Geology 101, Fall 2004

Proceedings (list of abstracts)

1. Travis Bays, North Seattle Community College

One of the original theories that helped prove plate tectonics exists, is the theory of continental drift and of the super continent pangaea. This theory was originally proposed by Alfred Wegner despite constant criticism from his peers. This theory states that once all of the land mass on the globe was one giant super continent which he called pangaea. Over a period of time the continent which floats on an underlying layer of the earth, would break up and float away. My poster covers why the theory of pangaea is correct.

2. Ashley Temple and Kelly Akers, North Seattle Community College
VANCOUVER ISLAND FOSSILS

3. Ann Streeter, North Seattle Community College
4. Daniella Arena, North Seattle Community College
LAPIS LAZULI: WHAT IT IS, HOW IT IS FORMED, AND WHAT IT IS USED FOR

Lapis lazuli is a beautiful blue stone used for ornamental and jewelry purposed, and as a paint pigment. The best specimens are found in Afghanistan, where it has been mined for over 7,000 years. Lapis is largely composed of the mineral lazurite, a complex aluminosilicate-bearing sulfur. That sulfur is reponsible for the characteristic rich blue color. It is formed in contact-metamorphism zones in limestone rocks, and typically occurs with pyrite, calcite, and other accessory minerals. Lapis is known as the " sapphire of the Bible" and the Ten Commandments are reported to have been carved on tablets of lapis lazuli.

5. Angela Cly, North Seattle Community College
THE STRUCTURE OF SHIPROCK, NEW MEXICO

Shiprock, New Mexico is a landmark located on the Navajo reservation by the four corners of the southwest. The 40 million year old volcanic pinnacle is 1800 feet above the plain and is 7,178 feet above sea level. Shiprock is the remains of what was once an active volcano. There are high trap dikes running to Utah, which is north of New Mexico. A high trap dike is the area where the lava formerly flowed. Shiprock is part of the Chuska Volcanic field. It has some unusual composition of rocks, which are minette and vogesite. Basaltic tuff and tuff breccia are also some kinds of rocks on Shiprock.

6. Jana Johnson and Kai Larrabee, North Seattle Community College
FORMATION OF THE GARDEN OF THE GODS

The end of the Laramide Orogeny laid the groundwork for the creation of the Garden of the Gods when the Rocky Mountain region was lifted 4,000-6,000 feet. Lifting, known as an epeirogeny, took place and by 15million years ago, Pikes

Peak, the Front Range, and the Rocky Mountain Range stood in place. The Pikes Peak granite batholith raised once again out of the earth, through the 11,400 feet of new strata that had been deposited. Lyons Sandstone and Fountain Formation, were closest to Pikes Peak thus more significantly deformed in the uplift. The activity that followed along the fault line in Pikes Peak Batholith caused uplift on both sides of the fault. Differential forces created more significant upward movement to the west of the fault line, distorting horizontal layers to the east which were turned almost vertical if not beyond. The final implement in sculpting the garden was erosion; this mechanism carved the rocks into the formations we see today.

7. **Preston Anderson and Damon Hendrickson**, North Seattle Community College
A Brief Look At The Great Sand Dunes Of Colorado

Standing at the foot of the Sangre de Cristo mountains, the Great Sand Dunes of Colorado reach heights to over 700 feet from the valley floor. The Great Sand Dunes stand as an example of how the processes of wind deposition act over time. The uniqueness of the Sand Dunes lay in the fact that they are not only the tallest sand dunes in North America, but they are a product of an interesting physical process that allows for an expansive stretch of sand dunes that reach terrific heights.

In analyizing the processes involved in the formation of the dunes, we discover the complexity of wind deposition and sediment transport. The sand dunes themselves, aged at 2000 to 12,000 years, have developed a complex system of equilibrium--measured in the physical conditions to reach a static point in growth and recession, and also in reference to the dynamic ecosystem it has consequently created. The Great Sand Dunes stand as a marvellous sight to behold.

8. Mike Dewey and Josh Morgan: North Seattle Community College
HISTORY OF THE YELLOWSTONE HOTSPOT AND ITS CREATIONS

Hotspots are huge plumes of hot and molten rock that form between the Earth's core and the lower mantle. As the mantle material heats up it rises to the crust, gets trapped under the crust until enough pressure builds up, and then releases that pressure in forms of geysers, earthquakes, and volcanoes (eruptions). The hotspot under Yellowstone has created some astonishing features in the Pacific Northwest, take for example the massive Columbia River Basalt flows which covered thousands of square miles with over a mile thick lava bed, but also pose a very dangerous situation for life on Earth. This hotspot traveled under a small portion of the Pacific Northwest, specifically Oregon, Idaho, and its current resting place at Yellowstone National Park. Yellowstone's hotspot has erupted 3 times that we know about, creating great flood basalts (CRB), geysers (Old Faithful to name one), and other land formations. Unfortunately, the Yellowstone hotspot hasn't erupted enough times to make an accurate assumption of when it will erupt again. Scientists have estimated with available data that the hotspot erupts every 600,000 years. It has been approx. 640,000 years since its last

eruption, thusly meaning that we may be overdue for its destructive VEI 8 eruption.

9. Jodi Chmielewski and Monty Reed, North Seattle Community College
LaBrea Tar Pits Fossils and Excavation Methods.

The LaBrea Tar Pits in Los Angeles California is one of the world's foremost sites for Late Pleistocene fossils. Animals, such as the saber-toothed tiger and the rare Arctodus simus (short-faced bear), seeking food or water here died as they became mired in the sticky asphalt. This tacky substance has served as an excellent preservative for their fossilized remains. Excavation of the LaBrea site has presented unique challenges to researchers at the Page Museum, which oversees work here. Those challenges have resulted in a specialized process for excavating this site. The process includes construction of support walls made of steel and wood that follow the site downward as it progresses.

10. Kari Rain and Brock Monroe, North Seattle Community College
COLUMBIA MAMMOTHS IN WASHINGTON STATE

Mammoths migrated from Asia to North America about two million years ago via the Bering Strait. The Columbia Mammoth of Washington State speciated from the Imperial Mammoth approximately 300,000 to 500,000 years ago. Mammoth bones and fossils have been found all over Washington, from the Olympic Peninsula, to Benton County in Eastern Washington. Their remains date back from 11,000 to 60,000 yr BP. Columbia Mammoths were herbivoires subsisting on grasses, sedges, sages, mosses, ferns and aquatic plants. Rapidly changing climatic conditions, deteriorating habitats, and hunting by humans all conspired to drive mammoths from the state. In the Puget Lowlands, mammoths were blocked from their seasonal grasslands by the rapidly advancing lobes of the Vashon glaciation by 15,000 yr BP. By 8000 yr BP, the Columbia Mammoths were extinct in Washington State.

11. David Leischner, North Seattle Community College
RECENT ARCHAEOLOGICAL EVIDENCE OF ICE AGE HUMAN MIGRATIONS

Twenty thousand years ago an ice bridge was formed that connected Siberia and Alaska. As ice sheets advanced across North America the water levels between Siberia and Alaska fell, exposing large areas of the continental shelves. The discovery of a land bridge brought theories of how humans migrated to the Americas. The most popular theory is the migration of humans hunting a herd of mammoths across the Bering Strait. Alternative theories bring into light the possibility of water routes, skirting the Northern Pacific and Northern Atlantic Oceans by boat. Evidence has been found, near Avella, Pennsylvania, and in southern Chile, to discredit a foot migration across the Bering Strait. New evidence brings new possibilities and a truer understanding of the migration of the first humans to the Americas.