Benjamin Leigh Smith's first Arctic expedition: Svalbard, 1871

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Received July 2005

ABSTRACT. Despite five difficult and distinguished scientific expeditions to Svalbard and Franz Josef Land between 1871 and 1882, the British yachtsman and explorer Benjamin Leigh Smith published no detailed account of his expeditions. Best known for a dramatic shipwreck at Cape Flora in Franz Josef Land in 1881, his early work in Svalbard — particularly his first effort when he developed the Arctic voyaging and scientific techniques he would employ on his subsequent expeditions — has received scant attention. In the summer of 1871, Leigh Smith launched the first of three consecutive annual geographic and oceanographic explorations of Svalbard. His unpublished 1871 journal details his growing appreciation of and expertise in the European high Arctic; corrects misstatements in later accounts of this first effort; details his exploration of Hinlopenstretet and the discovery and naming of Brochøya, Foynøya, and 31 other points in northeast Svalbard; and offers glimpses of an explorer who kept his personality well-hidden behind pioneering oceanographic and geographic observations of Svalbard and its surrounding seas.

Contents

Introduction 1
Background to the 1871 expedition 1
Early stages 3
Tromsø to Svalbard: the first ocean stations 4
Circumnavigating Danskøya and rounding Hakluythovden 5
The exploration of Hinlopenstretet 7
The limits of Svalbard 9
To the edge of the world 10
Sojourn at Kapp Petermann and return 11
Aftermath 12
Conclusions 12
Acknowledgements 13
References 13

Introduction

Benjamin Leigh Smith was born in East Sussex, England, on 12 March 1828 into a wealthy and politically progressive family (Credland 1980: 127–128; Cromack and Riffenburgh 2000: 305). His father, also named Benjamin, was a Member of Parliament for three years and encouraged his children to engage in independent travel as well as thought. Leigh Smith entered Cambridge at 20, where he was reputed a good shot and yachtsman. He earned a BA (1857) degree from Jesus College and was admitted to the Bar but did not practice. Instead, he earned a Master's certificate to gain the competence to sail his own ships (Jones 1975: 24).

Unlike other contemporary yachtsmen, who organized sailing trips to the far north to hunt exotic species and navigate in high latitudes, Leigh Smith (Fig. 1) was preoccupied with the scientific exploration of the Arctic. Between 1871 and 1882, his five expeditions all sought to engage in surveying of uncharted Arctic coastlines, conduct oceanographic research, and gather geological and biological specimens for natural history collections in Britain.

Five years after his last Arctic expedition, aged 59, Leigh Smith married Charlotte Seller, a woman some 30 years younger. They had one son, Philip. Despite the active scientific research practiced on his polar expeditions, Leigh Smith published no detailed account of his expeditions, leaving it to Clements Markham and others to write up his results from his expeditions to Franz Josef Land for the proceedings of the Royal Geographical Society and the Zoological Society of London. John C. Wells, a Royal Navy captain asked by Leigh Smith to oversee the oceanographic stations of the 1872 expedition to Svalbard, described him in his published account of the expedition simply as 'a friend' (Wells 1876: 53), but otherwise did not identify him across 355 pages. Whenever the RGS asked Leigh Smith to lecture on his expeditions or receive a medal for them, he always managed to find a reason why he could not attend.

No doubt as a result of this intense privacy and modesty, Leigh Smith was, despite his accomplishments, largely forgotten by the time of his death at Hampstead on 4 January 1913. His name survives in the gazetteers as a *kapp* (cape) and *breen* (glacier) in Svalbard (both discovered during his 1871 expedition there), and a sound in Franz Josef Land.

Background to the 1871 expedition

In the spring of 1871, apparently influenced by Lord Dufferin's *Letters from high latitudes* (1857) and Sir James Lamont's *Seasons with the sea-horses* (1861), both chronicles of early British private Arctic tourism (Jones 1975: 24; Credland 1980: 128; Cromack and Riffenburgh 2000: 305), Leigh Smith decided to sail far beyond the usual courses encountered as a member of the New Thames Yacht Club. He purchased an 85-ton topsail schooner named *Sampson* from a John Pallisser of

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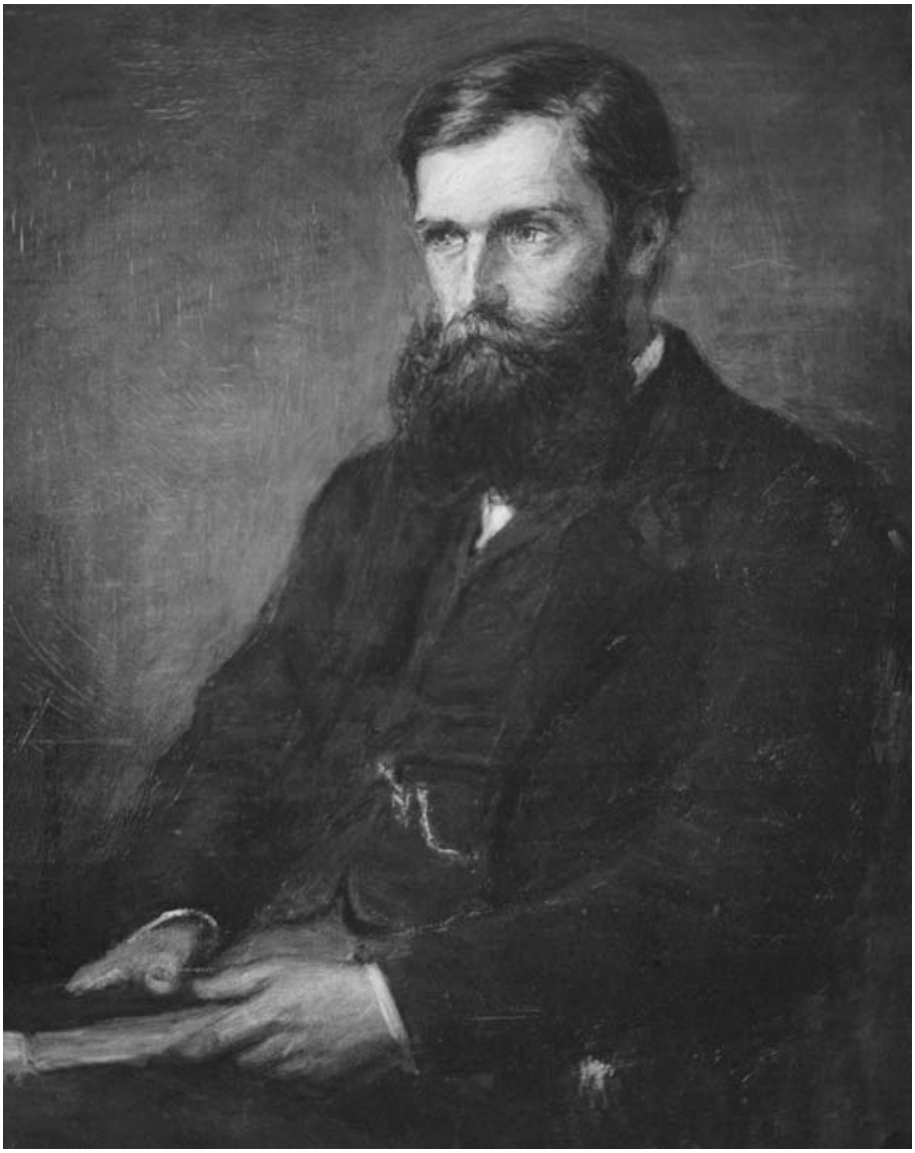


Fig. 1. Benjamin Leigh Smith. Picture courtesy Royal Geographical Society.

Comragh, Ireland. Built by Messrs John White of Cowes, Isle of Wight, in 1852, *Sampson* had already made two Arctic voyages while owned by Pallisser.

There is some confusion over the name of this vessel, as Jones (1975) used *Sampson*, while others (Credland 1980; Cromack and Riffenburgh 2000) employed *Samson*. The cover of Leigh Smith's own typescript journal (Leigh Smith ca. 1871) used *Samson*, which was then penciled over with *Sampson*, and *Sampson* was used throughout the remainder of the typescript. It is so followed here.

On Tuesday, 16 May, while *Sampson* lay moored at Grimsby Docks on the Humber River awaiting favorable winds, Leigh Smith began a journal he kept regularly for the next five months (Leigh Smith 1871: all unattributed quotes from this point derive from this undated, unnumbered journal). His companions for the expedition were an all-Norwegian crew from Tromsø. Only the mate and the captain, a 'well-known' (Petermann 1872a: 101) Norwegian sealing skipper named Erik Andreas Ulve (1833–96), spoke any English. There is no indication that Leigh Smith spoke or understood more than a few words of Norwegian.

While Credland (1980: 128) recorded that Captain Wells accompanied this first voyage, Leigh Smith's journal seems clear that he himself was the only non-Norwegian on board. (Credland (1980: 128) also noted an undated 'description of the 1871 voyage by Lt Col H.C. Chermside, RE,' but the Chermside typescript chronicles instead the 1873 expedition (Chermside, nd; Cromack and Riffenburgh 2000: 306, 316). In Tromsø, Leigh Smith mentions that five additional crewmembers came on board to make a crew of 14, suggesting that *Sampson* left England with a total complement of nine including Leigh Smith himself.

For the next five months, the Norwegians made seemingly little impression upon the Englishman. His journal reveals a man preoccupied with winds and tides,

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rocks and islets, and ocean temperatures and depths, with only brief views of personality showing through a thick veneer of scientific curiosity. Most of these glimpses were revealed in and around Tromsø, where Leigh Smith more than once remarked on the beauty and athleticism of the women of northern Norway. Yet, as soon as he opened one of these personal doors, he as quickly closed it, and returned to his observations of the skies, flora and fauna, geology, and oceanography.

Early stages

Early Friday morning, 19 May 1871, *Sampson* crowded on all available canvas and sailed out of the Humber, shaping a course north by northeast for the west coast of Norway. In moderate to fine breezes, *Sampson* coursed along between three and six knots, covering 239 miles from noon on the day of departure to noon two days later, before running into shifting winds and fog and having its daily run cut to 51 miles. Meandering along, Leigh Smith found his first chance to dip a survey bucket overboard, collecting a sample from 'great quantities of green stuff on the surface of the water [that] extended for several miles.' It proved to be fish spawn and, nearby, Leigh Smith sighted a whale. In the light winds, the all-Tromsø crew, anxious to be home after an extended absence, took to matching 'their luck in getting favorable breezes whilst on deck.'

During the afternoon of 24 May, the crew sighted land to starboard, which they believed to be in the vicinity of Bergen. Leigh Smith began to notice the increased daylight in the more northerly latitudes and by midnight that night he wrote 'scarcely any darkness during the night-time.' He began a running comparison of the coast of Norway with that of Scotland, with the contrast of 'plentiful snow on [Norwegian] mountain tops.' *Sampson* moved slowly northeast, passing several Norwegian cod-fishing boats. The weather was very warm and the seas smooth, and low clouds appeared to cut off the masts of the fishing boats. The *Sampson* crew dropped fishing lines in 50 fathoms and brought up a meal of cod.

By the 27th, both Leigh Smith and the crew became increasingly agitated about reaching Tromsø. Needing to engage more crew there to take him to Svalbard, Leigh Smith was concerned lest 'the best men all gone to Spitsbergen.' He seemed to absorb a lesson of caution when, with several of the crew, he lowered a dinghy and gave chase to a large fish 'showing a fin about three feet above the water.' As they put a rifle bullet into it, the fish threw up its tail into the air 'and fortunately for us did not touch the boat or our Arctic voyage would have ended in a very brief manner, as there were no boats that could be sent from the ship without some considerable delay getting them off the deck.'

The next day, the weather turned, and with increasing winds and a heavy sea rising, they were forced to reef sail. The captain shaped a course eastward of the Lofoten islands and into the shelter of Vestfjord. Leigh Smith began to regret all the calm sailing they had enjoyed, as 'so much indulgent weather is not qualified to prepare one for an Arctic cruise.' By the next evening, with rain 'blowing strong and thick [it] was not quite so comfortable on board as it had been during the former part of the voyage.'

Early on 29 May, as *Sampson* passed the islands of Røst and entered Vestfjorden with its high surrounding mountains and variable winds, the schooner's progress slowed to a crawl. Leigh Smith decided that 'a good steam launch would be a valuable addition to a sailing yacht.' Two years later, he would go this technological inspiration one better, chartering James Lamont's screw-steamer and Arctic veteran *Diana*, and, with *Sampson* as a reserve tender, voyage to Svalbard in relief of the Swedish expedition under Adolf Erik Nordenskiöld.

The one modern vessel that overtook *Sampson* was *Sophie*, an auxiliary screw-steamer bound for Svalbard to hunt white whales. Leigh Smith later heard that *Sophie* had caught 70 white whales in less than a month. Gliding in calm winds through a narrow, fast-running tidal gut near a village Leigh Smith identified as Sandtoiv, he had a 'musical box' brought on deck, 'being a very fine evening to give the crew a treat.'

Picking their way through fickle winds and rocks and shoals, *Sampson* anchored in Tromsø on the afternoon of 3 June. Several vessels were already in port, awaiting favorable winds for the sail to Svalbard. Once *Sampson* was hauled alongside and moored to the Norwegian brig *Tromsoe*, Leigh Smith went ashore to collect his mail and engage in ethnography. 'The houses are all built of wood, being varnished in the rooms gives them a light and cheerful appearance. The people dress well and look to be enjoying good health and I think the fashions are studied as much here as in any of our towns by both sexes. The women are very good-looking and for a small place they muster very strong . . . People do not seem to care about going to bed here. I think they are acting on the old maxim, "Make hay while the sun shines," and as they have a long dreary winter, they intend to make up for the lost time.'

The next day, a Sunday, Leigh Smith observed men and women rowing to church. After dinner, he walked to a shipyard to see the small Arctic cutter *Iceberg*, which was being fitted out to carry an Austro-Hungarian Exploring Expedition led by Karl Weyprecht and Julius von Payer 'with a view of getting to Gillie's Land.' The location and naming of 'Gillie's Land' had become something of an obsession for German and Austrian expeditions of the 1860s and 1870s inspired by the geographer August Petermann (see, for example, Petermann 1872b, 1872d). Petermann's goals included the naming of a major feature for Kaiser Wilhelm and the promotion of German polar exploration (Murphy 2002: 29). Weyprecht and Payer's pursuit of this unknown land led them far to the east the following summer, where they discovered Franz Josef Land.

Known variously as Gillie's Land, Gillis-Land, Giles Land, or The Commander Giles Land, the area was first sighted east of Nordaustlandet in 1707 by Cornelis Giles,

https://doi.org/10.1017/S0032247405004821 Published online by Cambridge University Press

the Dutch captain it was initially named for. Petermann studied older charts and, using those that actually mentioned it, placed it 50 miles east of the eastern point of Nordauslandet. Veteran Norwegian sealing captain Johan Kjeldsen (1840–1909) sighted it in 1876, five years after Leigh Smith's first expedition. It was eventually named Kvitøya (White Island) (Norsk Polarinstitutt 1991: 152–153) and figured prominently in the balloon expedition of Salomon A. Andrée. It was often confused — as it was during Leigh Smith's first expedition — with Kong Karls Land, a group of islands in southeast Svalbard first seen by the English whaler Thomas Edge in 1617 (Norsk Polarinstitutt 1991: 242–243).

One wonders how close Leigh Smith got to the escutcheon of *Iceberg*, as all other sources have identified the vessel used by Weyprecht and Payer in 1871 in their failed precursor to the *Tegetthoff* expedition as *Isbjørn* (for example, Slupetzky (1995: 108)). Evelyn Baldwin (1896: 341) also called Weyprecht and Payer's 1871 vessel *Isbjørn* and described it as a light sailing vessel, 55 feet in length and 50 tons burden, commanded by the Norwegian 'Kjelsen' (almost certainly Johan Kjeldsen). It is conceivable, perhaps, that Leigh Smith's Norwegian was so lacking that he mistranslated 'polar bear' as 'iceberg,' although this seems far-fetched.

On 8 June, Weyprecht came aboard *Sampson* to introduce himself, and during their conversation Leigh Smith discerned that he did not possess great confidence in *Iceberg*/*Isbjørn*. Weyprecht explained his plan to trend along the south coast of Svalbard to 'Walter Thymen's Strait [Thymen Strædet; eventually named Freemansundet, a 22 miles long and 3.5 miles wide strait separating Barentsøya from Edgeøya], [and] if impeded by ice to take the boats across the ice to reach Gillie's Land.' On 11 June, Weyprecht returned, this time bringing Payer with him. They dined on board with Leigh Smith, probably on fresh cod caught by the crew the previous evening. These meetings were of some moment, given Weyprecht and Payer's discovery of Franz Josef Land the following summer and Leigh Smith's own later explorations and shipwreck in that newly found archipelago.

Listening to the Austrian plans, Leigh Smith privately began to formulate his own method of Arctic exploration. His experiences along the coast of Norway had already begun to teach him the values of patience, flexibility, and opportunism. In a comment that must have been added after his return from Svalbard, Leigh Smith noted that 'it is utterly impossible to form any definite plans before leaving as the winds prevailing from any quarter have a great influence on the ice in general.'

This thought was the beginning of Leigh Smith's eventual voyaging strategy: go where conditions allow you to go, and record such data as conditions allow you to gather. As W.J.A. Grant (1881: 213, cited in Barr 1995: 61) wrote of the 1880 Franz Josef Land expedition, even Leigh Smith did not know exactly where they were going that year, since he had long decided 'to be guided entirely by circumstances, and if the ice prevented him from getting far north, or finding anything fresh to do in one direction, he could then try somewhere else.'

Tromsø to Svalbard: the first ocean stations

In Tromsø, *Sampson* loaded three walrus boats to go with the ship's dinghy, along with 'harpoons, lances, walrus lines and other gear requisite for the [walrus] boats during the voyage.' On 15 June, *Sampson* rode the tide out of Tromsø and began to work its way north through light and inconsistent winds to the island of Sørøya, from where they would take their departure for Svalbard. Anchored 21 June near an island Leigh Smith identified as Sanda, he went ashore to meet the foreman of the local fisheries, a Mr Roe, as well as his daughter, 'a buxom, healthy-looking lass of twenty summers, rejoicing in the name of Petra Christine Marie Roe, who seemed to take great pleasure in waiting on us and would have fain prevailed us to have taken coffee enough to have lasted us for our Arctic cruise.' The vision of Ms Roe seemed to bring with it fresh breezes from the northwest, and the following day *Sampson* cleared from the northern coast of Norway.

After two days of steady winds, on 25 June Leigh Smith sighted his first iceberg at a position of 74°06′N, 24°26′E, approximately 75 nautical miles southeast of Bjornøya (Bear Island). It was his first view of an iceberg and he 'considered it a novelty and now begin to realise that we are in the Arctic seas.' Two hours later, *Sampson* encountered an impassable barrier of ice to the north, and so shaped a course eastward in search of a way through. For the rest of the day, they threaded through icebergs and pack ice, before becoming trapped 'in an artificial lake amongst the ice and [with] no outlet.'

Thus began nearly two weeks of plodding back and forth amid ice-covered seas between 73° and 75°N in the vicinity of Bjornøya. 'It seemed rather strange at first to be thumping so much against the ice but we seem to be quite reconciled to it and look upon it as a matter of course.' Leigh Smith had started off in search for the elusive Gillie's Land, but soon set course to the west of Bjornøya. Eventually he tired of the slow pace, some of it at a paltry knot and a half, and by 6 July remarked that it was 'three weeks since we sailed from Tromsø, a very long passage for such a short distance.'

Yet Leigh Smith was not one to waste time. He used the meandering cruise to begin a series of ocean stations, recordings of both surface and deep-ocean temperatures along with samples of ocean bottom sediments. This scientific recording was a major element that would set all his Arctic voyages apart from those of earlier British Arctic tourists. Between 26 June and 7 July, he carried out seven such ocean stations (Fig. 2). In *The depths of the ocean* (1912: 11), John Murray credited these early deep-ocean data as helping define 'warmer layers of water beneath the colder surface waters of the Arctic Ocean.'

On 26 June, Leigh Smith for the first time used what he referred to as a 'Cassell's deep-sea thermometer' to record ocean temperatures at various depths. This almost certainly was a Miller-Casella pressure-protected

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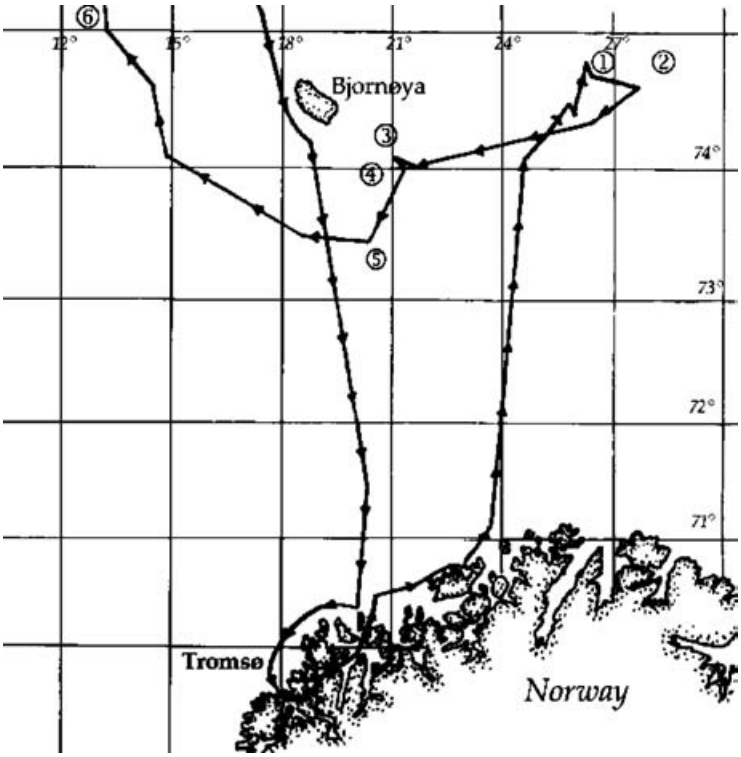


Fig. 2. Chart of Leigh Smith's first ocean stations, recorded around Bjornøya, 26 June–6 July 1871. These locations testify to *Sampson*'s difficulty in finding a route through the ice north and east of Bjornøya, finally settling on an advance north along the west coast of Svalbard. Chart derived from Petermann 1872c.

thermometer, introduced by the British Hydrographic Office in 1869 (McConnell 1982: 97–98), and testifies to Leigh Smith's employment of the latest in oceanographic recording technology.

With this instrument, Leigh Smith began to record a series of ocean temperatures at various depths, and to use these data to speculate on the nature of the intricate oceanography around Svalbard. At his first station, he found warmer temperatures the deeper he surveyed: 32.5°F at the surface, 34° at 30 fathoms, and 35.5° at 100 fathoms. These initial data, along with similar results obtained this same summer by Weyprecht, was the first of many such recordings that supported the idea that a layer of comparatively warmer Arctic sea water might exist between the surface and the bottom. This current would eventually become known as the West Spitsbergen Current.

The following day, Leigh Smith dredged up some light-colored mud from 200 fathoms. For the next week, as *Sampson* wallowed around Bjornøya, Leigh Smith continued to record ocean temperatures from the surface down to 230 fathoms. Credland (1980: 131) noted that Leigh Smith took 'particular pride' in these temperature recordings, while Jones claimed that it 'was one of his regrets that fuller credit was never given to this oceanographical work.' It is possible, in this regard, that when Leigh Smith died just after New Year's Day in 1913, that he had not yet had the chance to read of his place in the first comprehensive history of oceanographic research (Murray and Hjort 1912: 11).

In the first week of July, *Sampson* finally made some progress north, and at 4 AM on the morning of 7 July, large numbers of birds were seen flying toward what the crew assumed must be land. Svalbard was sighted 12 hours later, and by 8 PM Bellsund was 40 miles away to the east. After finding Grønfjorden (Green Harbour) clogged with ice, Leigh Smith continued north past Prins Karls Forland and made for Danskøya (Danes Island).

Circumnavigating Danskøya and rounding Hakluythovden

By 12 July, *Sampson* was only 20 miles offshore of Albert I Land, northwest of Kapp Mitra. They were entering historic waters. Leigh Smith wrote of a 'sea as smooth as glass, scarcely a ripple to be seen. No ice to be seen in any direction and any ordinary vessel could cruise here in perfect safety.' The following day, as *Sampson* tacked to the east, temperatures dropped, icebergs appeared to the north, and Amsterdamøya (Amsterdam Island) lay just 10 miles northeast.

With seemingly remote prospects for rounding Hakluythovden (Hakluyt's Headland) on the north point of Amsterdamøya, *Sampson* maneuvered toward Sørgattet, the strait separating Danskøya from the mainland (Fig. 3). Reluctant to risk *Sampson* in the shallow strait, a small boat was put over to gather eider duck

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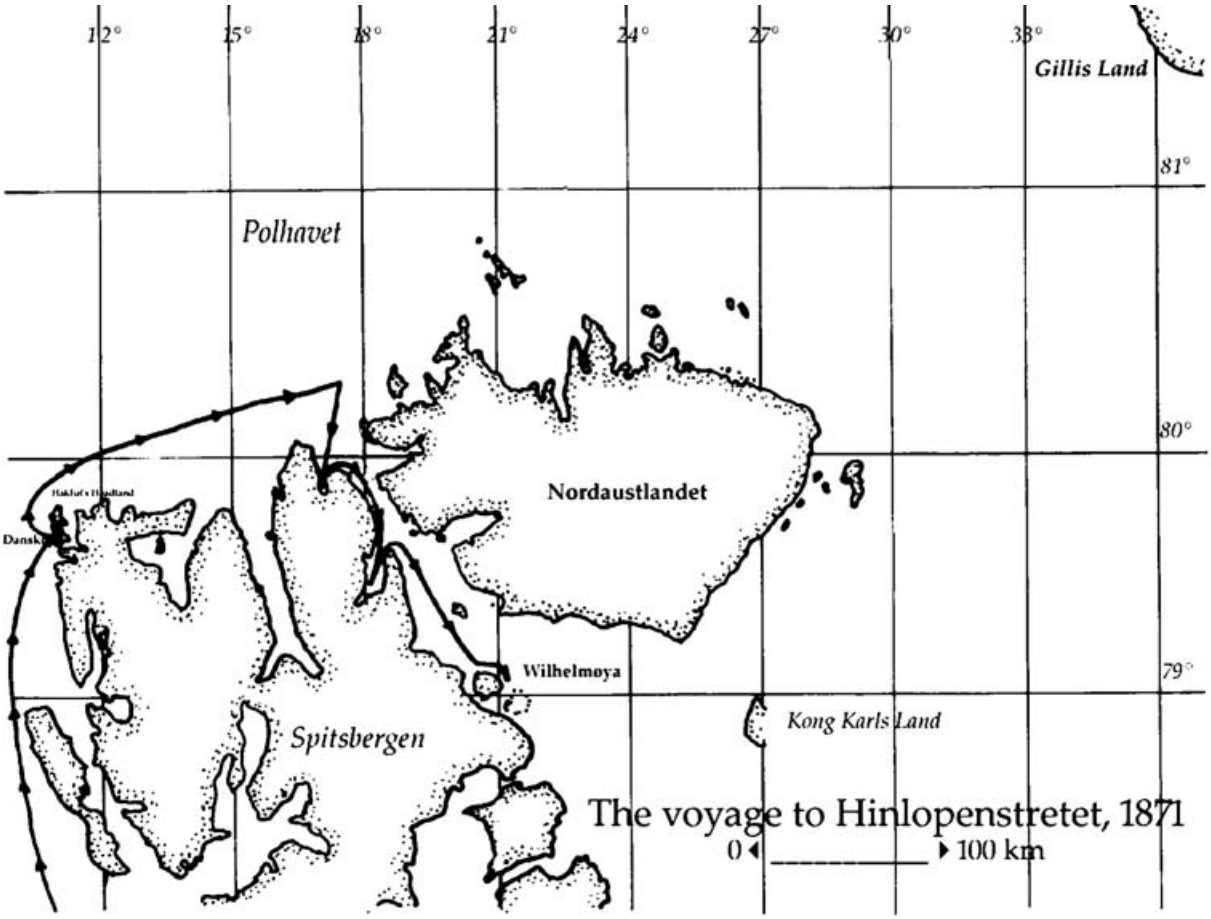


Fig. 3. Track of *Sampson* along Svalbard's west coast to Danskøya, round Hakluythovden, and to Sorgfjorden (7–31 July 1871). *Sampson* then penetrated Hinlopenstretet as far as Wilhelmøya (1–31 August 1871). Tumlingodden, from where Leigh Smith and others thought they could sight 'Gile's Land' (actually Kong Karl's Land), is the eastern point of Wilhelmøya. Petermann thought Gile's [Gillis] Land was actually farther north and east. He was correct in believing that what Leigh Smith had seen was Kong Karls Land. Chart derived from Petermann 1872c.

eggs and water on Moseøya, a small islet off the southern point of Danskøya. There a blank cartridge 'of English manufacture for [a] breech-loading fowling piece' was picked up, leading Leigh Smith to conclude that Lamont had recently passed that way. Leigh Smith and his mates bagged 20 ducks and collected 100 eggs.

Foiled in their search for water, *Sampson* maneuvered around the west coast of Danskøya and came to anchor in three fathoms in Kobbefjorden, just east of a small islet named Postholmen, located in the middle of the bay. The crew found a good place for filling water, along with shelter from all but westerly and southwesterly winds. Leigh Smith took his dogs ashore on Danskøya and walked inland. He ascended a snow-filled ravine to the top of the ridge that would later be named for the American journalist-explorer Walter Wellman, and from there had a panoramic view of Smeerenbergfjorden. Northeast winds, he noted, had pushed ice out of the fjord.

After Leigh Smith returned to *Sampson*, another yacht anchored in Kobbefjorden with a catch of 50 seals and two whales. The other vessel reported ice still clogging Hakluythovden, and that Lamont had escaped southwards. On Saturday, 15 July, still another hunting yacht anchored in the bay, and the crews of all three vessels joined on board *Sampson*, where one of the men provided entertainment with a concertina.

The following day, Leigh Smith recorded a balmy noontime temperature of 62°F. With bright sun and an easterly breeze, he decided on a miniature half-day expedition. Taking four men on one of the boats, they pulled for Sørgattet, intent on a rowing circumnavigation of Danskøya. No seals were seen, and what ice there was had grounded in the shoal water of Smeerenburgfjorden. Rowing against a strong tide in the shoals, the five men reached the site of the abandoned whaling station of Smeerenberg on the southeast corner of Amsterdamøya. Leigh Smith found great quantities of driftwood amongst the low and marshy flats. The men then pulled through Danskegattet, the strait separating Amsterdamøya from Danskøya. Leigh Smith noted the numerous rocks and shoals, and warned any vessel with a draft exceeding nine feet not to attempt the passage. They returned to *Sampson* at 11 PM 'with 200 eggs which we had collected on our journey on the islands.'

The winds shifted to the southwest on Monday, 17 July, and with them the expectation that ice would

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be pushed away from Hakluythovden. Accordingly, *Sampson* left Kobbefjorden at 2 PM and sailed northwards, rounding the headland three and a half hours later and shaping a course for Fuglesangen (Vogelsang Island). In dense fog, Leigh Smith 'heard' Fuglesangen before he saw it. 'It is a great resort for the auks, guillemots and other birds which build their nests in the cliffs; they make a great noise which you can hear in still weather one or two miles out and in foggy weather is a good warning when approaching land.'

Just before midnight, *Sampson* anchored in Fair Haven in just two fathoms. Leigh Smith went ashore, most likely at Ytre Norskøya, to look northward, spying ice as far as the eye could see. There was no passage north or east. Ice pressed down on *Sampson*, and the crew was forced to put a line on shore and warp close in to land to avoid it. When the warp snapped later that night, *Sampson* was shifted around a point to a more secure anchorage.

The next morning, Leigh Smith again went to check the state of the ice northwards, but found the same result. He also found several graves, 'the coffins were of very rude construction and skeletons still in them. They are supposed to be the remains of sea-men buried here in the former whaling seasons at Spitsbergen. At that time these islands were used as a rendezvous and to try out the blubber, having had boilers erected on shore.' These were most likely the ruins of the Dutch whaling station on Ytre Norskøya, dating from 1617, which contain the remains of train-oil boilers and about 180 graves (Susan Barr, personal communication). And the hill Leigh Smith most likely ascended was the point above the blubber cookeries called Utkiken (462 feet high), used 250 years earlier by the Dutch as a lookout point (Norsk Polarinstitutt 1991: 451).

On Friday, 21 July, they put their boats ahead to tow *Sampson* on the east-running tide. Rowing for four hours until the tide played out, they reached the mouth of Raudfjorden (Red Bay) before anchoring to an iceberg. Another day of towing with the tide put *Sampson* off Velkomstpynten (Welcome Point), the northern edge of Reinsdyrflya and the entrance to Woodfjorden. 'Here we find the benefit of a small ship as our moderate draft of water enables us to get close inshore and a few grounded icebergs keep the pressure of the smaller ice-floes clear of the ship.'

Leigh Smith took a dinghy the two miles to shore at Raudstranda (Red Beach), finding the beach sand 'corresponding to the name . . . given it by [William Edward] Parry's expedition.' He commenced 'a very rough journey' overland to a hill on the western shore of Liefdefjorden, in search of open water to the east, returning to the ship six hours later cold, wet, and unsuccessful. Later that same day, Leigh Smith went ashore again, this time with better results:

> In walking inland for about a half hour we came to a garden of Eden and no person would credit that flowers would grow in such a country and in such a short space of time. The ground was literally covered with a yellow flower similar to our primrose and several other kinds of which we gathered specimens. Here we found a beach inland as far as three or four miles which looked as if it had at one time been a sea-shore.

The yellow flower was either mountain avens (*Dryas octopetala*) or the Svalbard poppy (*Papaver dahlianum*). Leigh Smith probably also observed carpets of purple saxifrage (*Saxifraga oppositifolia*) (Hisdal 1998: 70–77).

Returning to *Sampson*, Leigh Smith found a number of other vessels, all waiting for ice to clear and open a path eastwards. For five days, the ships waited for clear water, making repeated trips ashore for provender. As Leigh Smith remarked, 'it will not require many visits to kill all on the ground.' Finally, on 27 July, the ice and 'very disagreeably cold' fog began to clear, and *Sampson* sailed slowly toward Verlegenhuken and the entrance to Hinlopenstretet. There, Leigh Smith was able to make his first deep-sea temperature recordings in two and a half weeks. At midnight, he also recorded his highest latitude yet on the voyage: 80°13′N.

Both Jones (1975: 24) and Credland (1980: 128) recorded that at this point Leigh Smith traversed the northern end of Hinlopenstretet on his way to the discovery of Kapp Leigh Smith. Instead, seeing a mass of ice to the east and north, Leigh Smith decided at midnight on 27 July to penetrate southwards into Hinlopenstretet as far as possible. At that moment the strait seemed relatively free of ice, although Leigh Smith was by this point convinced that ice conditions around Svalbard were never static for very long. *Sampson* would now spend the whole of August exploring this long strait that runs northwest to southeast and splits Svalbard in half.

The exploration of Hinlopenstretet

Before proceeding into Hinlopenstretet, Leigh Smith explored Sorgfjorden, especially the area around Hecla-hamna. Parry's *Hecla* had anchored at this harbor on the east side of Sorgfjorden in 1827 while the expedition's boats were pulled over the ice toward the pole. Leigh Smith seemed anxious both to pay homage to Parry wherever he could, and to critique him when he thought it appropriate. He disagreed with Parry's idea of separating his small boats from the expedition's mother ship. 'In our case with a small vessel we are never far from our boats when they are absent and the crews reap great benefit from the rest and warmth they get on returning to ship which is far preferable to remaining in boats for a week in these regions.'

On Saturday, 29 July, Leigh Smith set out to climb a mountain on the south side of Sorgfjorden ('supposed to be two thousand feet in height'), where he expected to find a cairn left by Parry. This was most likely Sørfjellet (1955 feet high), which stands astride three major glaciers. 'After a long and very rough journey, we clambered to the summit of it where we were amply repaid for our labor. We had a good view of the coast from North Cape to Hakluyt's Head including all the adjacent islands, and inland as far as eye could trace it seemed to be one immense glacier.'

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Leigh Smith found and dutifully rebuilt Parry's cairn, but the panorama commanded a 'very stillness [that] seemed to be quite oppressive to us.' After nine hours away, he returned to *Sampson* 'very tired.'

The next day, Leigh Smith recorded a noontime temperature of 72°F, prompting him to remark that if not for the surrounding ice on land and sea, 'no person could imagine they were in the Arctic regions.' He went ashore to hoist the New Thames Yacht Club ensign at Crozier Point, on a flagstaff erected by Parry's crew. Almost triumphantly, he found several pieces of hemp rope, 'about three-inch, Government private mark — a yellow thread in the strand — which could have been left here by no other vessel than the *Hecla*.'

On 31 July, *Sampson* weighed anchor and proceeded into Hinlopenstretet. Leigh Smith remarked that the other yachts, still lying at anchor, showed no inclination to follow. And indeed the weather in the strait was very different from the sheltered bay. With strong winds blowing from the southeast, with fog, grounded icebergs, and large floes making navigation hazardous, *Sampson* worked southward toward Lomfjorden. The temperature was 40° lower than the day previous in Sorgfjorden. 'Everything on deck is one mass of ice, the dense fog freezing as it settles on the ropes and sails and likewise on ourselves.'

In the fog, they narrowly avoided a collision with the eight-mile-long Isrundingen, the sheer edge of the Valhallfonna that flows into the west side of the strait. For Leigh Smith, it was a 'very close shave and made everyone on board open their eyes with astonishment.' Clearing Isrundingen, *Sampson* came to anchor in five fathoms in a tiny bay on the north side of Lomfjorden. Here he recorded a rather extraordinary sight, 100 whales that appeared to be standing erect in the bay, their white heads two feet above the surface. Unable to approach with harpoon, Leigh Smith speculated that perhaps a large stream flowing into the bay provided a source of food. Leigh Smith then rowed around Kapp Fanshawe to the bird cliffs at Alkefjellet, where he scattered thousands of guillemots by echoing his voice off the cliffs.

Sampson left Lomfjorden on 4 August, making a series of short tacks to avoid the icebergs. Leigh Smith sighted Svartberget on the east side of the strait, the 'black mountain' that — like so many locales in Hinlopenstretet — would be used for longitude determinations in 1898 by the Swedish-Russian Arc-of-Meridian Expedition (Carlheim-Gyllensköld 1900: 46; Norsk Polarinstitutt 1991: 418). That night, *Sampson* came to anchor under several grounded icebergs on the south side of Wahlbergøya. Two yachts on walrus hunts were already there. Leigh Smith recorded that the southern extremity of the island extended farther south than on existing charts, and provided good shelter.

The safe anchorage came just in time. A gale sprang up and blew for two days. One of the other yachts narrowly missed destruction when the berg to which it was moored suddenly toppled over. When the storm moderated on the evening of 6 August, Leigh Smith went ashore with his dogs and, walking inland, found an extended beach where he found plentiful shells and fossils, along with skeletons of both a polar bear and walrus, and ubiquitous Svalbard driftwood.

Looking eastward toward Torellneset on Nordaustlandet, Leigh Smith saw the way south blocked by ice. He longed for a clear sky 'to see whether we can get a glimpse of Giles Land of which there is so much talk.' Apparently, he was beginning to have his doubts about Giles Land. 'We have met with men this voyage in some of the vessels who positively affirm that they have seen it, and some state that they have been there, but from personal experience they are greatly addicted to lying.'

It is possible, through Captain Ulve, that Leigh Smith had encountered some of the Norwegian sealing captains who had so recently located what became known as Kong Karls Land. In 1853, a Tønsberg skipper, E. Eriksen, sighted Kong Karls Land from Edgeøya and mistook it for Giles Land. (For a discussion of this confusion, which endured for decades, see Norsk Polarinstitutt 1991: 242–243.)

Still, whenever the weather cleared, Leigh Smith would ascend the nearest mountain and scan the southern horizon for Giles Land. As early as 9 August, while at anchor off Wahlbergøya, he had ascended a mountain and, through a break in the clouds and fog, 'fancied we could see land in the far distance.' This may have been Svenskøya in Kong Karls Land, laying more than 60 miles southeast.

On 12 August, *Sampson* made a start in dense fog for Tumlingodden (Thumb Point), the eastern point of Wilhelmøya. The area was visited and given a preliminary survey in 1868 by the German *Grönland* expedition under Karl Koldewey (Murphy 2002: 27–31), which, thanks to Petermann, eventually accounted for many Germanic place-names in the area. When Leigh Smith cruised there, the name Wilhelmøya had not been settled, since it was not clear whether the area was a point of land sticking out from the mainland, or an island upon itself. As Leigh Smith wrote: 'This land called Thumb Point is supposed to be an island but no one has surveyed it accurately.' Mooring to an iceberg in the vicinity of Kapp Freeden later that day, Leigh Smith began a series of surveys in order to solve the problem.

On the morning of the 14 August, he took one of the small boats and rowed to a bay on the northwest corner of Wilhelmøya. There he disembarked with a small team and walked around the island. The party ran into muddy ground and then swampy clay. More than 12 hours after leaving *Sampson*, they were still trying to reach better ground. The Sun appeared for the first time in a fortnight to cheer them. At 2 AM, after rounding the northeast corner of the island, they spied *Sampson* weighing anchor to the north and rushed to meet the ship before it disappeared. The ship sailed anyway, and the men did not regain it until it anchored off Tumlingodden at 6 AM.

https://doi.org/10.1017/S0032247405004821 Published online by Cambridge University Press

They had been away from the ship without food for 20 hours, but had answered the local questions. The island and several features around it were named by Petermann after supporters of the German expedition of 1868 (Norsk Polarinstitutt 1991: 475).

On Saturday, 19 August, Leigh Smith made another trip to the summit at Tumlingodden 'and saw supposed land in that direction.' It was noted that the mountain was 'ascended by the Norw. sealing captain, E.A. Ulve, on Aug. 19, 1871 from where he sighted "Gillis-Land"' (Norsk Polarinstitutt 1991: 445), but, in fact, he was looking at Kong Karls Land. Neither Leigh Smith nor *Sampson* is mentioned in this note; neither is Leigh Smith cited in the comprehensive list of expeditions to Svalbard from the eighteenth to the twentieth centuries (Norsk Polarinstitutt 1991: 530–534), his place taken by a brief mention of Ulve.

On the other side of the ledger, nowhere in Leigh Smith's journal does he mention Ulve by name. And, in any case, by the next day the novelty of the sighting had worn off. As they waited out the ice in hopes for a passage either east or north, even the ship's harpooner hiked to the top of the mountain and claimed to see it in the distance.

Now, in late August, Leigh Smith saw no chance of progress through the ice. The temperatures were falling, and the first snow dusted the area on 23 August. A vessel from Tromsø met them the next day, and reported the area beyond Nordkapp (North Cape) on Nordaustlandet blocked by ice. For Leigh Smith, still stuck on the southern end of Hinlopenstretet, the summer was rapidly becoming a lost one.

On 28 August, Leigh Smith rowed to Bastianøyane (Bastion Islands) to hunt for bears and have one last look to the south and east. There was no navigable water in either direction. It was time to extricate *Sampson*. Ice was beginning to form on still water, and the Sun dipped below the horizon for the first time on 30 August. At noon the next day, with all boats ahead towing, *Sampson* slipped from its iceberg mooring and floated on the ebb tide northwards. By midnight they had passed Wahlbergøya, halfway up the strait and, four hours later, passed Kapp Fanshawe.

At 10 AM on Friday, 1 September, *Sampson* rounded Langgrunnodden (Shoal Point) and Leigh Smith found 'the coast is quite clear as far as we can see eastward.' At Lågøya (Low Island) two hours later, they found an abandoned Norwegian yacht, masts and spars cut away and all cargo removed, yet still riding at anchor inside of a reef. Having barely escaped Hinlopenstretet, a superstitious man might have turned around. Leigh Smith instead continued east, and during the next 10 days made the majority of his significant discoveries in Svalbard (Fig. 4).

The limits of Svalbard

Sampson passed Nordkapp just before noon on 2 September and came to anchor off Castrenøyane (South Castren's Island) in eight fathoms. On shore for two hours, Leigh Smith found more driftwood than he had seen at any other point in Svalbard, a significant observation. Two yachts that had been hunting in Novaya Zemlya arrived at the same anchorage. Leigh Smith sent over a bottle of brandy and preserved meat and vegetables to each, and was rewarded with a return gift of a Novaya Zemlya fox skin and some ptarmigan shot in Wijdefjorden.

A strong southwest gale forced *Sampson* from its berth on the afternoon of the 3rd, and they found clear water to the east. They crossed Nordenskiöld Bukta and, heading north, sighted the small island of Drabanten. This tiny bar was later joined to Karl XII-øya by wave action, losing its identity in the process. Petermann's chart of *Sampson*'s track does not show the vessel approaching the island(s), but Leigh Smith is clear in his journal that a boat from *Sampson* was sent through broken ice, in search of seals or walrus, although neither was found.

A heavy fog prevented further action, but when it cleared on 5 September, *Sampson* cruised toward what emerged as two small islands and then a third about three miles to the southwest of them. These were the first confirmed sightings of Brochøya, Foynøya, and Schübelerøya, small islands that would figure large in the *Italia* saga of 1928. Along with most of the other features Leigh Smith noted in this sector of Svalbard, these islands were later named for accomplished nineteenth-century Norwegians. After the cruise, Captain Ulve handed this geographic data to Professor Henrik Mohn of the University of Oslo. Mohn consulted upon an eventual 33 new place-names with Petermann, who published them in two articles and two charts in his *Mittheilungen* (Petermann 1872a, 1872b, 1872c, 1872d).

From the newly discovered islands, *Sampson* tacked farther eastwards, and at noon on 6 September came to the limits of Svalbard. 'We can see land bearing from our present position SSE,' Leigh Smith wrote, 'stretching to a very low point to the sea and inland it appears to be one continuous glacier.' Because of the fog, they had not been able to take their position for several days, but they figured *Sampson* to be 30 miles east of Repøyane. Petermann would later name the 'very low point' they had seen Kapp Leigh Smith, and the 'continuous glacier' Leighbreen.

From the masthead, there was still no ice to be seen to the east. Neither could they see any vessels, all other ships having made their retreat as it was late in the season. Leigh Smith was sorely tempted to attempt a rounding of this new point, but knew that if ice came in from the north they would have no escape route. If they were trapped, they had not enough supplies to support wintering. Petermann, not realizing the danger, later expressed his only regret about the voyage to Leigh Smith. 'What a pity you did not proceed further east on the 6th of September, sailing all around Spitzbergen and returning home that way' (Petermann 1872e).

At 4 PM on Wednesday, 6 September, they sailed westward. Two hours later, *Sampson* passed a quarter mile north of what Leigh Smith called 'Sampson Island.'

https://doi.org/10.1017/S0032247405004821 Published online by Cambridge University Press

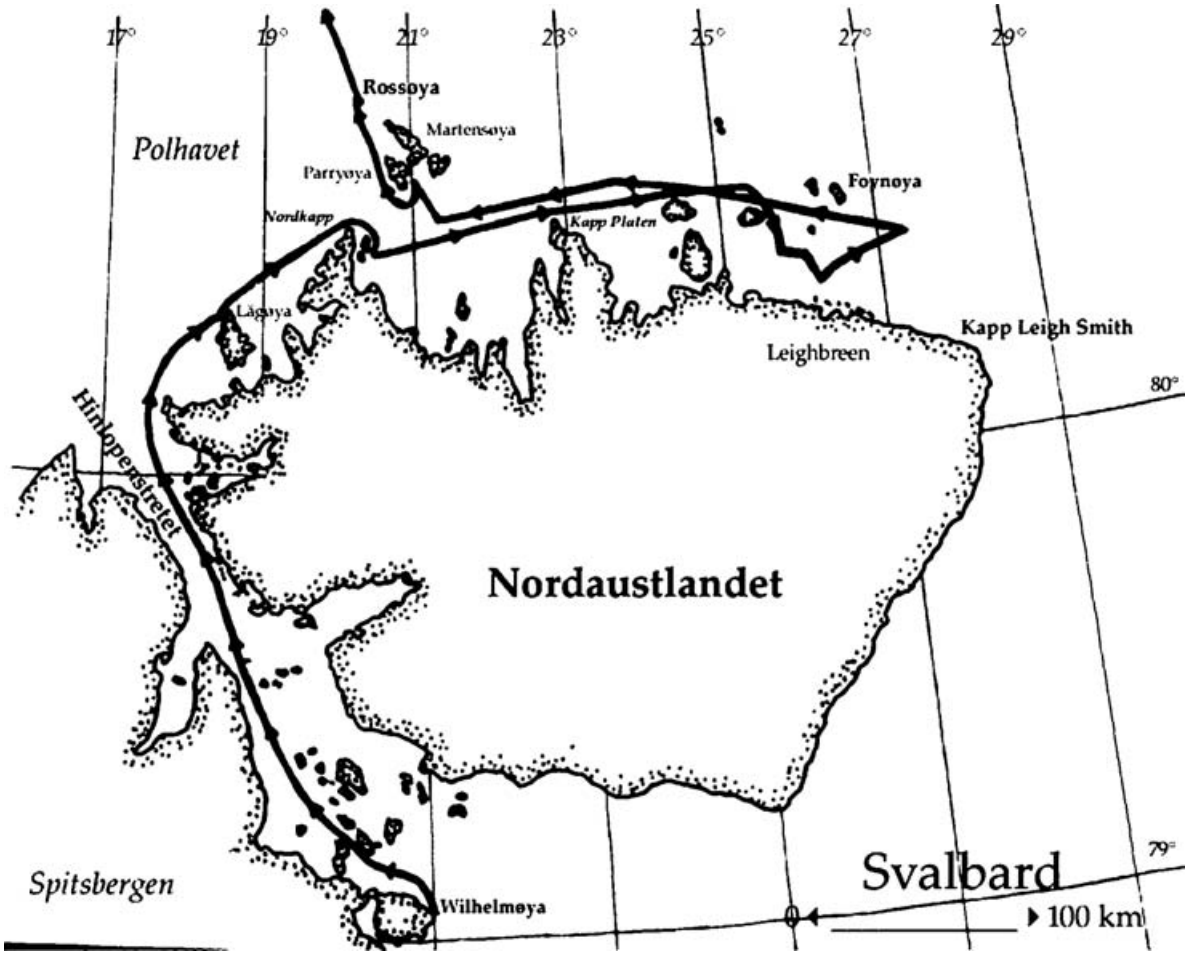


Fig. 4. The break-out from Hinlopenstretet (31 August 1871) and the flying expedition eastwards past Kapp Platen (4 September 1871) to Foynøya (5 September 1871), and Kapp Leigh Smith (6 September 1871). *Sampson* then retreated along the north coast of Nordauslandet to Sjuøyane. There, north of Rossøya, Leigh Smith made his farthest north of 81°25′ at 11 AM on 11 September 1871. *Sampson* then made for Wijdefjorden, where Leigh Smith charted Vestfjorden (12–16 September 1871). Chart derived from Petermann 1872d.

Evidently, Mohn and/or Petermann decided against this nomenclature. The only substantial island in this area is Raschøya, which was named for the Norwegian zoologist Halvor Heyerdahl Rasch (Petermann 1872a: 106). It was one of 22 new islands sighted and named during this cruise.

By the following morning, *Sampson* had shaped a course for Sjuøyane (the Seven Islands). Before abandoning the north for the year, Leigh Smith wanted to see the islands named after so many British naval explorers, and make one quick reconnaissance toward the North Pole itself.

To the edge of the world

Under a bright moon, *Sampson* approached the ice-shrouded Sjuøyane around midnight on 7 September and by the following afternoon was only two miles off the southern edge of Martensøya. Drifting in Straumporten, the strait between Phippsøya and Parryøya, Leigh Smith sighted the same derelict yacht noted off Lågøya a week earlier. He thought she had broken her anchors and floated north on the recent southerly winds. *Sampson* anchored in seven fathoms next to a large grounded iceberg on the east side of Parryøya.

On the morning of the 9th, Leigh Smith stepped ashore onto a sandy beach, where he located large quantities of driftwood along with the backbone of a whale and reindeer tracks in the sand. Atop ‘a very peculiar rock which we will call Pinnacle Rock,’ the shore party hoisted the yacht club ensign to celebrate the highest latitude they had yet attained. Leigh Smith saw open water both north and west. As he had at Danskøya, he then rowed around Parryøya, and, reaching a bay on the south side of Phippsøya, boarded the derelict yacht. She had not broken her anchor; someone had boarded her, cut away her anchors and cable, and set her adrift.

Ice from the east began to hem *Sampson* in, so the boats were employed to tow the ship through a reef at Parryøya that screened them from the force of the ice. Clearing the southeastern corner of the island and passing between Parryøya and Nelsonøya, *Sampson* headed north along the western edge of Sjuøyane, making for Tavleøya

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(Table Island). To the northeast, they saw the derelict yacht yet again. As Leigh Smith noted, she was 'driving away with the tide and no doubt she may accomplish what no human being has done, reach the North Pole.' There is a hint of a suggestion here that he longed to go along for the voyage.

At 7 PM on 10 September, *Sampson* arrived off Rossøya and Vesle Tavleøya, the northernmost islands in Svalbard, and a boat was lowered so Leigh Smith could go ashore. Again the ensign was hoisted, a salute fired, and Leigh Smith collected a few specimens of northernmost rock. He then rowed through the narrow strait separating the two small islands and circumnavigated Rossøya before returning to *Sampson*.

At 6 AM on 11 September, *Sampson* proceeded northward, for five hours sailing at five knots. Leigh Smith recorded that not an iceberg or ice of any description was to be seen. By 11 AM, approaching the edge of the pack ice in heavy seas, the expedition turned around and began their retreat. When the Sun appeared momentarily, they fixed their highest latitude at 81°25′ 00″, just short of Nordenskiöld's record of 81°42'N in *Sofia* in 1868. This was the farthest north Leigh Smith would attain on any of his expeditions. As they sailed southwest past Waldenøya (Walden Island), rather than celebrate his farthest north, Leigh Smith marveled that they had gone the entire Arctic cruise without the need of a fire in the cabin.

Sojourn at Kapp Petermann and return

Retreating southwestwards, *Sampson* made for Widjefjorden, intent on replenishing meat and water supplies before returning home. In the event, the excursion turned into a chance for the crew to hunt before they returned to Tromsø and for Leigh Smith to engage in more surveying.

Sampson entered the large deep fjord and located a previously uncharted island off Kapp Petermann on the evening of 12 September. The ship anchored on the south side of the small island in eight fathoms. Boats were sent into both Vestfjorden and Austfjorden in search of reindeer. Leigh Smith began to chart Vestfjorden and write up a set of sailing directions for any vessel that might explore this remote corner of Svalbard in future. Working from a small boat, he sounded from the island to Kapp Petermann, finding no bottom at 25 fathoms until he was half a mile from the kapp when he dredged up 'stiff red clay' from seven fathoms.

New ice was already forming at the head of Vestfjorden, and it became difficult to continue the survey. But Leigh Smith carried on in the mid-channel of Vestfjorden, finding no bottom at 25 fathoms as far as his miniature icebreaker could reach. By 14 September, the crew was returning from their hunting forays, and in calm, snowy weather, set to work skinning nearly 30 reindeer. Five-foot-long sharks appeared when the reindeer carcasses were set overboard for a cleaning, and the sharks themselves were caught and dissected for their livers. Thrown back overboard, Leigh Smith observed them swimming astern of the ship, not seeming 'any worse for being subject to such an operation.'

At 1 PM on 16 September, *Sampson* weighed anchor and headed down the bay. They made for Moffen Island but sailed around it without seeing any walrus. After a stay at Velkompynten on the mainland, *Sampson* rounded Hakluythovden at 2 AM on 20 September, and in a strong north breeze set all sail for Tromsø. The return to the Norwegian mainland was very rapid, *Sampson* reeling off as much as nine knots with the wind directly aft.

Recording a 'very singular change' upward in the surface water temperature off Sørkapp, Leigh Smith began his analysis of the hundreds of ocean temperature measurements he had recorded during the cruise:

> From the Prince Charles Foreland as we came further south we found the temperature of the water to be gradually decreasing owing no doubt to a current known to be constantly setting southwestward along the S coast of Spitsbergen, round the S. Cape and thence northward along the west coast. From the large quantities of ice between the NE land and Gile's Land there must evidently be a stream of cold water coming southwestward with the current which checks all influence the Gulf Stream has on other parts of the coast.

Leigh Smith was beginning to find a way to reconcile the relatively warm surface temperatures he recorded north and west of Svalbard with the colder temperatures he had recorded south and east of the islands. 'We have found when at the Henlopen Straits south entrance that the temp of water never exceeded 31° at surface, whilst at the Seven Islands the temp of water at surface was never less than 31° at surface.'

Leigh Smith was correct that a cold, westward-setting blocking current that passed south of Svalbard would account for the ability of ships to pass up its west coast for long periods of the year, while ships like his own and Weyprecht's were stopped if they tried to force a passage through east of Svalbard. Leigh Smith realized that he had only one summer's worth of data to rely upon. He was determined to return the following year to begin the creation of a series of observations over time that would contribute to a solution of the problem.

Early on the morning of 27 September, *Sampson* anchored again in Tromsø. The crew was disappointed on several counts. The entire haul from the cruise was 33 seals, eight bears, and 45 reindeer. Only now were they told they would all receive an equal share in the voyage, which led to regret that they had not engaged more energetically in their hunting. In Tromsø, it had been the best summer for herring fisheries in 20 years. Had the crew stayed home and fished in their own waters, instead of following a wealthy English wanderer around Svalbard, they would have enjoyed a much more profitable season.

When Captain Ulve signed off *Sampson* in Tromsø, it was left to Leigh Smith to get the ship back to England with an all-Norwegian crew already resentful over their summer losses. Adding to their misgivings was Leigh

https://doi.org/10.1017/S0032247405004821 Published online by Cambridge University Press

Smith's purchase of a polar bear cub from a ship arrived from Novaya Zemlya, which he named Sampson and intended for delivery to the Zoological Gardens in Regents Park.

Leigh Smith himself was in a better mood. He flirted with a young Tromsø woman, and received new visits from Weyprecht, whose ship had to be towed in by steamer from Hammerfest. Julius Payer had chosen to walk from Hammerfest. 'Their voyage,' Leigh Smith wrote, 'has not answered their expectations in any respect. They have not got one polar bear or seal the whole voyage on account of the great quantities of ice on the east coast of Spitsbergen. They have failed in their attempt to reach Gile's Land.'

Soon, however, Leigh Smith had his own disappointments. The young woman was already engaged and, upon sailing from Tromsø on 11 October, Sampson the polar bear attempted repeated escapes. During one such episode, while the crew looked on, Leigh Smith dove after the cub to grab its hind legs before it jumped over the taffrail. *Sampson* the ship fared little better, its desultory Tromsø crew unwilling to fight headwinds all the way to England. Unable to put force behind his English commands to a Norwegian crew, Leigh Smith turned back. *Sampson* returned to Tromsø, dropped anchor, and ended her 1871 Arctic cruise on 31 October.

Aftermath

In 1872, Leigh Smith had *Sampson* fitted out for another voyage to the Arctic. He was joined by a Royal Navy Captain, John C. Wells, who collected much of the oceanographic data in the form of soundings, dredging, ocean temperature readings, and measurements of currents (Wells 1876). The expedition left Hull on 13 May and voyaged to Jan Mayen to map the island. Continuing on to Svalbard, harpooners on board killed and processed two whales and 250 seals, a vast increase over 1871. The ice conditions were considerably worse than a year earlier, and *Sampson* was damaged and beached for repairs at Widjefjorden. Leigh Smith was forced to make for England in September, without sailing nearly as far to the north and east.

In 1873, Leigh Smith chartered Lamont's Arctic steamer *Diana*, and with *Sampson* in reserve attempted to round Svalbard and survey Kong Karls Land. But he was stopped and forced to turn back by ice at Kapp Platen. He did, however, succeed in relieving Nordenskiöld's expedition, beset the previous year near Mosselbukta.

Leigh Smith's experiences with varying ice conditions north of Svalbard, as well as his apparent desire to see how far north he could force a properly equipped screw steamer, likely factored into the design and construction of *Eira*. This 125-ft screw barkentine would take Leigh Smith on two pioneering expeditions to Franz Josef Land, recently discovered by Weyprecht and Payer's Austro-Hungarian Exploring Expedition in *Tegetthoff* in 1872–74.

Leigh Smith's plans to explore Jan Mayen and the northeast coast of Greenland in the summer of 1880 were thwarted by fog and ice, as was his attempt to pass beyond Hakluythovden. Showing his, by now, well-developed flexibility in the execution of a research cruise, Leigh Smith made for the known parts of Franz Josef Land. The archipelago was sighted on 14 August. From a point about 45 miles west of Wilczek Island, he surveyed westward.

The 1880 expedition charted the shorelines of McClintock, May, Hooker, Etheridge, Bruce, and Northbrook islands (the latter of which Leigh Smith named after the late president of the Royal Geographical Society), as well as parts of George Land and Alexandra Land. A striking amphitheater-like natural anchorage was discovered between Bell and Mabel islands and named Eira Harbour. Before returning to Svalbard in September and to England in October, Leigh Smith surveyed 109 miles of coast and extended geographical knowledge of the Franz Josef Land archipelago by 9° of longitude. Marine organisms dredged from the waters of the archipelago, as well as flora and geological specimens collected on various islands, were sent to the British Museum, and two live polar bear cubs captured and delivered to the Zoological Gardens.

The following year, Leigh Smith attempted a return voyage to Franz Josef Land with the same ship and a similar number of crew. Finding the ice fast, Leigh Smith had a prefabricated storehouse named Eira Lodge erected at Eira Harbour. He intended to search eastwards for the lost American *Jeannette* expedition, but ice conditions forced him ashore at Cape Flora where, on 21 August 1881, *Eira* was nipped by the ice and sunk in eleven fathoms. The crew salvaged about two months' supplies from the vessel before it sank, so the prospect of wintering was not as bleak as it could have been. A stone hut, 'Flora Cottage,' was constructed in a fortnight, and further supplies were fetched from Eira Lodge in September.

The following June, Leigh Smith and his men set off in four boats through gaps in the pack ice. After a difficult voyage, they gained the beach at Matockkin Shar on Novaya Zemlya on 2 August. The next day, dressed for the occasion in their best yachting clothes, they sighted and were rescued by relief ships sent from England to search for them. His active exploration career at an end, Leigh Smith continued to take an interest in the exploration of polar regions. He supported whaling expeditions to the Antarctic, and promoted Eira Harbour as the ideal staging area for a British attempt on the North Pole. The latter challenge was taken up, albeit unsuccessfully, by Frederick G. Jackson and the Jackson-Harmsworth Expedition of 1894–97.

Conclusions

Leigh Smith's first expedition to Svalbard was critical in defining the complex northeastern coastline and eastern limits of Nordaustlandet, and pioneered Arctic oceanographic research. It established a pattern Leigh Smith would follow on all four of his subsequent expeditions: draw up a general plan of geographic and oceanographic reconnaissance, then vary that plan according to the

https://doi.org/10.1017/S0032247405004821 Published online by Cambridge University Press

ever-shifting ice conditions between Greenland, Svalbard, and, eventually, Franz Josef Land.

Leigh Smith might be shocked to learn that the ice-laden East Spitsbergen Current, which in the summer of 1871 blocked the passage of both his and Weyprecht's ships, is even today only dimly understood (Gyory and others 2005). This current carries Arctic waters from the polar basin south between Franz Josef Land and Svalbard, then west along the southern coasts of Svalbard, where it rises up against the Spitsbergen Bank that runs from Edgeøya southwest to Bjornøya. There, it sets up a confusing series of oceanographic phenomena as it clashes with the warmer waters of the West Spitsbergen Current as the latter flows north out of the North Atlantic.

On this first Arctic cruise, Leigh Smith also combined a bit of daring with the good fortune of beginner's luck. Ice conditions north and east of Svalbard, which looked so forbidding in August, suddenly cleared in early September. It was during this bold flying expedition eastwards during the first two weeks of September when most of the geographic features associated with Leigh Smith's Svalbard expeditions would be scouted. Eventually, this foray would lead to 33 new place-names in northeast Svalbard, including 22 new islands. It was also in this moment when he would reach his personal farthest north, on a dash north of Rossøya.

Petermann, who did not lightly pass out exclamation points in his *Mittheilungen*, was thrilled with Leigh Smith's collection of new islands and his expansion of the limits of Svalbard. 'After the observations and measurements of the Smyth-Ulve' [sic] expedition, we now know that northeast Spitzbergen has a width of 10.5 degrees of longitude instead of, as on the best past maps, only 7.5!' (Petermann 1872a: 105). Leigh Smith had shown as well that new islands could be found north of this newly expanded Svalbard, so Giles Land might still be discovered somewhere northeast of Nordaustlandet. Equally, Leigh Smith's observations of open water east of Nordaustlandet and north of Rossøya, along with his ocean temperature recordings with their suggestion of potential inversion layers of warmer polar waters, seemed to support Petermann's notion that an open polar sea might surround the North Pole.

The turning of the northeast limits of Svalbard at what became Kapp Leigh Smith, along with the location and definition of Brochøya, Foynøya, Schübeleroya, and 30 other new Svalbard place-names, would have made the expedition a success. When combined with the geographic work at Tumlingodden on Wilhelmøya, the bathymetric survey at Vestfjorden, and Leigh Smith's pioneering deep-sea temperature recordings and scientific approach to solving the ice and ocean current dilemmas presented by Svalbard's unique geography and location, the 1871 *Sampson* cruise is an underappreciated triumph of a neophyte explorer. Leigh Smith himself would not enjoy such success again until his 1880 expedition to Franz Josef Land.

Acknowledgements

This research was supported by both a Research Development Grant and a Faculty Travel Grant from Penn State University Abington College. The author wishes to thank Dr James F. Smith, Dr Hannah Klieger, Dr C.L. Devlin, and Ms Jeannette Ullrich at Penn State University; Dr Susan Barr of Riksantikvaren in Oslo; and Dr Beau Riffenburgh of the Scott Polar Research Institute.

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