# Midterm 2 - INTD255

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April 11, 2025

## 1 Reading: Last Place on Earth, ch. 21-32

### 1.1 Chapter 21 - Scott Sails On

1. As the *Terra Nova* sailed to New Zealand and on to Antarctica, how did they find out about the *Fram* expedition? How did they react?

They learned about it through a cablegram. They were shocked.

2. The *Terra Nova* expedition had settled on ponies for transport. Where were they obtained? Describe how Meares had to transport them to New Zealand.

They were obtained from siberia. Meares transported them by ship through rough seas.

### 1.2 Chapter 22 - The Base at Framheim

1. List the advantages and disadvantages of setting the main Norwegian base, *Framheim*, at the Bay of Whales, as opposed to Cape Evans (Ross Island).

Framheim was closer to the pole and had smoother ice. But it was on a floating ice shelf making it vulnerable to cracking

2. What are some innovations the Norwegians created at Framheim? For example, their boots had to be altered *four times.* What else did they make or build?

They build well insulated bases, refined sledges, clothing for polar weather, and equipment like harnesses and tents

3. On the depot-laying journey, the Norwegians were creating future stores of food for the return journey from the South Pole during the next season. What sort of safety margins did they assume when deciding how much food and supplies to move to the depots?

Supplies for 110 dogs and 10 men

They deposited far more supplies than needed and spaced them conservatively

### 1.3 Chapter 23 - Sledging with the Owner

1. To lay depots, the British team had to get across McMurdo sound (sea ice). Having constructed their winter hut further South than the *Terra Nova*, they had to move several tonnes of gear across sea ice. In the end, however, they had to *put it all back on the ship, and sail it across.* Why?

The ice was to thin and made it dangerous

2. Discuss the advantages and disadvantages of having a chain of command. For example, when Scott issued orders, they were to be followed literally. Without orders, his men knew not to change plans without consulting the Captain. How did this differ from the Norwegian leadership style?

A chain of command is rigid, subordinates follow orders but hesitate to take initiative.

While Norwegian style offer freedom to question their superiors

### 1.4 Chapter 24 - The Pole Seeker Prepares

1. Explain the significance of a *single point of failure* in a complex system. Name several examples from the Norwegian and British expeditions that represented single points of failure.

A single point of failure is a critical point where if something fails it could destroy everything. An example would be when scotts bilge pump broke, an example for the Norwegians is when they left to early and almost froze to death

2. (a) Describe the effect that the cook, Lindstrom, had on the company morale. (b) What other leadership tricks did Roald Amundsen use to boost morale during the Antarctic night?

Lindstrom lifted everyone's moral with cooking. Amundsen kept moral high by assigning task and maintaining routine with all his members.

### 1.5 Chapter 25 - Wintering at Cape Evans

1. What forms of polar travel had Captain Scott selected for the journey South? Which was to be the one used

ultimately to arrive at the South Pole? What is the significance of this decision?

Scott planned to use ponies, motor sledges, and man hauling. Man hauling was ultimately used becuase the other ones failed. The significance was it slowed their progress and increase their fatigue

2. What is your impression of the leadership structure at Cape Evans, given the presence of Navy officers and enlisted Navy sailors? What would you have done differently? What winter tensions existed at Framheim?

My impression was that the structure maintained strict roles which is fine but when it doesn't allow for innovation it becomes a problem. I would keep the structure but only as a formality really. The most significant tension was between Amundsen and Hjalmar Johansen, an experienced explorer who publicly criticized Amundsen's leadership

### 1.6 Chapter 26 - False Start

1. What major error on the part of Roald Amundsen gives this chapter its title? As a result of this error, who had to forgo the South Pole trek, and why?

Amundsen started his trip too early. Johansen had to forgo the trek because after the mistake he criticized Amundsen creating a rift in the team

### 1.7 Chapter 27 - Scott's Caravan

1. During this chapter, there are signs of self-delusion in the leadership of Captain Scott. However, in the end, his party does reach the South Pole and travels almost all the way back. How does one recognize the early signs of leadership error? What makes addressing such errors difficult? (Give examples as necessary from the chapter).

You could tell because Scott made bad logical choices, lacked flexibility, and was stubborn on what to use for transportation

### 1.8 Chapter 28 - The Devil's Ballroom

1. What impressions of the Trans-Antarctic mountains do you recall from this part of the Norwegian journey? What kinds of terrain did they face, and how did they overcome it?

The mountains had unpreditable terrain like crevasses and icy slopes. They overcame it by scounting ahead and using disciplined teamwork

2. What made fixing the latitude and longitude difficult this close to the pole? Was calculating the longitude worthwhile?

Around the pole the longitudinal lines converge. Not really it had little navigational value

### 1.9 Chapter 29 - Man-Hauling Begins

1. How did Scott's men feel about man-hauling gear up the mountains? Were they able to be honest with the Captain about the risks?

They were exhausted having to man haul gear. They were never fully open with the captain.

2. What were the advantages of going up the Beardmore Glacier, as opposed to the Axel Heilberg and Devil's Glacier for the Norwegians?

The Beardmore was steep but already been mapped. The Axel and Devils were unexplored but manageable with dogs

### 1.10 Chapter 30 - The Race Won

1. Describe the meticulous calculations Roald Amundsen and team made to establish the location of the geographic South Pole. For reference, recall the story of Cook and Peary, and the uncertainty of their North Pole navigation.

They used celestial navigation, having to cross check multiple times and circle the area.

### 1.11 Chapter 31 - The Race Lost

1. After years of planning, 1200 miles of exploration on foot, ski, and sledges, and vastly different start times, what was the final difference in time between the Norwegian and British arrival at the South Pole?

The norwegians won by 33 days

2. How did scurvy begin to play a role in the trip home for the British? What vitamins did they lack?

Scurvy started to play a role when it affected them on their trip back. They lacked vitamin C

## 2 Reading: Deep Survival, ch. 5-8

### 2.1 Chapter 5 - The Anatomy of an Act of God

1. In this chapter, two brothers and a friend set out to climb a rock face in Yosemite. With regard to the plan, what begins to go wrong? Why is the group unable to act on the information indicating the plan is becoming

increasingly dangerous?

The weather begins to change. They were unable to act because they were committed to the plan and overconfident

2. For example: (a) why is cotton called "death fabric" by park rangers? (b) What is St. Elmo's fire?

Cotton is called this because it holds water and loses insulation when wet. An electrical discharge often seen before or during storms

### 2.2 Chapter 6 - The Sand Pile Effect

1. In general terms, desribe what a power-law effect is in nature. Why does a sand pile with a steady rate of new sand on top collapse regularly, even though basic physics does not predict when it will collapse?

Where a small changes can cause a large outcome. Adding sand to a sand pile makes it increasingly unstable, though each grain of sand is so small it cant be accounted for

2. What is meant by the term "normal accidents?" On mountains like Mt. Hood, for example, there are accidents that occur predictable, despite safety preparations. How does the sand pile effect explain this?

Normal accidents is when small issues combine cause of a complex system. The sand pile is the same where you dont know how one grain of sand can affect the pile

### 2.3 Chapter 7 - The Rules of Life

1. Consider this quote from the chapter: "It is well documented that co-pilots aren't likely to challenge pilots in aircraft cockpits and sailors aren't likely to challenge captains, sometimes with fatal consequences. Experienced climbers may be reluctant to challenge others with experience ... doctors won't challenge doctors." How do the documented accidents in this chapter connect to the results of the South Pole expeditions?

It shows how a hierarchy structure can suppress innovation. Just like how Scotts men didn't speak out of turn even when they had information, just like the document accidents in this chapter

### 2.4 Chapter 8 - Danger Zones

1. Consider the following paradox: surfing can be a beautiful and joyful experience, but also extremely dangerous, depending on the conditions. What kind of experiences are necessary to do it safely? Recall, for example, how the Hawaiian lifeguard and his family interacts with the author.

2. Compare the experience of the lifeguard to that of the CEO who survives winter blizzards for three days in Squaw valley, California. What characteristics helped him survive? How could he have avoided the experience in the first place?

The lifeguards skill comes from a lot of experience and an understanding of the ocean. The CEO who survives the blizzard had no experience. He survived because of traits like composure, creativity, and resilience. He could avoided it by checking the weather and preparing properly.

## 3 Scientific Studies

1. What is so striking about the discovery of life *beneath* the Ross Ice shelf? How far away from the sea ice does life extend? How was this life discovered?

It was shocking because scientists believed life couldn't survive in such solation. Life was found more than 600 km from the ocean, it was discovered using a camera lowered through a borehole

2. What hunting techniques do Antarctic orcas display that demonstrate teamwork and social organization?

Techniques like wave washing demonstrate teamwork

3. **Neutrino Physics in Antarctica and Greenland**

4. List some of the astrophysics experiments located in Antarctica and Greenland. Why are they located there, and for what are they searching?

IceCube, ANITA, ARA are located there because the ice is clear and stable, making ideal for neutrinos

5. What achievements are attributed to the IceCube Neutrino Observatory in the last 10 years?

Identifying cosmic neutrinos from deep space and linking them to specific galaxys

6. **Paleo-climatology with Antarctic Ice Cores**

7. Describe the process for measuring global average temperature using ice cores from deep boreholes in Antarctica. What gases or elements are used to make the measurements? How is this temperature measurement calibrated, using contemporary data?

You can analyze the trapped gases in ice cores. Gases like CO2 and CH4 are used. It is calibrated with modern readins and isotope ratios to build a timeline of earths climate

It requires physical skill but also
familiarty of the ocean and the weather.

# 4 Bonus: Solitude and Leadership

1. **Reflection on Leadership.** What makes a good leader, according to the essay "Solitude and Leadership?" (a) Reflect on one's ability to *pass exams*, versus *think independently*. (b) How does the example of Gen. David Patreus play a role in this reflection? (c) What advantage to leadership decisions is afforded to those who filter out information that is ultimately unimportant? What forms of information *do you think* are the most important?

What makes a good leader is the ability to think deeply. Being able to pass exams only proves ones ability to preform tasks well, not actual original thought. David is the ideal example, he shows that even though his superiors did like his ideas, they were still used because they were well thought out and he stood by them. The ability to filter out distractions and ignore trivial information allows leaders to focus on what truly matters. The most important information is ones values and priorities.