GeoContext:
A social and political context for geoscience education

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Companion Document for "Landscapes"

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This companion guide accompanies the slides for "Landscapes." For each slide, we provide a summary of content and a list of sources. For accessibility purposes, we provide alternative text for images.

Additional Context for Slides

Slide 2 **|** Geomorphology is the study of landscapes and there were many scientists studying landscapes in the 19th century during the formation of geology as a discipline. For example, John Wesley Powell wrote about rivers and canyons, and was a leader of the USGS, Mary Somerville, wrote the first English physical geography textbook, Louis Agassiz and Nathaniel Shaler, were professors at Harvard, and Arnold Guyot was the first professor of geoscience at Princeton. William Morris Davis is someone who we might recognize as the first of modern geomorphologist, and wrote a lot about river evolution through time.

The historical backdrop for these 19th century landscape scientists in the United States was western expansion and other imperialist projects that the US government was involved in, including government sponsored expeditions that hired geologists to describe landscapes and topography, with the aim of determining how land should be used and who should use it.

Many of these scientists (labeled by orange) were involved in research in scientific racism, and some used landscapes themselves to justify the inferiority or superiority of different human races.

Slide 3 **|** John Wesley Powell is famous for leading the first government sponsored expedition into the Grand Canyon. At the time, reports of his expedition were popular, and published in what might be travel magazines today, celebrating Powell as a hero and important discoverer.

However, Powell's accounts show how he downplayed the importance of contributions of Native Americans to his expedition, who helped guide the expedition, and also had very detailed knowledge about the topography. In his reports, Powell justifies the superiority of his knowledge, which he claims is more general and more important, than the topographic knowledge held by Native Americans, which he admits puts him "to shame".

Powell was inspired to study the Ute people of the canyonlands on his first expedition, and returned to conduct ethnographic studies on their language, describing how their language demonstrates the inferiority of Native American culture as barbaric. At this time, there was an idea inspired by a form of social darwinism (unicultural evolution) that culture evolved from savagery to barbarism to civilized, and that different human races could be categorized on this scale as inferior or superior, and so Powell used this framework in his anthropologic studies.

In reports to the US government, Powell made recommendations for Native American assimilation - read quote.

This picture shows Powell posing with a Ute woman, wearing clothing that was designed and sewn by Powell's sister for display at the Smithsonian Museum.

Although G.K Gilbert, someone considered foundational to the field of geomorphology, was not involved in these types of anthropologic studies, he accompanied Powell on later expeditions into the Rocky Mountains.

Slide 4 | William Morris Davis is famous as a founder of modern geomorphology, and proposed the concept of a river's life cycle through different stages of evolution. The image on the right shows the development of river meanders.

William Morris Davis was passionate about education, and wrote geography textbooks that included material describing connections of topography and climate to the superiority or inferiority of different human races. Here is a quote from his textbook: (read quote)

We can see how these ideas about race and human progress motivated studying the Earth system, and William Morris Davis was influential to other scientists and politicians that tried to explain perceived racial difference in physical, mental, and moral attributes by climate and geography.

This concept is known as geographical determinism or environmental determinism, and ultimately these ideas inspired the Nazi slogan "Blood and Soil", which described the concept that humans "bloodline" or genetic features were tied to the certain "soil" or landscape, on which they evolved, and this idea in part led to the justification of the Nazi eugenics program.

Slide 5 | These ideas were already present in geology earlier during the 19th century. For example, Louis Agassiz, who is famous for studying glacial landscapes, also studied human races. On the right is an image included in Agassiz's work with drawings comparing different human races to different animals. Agassiz used measurements of skulls of people of different human races to justify a racial hierarchy of inferior to superior human races.

Agassiz was part of the American School of Anthropology, which argued for polygenism, or the idea that different human races are actually different species and so they should not mix or have children together. This idea is quoted on the right, written by Louis Agassiz' wife Mary Agassiz. The photographs that Agassiz commissioned for these studies were often not taken with consent (see articles on daguerreotype of slaves as well as *Diary in Brazil*)

Mary Somerville, was the first woman elected to the Royal Astronomical Society, and published the first English geography textbook. In this book we see that these ideas about geography and race are incorporated: read quote

Slide 6 **|** Other scientists at this time wrote about similar topics connecting race to landscapes. Arnold Guyot, who founded the geoscience department at Princeton, was encouraged by Louis Agassiz to give tours of New England giving lectures which later formed his book "The Earth and Man".
These lectures describe how the distribution of continents, topography and climate ultimately determine hierarchy of human races according to beauty, physical ability, intelligence, and even morality. This illustration in his book is accompanied by text claiming the deterioration of beauty as you move away from the European continent.

Nathaniel Shaler, who was trained by Louis Agassiz and was a professor at Harvard, wrote on similar themes connecting topography to inferiority or superiority of different human races. For example, Shaler claims that North American topography is so complex that it is "unfit to cradle great peoples", and goes as far as to use North American topography and climate to justify the institution of slavery. Shaler claims there are "peculiar advantages" for those of "civilized races" because the land is ideal for the institution of slavery.

Alternative Text for Figures/Images

Figure 1 | Powell with Tau-Ruv

John Wesley Powell and Tau-Ruv, a Ute woman, pose both wearing Native American garments sewn by Powell's sister for the Smithsonian Museum. They hold a mirror case and glance down at it, with feet facing one another in close proximity. In the background are trees.

Figure 2 | Schematic in Physical Geography book, by William Morris Davis

Schematic showing evolution of river meanders through time including in William Morris Davis' book "Physical Geography", published in 1898.

Figure 3 | Louis Agassiz in Types of Mankind 1854

Matrix of sketches drawn by Louis Agassiz which feature cariacatures of humans of different races on the top row. The second row shows cariactures of skulls, and the next six rows show sketches of different animals pertaining to each continent that each human race is meant to represent

Figure 4 | Arnold Guyot in Earth and Man, 1849

Plate included in Arnold Guyot's book "The Earth and Man" published in 1849, entitled "Portrait Types of Different Races of Men". Includes caricatures of different human races.