LESSONS FROM HISTORY

The Role of the Expedition Doctor: Lessons From 100 Years Ago

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This paper explores the role of the doctor on the expeditions of the heroic age of Antarctic exploration. The medical role includes medical screening of prospective expedition members, choosing medical equipment so as to maintain a balance between being able to cope with any eventuality and the cost and weight of equipment and drugs, health screening during an expedition, first aid training for field parties without a doctor, and, obviously, treatment of any injury or disease that occurs. If injury or illness occurs, the presence of a doctor is of great psychological benefit to the expedition. Although medical experience is important, it is probably more important that the doctor is a “team member,” playing a full part in the expedition’s aims, whether these are scientific, exploration, or reaching some goal. Most of the lessons learned during these expeditions a hundred years ago are just as relevant today.

Key words: expedition medicine, Antarctica, history of medicine

Introduction

Expeditions that expect to be away from access to organized healthcare, usually take a doctor, especially if the area has potential hazards. During the heroic age of Antarctic exploration (1895–1922), there were at least 18 expeditions to the continent and these were usually away for between 18 and 30 months. Most took 1 or sometimes 2 doctors.

My aim in this paper is to examine the role of the doctor in these expeditions. Clearly much has changed since then, and in particular, communications have improved so that a doctor anywhere in the world can obtain a second opinion. However, I believe that most of the lessons learned during that era are still true.

Medical Role

It might seem obvious that the first role of an expedition doctor is to provide medical care and be able to cope with any medical eventuality, without the ability to obtain additional help. This requires experience, and Hans Gazert, doctor to the first German expedition

(1901–03) said that doctors should be experienced in surgery, hygiene, internal medicine, and psychiatry.¹ On the *Discovery* expedition (1901–04), Robert Falcon Scott insisted, “It must be understood that the Doctors are first medical men, and secondly members of the scientific staff, not vice versa.”^{2(p14)} Despite this, it is clear that Edward Wilson was appointed to this expedition for his zoological and artistic talents rather than on his medical abilities, and Reginald Koettlitz was appointed at the insistence of one of the sponsors of the expedition and none of his referees was medically qualified. Dr Koettlitz was, however, an experienced doctor (and with experience of Arctic exploration), although many of the doctors who accompanied the expeditions were inexperienced, with at least 5 going within 12 months of qualification.

Prevention is better than cure, and Alexander Macklin (surgeon on 2 of Shackleton’s expeditions) wrote, “The chief work of the surgeon of a polar expedition is done before the ship leaves England . . . [by] careful examination of personnel and insistence on absolute physical fitness.”³ However, Wilson failed his medical because of old tuberculosis but Scott took him anyway. Shackleton would have failed a medical for the *Quest* expedition (1921–22), on which he died, and

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possibly for the *Endurance* expedition (1914–17) as well but he was the expedition leader! This possibility was foreseen by Gazert, who said that the doctor can only make recommendations and the expedition leader has to make the final decision about applicants. However, he recommends that if the medical recommendations are not followed, the doctor should keep records of his advice.¹

Selection of drugs and medical equipment is important, and there is a balance to be struck between being able to cope with every eventuality and cost. This cost is not just the financial cost of the equipment and drugs but also the weight and bulk of equipment as when sledding, every pound of medical equipment meant a pound less of food or fuel. Leonard Hussey said that doctors need to check that “while drugs have been cut to a minimum on account of lack of space, everything that is likely to be needed is taken or can be improvised.”⁴

In addition to the treatment of disease and injuries, the doctor should monitor the health of the expedition members. During the heroic age, the main hazards were scurvy and beriberi, and the expedition members were often examined regularly to detect disease.

Macklin said, “Purely medical work forms a very small share of the total duties of the surgeon.”⁵ However frostbite and snow blindness were common, and there was more serious disease on some expeditions, including scurvy, wet beriberi,⁶ and psychiatric disease.⁷ Surgery was performed including 3 amputations (2 for frostbite), the enucleation of an eye after trauma (performed by a doctor qualified for 18 months), and an appendectomy. Managing a chronic unexplained illness that ended in death must have been very stressful, not only for the doctor but for the rest of the team members, and it would fall on the doctor to try to keep morale up. de Gerlache, leader of the Belgian expedition (1897–99) said that “[i]t is clear from all this that the position of the doctor on board was no sinecure.”⁸ Even less severe conditions can be problematic, such as treating fractures without x-rays and managing sciatica on board a ship or severe diarrhea while sledging.

Medical negligence claims against an expedition doctor are not impossible. When Ernest Shackleton made plans for what should happen should he die while attempting to reach the South Pole, he reassured Eric Marshall: “In the event of any action being brought against you in connection with your medical opinion expressed during the Expedition’s stay in the Antarctic: the action will be defended by my executors.”⁹

Dental problems were common,¹⁰ and medicine included dental and nursing care. Macklin wrote:

Every polar surgeon must be prepared to do his own nursing. There is no one else to do it. Conditions for a sick or injured man, even under the best circumstances, are far from being ideal, yet much can be done by improvising and keeping an adaptable mind. Comfort, even for an invalid, is a relative term. The great thing is to keep the patient cheery and . . . one can be continually doing little things to make him feel that he is being well looked after.³

Pathology was also within the remit of the expedition doctor. Thus Macklin performed a postmortem examination of Shackleton, and the doctors embalmed his body with a plan of bringing it back to Britain although his wife requested that he be buried on South Georgia.

Veterinary care was also the doctor’s responsibility, and there are descriptions of wounds on dogs being repaired under general anesthesia and postmortem examinations being performed on dogs, penguins, and other animals.

On a modern expedition, members can bring concerns (including nonmedical ones) to the doctor, in the expectation of confidentiality. The doctor can thus be a safety valve. This can cause conflict with the expedition leader, who feels that his authority is undermined. Nowhere have I seen this discussed in the literature of the time. However, I suspect that it happened as Gaston de Gerlache (son of the leader of the Belgian expedition, and himself an Antarctic explorer) has written:

. . . the medical officer on an expedition must be interested in research and take part in the general scientific programme so as not to find himself with nothing to do. Lack of occupation is not only frustrating for the man himself but it often has the effect of developing in him a critical attitude towards the way the expedition is being run, which then communicates itself to his colleagues.¹¹

Double Responsibility

The expedition doctor has responsibilities to both the individual patient and to the expedition and must be in a position to send a person home or prevent him or her from some hazardous activity if that might put others at risk. In these circumstances the relationship between expedition leader and doctor was a formal one as demonstrated by a memo from Scott to his senior doctor:

Discovery
Winter Quarters
Feb 19th [1903]
Memo:
Dr R. Koettlitz

As we must now be prepared to remain another winter in our present quarters . . . it becomes necessary to thoroughly consider the ability of various individuals on board this ship to withstand the rigours of another season . . .

I wish you to report to me any case of individuals or cases in your opinion would seriously risk their health in so doing . . .

I wish you to consider in your report the work which the various individuals have to perform and the different degrees of exposure which their duties may require them to face.

. . . [T]he executive officers should in my opinion enjoy such health as they can at any moment be called upon to undergo hardships & exposure . . .

I shall be glad to have your report as soon as possible.

R.F. Scott

Captain¹²

(The different management styles of Scott and Shackleton have often been discussed, but correspondence between Shackleton and his surgeons was just as formal.)^{9,13}

This duty may, obviously, conflict with medical confidentiality, and this makes it likely that individuals might not seek medical help when it is appropriate. Thus, Apsley Cherry-Garrard described how Henry Bowers “had bruised his leg in an ugly way, and for many days he came to me to bandage it. He was afraid that if he let the doctors see it they would forbid him to go forward.”¹⁴

Teaching

Even in expeditions with doctors, sledding parties spent weeks or months in the field, away from medical help, and it is essential that they have some first aid and medical knowledge. Single-handed doctors have a good incentive, even now, to train other expedition members in first aid and more advanced medical skills as the doctor on an expedition is by no means immune to illness or injury and may require treatment himself or herself.

Most expeditions had a series of lectures during the total darkness of the Antarctic winter. This was in part for education and, in part, for entertainment, and medical matters were covered. Thus Koettlitz lectured on frost-bite,¹⁵ Atkinson lectured on scurvy,¹⁶ and Gazert gave a series of lectures on medical topics.¹⁷ On Shackleton’s Ross Sea party, which could not recruit a doctor, the diaries of Spencer Smith and Irvine Gaze had drug doses

written down, indicating that they had received instruction before leaving.^{18,19}

Food

At the end of the 19th and beginning of the 20th century, the regulation of air, food, drink, sleep, and lifestyle were central to medical treatment regimens,²⁰ and the known risk of developing scurvy on polar expeditions was an additional reason for doctors to be interested in food.

On the *Discovery* expedition, Koettlitz, with his experience of Arctic exploration, selected the food, and Scott wrote:

There are regular duties in the medical line which are of great importance, and which are shared by the two doctors. Every tin of food has to be examined by them after it is opened and before it is served out. This is no light task when the hours are considered; for instance, Wilson has to be out early to examine the milk for the day.²¹

Macklin wrote that “[t]he surgeon is usually called upon to decide as to whether various portions of the animals killed for food are fit to eat.”²⁵ He found that seals, penguins, and sea birds “suffered largely from parasites,” and although these were usually confined to the alimentary tract, sometimes there was systemic parasitic disease.

Food inspection by doctors did not just occur on expeditions, as this would have also been a recognized role for military doctors at the time.

Team Member

Medicine is a supporting activity whether the aim of an expedition is exploration, achieving a goal such as the South Pole, or science. It has been noted previously that a number of the doctors were inexperienced, and being a good team member was almost certainly considered more important than being an experienced doctor. Macklin wrote, “All members of an expedition must take part in routine duties; they must be prepared to help in the work of the ship, take a trick at the wheel, even to take a turn as ‘Peggy,’ assisting in the galley and washing dishes.”²⁵ On an expedition whose aim is discovery or adventure, the doctor must share the enthusiasm for this. In the case of many of the expeditions during the heroic age, this meant pulling sledges: Wilson reached the South Pole with Scott and died with him on the return journey; Alister Forbes Mackay reached the South Magnetic Pole and Marshall got to within 97 miles of the South Pole with Shackleton; and Edward Atkinson was in one of Scott’s supporting parties. Hussey emphasized that the doctor “is just one cog in the whole machine.”²⁴

The doctors had other duties. Marshall was the surveyor and navigator for Shackleton's polar journey on the *Nimrod* expedition (1907–09) (an unusual choice as Shackleton, as a merchant naval officer, would have been an experienced navigator). Macklin was in charge of stores on the *Quest* expedition (1921–22), and Murray Levick did the same job for the Northern Party on the *Terra Nova* Expedition (1910–13). Levick was also photographer, as was Frederick Cook on the Belgian expedition (1897–99).

It is usually best to separate the medical from the leadership role, but when Scott failed to return from the pole, Atkinson was left in charge as Lt Evans, the second in command, was ill with scurvy and had to return to the United Kingdom. His leadership seems to have been well respected by his colleagues.

Research

As the expeditions were small (Scott's *Discovery* expedition was the largest with 47 members), it was not expected that medical matters would keep the doctors busy. On the expeditions in which there was an emphasis on science rather than reaching the South Pole, the doctor was expected to help with the scientific program. On the *Discovery* expedition, the doctors' instructions included the following: "When not engaged in the duties of your department, you are to assist in the scientific work, under instructions from the Director of the Civilian Staff."^{2(p87)}

Some doctors were clearly chosen for their science: I have noted earlier that Wilson was chosen for his zoological skills, and it is likely that Atkinson was appointed because he was a parasitologist. The Scottish expedition advertised for a bacteriologist²² and appointed Harvey Pirie, a new graduate. Other doctors were appointed first and then slotted into a vacancy. Thus, Koettlitz was appointed as botanist despite expressing a preference to do geology,²³ and Archibald McLean's letter of appointment to the Australian expedition (1911–14) advised "[i]t is well for you to discuss matters with Welsh [Professor of Pathology, University of Sydney] and arrange for any particular work you may be able to execute in the special conditions of Antarctica . . ."²⁴

The main focus of research of many of the doctors was bacteriology. The Swedish expedition (1901–03) benefited from Erik Ekelöf's microbiological skills when he discovered a yeast in dried potatoes, which he cultured, thus enabling the expedition to have fresh bread.²⁵

Where There Was No Doctor

Perhaps the importance of the doctor can be determined by what happened in groups in which there was no

doctor, as in a harsh environment injuries, illness, and occasionally death will occur. On the Ross Sea Party, Spencer-Smith died of scurvy. The Swedish expedition split up and there was 1 death (probably of beriberi)⁶ in a group with no doctor. On the first German expedition, a party of 5 was left on Kerguelen Island, and there were 2 cases of beriberi with 1 death. A survivor wrote that the situation was worse because digitalis was not available as this could only be prescribed by a doctor and implies that the death might have been prevented had there been a doctor.²⁶

On reviewing these cases, especially in the light of what happened in parties that did have doctors, it is likely that none of these deaths would have been prevented by the presence of a doctor. However, the planned absence of a doctor could leave an expedition open to criticism. Murphy says that the Australian media were very critical of inadequate medical arrangements for the Kerguelen party of the first German expedition.²⁷

The absence of a doctor could also be felt for less serious problems. On a sledging party on Scott's *Terra Nova* expedition, Thomas Griffith Taylor cut his hand while killing a seal and it became infected. In his diary he wrote:

[Tryggve] Gran had served on many vessels in his naval training and at first I had great faith in him. Gravely he felt my pulse and armpit, and then said, 'Do you feel pain here?' I truthfully said 'no!' 'No blood poisoning in that finger,' says Gran. Next day my hand was worse, and Gran proceeded to lance it with great gusto, with the result that the thumb and two fingers swelled [to] double normal size. For a week I could not sleep, and I tried all sorts of bandages and most of the pills—as expert opinion favored frost-bite, rheumatism or blood-poisoning. Gran remembered aspirin as good for rheumatism—so the patient swallowed two [pills]. Then he said he meant salicylate, so I took two of them; and then he cheered us by telling how a former invalid, with whom he had had medical dealings, died in his hands!^{28(p157)}

Gran was obviously not as confident as he appeared, as he had written "we are all—Taylor not least—anxious about the outcome. He is feverish, and I have given him a dose of pretty well every medicine in the chest. Something should help."^{28(p154)}

On the expedition organized by John Cope (1920–1922), 2 men were left on the Antarctic peninsula by a whaling crew and collected again the following year. Bagshawe wrote ". . . unfortunately Lester scratched his eyeball with a fragment of stone. As it became painful I examined it carefully through a magnifying glass, by the light of an electric torch, and bathed it . . . The eye took some little time to get thoroughly well . . . [I]t worried me. On some days I could see no improvement, but I had

to hide this from Lester, so that he should not be distressed. We should have been powerless if anything had gone seriously wrong.”²⁹

Although injuries and illness could be (and were) treated by others, my interpretation of the quotations above is that both patients and caregivers worried in the absence of a doctor. This would not be unexpected. Whether or not a doctor was competent and whether or not his treatments were effective, his presence was undoubtedly of psychological benefit in that patients and other expedition members would feel that they were getting the best treatment available in the circumstances. A doctor could shoulder all the responsibility for health and by his training could cope with this better than a layperson.

Conclusions

A doctor on an expedition has 3 roles. Although medical knowledge and expertise are necessary, it is more important that he or she is a good team member and plays a full role in the expedition, taking on general roles as well as medical ones. Finally, the doctor may, as part of the expedition aims, have a specific nonmedical role such as research, although a suitably experienced doctor may also take such roles as navigator, photographer, etc. The presence of a doctor is also of psychological benefit to the expedition.

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References

1. Gazert H. ärztliche erfahrungen und studien auf der Deutschen Südpolar- Expedition 1901–1903. In: Deutsche Südpolar-Expedition 1901–1903 im *Auftrage des Reichsamtes des Innern*. Vol 4 (1). Berlin: Walter de Gruyter & Co; 1927:297–352.
2. Markham C. *Antarctic Obsession: The British National Antarctic Expedition 1901–4*. Alburgh, Norfolk: Bluntisham Books and the Erskine Press; 1986:14.
3. Macklin AH. Appendix V–Medical. In: Wild F. *Shackleton’s Last Voyage: the Story of the Quest*. London: Cassells and Co Ltd; 1923:352–365.
4. Hussey LDA. A doctor’s job on polar expeditions. *Med Press*. 1952;227:125–127.
5. Macklin AH. A polar expedition. *Lancet*. 1921;1: 660–662.
6. Guly HR. Polar anaemia: cardiac failure during the heroic age of Antarctic exploration. *Polar Record*. 2012;48: 157–164.
7. Guly HR. Psychiatric illness and suicide during the heroic age of Antarctic exploration. *Hist Psychiatry*. 2012. In press.
8. De Gerlache de Gomery A. *Fifteen Months in the Antarctic*. Raraty M, trans. Huntingdon: The Erskine Press and Bluntisham Books; 1998:145.
9. Shackleton EH. Letter to E Marshall 21 October 1908. In: Daly RW, ed. *The Shackleton Letters*. Norwich: The Erskine Press; 2009:189–191.
10. Guly HR. Dental problems during the heroic age of Antarctic exploration. *Dent Hist Mag*. 2011;5:8–13.
11. De Gerlache G. Introduction. In: Cook FA, ed. *Through the First Antarctic Night*. London: Hurst and Co;1980:I–XV.
12. Scott RF. Letter to R Koettlitz 19 Feb 1903. Scott Polar Research Institute (Cambridge). Archives MS 366/14;ER.
13. Macklin AH. Letter to EH Shackleton October 1921 (exact date not stated). Scott Polar Research Institute (Cambridge). Archives MS1591/17/4.
14. Seaver G. *“Birdie” Bowers of the Antarctic*. London: John Murray; 1938:175.
15. Skelton J, ed. *The Antarctic Journals of Reginald Skelton*. Cheltenham: Reardon Publishing; 2004:57.
16. Cherry-Garrard A. *The Worst Journey in the World*. London: Picador; 2001:219.
17. Von Drygalski E. *The Southern Ice-Continent*. Garaty RR, trans. Huntingdon: Bluntisham Books; 1989:198–199.
18. Spencer Smith A. Diary page 79. Scott Polar Research Institute (Cambridge). Archives MS 1390/1–2.
19. Gaze I. Diary. Canterbury Museum Christchurch (NZ). MS105 p160.
20. Church R. The British market for medicine in the late nineteenth century: the innovative impact of S M Burroughs & Co. *Med Hist*. 2005;49:281–298.
21. Scott RF. *The Voyage of the Discovery*. London: John Murray; 1929:227.
22. Anonymous. Advertisement. *Br Med J*. 1902;2:826.
23. Koettlitz R. Letter to Sir Clement Markham, 3 March 1900. Royal Geographical Society, London Archive MS AA3/3/16.
24. Mawson D. Letter to AL McLean, 23 Sept 1911. In: AL McLean Scrapbook Library of New South Wales, Sydney. MS MLMSS 7642X Microfilm - CY 4655.
25. Ekelöf E. Medical aspects of the Swedish Antarctic Expedition October 1901–January 1904. *J Hygiene*. 1904;4:511–540.
26. Luyken K. Über die Kerguelen-Station der Deutschen Südpolar-Expedition. In: *Verhandlungen des Vierzehnten Deutschen Geographentages zu Coln am 2, 3 und 4 Juni 1903*. Berlin: Verlag von Dietrich Reime; 1903:3–12; translation at http://www.familie-luyken.de/07Genealogie/Bilder/10Gen/10044/veroeffentlichungen/10044_kerguelen_berichtE.htm. Accessed December 30, 2011.
27. Murphy DT. *German Exploration of the Polar World: A History 1870–1940*. Lincoln, NE: University of Nebraska Press; 2002:84.
28. Gran T. *The Norwegian With Scott*. London: Her Majesty’s Stationary Office; 1984.
29. Bagshawe TW. *Two Men in the Antarctic*. Cambridge: Cambridge University Press; 1939:99.