Relative and radiometric dating

Two general processes used to figure out the age of rocks is relative dating and radiometric dating. We will compare and contrast the strengths and weaknesses of both methods. According to Lutgens and Tarbuck, Relative dating is the process in putting events in their proper sequence. Relative dating is based on assumption, not able to give an accurate date but an estimated time period where the rock originated from. A Danish scientist, Nicolaus Steno is accredited for the Law of Superposition. This law basically tells us that each layer of sedimentary rock is younger than the one below it which is depicted in figure 8. in the text. Steno is also accredited for the Principle of Original Horizontality. The principle is shown in figure 8. 4 in the text showing rocks compounding with sediment escalating in height that have not been disturbed by geological disturbances. Another relative dating process is the Principle of Cross-Cutting Relationships. This takes place when faults force themselves through older rocks. This means that the faults or dikes have penetrated layers of sediment that were deposited long before the intrusion.

By implementing these theories and processes, we can assume a time period in the Earth’s history where these rocks originate from. However, this is an assumption and not a specific time as shown in figure 8. 10. Radiometric dating is the process of estimating the age of rocks from the decay of radioactive elements inside the rock specimen. This process utilizes radioactive isotopes to date igneous rocks. These radioactive isotopes have a distinctive number of atoms that present themselves unstable. These atoms will inevitably decay through a series of evolutions.

We will take Uranium as example. Uranium will ultimately decay into the stable element lead. The father element being the Uranium and the end result creating the daughter element lead. Radioisotope dating is used to date igneous rocks that have cooled from their molten stage. it is assumed that all daughter elements have escaped through the immense heat. Once cooled, no elements will escape based on assumption. In the event that elements do escape, is through radioactive decay. According to Lutgens and Tarbuck, The decay rate that takes place is measured in Half Life.

This is the length of time that one half of the remaining atoms to decay. This can be measured in a laboratory by finding the decay rate and counting time backwards to find the age of the rock specimen. Relative dating and radiometric dating have many strengths but also many weaknesses. Relative dating gives a general time frame where the rock exists whereas Radiometric dating has a scientific formula to give a more accurate account on where the rock originated from. However, it is safe to presume that both processes rely on assumption and not strict scientific fact.