

The importance of eating local: slaughter and scurvy in Antarctic cuisine

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A number of royal and small penguins and some seals were led by curiosity to visit us. They called, and cried, and talked, and grunted, as they walked over the ice about the ship. And were finally captured by the naturalist and the cook, who had an equal interest... in their future destiny.

– Frederick Cook, *Through the First Antarctic Night*¹

Unsafe for any living thing

A quick course in Antarctic 'heroic age' cuisine shows that living off the land was *de rigueur* in Antarctic exploration. Untold thousands of seals, penguins and penguin eggs, with more than a few sea birds thrown in for good measure, were consumed by expeditions scattered along the Antarctic coast. The menus were often as stark as the men were desperate. The carnage had actually begun in 1820, some eighty years before the official heroes of exploration arrived, with the oil harvesters (sealers and penguin hunters) who haunted sub-Antarctic waters for their well-insulated prey. The same wildlife they slaughtered for profit was eaten at dinner in a sort of survival cuisine. One mariner spoke of how delicious he found it: 'Manna from heaven could not have seemed more delicious than lumps of seal or penguin meat made into a hash with a handful of oatmeal.' The men made their island shoreline 'unsafe for any living thing.'²

When explorers and scientists stepped ashore at the turn of the twentieth century, these men of nobler purpose often ended up just as begrimed by the smoke of volatilized seal blubber as the hunters had been. All heroic age (defined here as between 1897 and 1922) expeditions found it necessary to harvest wild meat, though in varying proportions. Photos from nearly every terrestrial expedition show men shooting, gutting, and flaying the fat-rich seals, which were as edible and docile as pet cows. Easier to kill and far more useful for the larder than penguins, seals were usually shot at point-blank range, eviscerated and then separated from their densely-furred, mottled gray/brown skins. The quarter-ton Crabeater (*Lobodon carcinophagus*) or half-ton Weddell (*Leptonychotes weddellii*) carcasses were either cut up immediately or left to freeze for future use.

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¹ Frederick Cook, *Through the First Antarctic Night, 1898–1899: A Narrative of the Voyage of the Belgica among Newly Discovered Lands and over an Unknown Sea about the South Pole* (New York: Doubleday and McClure, 1900), 210.

² Jeff Rubin, 'Train Oil and Snotters: Eating Antarctic Wild Foods' (*Gastronomica – The Journal of Food and Culture*. Vol. 3, No. 1. 2003), 37–57. Quotes from F.D. Ommaney, 39 and 37.

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Every expedition that brought dogs fed them on seals, just as each group of men that suffered a catastrophe survived on whatever they could kill. But there were other key logistical reasons for the slaughter: To secure large amounts of local food, to provide fresh variety amid a bland litany of canned meat, and to fend off scurvy. I will briefly outline the issues behind these first two reasons – local availability and variety – and then explain in detail the problem of scurvy.

Food awaiting Antarctic explorers was food they did not have to purchase or transport. This was helpful, as often these expeditions departed under a cloud of debt. Exploration is a gamble, after all, and who likes to throw good money at eccentric men gambling with their lives for often rarified goals? Expedition leaders thus begged, cajoled, proselytized, politicked, lectured to universities and the public to stir government interest, wrote inspiring articles, offered exclusive commercial contracts for food and gear, fibbed about their plans, and promised rich donors the everlasting glory of geographical nomenclature. Despite the sponsors which provided large amounts of free goods in exchange for advertising, expeditions usually left the docks of Europe with bright flags and poor credit. They could little afford enough fresh meat for so many men for a year or two in the Antarctic, nor could they afford space for it aboard their usually undersized, underpowered wooden ships.

Ships were commonly so overloaded that they had little room for live sheep or cattle available in New Zealand or Australia on the way south. From the literature, there seems never to have been a ship headed for the Antarctic that was not dangerously top-heavy, chaotic on deck, and crammed to the gills below decks with food, gear and men. 'Like most expedition ships, she was grossly overladen,' writes R.W. Richards of the *Aurora* in 1914. '[W]e left with a heavy deck cargo of coal and cases of petrol stacked on top of the cook's galley (!) and on deck, where, incidentally, a fire broke out while at sea.'³ Thus, the local meat that awaited those crowded ships in Antarctic waters became as crucial to an expedition's logistics as it would be to their diet.

What the ships carried for food tended to be vast amounts of certain basic canned or dried items (often tasteless vegetables and bland meat), along with a sampling of fancier preserves. The fresh meat of seals and penguins, while unfamiliar, provided an opportunity to vary the menu. Whether this was a welcome change to the men of an expedition depended in good part on the

³ R.W. Richards, *The Ross Sea Shore Party, 1914–1917* (Cambridge: Scott Polar Research Institute, 1962), 5.

skills and experience of the cook. Fresh steaks, roasts and even fancier items like rissoles – deep-fried mince-filled pastry dressed with bread crumbs – were possible, but only if the fishy-tasting fat was completely removed. Only under conditions of starvation did these European arrivals find blubber palatable.

The heroic age coincided with a safer era of canning, since bacteriology had been first applied to the process in 1895, but this did not guarantee good taste or texture. Wilhelm Schwarz, cook of the 1901–1903 German South Polar Expedition, doled out fibrous tinned meat the men called ‘rope-yarn.’ So tasteless were these tins of food in general that it was easier for the Germans to distinguish the same product (e.g. canned beef) from different companies than it was to distinguish different products from the same company.⁴ A decade later, canned goods received better reviews in expedition narratives, but still much of the nutrition had been cooked out of them.

Food first ended up in cans because the British and French navies sought cheap, portable preserved foods as an improvement over staples such as salt beef, salt pork and salt brisket. Some of the first cans brought on board were medical supplies for ill sailors, partly in the vain hope that the canned items would cure scurvy. In Britain, the public began to grow enthusiastic about these preserved foods, particularly during the 1851 Great Exhibition in London, a massive display of commercial products from around the world. But just a few months later, their faith in the promise of cans was betrayed; a major scandal involving large tins of putrid, poor-quality meat turned the tide of public opinion. The main problem was that in response to the Navy’s quest for efficiency, manufacturers introduced cans too large to be fully cooked through. Pockets of bacteria remained.⁵ Over the next few decades, though, canning companies worked to improve quality, taste and variety, and slowly succeeded in tapping the home market at the same time they profited from military contracts. In the 1870s, for example, American kitchens had been transformed by the availability of a myriad of cheap cans, described sanguinely as a ‘kitchen garden where all good things grow, and where it is always harvest time. . . where raspberries, apricots, olives, and pineapples, always ripe, grow side by side with peas, pumpkins, and spinach; a garden with baked beans, vines and spaghetti bushes, and. . . through it running a branch of the ocean in which one can catch salmon, lobsters, crabs and shrimp, and dig oysters and clams.’ By the dawn of the heroic age, companies still promised more quality and taste than they could deliver, but were on track to provide reasonable, if monotonous, sustenance to these expeditions shipping off to Antarctica.⁶

Given the manifold psychological challenges men face at the end of the Earth, expedition leaders quickly learned that monotony in meals only exacerbated the intense sense



Figure 1. Charles Green skinning an Emperor penguin aboard the *Endurance* – Scott Polar Research Institute.

of isolation. Although some men – and these were the ones any leader would be grateful for – kept their *joie de vivre* regardless of harsh weather, hard work, frequent injury, difficult companions or poor food, most did not. Part of the problem was that the men came south with culinary expectations built out of the dawn of the industrial age. Most leaders and scientists, and some sailors, were well-educated men accustomed to a civilized diet, and who easily tired of gruel. The ‘addition of a few delicacies adds little to the cost of an expedition, but means a great deal to those engaged in it,’ as Dr. Alexander Macklin of the *Endurance* and *Quest* journeys wrote.⁷ Sometimes those delicacies came in the form of tinned jellies or tinned pheasant, and sometimes they lived at their icy doorstep. It is hard to overestimate the value of that first penguin egg in Antarctic summer to a voracious, gastronomically bored human, much less the perfectly cooked seal rissole to a group of men biding their time through the long polar winter (Figure 1).

Now imagine instead that would-be egg- or rissole-eater had for at least three months no fresh meat or vegetables at hand, and began to suffer aching joints, skin lesions and swollen limbs. Imagine dark, hemorrhaging gums protruding from his mouth. Imagine his teeth loosening, old wounds weirdly aching again, his mind succumbing to diet-induced depression. Then imagine his weakness increasing until death. This is scurvy, a simple if acute vitamin C deficiency, for centuries the bane of badly fed Europeans, particularly soldiers, sailors and polar explorers.

Embarking with nutritional deficiencies

Scurvy had become the mysterious, morbid companion to European voyages by the end of the fifteenth century, including those of Vasco de Gama, Magellan, Jacques Cartier, and Francis Drake, when ships were bold enough to stay at sea for several months. Sixteenth century English sea captain Sir Richard Hawkins said that ‘in his twenty years at sea he could give account of 10,000 men

⁴ Erich von Drygalski, *The Southern Ice Continent. The German South Polar Expedition aboard the Gauss 1901–1903*. Translated by M. M. Raraty (Alburgh, Harleston, Norfolk: Bluntisham Books and Erskine Press, 1989), 216.

⁵ An excellent account of the history of canned goods is available in Sue Shephard, *Pickled, Potted, and Canned: How the Art and Science of Food Preserving Changed the World* (New York: Simon and Schuster, 2000).

⁶ From James Collins, *The Story of Canned Foods* (Dutton, 1924), qtd. in Shephard, 247.

⁷ Frank Wild, *Shackleton’s Last Voyage: The Story of the “Quest”: From the Official Journal and Private Diary kept by Dr. A.H. Macklin* (London: Cassell, 1923), 355.

consumed with scurvy.' British Navy voyages over the next few centuries fared little better, with whole crews ravaged by the disease.⁸

This long and ugly history of scurvy is particularly tragic because most of the suffering could have been avoided with knowledge available at the time. Arctic and European cultures knew at least anecdotally that scurvy could be easily prevented or, when things had gone wrong, quickly cured by the consumption of raw green plants or fruit. More relevant to Antarctic exploration, Inuit cultures knew that large quantities of fresh meat, as long as it is raw or lightly cooked, will fend off scurvy as well.

Strangely, scurvy is not necessarily a disease of starvation; it is instead one of the diseases that result from incomplete nutrition. We can suffer or die while eating sufficient quantities of food which contain insufficient nutrients. Deprived of vitamin A, for example, we develop night blindness; without vitamin B₁, we contract beriberi (thiamine deficiency marked by fatigue and weight loss); without vitamin C, scurvy.

Vitamin C is ascorbic acid, ascorbic meaning literally 'anti-scurvy.' Plants and most animals synthesize it themselves, but primates cannot. Without vitamin C, we cannot produce collagen, an essential component of bones, cartilage, tendons and other connective tissues. Collagen binds our wounds, but that binding is replaced continually throughout our lives. Thus in advanced scurvy, old wounds long thought healed will magically, painfully reappear.

In a healthy individual, it takes at least two to three months without vitamin C before scurvy symptoms appear. Unfortunately, many people of the age were malnourished at home as well. Rapid European population growth had resulted in an urban, industrial society eating a diet mainly of grains, sugar and vegetable oils. Green vegetables, fruit, fresh meat and animal organs could be expensive or hard to find. Sailors in particular tended to be poor and, as one authority put it, when going to sea they often 'embarked with nutritional deficiencies.'⁹

That such deficiencies should still haunt Antarctic expeditions at the dawn of the twentieth century seems remarkable, considering that food had entered a new age of preserved and manufactured tastes. Raymond Priestley of the Northern Party (an autonomous team within Robert Falcon Scott's *Terra Nova* expedition) noted wryly that even in 1912 they 'learned over again the lesson of nearly all polar exploration: It is not the winter cold but malnutrition and starvation that are the greatest enemies of explorers.'¹⁰ Thus, at the same time that scurvy cast its shadow over these men exploring the inhospitable mass of Antarctic ice, Americans were treating themselves to Jell-O (1897), jelly beans (1898), and peanut butter and jelly sandwiches (1901).¹¹

⁸ Kenneth Carpenter, *The History of Scurvy and Vitamin C* (Cambridge: Cambridge University Press, 1986), 29.

⁹ Robert E. Feeney, *Polar Journeys: The Role of Food and Nutrition in Early Exploration* (Washington, D.C. and Fairbanks: American Chemical Society, 1997), 6.

¹⁰ Raymond Priestley, Inexpressible Island (*Nutrition Today*, 4(3):18-27, Autumn 1969), 18.

¹¹ Lynne Olver, The Food Timeline (<http://www.foodtimeline.org/>), a comprehensive and professionally-researched online food history source. (accessed 5/9/11; last updated 5/7/11).

Two great cooks

The best introduction to scurvy in the Antarctic, appropriately enough, is through the stories of two Cooks: Captain James Cook and Dr. Frederick Cook.

In 1773-1774, the great Captain Cook edged over the Antarctic Circle (66°33' South) a few times with the vessels *Resolution* and *Adventure* in the midst of his search for ice-clad southern lands. He was the first to sail so far south but, more to the point, did not lose a single member of the *Resolution* crew to scurvy. (The *Adventure* lost a few, including its cook, a 'dirty hinterland man, natural prey,' before Cook adjusted that ship's diet.) At a time when the disease was as common as sunburn in the British Royal Navy, when ships arrived in distant ports with half-dead crews, Cook's success was remarkable.¹²

Prevailing medical theories of the 1700s generally agreed that while fresh foods cured scurvy, their lack did not cause it. For example, the British naval surgeon Dr. James Lind, in a famous experiment in 1747, applied various dietary treatments to scurvy-ridden sailors and proved that one inclusive of fresh citrus would quickly cure the disease. Lind's work is considered the first controlled experiment in clinical nutrition, and predated the discovery of vitamins by 180 years. Unfortunately, he understood nothing about the mechanism of his success. Instead, Lind, like nearly all physicians of the day, created abstract, comprehensive theories – e.g. lack of oxygen in bodily tissues, canned food (ptomaine) poisoning, copper poisoning – to which he tried to fit the evidence. The trend of scientific knowledge in Europe from 1700 to 1770 actually led to a worsening of the scurvy problem by distracting physicians from the time-worn observation that the absence of fresh food created malnourished men.

By order of the British Admiralty, as an experiment to determine which alleged antiscorbutics might prove the most effective, Cook carried sauerkraut, salted cabbage, 'rob' of citrus (evaporated orange and lemon), wort of malt (a fermented drink of sprouted barley), portable soup (dried animal offal), saloup (a medicinal drink made from plant roots), carrot marmalade, soda water and mustard. But Cook's Antarctic voyage provided no clear experimental results. He carried too many possible cures and applied them without controls. Cook knew firsthand the value of fresh greens, fresh fruit, and sauerkraut as antiscorbutics but also praised sugar and malt (which contain little to no vitamin C), as well as fresh water and good hygiene. Still, through the eventual advocacy of another influential Navy physician, Sir Gilbert Blane, the inclusion of lemon juice on Navy vessels became mandatory from 1796 onward, and cases of scurvy were significantly reduced.

By the mid-1800s, however, citrus was erroneously discredited. The Navy bureaucracy, seeking efficiencies, replaced fresh juice with a lemon concentrate, distilled and bottled. Though they did not know it, the heat of distillation and a chemical reaction with copper pots (in which the

¹² Cook's story is well-told both in Feeney, *Polar Journeys*, and Carpenter, *The History of Scurvy and Vitamin C*. Quote here is in Feeney, 115, but originates in J.C. Beaglehole, *The Life of Captain James Cook* (Stanford: Stanford University Press, 1974), 338.

lemon juice was heated) and copper tubing destroyed much of the vitamin C. Then when West Indian limes, with only two-thirds the vitamin C and of variable quality, replaced Mediterranean lemons, scurvy returned to the high seas. The 1875 Nares expedition to the Arctic, for example, was forced to return early to Britain after sixty cases (with four deaths) of the disease.

Not long afterward, in 1897–1899, Adrien de Gerlache sailed the *Belgica* into Antarctica's ice-filled waters. This first major scientific expedition of the heroic age was staffed by a young, polyglot crew from Belgium, Norway, Romania, Poland and the U.S., and included two future giants of polar exploration: Roald Amundsen, eventual conqueror of the South Pole, and Dr. Frederick Cook, future false claimant to the North Pole. Despite the ignominy that would haunt him ten years thereafter, Cook was at the time of the *Belgica* journey perhaps the greatest non-native practitioner of polar medicine, and the eventual savior of the *Belgica* crew.¹³

From an earlier Arctic expedition with Robert Peary, Frederick Cook learned beyond doubt that a diet of fresh food prevented scurvy. Cook spent fourteen months with the Inuit of northern Greenland and made careful observations of dietary and other adaptations to polar life. His hosts thrived on a diet of mostly raw or lightly cooked meat and fish, having little access to fruit and green leafy vegetables.

Other westerners had observed this, certainly, but Cook's genius was his two-fold conclusion that the dread disease was the result of a dietary deficiency and that cooking food could make it nutritionally deficient: 'Scurvy is in the shadow line between tinned food and raw meat. In the process of cooking and preserving, something vital to our lives is in part destroyed. . . The effect on all of us half-witted whites is the same, while the Eskimos are in full vigor. Raw meat is the answer.'¹⁴

In Antarctic waters, the *Belgica* crew had expected to retreat north before winter set in. But Gerlache led the ship deeper into the ice, which then trapped them. Only four sets of cold weather clothing were aboard, and the ship carried perhaps a year's worth of food. The ice could easily keep them for two years or more. In the darkness of an unplanned winter, an atmosphere of frozen, perilous uncertainty turned at times to frustration, panic, anger and lunacy. Depression was common among the 'madhouse' crew of the ice-trapped *Belgica* and two sailors went insane. One never recovered. Even the ship's cat turned strange and died.

What little antiscorbutic food they had was exhausted early, with ineffective canned food as the only replacement. Frederick Cook also noted that their digestive systems rejected the tinned stuff, most of which tasted not like food with natural fiber but like 'laboratory mixes in cans. . . hashes under various catchy names; sausage stuffs in deceptive forms, meat and fishballs said to contain cream,

mysterious soups, and all the latest inventions in condensed foods.'¹⁵ They suffered 'gastric inertia' as a result. Worse, scurvy symptoms soon appeared.

Thus Cook, with support from the young Roald Amundsen, recommended to Gerlache that everyone on board eat fresh penguin and seal meat daily. The commander, however, took offense. The British Navy put its faith in lime juice, he said, and who knows more about scurvy than the Navy? Moreover, Gerlache had sampled the animals (badly prepared by cook Louis Michotte) and found them so disgusting that he actually tried to ban them from the *Belgica*. It did not help that even Cook compared the taste of penguin to 'a piece of beef, odiferous cod fish and a canvas-backed duck roasted together in a pot, with blood and cod-liver oil for sauce [Figure 1](#).'¹⁶ As such, scurvy also contributed to the death of magnetics expert Emile Danco, who refused to eat this strange new flesh.

In his position as doctor to the expedition, however, Cook was by late winter able to prescribe the meat as medicine rather than food. Those who obeyed first showed an immediate response: 'I am not dead!' wrote captain Georges Lecointe, 'The coma into which I plunged yesterday did not even last very long. I came out of it, mechanically ate a piece of penguin meat and, a few hours later, I woke up feeling much stronger.'¹⁷ Taking no chances, Lecointe ate penguin every day until they left Antarctic waters.

Initially, Roald Amundsen had been ill with scurvy too. As he recovered under Cook's guidance, the Norwegian helped bring the *Belgica*'s crew back to life with the fresh meat he actively hunted: 'Six seals with a layer of fat three inches thick appeared near the ship yesterday morning. Their fate requires no further explanation.'¹⁸ Amundsen, though, seems to be the only one who actually liked it. 'Penguin meat tastes excellent,' he wrote, 'but you must ensure that all the fat is cut off the meat. It does not need to be treated with vinegar to make it taste good; you simply take the meat as it is and fry it in a pan with a knob of butter.'¹⁹ Some of it he ate raw. One Emperor penguin (*Aptenodytes forsteri*), which can weigh up to ninety pounds, was enough to feed twenty-five men, but Amundsen preferred the tender meat of the fourteen-pound Adelie (*Pygoscelis adeliae*).

That Amundsen, at the time an unknown Norwegian second mate, would go on to be the first explorer to sail the whole Northwest Passage, the first to reach the South Pole, and the first to reach both Poles, among many other achievements, could scarcely have been imagined by his miserable companions. Thanks in part to Cook's instruction on the *Belgica*, Amundsen's future expeditions to both Poles never suffered from scurvy, a claim very few contemporary explorers could make.

By the end of July they were living mainly on penguin meat, with a marked improvement in the crew. Gerlache was the last to consent, and thus the last to be cured, but

¹³ Cook was also a pioneer researcher of what a century later would be known as Seasonal Affective Disorder. See Ralph M. Myerson's Frederick A. Cook, MD.: the art and science of medicine aboard the *Belgica*, in Hugo Declair and Claude De Broyer, eds., *The Belgica Expedition Centennial: Perspectives on Antarctic science and history. Proceedings of the Belgica Centennial Symposium, 14–16 May 1998, Brussels*, (Brussels: Vub Brussels University Press, 2002). See also Amundsen, *Belgica Diary*, 131.

¹⁴ Amundsen, 119.

¹⁵ Cook, *Through the First Antarctic Night*, 302.

¹⁶ *Ibid.*, 234.

¹⁷ Quoted in Roald Amundsen, *Belgica Diary* (Norwich: Bluntisham Books and Erskine Press, 1999), 124–125.

¹⁸ Amundsen, 99.

¹⁹ *Ibid.*, 92.

soon offered rewards to the crew for bringing in penguins for the larder – one frank for living birds, fifty centimes for dead ones. This was easy money, as it turned out. The crew learned in their final months that they could summon both penguins and seals to the ship by simply playing a tune on their cornet.

In an ironic event that might have spelled the death of the expedition, Frederick Cook spent a frosty midwinter night alone, away from the ship, to observe the stars from his sleeping bag. His hair froze to the hood of his bag, but he avoided a worse fate. On returning to the ship at dawn, he learned that Lecointe, not knowing of my presence on the ice, had taken me for a seal, and was only waiting for better light to try his luck with the rifle.²⁰

It paid for its cheek with its life

After the *Belgica*, scurvy lurked in the shadows, appearing in its full-blown form on nearly half of heroic age expeditions. These expeditions had neither brought the right food to cure scurvy nor in many cases were they wise enough to make proper use of fresh, local meat. But scurvy-ridden or not, Antarctic expeditions had a relationship with wildlife that always turned ugly; someone had to die.

Nicolai Hanson, zoologist on Carsten Borchgrevink's 1898–1900 *Southern Cross* expedition, found his fate particularly tied to the wildlife of Cape Adare. First, on the voyage south, his gun failed as he tried to kill a sleeping seal on an ice floe. He gave it an ice pick to the head instead, but the enraged seal attacked Hanson, who leapt onto the seal's back while still wielding the pick. But as Louis Bernacchi wrote, Hanson's 'place of refuge was extremely unstable.' Hanson slipped backward, and the seal literally crawled across him in its anger, working its powerful jaws. The zoologist fought back successfully and killed his seal, but he was in bad shape afterward, for as he said, 'it is not the most healthy occupation to have a big seal dancing about on one's chest.'

Hanson later died of a mysterious disease during the winter at Cape Adare. While it may have been beriberi (vitamin B deficiency) aggravated by their bland diet and difficult life, his illness was thought at the time to have a pre-Antarctic origin.²¹ Remarkably, as Hanson lived his final hour, the first Adelie penguin of the year returned to Cape Adare. It was captured and brought to the zoologist, who quietly asked, 'Is it full grown? Let me see its tail. . . Yes, it is full grown.' A few minutes before he died, he said, 'It is not so hard to die in a strange land, it is just like saying goodbye to one's friends when starting on a long journey.' Within days, half a million Adelies had arrived to take the zoologist's place on the peninsula.

Having an Adelie colony at their doorstep meant that the hungry expedition was able to steal four thousand eggs and pack them in salt. The expedition's egg-gatherers were its dog handlers, Ole Must and Persen Savio, two Sámi from northern Norway. Born to a traditional Nordic life, Per and Ole were more at home in the wild than Hanson, and so thought little of herding a Weddell seal back to camp rather than attacking it in the field. They brought it in, as

Borchgrevink noted, 'just as peasants at home drive their cattle to market.'

Unique in exploration, Erich von Drygalski and the 1901–1903 *Gauss* expedition hired an Emperor penguin to run a rope under the keel of their ice-trapped ship. Its payment was freedom, a gift few penguins received from the Germans. The line was part of the scientists' rig to dredge the ocean bottom as they drifted with the sea-ice off the Antarctic coast. They tied a cord to the Emperor's leg before chucking it into a small pool of open water at the bow. After trying to resurface there, and being chucked back in again, the penguin showed up at the stern, but without the rope. This was repeated twice more, 'the bird having been again careless,' before success and the bird's release.²²

Few wildlife stories ended as happily on the *Gauss* expedition. Long lines of curious penguins marched across the ice and right into camp, which almost always meant death as dog food, human food, or fuel for the boiler. A stew of penguin heart and liver became a crew favorite. Drygalski calmly describes a litany of slaughter, though shows moderate concern at times for the penguins walking wounded and bloody for days after being attacked by dogs. Often, seaman Leonhard Müller could be seen 'for all the world like the divine herdsman Eumaeus, rounding up his penguins for subsequent service in his beloved train-oil kettle in the boiler-room,' where their fatty bodies burned with a bright flame.²³ (Train oil is an old term for rendered blubber.) Seals too were boiled down, giving a 'satisfying' eight and a half kilos of oil from ten kilos of blubber.²⁴

At expedition's end, as the *Gauss* broke free of the ice, Drygalski noted a single Emperor 'waving its flippers as if in farewell.' Remains of penguins and seals drifted down into the cold waters from whence they came or were visible protruding from the filthy snow, 'a clear sign that thirty-two men had lived here for a year.'²⁵

Jean-Baptiste Charcot's 1903–1905 *Français* expedition is notable not just for its scientific and exploratory successes, but for its leader's marked empathy for wildlife. He was practical – he imagined making shoes from penguin skins – but he found it 'very painful to have to kill these fine and gentle beasts.'²⁶ Charcot's sensitivity and pragmatism often clashed in his expedition account. On one day, he poetically transferred his guilt to a seal corpse hanging from the *Français*' rigging, 'silhouetted against the grey mist, like a criminal swinging from a gibbet,' but on another he mentioned offhandedly that seal pups provide very tender meat.²⁷

As for penguins, the French crew thought the meat compared well in texture and taste to mule. Charcot regretted the gathering of penguin eggs, but they were a boon to the crew's health after the long winter. By early summer they were living on penguin eggs almost exclusively, harvesting over eight thousand, not counting those eaten raw

²² Drygalski, 161–162.

²³ Drygalski, 32.

²⁴ *Ibid.*, 219.

²⁵ *Ibid.*, 284.

²⁶ Jean-Baptiste Charcot, *Toward the South Pole Aboard the Français: The First French Expedition to the Antarctic 1903–1905* (Bluntisham: Bluntisham Books and Erskine Press, 2004), 71.

²⁷ *Ibid.*, 47.

²⁰ Cook, 215.

²¹ Michael H. Rosove, *Let Heroes Speak: Antarctic Explorers, 1772–1922* (New York: Berkley Books, 2000), 80.

by the crew on the spot. Though the penguins usually lay only two eggs, under the harvest pressure exerted on them by the *Français* crew, they laid up to eight, though the latter ones were smaller, and thus less likely to survive. Charcot tried to console the surviving parents with gramophone concerts.

Some Adelies, in what the expedition leader noted as ample proof of their intelligence, several times sought his protection from the dogs: 'Two of them, pursued... came to seek refuge between my legs, and certain of being in a place of safety, turned round to face their enemy. They only left me when the dogs had returned on board.'²⁸ Being the poetic sort, he also imagined the tales penguin in years hence would tell of the strange tall creatures that came among them, 'sometimes beneficent, sometimes hostile,' and of their four-legged companions, the 'fierce, cruel, devilish hairy monsters with long tails, red tongues and teeth which tore flesh and brought death.'²⁹

What Charcot had trouble imagining was the truth about scurvy. On this first expedition, one of his cook's sample menus from April (early winter) of 1904 shows only three meals per week included fresh portions of *Phoque* (seal) or *Pingouin*, though there was plenty of vitamin-deficient tinned meat (*Boeuf*, *Veau*, or *Tete de veau nature*) and vegetables (*Petits pois*, *Haricots verts*, *Choux*, *Jardinière*). Charcot's dislike of hunting may have deprived his French crews of vitamin C. Although their symptoms of scurvy were not fully expressed, by midwinter Charcot and his French crew exhibited various signs of nutritional deficiency, including lethargy, exhaustion and depression.³⁰

Five years later, Charcot returned on his second Antarctic expedition, this time in the *Pourquois-Pas?*. And again, Charcot and many of his men (including the cook, Modaine) were affected badly by scurvy during the winter. This time, though, they sought a cure in fresh meat, exercise and antiscorbutics such as sauerkraut, tomatoes, dried vegetables, fruit jam and lime juice. Two of his scientists grew hyacinths, watercress and onions under a ship's skylight. But Charcot was still tangled up in conflicting theories of scurvy. He wrote of his confidence that their diet was 'evidently more than sufficient to save us from the scurvy that attacked the expeditions of old; but it will be seen that these ordinary precautions were useless against what one may call modern scurvy – or, more strictly speaking, preserved-food sickness.'³¹

The discrepancy between his first-hand experience of fresh meat as antiscorbutic and the idea of 'preserved-food sickness' was rooted in an inverted logic: Scurvy was clearly provoked by some sinister element in canned foods rather than by the absence of fresh meat, because the symptoms disappeared when the cans were left on the shelf. Charcot could not see that the fresh food which replaced the cans, if eaten in sufficient quantity, provided the necessary nutrients for health. For all of his empathy,

²⁸ Ibid, 38.

²⁹ Ibid, 39.

³⁰ Ibid, 90–91.

³¹ Charcot, *The Voyage of the Why Not? in the Antarctic: The Journal of the Second French South Polar Expedition, 1908–1910*. Tr. by Philip Walsh. (London: Hodder and Stoughton, 1911), 19.

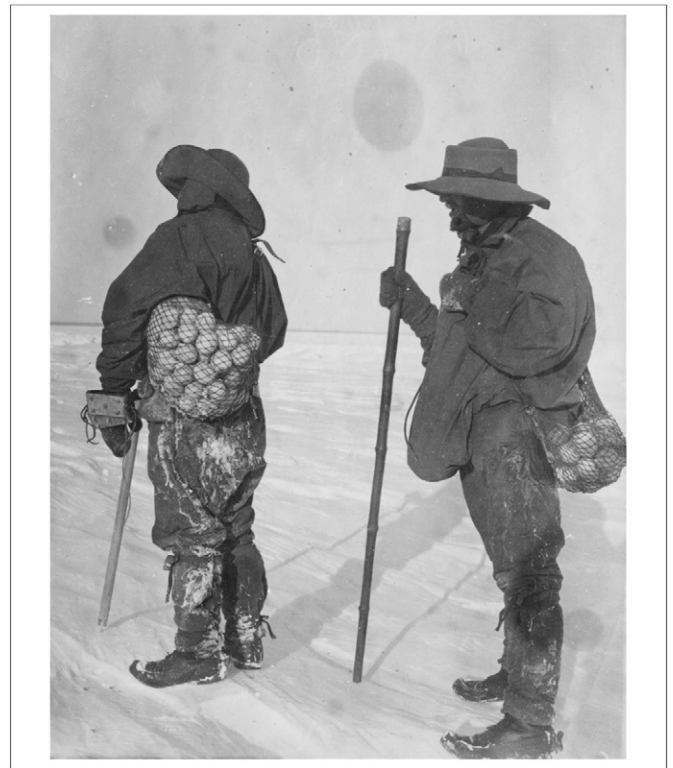


Figure 2. Gathering penguin eggs on Robert Falcon Scott's 1901 *Discovery* expedition – Royal Geographical Society (with IBG).

Charcot still had not trusted the answer to the scurvy question found in the traditional wisdom of the Arctic and explained in modern terms in Frederick Cook's account of the *Belgica*.

Seal meat and scurvy were both conundrums to Robert Falcon Scott, leader of the 1901–1904 *Discovery* expedition (Figure 2). For one thing, Scott, like Charcot, disliked butchering wildlife, having an aversion to the sight of blood. And while seal meat was no more distinct than any other beast for the table, the odd 'very dark mahogany color' and hard-to-define flavor of seal (neither fish nor fowl, beef nor mutton) left him perplexed. On blubber, though, Scott was clear. It was 'an abomination both in taste and smell' and even a morsel left in to fry with seal steak was enough to make him lose his appetite.³²

The *Discovery* crew did eat some wild foods. A dish of seal kidneys and liver became a favorite breakfast variation. Lunches alternated between seal meat and canned meat, while dinner tended to be leftovers from lunch. But their diet was largely composed of refined or processed foods, and the modicum of seal meat turned out to be insufficient for their nutritional needs, in part because the meat was probably overcooked. *Discovery* cook Charles Clarke's 'toothsome' cakes may have been tasty, but they would no more prevent scurvy than would Scott's sniffing tin cans for spoilage, or 'the virus of the bacterium of decay' as he understood the disease's cause to be.³³ Their refined diet bore its black fruit the next summer as crewmen on various journeys came trudging back with spongy gums and discolored limbs.

³² Robert Falcon Scott, *The Voyage of the Discovery*, in two volumes (New York: Cooper Square Press, 2001), 1:130–131.

³³ Ibid, 1:550.

Robert Scott's ideas on scurvy were shaped by his head surgeon, Dr. Reginald Koettlitz, one of just three men on the expedition with polar experience. Koettlitz was convinced that there was no such thing as an antiscorbutic, that in fact scurvy was a disease caused by bacteria. In part, this was because of the failure of lime juice in the Navy, and in part because he was influenced by germ theory. Though successful in explaining infection, germ theory simply confused the situation with scurvy. It made sense to the medical establishment that some negative agent in the cans of meat caused scurvy, since lime juice was ineffective and fresh meat brought men back to health. Their prime suspect was ptomaine, a nitrogen compound given off by rotting protein.

To his credit, Scott took practical steps after the outbreak. Aside from the arcane fluffing of beds and cleaning of the ship, and wondering in his journals about the source of his ptomaine, Scott agreed to the butchering of as many seals as were necessary. Once they located sufficient seal meat – one large carcass lasted the crew only two days – it was served daily and tinned meat was set aside. At this news 'there were not a few downcast faces,' Scott wrote in his journal, but within a fortnight he said 'I do not think there is a man who would go back to tinned meat.'³⁴ Their bodies recognized good food. Soon the men took turns waiting at a seal's breathing hole on the ice with a barbed harpoon.

As they began their second winter, 116 seals were stored frozen in a snow trench, and 551 South Polar skuas (*Catharacta maccormicki*) were hung from the *Discovery's* rigging. The fierce skua, a four-pound, brownish predator with a four-foot wingspan, was initially considered an 'unclean, carrion-feeding bird,' but upon experiment the men learned that its plump carrion-fed breast made a fine meal for two.³⁵ Scott deplored the lack of penguins in their menu (only at the end of the expedition did they find a nearby colony), but made do for carnivorous variety at lunch with frozen New Zealand mutton on Sunday, skua on Tuesday, and seal heart or seal steak on most other days. Kidneys were used for pies, livers were added to two breakfasts a week, but the sweetbreads – thymus and pancreas – apparently never got farther than the mouth of cook Charles Clarke. Thursday, the only day they ate tinned rather than fresh meat, became known as Scurvy Day.

'I have come to the conclusion that life in the Antarctic Regions can be very pleasant,' Scott wrote at the end of the *Discovery* expedition, after a final meal of penguin liver and seal kidneys.³⁶ That he would die eight years later in his miserable, malnourished, starving return from the South Pole speaks not just to the length of time he would be away from the antiscorbutic abundance of the coast, but also to the abiding confusion about the nature of the disease.

Certainly he seemed to have learned his lesson. Scott's 1910–1912 *Terra Nova* expedition ate plenty of wildlife while at the Cape Evans hut, built just a few miles south of the Adelie penguin colony at Cape Royds. Each man ate one to two pounds of fresh seal meat per day. The men

sought variety in these meals, but Tryggve Gran (a Norwegian ski expert recruited by Scott) noted that some experiments did not fare well: 'Seal is splendid fried in butter, but fried in penguin fat, as it was tonight, it is dreadful.'³⁷

During the first winter, as they prepared for next summer's assault on the South Pole, surgeon Dr. Edward Atkinson gave a lecture on scurvy. The lecture was one of many given during the winter meant to entertain or inform. For readers now it sounds like both, a medical equivalent to *The Blind Men and the Elephant*. Rather than describing the mysterious disease in its simple entirety, Atkinson brought forth brilliant observations of isolated symptoms. Thus, instead of discussions of diet he offered hypotheses concerning alkalinity of urine and acidity of blood. Instead of cautioning against malnutrition, Scott's men were told to beware tainted food, damp, cold, over-exertion, bad air, bad light, 'and the possibility of [bacterial] infection in epidemic form.' Atkinson admitted fresh vegetables cured scurvy, but despite the experience of recent polar expeditions, 'was doubtful of fresh meat.'³⁸

Atkinson himself is not to blame. His blindfold was prevalent in a profession influenced by germ theory and by the requisite pride that early twentieth century medicine took in its accomplishments. In this mindset, the best answers all lay in the future rather than the past. That said, Edward Wilson, Scott's friend and the other physician on the expedition, took a more pragmatic view of Atkinson's ideas: 'Wilson is evidently slow to accept the 'acid intoxication' theory; his attitude is rather 'non proven'... He proved the value of fresh meat in Polar regions.'³⁹ The notion that medical science was building slowly and logically toward the best possible answers was undercut by what information it had chosen to ignore.

By March of 1912, Scott and the last of his companions were dead in a tent on the Ross Ice Shelf, the contributing causes as various as too little food and a dearth of snowshoes for their Manchurian ponies. Slight improvements in weather, planning or skiing technique might have saved them.

Much has been written about the role of diet when determining whether Scott was at fault in the death of the Pole party.⁴⁰ Did they suffer from scurvy? Or did they merely starve? On the one hand, the examples of Inuit diet, Frederick Cook on the *Belgica*, and the concurrent scurvyless expedition of Roald Amundsen suggest that Scott and his surgeons failed to learn what others knew. Their trail rations were nearly devoid of antiscorbutics, and they may have embarked for the trail nutritionally deprived, due to a

³⁷ Tryggve Gran, *The Norwegian With Scott: Tryggve Gran's Antarctic Diary 1910–1913* (London: HMSO Books, 1984), 75.

³⁸ Robert Falcon Scott, *Scott's Last Expedition* (London: John Murray, 1929), 301.

³⁹ *Ibid.*

⁴⁰ Historian Roland Huntford saw inadequate preparations and inept leadership everywhere in Scott's story, not least in his dealings with scurvy. Scott, he wrote in *The Last Place on Earth*, after two years planning for the Pole "had not yet considered the subject of Polar diet," a perhaps overzealous claim. Noted explorer Sir Ranulph Fiennes in his 2004 work *Race for the Pole* worked hard to reinstate Scott's reputation after Huntford's brilliant polemic, but at times did so to a fault. In his discussion of scurvy, for example, he hedged his argument about malnutrition in the Pole party. Their rations were vitamin deficient, he acknowledged, but maintained that the men were not malnourished. For Fiennes, "Food was only responsible for the death of Scott's men through its absence at the end" (Fiennes, 337).

³⁴ *Ibid.*, 1:547.

³⁵ *Ibid.*, 2:176.

³⁶ *Ibid.*, 2:320.

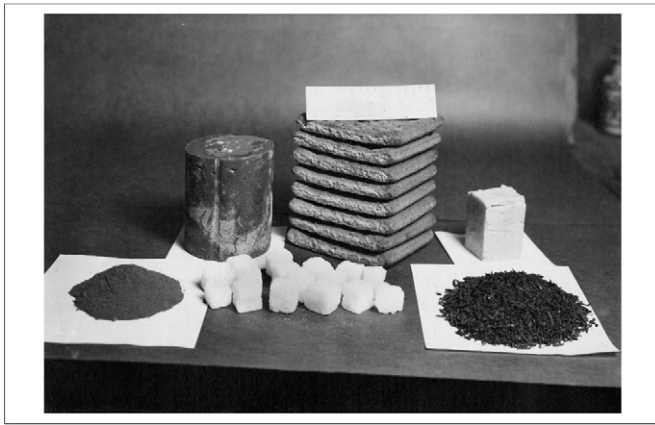


Figure 3. *Terra Nova* expedition trail cuisine: one man's daily rations of pemmican (removed from its can), biscuits, butter cocoa, sugar and tea – Royal Geographical Society (with IBG).

typical British diet supplemented by overcooked seal meat (Figure 3).

But Scott at least acted according to the notions of orthodox medicine. The very idea of antiscorbutics had been discredited. Furthermore, their frozen bodies apparently showed no indications of scurvy, nor is there a mention of the disease in the diaries of the dead men. It is possible that chunks of pony meat they ate for ten days after three and a half months on a poor sledging diet may have alleviated scurvy symptoms, but pony meat had not prevented Shackleton's *Nimrod* Pole party from developing scurvy three years earlier.

Certainly they starved. But Apsley Cherry-Garrard, companion to Scott on the final expedition, also concluded years afterward that the Pole party's diet 'was seriously deficient in, if not absolutely free from, vitamins.'⁴¹ Scott could have known nothing about vitamins, however, as his death predated their discovery. Cherry had stood over the glassy bodies of his friends when their tent was discovered seven months later, and heard the ice in Scott's arm break as his diary – the beautiful writing of which apotheosized British heroism against impossible odds – was extracted. That heroism, as nutritional chemist Robert Feeney put it, 'could not compensate for the poor knowledge of human nutrition at the time.'⁴²

A strange and somehow symbolic event occurred during the saddened *Terra Nova* expedition's second winter. On a stormy April night many weeks after Scott's party had been given up as lost, a bang on the hut door startled Trygve Gran. Gran, with the wild notion that Scott had risen from the dead, suddenly 'rushed out of the hut into the blizzard. Something loomed up and I ran toward it. Ugh! A big emperor penguin was paying us a visit. It paid for its cheek with its life.'⁴³ Why the emperor was knocking at the door seems to have been ignored. Assuming that Gran's account is valid, it is interesting to note the intelligence of a penguin knocking on the hut door, and to record the irony of the self-delivery of food that could have saved Scott's life.

⁴¹ Apsley Cherry-Garrard, *The Worst Journey in the World* (New York, Carroll & Graf, 1992), 620n.

⁴² Feeney, 147.

⁴³ Gran, 191.



Figure 4. Roald Amundsen's meat tent at Framheim – from Amundsen's *The South Pole*.

Meanwhile, Roald Amundsen and his Norwegian team on the 1911–1912 *Fram* expedition knew no more than Scott about the existence of vitamins or the dietary mechanisms of scurvy, but Amundsen had first-hand experience from both polar regions of how to prevent and cure it. After his time with Frederick Cook in the *Belgica*, Amundsen had led the first expedition to sail the full length of the Northwest Passage. In doing so he spent nearly two years among the Netsilik Inuit in the Canadian Arctic, and stayed healthy eating as they ate. It did not take him long after returning to Antarctica to put his knowledge to work.

Amundsen brought plenty of preserved Norwegian cloudbberries and whortleberries, known antiscorbutics. And as a native-trained polar explorer, he sought blood: 'Scurvy, the worst enemy of Polar expeditions, must be kept off at all costs, and to achieve this it was my intention to use fresh meat every day (Figure 4).'⁴⁴ Two hundred fifty seals were shot, most of them soon after the *Fram*'s arrival. True to his word, Amundsen ensured that lightly cooked meat was consumed throughout the winter preceding the trip to the Pole. Moreover, seal meat was cached in the regular depots his team had established en route, so that it was readily available (along with their sledging rations) to prevent any malnutrition acquired while on the trail. As it turned out, the fresh frozen meat was superfluous. Their pre-trip nutrition, the speed of their journey, the consumption of sled dog meat, and the quality of rations all contributed to the Norwegians' health. Men and (surviving) dogs all *gained* weight on the return trip.

Penguins ('tourists,' Lieut. Kristian Prestrud called them) were rare visitors, but as Amundsen and his men built the hut at Framheim, an Emperor 'gave exactly the impression of having come up simply to pay us its respects. We were sorry to repay its attention so poorly, but such is the way of the world. With a final bow it ended its days in the frying pan.'⁴⁵ Like the beheaded Emperor, Amundsen would find himself in the frying pan of public scrutiny in the years to come, long after he left Antarctica to inform the warm world of his accomplishment. Robert Scott's beautiful deathbed writing would turn the discussion about the race to the South Pole toward notions of honor and courage,

⁴⁴ Roald Amundsen, *The South Pole: An Account of the Norwegian Antarctic Expedition in the Fram, 1910–1912*, Tr. by A.G. Chater (New York: Cooper Square Press, 2001), 1:51.

⁴⁵ *Ibid.*, 1:185–186.

and so away from issues of diet, nutrition and the vagaries of scurvy.

Coincidentally, in the four years before Amundsen sailed from Norway to Antarctica, the first clinical trials to clearly establish scurvy as a dietary deficiency had taken place just a few fjords away. Norwegian sailors had for the previous decade been suffering from beriberi because the government altered its bread ration from traditional hard rye made with yeast to soft white stuff made with baking powder. The cause was not known at the time, but Norwegian researchers Axel Holst and Theodor Frølich system-

atically deprived their test subjects of normal diets until they died, and then examined the corpses. The test subjects were small, cheap, fuzzy, and available, having become a popular children's pet: guinea pigs. What the researchers did not know was that they had accidentally chosen an animal that shares with primates the inability to synthesize its own vitamin C. Guinea pigs fed just grains without veggies died differently than those starved on a complete diet; like so many heroic age Antarctic explorers, these victims of deprivation showed loose teeth, bad gums, and hemorrhaging limbs.⁴⁶

⁴⁶ Carpenter, 174–176.