear even saltier than the young fibrous variety. The fact remains, however, that spotted ice as a rule is fresher than fibrous ice.

To summarise:—Young-ice had two possible lines of development open to it: either it remained floating in water or was hummocked. In both cases its structure became spotted instead of fibrous; in the case of hummocked ice, it also became translucent in appearance. The saltiness was appreciably lessened in ice afloat, but, if

Other processes must be invoked to explain the decay, namely melting on the under surface and mechanical attrition. Probably there is little or no ice melted from below till the whole thickness reaches the melting-point. By all accounts, however, this is what happens in the Arctic; the diagrams obtained by plotting time against ice-thickness, based on the figures of the different expeditions, show at first a steep gradient until the thickness is about 8 inches; then a steady falling off in steepness, down to what appears to be the local average thickness; and then a line almost horizontal, until it suddenly steepens at the melting period. The steepness of the diagram at the melting period is ever so much greater than that at the initial freezing, indicating that the ice as a whole first reaches the melting-point and then melts practically all at once. On one occasion there was proof that this might happen in the Weddell Sea - on December 30, 1915, when it was possible to drive an ice-axe up to its head into the soft ice; but no large floe was ever actually seen to melt. Melting of this nature may be looked for, however, in sheltered bays, and is known to occur in the Ross Sea; but in the Antarctic ice-fringe as a whole the pack seems hardly ever to reach the melting stage until it has come under the influence of swells from the open sea.

In distinguishing drift-ice from pack-ice, it was pointed out that the former is opener and looser and moves faster accordingly; it lacks the inertia belonging to close-ice. This has a very important consequence, for it means that the outer edge is continually scaling off, so to speak, and the swell getting access to more extensive areas of ice than it would otherwise have operated on. The swell soon reduces the size of the floes, and this in turn helps on the formation of more drift-ice; and so on. Meantime, the movement of the floe up and down in the water is mechanically eroding the ice, apart from actual melting; melting alone would produce honeycombing, but this was a rare feature in the drift-ice fringing the pack; it looked, therefore, as if mechanical wear and tear was the most successful factor in producing decay.

In the case of the Weddell Sea ice, there was a local peculiarity, which must accelerate the break-up. In its progress north, the ice was being continually pressed against Graham Land and Joinville Island; S.E. winds accordingly had little effect in moving the ice, but S.W. ones drove it out towards the open sea; the former had a closing, the latter an opening effect. There was a point, however, where the ice did get away to the north-west, namely when it reached the latitude of Joinville Island. In the middle of March, 1916, in 64° S. lat., a south-easterly blizzard had practically no effect; in the beginning of April, in lat. 62° 30' S., a lighter wind from the same quarter drove the ice fast and far to the north-west. In this way separate areas are probably sliced off the main pack and driven into Bransfield Strait. There the noted currents of the Strait give it little peace, and it travels towards the South Orkneys often as fast as 20 miles a day. The Endurance party's experience of the current gave some idea of its force. From the 9th to the 12th of April the winds were easterly and east-north-easterly; and in this period during the daylight the boats were steered on a N. W. course; at night camp was generally made on a drifting floe. Observations on the 9th made the position 61° 56' S., 54° 05' W.; but on the 12th showed the boats to be in 62° 15' S., 53° 17' W. - a net loss of about 30 miles S.E. Dead reckoning, on the contrary, would have made the position at least 25 miles N.W. of that on the 9th, to say nothing of steady winds from E.N.E., which should have made it still farther west. These figures give an idea, though an inexact one, of the strength of the easterly running currents in Bransfield Strait.

To summarise what probably happens during the decay of the Weddell Sea ice:- The most important factor is the swell, which breaks down the floes, if not already in that condition, into smaller-sized pieces. Mechanical erosion then takes place by washing of sea-water against the ice. Finally, when the temperature allows of it, the ice-blocks are destroyed by melting. By the time that stage is reached, the ice is much comminuted, forming brash. The latter includes "bergy bits" (hummocked-ice finally taking this appearance) or "growlers," which are merely ice-fragments greenish in colour and so small that they hardly show above water. For several hours one morning the boats of the Endurance passed through a maze of bergy bits. At that time the ice was under the influence of the Bransfield Strait current; and this and the wind were carrying it, much battered and decayed, to its final melting-ground towards and beyond the South Orkneys.

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# Principal Expeditions during the Heroic Age of Antarctic Exploration

by R. K. Headland

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A SYNOPSIS OF EVENTS AND ACTIVITIES FROM THE EARLIEST  
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There have been several definitions proposed of the *Heroic Age* of Antarctic exploration, which generally concentrate on the attainment of the South Pole and other exploration of the interior of the continent. There were, however, various other expeditions and events concurrent during this brief, but intense, period. Several whaling recon-naissances from 1892 may be regarded as its practical beginning which incidentally aroused much public interest. The theoretical beginning was the Resolution adopted in 1895 during the sixth International Geographical Congress. The end of the age came during the First World War which caused exploratory activity throughout the world to diminish. Two subsequent expeditions are listed here – but their accomplishments were far less than planned.

During this period the earliest winterings were made south of the Antarctic Circle (1898, aboard *Belgica*) and on Antarctica (1899, at Cape Adare). The last of the peri-Antarctic islands was discovered (Scott Island in 1902) and the general limits of Antarctica became known. The South Pole was reached twice in the 1911-12 summer (35 days separated these events). The earliest Antarctic sound recordings were made in 1902 and ciné films in 1903. Twice in 1902 aircraft (hydrogen balloons) were used for aerial reconnaissance. The earliest radio communications were established with Antarctica in 1913, with Australia through a relay station on Macquarie Island. In 1903 the first permanent meteorological station was opened (on the South Orkney Islands) and in 1904 the first shore whaling station was established (Grytviken, on South Georgia). Eleven of the historic huts of the Antarctic date from this period.

At the same time there was an intense concentration of Arctic activity involving a total of 17 expeditions from six countries attempting, but failing, to attain the North Pole.

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### 1892-93 British whaling exploration (from Dundee)

Thomas Robertson	<i>Active</i>
Alexander Fairweather	<i>Balaena</i>
Robert Davidson	<i>Diana</i>
James Davidson	<i>Polar Star</i>

Pioneer Scottish whaling reconnaissance, the Dundee whaling fleet, visited Falkland Islands; William Speirs Bruce (*Balaena*) and Charles W. Donald (*Active*) undertook some scientific work in the Joinville Island group and northern Trinity Peninsula; Robertson discovered and roughly charted Active Sound and the Firth of Tay; William Gordon Burn Murdoch, an artist, accompanied the expedition aboard *Balaena*. No whales were successfully caught but a large quantity of seal pelts and oil (presumably from Crabeater Seals) were obtained. The fleet met Carl Anton Larsen aboard *Jason*, near Joinville Island, 24 December 1892. The earliest known photographs of Antarctica were taken during this expedition.

### 1892-93 Norwegian whaling exploration (from Sandefjord)

Carl Anton Larsen	<i>Jason</i>
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Pioneer whaling reconnaissance; raised Norwegian flag, 4 December 1892, and collected fossils on Seymour Island where left an inscribed pole; penetrated Weddell Sea to 64· 67°S, 56· 50°W, reporting an 'appearance of land' to the west of this position; visited South Orkney Islands. Larsen encountered the Dundee whaling fleet near Joinville Island, 24 December 1892. No whales were successfully caught although one was harpooned.

### 1893-94 Norwegian sealing and whaling exploration (from Sandefjord)

Carl Anton Larsen	<i>Jason</i>
Morten Pedersen	<i>Castor</i>
Carl Julius Evensen	<i>Hertha</i>

Visited South Shetland Islands. *Hertha* sailed south between Biscoe Islands and the Antarctic Peninsula to 69· 17°S, sighted Adelaide Island, Hugo Island, and Alexander Island. *Hertha* and *Castor* sailed in company to meet *Jason* at South Georgia. Whale harpooned from *Hertha*, but lost, in Royal Bay, 20 April 1894. Larsen discovered King Oscar II Coast, Foyen Coast, and Robertson Island (reported a volcanic eruption at Seal Nunataks); penetrated Weddell Sea coast of the Antarctic Peninsula to 68· 17°S, and made first use of ski in Antarctica; visited South Orkney Islands and Falkland Islands. Vessels reunited at Jason Harbour, South Georgia. The expedition secured 13 223 seal pelts (presumably Crabeater Seals from near the Antarctic Peninsula) and 6600 barrels [1· 1 × 10<sup>6</sup> l] of seal oil. [Larsen wrote to the Royal Geographical Society, London, inquiring about leasing South Georgia as a site for a whaling station, February 1896.]

### 1893-95 Norwegian sealing and whaling exploration (from Tønsberg)

Henrik Johan Bull	
Leonard Kristensen	<i>Antarctic</i>

Dispatched by Svend Foyn to investigate Antarctic whaling possibilities. Visited Tristan da Cunha, sighted Prince Edward Islands and Iles Crozet, took Elephant Seals on Iles Kerguelen, and reached Melbourne; during winter 1894 sighted Macquarie Island, visited Auckland Islands where met John Fairchild (*Hinemoa*) and Campbell Island where grounded on Terror Shoal, met HMS *Rapid* and Capt. Brown (*Gratitude*, 1894) who brought supplies (Bull wintered in Melbourne); in 1894-95 summer sighted Balleny Islands; landed on Possession Island in the Ross Sea, and at Cape Adare where raised the Norwegian flag, 25 January 1895 (the second landing on Victoria Land, and probably the sixth on mainland Antarctica). Made several Antarctic photographs, the earliest south of the Antarctic Circle. Searched for non-existent 'Royal Company Island' and 'Emerald Island'.

1895 Sixth International Geographical Congress meeting in London adopted a resolution (number 3) at its closing session, 3 August, 'That this congress record its opinion that the exploration of the Antarctic Regions is the greatest piece of geographical exploration still to

be undertaken. That in view of the additions to knowledge in almost every branch of science which would result from such a scientific exploration the Congress recommends that the scientific societies throughout the world should urge in whatever way seems to them most effective, that this work should be undertaken before the close of the century'. [The Seventh International Geographical Congress, Berlin, September to October 1899, continued this initiative and arranged for coordinating of expeditions.]

#### **1897-99 Belgian Antarctic Expedition**

Adrien Victor Joseph de Gerlache de Gomery *Belgica*  
Visited Tierra del Fuego. Continued to South Shetland Islands; explored the eastern part of Bismarck Strait; discovered and mapped Gerlache Strait and Danco Coast; named Palmer Archipelago; sighted Alexander Island. *Belgica* was beset by pack ice and drifted south of Peter I øy for 12 months, the earliest exploring vessel to winter on the Southern Ocean and first men (17) wintering south of the Antarctic Circle, kayaks made for local journeys, first uses of sledges in Antarctica. Two men died, off the South Shetland Islands and in the Bellingshausen Sea. Comprehensive scientific programme undertaken, detailed collections and photographic records made. [Roald Engelbregt Gravning Amundsen (1910-12, *q.v.*) and Frederick Albert Cook were aboard *Belgica*.]

#### **1898-99 German Deep Sea Expedition**

Carl Chun  
Adalbert Krech *Valdivia*  
Oceanographic voyage in Indian and Atlantic Oceans; visited Bouvetøya (and accurately fixed its position for the first time), Iles Kerguelen, Ile Saint-Paul, and Ile Amsterdam. Met Elysee Hermann and his family living on Ile Saint-Paul, running a fishing enterprise with the vessel *H.B.P.*

#### **1898-1900 British Antarctic Expedition**

Carsten Egeberg Borchgrevink  
Bernhard Jensen *Southern Cross*  
Visited Balleny Islands (reported an eruption), examined a large stretch of coast of Victoria Land; landed at Cape Adare and raised the British flag, 2 March 1899; built 2 huts where 10 men wintered ('Camp Ridley'), the earliest party to do so on Antarctica (*Southern Cross* wintered in New Zealand); examined the Ross Ice Shelf, sledging party reached a farthest south of 78° 83', 23 February 1900; dogs used for transport (first use in Antarctica); established a mid-winter camp, 'Stone Hut', on Duke of York Island where made another territorial claim. Nicolai Hanson (Norway), zoologist, died, 14 October 1899, and was buried on Cape Adare. On the return voyage visited Auckland Islands and Macquarie Island. Scientific investigations included zoology, geology, meteorology, and geomagnetism; ciné photography attempted unsuccessfully. By prior arrangement *Carin*, from Melbourne, awaited *Southern Cross* at Campbell Island with stores but missed her, 1 February to 21 March 1899. [The expedition included 2 Lapp, Ole Must and Persen Savio, employed as dog handlers. Borchgrevink was a Norwegian, resident in Victoria (Australia); he organized the expedition in Britain with private patronage, later he applied for United States citizenship. The huts at Cape Adare are now protected as 'historic sites'.]

**1901 Antarctic bibliography;** the earliest major specific compilation (878 references) was done by Hugh Robert Mill for *The Antarctic Manual*, edited by George Murray and published by the Royal Geographical Society.

#### **1901-03 German South Polar Expedition (from Hamburg)**

Erich Dagobert von Drygalski  
Hans Ruser *Gauss*  
*Gauss*, with a complement of 32, was beset and wintered in the Antarctic pack ice (drifting about 80 km offshore); expedition discovered Wilhelm II Land and sledged to Gaussberg;

visited Iles Crozet, Heard Island (investigated glaciation), Ile Saint-Paul, and Ile Amsterdam. Made 3 ascents in a tethered hydrogen balloon at winter quarters, 29 March 1902, reached 480 m elevation and relayed observations to the ship by telephone (first Antarctic use); sound recordings of birds on Edison cylinders made, used an electric lighting system, and made diving observations from the ship beneath the ice. Separate scientific party of 5 men, under Emil Werth, spent 16 months at Baie de l'Observatoire, Iles Kerguelen, 1902-03, with supply vessels *Tanglin* (Kapt. Neuhaus), *Duisburg* (Kapt. Brunhs), *Stassfurt* (Kapt. Wommelsdorf), and *Essen*, sheep introduced. Beri-beri caused two deaths of crew aboard *Tanglin*; Josef Enzensperger died on Iles Kerguelen, 2 February 1903. Escaped sledge dogs became feral on Iles Kerguelen. Comprehensive scientific programme conducted.

#### **1901-03 Swedish South Polar Expedition (from Göteborg)**

Nils Otto Gustaf Nordenskjöld

Carl Anton Larsen

*Antarctic*

Shore party of 6 men wintered on Snow Hill Island (1902 and 1903); proved Dumont d'Urville's 'Louis Philippe Land' (now Trinity Peninsula) to be a part of the Antarctic Peninsula, and mapped unknown gap between Gerlache Strait and Orleans Strait; discovered and mapped Antarctic Sound and Prince Gustav Channel; dog sledged to 66° 05'S on the east side of the peninsula; *Antarctic* visited Tierra del Fuego, Falkland Islands, and South Georgia (called in Royal Bay and Maiviken, rediscovered and named Grytviken) during the 1902 winter while sealing. At the end of that winter the ship could not reach Snow Hill Island, 3 men landed at Hope Bay to proceed overland but they encountered open water and failed to reach the island, so were forced to winter at Hope Bay in 1903 with minimal supplies (leader Gunnar Andersson). *Antarctic* was beset and crushed in the pack ice of Erebus and Terror Gulf and foundered, 12 February 1903, complement (20 men and the cat) reached Paulet Island where wintered, Ole Christian Wenersgaard died, 7 June 1903. Three search expeditions dispatched in 1903 (*Français* [1903-05], *Frithjof* [1903-04], and *Uruguay* [1903]) and a fourth was ready (*Scotia*, [1902-04]); all 3 parties rescued by the Argentine naval vessel *Uruguay* (Julian Irizar), November 1903. The expedition conducted a comprehensive scientific programme including work in Falkland Islands, Tierra del Fuego, and South Georgia. An artist, Frank Wilbert Stokes (United States), was aboard for the first summer. [The hut on Snow Hill Island and two ruined refuges are now protected as 'historic sites'.]

#### **1901-04 British National Antarctic Expedition (from London)**

Robert Falcon Scott

*Discovery*

Made the earliest extensive exploration on land in Antarctica; *Discovery* spent 2 winters off Hut Point, Ross Island (45 men in 1902 and 37 in 1903); a sledge party of 3 reached farthest south 82° 28'S, 30 December 1902; examined the coast of Victoria Land and the Ross Ice Shelf, Cape Crozier to the Bay of Whales; discovered King Edward VII Land; dogs used for hauling (cats also wintered). Ascents made in a tethered hydrogen balloon, *Eva*, 4 February 1902, reaching about 250 m (the earliest Antarctic flights, first by Scott, second by Ernest Henry Shackleton). Polar Plateau reached by a party led by Albert Borlase Armitage and Dry Valleys discovered. George Thomas Vince died in a blizzard, 11 March 1902. In 1902-03 *Discovery* remained ice-bound in McMurdo Sound, where supplied from *Morgenen* [*Morning*, 1902-03]. In February 1904 *Discovery* was freed, after the arrival of *Morning* and *Terra Nova* (1903-04); visited Macquarie Island on the outward voyage, Balleny Islands, Auckland Islands, and Falkland Islands during the return voyage. Electric lighting system used (wind powered, not very successful), colour photography attempted; comprehensive scientific programme conducted. [The hut at Hut Point is now protected as a 'historic site'.]

#### **1902-03 British relief expedition**

William Robinson Colbeck

*Morgenen* [*Morning*]

Organized by the Royal Geographical Society, carried stores and dispatches to *Discovery* in McMurdo Sound, took 9 men back and landed one; discovered, surveyed Scott Island (first named Markham Island), where a party landed and claimed it for Britain, 25 December

1902; landed on Possession Island and Beaufort Island; geological specimens collected on all landings. [The vessel was originally *Morgenen* but the translation to *Morning* was made for the next expedition, 1903-04.]

**1902-04 Scottish National Antarctic Expedition (Britain)**

William Speirs Bruce

Thomas Robertson

*Scotia*

First oceanographic exploration of Weddell Sea; *Scotia*, with a complement of 33, wintered at Laurie Island, South Orkney Islands, where meteorological observations began, 26 March 1903 (currently the oldest continuous record from the Antarctic), an observatory, 'Omond House', was built and the instruments transferred there, 1 November 1903; the island was charted. Allan George Ramsay, engineer, died, 6 August 1903; his grave is the first in the island's cemetery. Further operation of meteorological station entrusted to the Oficina Meteorológica Argentina from 22 February 1904. *Scotia* visited Falkland Islands (December 1902, December 1903, and February 1904); made a second Weddell Sea voyage which discovered northern part of Caird Coast, Coats Land, but no landing possible; and continued to Gough Island (April 1904). Conducted a comprehensive scientific programme; cine photographs and sound recordings made; dogs used for sledge hauling; prepared to search for the Swedish South Polar Expedition (1901-03) but found that *Uruguay* (1903) had rescued it. A subsidiary meteorological station was operated by John Pearce at Cape Pembroke, Falkland Islands. [The expedition originally intended to depart in 1901 to coordinate observations with British and German expeditions. Bruce subsequently planned a major expedition which, among many other objects, included a trans-Antarctic traverse through the South Pole. This was to begin in 1911 but did not eventuate. Ruin of 'Omond House' remains on Laurie Island are now protected as a 'historic site'.]

**1903 South Orkney Islands;** on 29 December the British Minister in Buenos Aires, William H. D. Haggard, invited, at the request of William Speirs Bruce (Leader of the Scottish National Antarctic Expedition, 1902-04), the Argentine Government to take over and continue the Scottish National Antarctic Expedition's meteorological observations which began on Laurie Island on 26 March 1903 (1902-04, *q.v.*). The Argentine Government accepted this and Presidential Decree 3073, 2 January 1904, authorized the Oficina Meteorológica Argentina, of the Ministry of Agriculture, to maintain the station. Argentine personnel sailed aboard *Scotia* and the transfer took place on 22 February 1904.

**1903 Argentine relief expedition (from Buenos Aires)**

Julian Irizar

*Uruguay*

Naval vessel visited South Shetland Islands; rescued men who wintered at Snow Hill Island, 8 November (the 'day of wonders'), Hope Bay, and Paulet Island of the Swedish South Polar Expedition, left provision depots, November. Alberto Chandler Bannen was Chilean representative aboard.

**1903-04 Swedish relief expedition (from Göteborg)**

Hans Olof Fredrik Gylden

*Frithjof*

Sailed to rescue the Swedish South Polar Expedition (Nils Otto Gustaf Nordenskjöld, 1901-03); reached Snow Hill Island, 4 December 1903, to discover that wintering parties there and at Hope Bay, and the company of *Antarctic*, had already been rescued on *Uruguay* (Julian Irizar). Axel Alexander Camille Rudolf Emannel von Klinckowström made ornithological observations, mainly of penguins, at Hope Bay.

**1903-04 British relief expedition**

William Robinson Colbeck

*Morning*

Henry Duncan Mackay

*Terra Nova*

Organized by the Royal Navy, joined *Discovery* in McMurdo Sound to assist the return of the British National Antarctic Expedition (1901-04); the 3 ships sailed north on 19 February

1904. Sighted Scott Island, visited Auckland Islands. *Terra Nova* visited the Falkland Islands during the return voyage.

#### 1903-05 French Antarctic Expedition

Jean-Baptiste Etienne August Charcot *Français*

Intended to search for the Swedish South Polar Expedition (1901-04) but found this had been rescued; wintered at a station on Booth Island, off the west coast of the Antarctic Peninsula, 1904; charted west side of Palmer Archipelago, partly by dog sledge; discovered and roughly charted Loubet Coast southwards to Adelaide Island; sighted Hugo Island and Alexander Island; pigs and cats also aboard; undertook a comprehensive scientific programme.

**1904 Compañía Argentina de Pesca** formed by Carl Anton Larsen (Swedish South Polar Expedition, 1901-03, *q.v.*) in Buenos Aires to begin whaling from South Georgia, 29 February. Larsen returned to Norway where he organized the enterprise in Sandefjord. [On returning to South Georgia Larsen founded Grytviken whaling station, 16 November, the company ran the station until 1960 when it was sold to Albion Star (Falkland Islands). Within the next decade 5 other companies established whaling stations on South Georgia where the industry continued until 1965.]

#### 1904 Scottish National and Argentine Antarctic Expedition (Britain and Argentina)

William Speirs Bruce (Leader, aboard *Scotia*)

Robert Cockburn Mossman (Officer-in-charge; Laurie Island, South Orkney Islands)

Thomas Robertson

*Scotia*

Collected all but 2 personnel from the Scottish National Antarctic Expedition, (1902-04); station formally transferred to Argentina by William Speirs Bruce, 22 February; 5 men wintered. [One of the 3 Argentine personnel opened a Post Office and made the first cancellations, 20 February 1904, using Falkland Islands and Argentine postage stamps (this functioned only in 1904 and 1905; another was established in 1941). After this voyage the Argentine Government has arranged an annual relief of the station.]

#### 1904 Norwegian and Argentine whaling enterprise (from Sandefjord)

Carl Anton Larsen (Manager)

Thorvald Christian Thorsen

Lauritz Edward Larsen

*Louise*

*Rolf* (transport ship)

with whale-catcher *Fortuna*

C. A. Larsen, of the Compañía Argentina de Pesca, established the first Antarctic whaling station on South Georgia, at Grytviken, 16 November 1904. Erik Sörling, of the Naturhistoriska Riksmuseet, Stockholm, made biological observations and collections; Larsen and Sörling began taking meteorological observations, 17 January 1905, which were maintained by Erik Nordenhaag (Sweden) from August, the observations have subsequently been continuous. [Larsen was accompanied by most of his family and about 100 employees; this event was the beginning of the modern Antarctic whaling industry and permanent occupation of the island (the whaling station operated until 1965). *Louise* remained as a storage hulk until abandoned and eventually burnt in 1987. The sealers' cemetery, near Grytviken, was adopted by the whalers.]

#### 1905-06 Norwegian whaling enterprise (from Sandefjord)

Alexander Lange (Manager)

Søren Andersen

*Admiralen* with

whale-catchers *Hauken* and *Ørnen*

Christen Christensen's Company, Aktieselskabet *Ørnen*, deployed the first floating whaling factory in southern regions; started whaling at New Island, Falkland Islands, 24 December 1905 under a government licence, then moved south to Admiralty Bay, King George Island,

South Shetland Islands, 28 January 1906; and returned to New Island, 27 February. [This was the beginning of South Shetland Islands whaling which lasted until 1931.]

**1906 *Congres Internationale des Regions Polaires*** convened at Mons, Belgium, by Georges Lecointe, September, and the Commission Polaire Internationale was formed. There were meetings in 1908 (Bruxelles) and 1913 (Roma) before it was dissolved in 1915. Several attempts to co-ordinate polar investigations were only partially successful but Jean Denoncé compiled a detailed Antarctic expeditions list (1911) and a bibliography of Antarctic exploration (1913).

**1907-09 *British Antarctic Expedition***

Ernest Henry Shackleton

Rupert George England (1907-08) and

Frederick Pryce Evans (1908-09)

*Nimrod*

Frederick Pryce Evans (1908)

*Koonya*

Party of 15 men wintered at Cape Royds on Ross Island; climbed Mount Erebus (3794 m), 10 March 1908; Shackleton and 3 others (Jameson Boyd Adams, Eric Stewart Marshall, and John Robert Francis [Frank] Wild), discovered and sledged up the Beardmore Glacier to a farthest south of 88· 38°S (01· 62° [180 km] from the South Pole) where Shackleton took possession of the Polar Plateau for King Edward VII, 9 January 1909; insufficient supplies necessitated their return; discovered nearly 500 km of the Transantarctic Mountains flanking the Ross Ice Shelf; discovered coal at Mount Buckley. Tannatt William Edgeworth David leading a party of three reached the region of the South Magnetic Pole (72· 42°S, 155· 27°E) and took possession for Britain of Victoria Land there, 16 January 1909, and at Cape Bernacchi, 17 October 1908. Dogs and ponies used for some sledge hauling. Visited Macquarie Island, searched for 'Dougherty's Island'. First experiments in motor transport in Antarctica, an Arrol Johnston motor car was used with limited success; ciné photographs of penguins and seals were made. The expedition used New Zealand postage stamps specially overprinted 'King Edward VII Land' and an expedition canceller; Shackleton was appointed Post-Master. Book, *Aurora Australis*, printed at Cape Royds, 90 copies made. [To conserve coal, in January 1908, *Nimrod* was towed 2700 km from Lyttelton to the ice edge by *Koonya* (reached 66· 52°S) which visited Campbell Island during the return voyage. The hut at Cape Royds is now protected as a 'historic site'.]

**1908 *Falkland Islands Dependencies***; British Royal Letters Patent of 21 July consolidated earlier territorial claims, dating from 1775 onwards, as Dependencies of the Falkland Islands, and specified the territories included ('· · · South Georgia, the South Orkneys, the South Shetlands, and the Sandwich Islands, and the territory known as Graham's Land, situated in the South Atlantic Ocean to the south of the 50th parallel of south latitude, and lying between the 20th and 80th degrees of west longitude, · · · '). [Although, for administrative convenience, these territories were constituted Dependencies of the Falkland Islands, the British title to them is separate and in no way derived from the title to the Falkland Islands. Neither parts of South America nor the Falkland Islands were included in the territories specified, although the converse has been argued on the basis that the geometric sector specified incorporated them. This was the earliest defined sovereign claim over Antarctica.]

**1908 *Norwegian expedition (from South Georgia)***

Carl Anton Larsen

Ottar Jørgensen

*Undine*

Reconnaissance of South Georgia and South Sandwich Islands in search of new anchorages for whaling vessels, November; met United States sealer *Daisy* (Benjamin Dunham Cleveland) in the Bay of Isles at former; concluded that whaling could not be based at latter because of absence of safe harbours and presence of volcanic activity. Larsen was almost asphyxiated by volcanic fumes on Zavodovski Island; he prepared maps of the islands.

### **1908-10 French Antarctic Expedition**

Jean-Baptiste Etienne August Charcot  
Ernest Chollet

*Pourquoi Pas ?*

Visited South Shetland Islands, bunkered at Deception Island, *Pourquoi Pas ?*, with a complement of 30 men wintered at Petermann Island, where built huts and left a plaque, 1909. Charted west coast of the Antarctic Peninsula and islands southwards to Adelaide Island and Alexander Island; discovered Marguerite Bay, Fallières Coast, and 'Charcot Land' (later proved to be an island, Charcot Island); sighted Peter I øy. Ciné photographs of selected activities were produced. Expedition carried 3 motor sledges but was able to use them experimentally only. Pursued a comprehensive scientific programme, partly supplied and assisted by whaling vessels, especially from Deception Island.

### **1910-12 Norwegian Antarctic Expedition**

Roald Engelbregt Gravning Amundsen  
Thorvald Nilsen

*Fram*

*Fram* reached the Bay of Whales, Ross Ice Shelf; party of 9 wintered in 'Framheim' (*Fram* wintered in Buenos Aires); 5 men (Amundsen, Olav Olavsen Bjaaland, Helmer Julius Hanssen, Sverre Helge Hassel, and Oscar Wisting) reached the South Pole ('Polheim'), 14 December 1911 (after adjustment for the International Date Line) by dog sledge, and claimed the South Polar Plateau for Norway ('Kong Haakon VII Vidde'); discovered Queen Maud Mountains. Kristian Prestrud, leading a party of 3, explored King Edward VII Land and took possession for Kong Haakon, 7 December 1911; reported 'Carmen Land', the existence of which has been disproved. *Fram* reached 78°41'S [78·68°S] in the Bay of Whales, 15 February 1911; continued during 1911 to circumnavigate Antarctica, investigated non-existent 'Nimrod Island' and 'Dougherty's Island', and made oceanographic observations in the South Atlantic. Encountered *Terra Nova* of the British expedition, January 1911, and *Kainan-maru* of the Japanese expedition, January 1912, in the Bay of Whales. Ciné photographs of selected activities were produced.

### **1910-12 Japanese Antarctic expedition**

Nobu Shirase  
Naokichi Nomura

*Kainan-maru*

Sailed from Tokyo Bay with a complement of 27; reached Coulman Island, Ross Sea, in 1910-11 but failed to penetrate the pack ice and wintered in Sydney, Australia. During 1911-12 reached the edge of the Ross Ice Shelf and landed at the Bay of Whales, where encountered the Norwegian expedition aboard *Fram*. From there a party of 5 (including 2 Ainu dog handlers) sledged 250 km south-east, this 'Dash Patrol' claimed the area within sight, 'Yamato Yukihara' ('Yamato Snow Plain'), on the Ross Ice Shelf, for Japan, 28 January 1912. Party investigated King Edward VII Land. Ciné photographs were produced.

### **1910-13 British Antarctic Expedition**

Robert Falcon Scott (Leader for 1911 winter, Captain 1910-11 outward voyage)  
Edward Leicester Atkinson (Leader for 1912 winter)  
Henry Lewin Lee Pennell (1911 return voyage and 1911-12), and  
Edward Ratcliffe Garth Russell Evans (1912-13)  
(Captains for different voyages)

*Terra Nova*

Spent 2 winters at Cape Evans on Ross Island (25 men in 1911, 13 in 1912, *Terra Nova* wintered in New Zealand); 5 men (Scott, Henry Robertson Bowers, Edgar Evans, Lawrence Edward Grace Oates, and Edward Adrian Wilson) reached the South Pole, 17 January 1912 by man-hauling, and found Amundsen's expedition had departed there 33 days previously; all perished during the return journey; a search party found their last camp, 12 November 1912. Extensive exploration and scientific investigations conducted (biology, geology, glaciology, meteorology, geophysics) along the coast of Victoria Land and on the Ross Ice Shelf; discovered Oates Land, made second ascent of Mount Erebus. Separate party of 6 men, led by Victor Lindsay Arbuthnot Campbell, wintered in a hut at Cape Adare (1911)

and in an ice cave at Evans Cove, Inexpressible Island, (1912) under great privation. Herbert George Ponting, present for the first winter, made earliest ciné documentary film of an Antarctic expedition (eventually titled *90° South*), prepared colour photo-graphs; telephone deployed between Cape Evans and Hut Point; established a Post Office using New Zealand postage stamps overprinted 'Victoria Land' and an expedition canceller. Ponies, mules, 'motorised sledges', and dogs were used for transport in addition to man-hauling. *Terra Nova* encountered *Fram* in the Bay of Whales, January 1911. [The hut at Cape Evans, ruin at Cape Adare, and site at Inexpressible Island are now protected as 'historic sites'.]

#### 1911-12 German South Polar Expedition

Wilhelm Filchner

Richard Vahsel (1911-12), Wilhelm Lorenz (1912), and

Alfred Kling (1912)

*Deutschland*

Visited South Georgia and South Sandwich Islands; at the former investigated the coasts aboard *Undine*, prepared charts and reopened the observatory at Royal Bay (1882-83); one man lost at sea. Continued south to 'Prinzregent Luitpold Land' [Luitpold Coast] and charted part of the south coast of the Weddell Sea; discovered the Filchner Ice Shelf where an attempt to establish a station was unsuccessful (it was deployed on a calving iceberg). *Deutschland*, with 33 men aboard, was beset and drifted in pack ice for 9 months; a winter sledge journey proved non-existence of Robert Johnson's 'New South Greenland', reported in 1821. Visited South Georgia a second time after getting free from the ice. Sledge dogs and Manchurian ponies carried for transport and ultimately left on South Georgia. [Vahsel died, 8 August 1912; succeeded by Lorenz to Grytviken and then Kling. The original plan was to cross Antarctica by the South Pole to the Ross Sea.]

#### 1911-14 Australasian Antarctic Expedition

Douglas Mawson

John King Davis

Thomas Holliman

John Bollons

*Aurora*

*Toroa* (1911)

*Tutanekai* (1913)

Discovered and explored King George V Land and Queen Mary Land, which were claimed for the British Crown at Cape Denison, March 1912, and at Possession Rocks, 25 December 1912; shore parties wintered at Cape Denison (18 men in 1912 and 7 in 1913) and on the Shackleton Ice Shelf (leader John Robert Francis [Frank] Wild, 8 men in 1912); the former explored Terre Adélie and sledged towards the South Magnetic Pole, which was determined by Eric Norman Webb, 21 December 1912 (70· 61°S, 148· 17°E), and more territory was claimed; the latter reached Gaussberg on 23 December 1912 and left a message; both undertook extensive scientific programmes, dogs used for hauling during second season (received from Roald Amundsen aboard *Fram*). The Cape Denison station was occupied for the 1913 winter to await the return of a 3 man sledging party led by Mawson (Mawson alone returned, on the day after the ship departed). A separate party, of 5 men, led by George Frederick Ainsworth, spent 23 months on Macquarie Island, made the earliest detailed scientific investigations there, mapped the island; introduced sheep, dogs, and hens; planted vegetables. Wireless stations were established at Cape Denison and Macquarie Island (as a relay); first signal received from Antarctica on 25 September 1912 but two-way communication not established with Cape Denison until 20 February 1913. Intended to take an aircraft to Antarctica, but it crashed in Australia during the outward voyage and was used without wings as an 'air tractor sledge'. Colour and ciné photographs produced by several men of the expedition. Traces of silver, gold, and cassiterite were detected, and a meteorite was found. Davis searched for the non-existent 'Royal Company Island' (31 May to 2 June 1912) and visited Auckland Islands, 24 June to 6 July 1912 (reported no trace of the Enderby Settlement at Hardwicke). [*Toroa* and *Tutanekai*, were chartered to convey stores and personnel to Macquarie Island, December 1911 and August 1913 respectively. The huts at Commonwealth Bay are now protected as 'historic sites'.]

### **1913-15 Commonwealth Meteorological Expedition (Australia)**

Harold Power (1914) and A. C. Tulloch (1915) (leaders of winter parties)

George William Charles Bedford *Endeavour*

Meteorological station established on Macquarie Island by the Australasian Antarctic Expedition (1911-14) transferred to the Commonwealth Meteorological Service; 3 men wintered. Breeding sheep (28), poultry, and ducks were introduced and an attempt made to start a pastoral industry. *Endeavour*, with a full complement aboard (21 men), disappeared without trace after relieving the station on 3 December 1914 (probably foundered on Macquarie Island). The station was maintained until 4 December 1915, when it was closed owing to the difficulty of securing a vessel for annual relief during the First World War; men taken off aboard *Rachel Cohen* (W. J. MacBryde).

### **1914-16 Imperial Trans-Antarctic Expedition [Weddell Sea Party] (Britain)**

Sir Ernest Henry Shackleton

Frank Arthur Worsley *Endurance*

Visited South Georgia and South Sandwich Islands; discovered southern part of Caird Coast. *Endurance*, with a complement of 28 men, was beset, drifted 10 months during which the non-existence of Robert Johnson's 'New South Greenland' was demonstrated; *Endurance* was crushed in pack ice of the Weddell Sea, abandoned 27 October and sunk on 21 November 1915, wrecking the plan to sledge across Antarctica; company drifted on the pack ice and later escaped in boats to Elephant Island, South Shetland Islands, 14 April 1916, where wintered; Shackleton with 5 others sailed 1450 km to South Georgia in modified whale boat *James Caird*; he and 2 of them made the first major trek across the island to Stromness; 5 relief expeditions were organized in 1916, of which the fourth rescued the party of 22 men from Elephant Island, 30 August 1916, which was led by John Robert Francis [Frank] Wild after Shackleton's departure. [*Endurance* was equipped with wireless telegraphy apparatus but it was insufficiently powerful to communicate with a coast station; dogs used for sledge hauling and a motor sledge carried; James Francis [Frank] Hurley made a ciné film and took colour photographs.]

### **1914-17 Imperial Trans-Antarctic Expedition [Ross Sea Party] (Britain)**

Æneas Lionel Acton Mackintosh (1914-15) and

Joseph Russell Stenhouse (1915-16) *Aurora*

Organized by Sir Ernest Henry Shackleton to meet the *Endurance* party intending to sledge across Antarctica from the Weddell Sea (1914-16); visited Macquarie Island to provision Commonwealth Meteorological Expedition there, December 1914; continued to Ross Island, where it was intended the vessel remain for winter. Attempts to deploy a hut at Cape Crozier were thwarted by ice, *Aurora* continued to McMurdo Sound where supplies were unloaded and moved to the ice shelf where 6 men began laying depots for the crossing party; dogs used for hauling. Blizzards and ice drove *Aurora* off, 11 March, leaving the men stranded at Hut Point. The ship reached Cape Evans where she prepared to winter until forced off her moorings, 6 May 1915, stranding 4 men ashore in the hut. The men from Hut Point sledged to Cape Evans and all 10 were reunited, 2 June 1915. During the 1915-16 summer depot laying continued southwards to the Beardmore Glacier under very arduous conditions with minimal supplies and equipment. Of the last returning sledging party one man died on the ice shelf, 9 March 1916; the 5 survivors reached Hut Point, but 2 of them were lost crossing sea-ice, 9 May 1916. During the 1916 winter 4 men were at Cape Evans and 3 survived at Hut Point before traversing to Cape Evans, 15 July. *Aurora*, with a complement of 18, became beset, then drifted in the Ross Sea pack ice passing Balleny Islands, until free, 14 March 1916, and reached New Zealand, 3 April. The 7 survivors from the shore party were rescued, 10 January 1917. [Mackintosh commanded *Aurora* during the outward voyage and remained ashore from January 1915, he died on sea-ice, May 1916; Stenhouse took command of the ship, 10 May 1915. Expedition had wireless telegraphy apparatus but reception was intermittent from Macquarie Island, it was insufficiently powerful to

communicate elsewhere; a motor sledge was carried but not used successfully; ciné film sections produced. There was no man designated as leader after the death of Mackintosh.]

**1916 Norwegian [first] relief expedition** (from South Georgia)

Ingvar O. Thom *Southern Sky*

Whale-catcher, with Sir Ernest Henry Shackleton aboard, attempted but failed to reach Elephant Island, South Shetland Islands, May, to rescue Shackleton's party left there, April 1916; conveyed Shackleton to Falkland Islands.

**1916 Uruguayan [second] relief expedition** (from Montevideo)

Ruperto L. Elichiri-Behety *Instituto de Pesca No I*

Called at Falkland Islands where took Sir Ernest Henry Shackleton aboard; attempted but failed to reach Elephant Island, South Shetland Islands, June, to rescue Shackleton's party left there, April 1916.

**1916 British [third] relief expedition** (from Punta Arenas)

Sir Ernest Henry Shackleton  
Frank Arthur Worsley *Emma*

Chartered vessel attempted but failed to reach Elephant Island, July, to rescue Shackleton's party left there, April 1916. Towed and escorted for part of voyage by Chilean vessel *Yelcho*.

**1916 Chilean [fourth] relief expedition** (from Punta Arenas)

Luis Alberto Pardo Villalon *Yelcho*

Chilean naval vessel, with Sir Ernest Henry Shackleton aboard, rescued 22 men of *Endurance* from Elephant Island, 30 August. [*Discovery* (James Fairweather) sailed from Plymouth to assist in the rescue (fifth relief expedition); reached Montevideo where heard of *Yelcho's* success. Arrangements for the loan of *Fram*, to be commanded by Carl Anton Larsen, were made by the Norwegian government and the Chilean navy also offered a vessel to rescue the Elephant Island party.]

**1916-17 Ross Sea relief expedition** (from Port Chalmers)

John King Davis *Aurora*

Funded by Australian, British, and New Zealand governments; after extensive refitting in Port Chalmers, *Aurora* rescued the 7 survivors from the Ross Sea party of the Imperial Trans-Antarctic Expedition from Cape Evans, Ross Island, 10 January 1917 (3 men had perished). Sir Ernest Henry Shackleton accompanied the voyage. [The ship had wireless telegraphy apparatus, sporadic contact was maintained with New Zealand.]

**1920 Scott Polar Research Institute** founded in Cambridge, Britain, 26 November.

**1920-22 British Expedition to Graham Land**

John Lachlan Cope (Leader for 1920-21 summer)  
Ole Andersen *Svend Foyn*

Four men were taken to South Shetland Islands by whaling vessels based at Deception Island; they intended to sledge southwards from Hope Bay but ice conditions prevented access; they continued to Paradise Harbour aboard *Svend Foyn* where a camp was established at the whalers' depot on Waterboat Point. Local exploration was made but the leader and George Hubert Wilkins returned to Britain aboard *Solstreif*. Thomas Wyatt Bagshawe and Maxime Charles Lester re-mained, with a dog team, and wintered during 1921 at Waterboat Point, recording meteorological, tidal and zoological observations until relieved, 13 January 1922 (a complete year of data were obtained), by Andersen, accompanied by Arthur George Bennett, Falkland Islands Dependencies Administrator. [This expedition was planned as a far more ambitious operation, the British Imperial Antarctic Expedition, but was unable to obtain sufficient finance. Transport was provided by several other vessels of the Norwegian whaling fleet. Sir Ernest Shackleton, with Wilkins, aboard *Quest* were prepared to rescue the Waterboat

Point party but this proved unnecessary. The remains of the base of the hut are now protected as a 'historic site'.]

### 1921-22 Shackleton-Rowett Antarctic Expedition (Britain)

Sir Ernest Henry Shackleton and

John Robert Francis [Frank] Wild

*Quest*

Visited South Georgia, where Shackleton died, 5 January 1922. Wild took command and expedition continued to the Weddell Sea; visited South Sandwich Islands; confirmed non-existence of 'New South Greenland'; attempts to discover new land in the Enderby Land region were unsuccessful; sighted Elephant Island, South Shetland Islands; returned to South Georgia, then visited Gough Island and Tristan da Cunha. A Post Office operated aboard *Quest*. [The expedition, with George Hubert Wilkins aboard, was prepared to rescue the Waterboat Point party but this proved unnecessary (British Expedition to Graham Land, 1920-22).]

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## The Endurance Photographs – Some Observations and Thoughts

By Shane Murphy



On the world stage of photography Frank Hurley's legacy is assured by his *Endurance* images. Discovering how Hurley took, developed and preserved his work under such extreme conditions has been my interest over the years, and my energy has gone into maintaining a comprehensive record of all ITAE Weddell Sea Party images, 1914-1917 taken above 60°S (and after-rescue images).

That Hurley secured the vast majority of these images with his own cameras is beyond question. He was obsessively dedicated to his profession, going anywhere and doing anything for the 'perfect picture.' He was innovative by necessity, clever by invention, and manufactured his needs from limited resources. He could be a trickster in the darkroom, in his dealings with Shackleton and others, and while telling the expedition story in his own words. But if not for Hurley's dogged and wily perseverance there would be few if any *Endurance* images.

Below, I've incorporated a collection of diary and other references to briefly illustrate Hurley's work during the *Endurance* expedition. The selections have the gift of telling their own backstories while simultaneously portraying the conditions under which Hurley worked.

Original diary entries, sometimes edited for clarity, are in *italics*.

## Outward Voyage

**Sunday, 18th October, 1914.**

**Buenos Aires Herald** — SHACKLETON'S MEN ENTERTAINED AT DINNER ... a brief [smoking] concert, and a lantern lecture by Mr. Frank Hurley, the official photographer to Sir Douglas Mawson's expedition, concluded the programme... Slides illustrating the principal incidents of the Mawson expedition were ... projected on the screen by Mr. Frank Hurley...

**Friday, 5th November.**

**Lees** — *Such a night; everything in our cabin flying about and incessant cursing and swearing from the six unhappy occupants. We have eight bunks in our tiny cabin which is 9 ft. by 9 ft. but only six of the bunks are occupied by people; the other two are, or rather were, full of scientific instruments, cameras now piled up in a muddled heap on the floor.*

**Tuesday, 5th January, 1915.**

**Hurley** — *Was awakened last night, towards midnight, to take photographs. The midnight sun was shining brilliantly, and, as its low light tipped the heavy pressure ice and floes, the effect was extremely beautiful.*

**Thursday, 7th January, 1915.**

**Lees** — *This afternoon I amused myself ... watching Hurley make and develop a quantity of bromide prints. He is a brilliant photographic artist, besides being a most versatile handy man.*

**Friday, 8th January.**

**Hurley** — *...We have had to retrace our course to the point which we reached on the 4th. The monotony of slow progression I have relieved somewhat by printing a series of prints from my negatives, with the intention of binding them up into a pictorial log [SPRI P66-19; the "Green Album"] of the Expedition.*

**Thursday, 14th January.**

**Hurley** — *Kept extremely busy with camera and Cinema. Exposed 12 1/1 plates and 200 ft. of Cine film.*

**James** — *For once a brilliant sunshiny day. Hurley at work early with his camera. He had been hard at it all day, but says he has some beautiful stuff.*

**Lees** — *Hurley was out on the floe photographing the ship but had to return hurriedly as the hummock that we had our stern made fast to by a wire broke off with a piece of the floe attached and we began to swing out away from the floe. This was probably due to having set some sails for the sake of making a good picture, though there was only the lightest of zephyrs blowing.*

## Beset

**Sunday, 24th January.**

**Hurley** — *Glorious sunny day. Took advantage of same to secure a number of natural colour plates. The pack bears no evidence of opening, and so here we are with the land in sight only some 30 miles distant and absolutely helpless...*

**Worsley** — *Hurley the irrepressible ... like a clucking bird in the Tpsail yardarm is taking a colour photo of the ship & ice ... from the snug comfort of the tub. He is a marvel — with cheerful Australian profanity he perambulates alone aloft & everywhere, in the most dangerous & slippery places he can find, content & happy at all times but cursing so if he can get a good or novel picture. Stands bare[headed] & hair waving in the wind, where we are gloved & helmeted, he snaps his snap or winds his handle turning out curses of delight & pictures of Life by the fathom.*

**Monday, 25th January.**

**Worsley** — *While all sail is set Hurley goes on floe & takes a picture of the ship & floe.*

**James** — *[Hurley] got a fine colour picture of Cheetham... with the red ensign & the Australian flag [and almost certainly the Paget of Vincent mending a net].*

**Friday, 29th January.**

**Hurley** — *Still held up [in the pack]. Spent day developing.*

**Saturday, 6th February.**

**Hurley** — *Have packed & unpacked my cases several times — barometrically with the ship's condition in the ice.*

**Sunday, 7th February.**

**Hurley** — *Had quite a run of sitters for portraiture this morning. Took the individual portraits of the shore party and developed same, 20 negatives in all. Also took cinema pictures of pups.*

**Lees** — *This morning Hurley took all our photographs and afterwards I took his. These are to be sent home "when the ship leaves" for we still talk of settling down in the hut and of the ship going back...*

**Tuesday, 16th February.**

**James** — *After dinner I went out with Hurley ... to photograph a beautiful formation of rime on the young ice of the near lead. The whole surface of the young ice was covered with flowerlike forms which occupied every little raised point. The effect was beautiful in the extreme like a field of white flowers...*

**Wednesday, 24th February.**

**James** — *Hurley as been very busy developing his film that he has taken so far.*

**Thursday, 25th February.**

**Hurley** — *Fit up the refrigerator as a dark-room for the development of Cine film, being dubious as to its keeping qualities. Commence developing Cine film find same okay. Difficulty is experienced in obtaining sufficient water for washing operations. Dry film by hanging it in the refrigerator, maintaining a temperature equable as possible with Sir Ernest's paraffin heater.*

**Worsley** — *Hurley is busy all this week fitting up the refrigerator as a dark room & these last 3 days he is developing his cinema films for which he requires the paraffin heater to keep the water [in] his dark room above the freezing point & 40 gallons of water each day for the films.*

**Herbert Ponting (p. 152, 1921)** — *On account of the difficulty of getting sufficient water, the tank system cannot be used ... films have to be developed, fixed and washed in strips of fifty feet on a revolving drum; by which method the necessary quantity of the solution, or of water, is reduced to the minimum. But it is exceedingly slow. Fifty feet of film last for less than a minute on the screen; but to develop, fix and wash that quantity of negative took about an hour and a half.*

**Thursday, 4th March.**

**James** — *Played chess with Hurley to-night & had a desperate & exterminating game ending in a stale-mate. We played in Hurley's darkroom which is cosy & warm. He has just finished developing about 3,000 feet of film. [According to Ponting, 3,000 feet of film would have required some 100 hours' labour.]*

**Friday, 12th March.**

**Hurley** — *The rush to tenant the Ritz cubicles having subsided I am besieged by many to bind photographs, à la Passe Partout. Mostly the portraits are of charming young ladies!*

**Saturday, 20th March.**

**McNish** — *...we had a lantern lecture from Hurley through Australia & Java it was very good we are having one every month*

**Saturday, 24th April.**

**Hurley** — *Owing to the fallen temperature — it being -19, a heavy condensation develops on cameras when brought aboard. I have made a cupboard on deck where they may be kept at an even*

low temperature. Nevertheless, the apparatus needs attention every occasion it is taken out, lubricating with petroleum &c, especially the cinematograph. Under these extreme temperatures, the film becomes extremely brittle and loses about 10% of its sensitiveness.

### **Wednesday, 19th May.**

**Hurley** — A form of mid-winter madness has manifested itself, all hands being seized with the desire to have their hair removed. It caused much amusement, and luxuriant curls, bald pates and parted crowns soon became akin. We are likely to be cool-headed in the future, if not neuralgic. We resemble a cargo of convicts, and I did not let the opportunity pass of perpetuating photographically this humorous happening.

### **Saturday, 29th May.**

**Hurley** — After three attempts, I succeed in securing a flashlight of my team being fed. The charges of flash power were placed in three shielded receptacles and fired electrically. The dogs were extremely scared, the kennel entrances having to be blocked to keep them out.



### **Saturday, 10th July.**

**Hurley** — Give a lantern lecture on New Zealand. Worsley I allowed to do the lecturing, he being a native born New Zealander. He spoke very uneloquently, his descriptions being confined to "It is - er -er - so & so." He, however, retrieved himself by executing a Maori war-dance.

**Worsley** — I do my best to give a lecture which consists mainly of 'this is such & such a place.' Tap tap with a stick for the next picture. At the conclusion I give an imitation of a Maori haka with three or 4 excellent pupils...

### **Monday, 16th August.**

**Hurley** — Clear afternoon. Worsley & self go picture stalking with cameras, he being used most effectively as a figure by which I include in pictures so that the size of the surrounding objects may be gauged.

**Worsley** — In the afternoon Hurley & I do a 6 mile round with the camera... I dispose my manly figure in more or less graceful poses as an accessory to the surrounding scenery — a kind of human meter to gauge the sublimity of Nature.

### **Friday, 27th August.**

**Hurley** — 1:30 a.m. All hands aroused by crack starting from under mizzen chains to starboard stern. All sledges are taken on board... During the night take flashlight of the ship beset by pressure. This necessitated some 20 flashes, one behind each salient pressure hummock, no less than ten of the flashes being required to satisfactorily illuminate the ship herself. Half blinded after the successive flashes, I lost my bearings amidst hummocks, bumping shins against projecting ice points and stumbling into deep snow drifts...

### **Monday, 30th August.**

**Hurley** — Dark room work rendered extremely difficult by the low temperatures, it being -13 outside. The dark room is situated abaft the engine room and is raised above freezing point by a primus stove. Washing plates is a most troublesome operation, as the tank must be kept warm or the plates become an enclosure in an ice block. After several changes of water, I place them in a rack in Sir Ernest's cabin, which is generally at a fairly equable temperature. The dry plates are all spotted and carefully indexed. Development is a source of much annoyance to the fingers which crack and split around the nails in a painful manner.

### Monday, 25th October.

**Hurley** — *During the afternoon, I packed up my album [SPRI P66-19; the "Green Album"] in waterproof cloth – it being the only record of my work I shall be able to take, should [we] be compelled to take to the floe.*

### Adrift

### Monday, 1st. November.

**Hurley** — *...went to wreck this afternoon... Endeavoured to rescue negatives. Alas! Covered by 3 feet water [?] & [?] ice.*

### Tuesday, 2nd November.

**Hurley** — *...hacked the sides out of refrigerator to try & salvage negatives & bared ... from head to waist probed for same below the mushy ice. The cases ... which fortunately were zinc lined & soldered & containing the negatives in galvanised tins I located beneath 3 feet of mushy ice and practically all were intact.*



**Hurley [Buenos Aires Herald, Wednesday, 1916]** — After all hope of saving the vessel had gone, [Hurley] said, I went for my films and found they had been forced underneath a lot of gear and that there were several feet of icy water over them. I shuddered a little at the prospect, but it had to be done — so I went in. I found them; they were in sealed cases and when I examined them I found that they were absolutely uninjured.

**Hurley [Edited typescript diary, 1917]** — During the day, I hacked through the thick walls of the refrigerator to retrieve the negatives stored therein. They were located beneath four feet of mushy ice and, by stripping to the waist and diving under, I hauled them out. Fortunately, they are soldered up in double tin linings so I am hopeful they may not have suffered by their submersion.

**Hurley [New York Times, Sunday, 8 March, 1924]** — ...In the hold of the derelict, beneath fifteen feet of pea-soupy ice, were two small, hermetically sealed cans of treasure worth a king's ransom. Nearly \$100,000 had been advanced on the motion picture rights to help finance the expedition at the outset, and the two cans contained the picture negative representing the results of twelve months' labors. I had tossed up my gold mascot coin with Seaman How to determine who should dive into the black, icy waters of the wreck. The mascot had failed me on the spin, but rewarded the issue into which it precipitated me. Hence my unattractive attire, my frostbitten body and the two ice-encrusted cases that lay on the ice and indicated that the desperate chance had been rewarded.

**DIVING FOR FILMS.** It was a decidedly shivery situation diving into the »soupy, freezing water which filled the splintered hold of the wrecked vessel, held up from sinking into 1,000 fathoms by frail ice tongues forced through her side. Groping blindly and numbly about in the dark, freezing waters, directed only by the feel of familiar objects, it needed all my will power to prevent me from becoming 'cold-footed' and giving up. It necessitated several dives to locate the cans of negative. The second can had just been passed up to Seaman How when the eerie stillness was broken by the icefields tightening their crushing grip on the wreck; to the warning of creaking and splintering timbers we dashed up from the bowels of the vessel to the safe outside almost into the arms of the leader. Thereafter those two cases and myself became inseparable.

**THAWED WATER.** The unique film I secured was developed at once to avoid possible deterioration. I rigged up a tent darkroom near the wreck, kept up the temperature with a Primus kerosene stove and set to work to develop 1,000 feet of film in ten foot lengths in a

washbasin! Every drop of water had to be thawed from ice and as the outside temperature was well below zero, the task was one that still brings shivers to my memory. In order to dry the film I had to festoon it at the apex of the tent to where the feeble heat ascended. Frequently the top of a loop would be dry and the bottom frozen! My fingers split badly with the chemicals and cold—but it was worthwhile, for the fingers soon healed and the film stirred the whole British Empire... The expression and incidents were actualities, and when it is taken into consideration that the camera man was just as susceptible to the physical agonies as the rest of the party, and still continued to crank his handle when most were so physically emaciated by starvation and hardship—although I say it personally—he accomplished something.



**Monday, 8th November.**

**Hurley** — *Have just escaped from the confines of sleeping bag after changing some 1/1 plates & am now comfortably ensconced in sleeping bag sucking butterscotch. [Hurley still has his large format film camera with him.]*

**Tuesday, 9th November.**

**Hurley** — *Selected the pick of my negatives about 150 & owing to the necessary drastic reduction in weight had to break & dump about 400.*

**Hurley** [Edited typescript diary, 1917] — *I spend the day with Sir Ernest, selecting the finest of my negatives from the year's collection. 120 I resoldered up and dumped about 400. This unfortunate*

*reduction is essential, as a drastic cutting down in weight must be affected, owing to the very limited space that will be at disposal in boat transport.*

**Tuesday, 22nd November.**

**Hurley** — *Packed album in brass case, and find blubber keeps soldering iron clean... Take the lenses out of mounts, and solder them up with film.*

Monday, 29th November.

**Hurley** — *...photographing during day — snow very soft.*

**James** — *Bright sunny day ... photograph new blubber stove which acts like a blast furnace.*

## Elephant Island

**Tuesday, 11th April, 1916.**

**Hurley, in response to James Fisher's written questions** — *I think the worst moment I experienced was when we got close to the open ocean. A lead opened through the tossing ice—a lane of clear water. Shackleton gave the order to launch the boats. We slid them over the edge of the rocking berg, tossed in our few boxes of stores including the tins with the films & negatives and rowed for dear life...*

**Wednesday, 10th May.**

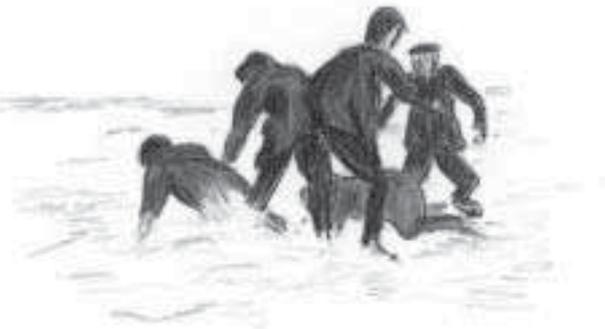
**Hurley** — *Sunshiny day with gorgeous pink glow on the peaks at sunset. Took photo of group — the most motley and unkept assemblage that ever was projected on a plate.*

**Saturday, 13th May.**

**Lees** — *The most valuable things we have from a financial point of view are the photos and cinematograph films. These are carefully guarded by Hurley who is, so he says, to get 25% of the takings of them, and should therefore make a small fortune out of them. Today they have been placed well up the hill and carefully "cached" in a snow hole together with Sir Ernest's bag containing the scientific records which are of little or no monetary value.*

Monday, 10th July.

**London Daily Mirror** — [Daily Mirror Exclusive — Photo captioned *The Pack, the sort of thing we fought ... The photograph got wet through and has been somewhat spoilt by the water...*]



**Saturday, 12th August.**

**Lees** — *Sir Ernest's bag is a fine old solid leather suitcase in which are locked up all the papers connected with the Expedition and other sundries. I put a small roll of my Brownie film in the case and as it cannot now be found I am louder than ever in my wails about it.*

## After Rescue

**Monday, 4th September.**

**Hurley** — *During the day, Mr. [Viega in Punta Arenas], the leading photographer of the town placed his fine dark rooms at my disposal and I spent most of the time in developing. All the plates which were exposed on the wreck nearly twelve months ago turned out excellently. The small Kodak film suffered through the protracted keeping, but will be printable. Mr. Dixon, Chief Engineer, Chilean Navy, is having constructed a developing machine in order that I might run through my film (Cine.)*

**Tuesday 5th September.**

**Hurley** — *The Governor held a reception yesterday afternoon, and boxes have been given us for the Theatre this evening; photographic work exonerates me from these manifold engagements. This latter has been phenomenally successful, considering the vicissitude through which it has passed and the fact that many of the films were exposed twelve months ago, and their guarantee as per label ended about that time.*

**Wednesday, 6th September.**

**Hurley** — *Spend the day between the hotel and [Viega's] dark room, developing Cinema film. The film exposed twelve months ago has lost nothing of its excellent quality. Developing apparatus was made by Mr. Dixon, Naval Engineer, gratuitously. A reception was given at the Club at 4 p.m. by the aforesaid gentleman, which all thoroughly enjoyed — my work precluded my attendance.*

**Hurley** [New York Times, ...

**Thursday, 7th September.**

**Hurley** — *Continue developing Cinema.*

**Saturday, 9th September.**

**Hurley** — *Devote the morning to the making of a number of lantern slides for Wild.*

**Sunday, 10th September.**

**Hurley** — *The Acturiano arrived from Buenos Ayres and Sir E. and self went on board early. We brought off a new cinema apparatus, that had been ordered from Buenos Ayres... Wild gave a lecture in aid of the hospital, which was well attended.*

**Wednesday, 11th September.**

**Hurley** — *Entertainments continue, which I dodge. Purchased a new Camera from Senor [Viega] and arrange for a voyage to Quartermasts Island to-morrow to cinema Penguins and Cormorants. Developing and printing...*

## Thoughts on *Endurance* Photographs

Diary entries and other sources lend a rough understanding of how the *Endurance* photos were taken, processed, protected and transported. But how many photos actually survived the expedition?

The global collection of *Endurance* images is composed of glass and plastic negatives of various sizes, lantern slides, and as printed material. This photographic record is located across different continents in different hemispheres. Some images are privately owned while others exist only in one form (i.e. as a single print, lantern slide, or lone newspaper article); still more are composites, sections of which are occasionally built from negatives that, apparently, no longer exist.

Nearly 550 separate *Endurance* images are known, an astounding number given the circumstances surrounding their history. Not all belong to Frank Hurley but nearly every one bears his name. These pictures, some accompanied by cine footage, document the expedition in detail (a telling exception is the boat journey to Elephant Island), beginning with its 1914 departure from Buenos Aires to after-rescue events in the same city; they include Hurley's brief return to South Georgia in 1917 when, among things, he exposed 100 Paget plates only a few of which are now accountable.

There is—or was—one original negative per image. But “identicals” are found across many collections. Prominent in Hurley's arsenal of glass negatives was the “strippable ordinary” whole plate. After exposure, and by contact printing onto a second whole plate, a positive would be made. After repeating the process with the positive plate, a new and nearly identical negative resulted. Outside of insignificant cosmetic blemishes, the two were indistinguishable. One of these negatives would have been given to Shackleton, as per contractual agreement. I suspect these were used to illustrate *South!*, other publications, and ‘blue’ presentation albums such as the one Frank Wild presented to the King. Thanks to Emily Shackleton, these negatives have been housed at the RGS since the late 1920s. But before that occurred the duplicate images had sailed to Australia with Frank Hurley. Stored lifelong in his darkroom, they arrived in Canberra following his death.

There are other problems with ‘originals.’ Variations in the same photo are common, and close study is sometimes required to determine which photo is, in fact, original — if even that can be said! For example, a night flashlight perspective of the ship encrusted in rime, taken from in front of the bow looking aft along the port side, presents in two variations. In one version a hawser is seen leading from behind the bowsprit to offscreen at the right of the photo; in other versions the hawser does not visibly extend from the ship.

In another image, taken from inside a cave on Elephant Island, the cave's dark features frame a stark outer landscape of bay water and brash ice with snow clad cliffs in the distance; but a lantern slide shows a man standing near the cave's entrance, the background conditions oddly different. With the aid of today's photo editing software, the brash ice in the first photo (and snow on the cliffs), can be identified in a separate image, itself a composite.

Even more interesting, this image is not among Hurley's fabled Vest Pocket Kodak “plastic” negatives held at RGS. Instead it lives at Mitchell Library, the State Library of New South



Wales, in SLIDES 22, with other one-of-a-kind images which decidedly expand the expedition's pictorial record.

The visual record is further augmented by the Orde-Lees collection at Alexander Turnbull Library, at PA COLL 2094, where several photos, taken by Lees with his Brownie camera, including a postal card of "My motor seldge" (2094.19), rest quietly and comfortably together and go largely unknown to the *Endurance* public.

Curiosities abound. Reginald James's personal album, a beautifully preserved document with rare images and fascinating commentary, does not picture the original departure scene from Elephant Island on 24 April, 1916; rather, it is 'the rescue' picture with a lone *Stancomb-Wills* on the horizon. Yet James's personal lantern slide collection contains the only extant glass plate showing both the *Wills* and *James Cairdon* the horizon that day. How did a print *not* end-up in this album? Worse, why is the actual rescue portrayed in a composite?

Frank Hurley was a master manipulator in the darkroom. A search of the National Library of Australia collection displays his solid mastery in touch-up and composite work, sometimes revealed in mid-step. I surmise he discarded ...*about 400...* glass negatives at Patience Camp in January, 1916 because he could afford to lose them; on hand were prints of many of these negatives, preserved in his personal album which later became SPRI P66/19. From these, with the effort and diligence for which Hurley was often remarked, he could produce useable negatives, proceeding to composite images if so desired. Dark spectacular clouds with dramatic rays of sunlight cutting through them were his speciality.

Viewed on a light table, the most vibrant images to me are Paget plates and period, hand-colored, lantern slides. The Paget's, while they do not usually print well, leap vibrantly from the table in full — glorious — detail and color. And the slides are deteriorating in extraordinary and gloriously colorful ways that lend solid credence to their unique heritage.

What remains in the wreck? I think a box or two of exposed Paget plates, more exposed cine film, at least four magic lantern lectures detailing several of Hurley's worldly adventures preceding his *Endurance* employment, sundry photographic equipment and supplies, the chess pieces and board with which he and Reginald James played games, and, a paraffin heater.



#### Internet links of interest:

**Hurley's Early Photography:** <http://www.photo-web.com.au/frankhurley/jfh/default.htm>

**Mitchell Image Library:** <http://libapp.sl.nsw.gov.au/cgi-bin/spydus/NAV/PM/COMB/196/47199,03701,1>

**National Library of Australia (quick look):** <http://www.nla.gov.au/apps/picturescatalogue?mode=advanced> Select: "Online Images"; Search For: "Frank Hurley" AND "Shackleton" (Search for " Frank Hurley" results in 11,713 photographs)

**National Library of New Zealand (Orde Lees images):** <http://www.natlib.govt.nz/> Search for: "PA Coll 2094"

**Royal Geographical Society:** <http://images.rgs.org/search.aspx?EventCategoryID=1> Select: "Imperial Trans-Antarctic Expedition 1914-1917" from the drop down menu.

**Scott Polar Research Institute:** <http://www.spri.cam.ac.Uk/library/pictures/expeditions/endurance/1.html>

I would give the actual address of the The Orde Lees Collection but the site is being modified and I can't get to it as of this writing.

# It Ain't Necessarily So - South Georgia Loose Ends

By Dr Michael Gilkes

I am not quite sure who coined the American aphorism "There are a lot of things that a lot of people know that just aren't so". What is certain is that in relation to a number of topics on South Georgia and Shackleton history the aphorism is valid.

The first, and perhaps the most important of these because it involves the misinformation of a large number of people who might visit the island as tourists, relates to the subject of Stromness Villa. It should perhaps be pointed out that the term "Villa" was used at all whaling stations to describe the main residence and often the administrative offices.

During my sojourn in the island in 1946/1947 I lived in the villa at Leith Harbour. I was, of course, quite aware of the significance of Stromness, the middle station in Stromness Bay, as being the final destination of Shackleton and his companions Worsley and Crean after their epic and indescribably unbelievable 32 hour traverse of the island after their equally incredible 16 day journey in the *James Caird* from Elephant Island.

One was certainly aware of the potential historical significance of the Stromness Villa as it existed but it was at that time inhabited by the Salvesen Chief Engineer, Hansen, and a number of his engineering staff. Stromness at that time was essentially the dock yard element of the Salvesen operation. I do not think that I went into the building more than 2 or 3 times during the whole period. But one was aware of its apparent status and apparent physical historical association with Shackleton and his companions. However, it must be said that the events of 1916 were probably never a significant part of any whaler's thoughts or interest. These were much more likely to be associated with the arduousness of labour and the potential and eventual reward of *penge* (cash).

Of course later, and to a considerable extent after the cessation of whaling activity in the middle 1950's, the emergence of an added and completely understandable interest in Shackleton and the consequences of the *Endurance Expedition* became more widely known and admired; steps were taken to somewhat upgrade the structure of the existing building. With the emergence of the specific interest fostered by Harding Dunnnett, the founder of the James Caird Society, a more active interest was focused on the building and its contents. In fact to this end a rather splendid stately wooden chair which had been situated in the Stromness Villa was eventually returned to Dulwich College: this might well be the chair in which Shackleton sat during his stay in the villa after the crossing of the island.

Further to this of course, because of its historical importance, the Villa was designated as a World Heritage Site and despite the later ban on anybody landing or visiting within 200m of the old whaling station, an appropriate World Heritage sign was erected specifying the particular significance of the site and building. (*Figure* )

It is, therefore, disturbing to discover that the present building at Stromness was not present in Stromness Harbour in 1916. It is in fact the building which was at one time the Manager's villa at Ocean Harbour whaling station: along the coast 30 or 40 miles east of Stromness Bay. The Ocean Harbour Station site proved to have flooding problems associated with the very flat enclosed valley floor where it was situated. Operations closed down in 1919 and significant portions of the station housing were acquired by the South Georgia Company (Salvesens) and transferred to Stromness Harbour and Leith. This of course occurred in about 1920 and the following season.

So, the attribution of the present building as having a physical association with Shackleton and his companions is just one of those things that is not so.

It should, however, be added that in 1916 the Stromness Villa was the next door building - a much smaller building immediately to the west of the main villa. This is a relatively humble structure and a vision that some people have raised of Shackleton and his people enjoying baths at the end of their walk has not, I think, very much evidential support.

The next loose end relates to the subject of boats.

In an earlier note attention was drawn to the fact that all accounts of the expedition referred to three ship's boats. It was only by chance that the author one day observed that in one of the famous pictures of the icebound "*Endurance*" a fourth boat with a very obvious propeller and exhaust pipe could be seen in the falls on the after port side. Study of the plans of the "*Polar Star*" which was the original name given to *Endurance* when she was built as a potential Polar tourist ship, show quite clearly the provision for four boats; later enquiry has demonstrated quite clearly that carpenter McNeish made use of material from this boat in strengthening and improving the *James Caird* herself when the boats and sledges were being prepared for the journey of the party across the ice to, hopefully, land on open sea.

So there were four boats and one was a motor boat; eventually publication of Orde-Lees' journals reveals that during the month that *Endurance* spent in South Georgia waiting for ice conditions to improve before heading south, the motor boat was used to help tow a whale in Grytviken Harbour.

It is perhaps germane to the subject of boats that Shackleton himself seemed a little concerned for the ultimate fate of the *James Caird* after the remaining three had been collected from King Haakon Bay by the whale catcher, *Southern Sky*. It was a little later that it was Norwegian whalers who determined that the boat should be brought back. It was eventually, through the good offices of Shackleton's supporter, Rowett, transported back to Bromborough Dock in Birkenhead. Certainly, at this time, it is understandable that Shackleton's fundamental preoccupation was with the companions still on Elephant Island and uncertain of their fate. A potential loose end which has now more or less been completely tied up concerns the "waterfall".

In January or February 1947, Neil Rankin, whose book "*Antarctic Island*" (a consequence of his voyages in the converted RNLI lifeboat *Albatross* which had come south on the *Southern Venturer* with two Shetlander's as crew), remains one of the fundamental source books for the history and natural history of the island. It is a pleasure to recall that many of the photographic plates in the book (quite a number of them taken on glass slides) were originally developed using the X-ray developing tanks in my hospital.

One day he had been reading in "South", Shackleton's account of the *Endurance Expedition*, how at the end of their incredibly arduous traverse of the Island and well in sight of the whaling station in Stromness Harbour, they had come across a waterfall in the river that they had been following from the col at the head of the bay and had had to rope down it. Rankin said, "Doc, where is this waterfall that they are said to have come down"?

I said that I had not at that time ever walked up the Stromness Valley; which he replied "In the next day or so before the next *Albatross* venture, we should go over and see if we could find it."

Accordingly, on a fine sunny day, we took the Buoy boat with its "chug chug" single Bolinder engine over to Stromness and set off up the valley. The obvious way to the col at the head of the valley leading over to Fortuna Bay was up the scree ridden slopes on the left-hand (east) side of the valley. When after, some quite uncomfortable scrambling we eventually

followed the ravine of the water course until finally we could look down into Fortuna Bay and the Konig Glacier coursing down into the fiord from the central mountain ridge.

This, of course, represented the last part of Shackleton, Worsley and Crean's island traverse walk which, it is reasonable to presume, had never been done by anybody before and probably very few people since.

We had some difficulty in identifying any specific waterfall in the quite small head of valley stream. It did seem that even very tired men would not have followed the stream but rather the steep but more accessible slope down the side of the valley.

Certainly there did not seem to be anything that merited the description in "South" of roping down a waterfall. This very pleasant expedition involved my first exposures to the attacks of Antarctic skuas nesting in the valley. The Antarctic terns prompted my learning of their incredible 20,000 mile annual polar migrations from north to south and south to north. Rankin was an ideal and enlightening guide.

The matter more or less ended there on this occasion but it was many years later that on returning to the various accounts of the crossing of South Georgia one became aware that there was a contradiction and confusion in the various accounts between Stromness Harbour and Husvik Harbour.

As a consequence of my knowledge of the Husvik where I paid a weekly medical visit, one was aware that there was certainly a quite substantial waterfall in that valley; fed by a not insubstantial lake just under the head of the valley.

We had had a splendid day. But we did not identify a significant waterfall. But there is one in the Stromness Valley and it was in the fifties at a later visit with the "Explorer" that Angus Erskine was able to convince me with a photograph. But it became clear that there was an inconsistency and it simply could not be the fall referred to by Shackleton and Worsley. Not only would roping down it be stupid but even with snow cover in May it would be obvious that a small diversion to either side would readily bypass the obstruction.

At a later visit in the 90's, when a party retraced the route from Husvik over to Fortuna Bay, Konig Glacier and Stromness col, it became obvious that the waterfall of "South" was almost certainly one of the steep scree-bounded rivulets along the east side of the Stromness Valley. Particularly with snow and ice on the slope in May one of these would impede the descent to the valley floor. Particularly for exhausted men -this would be facilitated by the use of the rope which would be left behind. Quite probably within yards of the site of the Stromness graveyard.



*The James Caird under full sail*

This led to interesting research amongst others who had actually been in the island at various times and some correspondence in the *Polar Record*.

This was brought to a satisfactory conclusion by the advantageous discovery of a Norwegian octogenarian's letter of 1916. The then Manager of Husvik Harbour had written home to Norway and in his letter described how Sorlle, the Stromness Manager had just told him that Shackleton and his men had arrived at Stromness Harbour (station) so that problem was put to bed.

It should, however, be noted that Shackleton in his account describes how these three ruffian looking men walking into Stromness Harbour Station were greeted by two little boys. The reality is that these were in fact Sorlle's daughters.

Slightly less misunderstanding surrounds the topic of Shackleton's White Ensign flag. I was invited to the Royal Yacht Squadron's headquarters in Cowes for lunch, passing through the kitchen corridor of the building, a large white ensign framed behind glass was observed. The flag looked somewhat the worse for wear, but one was informed that it was in fact Shackleton's White Ensign, a flag which, exceptionally, he had been allowed to fly from the time of his first South expedition in *Nimrod* in 1907. I commented that it was a very important artefact and wondered whether it might not benefit from some attention. It was quite a little later that the RYS's archivist, Diana Harding, very kindly informed me that my comments had been noted and the flag was now receiving expert conservation. It somewhat later transpired that not only had a similar flag been in use on *Endurance*; but later when Shackleton died on board *The Quest* the flag had been used to cover the coffin. Indeed a picture of the coffin being lowered from the ship appeared in the "Illustrated London News".

It was the original intention for Shackleton's body to be returned to England and the coffin was taken to Montevideo on the "SS *Woodvill*" However, Lady Shackleton decided that he should be buried in South Georgia and eventually the body and coffin were returned to Grytviken. Interment in the Grytviken cemetery took place on .....



*Stromness Villa (post 1920)*

It was therefore with some interest that I received a further letter from Diana Harding informing me that during the course of their activities the conservation people had detected traces of formaldehyde in the flag. This seemed to be a very convincing confirmation that this was indeed Shackleton's flag. It is good to be also able to report that it occupies a deserved place of honour on the wall of the Platform veranda, the RYS's starting line overlooking Cowes Roads.

There are, of course, many other loose ends relevant to South Georgia history. For example, the site of Peggoty Camp. From the moment you see it has got to be the place where it was. But that also engenders further questions. How did the six men get the *James Caird* up to the central position to provide shelter? And how did the whalers collect her in 1916? It is important to remember that when one looks at the head of King Haakon Bay now, ninety years ago the snouts of the glaciers which debouch into the bay were much larger and formidable. The problem of which route to take out to reach the assistance of whalers even more uncertain.

The three who made it across the island took a primus stove with them. If anybody who has tried to walk over hilly country reflects on this, there remains an interesting conundrum. It

has been suggested that they finally abandoned it at Whistle Cove in Fortuna Bay and there have even been suggestions of expeditions to see if it could be found. An interesting objective. A last thought. Railways and South Georgia would seem to be strange bedfellows. Certainly the southern most working railway is “Et Tren el Fin del Mundo”, the restored convict line at Ushuaia on the Beagle Channel in Argentina.

But the abandoned 0-4-0 Steam engine of the Ocean Harbour Station (used to transport coal from the still floating hulk of the “Bayard”) is still my favourite South Georgia artefact. Its origins remain obscure: probably German, Krausy? Perhaps some enlightened enthusiast can tell us.

Meanwhile, young fur seals nestle in the comfort of its wheels and coupling rods - if it had any.

### Editor’s Note:

Michael Gilkes was the Station Medical Officer on South Georgia (Leith Harbour) from 1946-7 and was Ship’s Surgeon aboard *Southern Harvester* from 1947-9. He has paid numerous visits to Antarctica/South Georgia (1986-2006). Michael is an ophthalmic surgeon by profession, a ‘Founder’ of the Friends of SPRI (Cambridge), Founder Member of the James Caird Society and member of the Royal Cruising Club.

Your editor is most grateful to Michael for contacting the *Journal* and offering a most useful insight into what appears to be a nascent South Georgian mythology.

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## ‘Ice Captain – *The Life of J.R. Stenhouse*’

by Stephen Haddelsey

(published by The History Press (2008) . (HB) ISBN 978-0-7509-4348-2)

This first full biography of the enigmatic sea captain, Joseph Russell Stenhouse (JRS), is to be welcomed. Its author, Stephen Haddelsey, is no stranger to polar biography, having published, recently, the much-acclaimed *Born Adventurer* – the life of Frank Bickerton, Antarctic Pioneer (see my review in *Number Four*).

When I first learned about the adventures of the *Aurora* I couldn’t help but feel sorry for the way JRS was treated by the Imperial Trans-Antarctic Expedition (ITAE) Committee back in London when the little ship finally arrived back in New Zealand (4<sup>th</sup> April 1916) after spending, in effect, 10 nightmare months adrift in and battling through the pack- ice and storms of the Ross Sea. Despite his heroic efforts on land (in terms of logistics/preparation before sailing) and sea to ensure the success of the Ross Sea venture (upon which Shackleton’s intended crossing of the Antarctic continent fully depended) Stenhouse was relieved of his duty as captain. When the *Aurora* finally returned to relieve the stranded and bereft Ross Sea party, it was another man who stood on the helm of the ship giving orders – the erstwhile John King Davis. Stenhouse never really got over this huge snub.

In researching his book, Haddelsey explained to me how he ‘hugely benefited from being given completely free access to the mass of original documents in the Stenhouse family’s hands’. He pointed out, also, how he was probably the first person able to read the ‘censored’ versions of various entries from Stenhouse’s ITAE diaries before they were handed over for the official account. Apparently, JRS pasted blank bits of paper over various entries written in the heat of the moment. ‘Only by handling the originals and holding them up to the light’ Haddelsey says, ‘is it possible to read what he *actually* wrote’.

As you might expect, a good portion of the book focuses on the many trials and tribulations of the Ross Sea Party (the parallel, albeit less well-known, expedition within the ITAE). The extraordinary seamanship (and courage) of Stenhouse stands out a mile and, perhaps inevitably, it is this Boys Own heroism that leaves an indelible mark on the life of this multi-faceted character and, dare I say, in the reader's mind.

Thanks to Haddelsey's attention to fine detail, we discover that our captain was a somewhat complicated character whose mood swings would shift markedly and in an instant. Prone to prolonged periods of depression he could be sullen and withdrawn one minute then buzzing and vainglorious the next. On board ship (and sometimes at home) Stenhouse was a stickler for good old-fashioned discipline. This did not always go down well.

As was so often the case with the prime 'movers and shakers' of the Heroic Age, Stenhouse's life and career after the ITAE was one of unsteady but certain decline and, in a sense, contradiction.

Following on from the ITAE, Stenhouse embarked on a rewarding career in the Navy – in charge of his own the anti-submarine mystery 'Q' ship and on Arctic duty in Russia. His industry and no little bravery on occasions resulted in him being awarded the DSO and the French Croix de Guerre. In 1919, Stenhouse was awarded the OBE for his services on *Aurora*. And yet, despite all this, one cannot help but detect a sense of pathos. Military action in Murmansk was hardly 'main-stream'. One wonders, too, whether his OBE was a hurried afterthought.

JRS was the natural choice to command the RRS *Discovery* in the National Oceanographic Expedition 1926/7- an expedition with serious intentions to discover the natural history of whales and the impact of the whaling industry on the economy of the Falkland Islands Dependencies. His appointment was assured by Dr Macklin's endorsement to the *Discovery* Committee, 'Stenhouse is a good man and an honest one and loyal'. And yet, notwithstanding his superlative seamanship and his hard-won efforts to manoeuvre the un-gamely ship through the turmoil of the southern swell, the chief scientist on board (Dr Stanley Kemp) was not a happy man. Rightly or wrongly he felt the tall, square-jawed sea dog of a captain was, at the end of the day, more committed to his ship and the romance of naval exploration than to the serious task of scientific endeavour. The inevitable happened, Stenhouse received a letter of dismissal smoke-screened by platitudes and grateful thanks for all his efforts. A sense of *deja-vu* prevailed, no doubt. In truth, it is likely that Stenhouse was probably on the point of a nervous breakdown and needed a break. The battle of wills (and egos?) with Kemp had taken its toll.

When war finally ended, as was a common thread among most Antarcticans, JRS was jobless and tried his hand in numerous (often fanciful) business ventures (polar tourism, treasure hunting, writing – even film making). They went nowhere – fast. His main anchor in life was, perhaps, his family (although, typically, he was often away travelling). He married Gladys (Aeneas Mackintosh's widow) in October 1923. Their union was described by one London Magazine as 'interesting'. In June 1924 their one and only child, Patricia, was born.

On occasions Stenhouse would skipper private yachts to earn a crust (although he despised the inexperience of the *nouveau-riche* mariner). How much this fulfilled him, however, is another matter. He was a man who, despite Shackleton's admiration, his indisputable seafaring prowess and significant contribution to the Heroic Age, never quite obtained the full accolade of his peers. He was a man caught in transition. He belonged, somehow, to a bygone age of sea travel and exploration which was becoming, rapidly, eclipsed by a new age of leisure mariners and organised scientific expeditions with its (often) fully-funded practitioners. He didn't really care for it too much.



Photograph of  
Frank Bickerton in his  
RFC uniform (1918).

With the advent of World War 2 Joseph Russell Stenhouse was quick to enlist and, almost immediately, was given the key responsibility of defending the Port of London. Most tragically, the captain lost his life in Spring 1941 on service in the Red Sea. He died with his boots on, so-to-speak, when his tug *Taikoo* was mined. He was 54 years old. He had spent 2/3rds of his life on the sea.

Throughout his life JRS shared a close friendship with Frank Worsley. They both served with Shackleton down south and joined him in the British Expeditionary Force during the Russian campaign. Later, they went into business together although commercial success eluded them. Writing an obituary for the *Polar Record* Worsley said of his friend, 'He (was) one of the most efficient seamen of this century. He had sailing ships in his blood... Duty was Stenhouse's watchword... His epitaph should be 'A seaman – he served his country well'.

I congratulate Stephen Haddelsey on providing us with a most readable and thought-provoking account of the *Aurora's* brave and courageous captain. As the author clearly states, 'He was a man born out of his time. Each of the things he loved most he saw in their last days: things of tremendous beauty still, but irrevocably doomed'. For me, this sums up the man and the book *Ice Captain* captures the mood perfectly.

*Stephen Scott-Fawcett FRGS.*

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## 'The Shackleton Letters – *Behind the Scenes on the 'Nimrod' Expedition'*

by Regina W. Daly

(published by The Erskine Press (2009). ISBN 978 1 85297 101 4)

Hot on the heels of Michael Rosove's recently-published letters between (principally) Lady Shackleton and her late husband's biographer (see my review in Number Four) Regina Daly's compilation of 165 letters and telegrams gives us a truly fascinating insight into the background of The British Antarctic Expedition 1907-09 (aka BAE or *Nimrod* Expedition).

The author is to be commended for her industry and commitment in bringing into the wider public domain the *actual* writings of those about whom we so often hear about 'second hand'. Whilst it is true, authors, scholars, polar history enthusiasts have long-since been able to jump on a train or jet-plane and handle the original material for themselves, in *The Shackleton Letters* Regina Daly has done all the hard work for us. Not only does she compile the letters into a useful chronology, she provides background notes which are both precise and accurate, allowing the reader to appreciate the historical or 'political' context of the letters and telegrams we read.

In some ways, this is an emotionally- exhausting book to read. With the notable exception of Beau Riffenburgh's authoritative book (*Nimrod*, Bloomsbury Press, 2004), simple histories of The British Antarctic Expedition 1907-09 fail to convey the shenanigans that went on behind the scenes. Regina Daly's collection of letters tells all. It reveals the innermost feelings of our

polar heroes -the agony and the ecstasy. It highlights the prejudices and the duplicities in relationships, often between those of high ranking in the Royal Geographical Society (RGS) and their principal 'clients' at the time – Shackleton and Scott, in particular.

Scott's jealousy towards Shackleton is plain to see. He is quick to assume that the Irishman, by announcing the BAE, was deliberately stealing a march on his own plans to return South. In truth, Shackleton was far more worried about talk of a Belgian (or 'Foreign') expedition. Although Scott eventually apologised for his misjudgement, his ire was re-kindled a short while later when it appeared that Shackleton had reneged on his promise not to establish his winter camp in Scott's *Discovery* 'territory'. The letters written by Shackleton to Emily, his wife, at the time make it quite clear that he felt terrible about having to turn westward, towards McMurdo, due to threatening ice conditions in the direction of King Edward VII Land and the total disappearance of Barrier Inlet. His conscience was clear, however, the safety of his men took priority. That Scott would be less than happy was all too obvious in Shackleton's mind. Notwithstanding the conciliatory letters that had been exchanged between the two men before the *Nimrod* sailed, Shackleton knew his decision to head for Hut Point was tantamount to a declaration of 'war'. In his letter of explanation to Emily he suggested that nothing was to be said to 'the enemy.. .the Scott faction'.

Scott and Shackleton were at least agreed on *one* basic point. The Antarctic continent, as travelled to and over during the *Discovery* days (1901-4), was British territory and on no account should be claimed by 'foreigners'.

*The Shackleton Letters* reveal many things. Reading between the lines it would appear Shackleton's main struggle over his (eventual) concessions to Scott (not to use Hut Point as the winter quarters and the McMurdo area, in general) was how this might affect the chief sponsors of the *Nimrod* Expedition. They, in all probability, had been told by Shackleton that polar priority was assured, given the territorial gains made in 1901/4 and the availability of an established base. Now this success was in jeopardy. Shackleton's task of achieving the Pole would be far more difficult without a starting point at McMurdo and without the use of the *Discovery* hut. Might the sponsors 'pull the plug'? As he explained to Emily, 'My money was given for me to reach the Pole'.

Other fascinating aspects of the *Nimrod* Expedition come to light. The myth of scientific 'ambivalence' is exposed for what it is. Shackleton was committed to serious scientific discovery. In explaining the intentions of the BAE to the RGS in 1907 he was clear, 'I hope to make a journey to as high a latitude south as possible but I shall not sacrifice the scientific objects of the expedition to this journey'. In the event, Shackleton recruited some outstanding scientists who carried out sterling work in the study of glaciers/ice, meteorology, geology and magnetic fields. A selected team under the leadership of scientist Professor T.W. Edgeworth David became the first to ascend Mt Erebus, an active volcano. Later, on 16<sup>th</sup> January 1909, David, Mawson and Mackay attained the (then) Magnetic South Pole. The scientific work undertaken during the *Nimrod* expedition together with Shackleton's achievement in marching to within 97 geographical miles of the Pole was nothing short of remarkable. Little wonder both king and country (not to mention an initially sceptical RGS) honoured 'Shackles' and his men on their return.

The dismissal of *Nimrod's* captain (Rupert England) on mental health grounds (upon his return to New Zealand after landing the party at McMurdo) appears to have sent shockwaves through the Press (at least) both in NZ and Britain. The newspapers claimed that Shackleton and his captain had come to blows concerning the latter's over- cautious handling of the little steamer in the ice pack. The subsequent correspondence reveals that, whilst Shackleton showed great patience, members of the party became increasingly upset with England's handling of the ship. For the sake of his own credibility as leader Shackleton had no option but to relieve the captain of his responsibilities. There then followed a veritable deluge of

mail between the affected parties, in essence denouncing the malicious rumours of confrontation reported in the Press and extolling Shackleton's virtues as a leader of men. 'He is a marvellous man and I would follow him anywhere' declares Harry Dunlop in a letter of support (January 1908). Rupert England himself wrote to Emily Shackleton making it absolutely clear that, whilst he was sad to be relieved of his duties, her husband had behaved impeccably and with clear authority.

The language used in some of the letters is colourful on occasions and belies the passionate views held by people at the time. In writing to J.Scott Keltie (secretary of the RGS) over Shackleton's change of plans Scott declares, 'I cannot bring myself to associate again with such a professed liar...' In discussing, earlier, the apparent intentions of the American Dr Frederick Cook to head for the Antarctic, Scott describes him as a 'wind bag'. In frustration over the lack of official financial support for the BAE, Herbert Dorman (aka CHD, Charles Herbert Dorman – Emily's brother) is reduced to bemoaning the 'stingy Government'. Referring to the constant struggle to raise funds, CHD describes how 'there is no use in disguising the fact that the general public do not take much interest in polar explorations so as to put their hands in their pockets except under *the magnetic influence of a silver tongued enthusiast like Ernest*' (my italics). I think that would be a great title for a book, 'Shackleton - The Silver-Tongued Enthusiast'

I agree with Regina Daly, Shackleton's inability to handle money and understand the basic rules on how to run a successful *business* operation is extraordinary. On reading Herbert's letters to his sister (Herbert was entrusted with finding £7000 to fund the safe return of the *Nimrod* and her party/crew after the second season) I am reminded of the way he left the funding of the Ross Sea Party (during the *Endurance* expedition) entirely to others on a virtually ad-hoc 'spur of the moment' basis. It's almost as if our beloved explorer-hero had a total blind spot when it came to serious accounting. It certainly caused Emily many sleeplessness nights if her brother's letters of reassurance are anything to go by.

In the final section of *The Shackleton Letters* we find 29 intimate letters written by Shackleton to the two ladies in his life – Emily (his wife) and Elspeth Beardmore (wife of his main benefactor, William Beardmore). One day, perhaps, we might discover how they replied.

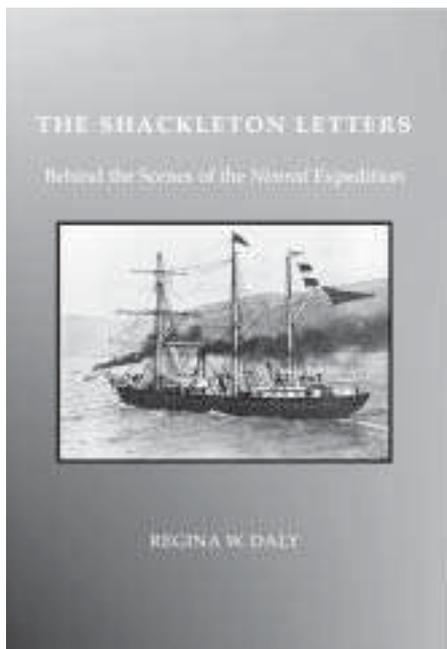
Back in university days I studied theology. I learned at a very early stage to ditch the secondary sources and concentrate on the original texts. Many very good polar histories have been written and they should be valued. However, there is nothing quite as exciting as reading the original texts whenever possible. That way, we hear from the 'horse's mouth' and we can form our own opinions if we want to. Regina Daly's book is an excellent aid in that process.

*Stephen Scott-Fawcett FRGS*

## Finding Ernest Shackleton and his World in Letters

An overview by Regina W. Daly

The Heroic Age of Antarctic Exploration has not been one of my lifelong interests. It is only in recent years, on the eve of my retirement from New York State government in 2001, that I discovered the utterly fascinating world of the Antarctic explorers. In the last week of 2000 I found the *Endurance* photographs of Frank Hurley in a magazine and realized immediately the magnitude of courage and leadership that Ernest Shackleton possessed. Over the next three months I read everything I could find, the three biographies, several *Endurance* accounts, and a number of other works about Ernest Shackleton or his boat or his sea captain or his



writings or the lost men of the Ross Sea party, as well as his own *South*. I was captivated by Ernest Shackleton. I wanted to learn everything I could about him but it seemed to me that everything that could be written about him had already been written and I had read most of it.

Roland Huntford's well researched biography, *Shackleton*, pointed out the way. As I read his book I checked references in the notes. There were numerous citations from Shackleton letters held in the archives of the Scott Polar Research Institute (SPRI) in Cambridge and they hadn't been published. In May, 2001, I attended my first dinner of the James Caird Society where I met Robert Headland, archivist at SPRI, and a few days later I visited the Scott Polar where I spent the day poring over catalogs and discussing my project with Headland.

Thereafter I flew to England twice a year and spent two weeks at a time transcribing letters on my computer. By

the time I completed collecting nearly all the correspondence I could find at SPRI, I had nearly 400 letters. There were other archives to mine, however, and in due time I would I would explore their holdings, but as I considered what I had thus far gathered, I saw large gaps in the material. For example, there were nearly 100 letters from Shackleton to his wife, Emily, but not a single letter from her to him. There were several periods of years for which no Shackleton letters existed and many of the letters in my collection were not written by the man himself. Furthermore, both quantity and quality of correspondence during the *Endurance* and *Quest* expeditions were disappointing except for the numerous desperate telegrams written by the "Boss" as he attempted to save his men stranded on Elephant Island.

I had had the good fortune of discovering within the first few days of research at SPRI, that many remarkable letters existed in the files concerning the *Nimrod* expedition, correspondence between Scott and Shackleton as Scott contended for his right to primacy at his old Hut Point base, for example, and the astonishing long and complete account of the clash between Captain Rupert England and Shackleton written by Harry J. L. Dunlop, chief engineer on the *Nimrod* to his friend and fellow engineer, J. D. Morrison. These letters and others like them were too good to pass by and I painstakingly typed them all. Recognizing the importance of *Nimrod* correspondence early meant that I never needed to see the files twice. By the time I completed the research phase at SPRI, I knew to narrow my search to *Nimrod* holdings at other archival repositories.

Fortunately most of what I was looking for at SPRI had been transcribed by James and Margery Fisher and while the type on many of their copies was indistinct as a result of their reusing carbon paper too many times- a strain on the eyes- all the words were legible. This was a far cry from the holographs. Although Shackleton ran words together, it was not difficult getting used to his writing style. However, some words were impossible for me to understand no matter how long I looked at them, even under magnification. And the handwriting of other correspondents whose epistles were limited to a mere one or two letters at times presented the greatest challenges, particularly when they omitted letters or whole words making it necessary, at times, to suggest a word which I always placed in brackets. Conducting research at the Royal Geographical Society (RGS) was considerably easier than at SPRI since I was able to have made photo-copies of the materials to take home. When working with copies of original documents, I often found that even the most illegible words became legible the second or third time I scrutinized them.

The Alexander Turnbull Library in New Zealand holds a vast collection of archival material along with an easy to use, searchable data base. From that source I borrowed several microfilms from the files of Leonard Tripp and Joseph Kinsey through International Library Loan, and spent two or three mornings a week during the summer of 2004 at my local library poring over microfilm. There were a great many *Endurance* records, a number of *Aurora* records, and an abundance of correspondence between Shackleton and both men. Fascinating as they were, the microfilm yielded but two letters I thought appropriate for my book.



Organizing the correspondence was a matter of arranging the letters in chronological order and with the exception of two or three letters intentionally placed out of sequence, this arrangement worked, but coherently weaving together the various sets of correspondence in a meaningful way was the issue. I realized I could accomplish this by writing a series of narratives wherein I would tell an abbreviated story of how the expedition came to be through its outcome.

Shackleton's letters to Elspeth Beardmore had only recently become available (they were restricted for perusal by the public until 2002.) These letters, juxtaposed with Shackleton's letters to his wife could elucidate his relationship with both women during the relevant years.

The original title for the book was "Shackleton's Antarctic Challenge in Letters" and I thought of the letters as evidence of the trials and tribulations of Ernest Shackleton before, during, and after the *Nimrod* expedition. Reading the sequential letters

between and among the cast of characters allowed me to peer into the window of the world in which Ernest Shackleton and his colleagues lived and to observe the multi-faceted dimensions of their personalities: the expression of ruffled feelings of Scott here, followed by the suggestion of a snide remark there, Scott's outright accusation that if Shackleton continued with his plan to go to McMurdo Sound then Scott must abandon his own plans. Not only was it possible to empathize with Scott as he wrestled with his anger, trying to keep control of himself, it was likewise possible to intuit Shackleton's demeanor as he must have bristled upon reading some of Scott's letters.

While Scott was furiously writing to Shackleton, he was also fuming with J. Scott Keltie, secretary of the RGS and the letters between them allow us a serious look at Keltie's character and add to what we know about Scott. Keltie's job was to be positive to everyone while committing to no one, keeping himself removed, above the fray of ruffled feelings, but when Scott whines about his experience with Shackleton whom, he says "was never very thorough in anything – one has but to consider his subsequent history to see that he has stuck to nothing & you know better than I the continued schemes which he has fathered," Keltie replies to Scott "as to Shackleton's capacity as a leader and his staying powers, I think you and I take the same view. He looks strong enough but it is clear, I think, that he is not absolutely sound."

Disingenuously however Keltie writes to Shackleton "you will no doubt be the first in the field and so have the start of any other expedition . . . and you should not relax your efforts in getting ready to leave in October . . ."

Now we cannot be too surprised to find a character study of Ernest Shackleton embedded within the letters, not just from his own correspondence but also from the letters of other people writing to him or to each other about him. For example, Shackleton's brother in law, Herbert Dorman, was given the responsibility of raising money to refit the *Nimrod* for the return voyage. He is quite beside himself when he cannot find contributors for the £7000 he needs. The task is more than he ever bargained for, he tells Emily. As the months go on he is ever more disappointed and thinks about going to the government or to the press to raise public contributions. Meanwhile, at the Cape Royds hut, Shackleton, as he prepares to leave for his southern journey towards the Pole, is promising salary increases and various amenities to several of his men and handsome bonuses of £3000 each to three of them to be paid at the end of the expedition from the proceeds of his book and speaking engagements. Following the expedition however, when he returns to New Zealand and knows about his indebtedness, what is the first thing he does? He gives a lecture to a packed hall, earns £300 and gives the money to charity. But that is not surprising to Shackleton enthusiasts. If we have read any of the biographies, particularly Huntford's, we already know that Ernest Shackleton is an incorrigible optimist with a devil-may-care attitude whose credo is "sudden the worst turns the best to the brave." It is only when we contrast Dorman's letters to Emily Shackleton with "the boss's" letters to his men that we clearly can see the gravity of Shackleton's personality flaw with regard to finances.

Insights into other characters that inhabited Shackleton's world would include this anecdote. Following the expedition there was an extended period of negative buzz among insiders in the RGS instigated by the curmudgeonly Sir Clements Markham, former president of the RGS and a powerful man among polar insiders who did not believe Shackleton reached 88° 23' and who did not think the scientific work of some of the scientists was valuable. Here is the way his thought processes worked. On 27 March 1909 Markham writes Keltie to say that he has read the newspapers and knows Shackleton has been successful and he will act as the proposer for Shackleton to receive the coveted and prestigious Patron's Medal for reaching 88°23'. But then he ponders the expedition, dissecting everything he has read about it and doesn't see how Shackleton could have achieved that latitude stopped by a three day gale as his party was, and advancing ever so slowly over crevassed ice on several days. A few days later he writes to Major Leonard Darwin, new president of the RGS and tells him: "Shackleton's failure to reach the South Pole when it could have been done by another [he means Scott]... rather aggravates me. By 22 April he has calculated and compared Scott's southern journey with Shackleton's. He writes to Keltie: "Scott went at the wonderful rate of 14 ½ miles a day and covered 725 miles, but he had two splendid men with him; both far better than Shackleton or Wild, going at the same rate and along a perfectly straight line Shackleton would just have reached 88°20'." Apart from his astonishing conjectures he seems to have forgotten that one of Scott's two "splendid" men was Shackleton.

By June he has cooled down writing to Shackleton "As an old friend of eight years standing, who knows how you have well kept up to the mark of excellence and ardent endeavour through all that time, you will receive my very cordial welcome as coming from one who has watched your career with the interest of a very sincere friend . . . Will you and Mrs. Shackleton give us the pleasure of your company at dinner . . ."

It is those kinds of private and candid remarks that made me realize there was remarkable drama in the letters themselves as they revealed how people responded to Ernest Shackleton and he to them. Again and again they demonstrated that what is now history was once real life and we can all be grateful that these splendid personal communications have been preserved for us and the readers who come after us.

# 'The Entire Earth and Sky Views on Antarctica'

by Leslie Carol Roberts

(Published by the University of Nebraska (2009).

ISBN 978-0-8032-1617-4)

Anyone who has been privileged to travel south will recognise the virtues of this book. It is a clever and enlightening synthesis of things 'ancient and modern'. On the one hand Leslie Roberts addresses the familiar history of human exploration (albeit, perhaps, controversially on occasions) and on the other, she brings us smack up to date with general observations on the activity of modern polar (or 'Polie') scientists and the issue of global warming.

More significantly, however, the author tangentially interweaves her whole narrative with, often, thought-provoking reflections on how it is that the very essence of the 'ice' (always a euphemism for the Great White) imbues the very life stream of the polar visitor. I never cease to be amazed at how writer after writer experience, by default, what amounts to a personal 'religious' experience once they have spent time south researching their books. It's as if ice flows through their veins, such is the intensity of finding a oneness with Mother Nature in her purest, wildest form. And the feeling does not dissipate- for many, the memory and experience of Antarctica changes the mindset for life. In fact, I believe this is true for ALL who have made the journey to the coldest, windiest and loneliest wildernesses left on this planet. I, for one, had withdrawal symptoms after reading *The Entire Earth and Sky*.

Whilst researching her book Leslie Roberts was asked what her book was to be about. She explained that, in essence, it was a study of Lyttleton and Christchurch (NZ) and their relationship with Antarctica and how people tell their stories of a place very very few will ever visit. In this, the author has succeeded, indeed, she achieves far more than this. Her style is at once factual and poetic. As another reviewer accurately states, *The Entire Earth and Sky* is a collage of the Heroic Age, Modern Age and her personal views. More importantly, her book describes the profound effect Antarctica has on humans, both in terms of the earth sciences and at the spiritual (or ethereal) level. It is a convincing read.

Controversially, perhaps, Leslie Roberts pours scorn on the historical over-emphasis of the Heroic Age leading figures. A propos the diaries and reminiscences of the ordinary explorer-seamen who accompanied figures like Shackleton and Scott on their great expeditions, the author observes, 'Their stories added texture to a sea of smooth, glossy, accounts. Unlike their leaders, they wrote without guile. Their absence from history reflected class conceit and snobbery and a disinterest in the very fact of exploration'. She declares that, in writing her book, she 'wanted to know about the men who came south and made nothing from their endeavour'. She goes on to say, 'There is a subversive history of exploration ...in contrast to the cleaner story of exploration currently on offer....All we need to do is peel back the skin'.

Whether you accept Leslie Roberts's somewhat rigid position or not, her challenge to polar historians (for that is what it is) is not unreasonable. In recent years I have been researching the life and polar experiences of Walter How, able seaman on *Endurance*. I have accumulated a small private collection of original 'Brownie' photographs taken by crew members of *Terra Nova*. To my mind the information that emerges serves to complement but not to negate or undermine the overall story of the major expeditions given to us in the 'official' accounts published long since. Some account is given by the author on the role of James 'Scotty' Paton from Lyttleton - he was able seaman on *Morning* and *Aurora*. This is a good start but it is only a start. I hope Leslie Roberts's next book will be wholly on this subject?

Notwithstanding the author's view on the need to emulate the working classes, I did find her near obsession in this book with Frank Worsley a little tiresome and somewhat at odds

with the basic premise. After all, Worsley was hardly an ordinary seaman. He was, truly, a remarkable man and a greatly talented mariner and navigator. Without question he was the man who made possible the success story that *was* the voyage of the *James Caird*. However, to describe the crew of the *Caird* as 'his men' is, to my mind, somewhat presumptuous and disrespectful towards Shackleton. The remarkable seafaring skills of Worsley were fully appreciated by the Boss and that is precisely why he delegated much of the responsibility of the *Caird* journey to the New Zealander. This was Shackleton's skill as a leader – he recognised his weaknesses and delegated when it was necessary.

Whilst I would take issue with Leslie Roberts on some of the historical facts, I wholly commend this beautifully written and sincere book. The author is unmistakably a devotee of all that is Antarctica. Her soul is the soul of the Great White. It is refreshing when, in the same book, one can embrace the serious environmental issues which challenge the modern scientist, meditate on the 'entire earth and sky' AND discover that the number 1 selling item in the Antarctic shop is a pair of string bikini underpants!

*Stephen Scott-Fawcett FRGS.*

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## The Dictionary of Falkland Biography (including South Georgia) From Discovery up to 1981 by David Tatham (Published 2008).

The DFB (as it has come to be called) is an extraordinary book edited by someone who has been intimately connected with the Falkland Islands. David Tatham was Governor of the Falkland Islands from 1992 – 1995. He is a founder member of the South Georgia Association.

Mention the Falkland Islands and, for most of us, the image of Prime Minister, Margaret Thatcher, standing outside Number 10 with a determined air; or Minister of Defence John Nott announcing the latest casualties of the Conflict; or maybe the BBC's war correspondent Brian 'I counted them all out and I counted them all in' Hanrahan, come to mind. Even as I write this review renewed tension is building up, once again, in the South Atlantic. With the advent of depleting natural energy resources, the Argentinian Government isn't happy that offshore drilling by the UK has started. Las Malvinas sovereignty is back on the agenda and, this time, the powers-that-be at the White House are not taking sides.

To see and understand the Falkland Islands only through a contemporary lens, however, is to do a huge injustice to this remarkable land and its people. Far from being, simply, a dry historical account the DFB is, in fact, a mosaic of personal histories. The book contains essays supplied by a great number of contributors (including Tatham) on the lives of 480 people. Those featured are a cross-section of inhabitants, visitors (some prominent, some not) and people who have never set foot on the Islands but who influenced their history.

In addition to the great number of fascinating biographies there are many wonderful and thought-provoking photographs and illustrations. It is a quality publication in every sense. The concept of this book is as successful as it is simple. To know a country you need to know the people. The people ARE the country. This is true of anywhere in the world. It is especially true of these remote, bracing and windswept islands which only the robust and resourceful dare to call, 'home'.

Constant themes which emerge from the DFB include: the perennial difficulty of communicating with the outside world; the search for alternatives to a wool-based 'monoculture'; the role and influence of the Christian faith and its advocates; the defence of the islands and their vulnerability to attack and, above all, the challenge of the natural environment, with a trend from exploration (Shackleton) to exploitation (whaling) and, latterly, on to conservation and protection of the countryside, coastal waters and wildlife therein.

Especially welcome (and yet inevitable for a dictionary) is the fact that no one is given 'priority'. Logger and farmer, Jack Abbott (1904 – 1986), starts us off in good alphabetical fashion and we end with Sir (William) Douglas Young (1859 – 1943), governor of modest distinction (1915 -19). In between, we read about explorers, politicians, artists, mariners, landowners, whalers and sealers, doctors, policemen, carpenters, bishops, dentists, pilots, surveyors and even good old Betty Josephine Biggs (nee Rowlands) (b 1929) – mother and philatelist!

My favourite image is a colour photograph of a smiling Bunny Fuchs taken in a frozen Antarctic landscape, wearing an Eskimo jacket (page 235). It is a sort of 'North meets South' moment.

I do commend this book and I congratulate David Tatham on producing this fine compilation.

*Stephen Scott-Fawcett FRGS*

## Biographical Dictionary of an Uninhabited Island

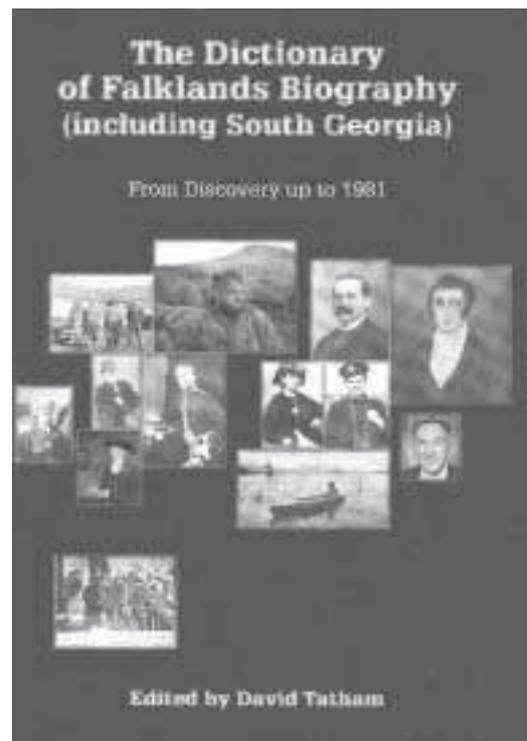
An overview by David Tatham

David Tatham, editor of the Dictionary of Falklands Biography (DFB), discusses the place of South Georgia, and Ernest Shackleton in particular, in a biographical dictionary of 470 personalities primarily devoted to the Falkland Islands

When I started work on the DFB in 2002 I had to decide where to draw the lines – whether to include the island of South Georgia, 800 miles to the east, or Antarctica, about 1,000 miles to the south. Both were administratively part of the Falklands – indeed they were officially described as the Falkland Islands Dependencies for most of the Twentieth Century and both were scarcely inhabited by a settled population. In the end I said yes to South

Georgia and decided to omit Antarctica, although both overlapped with the Falklands because many of the celebrated explorers called at Stanley on their way south.

It was precisely these personalities who convinced me that I must include South Georgia and prime among them was Ernest Shackleton. While some of the finest feats of his life took place further south, South Georgia was the goal of his unparalleled voyage in the *James Caird* and the scene of his extraordinary trek across the snow-swept and unmapped island. It was too where he died and is buried, and the DFB also features the eccentric governor who presided at that ceremony in 1928 (Arnold Hodson) and the unhappy magistrate (best left un-named here) whose wife is the only woman present in photographs of the unveiling of Shackleton's gravestone.



Most of the mourners that day were from the Norwegian whaling industry at Grytviken and a number of the founders and leaders of that extraordinary enterprise also feature in the DFB, first among them CA Larsen an outstanding business man and scientist.

Scientists and naturalists make up a good number of the South Georgia personalities in the DFB, all of them possessing a spark of genius and a dash of daring. From Captain Cook (1728-1779) to Duncan Carse, who died while the DFB was in preparation, South Georgia has attracted remarkable people who achieved extraordinary things. For me it has been a pleasure to commission some fine biographical essays from experts on their subjects, many of them members of the James Caird Society. I have tried to include better-known quotations from South Georgia's history and none of them is more appealing than Apsley Cherry Garrard's tribute to Ernest Shackleton which concludes Robert Burton's essay:

For a joint scientific and geographical piece of organisation, give me Scott; for a Winter Journey, Wilson; for a dash to the Pole and nothing else, Amundsen; and if I am in the devil of a hole and want to get out of it, give me Shackleton every time.

The DFB is usually for sale at meetings of the JCS for £30. It may be obtained by post from: The Editor, DFB, South Parade, Ledbury, Hereford, HR8 2HA, England (or e-mail: d\_tatham@hotmail.com) at a reduced price of £35 to cover post and packing. Please make clear that you are a member of the JCS and enclose a cheque made out to: D Tatham (DFB).

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## A Chronology of Antarctic Exploration

by R.K.Headland (Published 2009, Bernard Quaritch Ltd).

Bob (aka Robert Keith) Headland is 'God' when it comes to polar history. I am quite sure that there is *nothing* Bob doesn't know on this subject. I can picture him now, on board a touring ship back in 2000, waxing lyrical about sealers and their practise of boiling seals alive in large metal cauldrons. These said objects still litter Macquarrie Island's tussock hills. Macquarrie Island is Australian territory and lies, as good as, midway between Hobart and Cape Adare.

Bob's latest manifestation of his historical chronology is, most certainly, a handsome tome. Although it needed a small mortgage to acquire one, the book sits tall and wide on my bookshelf, complete with this dedication, 'To Stephen Scott-Fawcett. 'Congratulations on your excellent choice of literature''.

Need I say more?

Whether or not you own Bob's first *Chronology* (1989/Cambridge University Press), the new one is a worthy successor. The author admits 'that fewer than 10% of the entries in the 1989 edition have been significantly amended'. However, a new publication offered the chance to include changes in the introductory sections, insert additional entries and revise/improve some of the existing entries. Not least, some additional minor voyages of discovery have been included along with several hundred more sealing voyages and many more complete names. In all, more than 1500 additional entries have been inserted.

By definition, it is hardly a 'story book' of Antarctic exploration. Its intention is to record the detail of as many polar voyages as possible, using information and knowledge gained from 25 valuable years as archivist with SPRI. And the result is a most useful, cross-disciplinary, tool for scholars and polar enthusiast alike.

I have just one suggestion to make for the third edition (assuming the Banks are still granting mortgages). Please, Bob, we need more names. I have recently acquired a pack of playing cards used by a member of the 1955-58 Commonwealth Trans-Antarctic Expedition (Crossing Party). His initials are SGHD. Alas, not even this latest work has been able to throw any light on the identity of said individual. Who WERE these 'Members from Britain, New Zealand, Australia and South Africa' he alludes to?

*Stephen Scott-Fawcett FRGS*

## A Chronology of Antarctic Exploration

A Synopsis of Events and Activities from the Earliest Time until the International Polar Years, 2007-09

R. K. Headland, 2009

The International Polar Years, from 2007 to 2009, provide an appropriate time to conclude a compilation of the historical chronology of all Antarctic regions. This fortuitously coincides closely with the 50th anniversaries of the establishment of the Scientific Committee on Antarctic Research in 1958, and the adoption of the Antarctic Treaty in 1959. The work was prepared during 25 years at the Scott Polar Research Institute, University of Cambridge, by the former archivist.

The regions covered are the far southern parts of the Earth in general and Antarctica in particular. They are principally the regions with which the Scientific Committee on Antarctic Research is concerned and cover all areas under the aegis of the Antarctic Treaty as well as those defined by the Convention on the Conservation of Antarctic Marine Living Resources. The development of knowledge of these remote parts of the Earth is demonstrated historically; thus the early voyages which discovered the Cape of Good Hope and Cabo de Hornos are described, with those to several far southern temperate islands (Tristan da Cunha, the Falkland Islands, and some of the oceanic islands around New Zealand), especially those voyages which are important in the early history of the regions farther south. For most of the subsequent period, after the early 1800s, the area covered is the Antarctic continent and adjacent islands, as well as the 19 peri-Antarctic islands (South Shetland Islands, South Orkney Islands, Shag Rocks, South Georgia, South Sandwich Islands, Bouvetøya, Gough Island, Prince Edward Islands, Iles Crozet, Iles Kerguelen, Iles Saint-Paul et Amsterdam, Heard Island, Macquarie Island, Balleny Islands, Scott Island, Auckland Islands, Campbell Island, and Peter I øy). Details of the peculiar, but fascinating, 19 'non-existent islands' are also included.

Voyages range from those directly engaged in exploration and research to accidental discoveries by early merchant vessels blown off course. Sealers, mainly during the 1800s, and whalers in the 1900s are included because their activities had such profound effects on Antarctic biota. The compilation contains 4865 entries from 700 BC to 2008. The majority of these are for expeditions or voyages and give dates, nationalities, leaders (or captains, etc), vessels, places visited, a concise description, and, where appropriate, a reference. For other events a date, details of persons, countries, and inventions, and a brief description are provided. Occasional entries depart from these forms, depending on their significance and the amount of information available.

The early entries consist mainly of explorations and voyages penetrating to far southern regions. The majority of the nineteenth-century expeditions were undertaken by sealers, who discovered many and visited nearly all the peri-Antarctic islands, and there are also records of several scientific expeditions. The period from about 1890 until the First World

War includes the brief, but intense, expeditionary activity during the 'heroic age' of Antarctic exploration. The whaling industry also began in the period. Thence, until the Second World War, whaling was the major activity which is recorded with the discontinuous scientific expeditions of various nationalities. The regular annual expeditions of several countries form the bulk of the entries for the period after 1945 and these are continued to the present. Information from this current period includes the opening and closing of stations, major traverses, brief details of scientific programmes, and a large variety of other events.

The related historical events included are concise details of inventions and discoveries which have been important in Antarctic exploration (for instance: aircraft, photography, preservation of food, the Primus stove, and the cause of scurvy); political events, treaties and wars affecting the region; the foundation of scientific institutes and initiation of publications concerned with Antarctica; and similar subjects.

Each entry is numbered and indexed by these numbers. The index contains approximately 50 000 entries including: names of persons and vessels (with dates in parentheses), place-names, names of institutes and publications, names of Antarctic stations, inventions, legislation, and other historical events. The index is comprehensive and occupies a substantial part of the text. References to published material are given for entries where this is appropriate and practicable. Much of the information is derived from a great variety of unpublished sources ranging from Antarctic Treaty and Scientific Committee on Antarctic Research reports, correspondence with Antarctic research organizations and specialists, inscriptions, plaques, and grave markers on peri-Antarctic islands, and many others.

The majority of entries for countries currently undertaking Antarctic expeditions has been checked by persons in the institutes involved, who have provided many additional details. The compiler is greatly indebted to these correspondents for assistance in having the list as complete and correct as practicable.

The work has a comprehensive introduction describing its development and structure. The geography of Antarctica and the peri-Antarctic islands is concisely described and followed by a synoptic account of the historical stages of the region. Exploitation of Antarctic resources (sealing, whaling, and fishing) is covered and illustrated graphically. A section includes details of current circumstances, particularly the diplomacy involved with territorial claims, the Antarctic Treaty System, and modern national operations. Maps and plates are included to show the development of knowledge of the far south, the locations of places mentioned in the text, and events of several selected expeditions.

Earlier versions of the compilation have appeared in *Polar Record* (1958) and were published by Cambridge University Press (1989). These have proved useful in a very wide range of disciplines, including: history, politics, geology, glaciology, botany, zoology, meteorology, several other sciences, as well as philately and similar pursuits. They have proven very helpful in cataloguing Antarctic literature.

The book is published by Bernard Quaritch Ltd, Lower John Street, Golden Square, London, United Kingdom, W1F 9AU (Telephone: + 44 (0) 20 7734 2983, Facsimile: 7437 0967, e-mail contact: <E.Grass@quaritch.com>). It is a hardbound volume of 722 pages (including 40 plates, 27 maps, and 21 histograms). The ISBN is 978-0-9550852-8-4 and the price £ 110 (plus p&p). It may also be purchased from the Scott Polar Research Institute, contact <mbp25@cam.ac.uk>.

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# LETTERS TO THE EDITOR

From Julian Bickersteth, Sydney, Australia

Thank you for publishing in the JCS Journal (Number 4) the letter from Nigel Sitwell in which a number of criticisms of the conservation work being undertaken at Cape Royds are aired. It provides a good opportunity to talk about this project and to lay to rest misconceptions about what has been achieved over the last four years.

As the principal adviser to AHT on the conservation of the artefacts from almost the inception of the project, let me respond to the three main issues, namely:

- *That the very special atmosphere is being callously destroyed, to be replaced by a sort of 'Disneyfication'*
- *That the money being spent on the project is for the benefit of very few people.*
- *That Shackleton and Scott would not have approved of 'heritage' money being spent this way.*

By way of background, the JCS Journal (Number 3) reprinted a substantial excerpt of the Conservation Plan for Cape Royds *Nimrod* hut. This Conservation Plan is the document that underpins all the works at Royds. It directly involved a team of some 13 heritage specialists in its collation, as well as consultation with dozens of stakeholders internationally and was peer reviewed. Following consultation and feedback, the use of replica objects was not pursued. The Plan was written to address issues that had been agreed by heritage specialists, namely, that major intervention was needed to slow or halt deterioration of the building and the artefacts. To quote the Plan;

*'The unique quality of the site is its capacity to evoke the spirit of Shackleton's Expedition, and this is what makes it most comprehensible to visitors. This quality is being gradually eroded by the ongoing loss of fabric and artefacts.'*

So in answer to the first point of Mr Sitwell's letter, during the project it has become clear that almost the entire layout of artefacts at the hut is a 'construct', ie, it results from the well-meaning but generally guessed positioning by early heritage practitioners. In fact, the 'very special atmosphere' Mr Sitwell speaks of only existed until the early 1960's, when work parties progressively began 'cleaning up' the site. As part of the Implementation Plan, a workshop was convened at AHT in Christchurch in August 2006 for which polar historian prepared a paper on artefact positioning based on his historical research. The deliberations of this workshop then were used to inform the reorganisation of the hut in the summer season 2006/7 – away from its arrangement in 1999 to reflect the Ross Sea Party's briefest of occupations. Principal among this reorganisation was the relocation of the bunks, the re-hanging of canvas divider curtains and the rebuilding of the pantry food case wall. The current positions of all these artefacts were documented prior to relocation. The resulting layout is, therefore, based on the best information to-date of the location of artefacts during the *Nimrod* expedition. Nothing has been added.

As regards the second point Mr Sitwell raises, in terms of the money being spent for the benefit of the very few, the geographical location of the hut will always restrict visitation. But up to 2000 people now make the pilgrimage to the huts annually, and judging by their comments in the visitors book, the work that AHT is undertaking is hugely appreciated and supported. In addition, the project has brought the story of the expedition to a vastly wider audience through the highly popular Antarctic blog being written by the conservators

([www.nhm.ac.uk/antarctica-blog/](http://www.nhm.ac.uk/antarctica-blog/)), which at the present count is in the hundreds of thousands.

And finally, to the third point raised – as to what Shackleton would have thought of the works, we cannot know. But having personally worked in the hut, re-arranging the bunks according to his drawing in *The Heart of the Antarctic*, and revealing once again his chalk marks on the wall delineating everyone's area, I do not believe it is too long a bow to draw that he would have been pleased to see the layout once again reflecting the way he knew the hut interior.

## From Nigel Watson, Christchurch, NZ

Mr Sitwell (JCS Journal No 4) missed the point in criticising the conservation work at Sir Ernest Shackleton's only Antarctic expedition base at Cape Royds and at Captain Scott's base at Cape Evans. The buildings and contents were being lost to the ravages of time and the elements. A major conservation programme was needed to safeguard them for current and future generations.

A comprehensive programme of careful conservation has been undertaken during the last four years on both the building and the artefacts at Cape Royds. It has been undertaken by heritage professionals in keeping with ICOMOS\* charter principles and internationally accepted conservation principles. 5000 objects have been conserved by 17 professional conservators from Britain, New Zealand, Australia, Canada and the US. Carpenters with heritage expertise from North America, Australia and Britain have been working diligently on the fabric of the building. To suggest this conservation is 'philistine 'Disneyfication'' is absurd. (\* International Council on Monuments and Sites - Ed).

Far from benefiting a few visitors, over 500,000 visits to the website ([www.nhm.ac.uk/antarctica-blog/](http://www.nhm.ac.uk/antarctica-blog/)) have allowed people around the world to engage with this fascinating project.

Funders including the prestigious Getty Foundation in the US, The Governments of New Zealand, Britain and Ireland have all contributed, drawn by the quality of the conservation work alongside generous donors from New Zealand, Britain and beyond. Not least of which is the James Caird Society itself, whose President presented the proceeds of a Grand Polar Dinner (held at the Overseas League, London, on 15<sup>th</sup> February 2003 – Ed) to the cause. A capital fund for ongoing maintenance at Cape Royds has now been established.

It is the dedication of the team of professionals and generous funders who have preserved this site for future visitors and the world to treasure. It is thanks to them that Sir Ernest Shackleton's only a Antarctic base and a piece of exploration history will remain, so the likes of Mr Sitwell who has already had the privilege of visiting 'several times' and future generations of visitors will have the opportunity to see it firsthand.

A programme of planned conservation is well underway at Cape Evans. As to what Shackleton and Scott would have thought, who knows? But as (now former) English Heritage Chair, Sir Neil Cossons, on viewing the work and describing it of the highest order, so eloquently put it, 'the greatest beneficiaries of the Trust's work are yet to be born'.

[Figures quoted were correct at the time this letter was written, 1<sup>st</sup> October 2009 – Ed.]

## From Olaf Swarbrick, Arundel

The interesting article in 'Number Four' on the *Nimrod* Expedition failed to mention two other early and important expeditions to the edge of Antarctica. The first, in 1421/2 was by a fleet of Chinese junks which cruised between the South Shetland Islands and the Antarctic peninsula and eastwards along the edge of the ice then covering the Weddell Sea [see *1421 The Year China Discovered The World* by Gavin Menzies (published by Bantam Books (2003), ISBN 0-553-81522-9) pp 176). The Chinese had calculated the position of the South Pole and got within 1900 miles of it (sic) some 350 years before James Cook. Bellingshausen explored much of the Antarctic coastline in 1820/21. He approached within circa 1400 miles of the Pole in 1820 at 00:70 degrees south. These achievements ought to be recognised.

## From Michael Gilkes, Brighton

This is just a note to congratulate you on *JCS Number Four*. Lots of splendid material and lots of hard work! I will try and see if I can sort out something for your next (Journal). I have 'Feeding the Whales' in mind. Incidentally, I have an interesting little book on Balitore (Ireland) written circa 1852 by Betty Shackleton (E.S.'s Great Aunt). It fully confirms Jonathan Shackleton's letter (in Number Four). The more one thinks on it E.S. was *very* Irish. A piece on the 'False Villa' at Stromness might be fun.\*

[\*See Michael's fascinating essay in this issue. Ed]

## From Ken Hill, King's Lynn

I've been reading The James Caird Society *Journal* Number Three and congratulate you on achieving an excellent publication.

What particularly caught my interest was your account of meeting Grace Turzig, Walter How's niece. I can fill in the detail behind the photograph on page 66, described as 'circa 1955', by enclosing a photocopy of a page from *The Times* (dated 20<sup>th</sup> June 1964).

When I returned to England in June 1957 from an 18-month spell as a radio operator on the Antarctic Peninsula with the Falkland Islands Dependencies Survey (FIDS) I joined the Antarctic Club and was present when the photograph was taken by the *Times* photographer. The reporter got the identities of the 'lower deck' men confused.

As a 22-year-old radio operator I naturally found myself talking to the lower deck men during the river trip (ie along the *Thames* – Ed) and enjoyed myself immensely. At the time I was trying to decide how to earn a living, since radio operators – even fifty years ago- were feeling the approach of technology making their skills redundant. I decided to write up my House of Lords visit as part of a plan to become a journalist, and enclose a copy of that 'article'. I finally made it into journalism, but not until 13 years later.

I bought three prints of the photograph from *The Times* at the time. I still have one. Another is in the archives of the James Caird Society, and the second is with another society with polar interests but which one I do not recall.

I am very conscious not only of the polar centenaries which are going to be with us for a few years, but also of my own Antarctic experiences, which are now 50 years old. In fact, I just

looked up April 1957 in the diary I kept, and find that during the journey home we arrived at South Georgia on 4<sup>th</sup> April\*.

My 8mm Kodachrome film record of the experience, with which I lectured for the Commonwealth Institute for 3 years, is now on DVD and I am hoping shortly to record a commentary.

I hope I have been able to fill this little gap in your personal Antarctic archive.

[\*Ken wrote his letter to me on 2<sup>nd</sup> April 2007, thus almost 50 years to the day since he arrived in South Georgia. I am sorry it has taken me so long to publish his letter and thank him for sending me a copy of his most interesting DVD. Ed]

## “Endurance” men celebrate fifty years after Shackleton’s epic voyage

Beard jostled beard in the foyer of the Peers’ Entrance to the Houses of Parliament at 6pm on June 19, (1964) when Antarctic Club members and guests gathered to pay tribute to six men who joined the Endurance in 1914 at the start of the Imperial Trans-Antarctic Expedition under the leadership of Sir Ernest Shackleton.

We made our way along corridors where every flat surface was a coat of arms - they even peeked out from under the red carpet - to the Peers’ Dining Room. Lord Shackleton, the explorer’s son, himself a veteran of Arctic expeditions, was host to the gathering, and Sir Vivian Fuchs also greeted us as we joined the crowd, which was constantly moving as Antarcticans greeted Antarcticans, some for the first time since heaving stores together on an ice-strewn beach “down South”.

Lord Shackleton and Lord Jellicoe paid tribute to those who had played their part in the expedition, and Sir Vivian, who accomplished in 1958 the journey which Shackleton started in 1914, said he was not happy about the way the six members of the original expedition were referred to as “survivors”. There were in fact no lives lost on the epic voyage of the Endurance, even after the ship was crushed in the ice and sank.

Each of the 28 members survived nine months in the doomed ship held fast by the ice, followed by six months camped on floating ice, then a perilous six days voyage out of the ice in three lifeboats, and a gruelling stay on isolated Elephant Island in cramped makeshift conditions, awaiting rescue.

Shackleton’s incredible boat and mountain journey to a South Georgia whaling station was followed by four attempts to reach the main party, and only after four months on the island was the rescue effected.

Both surgeons of the expedition were present at the reception: Dr A H Macklin of Aberdeen and Dr J A McIlroy of Epsom, together with Commander Greenstreet of Norwich, First Officer of the Endurance. The cook, Mr C Green of Hull, attended, plus two of the five seamen - Mr W How of Tottenham, London, and Mr W Bakewell of Michigan, US A.

Charlie Green and Bill Bakewell recalled to me some of the moments of drama and humour of their ordeal.



*On the trip downriver to Greenwich which followed the House of Lords reception.  
The photograph shows, left to right: Mr W. How of Tottenham, London, seaman.  
Mr C. Green of Hull, cook. Mr W. Bakewell of Michigan, USA, seaman.  
Commander Greenstreet of Norwich, First Officer of the Endurance.  
Dr J.A. McIlroy of Epsom. Dr. A.H. Macklin of Aberdeen.*

Both men joined the Endurance at Buenos Aires in Argentina, replacing men whom Shackleton, a shrewd judge of character, considered unsuitable after the “shakedown” voyage from England.

“She looked a fine ship, so I joined her,” said Bill Bakewell, who followed his sailing career with sheep farming in the US, although he was born in Canada. He made the trip over to England with his daughter to attend the reunion.

Charlie Green, whose dedication to cooking is mentioned in most books written about the expedition, told me of the difficulties he surmounted to produce a nourishing “hoosh”, or stew, while they were camped on the ice.

“You never knew if the ice was going to break up towards the end, and you’d just have to grab the stove and run for the boats,” he told me.

Green’s ingenuity was allowed full play when they finally reached Elephant Island. “We used seaweed, little tufts of lichen which grew on the rocks, tiny shrimps we discovered in the rock pools, and now and then we’d get penguins and seals.”

Bill Bakewell asked him; “Do you remember that last hoosh you were cooking, when the Chileno (the Chilean tug Yelcho which rescued them) arrived to pick us up? I reckon that was one of the finest hooshes you ever made. Whatever happened to it?”

“I can’t remember,” said Green.

“You know what?” went on Bakewell, “I reckon it’s boiling there yet!”

Our launch passed the Discovery moored by Waterloo Bridge, and Bill Bakewell recalled he had been over her once when she was in Buenos Aires during one of her ocean survey trips. Later we passed the Cutty Sark at Greenwich, and Bill leaned forward to study it closely through the rain. “I’d just like to run up those yards now,” he said, remembering his years on square riggers.

When Bill joined the Endurance in Buenos Aires he managed to smuggle on board his good friend and shipmate Perce Blackboro, from Newport, Monmouthshire.

“We sailed from Newport before we got to BA and joined the Endurance,” he remembered.

When they were three days out from BA, Shackleton had faced the young stowaway and berated him about the extra stores and food the unexpected crew member would take up. As his tirade rose to a climax, Shackleton finished by putting his face close to Blackboro's. "Finally," he said, very clearly, "if we run out of food and anyone has to be eaten, you will be the first. Do you understand?"

Blackboro had smiled uncertainly, nodded, and spent the rest of the voyage thoughtfully assisting Charlie Green in the galley.

Bill Bakewell told me: "We were in Newport earlier this week seeing Perce's children - Blackboro died some years ago - and though we planned only one day there we stayed three. I've been writing to them for years."

When I asked the inevitable question about doing it again, Bill answered in typical seaman fashion. "Yes I would. She was a fine ship, so I joined her."

As Big Ben struck ten we landed again at Westminster Pier, and I heard Bill and his daughter planning their next day's sightseeing: "Discovery, Cutty Sark, Greenwich Museum." I heard him say.

*An unpublished report by Ken Hill (Antarctic Club)  
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*Radio operator, Hope Bay, Antarctic Peninsula, 1956/57,  
for Falkland Islands Dependencies Survey (now British Antarctic Survey)*

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