Antarctica: The Lore and the Profits

PETER D CLARKSON

Executive Secretary
The Scientific Committee on Antarctic Research (SCAR)
Scott Polar Research Institute

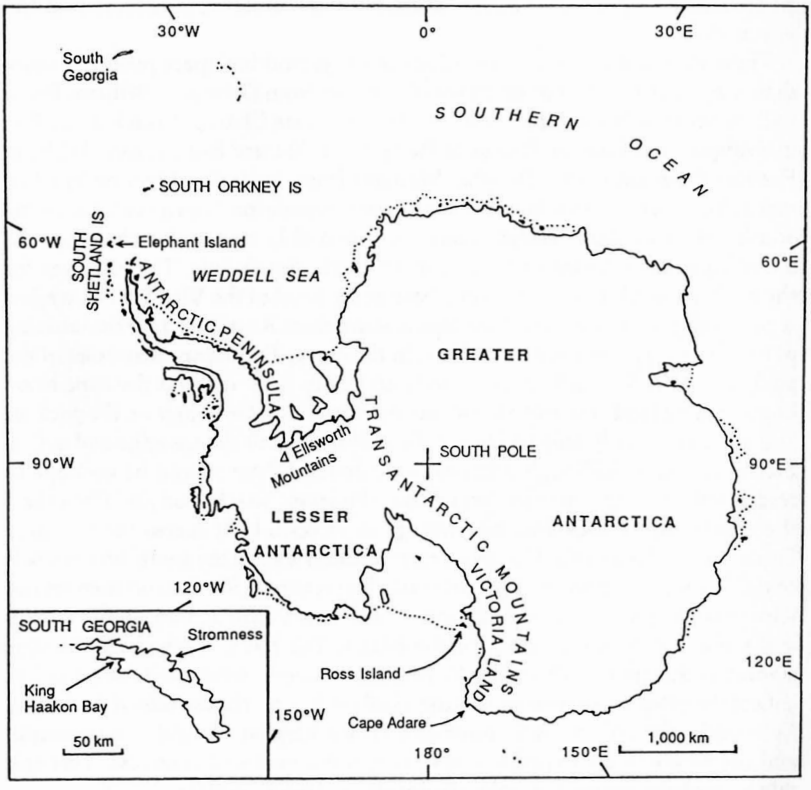
(*Plates 1, 2*)

Antarctica was the great *terra australis incognita* of the planet for centuries, although the ancient Greeks had postulated its existence to 'balance' the known world in the northern hemisphere. Early explorers who circumnavigated the globe gradually reduced the limit of the hypothetical southern continent as they sailed farther south without sighting land, but it was not until Captain Cook's second voyage (1772–75) in high southern latitudes that Antarctica's isolation and approximate maximum size were confirmed. Cook was rather unlucky in failing to sight the coast of Antarctica because his farthest penetrations south were in areas of extensive pack ice. But it was Cook who inadvertently precipitated the earliest exploration of the south polar regions when he reported the abundance of fur seals on South Georgia. Commercial interests drove sealers to exploit the seal stocks and then to search for additional sealing grounds as profits began to fall. This led to new discoveries, although they were often kept secret for proprietary reasons, but the sighting of the Antarctic continent is generally attributed to Thaddeus Bellingshausen. Geographical exploration stimulated other expeditions in the 19th century with the pioneering voyages of James Clark Ross, already famous for Arctic exploration, Charles Wilkes, Dumont d'Urville and others. However, it must not be forgotten that, in the minds of the sponsors at least, the thirst for knowledge was not entirely divorced from the hope of possible profitable returns from these ventures.

The close of the 19th and the start of the 20th century heralded a new era in Antarctic exploration. The shape of the continent was known in broad outline but what lay beyond the shores? Although some sealers in the South Shetland Islands had been stranded over winter in earlier years, the Belgian expedition (1897–99) of Adrien de Gerlache was the first expedition to winter in the Antarctic when the *Belgica* was trapped in the ice for 12 months. It is interesting to recall that the first mate of the ship was Roald Amundsen and the doctor was Frederick Cook, two men who were to achieve fame and infamy in the polar regions in subsequent years. Almost contemporaneously Carsten Borchgrevink led the first expedition (1898–1900) to winter on the continent and to do so intentionally, at Cape Adare in northernmost Victoria Land. The 'Heroic Era' of Antarctic exploration had begun and it continued with the first of Scott's

expeditions (1901–04) to Ross Island and Otto Nordenskjöld's Swedish expedition (1901–03) to the northern Antarctic Peninsula. The scene was now set for the entrance of heroes on to the stage of Antarctic legend. Scott's expedition was a remarkable success, capturing a wealth of scientific data as well as making long exploratory trips away from the coast and even making the first manned flight in Antarctica in a tethered hydrogen balloon. It should also be noted that a certain Lieutenant Shackleton was invalided home after the first winter. Nordenskjöld's expedition was less fortunate with two shore parties being separately stranded and forced to winter in the field after the expedition ship was sunk. Nevertheless, its scientific achievements were considerable and the whole expedition was rescued, apart from one man who died during the winter.

In 1907, Shackleton, determined to redeem his previous ignominious performance, returned to Ross Island with the expressed intention of reaching the South Pole. When just 100 miles from his goal he calculated that lives were more important than success and he returned north, a terribly hard decision in



A map of Antarctica showing the location of features mentioned in the text.
△ = Vinson Massif, Mount Shinn, Mount Gardner and Mount Tyree.



1. Antarctica: Adélie penguin and chicks. (*John Noble*) (p94)

2. Antarctic summer. (*John Noble*) (p94)



the circumstances and the mark of a great man. Just four years later Scott, back in the Antarctic with a second expedition to continue the science and to reach the Pole, was faced with a similar situation but in rather different circumstances. Scott knew that Amundsen was also in the Antarctic for the sole purpose of reaching the South Pole. He knew too that, while he and his companions were toiling to manhaul their sledges, and physically deteriorating at every step, Amundsen had many dogs to do the heavy work. There never was a race for the Pole as such, but personal and national pride decreed that there could be no turning back. For Scott, the question never arose so there was no decision to be taken and whatever view we may have of Scott in hindsight we should not forget that moral and ethical codes of conduct were very different 80 years ago to those of today.

The conclusion of the Amundsen-Scott story is well-known and need not be repeated here. Suffice it to say that Amundsen reached the South Pole on 14 December 1911 and is rightly accorded the honour of discovery while Scott arrived on 17 January 1912, an 'also ran' who sledged into history and legend when he and his party died on the return journey: 'to strive, to seek, to find and not to yield'.

These were not the only expeditions of the period but space prohibits more than a passing mention of Erich von Drygalski from Germany; William Bruce and the Scottish National Expedition; Jean-Baptiste Charcot from France, first in *Français* and later in *Pourquoi-Pas?*; Nobu Shirase from Japan; Wilhelm Filchner from Germany; Douglas Mawson from Australia. Mention must be made, however, of Shackleton's *Endurance* expedition (1914–16). Once the South Pole had been reached there remained only one major challenge for Shackleton, the crossing of the continent via the South Pole. The plan was for the main expedition to start from a base at the head of the Weddell Sea while a supporting expedition would lay depots south from Ross Island for the crossing party on its way north from the Pole. In the event, *Endurance* was beset in the pack ice of the Weddell Sea, crushed and finally sunk without the expedition ever reaching land. The expedition members survived the winter on the pack ice and were eventually able to launch the lifeboats from the ice edge and sail to Elephant Island. Although relatively safe on land there would be no hope of rescue unless word could be carried to civilisation. Shackleton and five others then made the famous 800-mile voyage in an open boat across the Southern Ocean to South Georgia. However, their landfall was on the south-western side of the island, the opposite side to the whaling stations. Shackleton then set out with two companions, a coil of rope, a carpenter's adze and a Primus stove to make the first major crossing of the island. The party reached the whaling station at Stromness where the Norwegian whalers immediately arranged to collect the other three men from King Haakon Bay on the far side of the island. Eventually, the fourth rescue attempt to reach Elephant Island was successful and the whole of the expedition was safe; not a man had been lost. This epic tale, one of the greatest in polar exploration, closed the 'Heroic Era'.

Shackleton returned with another expedition but he died in South Georgia in 1922 on the way south. So departed perhaps the greatest polar character of his time and yet one who never achieved any of his stated aims. Contemporaries

would say that if you wanted to travel, you needed Amundsen as your leader; if you wanted a scientific expedition, then Scott was your man; but if things turned out badly then you turned to Shackleton. There is no doubt that Shackleton figures largely in an Antarctic Valhalla.

After the First World War, the main activity in Antarctica was whaling. There were some expeditions, notably the United States expeditions of Richard Byrd in the Ross Sea area, and the British Graham Land Expedition to the Antarctic Peninsula region. These expeditions were driven by a mixture of science, exploration and adventure and they gradually drew back the curtain to reveal more and more of Antarctica's secrets. This situation continued with relatively little change until the late 1950s. One change was that the British established a continuous presence in the Antarctic Peninsula region from 1943 and what began as a war-time military operation is still active today as the British Antarctic Survey. Argentina was actually first in continuous activity, having been given William Bruce's Scottish expedition base in the South Orkney Islands and manned it since 1904. The major change came in 1957 with the International Geophysical Year (IGY), a major scientific investigation of the Earth as a whole but with a special effort in Antarctica.

Twelve nations took part in the IGY, a remarkably successful example of international scientific cooperation. It was coordinated by a Special Committee on Antarctic Research (SCAR) established by the International Council of Scientific Unions (ICSU). It proved to be so successful and so productive in scientific terms that SCAR was made permanent as the Scientific Committee on Antarctic Research and the scientific investigations continue unabated. The original 12 nations have now grown to 24 full members with four associate members and all the natural sciences are covered, not just the geophysical disciplines of the IGY.

Scientists around the world can work together very happily, often almost blissfully unaware of the political tensions that their international partnership may create. Antarctica has no indigenous population and hence, no natural sovereignty. During this century seven nations have laid claim to pie-shaped slices of the Antarctic continent and, in the Antarctic Peninsula region, three of the claims overlap. These overlapping claims of Argentina, Chile and Britain have, over the years, given rise to political tensions which, on occasion, have erupted into a show of force. The successful international cooperation of scientists in this unique continent required that there should be political accommodation and so the Antarctic Treaty was born in 1959. It came into force on 23 June 1961 when it was ratified by the twelve nations which established the IGY in Antarctica. The Treaty is essentially a peace treaty which provides for free exchange of information, prohibits military uses, nuclear explosions and the disposal of nuclear waste and holds the national territorial claims in abeyance for the duration of the Treaty. Subsequent instruments have been added for the conservation of fauna and flora, conservation of seals and the conservation of marine living resources. The Treaty continues in perpetuity and is open for accession by any nation, although only those nations which have an active Antarctic research programme may achieve consultative status and vote at Treaty meetings. There are currently 26 Consultative Parties and a further 14 non-Consultative Parties.

One aspect of Antarctica which the Treaty did not address was that of mineral resources. In 1959, not only was very little known about the geology of the continent but the Parties recognised that to incorporate an article in the Treaty on mineral resources would have delayed the negotiation of the Treaty. When, following the oil crisis of the 1970s, the Parties did decide to consider the minerals question it took six years of negotiation to achieve the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA). The Convention was opened for signature in 1988 but immediately several nations began to express reservations about the wisdom of having a regime to regulate mining. The environmental movement had raised world-wide public and political awareness of the environment and the need to conserve the environment before mankind destroys the planet. The discovery of the 'ozone hole' over Antarctica helped to focus attention on the south polar regions and to emphasise the need to protect what was called 'the last pristine wilderness on Earth'. Nothing short of a total ban on exploitation of Antarctic hydrocarbons and other minerals would suffice, and some more extreme factions argued for total isolation of Antarctica from all human activities. The Antarctic Treaty was now faced with a major dilemma and some pessimists foresaw the collapse of the Treaty if the problem could not be resolved.

The Eleventh Antarctic Treaty Special Consultative Meeting (XI ATSCM) opened in Viña del Mar, Chile, in November 1990 to negotiate an instrument to the Antarctic Treaty to provide comprehensive protection of the Antarctic environment. At the end of two weeks a draft protocol to the Treaty had been proposed. At further meetings in Spain the text was revised and refined; on 4 October 1991 the 'Protocol on Environmental Protection to the Antarctic Treaty' was signed by all but four of the Treaty Parties and these four are expected to sign in the near future. One of the principal articles of the Protocol prohibits mining in Antarctica. The article may be reviewed after 50 years but the prohibition may not be lifted until there is a regulatory regime in place beneath the Protocol. The environmentalists are claiming a victory for the protection of the environment although some might argue that the environment is not as well-protected under the Protocol as it would have been under CRAMRA and that the only real victory has been persuading politicians to change their collective mind.

There is obviously considerable interest in Antarctica but why is this? What makes Antarctica so different to the other continents and, indeed, so different to the Arctic? What is it about Antarctica that casts a spell over nearly all who go there? The answers to some of these questions are personal and vary between individuals but some may be answered by a description of the continent.

Antarctica is a continent of extremes; it is the highest, coldest, windiest, remotest part of the Earth. It is the only continent with no indigenous human populations, with virtually no life on land, and with effectively no national sovereignty. It is a continent devoted entirely to peaceful purposes where science is the predominant activity. There are some similarities with the Arctic (both are very cold places) but in general terms the Earth's two polar regions are, quite literally, poles apart. The Arctic is essentially an ocean basin almost completely surrounded by continents; the Antarctic is a continent completely

surrounded by ocean. The ice cap of the Arctic is the pack ice, the frozen surface of the sea. Most of the ice is multi-year ice which does not escape from the Arctic but is continually piled floe upon floe so that ice ridges and keels may be 50m or more thick. The pack ice of the Antarctic breaks up in spring and disperses northward into the Southern Ocean so that most of the Antarctic ice is only one year old and about 2m thick. The ice cap of Antarctica is based on rock, is up to 4.5m thick and the oldest parts may have fallen as snow more than 500,000 years ago. This last fact illustrates one aspect of the importance of Antarctica to science, because the air trapped inside the ice forms a record of the atmospheric composition at the time when that ice was deposited as snowfall. Hence the Antarctic ice sheet holds a climatic record of the past 500,000 years. In the Arctic, only Greenland with its ice sheet is comparable to the Antarctic but on a much smaller scale. Antarctica also forms a unique laboratory for measuring global pollution, partly on account of its location remote from centres of industrialisation but also because the record of atmospheric composition held in the ice sheet extends so far back in time, way beyond the industrial revolution towards the Stone Age.

Despite the harsh climatic conditions, Antarctica is a place of great natural beauty which inspires almost all who see it. Mountains rise straight from the sea to summits thousands of metres above; vast stretches of the coastline are icecliffs 30 to 50m high, the visible fronts of the ice shelves which extend downward for a further 200m; wave-worn icebergs of fantastic shape as well as the simply impressive tabular icebergs which calve from the ice shelves and may be as large as Belgium, afloat and moving under the influence of winds and currents. Then there is the wildlife: whales, which are becoming more numerous again now that whaling has virtually ceased; innumerable seals porpoising through the water or basking on ice floes or beaches and even more penguins which never fail to entertain. These are the unforgettable sights which were once the privilege of explorers and scientists only, but no longer. Tourists have discovered Antarctica.

Anyone with at least $10,000 to spare can now visit Antarctica on a tourist ship or, rather more adventurously, can fly inland and explore a mountain range from a static camp or even fly on south to the South Pole itself. Apart from such activities organised by tour operators there is a growing number of private yachts visiting Antarctica. Most of these visit the Antarctic Peninsula region where there are many bases to visit in comparatively sheltered waters as well as the wealth of wildlife and spectacular scenery to be photographed. There are also the mountaineers who visit Antarctica, largely on private expeditions, to climb and explore the last wilderness on Earth. Antarctica's mountains do not come into the first rank of the world's great mountains and they are rarely among the most spectacular as individual peaks but their very remoteness does provide a major new challenge for mountaineers. The Vinson Massif in the Ellsworth Mountains, the highest point of the continent at 4897m, was first climbed on 17 December 1966 by a United States mountaineering expedition led by Nicholas Clinch but, as its name suggests, it is not too spectacular. However, the nearby peaks of Mount Shinn, Mount Gardner, and Mount Tyree, also climbed by the 1966 expedition, are proving a magnet to climbers.

Similarly, the peaks of the Transantarctic Mountains in northern Victoria Land are attracting other climbers on account of their rather easier access.

When the new Protocol on Environmental Protection to the Antarctic Treaty was negotiated, four annexes on Marine Pollution, Waste Disposal, Conservation of Fauna and Flora, and Environmental Impact Assessment were incorporated. A fifth annex on Protected Areas was added at XVI ATCM in Bonn during October 1991 and, at that meeting, it was also agreed that an annex on Tourism should be discussed at the next ATCM. The provisions of the Protocol apply to all who visit Antarctica so that some delegates argued that there was no need for a separate annex to regulate tourists; other delegates felt strongly that tourism should be specified in a separate annex and that tourism should be defined. Obviously a shipload of fare-paying passengers is tourism but many readers of this article might be a little aggrieved at being classed as tourists. Certainly any non-governmental expedition bent on scientific research as its primary objective would be upset to be regarded as mere sightseers and understandably so. It may be, then, that there is a case for an annex on tourism.

This article has considered, very briefly, the past and the present in Antarctica but what of the future? The past and, to some extent, the present have provided the lore of Antarctica, the tales of the heroic exploits of our predecessors, but the future will be much more businesslike. Most of that business will be science in which many see little profit but there is undoubtedly profit in commercial tourism. However, it should not be forgotten that scientific research can also provide profit, often from quite unexpected quarters. Governments which have poured money into Antarctic research have not done so for purely altruistic reasons and many have surely hoped that there would be a financial return at some point in the future. Such a return, at least as regards mineral and hydrocarbon exploitation, has now been prohibited for a minimum of 50 years, but the controlled exploitation of the marine living resources, as opposed to the uncontrolled slaughter of the past, may yet contribute substantially to the world's food supply. But most important of all in this industrialised consumer age, Antarctica can serve as an indicator of the well-being of the planet. *Homo sapiens* will indeed be wise to heed the warnings that are written in Antarctic science and to conserve this unique continent for future generations to enjoy.

BIBLIOGRAPHY

W N Bonner and D W H Walton (eds), *Key environments – Antarctica*, Pergamon Press, 1985.

R Fifield, *International research in the Antarctic*, Oxford University Press for SCAR and ICSU Press, 1987.

G E Fogg and D Smith, *The explorations of Antarctica: the last unspoilt continent*, Cassell, 1990.

R K Headland, *Chronological list of Antarctic expeditions and related historical events*, Cambridge University Press, 1989.

J A Heap (ed), *Handbook of the Antarctic Treaty System*, (Parts 1–4), Polar Publications, 1990.

R M Laws, *Antarctica: the last frontier*, London, Boxtree, 1989.

O *Nordenskjöld, J G Andersson and C A Larsen, Antarctica, or Two Years Amongst the Ice of the South Pole*, Hurst and Blackett, 1905. [New edition: C Hurst, 1977.]

R E Priestley, *Antarctic adventure: Scott's northern party*, Fisher Unwin, 1914. [New edition: C Hurst, 1974.]

Reader's Digest, *Antarctica: great stories from the frozen continent*, Reader's Digest, 1985.

E H Shackleton, *South*, Heinemann, 1919. [New edition: Century, 1991.]

D W H Walton (ed), *Antarctic science*, Cambridge University Press, 1987.