Lost explorers

Suitable Grade levels: 7th-12th	**Time:** 20 - 45 min
Subjects: History, Geography, Social studies	
Related content: • Reading text: Cumulative culture	

Lesson Overview

In his book “The secret of our success”, and in numerous talks such as this one, evolutionary anthropologist Joseph Henrich highlights the fate of explorers in the 19th century. These are stories in which European or American explorers got trapped in environments that had not been explored by them before, such as in Australia or in the Arctic. Humans have been living in these environments for thousands of years, but these explorers died because of lack of food, water, shelter, or because of disease. Particularly, they lacked access to the cultural knowledge that had been accumulated for thousands of years by regional hunter-gatherers and that allowed them to survive in these environments.

The lesson contains two stories, adapted from the references listed below, one of which tells the fate of a team of explorers in the Australian outback, and the other story is about the polar Inuit. Both stories happened around the year 1860.

The stories help students reflect on the role of cultural knowledge and its transmission in the survival and evolutionary success of our species in the past and in the future.

Learning goals

Understandings
Students will understand that:

- The evolutionary success of our species is to a large degree due to our ability to accumulate and transmit vast amounts of cultural knowledge. This allowed our species to adapt to and survive under a broad range of environmental conditions.

- The sustainable development of our species will also depend on cultural knowledge that will help us adapt to changing conditions and solve pressing problems in the future. It is up to us to decide what kinds of cultural knowledge is most important to achieve this and should be taught to future generations.

Learning Objectives & Skills:

Students will be able to

- describe the role of individual intelligence, cultural knowledge, social learning, and teaching, and other social interactions for the evolutionary success (survival and reproduction, population growth) of our species;
- evaluate the role of cultural knowledge and education for the future wellbeing and sustainable development of our species.

Concepts

social learning, teaching, collective brain, cumulative cultural knowledge, information, information transmission and storage, adaptation, social networks

Essential Questions

- What is the role of individual intelligence, cultural knowledge, social learning, and teaching, and other social interactions for the evolutionary success (survival and reproduction, population growth) of our species?
- What will be the role of our accumulated cultural knowledge and social networking for the future evolution of our species?
- Is education, i.e. the accumulation and transmission of cultural knowledge, essential for the future sustainable development of our species? If yes, what kinds of cultural knowledge are most important and should be taught to all humans, in school and throughout life?

The Burke and Wills expedition

The Burke and Wills expedition, led by Robert Burke and William Wills, took place in 1860/61 as the first expedition to cross the interior of Australia. Australia was colonized 60,000 years ago, so it was full of aboriginal hunter-gatherers, but no agriculture had ever emerged there until the Europeans arrived.

The expedition, consisting of 19 men, started in Melbourne in the South, and went up towards the Gulf of Carpentaria in the North (Fig. 1). This expedition was launched for both exploration of the interior of the continent, but also the possibility of running a telegraph cable across the continent, so it was extremely well-funded. They had 23 horses, 6 wagons and they even took 26 camels from India because they thought they would be good in the desert. The expedition took a large amount of equipment, including enough food to last two years.

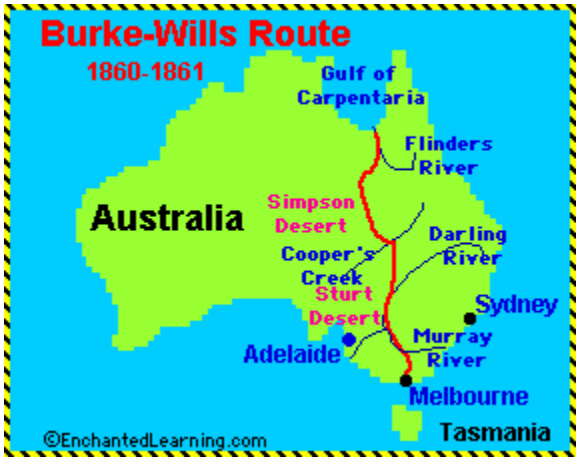

Fig. 1: Route of the Burke and Wills expedition. Image source: https://www.enchantedlearning.com/explorers/page/b/burkewills.shtml

There was a camp in the interior of the country at a place called Cooper Creek. One group of four men, including Robert Burke and William Wills, took off from there to go further North to reach the coast, while another resupply group stayed to take care of the camp and await them. The four men take 12 weeks of food, but things start going poorly, and they start running out of food. They have to eat their pack animals. They're having trouble finding food, going very slowly. The group at Cooper Creek is waiting for them, and when the deadline comes, they decide to wait another month. When they still don't arrive, they decide to leave early one morning, leaving behind some food supplies for the other men. Later that same morning, the group of Burke and Wills come in. One of the men had died along the way, so they are only three men now. Finding the camp deserted, they dug up the cache of supplies, and a letter explaining that the party had given up waiting and had left. Burke's team had missed them by only nine hours. The three men

and two remaining camels were exhausted; they had no hope of catching up to the main party. The leader Burke decides their best chance is to head for a police station at a place called Mount Hopeless. So they start following Cooper's Creek, and
that's going pretty well. However, they ended up getting trapped along Cooper's Creek because their last camel died in the mud, and there's a stretch of desert that they need to cross in order to get to the police post. Without pack animals, Burke, Wills and King were unable to carry enough water to leave Cooper Creek and cross the desert to Mount Hopeless, so the three men were unable to leave the creek. Their supplies were running low and they were malnourished and exhausted. They were struggling to catch fish or hunt.

But things started looking hopeful when they got gifts of fish and beans from the local aboriginals, the Yandruwandha tribe. When they were with the Yandruwandha, they noticed them making nardoo cakes (bush bread, see here). This is a type of damper made from the ground sporocarps of the ngardu (nardoo) plant (*Marsilea drummondii*). They noticed how the women were gathering and grinding them. As Burke and Wills continued travelling, they managed to find some of these, and they ground them and ate them. So it seemed like they were going to do well because they were getting enough calories and they were getting these gifts of fish. But when they were in the camp, what they didn't notice is that the women actually used a sophisticated processing. So they grind them, leech them, heat them, and then only eat with a mussel shell. Or they grind them, leech them, and bake them in ash-- because if you don't do that, nardoo turns out to be toxic and indigestible. In particular, it has an enzyme called thiaminase, which depletes the Vitamin B1 in your system. You eventually get a horrible disease called beriberi. William Wills was actually writing in his journal as he experienced these symptoms, which you can actually read online. So Burke and Wills basically poison themselves and starve to death at the same time. The third member of their group, King, wanders, delirious, off into the bush but is rescued by the Yandruwandha and eventually gets rescued by a team that came from Melbourne.

Unknown to the explorers, ngardu sporocarps contain the enzyme thiaminase, which depletes the body of vitamin B1 (thiamin). It is probable that they were not preparing the seed cakes in accordance with Aboriginal food preparation methods, as the food was a staple among the local people. It has been argued that they did not first process the food into a paste, which might have prevented the ill effects they suffered. Despite eating, the men got weaker and weaker.

The polar Inuit

The northernmost human population in the world are the polar Inuit, also called Inughuit, a group of hunter-gatherers who live in an isolated region of northwestern Greenland (Fig. 2).

Fig. 2: The distribution of the Inuit tribes in Canada, Russia, and Greenland.

Two Arctic explorers, Elisha Kane and Isaac Hayes, encountered them around the 1850s and 1860s. They found that these Inuit lacked many of the technologies and fancy tools that Inuit typically have, and that had been recorded by so many other explorers and anthropologists before. For example, they lacked the typical Inuit houses which have a long entrance in order to keep the heat trapped inside. They lacked the complex Inuit bow and arrow, which is necessary for hunting caribou. They also lacked the fishing leister, which is a three-pronged fishing spear that keeps the fish from sliding off the pole. And crucially, they had lost the ability to make kayaks. With the loss of kayaks, the Polar Inuit became effectively isolated, unable to maintain contact with other Inuit populations. They were limited on what they could hunt and fish, and their populations were declining. Crucially, another explorer named John Ross had been there in the 1820s, and he records them as having all these Inuit technologies. So sometime between 1820 and 1850-1860, something must have happened that lead to them losing all of it. It turned out that after the 1820s, an epidemic hit this population of hunters and selectively killed off many of its oldest and most knowledgeable members, leading to the sudden disappearance of the know-how carried by these individuals, which was never able to be regenerated by the people in the community.

The population declined until 1862, when another group of Inuit from around Baffin Island came across them while traveling along the Greenland coast. The group taught them all the Inuit things that they had lost. This cultural reconnection allowed the Polar Inuit to rapidly reacquire what they had lost, copying everything, including the style of Baffin Island kayaks. They were hunting again with their bows and arrows, and they were using kayaks for the seals. The population decline had reversed, and it was increasing. Their kayaks now resembled the Baffin Island type and not the one typical of western Greenland. Eventually, in the next 50 years, their kayaks reverted back to the style of Western Greenland, because they've been reconnected to the rest of the Greenland Inuit.

Discussion Questions

Based on these stories, discuss the role of individual intelligence, cultural knowledge, social learning, and teaching, and other social interactions for the evolutionary success (survival and reproduction, population growth) of our species.

These stories are from the 19th century, and crucial cultural knowledge of the hunter-gatherer groups was apparently stored in the heads of the people living in these groups, especially elders, who transmitted the knowledge to others (who then again stored it in their brains). In what other ways is cultural knowledge stored and transmitted today?

What do you think will be the role of our accumulated cultural knowledge and social networking for the future evolution of our species?

Is education, i.e. the accumulation and transmission of cultural knowledge, essential for future sustainable development? Why, or why not?

If yes, what kinds of today's cultural knowledge are most important and should be taught to all humans, in school and throughout life?

References

Henrich, J. (2016a). The Secret of Our Success. How Culture Is Driving Human Evolution, Domesticating Our Species, and Making Us Smarter. Princeton, Oxford: Princeton University Press.

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This material was developed in collaboration with the department of Comparative Cultural Psychology at the Max Planck Institute for Evolutionary Anthropology.

Comparative Cultural Psychology

https://www.eva.mpg.de/comparative-cultural-psychology/education.html