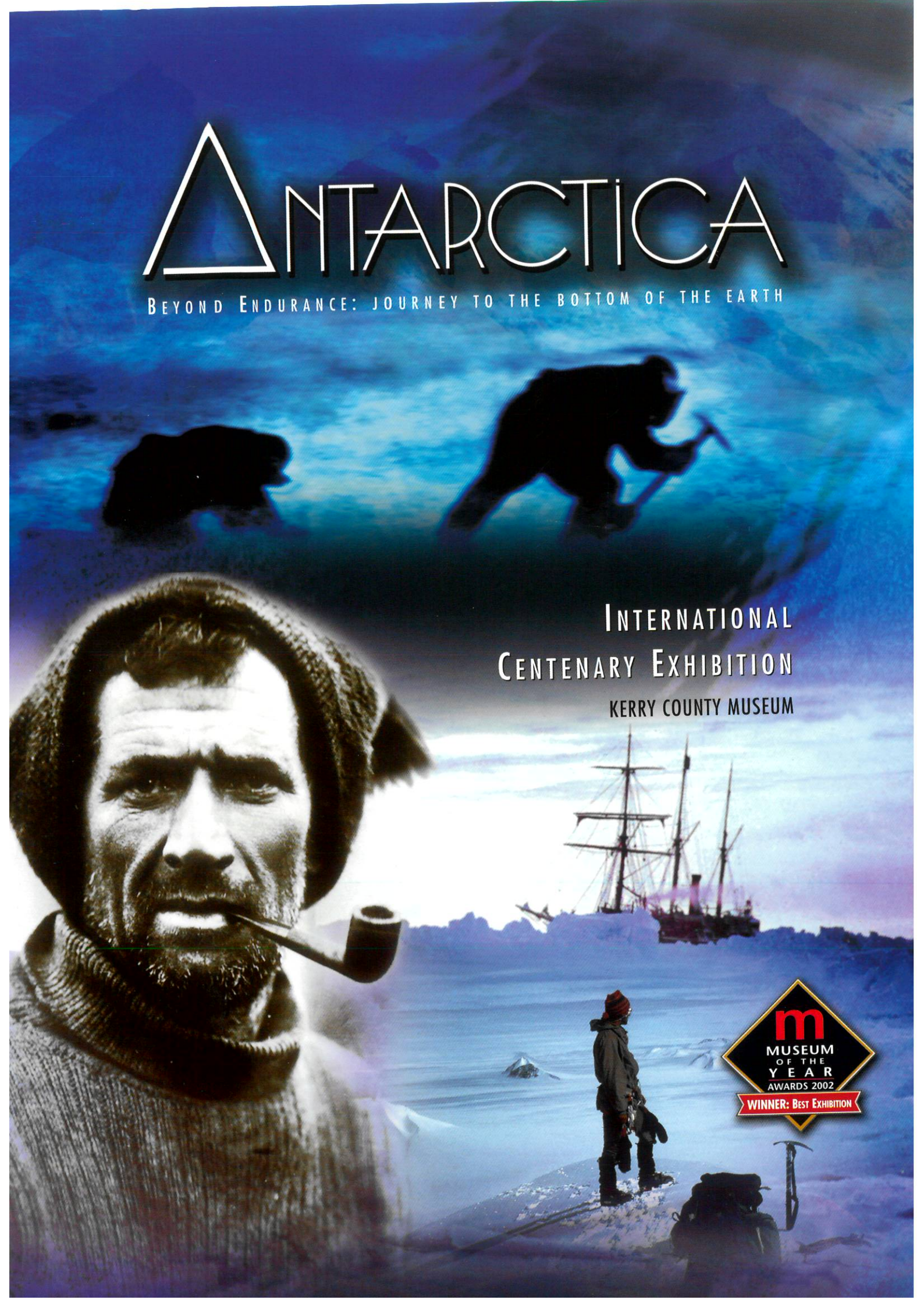


# ANTARCTICA

BEYOND ENDURANCE: JOURNEY TO THE BOTTOM OF THE EARTH

INTERNATIONAL  
CENTENARY EXHIBITION  
KERRY COUNTY MUSEUM









# ANTARCTICA

BEYOND ENDURANCE: JOURNEY TO THE BOTTOM OF THE EARTH

INTERNATIONAL  
CENTENARY EXHIBITION  
**KERRY COUNTY MUSEUM**

TRALEE, COUNTY KERRY, IRELAND



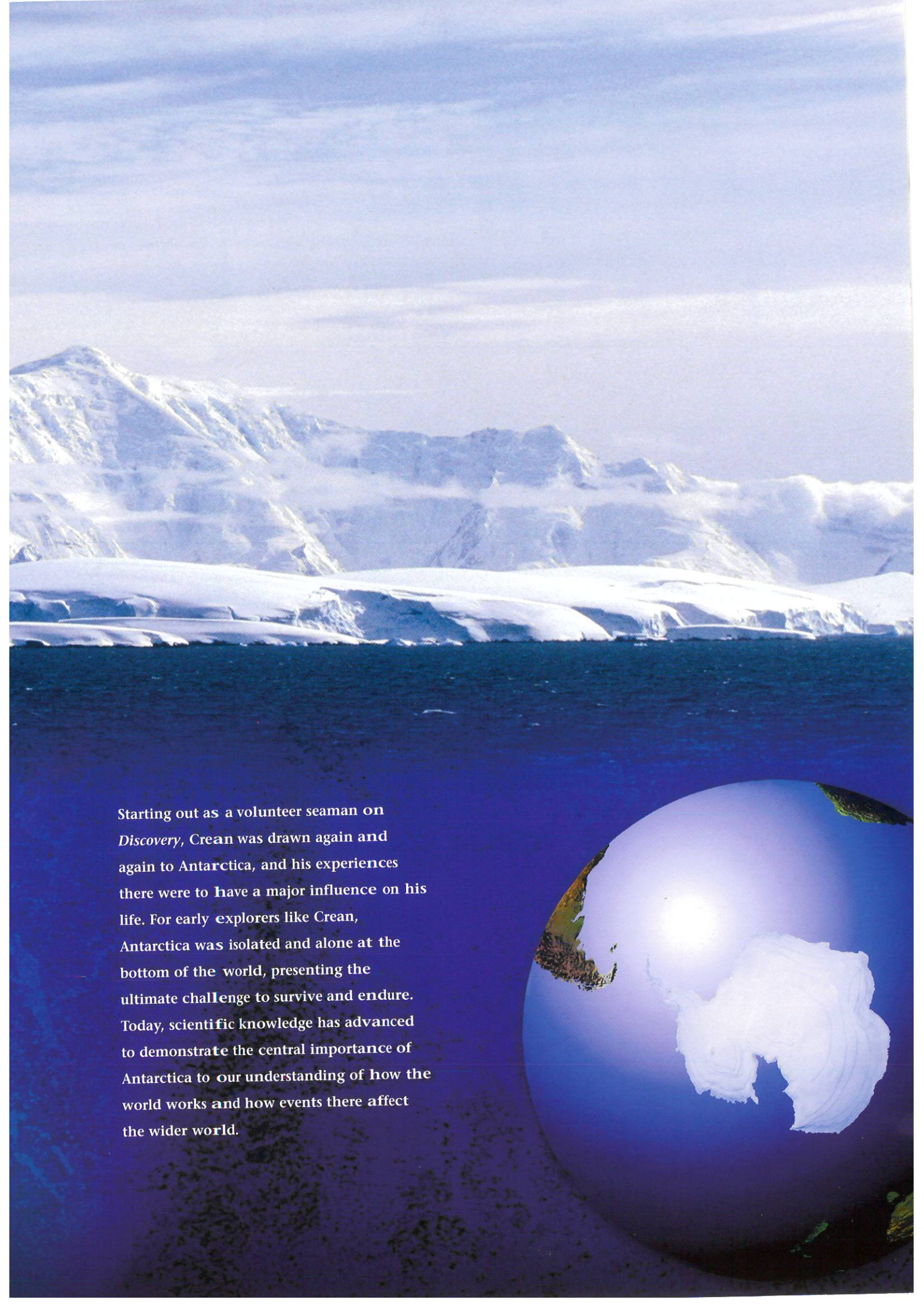




# ANTARCTICA

**I**N the early twentieth century Antarctica became the focus for exploration and discovery. Many countries vied to be the first to unlock the secrets of this remote continent and to plant a flag at the South Pole. The exhibition at Kerry County Museum concentrates on three of the most famous expeditions: *Discovery*, *Terra Nova*, and *Endurance*. Each of these expeditions has its own story but they are inextricably linked by the characters who took part in them. The Kerryman, Tom Crean, provides the link in the exhibition as he served on all three expeditions.





Starting out as a volunteer seaman on *Discovery*, Crean was drawn again and again to Antarctica, and his experiences there were to have a major influence on his life. For early explorers like Crean, Antarctica was isolated and alone at the bottom of the world, presenting the ultimate challenge to survive and endure. Today, scientific knowledge has advanced to demonstrate the central importance of Antarctica to our understanding of how the world works and how events there affect the wider world.







Crew of Discovery

Captain Robert Falcon Scott

# DISCOVERY

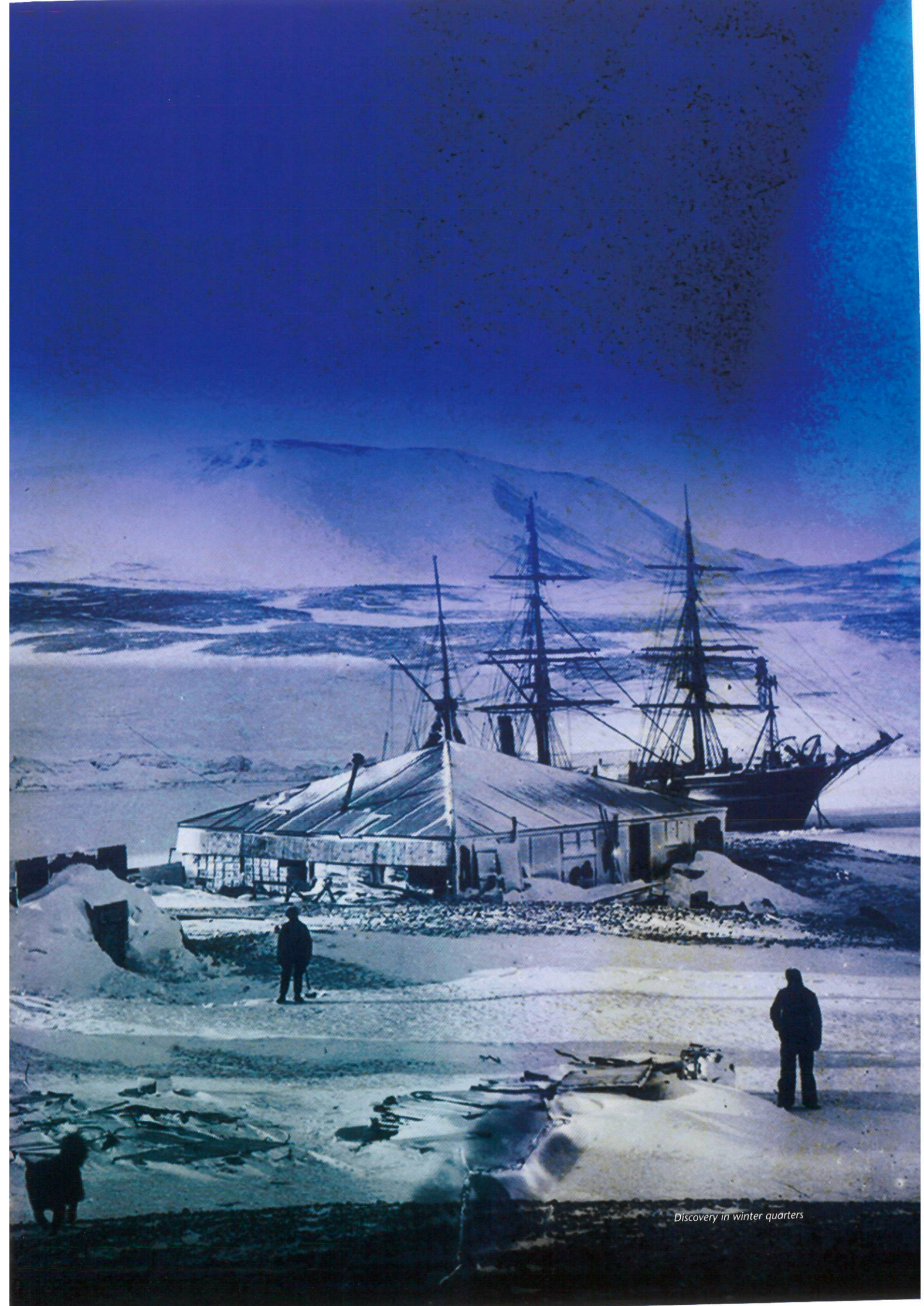
THE DISCOVERY EXPEDITION, 1901-04

**T**OM CREAN was born on 20 July 1877 and grew up in a large family on a small farm in Annascaul, Co. Kerry. He enlisted in the Royal Navy on 10 July 1893, shortly before his 16th birthday. In December 1901 he was serving as an Able Seaman on HMS *Ringarooma* in New Zealand when the British National Antarctic Expedition ship *Discovery* arrived en route to Antarctica to explore the last remaining unknown continent on Earth.

Robert Falcon Scott commanded a mixed crew of scientists, Naval and merchant seamen, which included Ernest Shackleton, Dr. Edward Wilson, Edgar Evans, William Lashly and Frank Wild, all of whom Crean would serve with again in Antarctica. *Discovery* put into the port of Lyttleton, New Zealand, and on 10 December 1901 Tom Crean volunteered for his first Antarctic expedition.







*Discovery in winter quarters*





Shackleton, Scott and Wilson at the start of their southern journey

## FIRST STEPS SOUTH

THE EXPEDITION'S winter quarters were set up in February 1902 on Ross Island in McMurdo Sound, and the men lived on board *Discovery* which was allowed to freeze in. Having made preparations over the winter, a small party consisting of Scott, Shackleton and Wilson set out on a southern journey on 2 November 1902 with the aim of reaching the furthest south.

Tom Crean was a member of the support party of twelve led by Lt. Michael Barne which travelled ahead laying food depots. The support party turned back on 15 November and the three pressed ahead. They reached 82° 17'S, about 460 miles from the Pole, on 30 December before sickness and hunger forced them back. They reached safety on 3 February 1903 but the journey nearly cost them their lives.



Crew of *Discovery* in London 1904

A RELIEF SHIP, *Morning*, arrived in early February 1903 with orders for *Discovery* to sail to Lyttleton, New Zealand. *Discovery*, however, was firmly frozen in and could not be broken free. Scott ordered eight men home, including Shackleton who had nearly died on the journey back to base camp. The rest of the party remained for a second winter and a second season of exploring.

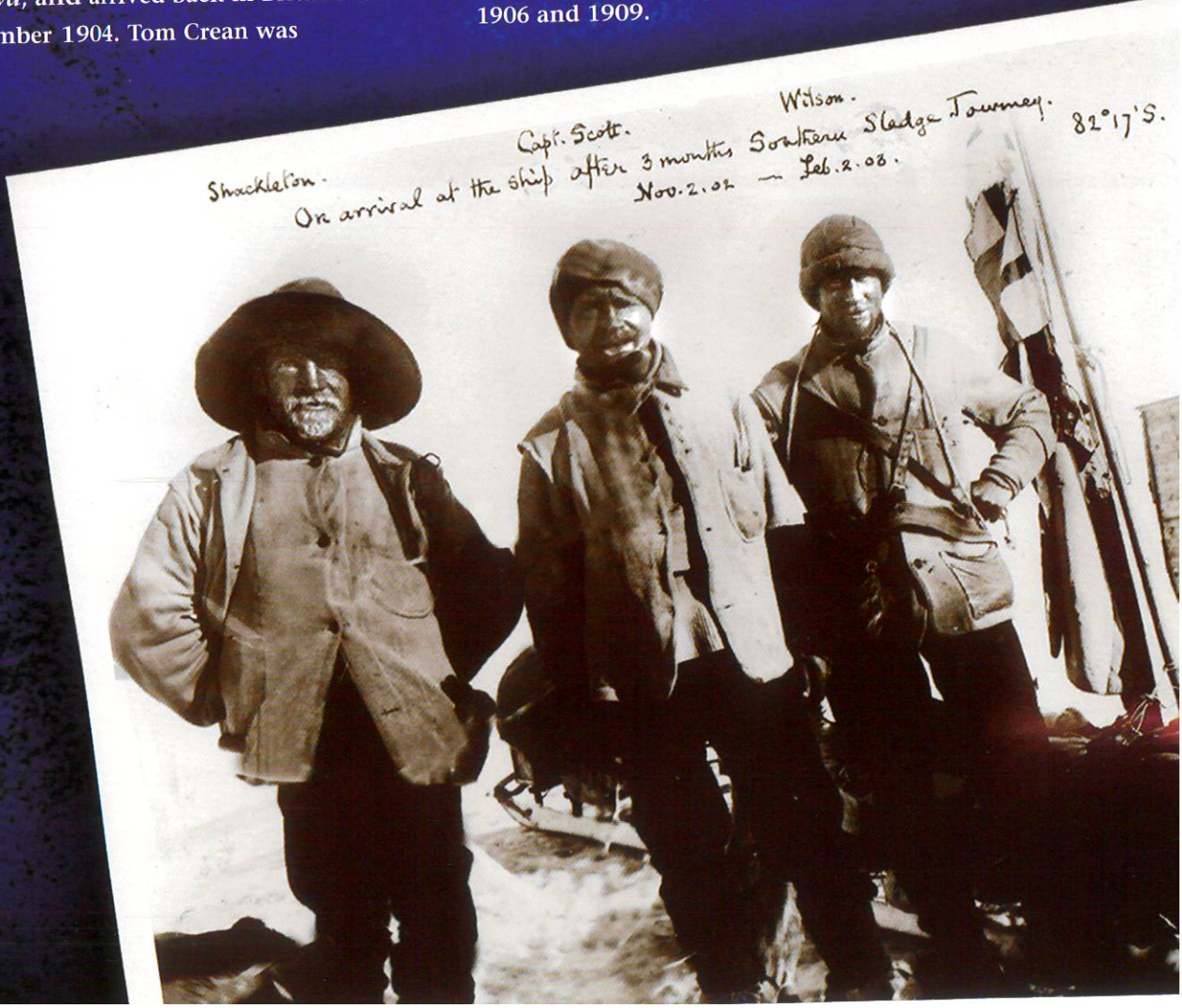




Southern support party setting out

In February 1904 *Discovery* was freed from the ice by two relief ships, *Morning* and *Terra Nova*, and arrived back in Britain on 10 September 1904. Tom Crean was

promoted on Scott's recommendation to Petty Officer 1st Class on his return to the Navy, and he served with Scott between 1906 and 1909.

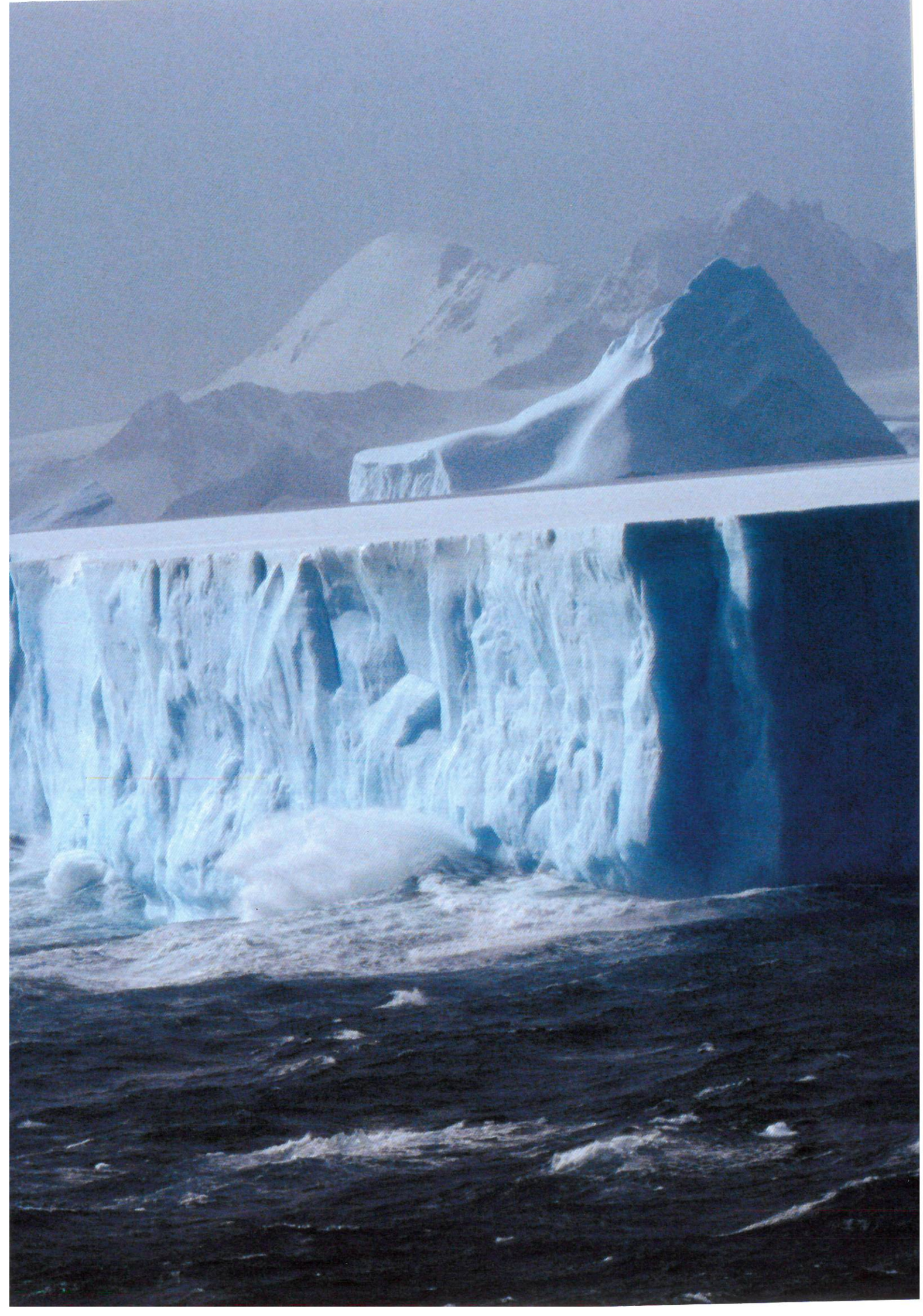


Shackleton.  
Capt. Scott.  
Wilson.  
On arrival at the ship after 3 months Southern Sledge Journey. 82°17'S.  
Nov. 2. 02 - Feb. 2. 03.













# TERRA NOVA

*THE TERRA NOVA EXPEDITION, 1910-13*

**I**N September 1909 Scott announced his intention to return to Antarctica. This expedition also had a strong scientific emphasis, but Scott was clear that the main aim was 'to reach the South Pole and secure for the British Empire the honour of this achievement'.

The expedition would have a Naval backbone and it included Antarctic veterans such as Tom Crean, Edgar Evans and William Lashly, as well as scientists and paying guests.

The expedition sailed from Cardiff on *Terra Nova* on 15 June 1910. It was not the only ship heading for Antarctica.

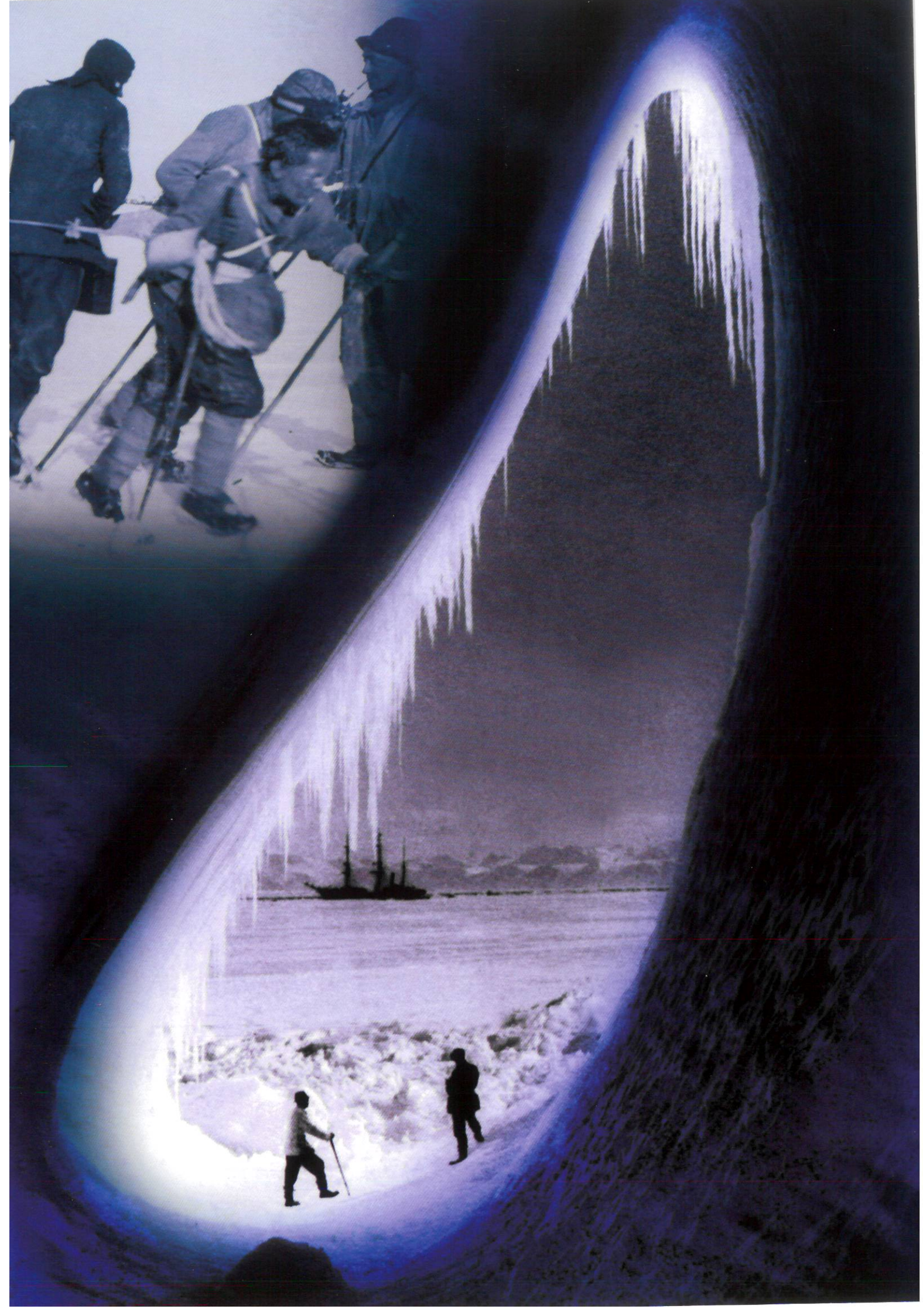


*Norwegian explorer  
Roald Amundsen*

The Norwegian *Fram* expedition, led by Roald Amundsen, had started as an attempt on the North Pole, but with two American claims to have reached it in 1909, Amundsen decided to turn south. He left Norway in August 1910 but only revealed his plans in October, sending a cable to Scott, then in Australia:

'Beg leave to inform you Fram proceeding Antarctic: Amundsen'









*Patrick Keohane making a model of the Terra Nova.*

**F**ROM Coolbaun in west Cork, Patrick Keohane served as a Petty Officer on the *Terra Nova* expedition. At the midwinter festivities on 22 June 1911 Scott recorded that 'Keohane had grown intensely Irish and desirous of political argument.' He was a member of one of the support parties on the journey to the Pole,

keeping his tent-mates Scott, Wilson and Oates amused with rhymes when they were trapped in their tent by a blizzard.

He served in the Navy during both World Wars and in the Coast-Guard Service. He died in 1950, aged 71.





**M**ORTIMER and Timothy McCarthy from Kinsale, Co. Cork, both served on Antarctic expeditions; Mortimer on *Terra Nova* as a member of the ship's party and Tim on *Endurance*. Mortimer had intended to join *Endurance* but went instead on an Arctic expedition. Tim McCarthy, described by Shackleton as 'the best and most efficient of the sailors, always cheerful under the most trying circumstances', was killed in World War 1, within weeks of his return from Antarctica. Mortimer settled in Lyttleton, New Zealand, where he died in 1967, aged 85.

Mortimer McCarthy at the wheel of *Terra Nova*





Tom Crean

## PREPARING FOR THE POLE

A BASE was built at Cape Evans, in McMurdo Sound, in January 1911, and *Terra Nova* left for the winter. At the end of January, using ponies to haul the sledges, the men began laying food depots on the route south. Problems with the ponies meant that the most southerly 'One Ton' depot was 35 miles away from the

intended point at 80°S, and this would have fatal consequences for the return journey from the Pole.

Three of the ponies collapsed from exhaustion and three were killed when Crean, Lt. Henry 'Birdie' Bowers and Apsley Cherry-Garrard found themselves adrift on sea ice and surrounded by killer whales. Crean leapt from floe to floe to get help and the two men and one pony were saved.

On his return to base, Scott discovered that Amundsen was in the Bay of Whales, 400 miles to the east on the Great Ice Barrier, and 60 miles closer to the Pole.



Tom Crean and Edgar Evans mending sleeping bags









*Southern party  
before the journey  
to the Pole*



## THE JOURNEY TO THE POLE

SCOTT and his men set off on 1 November 1911 accompanied by dogs, ponies and motor sledges.

The support parties would turn back once they had laid their food depots and a team of four would continue to the Pole. Nobody knew who would be in the final four until the last support team was sent back. The ponies were shot as they weakened to provide meat, some of which was left as food for the return journey.

Finally, on 3 January 1912, 150 miles from the Pole, Scott picked his team from eight remaining men.

He decided to add a fifth man, Birdie Bowers, to the Polar party of Dr. Wilson, Petty Officer Edgar Evans and Captain Lawrence Oates. Despite their disappointment, Lt. Teddy Evans, Tom Crean and William Lashly waved them off with three cheers on 4 January and turned to make the journey home.



## CROSSBAR TO THE H OF HELL

EVANS, Crean and Lashly began their 800-mile journey home across the Polar plateau, down the Beardmore Glacier and over the Great Ice Barrier, pulling a sledge intended for four. Having found their way onto the Beardmore Glacier by sliding down hundreds of feet of icefalls on the sledge, the men were blocked by huge crevasses. Their only option was to go 'along the crossbar to the H of Hell', as Crean described the crossing of the precarious snow bridges stretching over the crevasses.

As they reached the Barrier, Evans began to suffer from scurvy. His condition deteriorated until, 100 miles from home, he could no longer stand. Crean and Lashly refused to leave him and pulled him on the sledge to within 35 miles of Hut Point.

While Lashly stayed behind to care for the dying Evans, Crean set out alone on an eighteen hour non-stop march to reach help at the hut. Evans was saved and he never forgot the two men who had, he later wrote, 'hearts of lions.' Crean and Lashly were awarded the Albert Medal for saving Evans's life.



Lt. Teddy Evans



Tom Crean

ALBERT MEDAL OF THE SECOND CLASS.

CHIEF STOKER WILLIAM LASHLEY, R.N.

PETTY OFFICER (FIRST CLASS) THOMAS CREAN, R.N.

At the end of a journey of 1,500 miles on foot the final supporting party to the late Captain Scott's expedition towards the South Pole, consisting of Lieutenant (now Commander) Edward R.G.R. Evans, R.N., Chief Stoker William Lashley, R.N., and Petty Officer (First Class) Thomas Crean, R.N., were 238 miles from their base when Lieutenant Evans was found to be suffering from scurvy. His condition rapidly became worse. When 151 miles from the base he was unable to stand without support on his ski sticks, and after struggling onward on ski in great pain for four days, during which Lashley and Crean dragged their sledge 53 miles, he collapsed and was unable to proceed further.

At this point Lieutenant Evans requested his two companions to leave him, urging that 83 miles lay between the party and the nearest refuge hut, and that unless they left him three lives would be lost. However, the

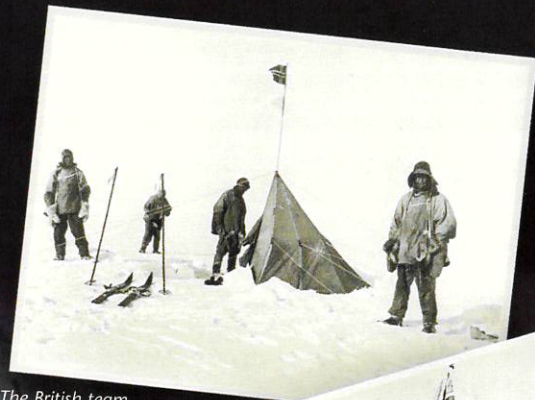


## THIS AWFUL PLACE

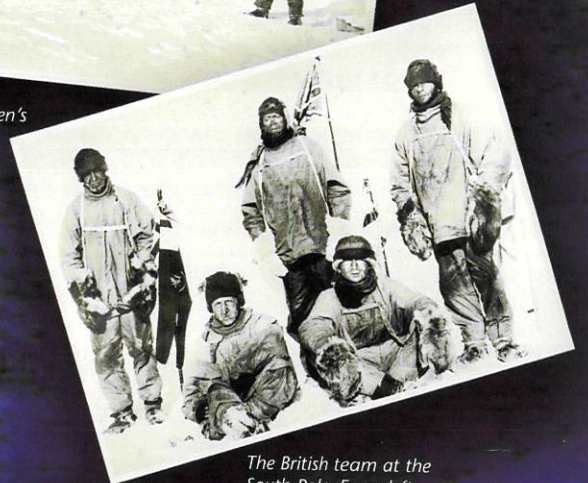
ON 17 January 1912 Scott and his four companions arrived at the South Pole to find that Amundsen had been there before them on 14 December 1911. Disheartened, the five men began the trek homewards. On 17 February, on the Beardmore Glacier, Edgar Evans collapsed and died, having suffered from gradual starvation, hypothermia and scurvy.

As the remaining four reached the Barrier they encountered dramatically low temperatures. On 17 March, Oates, suffering with gangrenous feet, could no longer continue and left the tent with the words, 'I am going outside and may be some time'. His body, like Evans's, was never found.

By 21 March, Scott, Wilson and Bowers were at the end of their fuel and rations and were 11 miles from the large One Ton food depot. Scott had gangrene in his right foot, and Wilson and Bowers, reluctant in any case to leave him, were prevented by bad weather from making a journey to One Ton depot and back. The men could go no farther. Their bodies were discovered in the tent seven months later.

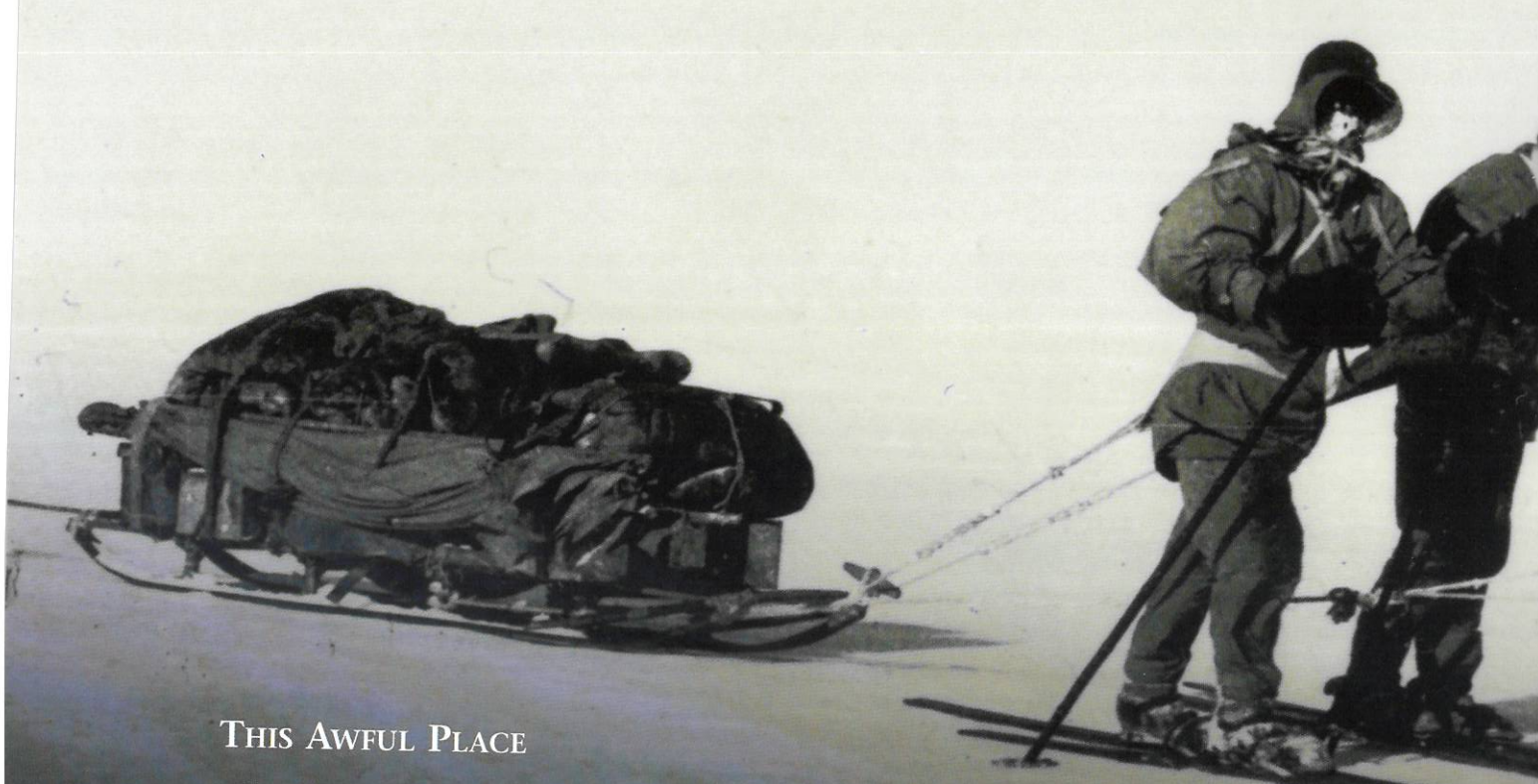


The British team discover Amundsen's tent left at the South Pole



The British team at the South Pole. From left, Oates, Bowers, Scott, Wilson and Evans.

Scott's tent as it was found on 12 November 1912







*Scott, Wilson, Oates and Evans on the Polar plateau; photograph taken by Birdie Bowers*

## THE SEARCH PARTY

AS the winter approached, the men remaining at base camp knew that the Polar party had perished. There was nothing they could do until the following season. In November 1912, a search party which included Tom Crean found the tent with the bodies of Scott, Wilson and Bowers, approximately 170 miles from the base at Cape Evans.

The search party left the bodies where they lay and built a snow cairn over them, topped by a cross made from two skis. A second, larger cross erected by the same men still stands at Hut Point.

The news of the deaths of Scott and his men had a huge impact when *Terra Nova* returned to Britain in the early summer of 1913. On his return to the Navy, Tom Crean was promoted to Chief Petty Officer in recognition of his contribution to the expedition. Barely a year later he would be on his way back to Antarctica.



*Snow cairn built over Scott's tent*













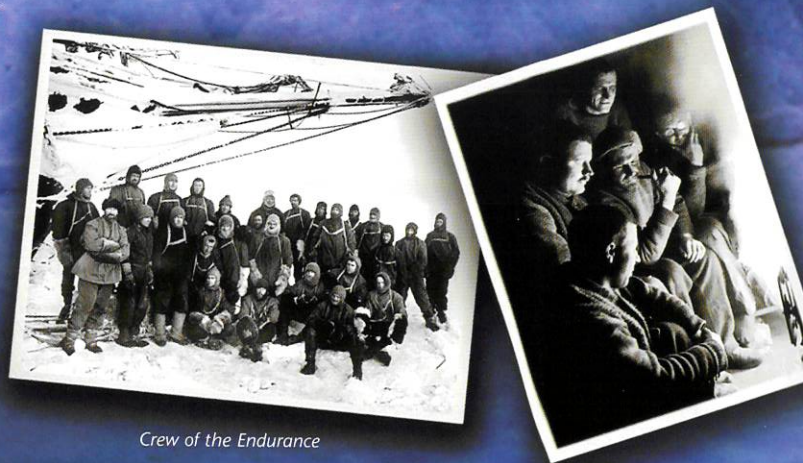
# ENDURANCE

*THE ENDURANCE EXPEDITION, 1914-17*

**I**N December 1913 Sir Ernest Shackleton announced his intention to return to Antarctica. His ambitious plan was to cross the Antarctic continent from the Weddell Sea to the Ross Sea via the Pole using dog teams. He bought a Norwegian whaler called *Polaris*, renamed her *Endurance* (from his family motto) and selected 27 men, including a number of experienced Antarctic explorers.

Tom Crean, stationed at Chatham Barracks

since his return to the Navy in October 1913, was chosen as Second Officer and as one of six who would make the crossing of the continent. On his third expedition, Tom Crean took his place for the first time in the officers' quarters. *Endurance* sailed from London on 1 August 1914 just as war broke out. Shackleton offered the ship and crew for the war effort but the Admiralty commanded they 'proceed'.



*Crew of the Endurance*







Tom Crean with pups Nell,  
Toby, Roger and Nelson

## TRAPPED IN THE ICE

The *Endurance* sailed to the Weddell Sea via South Georgia. The pack-ice quickly closed around the ship, and *Endurance* became trapped on 19 January 1915 despite strenuous efforts to free her. From January to October the ship drifted north with the ice while the men waited for the pack to break up and release them.

Hockey and football on the ice provided exercise and morale was kept up by observing holidays such as Empire Day on 24 May, celebrated by the singing of patriotic songs. The dogs were moved off the ship into ice-block kennels known as dog-loos and Tom Crean was one of the six men who each had charge of a team of nine dogs.





## ABANDON SHIP

FROM July onwards *Endurance* began to be crushed by the pressure of the ice and by the middle of October she could no longer hold out. Shackleton wrote that 'the floes, with the force of millions of tons of moving ice behind them, were simply annihilating the ship'.


On 27 October 1915 *Endurance* had to be abandoned and she finally sank on 21 November.

*The morning after the ship was abandoned*

The men made two attempts to march over the ice to land, dragging the ship's boats, but surface conditions were so bad that it became a futile effort. Shackleton decided to set up camp on the ice and wait for the break-up of the pack, which would allow them to take to the boats in open water. The drifting ice was to be their home until early April 1916.








*Charles Green and Thomas Orde-Lees cooking on the ice*

## PATIENCE CAMP

THE men were now marooned on drifting ice floes, far from land and with just three ship's boats for survival. Penguins and seals were killed for food and fuel. Four of the dog teams were shot in January to save food.

By the end of March they had drifted north out of the Weddell Sea and into the South Atlantic Ocean. They knew that the floe would soon disintegrate, food was getting scarce and daylight was shortening as

winter approached. The last of the dogs were shot and the younger ones eaten. The ice began to break up, and on 9 April 1916 Shackleton decided to launch the three boats in an effort to reach Clarence or Elephant Island, about 100 miles to the north.



*Leonard Hussey lifting Samson*







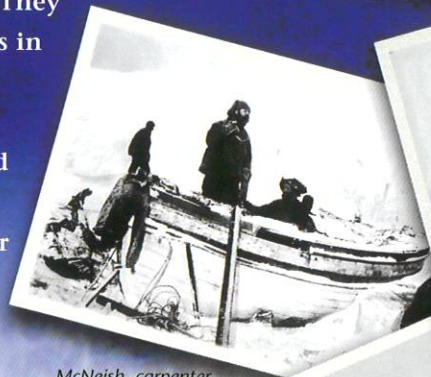
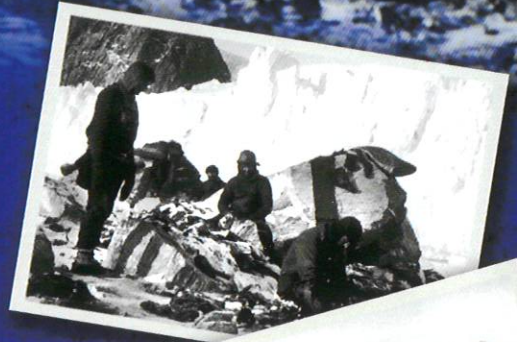


## ELEPHANT ISLAND

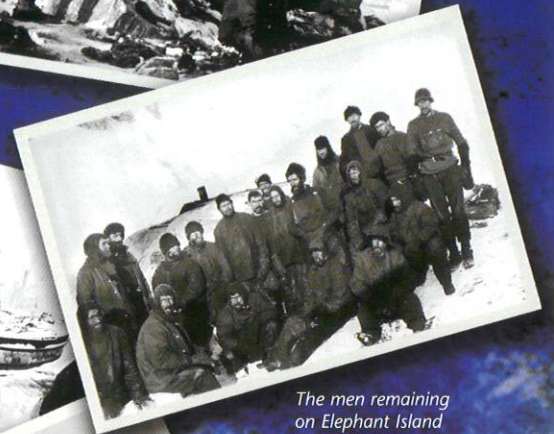
THEY reached Elephant Island on 15 April 1916 having suffered exposure, seasickness and exhaustion. Some of the men were near death. It was their first time on land since 5 December 1914 and they had landed on one of the most barren rocks in the South Atlantic. There was little chance of rescue as Elephant Island was remote and no-one would look for them there. They would have to risk sailing 800 miles in one of the boats to the whaling stations of South Georgia.

The *James Caird* was the largest and most seaworthy of the boats and McNeish, the carpenter, adapted her for the voyage.

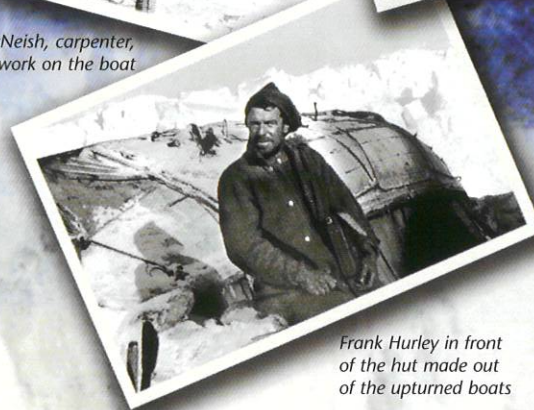
Five men would accompany Shackleton: Frank Worsley, the navigator, Tom Crean, Tim McCarthy, 'Chippy' McNeish and John Vincent.



*McNeish, carpenter, at work on the boat*



*The men remaining on Elephant Island*



*Frank Hurley in front of the hut made out of the upturned boats*





## VOYAGE TO SOUTH GEORGIA

ON 24 April 1916, Easter Monday, the *James Caird* was launched on her 800-mile journey across the stormiest sea in the world. The boat was cramped and the men could neither sit up properly nor lie down comfortably. Ice formed on the improvised canvas decking, threatening to capsize the boat.

The men took it in turns to crawl along the deck to chip the ice off, taking care not to tear the canvas. There were constant gales and enormous swells. They had to pump and bail almost continuously. Water began to run short and, afflicted by raging thirst, the men's mouths became dry and their tongues swollen.



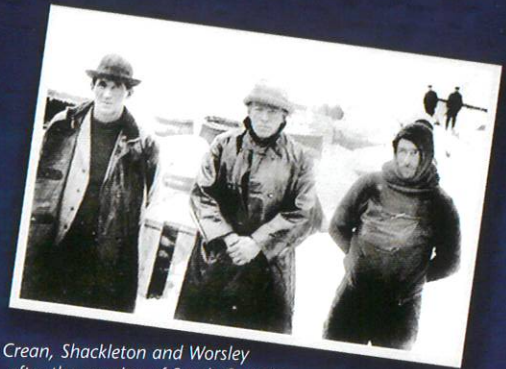
On 8 May they sighted South Georgia but a violent gale threatened to sink them just as they had reached their goal. They landed on the south side of the island on 10 May 1916. It had taken them 17 days to sail from Elephant Island.





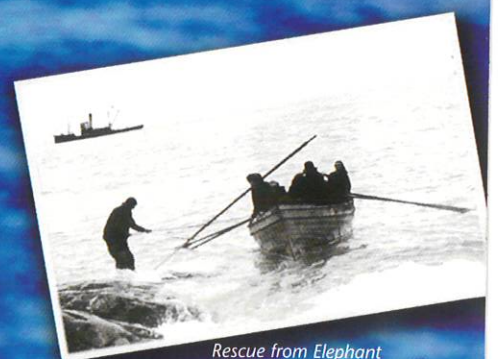
## CROSSING SOUTH GEORGIA

THE whaling stations were on the north of South Georgia and Shackleton was reluctant to risk the boat on a further journey. The interior was uninhabited and unmapped with mountains of up to 3,000 feet, but on 19 May 1916 Shackleton, Worsley and Crean set out to cross the island. They were weak, inadequately dressed and badly equipped. They took three days' provisions and no sleeping bags, intending to march straight through. They finally arrived at the whaling station in Stromness at 4pm on 20 May, having travelled for 36 hours without rest.



*Crean, Shackleton and Worsley  
after the crossing of South Georgia*

In the next four months Shackleton, Worsley and Crean made three unsuccessful attempts to rescue the men on Elephant Island but were defeated by the ice. Finally, at the end of August, the ice opened long enough for them to get through on the Chilean *Yelcho* and all twenty two men were rescued. Not a single man had died.

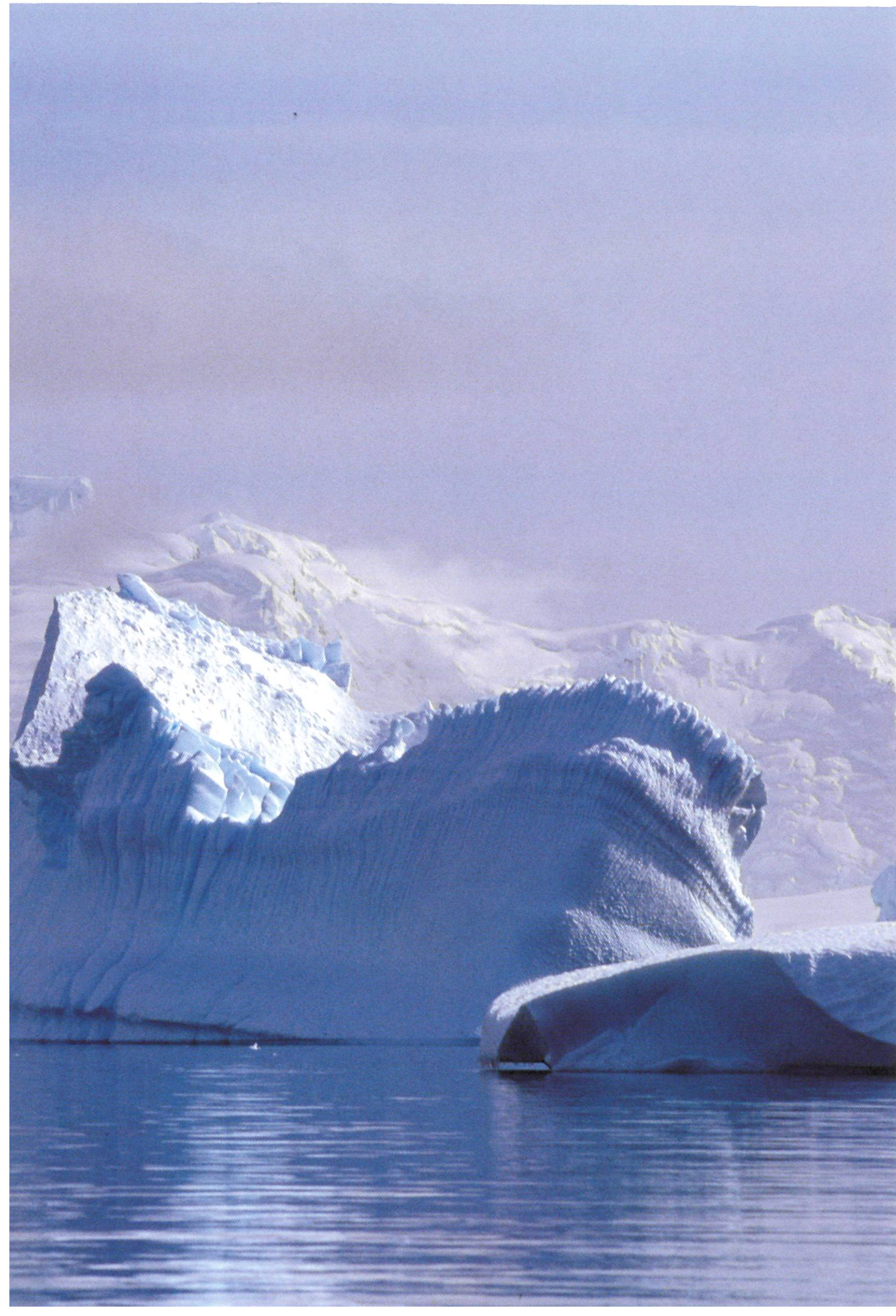


*Rescue from Elephant  
Island August 30, 1916*











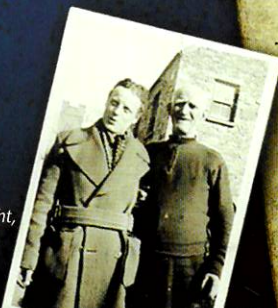


Tom and Nell Crean with their daughters Mary and Eileen in the 1920s

## RETURN TO IRELAND

ALL of the men on the *Endurance* returned to serve in World War 1, which to their astonishment was not yet over. Tom Crean had a relatively quiet war, serving in the Naval bases in Chatham, Cobh and Berehaven. He retired from the Navy in 1920 and the following year Shackleton tried to inveigle him to come on a fourth expedition, the *Quest*, with a number of Antarctic stalwarts but he refused. He was now married with two children and content to live a quiet life in Annascaul. Tom Crean and his wife Nell opened a public house, 'The South Pole Inn', and it was his only public reference to his time in Antarctica. In the Ireland to which he returned, Polar heroes, especially those who had served for twenty-seven years in the British Navy, were an unwanted commodity. Recognition in Ireland for his heroism in Antarctica would only come many years after his death in 1938.

Tom Crean, on right, in Dingle



S. 440 (date 8-178). (Revised—November, 1912.)  
 FORM OF THE PASSING CERTIFICATE OF QUALIFICATION IN SEAMANSHIP  
 For a Warrant Officer of the Military Branch.  
 (Authority—Articles 285, 290, 334 and 335 of the Admiralty Instructions.)

For use at the Admiralty.

This Certificate is to be made out in duplicate, one copy being sent to the Secretary of the Admiralty and the other handed to the Candidate.

PURSUANT to an order from  
 are hereto subscribed, have examined  
 follows:—  
 He produces a certificate as *Guinness of St. John's* from H.M.S. *(Cambridge) Pembroke (S)*  
 He appears to have served in the ship *(undermentioned, viz:—)*

Ship	Captain	Entry	Quality	Discharge	Character	Time
						Days
<i>Services Commenced in N.H. in Impregnable on 10<sup>th</sup> July 1893 or earlier with V.S. in every case until detailed list of ships shown hereon:—</i>						
<i>Pembroke</i>		<i>1-1-07</i>		<i>25-8-07</i>		
<i>do</i>		<i>26-8-07</i>		<i>30-7-07</i>		
<i>Essex</i>		<i>1-10-07</i>		<i>28-1-08</i>		
<i>Pembroke</i>		<i>29-1-08</i>		<i>29-5-08</i>		
<i>do</i>		<i>30-5-08</i>		<i>9-9-08</i>		
<i>Albatross</i>		<i>10-9-08</i>		<i>26-3-09</i>		
<i>Pembroke</i>		<i>25-3-09</i>		<i>2-4-09</i>		
<i>Victoria</i>		<i>3-4-09</i>		<i>8-9-09</i>		
<i>Eschscholtz</i>		<i>9-9-09</i>		<i>15</i>		
<i>President</i>		<i>14-4-10</i>				
<i>Pembroke</i>		<i>6-10-10</i>				
		<i>25-5-14</i>				
		<i>8-11-16</i>				

He produces certificates of service, ability, and good conduct in the Navy as required by the Admiralty, to qualify him to receive a Warrant Officer's Commission to the rank of *Warrant Officer* for *1* years.

C.W.



No. 642

THIS IS TO CERTIFY that Mr. *Thomas Crean* has served as *Boatswain* on board H.M.S. *Albatross* under my command from the *12<sup>th</sup> day of December 1902* to the *3<sup>rd</sup> day of March 1903* during which period he has conducted himself *in a most efficient manner* and *has shown himself to be a most reliable and capable officer* and *is well fitted to discharge the duties of a Boatswain*.

Given under my hand and the seal of the Admiralty at *Whitehall* this *10<sup>th</sup> day of December 1902*.

*John Jellicoe*  
 Captain (R) Admiral

S. 536 (date 8-61.)  
 (Revised—December, 1907.)  
 CERTIFICATE of the Service of  
*Thomas Crean* in the Royal Navy.

First Entry in the Service *Chatham* Date *10 July 1875* Official Number *144699*

Date of Birth *20<sup>th</sup> July 1844* County *County Kerry*

Where born Parish *Annascaul* Town or County *C. Kerry*

Usual place of Residence *Particurrane near Annascaul, C. Kerry*

Trade brought up to *School*

Religious Denomination *Roman Catholic*

Man's signature on discharge or pension

Continuous Service Engagements			Marks, Claps, &c.	
Date of actualy volunteering	Commencement of time	Period volunteered for	Date Received	Nature of Discretion
<i>20 July 1893</i>	<i>20 July 1893</i>	<i>12 Years</i>	<i>10 Dec 1905</i>	<i>Antarctic Medal</i>
<i>20 July 1904</i>	<i>20 July 1904</i>	<i>10 complete years for pension</i>	<i>21 June 1913</i>	<i>Arctic Medal 2cl</i>
			<i>14 July 1915</i>	<i>Silver Clasp Antarctic 1910-15</i>

*Accepts new Conditions* *Survival* *Petty Times*

Description of Person	Stature		Colour of		Marks, Wounds, and Scars
	Feet	In.	Hair	Eyes	
On Entry as a Boy	<i>5</i>	<i>7 1/2</i>	<i>Dark</i>	<i>Brown</i>	<i>Scars</i>
On advancement to main rating, or on entry into 28 years	<i>5</i>	<i>8 1/2</i>	<i>Dark</i>	<i>Brown</i>	<i>Scars</i>
On re-entry for 28 years Non. C.S. after attaining 28 years	<i>5</i>	<i>10</i>	<i>do</i>	<i>do</i>	<i>Scars</i>

Further description if necessary

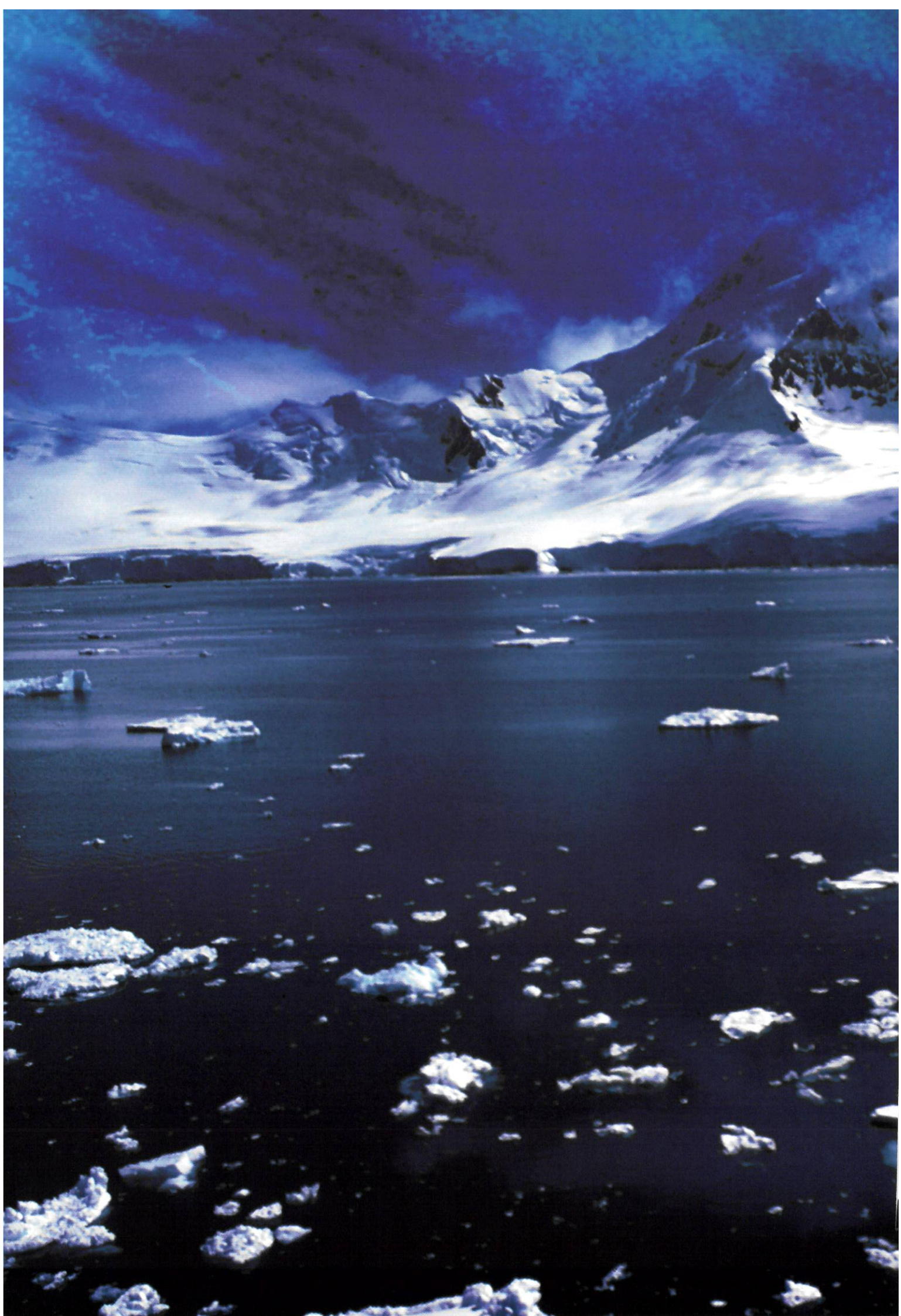
0-8 (1901), 100 (1917) 2000





*Tom Crean  
Antarctic explorer*

















## A PLACE LIKE NO OTHER

**A**NTARCTICA is the coldest, windiest, driest, highest place on Earth. The temperature rarely gets above  $-15^{\circ}\text{C}$  in summer while in winter it plunges to  $-50^{\circ}\text{C}$ . The lowest recorded temperature is  $-89^{\circ}\text{C}$ , recorded at Russia's Vostok Station in July 1983. Winds reaching 185 miles (300km) per hour blow out from the centre. The winds create wave-like patterns and sculptures in the snow, known as sastrugi. Less than one inch of precipitation falls per year but the winds constantly whip the snow up into blizzards. The average elevation is 7,500 feet (2,500m). The great height is not due to the height of tall mountains but to the depth of ice covering the continent. Antarctica is bigger than Europe or the United States and it is 161 times the size of Ireland.







# ANTARCTIC SCIENCE

For the early explorers Antarctica was the ultimate survival contest. For modern scientists Antarctica is of key importance to our understanding of how the world works. Climate changes over the last several hundred thousand years are recorded in the ice cap that covers the continent and is up to 2.5 miles (4 km) deep in places. The world's most biologically productive oceans surround Antarctica, and it is a major site for the production of the cold deep water that drives circulation in the oceans.

It is the largest storehouse of fresh water, with three-quarters of the world's supply contained in the ice cap. The processes now taking place in Antarctica affect the world's climate and oceans and they link the continent to our experiences thousands of miles away. All scientific disciplines have a role to play and challenges to meet in Antarctica.







## GONDWANALAND & ANTARCTIC GEOLOGY

Less than 1% of Antarctica's frozen landscape is exposed rock, yet geologists have found that the continent can yield information about our planet that cannot be found anywhere else. Antarctica originally belonged to a landmass straddling the equator that included Africa, Australia, India and South America. About 160 million years ago this supercontinent, called Gondwana, began to break apart and newly formed individual land masses gradually drifted to their present locations around the globe. A Wicklow-born geologist, Professor Bryan Storey, has played a key role in increasing our knowledge of the evolution of the continent. His research has focussed on the Gondwana break-up and geo-dynamic evolution of the Antarctic Peninsula. He is currently the Director of Gateway Antarctica at the University of Canterbury, New Zealand.





## ICE CORING

ICE cores drilled from the ice cap provide a sample of all the layers of snow accumulated over thousands of years. When light is shone through the ice core from behind, alternating bands of light and dark snow can be seen. The light layers indicate summer snow and the dark layers, winter snow. The layers can be counted in much the same way as tree rings. Not only do ice core records reveal natural fluctuations between ice ages and warm periods, they also show that there has been a recent human influence on the Earth's climate.

For example, carbon dioxide levels have risen by 30% as a result of deforestation and the burning of fossil fuels. Together with investigations into Antarctica's present-day climatic conditions, these records of past climate are crucial for understanding how the Earth works and will lead to better predictions for future global change.



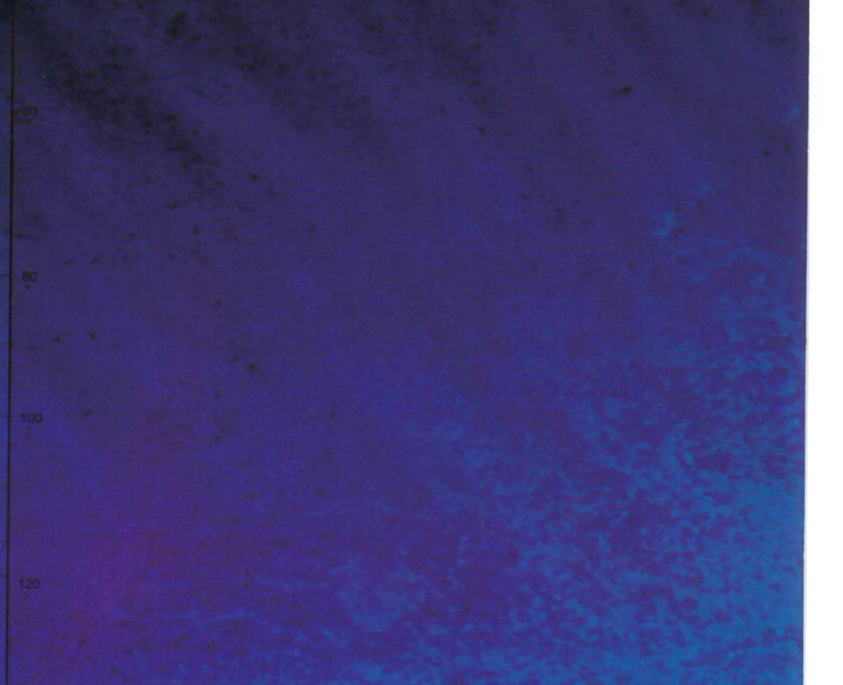




## WHO OWNS ANTARCTICA?

EARLY Greek geographers believed there must be a large landmass around the South Pole to balance the known land in the northern hemisphere. They named it Anti-Arkitkos – Antarctica, the opposite of the Arctic. Today, Antarctica is not owned or ruled by any one country. In 1959 the Antarctic Treaty was signed, taking effect in 1961. It is short and simple and it is one of the most successful international agreements ever made. The Treaty sets aside territorial claims, allows scientists freedom

to work and to exchange information, bans testing of nuclear weapons and dumping of nuclear waste, and forbids the building of military bases on the continent. The Treaty remains in force indefinitely and forty-four countries have now signed up to it. The Treaty nations meet every year to discuss Antarctic affairs and to agree and update the rules under which activities in Antarctica are governed. Ireland has yet to become a signatory to the Antarctic Treaty.







## LIFE FORMS IN ANTARCTICA

ONLY a few small plants and insects can survive in the extreme conditions in Antarctica. Sea life, in contrast, is abundant in the surrounding waters. Penguins, seals, whales, and many kinds of sea birds call Antarctica their home, although they come ashore only to breed. They spend most of their time in or over the water, where they get their food. The basis of the Antarctic food chain is phytoplankton, a small microscopic plant that flourishes in the upper waters during the summer months. This is eaten by krill, a shrimp-like creature that is the staple diet of many species of fish, birds, seals and whales. The relatively simple ecosystem and extreme environment of Antarctica make the continent an ideal natural laboratory for studying early signs of environmental

change. Among the world leaders in this research area is the Dublin-born biologist, Dr. Donal T. Manahan, after whom Manahan Peak in Antarctica is named.

### PENGUINS

Penguins are the most common birds in the Antarctic. They live in colonies larger than some cities and can survive in the harshest of conditions. There are eighteen different species of penguin, and only two, the emperor and the Adelie, make the Antarctic their true home. The emperor penguin is the only one capable of sitting out the desolate winter on the ice.





## SEALS

Weddell, Ross, crabeater and leopard seals have made Antarctica their home. They form a distinct group whose ancestors probably colonised Antarctica about ten million years ago when the continent was much warmer than it is today. These have now become adapted to the ice. Seals are now a protected species and number about 1.5 million today, which is much less than their pre-hunting numbers.

## WHALES

Whales, the world's largest mammals, have been severely exploited by man in the past. There are two natural groups of whales – toothed and baleen. Toothed whales include the large sperm whales together with the smaller dolphins and porpoises, which prey on fish and squid, and the killer whales which prey on fish, penguins and seals.



A person in silhouette is working on a piece of equipment on the deck of a ship. The sun is setting in the background, creating a bright orange and yellow glow. The sea is visible in the distance. The person is standing on a wooden structure, possibly a mast or a piece of rigging. The overall scene is dramatic and atmospheric.

## LIVING ON THE ICE

**A**NTARCTICA has no native people. Those who live and work there today are mostly from scientific organisations. The United States, Great Britain, Russia and many other countries have research stations specially designed and built to withstand the harsh weather. The largest is the US McMurdo Station. In summer the total population may exceed 5,000 but in winter it decreases to less than 500. Access is available by air and sea only during the summer months.

To survive in the harsh environment all scientists and support staff are issued with modern polar clothing consisting of several thin layers, rather than a few thick garments, to trap air and provide insulation. The foods supplied are high in carbohydrate and fat. The average daily ration is about 3,500 calories, double the intake of the average adult in temperate climates.







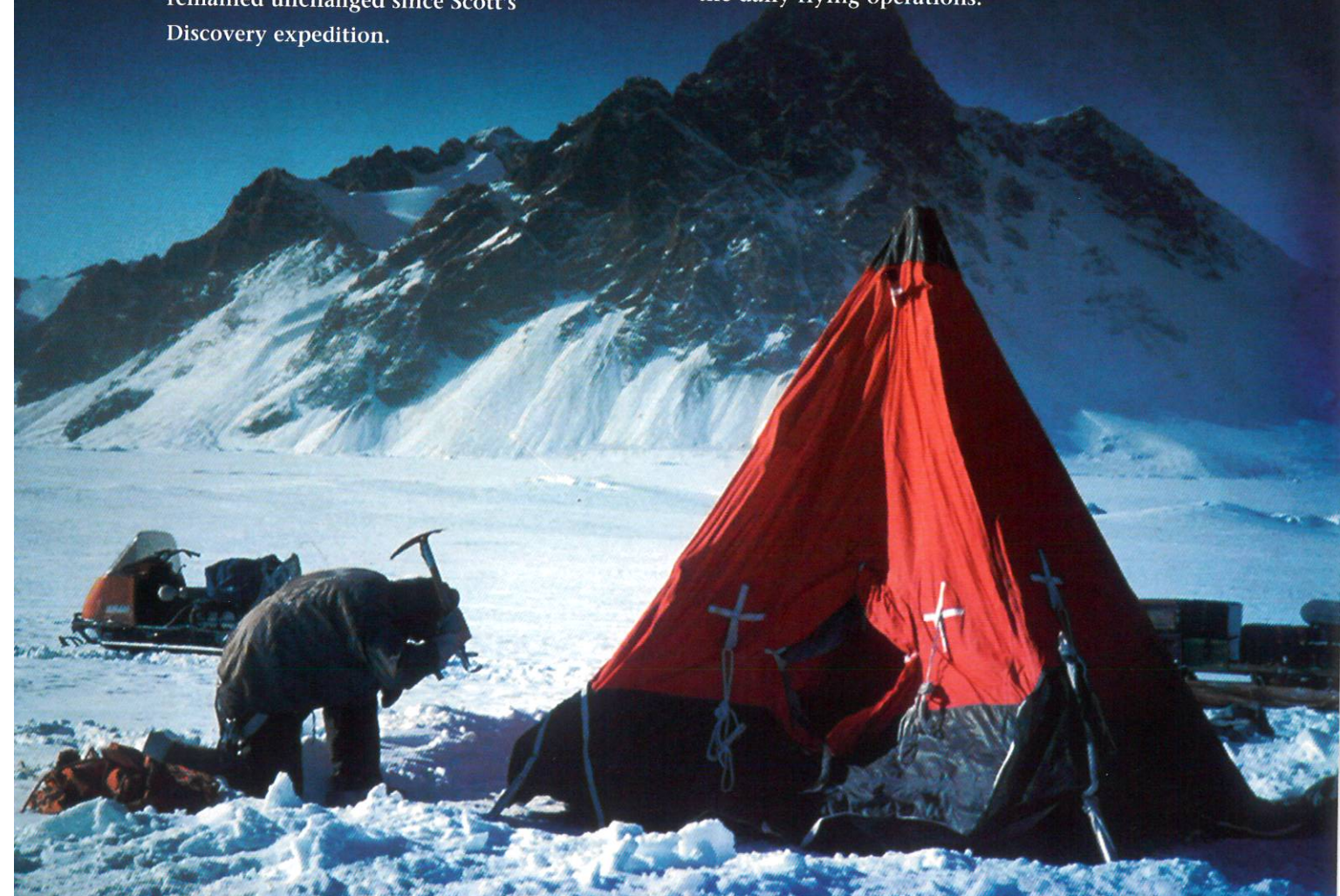
## BAS FIELD CAMP

**T**HE BRITISH Antarctic Survey deploys around fifteen field parties every year over an area many times larger than Britain and Ireland.

Scientists regularly spend four months of the Antarctic summer (November to February) travelling and camping in the interior of the continent. The basic design of the pyramid tents that they use has remained unchanged since Scott's Discovery expedition.

The modern tents are made of ventile cloth and can withstand winds of over 100 miles per hour. Cooking is still done on a paraffin primus stove, and the lighting (necessary only at the end of summer when the sun sets) is by a paraffin lamp.

Each day the field parties have a radio schedule with the main station at Rothera Station to relay weather information for the daily flying operations.





## EVENTS OF THE CENTURY 1902-2002

**T**HE last hundred years in Antarctica have transformed our understanding of the continent and its interaction with the rest of the world. While it is impossible to chronicle every achievement and accomplishment that has occurred below 60 degrees south, the following are highlights from the last hundred years on The Ice.



Robert Scott

**1902** Capt. Robert Scott's *Discovery* Expedition, which includes the Annascaul-born Tom Crean and Kildare-born Ernest Shackleton, arrives in Antarctica.

The Scottish National Antarctic Expedition led by William Bruce establishes station in South Orkney Islands.

**1904** Establishment of the first shore-based whaling station at Grytviken on South Georgia by the Norwegian Captain C. A. Larsen.

**1908** Ernest Shackleton's *Nimrod* Expedition makes the first ascent of Mount Erebus.

**1909** Edgeworth David, Douglas Mawson and Alistair McKay reach the South Magnetic Pole.

Shackleton and three colleagues sledge to within 97 nautical miles of the South Pole.



Roald Amundsen

**1910** First Japanese Antarctic Expedition

**1911** Norwegian Roald Amundsen aboard the *Fram* and Britain's Captain Robert Scott aboard the *Terra Nova* race for the South Pole. Amundsen and four companions reach the Pole on December 14, 1911 and successfully return. On January 18, 1912 Scott and four companions achieve the Pole but all die on the return trip.

**1913** On the first Australasian Antarctic Expedition, the leader, Douglas Mawson, returns to his base after the deaths of his two companions on a trip through George V Land.

**1915** Shackleton, seeking to be the first to cross Antarctica, abandons his ship *The Endurance* after it is crushed in the pack ice of the Weddell Sea.

**1916** Shackleton, Crean and Worsley reach the whaling station on South Georgia Island after a 17 day open-boat journey in the *James Caird* across the Southern Ocean from Elephant Island.

**1922** Shackleton dies on board *The Quest* on 5 January and is buried on South Georgia Island.

**1928** Taking off from Deception Island, Australian Hubert Wilkins makes the first flight in Antarctica.

**1929** US aviator and explorer, Richard E. Byrd, and a crew of three become the first to fly over the South Pole.

**1934** Byrd becomes the first person to winter in the continent's interior alone at an encampment on the Ross Ice Shelf.

**1935** The first woman - Norwegian Caroline Mikkelsen - sets foot on the continent at Vestfold Hills.

**1937** In the first real attempt to regulate Antarctic whaling, nine nations sign the International Convention on Whaling.

**1939** Nazi Germany drops swastika-engraved darts on Dronning Maud Land in an effort to claim the territory for the Third Reich.

**1944** *Operation Tabarin* establishes the first permanent British stations on the continent at Deception Island and Port Lockroy.

**1946** International Convention to regulate whaling signed by 14 countries in Washington DC

**1947** *Operation Highjump*, organised by the United States Navy, brings 4,000 men, 13 ships and 23 aircraft to Antarctica.

**1950** In the first truly international official Antarctic expedition, Britain, Norway and Sweden set up a joint base in Dronning Maud Land.



Sir Ernest Shackleton



Richard E. Byrd





Sir Edmund Hillary

**1954** Australia establishes Mawson base, the first large permanent scientific station on the continent.

**1956** Dr. Vivian Fuchs and Sir Edmund Hillary jointly lead the Commonwealth Trans-Antarctic Expedition to cross the continent from the Weddell Sea to the Ross Sea via the South Pole.

**1957** International Geophysical Year begins. Scientists from 67 countries combine in an ambitious and successful programme of co-operation. The number of bases on the continent is increased from 28 to 40. One of these, Amundsen-Scott South Pole Station, is built by the United States at the South Pole.

**1958** On January 4th Sir Edmund Hillary of New Zealand becomes only the third person, after Amundsen and Scott, to reach the South Pole overland and, on March 2nd, Dr. Vivian Fuchs completes his 99-day mechanised crossing of the continent, from the Weddell Sea to the Ross Sea. The US McMurdo Station is established; 93 men winter-over the first year.

**1959** Twelve nations sign the Antarctic Treaty, dedicating the continent indefinitely to peace and science. The Treaty comes into force in 1961.

**1962** Nuclear power plant installed at McMurdo Station. It is closed in 1972.

**1965** Last whaling station on South Georgia closes due to scarcity of whales.

**1965** Antarctic tourism begins with a luxury cruise to the Antarctic Peninsula.

**1969** First women at South Pole: Americans Pam Young, Terry Tickhill, Lois Jones, Eileen McSaveney, Kay Lindsay and Jean Pearson.

**1970** Start of regular tourist cruises to the Antarctic.

**1975** South Pole dome is dedicated.

**1978** Emilio Marco de Palma becomes the first person born in Antarctica, at an Argentine base.

**1979** An Air New Zealand DC 10 carrying 257 people on a tourist flight over Antarctica crashes into the side of Mt. Erebus. There are no survivors.

**1981** The Trans Globe Expedition - the first circumnavigation of the world via the poles - complete their crossing of Antarctica and arrive at Scott base. The three men, under Sir Randolph Fiennes, are only the second party to cross the continent and only the tenth to travel overland to the Pole.

**1983** The Earth's lowest ever temperature - 89.6°C (-129.3°F) is recorded at Russia's Vostok Station on July 21st.

**1985** Scientists at the British Antarctic Survey at Halley Station base discover the first hole in the Ozone Layer over Antarctica. The Team leader was Dr. Joe Farman.



Dr. Joe Farman

**1989** In the longest possible traverse of the continent, an international team crosses from the Antarctic Peninsula to Mirnyy.

**1994** Southern Ocean Whale Sanctuary established to protect feeding grounds of whales. In accordance with the Madrid Protocol, the last huskies leave Antarctica.


**1997** Norway's Boerge Ousland becomes the first person to cross Antarctica alone and unaided.

**1998** Agreement banning mining and oil drilling in Antarctica for 50 years comes into effect. In September the hole in the ozone layer over Antarctica grows to its largest size ever recorded. It opens to 2 1/2 times the size of Europe.

**1999** The Cape Roberts Project drills the deepest bedrock hole in Antarctica: 3,084 feet.

**2000** In March an iceberg measuring 183 miles long and 22 miles wide, approximately the size of County Kerry, breaks adrift in the Ross Sea.





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