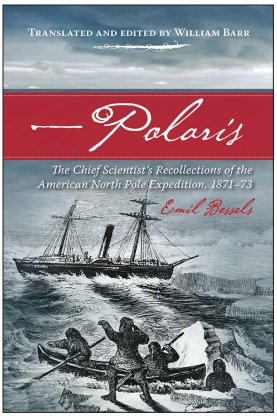
UNIVERSITY OF CALGARY
Press



POLARIS: The Chief Scientist's Recollections of the American North Pole Expedition, 1871–73 by Emil Bessels Translated and edited by William Barr

ISBN 978-1-55238-876-1

THIS BOOK IS AN OPEN ACCESS E-BOOK. It is an electronic version of a book that can be purchased in physical form through any bookseller or on-line retailer, or from our distributors. Please support this open access publication by requesting that your university purchase a print copy of this book, or by purchasing a copy yourself. If you have any questions, please contact us at ucpress@ucalgary.ca

Cover Art: The artwork on the cover of this book is not open access and falls under traditional copyright provisions; it cannot be reproduced in any way without written permission of the artists and their agents. The cover can be displayed as a complete cover image for the purposes of publicizing this work, but the artwork cannot be extracted from the context of the cover of this specific work without breaching the artist's copyright.

UNIVERSITY OF CALGARY
Press
press.ucalgary.ca

Acknowledgement: *We acknowledge the wording around open access used by Australian publisher,* **re.press**, *and thank them for giving us permission to adapt their wording to our policy* http://www.re-press.org

Epilogue: Motive for Murder

While working on his excellent biography of Charles Francis Hall, *Weird and Tragic Shores*,[1] Dr. Chauncey Loomis became intrigued by the mysterious circumstances of Hall's death and especially by the suspicion that he might have been poisoned. On the basis of the documentary evidence he concluded "that murder was at least possible and plausible."[2] His curiosity was sufficiently aroused that he applied to the Danish government's Ministry for Greenland for a permit to visit Thank God Harbour, to disinter Hall's remains (in the hope that they had been relatively well preserved in the permafrost) and to conduct an autopsy. His application was referred to the archeologist Count Eigil Knuth, who acted in an advisory capacity to the ministry. Count Knuth's initial reaction was quite negative, in that he felt that the idea of disturbing the grave was repugnant. Loomis visited the Count in Copenhagen and, on Loomis's assuring him that he would leave the grave exactly as he found it, the Count gave his approval and official permission was granted.

Loomis then assembled his team: pathologist Dr. Franklin Paddock, outdoorsman William Barrett and ex-Marine Tom Gignoux. In August 1968 they flew north by scheduled airline to Resolute Bay and from there the renowned bush pilot Weldy Phipps, owner of Atlas Aviation, flew them in a de Havilland single-Otter to Thank God Harbour. They easily located the grave from the commemorative plaque erected to Hall's memory by members of the Nares expedition, and having found Hubbard Chester's headboard lying face-down on the ground, they began examining the remains of Bessels's observatory. Next day the task of disinterring Hall's remains began. On opening the coffin they found the body wrapped in an American flag. On removing it they found Hall's

face only partly preserved: there was still some flesh and most of the hair and beard, but the eye-sockets were empty and the nose was almost gone. The skin was tanned and stained by the dyes from the flag.

From the waist down the body was encased in ice, although Hall's stockinged feet stuck out rather incongruously at the end of the coffin. The upper part of the torso was clear of ice, and hence Paddock was able to start the autopsy, although this involved him straddling the coffin in an awkward position. Unfortunately the internal organs had almost totally disappeared. The best samples he was able to remove were samples of hair and fingernails and a triangular section of skull. After Paddock's three hours of painstaking work, the corpse was reclosed, the coffin lid replaced, the earth shovelled back and the rocks replaced.

On the team's return to the United States, for a preliminary investigation the skull sample was submitted for analysis to the Massachusetts Department of Public Safety Laboratory.[3] Analysis revealed an unusually high level of arsenic in the bone.

Next the samples of a fingernail and hair were submitted to the Centre of Forensic Sciences in Toronto, along with two chips of bone and two samples of soil from around the grave. The overall conclusion from the neutron-activation tests to which the samples were submitted was that they indicated "an intake of considerable amounts of arsenic by C.F. Hall in the last two weeks of his life."[4]

The best evidence had come from the fingernail sample. Dr. A.K. Perkons sliced the fingernail into small segments, each of which was submitted separately to the neutron-activation test. The results revealed an increase in the concentration of arsenic from tip to base, namely from 24.6 parts per million at the tip to 76.7 ppm at the base. Given the normal growth rate of fingernails this would indicate a large intake of arsenic in the last two weeks of the individual's life. The soil samples from around the grave yielded quite a high level of arsenic (22.0 ppm), and while some arsenic might have migrated from the soil to the body this would not explain the increase in arsenic concentration from tip to base of the fingernail.

Many of the symptoms which Hall exhibited—the initial gastro-intestinal pains and vomiting, difficulty in swallowing, dehydration, stupor, delirium and mania and, shortly before his death, skin eruptions on

his face—are consistent with the symptoms of acute arsenic poisoning.[5] But this raises the questions of how the arsenic was introduced into Hall's system, and who was responsible.

There is the possibility that Hall may have been unwittingly responsible (at least in part) for his own demise. Arsenic was commonly used as a medication, in the form of arsenious acid, in the nineteenth century. In a popular remedy, "Fowler's Solution," it would have been present in any comprehensive medical kit, and such a kit would undoubtedly have been on board *Polaris.* It is conceivable that during the period when Hall was refusing Bessels's ministrations, he might have been taking such a medication, and thereby, if it were in large doses, accidentally poisoning himself. But this does not explain the initial symptoms of which he complained prior to that point.

Two individuals stand out as possible candidates for having tried to poison him. Budington had made it no secret that he disliked Hall intensely and was determined to ensure that *Polaris* did not go farther north. He had tried to persuade Hall to winter much farther south, at Port Foulke. But there is no evidence that he was even near Hall for any length of time after the latter first fell ill. Moreover, while he might have somehow obtained arsenic from Bessels's medical supplies, it seems unlikely that he would have had the knowledge or the skill to administer it in appropriate doses over such a lengthy period as to simulate the effects of "apoplexy," i.e., a stroke.

Bessels is a more obvious candidate, in terms of opportunity, medical knowledge and skill. Significantly, during the period when Hall refused to let Bessels treat him, Hall's condition improved noticeably. Also, at the start of Hall's illness, when others had suggested administering an emetic, Bessels had refused. In this context, while an emetic would have been dangerous if Hall had suffered a stroke, an emetic would have purged the system of any arsenic, if it had been administered. When Budington offered to take the medicine which Bessels was prescribing, in Hall's presence, to demonstrate that it was not poisonous, Bessels refused to allow him to do so; if it had contained arsenic, Budington would have been poisoned too. And while Bessels claimed that he was injecting quinine, it might equally well have been arsenic.

The main drawback to the argument that Bessels might have poisoned Hall is the lack of an obvious motive. While he may have harboured a degree of contempt for Hall as being uneducated and unrefined, unlike Budington he was keen to continue to push north and, indeed, made attempts to do so, even after *Polaris* was aground and effectively abandoned.

Loomis's considered and cautious appraisal of Hall's death is as follows:

> Perhaps Bessels murdered Hall. Perhaps. The only certain truth that can be found in this case is a knowledge of the inevitable and final elusiveness of the past. What happened aboard the USS *Polaris* between October 24 and November 8, 1871, can never be entirely known. What went on in the minds of Hall, Bessels, and the others aboard that ship, and what they did furtively, on their own, is done, gone, past. The questions that the Board of Inquiry did not ask can be asked today, but many of them cannot be answered.[6]

Elsewhere Loomis wrote:

> Bessels had the opportunity, the skill, and probably the material [to murder Hall], but why would he do it? He had no apparent rational motive; he would gain nothing concrete by Hall's death.[7]

But now, some 45 years later, a potential and very credible motive has surfaced. At an online auction, arctic historian Russell Potter spotted an envelope that was for sale. It had been sent from *Polaris* at Upernavik and bore Hall's name, and was addressed to Miss Vinnie Ream, 726 Broadway, New York.[8]

Vinnie Ream, aged 22 or 23, was a young sculptor/singer/musician, who is probably best known for her statue of Abraham Lincoln which stands in the Rotunda of the Capitol building in Washington. She had a reputation for cultivating influential older men (usually 20 years or more her senior) to her own advantage.[9] A measure of her success in this is that she is probably the only artist to be provided with studio space

in the Capitol, rent-free. She met Hall in Washington while *Polaris* was being fitted out, and gave him a photo of her statue of Lincoln, which had only recently been unveiled.

While *Polaris* lay at the Brooklyn Navy Yard, more than once Hall had dinner with Vinnie, who was organizing a studio in New York. On several occasions Bessels accompanied Hall. While Hall probably was simply enjoying the company of an attractive young woman, Bessels was infatuated with her. On 28 June, on the eve of their sailing from New York, he wrote to her:

> While thinking of you all the time and anticipating the pleasure of seeing you tomorrow we received very unexpectedly an order requiring us possibly to leave early tomorrow before starting our perilous and uncertain voyage. Send by the reply vessel, which leaves shortly, a few words to one who will cherish your memory, dear Vinnie, and who must now, however unwillingly, bid you a long farewell.[10]

We do not know what Vinnie's feelings for Bessels were, but Hall had evidently made quite an impression on her, and in addition to a photo of her statue of Lincoln, after *Polaris* had sailed she also sent him a bust of Lincoln and other items via the steamer *Congress*, which caught up with *Polaris* at Upernavik. On 21 August, at Upernavik, Hall wrote to her:

> Your notes, flags and other valuables all quickly and safely received by the US steamer *Congress.* You should see my sweet little cabin. As you enter it our great, noble-hearted statue of Lincoln strikes the eye while beneath it hangs the photograph you gave me of the statue of Lincoln. Today I resume my voyage—the Smith Sound remarkably open—never known to be more so. You may expect that when you again hear from me and my company, that the North Pole has been discovered. How true is your faith that we are going to conquer.[11]

It is not inconceivable that Bessels, pathologically jealous of Hall as competition for Vinnie Ream's affections, grasped the opportunity to

eliminate him. Men have been murdered for much weaker motives. It would be fascinating to know whether Bessels tried to renew his relationship with Vinnie on his return to the United States. But if, as seems likely, he made such an attempt but simply received the brush-off, neither is likely to have retained any relevant correspondence.

— William Barr

Appendix 1

Scientific Appendix (outline)

Bessels's scientific appendix, dealing with the marine and atmospheric environments, covers 113 pages. In that all the data presented here are also available in the Scientific results which were published in English (US Navy Department 1876), only the main headings will be listed here, to give some idea of the scientific scope of the expedition's work.

I Hydrographie (Hydrography)

1. Ebbe- und Flutbeobachtungen (Tidal observations) (pp. 530–48)
2. Aräometer-Beobachtungen (Observations of specific gravity of sea water) (pp. 548–51)
3. Meeres-Strömungen (Sea currents) (pp. 552–60)
4. Bemerkungen über die Eisverhältnisse (Sea ice observations) (pp. 561–65)

II Erdmagnetismus und Nordlichter (Terrestrial magnetism and aurora borealis)

1.Erdmagnetismus (Terrestrial magnetism) (pp. 566–70)
2.Nordlichter (Aurora borealis) (pp. 570–71)

III Meteorologie (Meteorology)

(The meteorological data are for both Thank God Harbor and for Polaris House)

1. Die Temperatur der Luft (Air temperature) (pp. 573–86)
2. Die Winde (Winds) (pp. 586–601)
3. Der Luftdruck (Air pressure) (pp. 602–13)
4. Hygrometrische Beobachtungen (Hygrometric observations) (pp. 613–29)
5. Die atmosphärischen Niederschläge (Precipitation) (pp. 629–32)
6. Die Bewölkung (Cloud cover) (pp. 632–36)
7. Die Wärmestrahlung der Sonne (Solar radiation) (pp. 637–41)
8. Der Ozon-Gehalt der Luft (Ozone content of the air) (641–43)

Appendix 2

Hall's Instructions[1]

Navy Department, June 9, 1871

Sir: Having been appointed, by the President of the United States, commander of the expedition toward the North Pole, and the steamer Polaris having been fitted, equipped, provisioned, and assigned for the purpose, you are placed in command of the said vessel, her officers and crew, for the purposes of the said expedition. Having taken command, you will proceed in the vessel, at the earliest possible date, from the navy yard in this city to New York. From New York you will proceed to the first favorable port you are able to make on the west coast of Greenland, stopping, if you deem it desirable, at St. John's, Newfoundland. From the first port made by you, on the west coast of Greenland, if farther south than Holsteinberg [*sic*], you will proceed to that port, and thence to Godhaven, (or Lively), in the island of Disco. At some one of the ports above referred to you will probably meet a transport, sent by the Department, with additional coal and stores, from which you will supply yourself to the fullest carrying capacity of the Polaris. Should you fall in with the transport before making either of the ports aforesaid, or should you obtain information of her being at, or having landed her stores at any point south of the island of Disco, you will at once proceed to put yourself in communication with the commander of the transport, and supply yourself with the additional supplies and coal, taking such measures as may be most expedient and convenient for that purpose. Should you not hear of the transport before reaching Holsteinberg you will remain at that port, waiting for her and your supplies, as long as

the object of your expedition will permit you to delay for that purpose. After waiting as long as is safe, under all the circumstances as they may present themselves, you will, if you do not hear of the transport, proceed to Disco, as above provided. At Disco, if you hear nothing of the transport, you will, after waiting as long as you deem it safe, supply yourself as far as you may be able, with such supplies and articles as you may need, and proceed on your expedition without further delay. From Disco you will proceed to Upernavik. At these two last-named places you will procure dogs and other Arctic outfits. If you think it of advantage for the purpose of obtaining dogs, &c., to stop at Tossak, you will do so. From Upernavik, or Tossak, as the case may be, you will proceed across Melville Bay to Cape Dudley Digges, and thence you will make all possible progress, with vessels, boats, and sledges, toward the North Pole, using your own judgment as to the route or routes to be pursued and the locality for each winter's quarters. Having been provisioned and equipped for two and a half years, you will pursue your explorations for that period; but, if the object of the exploration require it, you will continue your explorations for such a further length of time as your supplies may be safely extended. Should, however, the main object of the expedition, viz., obtaining the position of the North Pole, be accomplished at an earlier period, you will return to the United States with all convenient dispatch.

There being attached to the expedition a scientific department, its operations are prescribed in accordance with the advice of the National Academy of Sciences as required by the law. Agreeably to this advice, the charge and direction of the scientific operations will be intrusted, under your command, to Doctor Emil Bessels; and you with render Dr. Bessels and his assistants all such facilities and aids as may be in your power to carry into effect the said further advice, as given in the instructions herewith furnished in a communication from the president of the National Academy of Sciences. It is, however, important that objects of natural history, ethnology, &c., &c., which may be collected by any person attached to the expedition, shall be delivered to the chief of the scientific department, to be cared for, under your direction, and considered the property of the Government; and every person be strictly prohibited from keeping any such object. You will direct every qualified person in

the expedition to keep a private journal of the progress of the expedition and enter on it events, observations, and remarks, of any nature whatsoever. These journals shall be considered confidential and read by no person other than the writer. Of these journals no copy shall be made. Upon the return of the expedition you will demand of each of the writers his journal, which it is hereby ordered he shall deliver to you. Each writer is to be assured that when the records of the expedition are published he shall receive a copy; the private journals to be returned to the writer, or not, at the option of the Government; but each writer, in the published records, shall receive credit for such part or parts of his journal as may be used in such records. You will use every opportunity to determine the position of all capes, headlands, islands, &c., the lines of coasts, take soundings, observe tides and currents, and make all such surveys as may advance our knowledge of the geography of the Arctic regions.

You will give special written directions to the sailing and ice master of the expedition, Mr. S.O. Buddington, and to the chief of the scientific department, Dr. E. Bessels, that in case of your death or disability—a contingency we sincerely trust may not arise—they shall consult as to the propriety and manner of carrying into further effect the foregoing instructions, which I here urge must, if possible, be done. The results of their consultations, and the reasons therefore, must be put in writing, and kept as part of the records of the expedition. In any event, however, Mr. Buddington shall, in case of your death or disability, continue as the sailing and ice master, and control and direct the movements of the vessel; and Doctor Bessels, in such case, continue as chief of the scientific department, directing all sledge journeys and scientific operations. In the possible contingency of their non-agreement as to the course to be pursued, then Mr. Buddington shall assume sole charge and command, and return with the expedition to the United States will all possible dispatch.

You will transmit to this Department, as often as opportunity offers, reports of your progress and results of your search, detailing the route of your proposed advance. At the most prominent points of your progress you will erect conspicuous skeleton stone monuments, depositing near each, in accordance with confidential marks agreed upon, a condensed record of your progress, with a description of the route upon which you propose to advance, making caches of provisions, &c., if you deem fit.

In the event of the necessity for finally abandoning your vessel, you will at once endeavor to reach localities frequented by whaling or other ships, making every exertion to send to the United States information of your position and situation, and as soon as possible to return with your party, preserving, as far as may be, the records of, and all possible objects and specimens collected in the expedition.

All persons attached to the expedition are under your command, and shall, under every circumstance and condition, be subject to the rules, regulations, and laws governing the discipline of the Navy, to be modified, but not increased, by you as the circumstances may in your judgment require.

To keep the Government as well informed as possible of your progress, you will, after passing Cape Dudley Digges, throw overboard daily, as open water or drifting ice may permit, a bottle or small copper cylinder, closely sealed, containing a paper, stating date, position, and such other facts as you may deem interesting. For this purpose, you will have prepared papers containing a request, printed in several languages, that the finder transmit it by the most direct route to the Secretary of the Navy, Washington, United States of America.

Upon the return of the expedition to the United States, you will transmit your own and all other records to the Department. You will direct Dr. Bessels to transmit all the scientific records and collections to the Smithsonian Institution, Washington.

The history of the expedition will be prepared by yourself, from all the journals and records of the expedition, under the supervision of the Department. All the records of the scientific results of the expedition will be prepared, supervised, and edited by Dr. Bessels, under the direction and authority of the president of the National Academy of Sciences.

Wishing for you and your brave comrades health, happiness, and success in our daring enterprise, and commending you and them to the protecting care of the God who rules the universe,

I am, very respectfully, yours,

GEO. M. ROBESON
Secretary of the Navy.

CHAS. F. HALL.
Commanding Expedition toward the North Pole.

Appendix 3

The Board of Inquiry

On the same day that *Frolic* reached Washington (5 June 1873) with Tyson and the other ice-floe survivors on board, an official Board of Inquiry was hurriedly convened on board *Talapoosa* at the Washington Navy Yard. In the chair was Navy Secretary George Robeson, and the other members of the Board were Commodore William Reynolds, Professor Spencer F. Baird of the Smithsonian Institution, and Captain H.W. Howgate of the Signal Service Corps.[2] The remainder of *Polaris*'s complement, including Bessels, reached Washington from New York on board *Tallapoosa* on 7 October. The Board of Inquiry, still with the same composition, reconvened, again on board *Tallapoosa*, and resumed its questioning on the morning of 11 October. On 16 October, by special invitation from Robeson, Surgeon-General W.K. Barnes of the United States Army and Surgeon-General Joseph Beale of the United States Navy were also present for Bessels's testimony.[3]

Even before the Board met for its first session to question Tyson and the other survivors on 5 June, the newspaper accounts, and simply the fact that the expedition had split into two groups, one of which had barely survived, and the fate of the other of which was still unknown, must have given George Robeson, as Secretary of the Navy, enormous cause for worry. That this expedition, outfitted by the US Government at such great expense and dispatched with such great fanfare, had clearly disintegrated without even starting to achieve its objective was a cause for acute embarrassment.

And once the survivors started to give their testimony, Robeson's level of worry and embarrassment must have risen exponentially. First of all there was the disturbing revelation that Budington (sailing master, and, after Hall's death, expedition leader), on the way north had openly expressed his preference that they should winter at Port Foulke (some 500 km south of the latitude which *Polaris* ultimately reached). This, of course would have been impossibly far south to be the starting point at any attempt at reaching the North Pole. When questioned on the subject Budington insisted, "I did my best to get the ship north. I never said anything about never going any further north."[4] Various members of the expedition testified that Budington clearly had no interest in the expedition's primary objective, namely trying to reach the Pole. For whatever reason Tyson opted not to reveal the plan which Budington had disclosed to him in January or February 1872, namely that after the ice breakup he would take the ship south to near Upernavik, deliberately run it aground and then take to the boats as far as Disko (where a substantial depot of provisions and fuel had been left). From there he proposed travelling by whaler to Europe, then home by steamer at government expense. He anticipated that his (and the crew's) pay would continue as if still actively engaged on the expedition.[5] One can only guess as to why Tyson decided not to reveal this astonishing plan to the Board of Inquiry; Budington undoubtedly would have denied it.

Another accusation levelled against Budington by both officers and crew members was that he was frequently drunk, having helped himself to Bessels's supply of alcohol for preserving specimens or, after Hall's death and after he (Budington) had inherited Hall's keys, to the limited supply of alcohol on board, intended for celebrations. Probably the worst of his bouts of drunkenness (in terms of its ultimate results) occurred during the night of 14–15 August, as *Polaris* was steaming south in open water in Kennedy Channel. Budington, who had the helm, was drunk, and in this condition allowed the ship to stray from the open channel until she was solidly beset.[6] This led, subsequently, to the disastrous night when half the ship's complement was left on the ice, which led in turn to their remarkable ice-drift for the full length of Baffin Bay, Davis Strait and the Labrador Sea. When confronted by the accusation of drunkenness by Robeson, who asked, "Were you in the habit of

drinking alcohol?," Budington replied, "I make it a practice to drink very little. I did take too much twice during this voyage, that I recall."[7] With respect to one of these occasions (when Bessels had caught him stealing alcohol), Budington told the Board of Inquiry, "I did not consider, however, that I was not in a condition to do my duty. I merely felt the liquor. I do not think a stranger would have seen it on me at all. I had drank occasionally before but not to any excess."[8]

Possibly even more damning was Tyson's accusation that Budington had been a "disorganizer." When asked for clarification Tyson replied that "he [Budington] associated himself with the crew very much, cursing his commander, and blaming him, and speaking slightingly of him. . . . His ground of complaint was that the captain was not a seaman. On the most frivolous things he would be among the crew and complaining of Captain Hall."[9]

Any one of these three deficiencies—lack of enthusiasm for the main objective of the expedition, repeated drunkenness, or belittling his superior officer to the crew—would normally in the United States Navy have been grounds for a court-martial, and probably dismissal. But Budington was a civilian. Partly because of this, and partly to avoid the scandal of further "washing of dirty laundry" in public, the Board of Inquiry made no recommendation to punish Budington.

Nonetheless Robeson's summation as to Budington's character and capabilities was more than somewhat damning:

> The facts show that though he was perhaps wanting in enthusiasm for the grand objects of the expedition, and at times grossly lax in discipline, and though he differed in judgment from others as to the possibility, safety, and propriety of taking the ship further north, yet he is an experienced and careful navigator, and when not affected by liquor, of which there remained none on board at the time of the separation, a competent and safe commander.[10]

Potentially an even more scandalous topic which emerged when the Board started to probe the details of Hall's death was the fact, revealed by various witnesses, that Hall believed that he was being poisoned.

Apart from his having the means and the opportunity, if Hall was indeed poisoned, various aspects pointed to Bessels as being the culprit: for example, his refusal to administer an emetic—which would have cleared his system of any poison—or the fact that Hall experienced a noticeable recovery during the several days when he refused to be treated by Bessels, but then suffered a serious and fatal relapse when Bessels started treating him again.

If Surgeon-General Barnes and Surgeon-General Beale had any suspicions, however, they clearly decided that it were best for the Navy's reputation that any such suspicions not be publicly aired. After listening to Bessels's testimony (which differed only minimally from what he would later state in his book[11]), they submitted their own, separate assessment of the circumstances of Hall's death:

Washington, D.C., December 26, 1873

> Sir: We, the undersigned were present by request of the honorable Secretary of the Navy, at the examination of Dr. Emil Bessels, in regard to the cruise of the *Polaris* and the circumstances connected with the illness and death of Captain Hall. We listened to his testimony with great care and put to him such questions as we deemed necessary.
>
> From the circumstances and symptoms detailed by him, and comparing them with the medical testimony of all the witnesses, we are conclusively of the opinion that Captain Hall died from natural causes, viz. apoplexy, and that the treatment of the case by Dr. Bessels was the best practicable under the circumstances.
>
> Respectfully, your obedient servants
>
> W.K. Barnes
> Surgeon-General of the United States Army
>
> J. Beale
> Surgeon-General of the United States Navy[12]

The Board, as a whole, recommended that no action be taken against anyone among the officers and crew of *Polaris* and that no further investigation be undertaken. Undoubtedly embarrassed by the disastrous outcome of its expensively outfitted and equipped expedition, the United States Navy was clearly keen that no further scandalous revelations should emerge.

Appendix 4

Biographical sketches

EMIL BESSELS was born to Jewish parents in Heidelberg on 2 June 1847. His father ran a boys' boarding school and his mother was the principal of a girls' boarding school.[13] French and English were used almost as much as German on a daily basis at home. His first choice was to pursue a scientific career, but since she had three young children to consider, his mother insisted that he leave high school at the age of 15. He was then apprenticed to a banker. But while pursuing a banking career he devoted his evenings and weekends to studying, improving his artistic skills, and expanding his knowledge of the sciences, especially zoology.

Fortunately for him, after two years his family recognized that he was not suited for the banking profession, and, with his boss's approval, he left his job and devoted himself full-time to his scientific studies. He entered the University of Heidelberg, but since he had not graduated from high school, he had no prospects of being accepted to a medical programme. His solution was to enter a prize competition in which he won first prize. He not only was allowed to enter the programme but submitted his prize-winning essay as his doctoral dissertation. And at the age of 18, in 1865, he became the youngest doctor that the Ruprecht-Karls Universität Heidelberg had produced until then. He then published his dissertation, titled *Studien* über *die Entwicklung der Sexualdrüsen bei den Lepidopteren* (Studies on the development of the sexual glands in lepidoptera).[14]

Thereafter, having developed an interest in Africa, Bessels started to learn Arabic, as well as pursuing medical and natural history studies

at Jena and Stuttgart. At the age of 20 he became curator of the Natural Sciences Museum in Stuttgart. But then, some 18 months later, he got in contact with August Petermann, well-known geographer and promoter of geographical exploration. The latter persuaded him to change his geographical focus, and in 1869 at Petermann's recommendation he took part in the combined sealing and exploring expedition mounted by ship owner Albert Rosenthal on board *Albert* (Captain Hashagen).[15] *Albert* put to sea from Bremerhaven on 23 May. The aim was to round Spitsbergen on the north, but the ship reached her highest latitude at 80°14'N; 9°52'E, where she was blocked by close, heavy ice. Two attempts at reaching Hinlopenstretet, from where a search for Gillis Land was contemplated, were foiled by heavy ice. An attempt to reach Gillis Land by running south around Spitsbergen was no more successful, reaching only Tusenøyane. Swinging south, Bessels was able to determine the position of Hopen more accurately than previously, fixing its southern tip at 76°35'N; 25°47'E. From there *Albert* ran east until Mys Nassau at the northern tip of Novaya Zemlya loomed through the fog. From there the ship started south, reaching Bremerhaven on 22 September. Bessels carried out meteorological observations and soundings throughout. One of his more important achievements on this voyage was to confirm Petermann's hypothesis that the warm waters of the North Atlantic Drift (the continuation of the Gulf Stream) penetrated north to between Svalbard and Novaya Zemlya.

In the following year, once again at Petermann's initiative, Bessels began preparations for a further arctic expedition, on this occasion aiming for the area northeast of Svalbard. But when a possible financial contributor withdrew his promised support, and when the Bremen Committee, which had organized the First German North Pole Expedition, led by Karl Koldewey, refused Petermann's request to use that expedition's ship *Grönland*, the plans for the expedition collapsed

It was partly on the basis of Bessels's arctic experience that Petermann was able to convince the American authorities that he was the ideal candidate for the position of Chief Scientist on the *Polaris* expedition.[16] At the time Bessels was fulfilling his military service during the Franco-Prussian War, but Petermann was able to obtain his release.

On his return from the expedition Bessels settled in Washington and, from an office at the Smithsonian Institution, worked on the first volume of the scientific results, namely "Physical Observations."[17] Thereafter he continued to work intermittently on further scientific results of the expedition. But by 1883, with no sign of further volumes appearing, Spencer Baird's patience was exhausted. Bessels's salary was cut off and he received a blunt note from Baird's secretary that he must vacate his office since the space was required for a visitors' toilet.[18]

Bessels's delay in publishing further expedition results was undoubtedly due in part to the fact that he was involved in at least one further expedition. In 1875 he was dispatched north by the US government, this time to the Chukchi Sea, with instructions to collect ethnographical material for the Centennial Exhibition in Philadelphia in 1876.[19] Bessels sailed on board USS *Saranac* (Lieutenant Commander Sanders), a side-paddle steamer of 2100 tons. Heading north, Sanders chose the Inside Passage between Vancouver Island and the mainland but had the misfortune to hit notorious Ripple Rock in Seymour Narrows, while steaming at 14 knots with a 7-knot current, on 18 June 1875. Sanders managed to beach his ship on the Vancouver Island shore, but she later sank completely. All on board got ashore safely and set up a camp. Sanders and a party of men made their way overland to Victoria.[20]

Returning to Washington and to his office at the Smithsonian Institution, in 1881 Bessels started planning for a further arctic expedition, to take place in 1882 and funded by private contributions, but the plan fell through. However, in 1881 Bessels was voted $10,000 by the 46th United States Congress for his contribution to Arctic science.[21] In the early morning of 25 December 1885 he suffered the serious misfortune that his house near Washington burned down and he lost all his books, manuscripts, sketches and collections.[22] He himself escaped only by jumping from the third floor. Thereafter he suffered from insomnia and convulsions. Early in 1888 he returned to Germany to visit his aged mother, and for some rest and recuperation. After an evening among friends, he died of a heart attack at his home in Stuttgart on 30 March 1888.

SIDNEY O. BUDINGTON (1823–1888) was a native of Groton, Connecticut. Like so many of his relatives he went to sea at an early age on board whaling vessels sailing out of New London. By 1860, when Charles Francis Hall came to New London in search of a ship which could take him to the Arctic, Budington offered to take him on board his ship; by then he was captain of *George Henry* owned by Messrs. Williams and Haven of New London.[23] This offer appealed especially to Hall in that Budington had brought an Inuk, Kallarjuk, south from Baffin Island the previous year and would be taking him back north in 1860. Hall saw this as an opportunity to learn Inuktitut. Unfortunately Kullarjuk died off the Greenland coast on 1 July.[24] *George Henry* wintered in Cyrus Field Bay, and with Hall on board, returned to New London on 7 September 1862.

In July 1863 Budington headed north again, again in command of *George Henry*, but this time bound for Hudson Bay, where the ship ran aground and sank.[25] In the meantime Hall had had a serious disagreement with Budington. Nevertheless, when the former returned from his second expedition (to northwestern Hudson Bay and King William Island) in December 1869, accompanied by Ebierbing and Tookoolito, who were to stay with the Budingtons, Hall visited them there, evidently with a view to also patching up his friendship with Budington. In this he was successful, and Budington was Hall's first choice to command *Polaris* in 1871.

After the expedition, and after the revelations as to his conduct which emerged at the Board of Inquiry, Budington never went to sea again. He is buried in the Starr Burying Ground in Groton, Connecticut.[26]

EBIERBING (more correctly IPIIRVIK) and TOOKOOLITO (TAQULLITUQ). Ebierbing, known to the whalers and the members of the *Polaris* expedition as Joe or Joseph, was born at Qimmigsut, off the south shore of Cumberland Sound, probably in 1836. At some time prior to 1853 he married Tookoolito according to Inuit custom.[27] She (otherwise known as Hannah) was born at Cape Searle on the east coast of Baffin Island in 1838. In 1853 they were taken to England by John Bowlby, who was in Baffin Island hoping to develop a cod fishery.[28] There they spent two years, during which they converted to Christianity, acquired

a command of English (Tookoolito more so than Ebierbing), and on one occasion were presented to Queen Victoria and Prince Albert. They were also "exhibited" on numerous occasions in Hull and London.

In the fall of 1860 Tookoolito met Hall on board *George Henry* at the mouth of Frobisher Bay, and she and Ebierbing accompanied him as interpreters and, in the latter's case, as hunter and dog driver for the remainder of his travels around southern Baffin Island. They and their infant son travelled south with him on board *George Henry* in the fall of 1862. Once again they were exhibited in public, for example at Barnum's Museum in New York,[29] and appeared at Hall's numerous lectures, aimed at raising funds for his next expedition. Stressed by the rigorous schedule and by the relatively hot climate, Tookoolito was frequently ill, and their young son died in the spring of 1863. When not travelling with Hall they stayed with Captain Sidney Budington and his wife in Groton, Connecticut.

They once again accompanied Hall on his second arctic expedition (1864–69), aimed at searching for possible records left by the Franklin expedition, and during which they roamed from Depot Island to Repulse Bay, Melville Peninsula and, briefly, southern King William Island. During this expedition Tookoolito gave birth to, and lost, a second baby. She then adopted a daughter, Isigaittuq, in Igloolik. In his writings Hall refers to her as Punna, his rendering of Panik, the Inuktitut word for "daughter."[30]

After returning to Groton in 1869, Ebierbing bought a house on Pleasant Valley Road. He worked as a carpenter and Tookoolito as a seamstress, making fur clothing. Their daughter, known as Sylvia Ebierbing, attended the local school.[31]

Following the *Polaris* expedition, the ice-floe drift—during which few of their companions, if any, would have survived without their skills, he as a hunter and she as a cook and seamstress[32]—and then the Board of Inquiry, the small family settled down again in Groton. But Ebierbing soon headed north again, this time as interpreter on board Sir Allen Young's *Pandora* in 1875. Young's aim was to try to relocate the North Magnetic Pole and, if possible, to continue west through the Northwest Passage. After running south through Peel Sound, *Pandora* was blocked by ice in Franklin Strait and was forced to turn back.[33]

Tookoolito died on 31 December 1876 and is buried in the Starr Burying Ground in Groton, her grave marked by a substantial headstone.[34] Also buried in this grave are Panik (Sylvia) and Tarrilikitak, the son who had died in 1863.

In 1878 Ebierbing headed north once again, this time on Frederick Schwatka's expedition, whose aim was to investigate reports that records from the Franklin expedition might have survived.[35] After landing from the whaler *Eothen* near Depot Island, the expedition made contact with the local Inuit and, travelling with some of them, headed north. Schwatka searched the south and west coasts of King William Island and discovered numerous skeletal remains and artefacts. When the expedition started back south from Depot Island on board the whaler *George and Mary* on 1 August 1878, Ebierbing elected to remain behind, on Marble Island. He died in the Arctic soon afterward, although his name appears on the family headstone in the Starr Burying Ground in Groton.[36]

CHARLES FRANCIS HALL (1821–1871) was born in Rochester, New Hampshire (although possibly in Vermont, moving to Rochester with his family at an early age).[37] After only a few years of schooling he was apprenticed to a blacksmith. A few years later he moved west and, possibly after a few stops along the way, and having married his wife Mary, had settled in Cincinnati, Ohio, by 1849. Initially employed in a seal-engraving business, after three years he struck out on his own as an engraver. But then in 1855 he started publishing a small, single-page news sheet, the *Cincinnati Occasional*, and in 1859 he graduated to publishing a daily newspaper, the *Daily Press*.

By this time Hall's interest in Arctic exploration had been kindled, possibly by his having witnessed the transfer of the body of Elisha Kent Kane from a riverboat to a train at Cincinnati, on its long journey from Havana to Philadelphia, on 7 March 1857. Thereafter Hall began reading intensely about Arctic exploration. His interest was probably further sparked by reading that Lady Franklin was about to dispatch Lieutenant Francis Leopold McClintock on board *Fox* to search for survivors or news of her husband's missing expedition.[38] As a result he decided to mount his own expedition to search for documents or relics from the

expedition. Frustrated in his attempts to persuade Henry Grinnell to provide him with a ship of his own and to find a captain, in 1860 he set off north on board the whaling ship *George Henry* (Captain Sidney Budington), and taking his own small boat.[39] To his immense good fortune, off Frobisher Bay he encountered Tookoolito (Hannah) and her husband Ebierbing (Joe), who would act as his guides and interpreters on this and his subsequent expeditions. His plan was to head west to King William Island via Frobisher Bay (then still thought to be a strait). This plan was thwarted when his boat was wrecked and when he discovered that Frobisher Strait was a bay, not a strait. This discovery and the discovery, guided by local Inuit oral tradition, of the site of Martin Frobisher's mining activities on Kodlunarn Island in 1558, represented the most important results of Hall's expedition.

On his return south (along with Ebierbing and Tookoolito), Hall did not return to his own family in Cincinnati but lived either with Sidney Budington and his wife in Groton, Connecticut, or, after he had quarrelled bitterly with him, in New York. Apart from writing his account of his expedition and lecturing, over the next few years Hall was fully engaged in preparing for a further expedition, again aimed at solving the mystery of the fate of the Franklin expedition, but tackling the problem from the south, from Hudson Bay, rather than from the east. Again accompanied by Ebierbing and Tookoolito, in 1864 he shipped aboard the whaling ship *Monticello* (Captain Edward Chapel), bound for Roes Welcome Sound. The arrangement was that he would be landed at Wager Bay, with the aim of wintering at Repulse Bay, but by mistake he was landed some 60 km further south, near Depot Island. He wintered among local Inuit there, but this error may well have cost him a year. Over the next few years his plan to reach and search King William Island was frustrated by the reluctance of the Inuit to guide him there, although he did manage to push north to Igloolik. There were several American whalers wintering near Depot Island, and in the hopes that members of their crews might be more cooperative, Hall hired five of them to accompany him on his further searches. Hall had a disagreement with one of them, Patrick Coleman, and shot him.[40] On his return south he asked Henry Grinnell for advice on the matter, and the latter contacted the British ambassador in Washington. His reply was that

since the incident occurred beyond the boundaries of Canada (which at the time extended barely beyond Lake Superior), Canada, and hence Britain, had no jurisdiction over the matter. In 1869 Hall finally reached the south coast of King William Island, but his Inuit companions refused to accompany him any farther; he found a few relics and skeletons from the Franklin expedition, and during his sojourn in the general area he recorded several oral accounts of the Inuit's interactions with the Franklin expedition members. On 13 August 1869 Hall, Ebierbing and Tookoolito were on board the whaling ship *Ansel Gibbs* when she sailed from Repulse Bay, southward bound for New Bedford.[41]

Hall was not finished with the Arctic, however. But now his attention was focused on trying to reach the North Pole. Remarkably, through his persistence, luck and his influential contacts, especially Henry Grinnell, his ambition resulted in a major expedition, sponsored and funded by the United States government. Unfortunately, as Bessels's account reveals, the expedition did not live up to expectations but ended in dissension, acrimony, disaster, and in Hall's death, and might well have resulted in the loss of life of most of its personnel.[42]

AUGUST HEINRICH PETERMANN (1822–1878) was born on 18 April 1822 in Bleicherode, Thuringia, the son of August Rudolf Petermann, the local registrar. From an early age August showed a keen interest in maps and a remarkable talent in drafting maps. After he attended the high school in nearby Nordhausen, having recognized his talent his father enrolled him in Heinrich Berghaus's "Geographische Kunstschule" (Geographical Art School) in Potsdam. Berghaus also spotted that he had exceptional talent as a cartographer and "adopted" him as a sort of a foster son. Having mastered a wide range of cartographic techniques, on graduating from Berghaus's establishment in 1845 Petermann moved to Edinburgh, where he worked for cartographer Alexander Johnston. Then in 1847 Petermann moved south to London. Initially he worked as a reporter for the periodical *Athenaeum*, but then in 1854 he established his own cartographic business: "The Geographic Establishment: Engraving, Lithography and Printing Office." He published a wide range of maps and atlases, including maps for the Royal Geographical Society. He had become a member of the latter as soon as he moved to London,

and in 1850 he became Under-Secretary of the Society. In London he got to know a wide range of scientists and explorers, and his later interest in polar exploration evolved from this, especially during the period of intense searches for the missing Franklin expedition in the early 1850s.

In 1854 Petermann moved back to Germany, where he joined Wilhelm and Bernhardt Perthes's publishing company in Gotha; he was also appointed professor at the University of Göttingen. In 1855 he published the first instalment of his *Mittheilungen aus Justus Perthes Geographischer Anstalt* über *wichtige neue Erforschungen auf dem Gesamtgebiet der Geographie von Dr. A. Petermann.* Under the much more convenient title of *Petermanns Geographische Mitteilungen,* this publication continues to the present.

Petermann was very active in promoting geographical exploration, especially polar expeditions, from the very first German polar expedition in 1865 onward. And it was his strong recommendation that resulted in Bessels being hired to participate in Hall's expedition.

Petermann retired from the Perthes's establishment in 1876, but was subject to manic-depressive problems and committed suicide on 25 September 1878.

GEORGE E. TYSON (1829–1906) was born in New Jersey, but at an early age moved with his parents to New York. On leaving school he worked in an iron foundry.[43] Determined to see the Arctic, in 1850 he shipped aboard the New London whaleship *McLellan* (Captain William Quayle), for a voyage to Davis Strait and Baffin Bay. At the close of the following whaling season, along with 11 others, led by first mate Sidney Budington, he volunteered to winter ashore in Cumberland Sound, in order to be able to start whaling early in the spring before any ships could reach that location. In 1855 Tyson shipped as boatsteerer aboard the bark *George Henry* (Captain James Budington). Late in that season Tyson was one of the party which went aboard the derelict HMS *Resolute*, abandoned by Captain Henry Kellett off Cape Cockburn, Bathurst Island, in May 1854).[44] Thereafter Budington put a crew aboard her, who took her to New London. She was purchased by the US government, refitted, and as a gesture of goodwill donated to Queen Victoria.[45]

In 1860 Tyson headed north as captain of *Georgiana*, his first command, and encountered Charles Francis Hall, on his first arctic expedition, on board *George Henry,* in Cyrus Field Bay, although he had met him earlier in New London. He met Hall again in the winter of 1865–66 in Hudson Bay, when Tyson was commanding the bark *Antelope* and Hall was on his second arctic expedition. In 1867–68 Tyson was back in Hudson Bay again, this time aboard the topsail schooner *Era* and again encountered Hall, who was still trying to reach King William Island. In 1869–70, again on board *Era*, Tyson wintered in Cumberland Sound. Soon after he returned home to New London in October 1870, Hall came to see him to invite him to come on his North Pole expedition on board *Polaris* as sailing master or ice pilot.[46]

Having survived the winter (1871–72) on board *Polaris* at Thank God Harbor, the harrowing experience of the ice-floe drift over the winter of 1872–73, and finally the pointed questioning of the Board of Inquiry, Tyson returned to his life as a whaler. But in 1877 he headed north on board the small schooner *Florence* on a special mission, known as the Howgate Preliminary Arctic Expedition. Captain Henry Howgate of the US Signal Service had proposed establishing a colony of some 50 men at Lady Franklin Bay on northern Ellesmere Island. As a support party he proposed including a number of Inuit families. Tyson's task was to spend a winter in Cumberland Sound, where he was to acquire fur clothing from the local Inuit, recruit a party of Inuit for the main expedition, and in the summer of 1878 take them across Davis Strait to Disko, to rendezvous with the main expedition ship, on its way north to Lady Franklin Bay. Along with two scientists, Tyson wintered on board *Florence* at Anarnitung in Cumberland Sound and managed to recruit four Inuit men, along with the wives of two of them and four of their children, and transported them across to Disko. But when the main expedition did not materialize since the plan was voted down by Congress, Tyson waited at Disko until 22 August, then returned the Inuit to Cumberland Sound, and then headed back south.[47] Tyson died in Washington, DC, on 18 October 1906.

Notes

Notes contributed by Bessels are indicated by E.B.

Foreword

1 Loomis 1971:263.
2 Anonymous 1873.
3 Blake 1874.
4 Davis 1876.
5 Blake 1874:110.
6 Ibid., 134.
7 Ibid., 142.
8 Loomis 1971:265.
9 Parry 2001:57–60.
10 Blake 1874:74.
11 US Navy Department 1876.
12 Loomis 1971.
13 See biographical sketch, p. 556.
14 Krause 1992:17–18; Murphy 2002: 21–22.
15 Koldewey 1871:4.
16 Freeden 1869.
17 Koldewey 1874.
18 Krause 1992; Hegemann 1993.
19 Smith 1830.
20 See biographical sketch, pp. 555–57.
21 *Petermanns Geographische Mittheilungen* 1869.

Dedication

1 This dedication is in English in the original.
2 In 1873 Captain Albert Markham had shipped aboard the whaling ship *Arctic* (Captain William Adams) on a cruise to Baffin Bay in order to gain experience for his later participation in George Strong Nares's British Arctic Expedition

(1875–76), and thus was on board *Arctic* when that vessel rescued Bessels and one party of the survivors from the *Polaris* expedition (see p. 495) (Markham 1874).

3 Markham was leader of a sledge party from HMS *Alert*, which had wintered near the site of the present station Alert on northern Ellesmere Island and which reached a record high latitude of 83° 20'26'N on 12 May 1876 before being forced to turn back due to an outbreak of scurvy (Markham 1878; Nares 1878).

PREFACE

1 In fact the natural history results were never published.

2 Bessels reached Dundee, Scotland, on board the whaling ship *Arctic* and then travelled by train to Liverpool to catch a passenger steamer to New York (see p. 495).

3 Also referred to as Joe or Ebierbing in contemporary accounts, or more correctly Ipiirvik. See biographical sketch, p. 558-60.

4 Davis 1876.

5 Ibid.

6 US Navy Department 1876.

7 By this term Nares was referring to the Lincoln Sea or the Arctic Ocean in general.

8 Captain James Cook, on board HMS *Resolution*, reached his highest southerly latitude of 71°10'S in the Southern Ocean, where he was stopped by ice on 30 January 1774 (Beaglehole1961)

9 Bessels is possibly referring to James Weddell, who, in the *Jane* of Leith, reached a record high southerly latitude of 74°15'S in the Weddell Sea on 20 February 1823 (Weddell 1825). But Weddell was a sealer, not a whaler.

10 The term "ice cellar" was coined in 1838 by academician Karl Maksimovich Ber, who had made a voyage to Novaya Zemlya and had reached the east end of Matochkin Shar in 1837 (Solov'ev 1934).

11 The reference is to A.E. Nordenskiöld's ship *Vega*, in which he completed the first transit of the Northeast Passage in 1878–79. Having been blocked by ice, he was forced to winter at Kolyuchinskaya Guba, only a short distance short of Bering Strait, and emerged from that strait on 20 July 1879. He then returned to Stockholm via the Suez Canal (Nordenskiöld 1881).

12 Cape Dezhnev, the easternmost tip of Eurasia.

1: Origin of the expedition and its outfitting

1 The reference is to Sir John Franklin's expedition, whose aim was to complete a transit of the Northwest Passage from east to west. His ships *Erebus* and *Terror*, with combined crews of 129 men, disappeared into what is now the Canadian Arctic Archipelago in 1845, giving rise to an intense search for them which continues to the present (Cyriax 1939). The sunken wreck of *Erebus* was discovered in eastern Queen Maud Gulf by underwater archeologists with Parks Canada in early September 2014 (Geiger and Mitchell 2015). The search for *Terror* continues. The wreck of H.M.S. *Terror* was found by the Arctic Research Foundation's *Martin Bergmann* in Terror Bay on the south coast of King William Island on 3 September 2016.

2 In 1850, *Advance* (Captain Edwin De Haven) and *Rescue* (Samuel Griffin) pushed north through Baffin Bay and west along Lancaster Sound to Beechey Island, where their crews joined those of three British expeditions in examining the traces of the Franklin expedition, which had wintered there in 1845–46. The two American vessels then became beset in the ice and drifted with the ice north up Wellington Channel, back south again, east out of Lancaster Sound and south through Baffin Bay throughout the winter, finally being released in June 1851 (Kane 1854).

3 The graves of John Hartnell and William Braine of *Erebus* and John Torrington of *Terror*, who had all died during the winter of 1845–46. Their bodies (amazingly well preserved in the permafrost) were exhumed and samples of tissues taken for forensic investigation by an expedition led by Dr. Owen Beattie of the University of Alberta in 1984 and 1986 (Beattie and Geiger 1989).

4 Remarkably, despite extensive searches no messages were found as to intended further routes—in contravention of standard arctic expeditionary procedure.

5 This geographical name has not survived; now Inglefield Land.

6 Pushing north through Baffin Bay and Smith Sound into Kane Basin in 1853, Kane wintered twice at Rensselaer Fiord on the Greenland coast of the basin at 78°37'N. In the spring of 1854 several sledge trips were made farther north. When there was no sign of the ship getting free of the ice in the summer of 1855, Kane and his men started south by sledge and boat, reaching Upernavik safely (Kane 1856; Villarejo 1965; McGoogan 2008).

7 In his schooner *United States*, Isaac Hayes pushed north through Baffin Bay, hoping to reach "an open polar sea" and the North Pole. Encountering heavy ice in Smith Sound, he was forced to winter in Foulke Fiord near the Inughuit settlement of Etah. In the spring of 1861 he sledged across Kane Basin to the coast of Ellesmere Island and headed north. He claimed to have reached 81°35'N, but this claim is now disputed. *United States* got underway again on 14 July 1861 and returned safely to Boston (Hayes 1867; Wamsley 2009).

8 Strangely, Bessels has reversed Charles Francis Hall's Christian names. For his background and two earlier arctic expeditions (in 1860–62 and 1864–69) see the biographical sketch, p. 560–62. Most importantly, during the first of these he had met Ebierbing (Ipiirvik) and Hannah (Tookolito; Taqulittuq), who would accompany him on all three of his arctic expeditions (Hall 1865; Nourse 1879).

9 By invitation, on 5 March he gave a lecture in Lincoln Hall, which was attended by the President, Ulysses S. Grant, and by Vice President Schuyler Colfax, on "Arctic expeditions, past and prospective" (Davis 1876:25–26; Henderson 2001:15).

10 Congressman Job Evans Stevenson.

11 Ulysses S. Grant. Hall had met privately with the President on 3 February, only three days after his arrival in Washington (Loomis 1971:233; Henderson 2001:15).

12 Senator John Sherman.

13 Chaired by the Hon. Charles Sumner of Massachusetts (Blake 1874:100).

14 Isaac Hayes was a serious contender for the position of expedition leader (Loomis 1971:238–39; Henderson 2001:17–18).

15 But it barely passed the Senate; it was a tied vote, broken only by the vote of Vice President Schuyler Colfax (Loomis 1971:240).

16 Hall had requested $100,000.

17 The Statutes at Large and Proclamations of the United States of America from December 1869 to March 1871. Boston 1871, Vol. XVI, Chap. 251, Sec. 9, p. 251 (Davis 1876:27; E.B.)

18 That commission read as follows:

Executive Mansion, Washington, D.C., July 20, 1870.

Captain C.F. Hall:

Dear Sir,

You are hereby appointed to command the expedition toward the North Pole. To be organized and sent out pursuant to an Act of Congress approved July 12, 1870, and will report to the Secretary of the Navy and the Secretary of the Interior for detailed instructions. U.S. Grant. (Blake 1874:101).

These "detailed instructions" signed by George Robeson, Secretary of the Navy, are presented in full in Appendix 2.

19 She was a screw tug, built in Philadelphia in 1864 and originally named *America* (Henderson 2001:29).

20 Bessels must have been misinformed; she operated as a gunboat on the Potomac, Chesapeake Bay and especially the Rappahannock (Henderson 2001:29). After the Civil War she was based at Norfolk, Virginia, which is where Hall found her.

21 Her timbers were extensively replaced and additional ice-strengthening installed; she was also caulked and coppered. She was rigged as a topsail-schooner. The bow was strengthened with iron plates for 40 feet aft from the stem (Henderson 2001:29–30).

22 Always keen to save money, Hall had organized a free passage for Bessels through a German shipping company, Oelrichs & Co. (Loomis 1971:252).

23 Of interest is the fact that Bessels was not the first choice as chief scientist. At Lady Franklin's suggestion, Dr. David Walker had offered his services (Loomis 1971:247). Walker had served as medical officer on board McClintock's *Fox* on his 1857–59 voyage, when the only message, and many relics and skeletal remains, from the Franklin expedition had been discovered. At the time he wrote, Walker was serving in the United States Army. Hall, accepting Lady Franklin's recommendation, wrote to Dr. Spencer Fullerton Baird at the Smithsonian Institution, responsible for engaging the scientific staff, to propose Walker as chief scientist. This proposal was accepted, in principle. But then August Petermann, the distinguished German geographer (see biographical sketch, p. 562–63), proposed as his candidate Dr. Emil Bessels. Like Walker, Bessels already had arctic experience, having participated in Petermann's 1869 expedition on board *Albert*, and Baird and Professor Joseph Henry felt that Bessels's scientific credentials were stronger than Walker's (Loomis 1971:252). Thus it was Bessels who was hired.

Hall's instructions included the following order: "The charge and direction of the scientific operations, will be intrusted, under your command, to Dr. Emil Bessels; and you will render Dr. Bessels and his assistants all such facilities and aids as may be in your power" (Blake 1874:108).

24 Joseph Henry, Secretary of the Smithsonian Institution and President of the National Academy of Sciences.

25 Dr. Spencer Fullerton Baird; then Assistant Secretary at the Smithsonian, he would succeed Henry as Secretary on the latter's death in 1878.

26 Rear-Admiral Benjamin F. Sands.

27 Commodore (later Rear-Admiral) Daniel Ammen, then Chief of the Bureau of Yards and Docks.

28 Although later promoted Commodore and later Rear-Admiral, in 1873 Robert H. Wyman's rank was Captain; he was the head of the Hydrographic Office.

29 Julius Erasmus Hilgard (1825–1890), a German-American engineer with the Coast and Geodetic Survey.

30 Carl Anton Schott (1826–1901), a German-American engineer with the Coast and Geodetic Survey.

31 In late May President Ulysses S. Grant, Secretary of the Navy Robeson and various other officials had visited the ship. On that occasion the Reverend Dr. Newman had led a brief service (Loomis 1971:255; Henderson 2001:30–31).

32 For further details of the ship, and of the modifications to prepare her for work in ice, see Blake 1874:102–3.

33 A summary of the scientific observations which were to be pursued is to be found in Blake 1874:109–10.

34 1 centner = 50 kg approximately.

35 Tookolito (Taqullituq) and her husband Ebierbing (Iviirvik) (also named Joe or Joseph by the whalers: see biographical sketches, p. 558–60).

36 Her first child, a son, Tarrilikitak, had died at Groton on 28 February 1863 (Nickerson 2002:28). She gave birth to a second son on 16 September 1865, during Hall's second expedition; Hall called him "Little King William," but his true Inuit name appears not to have been recorded. He sickened and died on 13 May 1866 during one of Hall's attempts to reach King William Island from Repulse Bay (Nickerson 2002:34). It was probably this son to whom Bessels was referring.

37 Only when her face became screwed up when crying did her brows, which arched above somewhat expressionless dark eyes, acquire a slant and her features changed completely, assuming an unmistakably Japanese cast. E.B.

38 The speakers included Captain William Morton, Bessels and of course Hall. The latter was introduced by Judge Daly, President of the American Geographical Society (Loomis 1971:258). For a summary of Hall's presentation see Henderson 2001: 22–23.

39 The Cooper Institute for the Advancement of Science. The building, erected in 1859, still stands on Cooper Square in Manhattan.

40 The United States Exploring Expedition of 1838–42, led by Lt. Charles Wilkes, consisted of six vessels, and its focus was exploration of the Antarctic. The flag was presumably on board the flagship, *Vincennes*, when Wilkes completed a coastal survey of Terre Adélie, Wilkes Land and Queen Mary Land (i.e., in the southern Indian Ocean), in the southern summer of 1839–40 (Stanton 1975). This flag was a somewhat ill-omened symbol, in that the Wilkes expeditions had been riven by dissension, and ended in Wilkes being court-martialled.

41 See p. 567, n.2.

42 See p. 567, n.7.

2: From New York to Newfoundland

1 Now Roosevelt Island.

2 The Renwick Smallpox Hospital, opened in 1856; the ruins of the building are still standing.

3 The Blackwell's Island Penitentiary was closed and its inmates moved to Rikers Island in 1936.

4 Blackwell's Island Insane Asylum was New York's first mental hospital and the first municipal mental institution in the United States. The building Bessels saw was completed in 1839.

5 Hell Gate is a narrow strait in the East River between Wards Island on the west side and Astoria, Queen's. The Army Corps of Engineers made repeated efforts at removing underwater hazards from 1851 onward. Bessels is perhaps referring to preparations for a major underwater explosion which took place on 24 September 1876.

6 Completed in 1777 and named after Governor Jonathan Trumbull, Fort Trumbull was captured by the British under Benedict Arnold in 1781 during the Revolutionary War. It is now a state park.

7 Fort Griswold, captured, then abandoned by Benedict Arnold in 1781, is now the centrepiece of Battle of Groton Heights State Park.

8 It was the assistant engineer, Wilson, who had deserted in New York; his replacement was Alvin Odell (Blake 1874:453; Loomis 1971:258).

9 William Jackson (Loomis 1971:258)

10 For Tyson's earlier career see the biographical sketch p. 563. Tyson had made a very good impression on Hall on the basis of their various past encounters, and he was his first choice as sailing master on board *Polaris*, but by the time he made him an offer Tyson had already committed himself to a whaling cruise and had to decline. But the whaling voyage was cancelled, and Tyson contacted Hall. By then, however. Hall had hired Sydney Budington as sailing master. Having cleared the unusual appointment with George Robeson, Secretary of the Navy, Hall then appointed Tyson "assistant navigator" (Henderson 2001:27).

11 For the exact wording of that communication see Blake 1874:102.

12 The clergyman who conducted the service on board was Dr. Foster of New London (Davis 1876:47).

13 John Cleve Symmes (1780–1829); in 1818 he circulated a pamphlet in which he argued that the Earth was hollow and that the interior was habitable.

14 John Philip Newman (1826–1900), Chaplain to the US Senate (1869–74).

15 Rave Rock pilot station, off Fisher Island at the mouth of the Thames River.

16 Off the east end of Nantucket Island.

17 More correctly, the Labrador Current.

18 Unless otherwise indicated, temperatures are always given in Celsius and longitudes from Greenwich. E.B.

19 Possibly Leach's storm-petrels (*Oceanodroma leucorhoa*) (Sale 2006:76).

20 The northern bottlenose whale (*Hyperoodon ampullatus*) has a range which extends from the Gulf of St. Lawrence to Davis Strait and the Barents Sea (Sale 2006:440–41).

21 St. John's harbour.

22 There were two fair-sized icebergs in the harbour (Blake 1874:142).

23 Fort Amherst Lighthouse, on the south side of the harbour entrance.

24 Not the present tower, Cabot Tower, which was completed only in 1900. It, however, was preceded by a series of other towers from 1704 onward, which served the same purpose, i.e., to inform the city, by a system of flags, of the details of approaching vessels.

25 During World War II anti-submarine nets were stretched between the two rocks.

26 Known as "flakes."

27 Thomas N. Molloy, US consul at St. John's.

28 The Basilica-Cathedral of St. John the Baptist, still the most prominent building on the skyline of St. John's.

29 Governor of Newfoundland 1825–34.

30 Now the residence of the Lieutenant-Governor for Newfoundland and Labrador.

31 Richard Edwards (ca. 1715–1795), Governor of Newfoundland.

32 Charles Pedley,*The history of Newfoundland from the earliest times to the year 1860* (London: Longman, Green, 1863), 155.

33 Lying between the town centre and the sea, this small lake is the site of the annual Royal St. John's Regatta, a rowing regatta and the oldest sporting event in North America.

34 The most easterly point and the most easterly lighthouse in North America.

35 Sir Stephen John Hill (1809–1891), Colonel in the West India Regiment, was Governor of Newfoundland from 1869 until 1876. In fact Captain Hall and all his officers were invited to lunch at the Governor's residence on the 13th. In return the Governor and his entourage were entertained on board *Polaris* (Davis 1876:48).

36 One presumes Bessels is referring to an outhouse. Perhaps an "O" cut in the door was a German or European tradition. In North America the tradition of the crescent-moon on outhouse doors has an extremely long history.

37 A reference to Don Quixote's broken-down old nag in Miguel de Cevantes novel *Don Quixote.*

38 The Hospital for Mental Diseases, on Waterford Road, now known simply as Waterford Hospital, was opened in 1854. It seems a strange destination for a casual visitor to St. John's.

39 Cormack 1928.

40 In terms of agriculture Newfoundland is still not a major producer. According to Statistics Canada's Census of Agriculture, in 2006 there were only 22,571 acres of cropland. The main crops were hay, potatoes, turnips, carrots, beets, cabbage and broccoli. There were 558 farms, averaging 160 acres in size, and 710 farm operators, 45.8% of whom also worked off-farm. The main sources of farm income were poultry, eggs and dairy products, the farms producing these being mainly

clustered around St. John's; other significant agricultural areas were around Deer Lake and in the Codroy Valley.

41 According to the Economic Research and Analysis Division of the Department of Finance for Newfoundland and Labrador, the population (including that of Labrador) on 1 January 2014 was 526,896.

42 By contrast, mining is now a major component of the economy of Newfoundland and Labrador, but mainly in the Labrador section of the province. Of major importance here are the iron mines at Wabush and Labrador City and the nickel mine at Voisey's Bay on the Labrador coast.

43 The Tilt Cove copper mine continued to operate until 1920. It re-opened in 1957 but closed again a decade later. Most recently it has been functioning since 2011.

3: From Newfoundland to Greenland

1 29 n. miles north of St. John's.

2 William Scoresby Jr. (1789–1857), English whaler and arctic scientist, published a remarkable treatise (Scoresby 1820) on the arctic environment, to which Bessels is here making reference.

3 Bessels appears to be a little confused as to terminology. Sea-lice are parasitic crustaceans of the order Cyamidae which infest the skins of whales. *Limacina arctica* (also known as *Clione limasina*) is a free-swimming pteropod (common name: naked sea butterfly) which inhabits the North Atlantic and North Pacific oceans.

4 Kane 1856.

5 Present name: Qeqertarsuatsiaat.

6 Hans Hendrik.

7 August Sonntag (1832–1860) participated as astronomer in Kane's Second Grinnell Expedition and as astronomer and second-in-command on Isaac Hayes's North Pole Expedition. While travelling with Hans from the expedition's winter quarters at Port Foulke (Foulke Fiord) south to Northumberland Island to buy dogs to replace those which had died of disease, Sonntag fell through thin ice and, although able to struggle out of the water with Hans' assistance, died soon afterward (Hayes 1867:231; Wamsley 2009:281–82).

8 Hayes 1867:66.

9 Tyson describes it as "a heavy piece of ship's timber" (Blake 1874:143).

10 On 27 July (Davis 1876:49).

11 They probably obtained the cryolite from the deposit at Ivigtut (Ivittuut), where the mine, now abandoned, operated for many decades, as the only known commercial source of the mineral, essential in the production of aluminum.

12 "Schönheit" means "beauty" in German.

13 *Eriophorum vaginatum* —Tussock cotton-grass.

14 Most probably *Draba lactea* (Lapland or milky whitlow grass), a small white, circumpolar flower.

15 Present name Akunnat.

16 Like almost all the settlements in West Greenland, Lichtenfels was founded by the Herrnhuter Brüdergemeine, commonly known as the Moravian Church, which operated in Greenland between 1733 and 1800.

17 The capital (present name Nuuk).

18 Present name Ilulissat.

19 Emil Schumann; the seamen were Nindemann and Mauch (Davis 1876:50).

20 I.L. Starick, Moravian missionary.

21 J.-W. Uellner, who spent 38 years at Lichtenfels.

22 Rothspohn, or Rotspon: a red wine produced in Lübeck, but a French wine in origin, which has been transported in barrels and stored in barrels until bottled.

23 Bessels appears to be referring to china figurines; Neuruppin now supports several manufacturers of semiconductors, which have evolved from a ceramics industry.

24 The reference is to Anthony van Dyck's painting "The Virgin and child with repentant sinners" (1625).

25 *Corvus corax principalis*, occurring throughout northern North America, including the Canadian Arctic Archipelago and the ice-free areas of Greenland, except the extreme north and northeast coasts (Sale 2006:310–11).

26 The heathen Eskimos at the entrance to Smith Sound displayed an unmistakable abhorrence of the same perfume (Jockey Club); by contrast they had an expressed preference for asaphoetidae and butyric acid. E.B.

27 Northern fulmar (*Fulmarus glacialis*), ranging throughout the North Atlantic and North Pacific (Sale 2006:72–73).

28 Holboell, *Ornithologischer Beitrag zur Fauna Grönlands*. Leipzig: Ernst Fleischer, 1854. p. 58. E.B.

29 Present name Qeqertarssuak, on Disko.

30 During his voyage on board *Albert* in 1869.

31 Present name Sisimiut.

32 A.E. Nordenskiöld had found large metallic blocks at Blåfjeld (Uifvaq, southwestern Disko), and believed them to be meteorites (Nordenskiöld 1872). They later proved not to be meteorites.

33 Frederik Wilhelm von Otter, later Prime Minister of Sweden, 1900–1902.

34 In the recently published hydrographic reports of the British Admiralty, produced by that country's Hydrographic Office (Hydrographic Notice No. 36) it states, with regard to Holsteinsborg (p. 2): "The tide in the harbour is barely perceptible." In fact Holsteinsborg possesses the only harbour in the whole of Greenland where the tidal range (10 feet at springs) is sufficiently large to permit careening of a ship. In the same notice the position of the flagstaff at the harbour (cf. the figure in the text, p. 74) is given as 66°54'14"N; 53°40'W, whereas on the chart which appeared somewhat later (British Admiralty Chart No. 2266, May 1876) it is recorded as 66°55'42"N; 53°42'W. According to Hall's observations, made 6 paces west of the flagpole, its position is 66°57'N; 53°53'45"W. I shall refrain from offering any explanation for the difference in latitude; on the other hand I must note that our chronometric determination of longitude is totally reliable. It is based on a time-transfer from St. John's Newfoundland. Our six box-chronometers kept perfect time and suffered no disturbances; this was

confirmed by a second time-transfer from the same location to Godhavn made by the corvette *Congress* on 10 August. E.B.

35 Professor Theodor Magnus Fries (1832–1913), Lund University, lichenologist.

36 Botanist.

37 The Swedish expedition was now southward-bound. Von Otter reported that they had been as far north as Upernavik, and had encountered little ice, although there had been occasional bergs between Disko and Upernavik (Blake 1874:134). He had taken 30 deep sea soundings and water temperatures, which Blake presents in an appendix (Blake 1874:457).

38 Dr. Hinrich Johannes Rink (1819–1893), a Dane, first arrived in Greenland to study geology in 1848. From 1857 until 1868 he was the Royal Inspector for South Greenland and from 1871 until 1882 the Director of the Royal Greenland Trading Department.

39 In the meantime nickel has been discovered in the basalts of New Mexico and Arizona, in association with cobalt (0.03%). Cf. Low's geological section in *Report upon Geographical and Geological Explorations and Surveys west of the hundredth Meridian*, Vol. III, pp. 646–47. Washington: Government Printing Office, 1875. E.B.

40 Loch Shin, Sutherland, is a narrow lake some 27 km in length in the northwest Highlands of Scotland.

41 The Royal Greenland Trading Department (Den Kongelige Grønlandske Handel) held a trading monopoly with all the Greenlandic settlements from 1774 until 1979.

42 Governor Lowertz Elberg (Loomis 1971:271).

43 Hans Egede, a Dano-Norwegian Lutheran minister, arrived in Greenland in 1721, in search of traces or survivors of the earlier Norse settlers. He founded the capital, Godthåb (now Nuuk).

44 Present name Qaqortoq.

45 Some individual lamps in the American National Museum in Washington are very remarkable; they were found on the Aleutians, and must be ascribed a very great age, from their shape and where they were found. They represent the Eskimo lamp in its most original form and consist of beach cobbles in which the water has eroded hollows. Some of them clearly show traces of fire, and microscopic analysis of the foreign particles adhering to them allows one to deduce their earlier use without any doubt whatsoever. E.B.

46 Cranz 1820.

47 See the picture of Fiskernæsset on p.55, in the foreground of which one of these boats is shown. E.B.

48 Greenland shark, now *Somniosus microcephalus*.

49 Hall had also hoped to obtain coal here, but had no success. Although the governor, Elberg, had only 15 tonnes on hand, he offered two thirds of it to Hall; the latter understandably declined this generous offer, counting on replenishing his stocks from his supply ship at Disko (Blake 1874:135).

50 Nindemann.

51 According to Davis (1876:51) he was rescued by a boat from the Swedish vessel *Ingegerd*.

4: From Holsteinsborg to the northernmost settlement on Earth

1 An alternate name for Godhavn (Qeqertarssuaq).

2 Governor Elberg accompanied the expedition as far north as Tasiusaq (Loomis 1971:271).

3 Atlantic halibut: now *Hippoglossus hippoglossus*.

4 Now *Reinhardtius hippoglossoides* (Greenland halibut).

5 Sole.

6 Now Aasiaat.

7 Now Qasigiannguit.

8 Now Paamiut.

9 White whales (*Delphinapterus leucas*): circumpolar in distribution, and even frequenting such southerly locations as James Bay and even the Saguenay and St. Lawrence rivers (Sale 2006: 436–47).

10 The gyrfalcon (*Falco rusticolus*), the largest of the falcons, is circumpolar in distribution (Sale 2006: 156–57).

11 A former name for the Hoary redpoll (*Carduelis hornemanni*) (Sale 2006:335–36).

12 On 4 August (Blake 1874:144).

13 Sophus Theodor Krarup-Smith (1834–1882), Inspector for North Greenland, 1867–82.

14 Hubbard C. Chester.

15 In his absence Hall was received by his deputy, Governor Lassen, with Mrs. Krarup-Smith acting as interpreter (Davis 1876:54).

16 Now Sullorsuaq Strait—between Disko and the mainland of Greenland; the coal seams outcrop on Disko on the west side of the strait.

17 Captain Edward Inglefield, on board *Isabel*, searching for Franklin in the summer of 1852 (Inglefield 1853).

18 From our observations taken 10 paces northwest of the flagpole that is visible on the adjoining illustration between the inspector's house and the administrator's. E.B.

19 N.A.E. Nordenskiöld, during his expedition in 1870 (Nordenskiöld 1872).

20 The English whaler William Scoresby Jr. during his voyage aboard *Baffin* in 1822 (Scoresby 1823).

21 Mrs. Krarup-Smith.

22 Leonora was the heroine of Beethoven's opera *Fidelio*.

23 More likely *Salix arctica* (Arctic willow).

24 Three-banded ladybug.

25 Rove beetle.

26 Rock ptarmigan (*Lagopus mutus*); circumpolar in distribution, including all coastal areas of Greenland (Sale 2006:162).

27 Probably *Andromeda polifolia* (bog rosemary).

28 If there is no indication to the contrary all bearings are corrected for compass variation. E.B.

29 USS *Congress,* (Captain H.K. Davenport) (Davis 1876:55).

30 One of them was Richard W.D. Bryan, the third member of the scientific group (Henderson 2001:44). Also on board as passengers were Rev. E.D. Bryan, Richard Bryan's father, and Captain James Budington, Sydney Budington's uncle (Davis 1876:57). *Congress* also brought Tyson's commission as assistant navigator; since his appointment to that position had been made so late, there had not been time to make it official before the ship left the United States (Blake 1874:136).

31 This had involved Chester and his crew in a trip of 175 miles, mainly under oars (Blake 1874:135).

32 On 11 August. Davenport was accompanied by Captain Hall; they were welcomed by a gun salute, which was returned by *Congress* (Davis 1876:55). Inspector Krarup-Smith arranged for a depot of stores intended for the expedition to be stowed in a government warehouse.

33 Bertel Thorvaldsen (1770–1844) was a famous Danish sculptor, for whose considerable output of work the Thorvaldsen Museum located next to the Christiansborg Palace in Copenhagen was built, and opened in 1848. The original of his roundel "Night" ("Nyx"), sculpted in 1815, hangs in the Museum opposite the matching roundel "Day," each representing female figures.

34 On the 13th.

35 Dr. Newman, who had come north on board *Congress* specifically to give the expedition his blessing (Loomis 1971:266) and Rev. E.D. Bryan.

36 Dr. Newman then led a prayer, the exact words of which may be found in Blake (1874:145) or Loomis (1971:268). Loomis surmises that this part of the prayer might have been in response to the dissensions which Newman had observed even during his brief presence on board.

37 At 2.00 p.m. on 17 August (Blake 1874:136, 145), while *Congress*'s crew manned the yards and gave three cheers (Davis 1876:56–57).

38 Dr. med. Christian Nicolai Rudolph (1811–1882).

39 Present name Kangersuatsiaq.

40 Again under the command of first mate, Hubbard Chester; his crew, rowing, covered the 100 miles to Prøven and back between noon on 19 August and 8.00 p.m. on the 20th (Blake 1874:137).

41 William Morton, second mate.

42 From an accident during the Kane expedition (Davis 1876:60).

43 Bessels has modestly excluded himself from this list.

44 But Bessels has omitted the following seamen: Friedrich Jamka, Peter Johnson, Robert Krüger and William Nindemann.

45 A play on the Hanseatic trading cities of the Baltic and North Sea coasts, such as Bremen, Hamburg and Lübeck. Bessels employs this play on Hans Hendrik's name regularly to denote him and his family.

46 Bessels's rendering of "Mirquiti," Inuktitut for "needle."

47 Diminutive for Susanne.

48 This is a literal translation of the German simile. "As ugly as sin" would be the English equivalent.

49 To try to buy dogs and furs (Davis 1876:63).

50 The reference is to the farce *Der böse Geist Lumpazivagabundus* or *Das Liederliche Kleeblatt*, written by Johann Nestroy and first performed in the Alttheater in Vienna on 11 April 1833.

51 Peter Jensen, who served as interpreter and dog driver on Hayes's expedition in 1860–61. For a photo of Jensen see Wamsley 2009, p. 258.

52 Either thick-billed murres (*Uria lomvia*) or common murres (*Uria aalge*), more probably the former (Sale 2006:264–66).

53 *Plectrophenax nivalis.*

54 Atlantic puffin (*Fratercula arctica*), which breeds both farther south (in the Uummannaaq area) and farther north (Sale 2006:277–78) but not in the Tasiusaq area, and hence would be relatively uncommon there (Sale 2006:264–6).

5: Historical review

1 For further details see Markham 1881.

2 The reference is to the book by Sir John Barrow, Second Secretary at the Admiralty (Barrow 1818). But even greater damage had been done to Baffin's reputation much earlier. Samuel Purchas (1905–7) published Baffin's journal but not his chart or hydrographical observations.

3 For complete details see Ross 1819.

4 This improvement to the chart has not been mentioned by any historian, although Ross plots the course of the coastline according to his predecessors' surveys and according to the results of his own survey. Cf. Ross 1819, frontispiece. E.B.

5 In that Lancaster Sound would subsequently prove to be the entrance to the Northwest Passage, Ross's error in that case was extremely unfortunate. He was so convinced that the strait was blocked by a range of mountains that he even named them—the Croker Mountains. Nobody on board Parry's ship, *Alexander*, some distance astern, saw these "mountains."

6 This was the name Ross gave to snow-covered cliffs just west of Cape York, coloured red by the snow algae *Clamydomonas nivalis*.

7 Dr. A. Petermann. Das nördlichste Land der Erde. *Geograph. Mitt.*, 1867, Tafel VI. E.B.

8 Perhaps the accuracy of the positions is to be ascribed to the fact that for measuring the sun's altitude Bylot and Baffin used an astrolabe instead of the cross-staff, then more common. Since the ship was commonly beset by ice, there was nothing to compromise the reliability of the former instrument on board, since the ice dampens the swell so completely that a beset ship lies almost motionless. But on firm ground a good astrolabe, according to a report by Tycho Brahe, allows readings to within a sixth of a minute of arc. [Tycho Ottesen Brahe (1546–1601) was a renowned Danish astronomer, famous for, among other things, the fact that he wore a false nose, having lost the original in a duel.] The higher latitudes which the two seafarers attained meant sun's altitudes which did not exceed 45°. Hence if in calculating their observations they used Tycho's refraction tables, which proceeded from the false assumption that altitudes over 45° were not influenced by refraction (Delambre, *Histoire de*

l"Astronomie moderne, Tome 1, p. 151), they would have avoided the then widespread source of error, which could easily amount to one minute of arc.

In order to recognize the superbness of the Baffin/Bylot observations in their full significance it finally should also be mentioned here that important astronomers such as Regiomontanus and Peuerbach recorded many latitudes with errors of 26» (Venice) or even 27» (Nurnberg) (*Alfontii Regis Castellae Tabulae impr. Erhardus Ratdolt*); and their instruments were no more imperfect than those of the English seafarers, since until the invention of Hadley's octant the same means were used, as those used by the Greeks and Arabs. E.B.

9 Unfortunately I am unable to find a copy of Inglefield's *Summer search for Sir John Franklin* here in Washington. Instead of trusting to memory I opted, in compiling the above lines, to use the brief overview of the Inglefield expedition that Petermann published in the previously mentioned article, "Das nördlichste Land der Erde." I hope this fact explains the brevity with which I have treated this epoch-making voyage. E.B. The full details of Inglefield's voyage may be found in Inglefield 1853.

10 These coordinates are based on a measurement taken from Petermann's map. E.B.

11 For full details of Kane's voyage see his account: Kane 1856. E.B.

12 Henry Grinnell (1799–1874), an American shipowner, was the major financier of a series of arctic expeditions, including Edward de Haven's in search of the missing Franklin expedition (1850–51), Elisha Kent Kane's (1853–55), Isaac Hayes's (1860–61) and Charles Hall's (1860–62 and 1864–69).

13 George Peabody (1795–1869), American merchant, banker and philanthropist.

14 Ice conditions in Baffin Bay and the adjacent sea areas will be discussed in greater detail in a later chapter. E.B.

15 Perhaps not until the 8th; here there is clearly an error in Kane's journal. Unfortunately I am not in a position to clear up this and other errors, since when the Smithsonian Institution burned down [in 1865] the log was a victim of the flames. Also the descriptive part of the journal, which was in Kane's estate, could not be found by the heirs. E.B.

16 Isaac Israel Hayes, the expedition's medical officer. For details see Wamsley 2009.

17 Kane plotted Cape Constitution, which rises only a few miles north of Cape Independence at 81° 22'N, almost 22 miles farther north than it was confirmed by Morton's astronomical determination and by the latter's estimated distance. Instead of viewing the astronomically determined point as decisive, he incomprehensibly based the construction of his published map on the mean position derived from the estimate of distances covered and the astronomically determined positions. Five years after the appearance of Kane's work the Smithsonian Institution in Washington published the observations made by the expedition (*Physical observations in the Arctic Sea, reduced and discussed by C.A. Schott*. Washington 1859–60), whereby the map underwent significant modifications. The accuracy of these final positions will be discussed later. E.B.

18 This was HMS *North Star* (Captain William Pullen), the depot ship of Captain Sir Edward Belcher's squadron.

19 The party was led by Dr. I.I. Hayes; for details see his account: Hayes 1860.

20 These were USS *Release* (Captain Henry Hartstene) and *Arctic* (Captain Charles Simms). For details see: Laws 1967.

21 For full details see Hayes's own account: Hayes 1867. See also: Wamsley 2009.

22 All fairly large vessels that visit the high latitudes carry a barrel at the main mast-head (called a crow's nest by the old whalers), in which the lookout maintains a watch. The bottom of the barrel consists of a trap door through which the lookout slips in and out. The time at which he is relieved depends on the temperature, the wind strength and the ice conditions. E.B.

23 A latitude of 78°18'30"N is more correct than that quoted by Hayes, as our expedition's later observation revealed. E.B.

24 August Sonntag (1832–1860), astronomer and second-in-command on Hayes's expedition.

25 The same Hans Hendrik who later took part in Hall's expedition.

6: Into unknown territory

1 Governor Elberg left the ship at this point, taking Hall's dispatches with him and promising to ensure that they would ultimately reach the American ambassador in Copenhagen. They included Hall's report of events thus far to George Robeson, Secretary of the Navy, quoted in full in Blake 1874:138–40.

2 On the 26th (Davis 1876:71).

3 *Odobenus rosmarus*; with bulls weighing up to 2000 kg, and with tusks up to 75 cm long (longer in the Pacific subspecies) (Sale 2006:427), a herd of walrus hauled out makes a spectacular sight. This herd was lying on the ice between Wolstenholme and Saunders islands (Davis 1876:72)

4 Bessels alternates between "Augustine" and "Josephine" as the name of this girl.

5 Budington tried to persuade Hall to make Port Foulke his winter quarters, and to continue north by sledge from there (Henderson 2001:54). Hall refused.

6 At 5.00 p.m. on the 27th (Davis 1876:75).

7 At 8.00 p.m. on 27 August (Loomis 1971:275).

8 The name then applied to the northern half of Ellesmere Island.

9 On 27–28 August (Blake 1874:147).

10 Recently the subject of a fairly amicable dispute between Canada and Denmark, as to which country possesses sovereignty over the island, since it lies exactly midway between the two.

11 This would be the highest latitude which *Polaris* would reach; to quote the report of the later Board of Inquiry, chaired by George Robeson "the ship. . ., on the 30th of August, attained the highest northern latitude reached by the Expedition, in latitude declared by Captain Hall to be 82°26'N., but afterward found, by the careful calculation of Mr. Meyer, to be 82°16'N" (Davis 1876:85). At this point *Polaris* had reached the point where Robeson Channel opens into the Lincoln Sea, i.e., into the Arctic Ocean.

12 Carrying the ship with it.

13 Accompanied by Tyson (Blake 1874:149).

14 Anonymous 1873:447. E.B.

15 This meeting was held on the afternoon of 31 August (Davis 1876:91–92).

16 Anonymous 1873:480–81.

17 Ibid., p. 556.

18 Ibid.,p. 498.

19 US Navy Department 1876, Part IX, p. 6.

20 Donated by Henry Grinnell; it had been used by Lt. Henry Hartstene on board USS *Release* during his search for the missing Kane expedition in 1855 (Davis 1876:100).

21 Led by Bryan (Davis 1876:102).

22 We can probably claim a higher latitude than 82°26'. Another calculation of the relevant day's run gave 82°29', but for well-known reasons the results of a log calculation cannot be very accurate. On a later occasion the latitude of the bay, which Hall named Repulse Harbour, was determined to be 82°9'N; from all appearances, when *Polaris* reached her highest latitude she was more than 9 n. miles north of that point. The mean of the three observations, 82°24', may well have come closest to the truth. E.B.

23 On 4 September (Davis 1876:103).

24 It had been accidentally closed by one of the seamen who had hung something on it to dry (Davis 1876:104).

25 This flag raising occurred on the night of September 4–5 (Blake 1874:150; Davis 1876: 104). After searching for a more suitable site, Hall decided that this was the best he would find, and returned there several days later. At this point he named the bay Thank God Harbor.

26 This decision, i.e., to settle in to winter quarters, was not made until 7 September according to Tyson (Blake 1874:150).

7: The first days in Polaris Bay

1 This berg, the largest the expedition had encountered since entering Kennedy Channel, was aground in 13 fathoms, i.e., nearly 80 feet of water; it was 450 feet long, 300 feet wide and 60 feet high (Blake 1874: 151; Davis 1876: 110).

2 Steller 1774.

3 King William Island.

4 Pond Inlet, northern Baffin Island.

5 Cumberland Sound, southern Baffin Island.

6 A German mile varied in length from one part of what is now Germany to another, but was generally around 7.5 km.

7 Georg Wilhelm Steller (1709–1746), naturalist on Vitus Bering's Second Kamchatka Expedition. The reference is to Steller's account of the expedition (Steller 1774).

8 Wrangel 1840.

9 Black-legged kittiwake (*Rissa tridactyla*) (Sale 206:253).

10 Probably a purple sandpiper (now *Calidris maritima*).

11 Historically, in terms of its distribution in Greenland, the muskox (*Ovibos moschatus*) was confined to the ice-free coastal strips of north Greenland (north of the Humboldt Glacier) and northeast Greenland (south to Scoresbysund). Recently, however it has been introduced to two locations in West Greenland.

12 A hunting party consisting of Bessels, Chester, Joe and Hans, set off immediately (Blake 1874:152).

13 Which he shared with Bessels, Bryan, Meyer, Schumann, the cook, William Jackson and steward, John Herrod (Loomis 1971:277).

14 He was found by Morton and Siemens, who had set out to look for him, quite close to the ship, staggering as if drunk, and barely conscious (Davis 1876:130).

15 He had passed out soon after coming back aboard, and regained consciousness only some time later, after he had been manhandled into his bunk (Loomis 1971:278).

16 Aaron Arctander, the assistant on Andreas Bruun's expedition (1777–79), whose mandate was to investigate the economic potential of the Julianehåb area. For details see Ostermann 1944.

17 Peter Christian Pingel, who mounted a private expedition to the Julianehåb area in 1828–29. For details see Pingel 1841.

18 Christian Leopold von Buch (1774–1853) a well-known German geologist who spent two years (1806–8) in studying the geology and natural environment of Norway and Sweden.

19 Brown was the naturalist on Edward Whymper's 1867 expedition to the Ilordlik Fjord area (near Jakobshavn) aimed primarily at investigating the Greenland Ice Cap (Holland 1994:271).

8: The first sledge journey

1 More correctly *Mallotus villosus* or capelin, a small fish of the smelt family.

2 Bessels is referring to the northern collared lemming (*Dicrostonyx groenlandicus)* the only lemming species occurring in Greenland, and only in the extreme northern and northeastern coastal areas (Sale 2006:363).

3 A Silurian nautiloid cephalopod.

4 Eating the raw meat caused two of my companions violent diarrhea; Joseph and I were spared this affliction. On later occasions, due to lack of fuel we often found ourselves obliged to eat large quantities of raw meat, but none of us was afflicted by the state of weakness that some polar travellers mention as the result of an exclusively meat diet. Even after my return from the polar regions I lived for a full year exclusively on animal food without my health suffering in the slightest. I would enjoy a standard breakfast of raw oysters, baked fish, beef steak and eggs; during the summer a few raw tomatoes replaced the oysters. My noon meal consisted of soup, fish and several meat dishes, as well as some olives; only on rare occasions would I eat bread or vegetable. E.B.

5 They took most of the meat back to the ship with them; Tyson reported it "was good, and did not taste of musk in the least—very much like other beef" (Blake 1874:154).

6 Nicolas Jérémie (1669?–1732), a Quebec-born employee of the Compagnie du Nord, participated in d'Iberville's expedition against the English at Fort York, and in his account describes his experiences and the Hudson Bay region and of the customs and activities of the Indians (Jérémie 1720).

7 Baron Jean Léopold Nicolas Frédéric Cuvier (1769–1832), naturalist and paleontologist; his best-known work was *Le règne animal* (The animal kingdom), 1817.

8 Sir Richard Owen (1804–1892), British naturalist and paleontologist, probably best known for coining the word *dinosaur* [terrible lizard], and for his opposition to Charles Darwin's theory of evolution by natural selection.

9 The expedition on board *Germania* and *Hansa*, led by Karl Koldewey and Friedrich Hegemann, 1869–70. While *Hansa* became beset in the ice and was ultimately crushed, without ever reaching the coast of East Greenland, *Germania* wintered off Sabine Ø and Koldewey and his men made extensive sledge trips, exploring large sections of the coast (Koldewey 1874).

10 Muskoxen are still absent from Baffin Island.

11 A former name for Nettilling Lake, southern Baffin Island.

12 For a detailed discussion of the variations in the range of the muskox, see Barr 1991.

13 Andrew Dickson Murray (1812–1878), Scottish naturalist and author of *The geographical distribution of mammals*. London, 1866, p. 140. E.B.

14 This is somewhat of an exaggeration; rarely does a herd of muskoxen exceed 10–12 in number.

15 Muskoxen (especially solitary animals) are also commonly attacked by wolves.

16 Earlier that day, during his usual Sunday service, Hall had complimented the crew on their behaviour. In response they sent him a letter of thanks:

"The men desire to publicly tender their thanks to Capt. C.F. Hall for his late kindness, not, however, that we were suffering want, but for the fact that it manifests a disposition to treat us as reasonable men, possessing intelligence to appreciate respect and yield it only where merited; and he need never fear but that it will be our greatest pleasure to so live that he can implicitly rely on our service in any duty or emergency. H. Siemens and others." (Davis 1876:132).

In his reply he wrote, in part: "The reception of your letter of thanks to me of this date I acknowledge with a heart that deeply feels and fully appreciates the kindly feeling that has prompted you to this act" (Davis 1876: 132–33; Blake 1874:154).

17 According to Tyson the storm broke on the morning of 27 September and continued until the evening of the 28th (Blake 1874:154).

9: Hall's sledge trip

1 It is perhaps significant that Bessels did not think it relevant to mention Hall's death in this chapter title.

2 The two teams each consisted of 7 dogs. The date of 12 October is an error for 10 October; see Bessel's later report that Hall could not continue his journey after Hans had returned, until the morning of the 12th. Davis (1876:141), Loomis (1971:278), Tyson (Blake 1874:155), Henderson (2001:71) and Nickerson (2002:47) all place the initial departure from the ship on the 10th. Tyson and some of the men initially accompanied the sledge party to assist them up the first steep climbs (Blake 1874:155).

3 See Davis 1876:141–47.

4 The reference is to the drift of De Haven's ships *Advance* and *Rescue* – in 1850–51, not 1851–52. From near Beechey Island they drifted north up Wellington Channel, back south again, east along Lancaster Sound and then south through Baffin Bay (Kane 1854).

5 *Fox* became beset in the ice of Melville Bay in mid-August 1857 and drifted south through Baffin Bay and Davis Strait, getting free only on 25 April 1858 (McClintock 1859).

6 The note is quoted in full in Blake 1874:156–57. Parry (2001:99) would interpret the fact that Hall had forgotten so many items as a measure of his incompetence, and a reminder to Bessels to wind the chronometers daily, from a man with no scientific qualifications, as a deep insult.

7 It was last seen on the 17th at the ship (Davis 1876:148; Blake 1874:157).

8 See Davis 1876:152–53.

9 Hall now named this inlet Newman Bay.

10 That morning Hall read a prayer, prepared by Dr. Newman (Davis 1876:154).

11 Hall's own description of this climb may be found in Davis 1876:156–57.

12 This was the coast of Ellesmere Island.

13 *Physical Observations in the arctic seas by Isaac I. Hayes. reduced and discussed at the expense of the Smithsonian Institution by Ch. A. Schott.* Washington: Smithsonian Institution, 1867, p. 20.

In view of the importance of the matter I shall present the relevant observations here:

Northernmost camp, Kennedy Channel

Observation to determine the latitude of the camp,

17 May 1861

Sun's noon altitude, Dr. I.I. Hayes, observer.

	2⊙
Pocket sextant	56°52'
Index correction	–1 31
55 21	

Temperature = +22°F

Altitude	27 40.5

Barometer 30.0' at 53°F approx.

Refraction par.	–1.8

Approx. longitude = 4 h. 35.5 m.

Semidiameter	+15.8
Max. Altitude	27 54.5
Decl. at apparent noon	19 26.0
	81° 31.5' EB.

14 Ibid., p. 20; the following observation is recorded:

Leidy's Camp, Smith Sound,

Observation to determine the latitude of the camp,

20 May 1861.

Noon altitude of the sun, Dr. I.I. Hayes, observer.

	2⊙
Pocket sextant	61° 14"
Index correction	–1 30
59 44	

Temperature = +22°F approx.

Altitude	29 52.0

Barometer = 29.7 at 52° approx

Refraction, par.	–1.7

Approx. longitude = 4 h. 44 m.

Semidiameter	+15.8
Maximum altitude	30 06.1
Decl. at apparent noon	20 04.6
	79° 58.5" EB.

15 It is only with reluctance that I use the word "homology," as it has been proposed by Louis Agassiz in the geographical sense and has been introduced by Peschel into science, since this expression is not strictly correct. Agassiz, who as a zoologist borrowed it from comparative anatomy, would probably never have seen the wing of an insect as a homology for a bird's wing. E.B.

Jean Louis Rodolphe Agassiz (1807–1873) was a Swiss geologist/zoologist, probably best known for his deduction that the Swiss glaciers had once been much more extensive, coalescing into a massive ice-cap—an important step toward the concept of the Pleistocene glaciations.

Oscar Ferdinand Peschel (1826–1875), a German geographer and anthropologist, probably best known for his classification of the various human races as set out in his book. *The races of man and their geographical distribution* (1876).

16 Davis 1876:160–62. Here, and elsewhere, quotations from Hall's journal have not been re-translated from Bessels's German translation.

17 *Andromeda tetragona* was not found in the newly discovered land. What Hall collected was evidently *Dryas octopetala*. E.B.

18 Davis 1876:163–66.The original is reproduced in Davis 1876:70–71.

19 A diagram and description of the establishing of this cairn and location of the messages may be found in Davis 1876:162–63.

20 Davis 1876:167–68.

21 Tyson, who was engaged in banking up the ship with snow, saw them coming and went to meet them. He recorded the meeting as follows: "Captain Hall looks very well . . . Captain Hall seems to have enjoyed his journey amazingly. He said he was going again, and that he wanted me to go with him. He went aboard, and I resumed my 'banking'" (Blake 1874:159).

22 Which was handed to him by the steward, John Herron (Nickerson 2002:47).

23 Bessels announced that Hall had had an apoplectic attack (Davis 1876:173). He administered a powerful laxative, consisting of castor oil and a few drops of croton oil (Henderson 2001:78).

24 Tyson has described the onset of Hall's illness as follows:

"*Oct, 24, evening.* I kept at work till it was too dark to see, and then came aboard. Captain Hall is sick; it seems strange, he looked so well. I have been into the cabin to see him. He is lying in his berth, and says he feels sick at his stomach. This sickness came on immediately after drinking a cup of coffee. I think it must be a bilious attack, but it is very sudden. I asked him if he thought he was bilious, and told him I thought an emetic would do him good. He said if it was biliousness it would. Hope he will be better tomorrow.

"*Oct. 25.* Captain Hall is no better. Mr. Morton and Mr. Chester watched with him last night; they thought part of the time he was delirious.

"*Evening.* Captain Hall is certainly delirious; I don't know what to make of what he says. He sent for me as if he had something particular to say but—I will not repeat what he said; I don't think it meant anything. No talk of anything in the ship but Captain Hall's illness; if it had only been 'the heat of the cabin,' which some of them say overcame him, he could have got out into the air, and he would have felt better. I cannot hear that he ate anything to make him sick; all he had was that cup of coffee." (Blake 1874:160–61).

According to Henderson (2001:77), in response to Tyson's and Hall's conversation about possibly administering an emetic, Bessels disagreed, saying, "No, that will not do. It will weaken you."

25 Bessels also injected him with what he said was quinine (Davis 1876:174).

26 From 30 October until 4 November Hall refused all medical treatment, afraid that he was being poisoned (Davis 1876: 174–75) and his condition improved noticeably. Tyson describes Hall's last few days as follows:

"*Nov. 1.* Captain Hall is a little better, and has been up, attempting to write; but he don't act like himself—he begins a thing and don't finish it. He begins to talk about one thing, and then goes off to something else; his disease has been pronounced [by Bessels] paralysis, and also apoplexy. I can't remember of any one dying of apoplexy in the north except Captain M'Clintock's engineer [George Brands, engineer on board *Fox*, who died 6 November 1858], and he died very suddenly . . . Hope the captain will rally.

"*Nov. 4.* Captain Hall very bad again. He talks wildly—seems to think someone means to poison him; calls for first one and then another, as if he did not know who

to trust. When I was in he accused — — and — — of wanting to poison him. When he is more rational he will say 'If I die, you must still go on to the Pole,' and such like remarks. It's a sad affair; what will become of this expedition if Captain Hall dies, I dread to think.

"*Nov. 5.* No change for the better—worse, I think. He appears to be partially paralyzed. This is dreadful. Even should he recover his senses, what can he do with a paralyzed body?

"*Nov. 8.*Poor Captain Hall is dead; he died early this morning. Last evening Chester said the captain thought himself that he was better, and would soon be around again. But it seems he took worse in the night. Captain Buddington came and told me he 'thought Captain Hall was dying.' I got up immediately, and went to the cabin and looked at him. He was quite unconscious—knew nothing. He lay on his face, and was breathing very heavily; his face was hid in the pillow. It was about half-past three o'clock in the morning that he died." (Blake 1874:162).

27 Hall was convinced that it was Bessels who was trying to poison him, and banned the doctor from his bedside from 29 October until 4 November (Henderson 2001:82).

28 Morton, who was sitting up with him, suddenly noticed that Hall had stopped breathing (Henderson 2001:87). Davis cites several instances during Hall's 1864–69 expedition when he had experienced severe cardiovascular and gastric attacks, and attacks, including severe vertigo, during the preparations immediately before the start of the North Pole expedition. He describes them as "sudden attacks, not unlike the one of which Hall died" (Davis 1876:178).

29 According to Henderson (2001:89–90), it was Tyson and Morton who laid out and dressed the corpse.

30 On the 11th according to Tyson (Blake 1874:162), but on the 10th according to Davis (1876:184).

31 The flag on the flag-staff above the observatory had been lowered to half-mast (Blake 1874: 165).

32 Bryan read a brief burial service (Davis 1876:184).

33 Tyson makes the prescient comment: "But with his death I fear that all hopes of further progress will have to be abandoned" (Blake 1874:165). By contrast, two weeks later Bessels remarked to Noah Hayes, "You know, Hayes, Captain Hall's death was the best thing that could have happened to this expedition." (Henderson 2001:94).

34 Dante's *Inferno*, Canto XXXII, terzina 13:37–39.

10: In the realm of darkness

1 Astronomically the upper edge of the sun should have disappeared at 0 h. 11 m. 6 on 17 October at the latitude of Polaris Bay. The adjustment for refraction is based on a barometric pressure of 29.9" and a temperature of –24.4°C. E.B.

2 Bessels is overlooking the Inughuit of northwest Greenland, who would later play a major role in the survival of him and his group.

3 This document reads as follows:

Consultation.

THANK-GOD HARBOR

November 13, 1871.

First consultation held between Messrs. S.O. Budington and E. Bessels. Through the mournful death of our noble commander, we feel compelled to put into effect the orders given us by the Department, viz.:

"Mr. Budington shall, in case of your death or disability, continue as the sailing and ice master, and control and direct the movements of the vessel; and Dr. Bessels shall, in such case, continue as the chief of the scientific department, directing all sledge-journeys and scientific operations. In the possible contingency of their non-concurrence as to the course to be pursued, then Mr. Budington shall assume the sole charge and command, and return with the expedition to the United States with all possible dispatch."

It is our honest intention to honor our dear flag, and to hoist her on the most northern part of the earth, to complete the enterprise upon which the eyes of the whole civilized world are raised, and to do all in our power to reach our proposed goal.

S.O. Budington.

Emil Bessels.

(Davis 1876: 227–28).

4 In other words during spring tides, when the tidal range was greatest.

5 Nathaniel Coffin.

6 On the night after the funeral for Hall, i.e., 11–12 November (Henderson 2001:95).

7 Carbonic acid, according to Loomis (1971:285).

8 According to Davis it appeared on 16 November (Davis 1876:231).

9 On his way to the tide gauge at 4.00 a.m. on the 20th, Siemens was blown off his feet and hurled about 39 m, ending up in water which had surged up through a crack (Davis 1876:233; Henderson 2001:96)

10 One of Bessels's ears was also frozen (Blake 1874:167).

11 This was a rope soaked in kerosene (Loomis 1971:282; Henderson 2001:97).

12 *Polaris* was warped ahead some 80 feet, where, 50 feet from the berg, it was hoped that she would be frozen in solidly, sheltered by the berg, but a safe distance from it (Davis 1876:241)

13 On 28 November (Davis 1876:243).

14 Also various other meats, vegetables (including green peas), apple and cherry pies with an excellent plum sauce, nuts, raisins and wine punch. The entire crew was invited to the lower cabin for the Thanksgiving dinner (Davis 1876:247).

15 Played by Noah Hayes (Davis 1876:248).

16 Peter Johnson.

17 But in the early hours of the 6th a severe blizzard had been blowing. Bessels became disoriented on his way to the observatory and wandered about until about 6.00 a.m. Thereafter a rubber-coated wire was strung from the ship to the observatory to act as a guide in poor visibility (Blake 1874:169; Davis 1876:256).

18 Friedrich Jamka, known as Big Fred (Davis 1876: 263).

19 This ingenious arrangement had been devised by Bessels (Davis 1876:262).

20 *Favus* occurred almost simultaneously in the Newfoundlanders. Only the pure-blooded animals were afflicted with this ailment; the smooth-haired ones were spared entirely. E.B.

21 I would recommend to future expeditions that they take dried horse meat with them for the dogs, since in the majority of cases pemmican might be too expensive. Each animal received a ration of 2 lbs., costing $1. E.B.

22 *Struwwelpeter* [Shock-haired Peter] was the title of an illustrated children's book by Heinrich Hoffmann (1845) which included ten stories, one of which, *Zappel-Philipp* [Fidgety Philip] deals with a young boy who would not sit still at table at meal-times, the ultimate result being that everything on the table landed on the floor.

23 And were rewarded with hot spiked punch, brewed by Bessels (Davis 1876:269).

11: The New Year

1 The diagram and the description of the apparatus have been taken from Schott's discussion of Hayes's observations, since we had to leave the pendulum behind when we began our retreat. Cf. *Physical observations in the arctic seas*, by Isaac I. Hayes, [Washington, DC: Smithsonian Institution, 1867], p. 29. E.B.

2 It was used for dressing leather and also used medicinally.

3 This is as close as Bessels comes in his book to outright criticism of Budington, whom he despised.

4 Emil Schumann.

5 An Ecuadorean volcano, 6,268 m in height, inactive at present.

6 And a sledge team (Blake 1874:172).

7 With 4 men and 12 dogs (Blake 1874:172).

8 They set off at 10.00 a.m. and were back by 4.00 p.m. (Blake 1874:172).

9 Johann Carl Friedrich Gauss (1777–1855) had established a magnetic observatory in Göttingen in 1833, and Göttingen time became the standard for magnetic observations worldwide.

12: Through darkness to the light

1 A. Bravais and V.C. Lottin were members of the French scientific expedition on board *La Recherche* (Captain Jean-Jacques-Louis Fabvre) in 1838–40. The expedition leader was Paul Gaimard. The expedition operated in northern Norway (Bossekop is on Altenfjord) and on Svalbard. For details see Marmier 1844–47.

2 The reference is to Adolf Erik Nordenskiöld's expedition to Svalbard on board *Polhem, Gladan* and *Onkel Adam*; the expedition wintered at Mosselbukta in northern Spitsbergen. For details see Kjellman 1875.

3 August Wijkander, geophysicist and astronomer.

4 Louis Palander, captain of *Polhem*.

5 Salvator Rosa (1615–1673), a Baroque Italian painter and artist whose work is generally considered unorthodox and extravagant.

6 Davis 1876:305–11.

7 Davis 1876:314–15.

8 With an unobscured horizon, we would have sighted the upper edge of the sun on 25 February at 11.30.4 a.m. The refraction, which lies at the base of this calculation, is 39.7'. EB

9 To mark the occasion, each man was given a half-bottle of wine and 100 cigarettes (Davis 1876:313–14).

10 The ivory gull (*Pagophila eburnean*) is a spectacular, pure white gull; it is an exclusively High Arctic species, circumpolar in distribution (Sale 2006:255).

11 *Alopex lagopus*; Bessels's reference to a white variety is based on the fact that there are two forms of this species, a white morph (grey-brown in summer, white in winter) and a blue morph (dark chocolate-brown in summer, pale blue-grey in winter) (Sale 2006:385)

12 In Greenland the ermine, also known as the stoat or short-tailed weasel, is found only in the coastal zones of extreme northern and northeastern Greenland (Sale 2006:401–2).

13 Two ptarmigan (probably the same birds) were also seen by Robert Krüger and Friedrich Anthing on an iceberg the same morning (Davis 1976:328).

14 From the arctic willow (*Salix arctica*), which adopts a creeping form, rarely exceeding a height of 15 cm.

13: The southern sledge trip

1 Baron Jurij Bartolomej Vega (1754–1802), a Slovenian mathematician, physicist and artillery officer, published his *Thesaurus Logarithmorum Completus* [Complete treasury of logarithms] in 1794.

2 Alfred de Musset (1810–1857), French Romantic poet, dramatist and novelist, published his *Poésies nouvelles* in 1850.

3 The intention was to link up with Kane's survey (Davis 1876:332).

4 It reached the ship at 1.00 p.m. (Davis 1876:332).

5 Along the way Bryan tried practising with his whip and accidentally hit Bessels in the face, "which caused great pain and called forth some remarks of a significant character; but the doctor's equanimity was soon restored, and it was mutually agreed that whip-practice should be deferred to a more fitting occasion" (Davis 1876:346).

6 According to Henderson's mistaken version (2001:117), it was Hans who was sent back to the ship. On arrival he allegedly reported that the broken runner was caused by Bessels being too lazy to get off the sledge while tackling rough ice.

7 A children's harmonica.

8 On his return Bessels was aghast to find that his stock of 48 bottles of spirits had been stolen from his locker (Henderson 2001:120). Parry (2001:147) assessed the results of Bessels's trip south, namely the crucial achievement of tying his own and other surveys to those of Kane, as having little to show for his efforts.

14: Early summer

1 John Herron.

2 The end product was sour and bitter, but the men seemed to enjoy it, and it was deemed to be beneficial (Davis 1876:357).

3 They had left three of them in a snow house, since the dogs could not haul more than four (Blake 1874:179). They found a fœtus in one of the cows and brought it back for Bessels (Davis 1876:353).

4 *Bubo scandiacus*; in terms of its breeding distribution in Greenland, it is confined to the extreme northwest and the northeast of the island (Sale 2006: 283–85).

5 During a trip to recover the three muskoxen left in the snow house by Joe and Hans (Blake 1874:179). They had travelled to the head of Newman's Bay to where a glacier discharged at its head. On their return Chester and Jamka were suffering from snow blindness (Davis 1876:355).

6 During his voyage on board *Albert* (Captain Hashagen) in 1869.

7 This was a serious attempt to get as far north as possible, i.e., not just a hunting trip (Davis 1876:356; Blake 1874:180).

8 They had killed eight on the first day they encountered the herd and, on following the herd, a further four next day (Blake 1874:181).

9 John Booth.

10 Some of the crew had complained to Budington since the Inuit were housed just forward of the men's quarters (Davis 1876:361).

11 By Robert Krüger on the 26th (Davis 1876:360).

12 In the interim, on 20 May one of the boats was sent to Cape Lupton on a sledge, this being the closest open water in which to launch it, with a view to attempting an advance northward by sea. A second one was transported to Cape Lupton on 24–25 May. Despite his conviction that Budington's plan for an expedition northward by boat so early in the season was bound to fail, Tyson had agreed to participate (Blake 1874:182).

13 Fossils of fairly large tropical trees (Davis 1876:372).

14 Near Cape Lupton (Davis 1876:360).

15 Karl Koldewey's expedition of 1869–70.

16 Hermann Siemens.

17 Robert Krüger.

18 Friedrich Anthing and Friedrich Jamka.

19 Gustav W. Lindquist.

20 Heinrich Hobby.

21 William Nindemann.

22 Peter Johnson.

15: The boat voyage north

1 Probably named after Paul Hegemann (1836–1913), captain of *Hansa* on the Second German North Pole Expedition, 1869–70.

2 1 rod = 16½ feet.

3 Davis 1876:375–77.

4 A large spiral gastropod.

5 We had got into the habit of calling three small headlands north of Cape Lupton, the First, Second and Third capes. They remained unnamed on the map. E.B.

6 On 10 June (Blake 1874:186).

7 The boat was hauled up on the floe. Bessels was suffering severely from snow blindness (Blake 1874:186).

8 Over a distance of about 2½ miles (Blake 1874:679).

9 He and his crew had rowed 23 miles that day (Blake 1874: 675). Tyson was not greatly impressed by their vessel: "Chester's party are not very comfortable in their canvas boat. She is not fit for such rough sailing as we have to encounter; it is square fore and aft, and the slowest craft I ever saw. She would do for a party of children to paddle about on a calm and placid lake; but you might as well put an egg-shell in the way of an ice-pack as this patent contrivance" (Blake 1874:188).

10 The opening line was "We are going to the Pole" (Davis 1876:3678).

11 Chester and his men also launched their boat, but having covered only 2½ miles, they were forced to retreat some distance and haul the boat out onto the ice (Blake 1874:675–76).

12 Meanwhile Chester's party was "camping" under the overturned canvas boat with rubber blankets draped over the front (Blake 1874:676).

13 These men were Siemens and Krüger. Meanwhile Meyer buried a cylinder with a message recording Hall's death and the coordinates of the location, and then built a cairn over it (Blake 1874:187).

14 Chester and party had no cooking equipment or fuel and that evening heated some coffee by burning some worn-out boots (Blake 1874:676).

15 Siemens and Krüger (Blake 1874:676).

16 Tyson, however, was proposing to make an attempt to push north overland on foot, but could not persuade anybody to join him. But Budington, who was determined to take the ship south, told him that "if he got a chance he would not wait"; this put paid to Tyson's plans (Blake 1874:188).

17 Chester and party were forced to pack up and retreat 200–300 yards (Blake 1874:676).

18 He set off at 3.00 p.m. on the 30th (Blake 1874:676).

19 At 5.00 a.m. (Blake 1874:676). They relayed Budington's message (now more urgent) that both parties should return to the ship (Blake 1874:681).

20 According to Tyson the plan was to haul the boat ashore at a secure spot, and then to walk back to the ship; it took them almost 48 hours to reach a suitable ravine near Cape Sumner (Blake 18874:189).

21 Jamka and Krüger; they were followed by Meyer at 2.00 p.m. (Blake 1874:677).

22 The canvas boat was cached beside Tyson's boat (Blake 1874:191).

23 *Juglandaceae*: trees of the walnut family.

24 One of these branches was about 4½ inches in diameter and about 18 inches long (Blake 1874:678).

16: The summer

1 On the 25th there was a sudden increase in the inflow of water. Budington divided the crew into two watches, so that pumping could proceed continuously; once the water level had been reduced to a manageable level, pumping for only 2 to 4 minutes per hour kept the situation under control (Blake 1874:191).

2 On the Ellesmere Island coast, just south of Lady Franklin Bay.

3 On this occasion Tyson ruefully assessed the expedition's accomplishments—or lack of them: "What opportunities have been lost! And the expedition is to be carried back only to report a few geographical discoveries, and a few additional scientific facts. With patience we might have worked up beyond Newman Bay, and there is no telling how much farther. Someone will someday reach the Pole, and I envy not those who have prevented the *Polaris* having that chance" (Blake 1874:192).

4 It was erected by Emil Schumann (Loomis 1971:288).

5 This inscription is in English in Bessels's account.

6 Chester added this additional inscription (also in English in Bessels's account) on 27 July (Davis 1876:395).

7 A copper cylinder containing a brief history of the expedition, was also buried in the grave mound (Davis 1876:386).

8 The following vascular plants were observed: *Ranunculus nivalis* L. var.; *Papaver nudicaule* L.; *Vesicaria arctica* Br.; *Draba alpina* L. var. *algida*; *Draba alpestris* Br.; *Cochlearia fenestrata* Br.; *Lychnis apetala* L.; *Cerastium alpinum* L.; *Dryas octopetala*; *Potentilla nivea* L.; *Saxifraga oppositifolia* L.; *Taraxacum palustre* DC.; *Polygonum viviparum* L.; *Oxyria digyna* Campd.; *Salix arctica* Poll.; *Juncus biglumis* L.; *Eriophorum vaginatum* L.; *Alepocurus alpinus* Sm.; *Carex dioica* L.; *Dupontia psilosantha* Rupr.; *Poa arctica* Br.

Professor Asa Gray of Cambridge, Mass., was so kind as to verify the above identifications. The identification of *Dupontia* was entirely his. I should like to add a *Pedicularis* sp. conditionally to the above list. Mauch and Bryan found a plant that from their description was probably *Pedicularis*. E.B.

9 *Saxifraga oppisitifolia*.

10 These swarms consisted mainly of *Chironomus polaris* Kirby. Among them Mr. C.R. von Osten-Sacken [Baron Carl-Robert von Osten-Sacken (1828–1906), Russian-German entomologist], who was so kind as to identify the diptera we had collected, found a new species: *Tipula bessels* n. sp. *Grau*. Thorax and abdomen with dark stripes; wings with dark brown stigma; antennae black; ovipositor of the female very short. Body length, male, 9–10 mm; female, 12–13 mm. Wing length, male, 12–14 mm; female, 15 mm. E.B.

11 *Bombus kirbyellus* Curtis. Among the Hymenopterae, Dr. A.S. Packard, Jr. [American entomologist, 1839–1905)], who identified some of our insects, found a new ichneumon [wasp]: *Microgaster hallii* n. sp. E.B.

12 *Laria rossii*. E.B.

13 *Colias boothii* Curtis. E.B.

14 *Podura humicola* Fabr. One of the *Poduridae* [springtails] that we collected was new to science. Packard named it *Isostoma besselsii* n. sp. E.B.

15 *Daphnia rectispina* Kr.; *Branchinecta groenlandica* Verrill. E.B.

16 Ruddy turnstone (*Arenaria interpres*). While Eurasian birds may migrate south as far as South Africa, the Greenland birds migrate south as far as Chile and Argentina (Sale 2006:222).

17 *Lycosa glacialis* Thor. Dr. T. Thorell of Genoa [Tord Thorell, 1830–1901], Swedish expert on spiders, was so kind as to undertake the identification of the spiders. Apart from the above-named species, our collection also included *Erigone psychrophila* Thor., *Erigone pensa* n. sp. Thor., *Trochosa* inc. spec. E.B.

18 Sea spiders.

19 The following list contains the names of those mammals which indubitably occur abundantly north of 81°N:

Ursus maritimus L., polar bear; *Canis lagopus* L. [now *Alopex lagopus*], arctic fox; *Phoca groenlandica* Müller, harp seal; *Phoca hispida* Erxleben [now *Pusa hispida*], ringed seal; *Phoca barbata* Müller [now *Erignathus barbatus*], bearded seal; *Lepus glacialis* Leach [now *Lepus arcticus*], arctic hare; *Myodes torquatus* Pallas [now *Dicrostonyx torquatus*], lemming; *Ovibos moschatus* Zimmermann, muskox.

By contrast the occurrence of the following mammals is problematic:

Mustela erminea L., ermine. Several times we encountered the tracks of a small mammal that had not been made by lemmings. They had probably been left by ermines.

Canis lupus L., wolf. Some of the seamen asserted that they had seen a wolf; others, however, thought this animal was a dog. The natives were inclined to identify various tracks that they encountered as wolf tracks.

Cervus tarandus L. [now *Rangifer tarandus*], reindeer. Joseph found a cast reindeer antler. Since traces of nomadic Eskimos were discovered in the vicinity of where it was found, the antler might have reached Polaris Bay through human means.

The following species of birds were observed:

Falco arcticus Holb. [now *Falco rusticolus*], gyrfalcon. Spotted by Hall during his sledge trip in the vicinity of Newman's Bay. During spring some specimens were also seen. Probably nests in the Far North.

Strix nyctea L. [now *Bubo scandiacus*], snowy owl. Seen by Hall near Newman's Bay and by some seamen during the spring. During the last days of July, Joseph and I heard the call of this bird in a ravine near the anchorage, but did not see it. On a later occasion I found freshly cast-up pellets that consisted of lemming bones and hair. In assuming that these pellets were produced by a snowy owl, I can scarcely be mistaken. The smallest of them was the size of buckshot. During the first days of August, I found a shed breast feather with brownish-black speckles. Probably nests in the vicinity of Newman's Bay.

Corvus corax L., raven. A solitary specimen of the bird was seen by Mrs. Hannah near the ship on 19 June. During our sojourn on the ice fields of Newman's Bay, we several times heard distant bird calls, which resembled the croaking of a raven. It is certainly not a permanent resident as it is at somewhat lower latitudes.

Emberiza nivalis Naum. [now *Plectrophenax nivalis*], snow bunting. Was spotted in flocks during fall. The first specimen appeared on 14 March. Nests near Polaris Bay; however, we found only young birds, but no nests.

Stresilas interpres L. [now *Arenaria interpres*], turnstone. Appeared in large flocks in late July and early August, consisting of adult males and females as well as young birds. Hence the bird nests in the Far North.

Tringa maritima Brünnich [now *Calidris maritima*], purple sandpiper. The only specimen of this bird was seen soon after the ship's arrival.

Tringa canutus L. [now *Calidris canutus*], knot. A single male specimen with extremely bright plumage was shot at the end of June. The circumstance that the bird was in full breeding plumage might indicate that this species of shorebird nests in the vicinity of our anchorage.

Calidris arenaria, L. [now *Calidris alba*], sanderling. Common in the vicinity of Polaris Bay. In mid-July two of its simple nests were found. One clutch contained three, the other four, of its extremely rare eggs.

Lagopus spp., ptarmigan. Probably a permanent resident. Fairly common. Nests in the Far North. No eggs found.

Sterna macroura Naum. [now *Sterna paradisaea*], arctic tern. Nests on the shores of Polaris Bay. Very common.

Xema sabini Sabine, Sabine's gull. Spotted at the beginning of July in company of *Sterna macroura*. Not common. Only two specimens of this bird were killed, a male and a female. Both possessed a brood patch. There was an egg with a soft, chalky shell in the female's oviduct.

Larus glaucus Brünnich [now *Larus hyperboreus*], glaucous gull. Not common, but undoubtedly nesting.

Larus eburneus Phipps [now *Pagophila eburnea*], ivory gull. Somewhat more common; also nesting.

Larus tridactylus L. [now *Rissa tridactyla*], kittiwake. Was encountered in flocks in Newman's Bay in June; less common near *Polaris'* anchorage. Nesting?

Stercorarius parasiticus Brünnich, parasitic jaeger. Was seen often and several specimens were killed. Probably nesting.

Stercorarius longicaudus Briss, long-tailed jaeger. Less common than the preceding species. Probably nesting.

Procellaria glacialis L. [now *Fulmarus glacialis*], northern fulmar. Sighted once during the fall. Non-nesting.

Bernicla brenta Pall. [now *Branta bernicla*], brent goose. Very common. Nesting.

Harelda glacialis L. [now *Clangula hyemalis*], oldsquaw. Rare, but nesting.

Somateria mollissima L., common eider. Fairly common. Nesting.

Somateria spectabilis L., king eider. In flights with the previous species; fairly rare. We were unable to determine if this bird nests north of the 81st parallel.

Uria grylle L. [now *Cepphus grille*], black guillemot. The commonest of all birds. Probably winters sporadically. The first individuals noted on 28 February. Nesting. However, the eggs were never collected.

Uria arra Naum. [now *Uria lomvia*], thick-billed murre. Fairly common and nesting.

Mergulus alle Sabine [now *Alle alle*], dovekie. Only two individuals seen in Newman's Bay. E.B.

20 But he admonished to start back immediately if the wind became northeasterly, since that would release the ship and he planned to take the first opportunity to start south (Davis 1876:404).

21 Despite these observations, it is in fact a bay.

17: Southward

1 Many of the crew had not even realized that she was pregnant, deceived by her normal substantial girth and the loose-fitting fur clothing she wore (Henderson 2001:135).

2 On 12 August 1872.

3 Named "Tiger" (Davis 1876:407).

4 The isolated, steeply cliffed and flat-topped island in the North Sea, about 80 km northwest of Bremerhaven.

5 According to Henderson (2001:139–40), the ship had become beset as a result of Budington's orders to the helmsman while drunk.

6 And managed to pass Cape Constitution (Blake 1874:193).

7 This involved piling provisions, clothing and bags of coal on deck, ready to be thrown overboard onto the ice at a moment's notice (Blake 1874:193).

8 The stovepipe from the galley stove was led up through the upper cabin, providing a source of heat (Davis 1876:418).

9 Over several days, starting from 16 September. This house, measuring 27 by 24 feet, was built by Tyson, assisted by Morton, Bryan, Mauch and Joe (Davis 1876:418).

10 Despite his initial reluctance at drinking fresh blood and eating the meat raw (Davis 1876:421).

11 The ice-drift carried the ship past Rensselaer Harbour on 4 October (Blake 1874:195).

12 Two men had already been manning the pumps, but now the leak became much worse, gaining on the pumps (Blake 1874:197).

13 As, too, were all the boats.

14 Bessels presents a much better organized picture than the reality—which was a confused, panic-stricken operation. To quote Tyson: "[Budington] threw up his arms, and yelled out to 'throw everything on the ice!' Instantly everything was confusion, the men seizing everything indiscriminately, and throwing it overboard. These things had previously been placed upon the deck in anticipation of such a catastrophe; but as the vessel, by its rising and falling motion, was constantly breaking the ice, and as no care was taken how or where things were thrown, I

got overboard, calling some of the men to help me, and tried to move what I could away from the ship, so it should not be crushed and lost. . .” (Blake 1874:198).

A measure of the confusion that prevailed is provided by the following incident, as related by Tyson: “We did not know who was on the ice or who was on the ship; but I knew some of the children were on the ice, because almost the last thing I had pulled away from the crushing heel of the ship were some musk-ox skins; they were lying across a wide crack in the ice, and as I pulled them toward me to save them, I saw that there were two or three of Hans’s children rolled up in one of the skins; a slight motion of the ice, and in a moment more they would either have been in the water and drowned in the darkness, or crushed beneath the ice” (Blake 1874:201).

15 They were Budington, Chester, Morton, Bessels, Bryan, Schumann, Odell, Coffin, Booth, Campbell, Mauch, Hayes, Siemens and Hobby (Davis 1876:439).

16 William Jackson.

17 John Herron.

18 Peter Johnson.

19 Gustav Lindquist.

20 William Nindemann.

21 Johan W.C. (Robert) Krüger.

22 Friedrich Jamka.

23 Friedrich Anthing.

18: On terra firma

1 It was at about this time that Tyson, marooned on the ice, spotted the ship about 8 or 10 miles away, travelling under sail and steam, smoke belching from her funnel. He hoisted a flag, and a piece of waterproof cloth—but to his amazement and intense disappointment, *Polaris* disappeared behind Littleton Island (Blake 1874:204).

2 Meyer’s and Bryan’s records, which were all placed on the ice, are listed in detail by Davis (1876:430–33).

3 To complicate the situation, the sun had disappeared for the winter on the 16th (Davis 1876:444).

4 They both wore polar-bear-skin pants (Davis 1876:445), still invariably worn by the Inughuit, the Inuit of northwest Greenland.

5 From previous encounters with Inuit during his career as a whaler, Budington had at least some knowledge of the Inuit language, sufficient when supplemented by sign language to make some communication possible (Davis 1976: 446).

6 Bessels fell through the ice twice and Mauch once (Davis 1876:447).

7 Claude Servais Mathias Pouillet (1790–1868), a professor of physics at the Sorbonne and a member of the Académie des Sciences, famous for having calculated the solar constant in 1837–38 as 1,228 watts/m^2.

8 Cumberland Sound, southern Baffin Island.

9 Unless his was a slightly later migration, he was thus the son of Qitdlarssuaq, who led the remarkable migration from southern Baffin Island to northwestern

Greenland in the mid-nineteeth century. During its progress north, the group was encountered by Commander Inglefield of HMS *Phoenix* at Dundas Harbour on 29 July 1853 (Inglefield 1853), and by Captain McClintock, in command of *Fox*, at Cape Horsburgh on 11 July 1858 (McClintock 1859:144). The migration is described in great detail by Mary-Rousselière (1991).

10 If they had arrived with Qidtlarssuaq, given McClintock's encounter with the group at Cape Horsburgh in 1858, they may well have reached Etah earlier than 1865, i.e., this may be an example of the Inuit's well-documented vagueness in determining the dates of events.

11 This incident was described by Ivalu (Davis 1876:463). It is discussed in some detail by Mary-Rousselière (1991:63–64).

12 The Prager Rattler typically has tan or yellow markings on its head and legs.

13 In the event that the word "Majuk" reveals itself to be a dialectal variant of *Maujôk*, which is extremely probable—naturally the final decision must be left to the linguist—this might provide very significant clues as to the former wanderings of the residents of Smith Sound. In the *Grønlandske Ordbog, omarbeidet af Sam. Kleinschmidt: udgiven paa Foranstaltning af Minsteriet for Kirke- og Underviisningsvæsen et og med det kongelige danske Videnskabernes Selskabs Understøtelse ved H.F. Jørgensen. Kjøbenhavn. L. Klein. 1871* one finds on p. 205: Maujôk = "an unknown animal." And in parentheses "formodenlig en Gnaver af Musefamilien." This unknown animal can scarcely be anything other than the lemming, whose occurrence in West Greenland is confined only to the extreme uninhabited north, where we discovered it. E.B.

14 It was during this period that an incident occurred, the description of which certainly represents the clearest example of Davis's whitewashing of relations during the expedition: "On the 7th [December] a serious violation of discipline occurred – the only one during the voyage. An engineer and a seaman quarreled about the possession of a shelf, and made use of threatening language and gestures" (Davis 1876:460).

15 *Kater* may mean either a tomcat or a hangover.

19: An ethnographic sketch

1 An apparent reference to Church of England missionary Adam Elliot's *Vocabulary of Mohawk* (1846). Reprint: *American Language Reprints,* Vol. 20, 2000.

2 Ross 1819.

3 Cyriax 1964.

4 Homer, *Odyssey*, Book 1, line 23.

5 French anthropologist Louis Laurent Gabriel de Mortillet (1821–1898). The quotation may be translated as: "Overall the head appears to be intermediate between the conventional representation of Mephistophele and the head of François I."

6 Hermann Welcker (1822–1897), anatomist and anthropologist, Professor, University of Halle.

7 Joseph Barnard Davis (1801–1881), English medical doctor and phrenologist.

8 Rudolf Carl Virchow (1821–1902), German medical doctor and pathologist, Professor, University of Berlin.

9 Adolf Pansch (1841–1887), medical doctor and anatomist, Associate Professor, University of Kiel, surgeon on board *Germania* on the Second German North Pole Expedition 1869–70.

10 Samuel Petrus Kleinschmidt (1814–1886), born in Greenland of German missionary parents, published his grammar of the Greenlandic language in 1851.

11 Hayes and Campbell, who happened to be visiting the settlement (Davis 1876:484–85).

12 On 3 May. The funeral was observed by Hayes and Campbell (Davis 1876: 484).

13 Rink 1875.

14 Parry 1824.

20: Further progress

1 Astronomically the upper edge of the sun should have disappeared at 00 18 min. 6 sec. on 25 October and reappeared at 11 11 2 on 16 February. For the day of its disappearance, I took a refraction of 38.4' into my calculations; for the day of its reappearance, by contrast 41.3'. E.B.

2 *Advance*, which Kane had abandoned at Rensselaer Harbour (Kane 1856).

3 In fact it is a multi-branched fiord.

4 Qalasirssuaq, alias Erasmus York, so named by Captain Erasmus Ommanney, joined the latter's ship HMS *Assistance* when she called at Cape York in 1850, and after spending the winter on board, was still on board when she returned to England in the fall of 1851. There he was known as Erasmus Augustine Kallihirua.

5 Captain Erasmus Ommanney (1814–1904) was captain of HMS *Assistance* in 1850–51, and led a complex sledging operation to search Prince of Wales Island for any traces of the missing Franklin expedition.

6 Nathaniel Coffin.

7 While he may have designed and fabricated the hinged joint, the wooden leg had first been made by James Rae, assistant surgeon on board HMS *North Star*, wintering at Wolstenholme Fiord in 1849–50 (Mary-Rousselière 1991:65) and later had been repaired by Hayes (Davis 1876:474).

8 50 lbs. of pork and 100 lbs. of hardtack, as well as 2 gallons of molasses (Davis 1876:476).

9 Bessels was accompanied by Jimmy and Avatok; the latter hoped to find a wife on Ellesmere Island, which Bessels was planning to reach after visiting the Humboldt Glacier (Davis 1876:479).

10 In fact a peninsula, rather than an island.

11 Bessels appears to have been completely unaware of how dangerous his action was. The murders of the American explorers Harry Radford and Thomas Street by Inuit near Bathurst Inlet in 1912 (Anderson 1972) and of the priests Father Jean-Baptiste Rouvière and Father Guillaume LeRoux on the Coppermine River in 1913 under almost identical circumstances, i.e., a Kabluna (a non-Inuit) threatening Inuit in

an attempt to persuade them to travel against their wishes (Moyles 1979), clearly demonstrate the risk Bessels was running.

12 Sharky later confessed that he had broken the sledge runner deliberately, since he did not wish to go any farther (Davis 1876:481).

13 Selachians: cartiliganous fish including sharks and rays.

14 Heinrich Hobby.

15 The longitude of which had been accurately determined during Kane's wintering there in 1853–54.

16 The dog spotted it first, and reached it first (Davis 1876:490).

17 En route Avatok had given Bryan a demonstration of his skill at catching dovekies out of the air, using a small net fastened to a long pole (Davis 1876:494–95).

18 This is an impressively accurate description. See Sale (2006:262).

19 Each man was allowed only 8 lbs. of personal belongings (Davis 1876:495).

21: The start of the ice floe drift

1 Dante's *Inferno*, Canto IX, l. 7.

2 Eight-man whaleboats (Nickerson 2002:58).

3 In fact, despite Tyson's pleadings the men had insisted on cooking and eating a meal and even, in some cases, changing their clothes, before they agreed to help (Blake 1876:203).

4 But only through the efforts of Tyson and Joe and 5 or 6 dogs which hauled the boat across the ice (Blake 1896:208). Both kayaks were also discovered by Joe, but since most of the men refused to try to recover them, only one was saved (Blake 1896:209).

5 Joe and family had a snow house of their own according to Tyson (Blake 1896:209).

6 German mile = 7.5 km.

7 He was laid up for three days (Blake 1876:218).

8 They had gobbled down some of the provisions (Nickerson 2002:70).

9 For Thanksgiving dinner Tyson, Hans and his wife and daughter shared 6 hardtack biscuits, 1 lb. of canned meat, a small can of corn, and a small can of mock-turtle soup—all mixed together and warmed over the lamp (Blake 1876:223–24).

10 Also on the 30th, Bessels, accompanied by Herron, Jackson, Johnson and Lindquist made a trip to the old hut to salvage the canvas, which was then used to line Hans's snow house (Blake 1874:225).

11 Along with a few mouthfuls of dried apples (Blake 1876:233).

22: Between hopelessness and optimism

1 The temperature on New Year's Day was –29°, the coldest day thus far during the ice-drift (Blake 1876:237).

2 With the exception of John Herron (English) and the black cook William Jackson (American), all the men were German and generally conversed in German, a language Tyson could not understand.

3 This would indicate a temperature of around –40° or colder.

4 Due to Meyer's consistent errors as to longitude, especially since he was also German the men believed him and repeatedly insisted that they should head east, hauling the boat across the ice, in order to reach Disko, where they knew a large depot had been left. Such an attempt would, of course, have been suicidal (Blake 1876:247; 255–56).

5 On 30 January, almost at the end of his tether under the stress of hunger, cold, and the responsibility he felt for keeping the entire group alive, despite the machinations and lack of cooperation from the men, Tyson wrote a sort of last will and testament:

"Now as death is liable to all men and especially to one in my situation I wish here to make a few remarks which, whether I live or die I sincerely hope will come to light. I here brand Sailing Master and Ice Pilot Sydney O. Budington as a villain, a liar, a thief, a coward and a drunkard and now has, I fear, added murder to his many crimes" (Nickerson 2002:95). This last accusation is to the effect that Budington had murdered Hall; a few days before Hall set off on his last sledge trip Budington had predicted: "the damn old son of a bitch will die soon. . ."

6 Tyson's account differs somewhat from this: the seal had stuck its head up through young ice, and it remained visible after Hans had shot it. To reach it he had "paddled" his kayak across the thin ice, which would not have borne his weight if he had tried walking (Blake 1876:270).

7 As with all cetaceans the "spout" is the moist exhalation from the blow-hole, the water vapour in the exhalation condensing in the cold air.

8 The group had initially had one of the ship's whaling harpoons, but one of the men had cut it down into a spear—useless for harpooning a narwhal (Blake 1876:275–76).

9 This name is no longer current, but must be in the area of the Henry Kater Peninsula, eastern Baffin Island.

10 Despite Tyson's warning the men all ate the liver of the bearded seal, and were all seriously sick for most of a week (Blake 1876: 298–99). Like the liver of the polar bear, this seal's liver is toxic due to the high concentration of Vitamin A.

11 On 11 March (Blake 1876:301).

12 *Phoca groenlandica*; also known as harp seals.

23: Spring on the floe

1 *Cystophora cristat*a.

2 This is correct with regard to Baffin Bay, but in the Svalbard area, its range reaches 80° (Sale 2006:422).

3 According to Tyson 9 hooded seals were shot, but only 4 recovered (Blake 1876:307). Tyson calculated that they had enough meat for 18–20 days.

4 The work included fitting washboards to the top of the gunwales to prevent waves breaking inboard (Blake 1876:311).

5 This occurred in the early hours of 8 April (Blake 1876:313).

6 But it was discovered that Meyer had frozen some of his toes during his ordeal (Blake 1876:315–16), and his condition deteriorated rapidly thereafter.

7 This was the night of April 20–21 (Blake 1876:320).

8 On the afternoon of the 22nd (Blake 1876:323).

9 Having eaten his share of the bear meat, Meyer soon showed signs of recovering (Blake 1876:324).

10 Tyson later learned that this was the sealing vessel *Eagle* (Captain Jackman), of St. John's (Blake 1876:333).

11 In case another ship approached during the night they lit fires with seal blubber on the ice (Blake 1876:326).

24: The seals

1 For the best comprehensive history of the Newfoundland seal hunt see Ryan 1994; and for one of the worst losses of life at the seal hunt, involving the crew of the *Newfoundland* in 1914, see Brown 1972.

2 The main species involved is the harp seal (*Phoca groenlandica*).

3 Bessels's account of the seal hunt is somewhat inaccurate. The mother seal would invariably take to the water as a sealer approached, and few adults were killed. The main quarry was the white-coat pup, which was killed for its skin and the underlying layer of blubber, known as a "sculp."

4 Here again Bessels is mistaken; it was the sculps, not the unskinned carcasses, that were piled up, to be picked up later by the ship; the piles, known as "pans," were then flagged. The skinned carcasses were abandoned.

25: Salvation

1 Captain Isaac Bartlett, an uncle of Bob Bartlett, who accompanied Robert Peary on his various attempts at the North Pole, and who was captain of Vilhjalmur Stefansson's ill-fated *Karluk*, crushed by the ice to the north of Ostrov Vrangelya [Wrangel Island] in January 1914.

2 About 50 km northeast of the present-day town of Cartwright and only some 120 km north of the Strait of Belle Isle.

3 To Tyson's surprise and delight Captain Bartlett held a church service that evening (Blake 1876:334).

4 If the *Polaris* survivors had still been on the ice floe, they would almost certainly have perished in this gale (Blake 1876:334).

5 Misappropriation of each other's pans of sculps in this fashion was a common feature of the seal hunt throughout its history. For details see Brown 1972.

6 Several of them were in poor health; two of the men as well as Joe and Hannah were ill; Meyer and Tyson had swollen feet and ankles, and Meyer's hands were

badly frostbitten. Almost all were suffering from colds, sore throats and rheumatism (Blake 1876:335).

7 In southwestern Conception Bay.

8 On shore Tyson and Captain Bartlett met the American consul from Harbour Grace, who then telegraphed the news of their arrival to Mr. Molloy the consul in St. John's (Blake 1876:336).

9 *Frolic* was a side-wheel paddle steamer of 880 tons (Henderson 2001:227).

10 Pentecost or Whit.

11 Victoria Day.

12 Bessels is in error here; *Frolic* took Tyson and his party directly to Washington, arriving there on 5 June (Henderson 2001:227; Loomis 1971:297).

26: The boat voyage in arctic waters

1 On 2 June these were cached, along with Hall's extensive arctic library, the pendulum, the transit instrument and three chronometers, in a cairn about 400 meters ESE from the house (Davis 1876:499).

2 Also Nathaniel Coffin (Davis 1876:495).

3 On 3 June 1873.

4 Now *Calidris canutus*.

5 A soup made from dovekies (Davis 1876:500).

6 Although Bryan, Hayes and Mauch made themselves remarkably comfortable, in the lee of a large rock and on a bed of moss with one blanket below them and two on top (Davis 1876:501).

7 Emergency blue flares.

8 On 9 June (Davis 1876:502).

9 Iceland gulls—now *Larus glaucoides*.

10 *Branta bernicla*.

11 Bessels is distinguishing between *Anser alvifrons flavirostris* (the Greenland white-fronted goose) and *A. a. gambeli* (the Pacific white-fronted goose), which breeds in the Mackenzie Delta and farther west (Sale 2006: 92).

12 Chimney swift.

13 Barn swallow.

14 Sand martin; now *Riparia riparia*.

15 Theodor von Heuglin, 1872–73. *Reisen nach dem Nordpolarmeer.* Braunschweig: Georg Westermann.

16 Erik Ulve, captain of *Samson* on a walrus-hunting voyage (Holland 1994:283).

17 Barn swallow.

18 Robert Ridgway (1850–1929), American ornithologist and artist, curator of birds at the Smithsonian Institution.

19 The reference is to the lotus *(Nelumbo nucifera*).

20 Bryan's observations at midnight revealed a latitude of 76°02'30"N (Davis 1876:507).

21 Ross's gull.

22 Pomarine jaeger.

23 On 19 June.

24 One plank had been stove when the boat was caught in a nip before her crew could haul it up onto the ice (Davis 1876:510).

27: Whaling

1 The ship's position was 75°38'N; 65°35'W (Davis 1876:512).

2 Shetlanders and Orkneymen would not have been Gaelic speakers, but would have spoken a dialect of English influenced by Norn, the language spoken in these islands until gradually replaced by English after they became Scottish in 1468–69.

3 Captain Allen had his carpenter repair it, however. Arriving with the ship at Dundee, the owner, Mr. Lockhart, presented it to the Smithsonian Institution. It was transported to the United States by the steamer *Georgia* of the State Line free of charge, and on 10 May 1876 it was exhibited at the International Exhibition in Philadelphia alongside Kane's boat, *Faith*, as part of the Arctic collection exhibited by the United States Naval Observatory (Davis 1876:514–15).

4 Initially the ship followed the Devon Island coast until past Cape Warrender, then crossed to Admiralty Inlet (Davis 1876:515).

5 Albert Markham, R.N. (1841–1918), who was on board *Arctic* to gain experience prior to serving on board HMS *Alert* during Nares's expedition of 1875–76. He reported that Bessels was "the only man of scientific attainments in the ship, and the only man besides Hall and Chester, who felt any enthusiasm for the objects of the voyage" (Markham 1875:188). He further noted that while Budington was paid $120 per month, Bessels was initially offered only $75. He asked for an assistant, to whom he proposed handing over his salary. At this his salary was raised to $100 per month.

6 A tragedy by William Shakespeare, written between 1605 and 1608.

7 On 10 July off Cape Graham Moore, Markham and Chester contributed to one of these successes: hiking across the ice with a harpoon gun, they managed to kill a whale which had already been harpooned but was seeking safety among the ice (Markham 1874: 202).

8 This is a translation from Lindeman's German translation of Cornelis Gijsbertsz Zorgdrager's original Dutch version. See Lindeman 1869:55.

9 The description which follows is of a bowhead whale (*Balaena mysticetus*).

10 The orca or killer whale (*Orcinus orca*)

11 Markham and Bessels had been taking the specific gravity of the sea water every two hours, but on 13 July their hydrometer broke. Next day Bessels manufactured a replacement from a small bottle, a quill and a little mercury—which turned out to be a great success (Markham 1874:204).

12 *Silene viscaria*.

13 This is possible but seems unlikely. The common starling (*Sturdus vulgaris*) is a European species, introduced to North America (in Central Park, New York) only in 1890 and now common throughout North America.

14 In striking contrast to Bessels non-judgmental comments, Markham wrote, "They seem to me about the lowest specimens of humanity I have ever come across, not excepting the Solomon Islanders" (Markham 1874:213)

15 On the east side of the entrance of Admiralty Inlet.

16 From streams flowing down the cliffs (Markham 1874: 218).

17 Chester, Markham and Dr. Graham were in the same boat. Markham describes his misadventure as follows: "The dingy failed to get clear of the brute's tail, which it had thrown up out of the water on receiving the contents of our gun and which, descending with tremendous violence, just caught the gunwale of our boat, knocking me over the stern. Before coming to the surface, I imagined the dingy had been smashed to pieces, which would have been rather a bad case for us, as the other boats were some way off, and, also, fast to fish, and no loose boat being near us, and with the temperature of the water only a few degrees above freezing point, I don't think that I for one could have kept up long, accoutered as I was in a heavy monkey jacket and sea boots. However, on rising to the surface, I had the satisfaction of seeing the dingy a couple of boats' lengths off, and the doctor (who had taken to the water, imagining that the tail was coming right down upon us) and myself were soon hauled in. If the boat had been one foot nearer the fish she would most assuredly have been dashed to pieces and we should all have been killed before having time to jump overboard" (Markham 1874:223–24).

18 Parry had wintered here in *Fury* and *Hecla* in 1824–25. For details see Parry 1826.

19 If Captain Adams had achieved this, his would have been the first ship to negotiate Fury and Hecla Strait.

20 And which they had named Somerset House (Ross 1835).

21 There is only one species of Orca.

22 Hermann Siemens.

23 The second branch of the antler.

24 The distance involved was about 5½ miles. To make the task easier they quartered the animal; Siemens took the hind quarters and the other two a fore quarter each (Markham 1975:253).

25 *Arctic* was now a full ship and Captain Adams had decided to head for home (Markham 1875:255).

28: The search

1 The US government paid the Newfoundland owners $60,000 for the ship. Built in Québec in 1871, she was a strongly built vessel of 350 tons, with engines of 1200 hp, rigged as a barkentine (Blake 1874:344–47).

2 The cabin was enlarged and two deck-houses were added to accommodate the number of officers involved (Blake 1874:344).

3 *Juniata* was a screw-steamer (Blake 1874:342).

4 On board, serving as ice pilot, was Captain James Budington, uncle of Sydney Budington (Blake 1874:342).

5 Following a visit by the Secretary of the Navy, George Robeson, on the 12th and a brief sortie to the buoys off Sandy Hook to correct the compass deviation on the 12th–13th (Blake 1874:356).

6 Wilhelm Nindemann was clearly a glutton for punishment; having survived the ice-floe drift, and this search expedition on board *Tigress*, he would later serve on board the ill-fated *Jeannette* and would be one of the only two survivors from De Long's boat, and even thereafter, helped Melville in the search for De Long's party (see note 11 below).

7 Significantly, the ship's engineer, George W. Melville, would later (in 1878–81) serve in the same capacity on board the ill-fated *Jeannette*, and, having reached the Lena Delta safely, would mount a search for the only other boat's crew which reached land, but of which only two men survived, one of them being Nindemann (Melville 1884).

8 Abeam of Sukkertoppen (now Manniitsoq) (Blake 1874:362).

9 A dance was held on shore in honour of the American visitors (Blake 1874:363).

10 At Upernavik, arriving on 10 August (Blake 1874: 364).

11 George W. De Long, who would later command the ill-fated USS *Jeannette* which, having become beset in the ice near Wrangel Island, drifted north and west to a point north of the New Siberian Islands. De Long died of starvation and exposure after reaching the Lena delta. For further details see De Long 1884.

12 Lt. Charles Chipp, who also served on board USS *Jeannette*, and along with the crew of one of the three boats heading south across the Laptev Sea, disappeared in September 1881 (De Long 1884).

13 Evidently a small island off the Greenland coast and not the much larger Canadian island on the opposite side of Baffin Bay; the name has not survived.

14 *Tigress* had arrived only on the previous day from Upernavik (Blake 1874:364).

15 Greer and Tyson had had an exchange of letters on the topic, Tyson affirming that the separation from *Polaris* had not occurred off Northumberland or Hakluyt islands but rather off Littleton Island (Blake 1874:365).

16 With Joe acting as interpreter (Blake 1874:353.)

17 But Tyson spotted one of the hawsers by which she had been moored, one end made fast to a rock, the other end trailing in the water (Blake 1874:366).

18 He found that the interior of the hut had been thoroughly trashed, but it was not clear whether this was the work of the *Polaris* party or of the Inuit (Blake 1874:354). Tyson salvaged books, tools and manuscripts, which he gave to Greer (Blake 1874:366).

19 She had put to sea on the 16th; on the way south a fire in a coal bunker had caused some anxiety but was quickly extinguished (Blake 1874:368–69). Then on the 18th a bear was sighted and shot; roast bear was served for dinner. And that evening a collision with an iceberg in thick fog was narrowly averted (Blake 1874:370).

20 Here too, on two evenings in succession the Americans were invited to a dance on shore (Blake 1874:372).

21 He had learned at Godhavn that *Arctic* and 8 other whalers had gone north, and hence there was a high probability that one of them would have picked up the *Polaris* party (Blake 1874:355).

22 Having experienced a very severe gale on the 1st and 2nd (Blake 1874:374–75).

23 This deposit became of crucial importance in the manufacture of aluminum, and was a major factor in prompting the occupation of Greenland by the United States during World War 2. The mine was abandoned in 1987 and the town soon afterward.

24 Karl Ludwig Giesecke (1761–1833) led an extended geological expedition to southwestern Greenland from 1806 until 1813, investigating the geology from Cape Farewell as far north as Tasiusaq (Holland 1971:172).

25 Having loaded 190 tonnes of coal (Blake 1874:381). Having experienced several days of severe gales and fog, *Tigress* reached St. John's on 16 October, to learn for the first time that Budington, Bessels and party were safe. On 9 November *Tigress* reached New York (Blake 1874:386).

29: Homeward bound

1 Northern tip of Brodeur Peninsula, Baffin Island.

2 From an iceberg rather than from a glacier (Markham 1874:272).

3 Common linnet (*Carduelis cannabina*), normally confined to Europe, western Asia and northern Africa.

4 Lapland longspur (*Calcarius lapponicus*), occurring in both Baffin Island and west Greenland (Sale 2006:326–28).

5 *Motacilla alba*—generally a Eurasian species, although it does occur in Iceland and in a small area of east Greenland (Sale 2006:295–96).

6 Bessels is almost certainly mistaken; Barra is the southernmost of the larger islands of the Outer Hebrides, whereas the small, rocky neighbor of Rona is Sula Sgeir.

Epilogue: Motive for Murder

1 Loomis 1971.

2 Ibid., 338.

3 Henderson 2001:282.

4 Loomis 1971:344.

5 Ibid., 345.

6 Ibid., 353.

7 Ibid., 348–49.

8 Potter 2015.

9 Cooper 2004.

10 Ibid., 159.

11 Ibid.

Appendices

1 Full title: *Instructions for the Expedition towards the North Pole from Hon. Geo. M. Robeson, Secretary of the Navy.* Washington: Government Printing Office, 1871. Bessels included these instructions in English.
2 Henderson 2001:229.
3 Ibid., 270.
4 Loomis 1971:304.
5 Henderson 2001:110–11.
6 Ibid., 140.
7 Loomis 1971:302.
8 Henderson 2001:263.
9 Loomis 1971:305.
10 Parry 2001:275.
11 See p. 217.
12 Loomis 1971:329–30.
13 *Allgemeine Zeitung des Judentums,* 1888.
14 Bessels 1867.
15 *Petermanns Geographische Mitteilungen* 1869.
16 See p. 563.
17 US Navy Department 1876.
18 Parry 2001:310.
19 *Allgemeine Deutsche Biographie* 1902.
20 *Sidney Morning Herald* 1875.
21 *Deutsche Rundschau für Geographie und Statistik* 1882.
22 Letter, Emil Bessels/Franz Boas, Washington/New York, 13 January 1886. Franz Boas Papers, American Philosophical Society, Philadelphia, PA.
23 Loomis 1971:52.
24 Harper 2013.
25 Loomis 1971: 170.
26 Harper 2013.
27 Loomis 1996b.
28 Harper 2005.
29 Davis 1996.
30 Harper 2005.
31 Nickerson 2002.
32 Ibid..
33 Young 1876; 1879.
34 Nickerson 2002:162.
35 Gilder 1881; Klutschak 1987.
36 Nickerson 2002:162.

37 Karpoff 2005.
38 McClintock 1859.
39 Hall 1865.
40 Nourse 1879.
41 Ibid..
42 Davis 1876; Loomis 1971; 1996a; Henderson 2001; Parry 2001.
43 Blake 1874:77.
44 De Bray 1992:171.
45 Ibid., 184–85.
46 Blake 1874:99.
47 Tyson 1879.

Bibliography

Allgemeine Deutsche Biographie. 1902. Bessels, Emil, *Allgemeine Deutsche Biographie*.

Anderson, I.S. 1972. Bathurst Inlet patrol, *The Beaver* 302(4):20–25.

Anonymous. 1873. *Annual report of the Secretary of the Navy on the operations of the Department for the year 1873.* Washington DC: Government Printing Office.

Barr, W. 1991. *Back from the brink: The road to muskox conservation in the Northwest Territories* (Komatik Series 3). Calgary: Arctic Institute of North America.

Barrow, J. 1818. *A chronological history of voyages into the Arctic regions: Undertaken chiefly for the purpose of discovering a North-east, North-west, or polar passage between the Atlantic and Pacific.* London: John Murray.

Beaglehole, J.C., ed. 1961. *The journals of Captain James Cook on his voyages of discovery.* Vol. II: *The voyage of the Resolution and Adventure, 1772–1775.* Cambridge: Hakluyt Society.

Beattie, O. and J. Geiger. 1989. *Frozen in time: Unlocking the secrets of the Franklin expedition.* Saskatoon: Western Producer Prairie Books.

Bessels, E. 1867. Studien über die Entwicklung der Sexualdrüsen bei den Lepidopteren, *Zeitschrift für wissenschaftliche Zoologie* 17:545–64.

———. 1879. *Die Amerikanische Nordpol-Expedition.* Leipzig: Wilhelm Engelmann.

Blake, E.V. 1874. *Arctic experiences: Containing Capt. George E. Tyson's wonderful drift on the ice-floe . . .* New York: Harper and Bros.

Brown, C. 1972. *Death on the ice: The great Newfoundland sealing disaster of 1914.* Toronto: Doubleday.

Cooper, E.S. 2004. *Vinnie Ream: An American sculptor.* Chicago: Academy Chicago Publishers.

Cormack, W.E. 1928. *Narrative of a journey across the island of Newfoundland in 1822.* London: Longmans, Green.

Crantz, D. 1820. *The history of Greenland: Including an account of the mission carried on by the United Brethren in that country.* London: Longman, Hurst, Rees, Orme & Brown.

Cyriax, R.J. 1939. *Sir John Franklin's expedition: A chapter in the history of the Royal Navy*. London: Methuen.

———. 1964. The voyage of H.M.S. *North Star,* 1849–50, *Mariner's Mirror* 50(4):3307-318 .

Davis, C.H., ed. 1876. *Narrative of the North Polar Expedition, U.S. Ship* Polaris, *Captain Charles Francis Hall commanding.* Washington D.C.: Government Printing Office.

Davis, R.C. 1996. Ebierbing. In R.C. Davis, ed.,*Lobsticks and stone cairns: Human landmarks in the Arctic,* Calgary: University of Calgary Press, pp. 52–54.

De Bray, E.F. 1992. *A Frenchman in search of Franklin. De Bray's arctic journal 1852–1854,* W. Barr, trans and ed. Toronto: University of Toronto Press.

De Long, G.W. 1884. *The voyage of the Jeannette. The ship and ice journals of George W. De Long..., 1879–1881.* Boston: Houghton Mifflin.

Deutsche Rundschau für Geographie und Statistik. 1882. Dr. Emil Bessels, *Deutsche Rundschau und Statistik* 4:139–40.

Freeden, W. von. 1869. Die wissenshaftlichen Ergebnisse der ersten deutschen Nordfahrt, *Petermann's Geographische Mittheilungen* 15: 2011–219.

Geiger, J. and A. Mitchell. 2015. *Franklin's lost ship. The historic discovery of HMS* Erebus. Toronto: HarperCollins.

Gilder, W.H. 1881. *Schwatka's search. Sledging in the Arctic in quest of the Franklin records* . New York: Charles Scribner's Sons.

Hall, C.F. 1865. *Arctic researches and life among the Esquimaux.* New York: Harper & Bros.

Harper, K. 2005. Ebierbing, Hannah (Tookoolito) and Joe. In M. Nuttall, ed., *Encyclopedia of the Arctic.* New York and London: Routledge, I:520–521.

———. 2013. Inuit graves in Groton, Connecticut, *Taissumani/Around the Arctic*, 8 March 2013.

Hayes, I.I. 1860. *An arctic boat journey in the autumn of 1854.* Boston: Brown, Taggard and Chase.

———. 1867. *The open polar sea: A narrative of a voyage of discovery towards the North Pole.* New York: Hurd and Houghton.

Henderson, B. 2001. *Fatal North: Adventure and survival aboard USS* Polaris. *The first US expedition to the North Pole*. New York: New American Library.

Hegemann, P.F. 1993. Journal of Captain Friedrich Hegemann of the ship *Hansa* during the German expedition to East Greenland 1869–1870, *Polar Geography and Geology* 17: 264–329.

Holland, C. 1994. *Arctic exploration and development, c. 500 B.C. to 1915: An encyclopedia*. New York & London: Garland Publishing.

Inglefield, E.A. 1853. *A summer search for Sir John Franklin with a peep into the polar basin.* London: Thomas Harrison.

Jérémie, N. 1720. Relation du détroit et de la baie d"Hudson. In J.F. Bernard, ed.,*Recueil de voyages du Nord*, Amsterdam, No. 6. (Reprinted in *Bulletin de la société historique de Saint Boniface*, 1912. And in English as *Twenty years of*

York Factory, 1694–1714, R. Douglas and J.N. Wallace, eds. Ottawa: Thorburn and Abbott, 1926.

Kane, E.K. 1854. *The U.S. Grinnell expedition in search of Sir John Franklin. A personal narrative.* New York: Harper and Bros.

———. 1856. *Arctic explorations; the second Grinnell expedition in search of Sir John Franklin, 1853, "54, "55.* Philadelphia: Childes & Peterson.

Karpoff, J.M. 2005. Hall, Charles F. In M. Nuttall, ed., *Encyclopedia of the Arctic.* New York and London: Routledge, pp. 826–27.

Kjellman, F.R. 1875. *Svenska polar-expeditionen* år *1872–1873 under ledning af A.E. Nordenskiöld*. Stockholm: P.A. Norstedt.

Klutschak, H. 1987. *Overland to Starvation Cove: With the Inuit in search of Franklin 1878–1880*, W. Barr, trans. and ed. Toronto: University of Toronto Press.

Koldewey, K. 1871: Die Erste Deutsche Nordpolar-expedition im Jahre 1868. *Petermann's Geographische Mittheilungen, Ergänzungsheft* 28. Gotha: Justus Perthes Verlag. Reprint 1993: Gotha: Justus Perthes Verlag.

———. 1874. *The German Arctic Expedition of 1869–70, and narrative of the wreck of the "Hansa" in the ice.* London: Samson Low, Marston, Low and Searle.

Krause, R.A. 1992. Die Gründungsphase deutscher Polarforschung 1865–1875, *Berichte zur Polaforschung* 114. Bremerhaven: Alfred-Wegener-Institut für Polar- und Meeresforchung.

———. 1997. Zweihundert Tage im Packeis. Die authentischen Berichte der "Hansa"–Männer der deutschen Ostgrönland-Expedition, *Schriften der deutschen Schiffahrtsmuseum* 46.

Laws, J. 1967. Dr. James Laws' journal of the Kane relief expedition, *Polar Notes* 7:1–24.

Lindeman, M. 1869. Die arktische Fischerei der deutschen Seestädte 1620–1868 in vergleichender Darstellung, *Petermanns Geographische Mittheilungen, Ergänzungsband* VI, No. 26.

Loomis, C. 1971. *Weird and tragic shores. The story of Charles Francis Hall, explorer.* New York: Alfred A. Knopf.

———. 1996a. Charles Francis Hall (1821–1871). In R.C. Davis, ed., *Lobsticks and stone cairns.* Calgary: University of Calgary Press, pp. 49–51.

———. 1996b. Ebierbing (ca. 1837–1881). In R.C. Davis, ed., *Lobsticks and stone cairns.* Calgary: University of Calgary Press, pp. 52–54.

McClintock, F.L. 1859. *The voyage of the "Fox" in the arctic seas: A narrative of the discovery of the fate of Sir John Franklin and his companions*. London: John Murray.

McGoogan, K. 2008. *Race to the Polar Sea: The heroic adventures of Elisha Kent Kane*. Berkeley CA: Counterpoint.

Markham, A.H. 1874. *Whaling cruise to Baffin's Bay and the Gulf of Boothia. And an account of the rescue of the crew of the "Polaris."* London: Sampson Low, Marston, Low & Searle.

——. 1878. *The great frozen sea: A personal narrative of the voyage of the "Alert" during the Arctic expedition of 1875–6*. London: Daldy, Isbister & Co.

Markham, C.R. 1881. *The voyages of William Baffin, 1612–1622.* London: Hakluyt Society.

Marmier, X. 1844–47. *Voyage de la Commission scientifique du nord, en Scandinavie, en Laponie, au Spitzberg et au Feröe, pendant les années 1838,1839 et 1840, sur la corvette la Recherche . . . Relation du voyage.* Paris: Arthur Bertrand.

Mary-Rousselière, G. 1991. *Qidtlarssuaq: The story of a polar migration.* Winnipeg: Wuerz Publishing.

Melville, G.W. 1884. *In the Lena delta: A narrative of the search for Lieut.-Commander De Long and his companions.* Boston: Houghton-Mifflin.

Moyles, R.G. 1979. *British law and Arctic men: The celebrated 1917 murder trials of Sinnisiak and Uluksuk, first Inuit tried under White man's law.* Saskatoon: Western Producer Prairie Books.

Murphy, D.T. 2002. *German exploration of the polar world, 1870–1940.* Lincoln NE: University of Nebraska Press.

Nares, G.S. 1878. *Narrative of a voyage to the polar sea during 1875–6 in H.M. ships* Alert *and* Discovery. London: Sampson Low, 2 vols.

Nickerson, S. 2002. *Midnight to the North: The untold story of the Inuit woman who saved the* Polaris *expedition*. New York: Jeremy Tarcher/Putnam.

Nordenskiöld, N.A.E. 1872. Account of an expedition to Greenland in the year 1870. *Geological Magazine* 9:289–306; 355–68; 409–27; 449–63; 516–24.

———. 1881. *The voyage of the Vega around Asia and Europe.* London: Macmillan, 2 vols.

Nourse, J. E., ed. 1879. *Narrative of the second arctic expedition commanded by Charles F. Hall*. Washington DC, Government Printing Office.

Ostermann, H., ed. 1944. Dagbøker av Nordmenn på Grønland før 1814. 2. Andreas Bruuns og Aaron Arctanders dagbøker fra undersøkelsesreisen i Julianehaab district 1777–1779, *Norges Svalbard-og Ishavs-Undersøkelser, Meddelelser* 58.

Parry, R. 2001. *Trial by ice: The true story of murder and survival on the 1871* Polaris *expedition.* New York: Ballantine Books.

Parry, W.E. 1824. *Journal of a second voyage of the discovery of a North-West Passage from the Atlantic to the Pacific performed in the years 1821–22–23.* London: John Murray.

———. 1826. *Journal of a third voyage for the discovery of a North-West Passage from the Atlantic to the Pacific, performed in the years 1824–25.* London: John Murray.

Petermanns Geographische Mitteilungen. 1869. Rückkehr der Rosenthal'schen Dampfer "Bienenkorb" und "Albert" und der Lamont'schen Expedition…, *Petermanns Geographische Mitteilungen* 15: 350–55.

Pingel, P.C. 1841. "Om sænkning af Grønlands vestkyst," *Skandinaviske naturforskeres Møde. Forhandlingar* 2:353–63.

Potter, R. 2015. A motive for the murder of Charles Francis Hall, *Visions of the North*. http://visions.north:blogspot.ca/2015/07/a-motive-for-murder-of-charles-francis.html.

Purchas, S. 1905–7. *Haklutus posthumus* or *Purchas his pilgrims: Contayning a history of the world in sea voyages and lands travels by Englishmen and others*. Glasgow: James MacLehose & Sons, 20 vols. (First published 1625).

Rink, H. 1858. On the supposed discovery by Dr. E.K. Kane, U.S.N. of the north coast of Greenland, and of an open polar sea…, *Journal of the Royal Geographical Society* 28:272–87.

———. 1875. *Tales and traditions of the Eskimo*. R. Brown, trans. Edinburgh/London: Blackie & Sons.

Ross, J. 1819. *A voyage of discovery, made under the orders of the Admiralty, in His Majesty's Ships* Isabella *and* Alexander, *for the purpose of exploring Baffin's Bay, and inquiring into the probability of a Northwest Passage.* London: John Murray.

———. 1835. *Narrative of a second voyage in search of a North-West Passage, and of a residence in the arctic regions during the years 1829, 1830, 1831, 1832, 1833.* London: A.W. Webster.

Ryan, S. 1994. *The ice hunters: A history of Newfoundland sealing to 1914.* St. John's: Breakwater.

Sale, R. 2006. *A complete guide to arctic wildlife.* London: Christopher Helm.

Scoresby, W. Jr. 1820. *An account of the arctic regions with a history and description of the northern whale fishery.* London: Constable, 2 vols. Reprint: Newton Abbott: David & Charles, 1969.

———. 1823. *Journal of a voyage to the northern whale fishery, including researches and discoveries on the east coast of West Greenland, made in the summer of 1822, in the ship Baffin of Liverpool.* London: Constable.

Sidney Morning Herald. 1875. The wreck of the *Saranac, Sidney Morning Herald,* 15 September 1875.

Smith, J, ed. 1830. Journal of a voyage to Spitzbergen and the east coast of Greenland in His Majesty's Ship *Griper, Edinburgh New Philosophical Journal, New Series* 9:1–30.

Solov'ev, M.M. 1934. *Ber na Novoy Zemle.* Leningrad: Izdatel'stvo Akademii Nauk.

Stanton, W. 1975. *The Great United States Exploring Expedition.* Berkeley CA: University of California Press.

Steller, G.W. 1774. *Beschreibung von dem Lande Kamschatka. Reise von Kamschatka nach Amerika. Ausführlicher Beschreibung von sonderbaren Meerthieren.* Frankfurt/Leipzig: J.G. Fleischer.

Tyson, G.E. 1879. *The cruise of the Florence; or Extracts from the journal of the Preliminary Arctic Expedition of 1877–"78.* Washington D.C.: James J. Chapman.

US Navy Department. 1876. *Scientific results of the United States Arctic Expedition. Steamer* Polaris, *C.F. Hall commanding.* Vol. I. *Physical observations.* Washington D.C.: Government Printing Office.

Villarejo, O.M., ed. 1965. *Dr. Kane's voyage to the polar lands.* Philadelphia: University of Pennsylvania Press.

Wamsley, D.W. 2009. *Polar Hayes: The life and contributions of Isaac Israel Hayes, M.D.* Philadelphia: American Philosophical Society.

Weddell, J. 1825. *A voyage towards the South Pole in the years 1822–24.* London: Longman, Hurst, Rees, Orme, Brown and Green.

Wrangel, F. von. 1840. *Narrative of an expedition to the polar sea in the years 1820, 1821, 1822 & 1823.* London: James Madden.

Young, A. W. 1876. *Cruise of the "Pandora." From the private journal kept by Allen Young.* William Clowes & Sons.

———. 1879 *The two voyages of the "Pandora" in 1875 and 1876.* London: Edward Stanford.

Index

A

B

C

D

E

F

G

H

K

L

M

N

O

P

Q

R

S

S

U

V

W

Y

Z

In 1871 the *Polaris* set sail from New York with an expedition led by Charles Francis Hall aboard, and with Emil Bessels as the chief scientist and medical officer. While those on board hoped to be the first to reach the North Pole, within a few months Hall would be buried in the permafrost, his death mired in suspicion, and by 1873 the *Polaris* would be smashed to pieces in the ice off Greenland, and the rest of the bedraggled crew would have trickled home – some after months of drifting at sea on an ice floe.

In *Polaris: The Chief Scientist's Recollections of the American North Pole Expedition, 1871–73* William Barr provides the first complete English translation of Bessels' original German account of the voyage. In addition to making the officer's unparalleled scientific and anthropological observations available to a new audience, Barr's introduction and epilogue provide a rich historical contextualization of the work, and delve into the mystery of Hall's death.

After his body was exhumed in 1968, tests revealed that Hall died of arsenic poisoning, though Bessels had declared his death the result of a stroke. While Bessels has long been the prime suspect in Hall's murder, no motive was ever found–until now. Set sail with the Polaris to discover what life was like on a nineteenth-century polar expedition, and to uncover a motive for murder.

WILLIAM BARR is a research fellow at the Arctic Institute of North America. A glacial geomorphologist by training, his major research focus is the history of exploration in the Arctic, a subject on which he has published extensively. In May 2006, he received a lifetime achievement award from the Canadian Historical Association for his contributions to the historiography of the Canadian North.

UNIVERSITY OF CALGARY Press

press.ucalgary.ca