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# INTD255
# Safe Return Doubtful: Midterm 2
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## 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 found out when they got a telegram saying Amundsen was going to the South Pole. Scott's team was surprised and worried, but kept everything the same and continued on their trip.

**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.**

The ponies were bought in Siberia, and Meares had to transport them by ship to New Zealand and some ponies got sick.

### 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).**

**Advantages:**

- Closer to the South Pole, so they didn't have to travel that much.
- The bay of Whales had an easier landing for the ship.
- Flatter terrain for sled travel.

**Disadvantages:**

- Not much information about past expeditions on the Bay of Whales compared to Cape Evans.
- The ice had a bigger chance of breaking there.
- More isolated.

**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?**

Apart from changing their boots 4 times, they built new and improved sledges, special clothing with animal fur, and a system of flags for their travel.

**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?**

For safety margins, they decided to get double the amount needed to be safe. They calculated the food they needed for both ways and grabbed twice as much as they needed.

## 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 sea ice became too thin and dangerous to cross, so they had to move the gear into the ship and sail it across McMurdo Sound.

**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?**

**British:**

- Very strict orders and rules.
- Hard to change the original plan.
- You have to follow the leader.

**Norwegian:**

- More flexible planning and easier to change.
- Everyone can give their opinion and decide together.
- More freedom

## 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 failure means that if something fails, the whole plan will stop working. For example, in the British expeditions if the ponies died, they had nothing else to pull their sleds. And in the Norwegian expedition, if some sled broke, they would have no backup fort their transport.

**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?**

**(a)** Lindstrom kept the morale high by making good food, joke around, and creating a team bonding.

**(b)** Amundsen also gave the people different jobs to stay busy. Make proper celebrations whenever they reached crucial points of the expedition. Finally, he also made everyone feel equal and important in the expedition.

### 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?**

Captain Scott chose ponies, motor sledges, dogs, and man-hauling. But they mostly just used ponies and man-hauling to reach the South Pole. The significance of this decision was that with man-hauling, the expedition was going to be slower and way more exhausting.

**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?**

The leadership structure was very similar to the military, Instead, I would have made the expedition like Roald Amundsen, by making everyone more equal and working through teamwork. However, at Framheim, there were also some conflicts, but Amundsen managed it very good like a good leader.

### 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's major error was that he made the team leave too early, before the weather was good, so the team suffered extreme cold. As a result, they had to turn back, and Johansen criticized Amundsen's decision, so he left 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).**

One recognizes early signs of leadership error when everyone in your team confronts your decisions or you start having second thoughts. Addressing these errors can be very diffiicult because the leader may not listen to others and be very stubborn, so the people just have to follow the bad planning. For example, Scott didn't change the planning even though it was starting to be very obvious that it was going badly.

### 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 looked very dangerous as they were very big and icy. They had to face deep crevasses, steep climbs, and slippery ice terrains. They overcame it with a good and careful planning, and using dogsleds and skis to move faster and safer.

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

It made it difficult since the sun never set, so it was very hard to use the sun for direction. Also, the longitude lines were very close together, which made it confusing. However it was worthwhile since they needed to find the Polar Plateau

### 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?**

Scott's men felt tired and frustrated since man-hauling was exhausting and slow, especially on the mountains. But due to Scott's bad leadership, they didn't feel comfortable speaking up to him.

**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 advantages of the Beardmore Glacier were that it was wider and not that steep, so it was easier to climb, and it was also better known and mapped. However, the Axel Heiberg and Devil's Glacier route was steeper and way more dangerous but it had a shorter path to the Pole, which saved time.

### 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**

Amundsen's team made meticulous calculations by using different readings about different spots from where they thought the South Pole was before. They used compasses and latitude and longitude to measure their position and their distance to the Polar Plateau. To avoid the mistakes of Cook and Peary, who claimed to reach the North Pole but had no solid proof, they set up a a 10 mile circle of flags around 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 arrived 34 days before the British at the South Pole.

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

On the trip home, scurvy began to weaken the British team since they lacked vitamin C as their food didn't have enough fresh nutrients.

## 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?**

In Yosemite the plan went wrong since the weather got worse, and the climb became too dangerous. But the group didn't turn back because they were very stubborn and just followed the original plan.

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

**(a)** Cotton is called death fabric because when it gets wet, it stays wet for a long time and makes you cold, which can lead to hypothermia.

**(b)** St. Elmo’s fire is a blue glow of electricity seen during storms. It is caused by a high electrical charge in the air.

## 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?**

A power-law effect means that small things happen often, but big events happen randomly. When making a sand pile, if you add sand slowly it will build into a big pile until it randomly collapses.

**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 are failures that happen even in normal and properly planned terms. So it can always happen. The sand pile effect explains this because with just a small grain, the sand pile can collapse, even though you added thousands before.

## 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?**

The quote **“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.”** shows how people often stay silent, even when they see something dangerous, just because they don’t want to question their leader. For example, in the South Pole expeditions, on Scott’s team, his men didn’t challenge his choices because they didn’t want to question him.

**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.**

To surf safely, you need years to have a good surfing lesson before stepping in the ocean. The teacher has to let you know of all the risks that are involved with surfing. Also, with more the more experience you get, it gets safer. The Hawaiian lifeguard and his family grew up in Hawaii near the ocean, so they have grown while being taught of the risks and the proper way to act when something bad happens. Therefore, they taught the author to respect nature and know when not to go in.

**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?**

However, the CEO only survived because he stayed calm, made smart choices, and used his resources wisely. However, he could've avoided the whole thing if he had read the weather reports.

## 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?**

That life was found deep under the ice, where there's no sunlight. It was discovered hundreds of miles from open sea, in total darkness and cold. Scientists found it by drilling through the ice and with cameras.

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

Antarctic orcas use teamwork to hunt. For example, they work together to create waves that knock seals off ice.

**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 Neutrino Observatory (Antarctica):** This observatory detects high energy neutrinos using thousands of optical sensors inside the Antarctic ice.

**ANITA (Antarctic Impulsive Transient Antenna):** Experiment that searches for ultra high energy neutrinos by detecting radio pulses generated when neutrinos interact with the Antarctic ice .

**RNO-G (Radio Neutrino Observatory in Greenland):** This experiment is looking to detect high energy neutrinos by capturing radio signals when neutrinos interact with the ice in Greenland.

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

**Detection of High-Energy Astrophysical Neutrinos:** In 2013, the IceCube Neutrino Observatory announced the first observation of high energy neutrinos originating from outside our solar system

**Identification of Neutrino Sources:** In 2018, the IceCube Neutrino Observatory traced a high energy neutrino back to a blazar, being the first evidence of a specific astrophysical source of neutrinos

**Mapping the Milky Way in Neutrinos**: In 2023, the IceCube Neutrino Observatory created the first map of high energy neutrino emissions from our galaxy.

**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?**

To study the process for measuring the global average temperature Scientists drill ice cores in Antarctica to study the old air bubbles. With those bubbles they measure $CO_2$, $CH_4$, and oxygen isotopes to learn about past temperatures. Then, they compare this data with modern data to understand and calculate climate change over time.

## 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?**

**(a)** Passing tests and doing many activities doesn't make someone a leader, a good leader is someone who embraces solitudes and has the hability to concentrate and think, not just follow rules or memorize answers.

**(b)** Petraeus is a good example because he had his own ideas about how to fight the war. He didn't just follow others or the normal way. He showed enough courage to challenge his authorities and speak up.

**(c)** Good leaders can focus on what really matters. They don't get distracted by others and this helps them make smart and clear decisions.

For me, your values and past experiences should definitely help you in problem solving, as well as listening to others and getting as much information as you possibly can, so you can properly make the best decision you possibly can.