**Post-Lab Questions (Lab Worth 40 points).**

**Please answer questions in full sentences and correct grammar and upload to assignment as a word or pdf document.**

1. Examine the Foramen Magnum Index graph. Describe the trend in the FMI as you look from left (dog) to right (human) among the hominin skulls. (2 points)

**As you look from left to right in the graph, the average FMI tends to increase.**

1. Determine which of the skulls in this graph is the oldest by looking at the Geological Time Scale graph. Now, compare the FMI of this oldest species to that of the dog and human. Do you think that this species was bipedal or quadrupedal? Why? (5 points)

**Skull G was present in the time period farthest away from present time, meaning it is the oldest. From the lab report, “*The closer to 0.3 the FMI of a species is, the better adapted they were to upright/bipedal walking.*” The average FMI for our class was 0.33, which is very close to 0.3. This would imply that skull G was likely bipedal**

1. Which of the 4 species (L, H, R, E) would you predict is best adapted to upright walking? Why?

**I would predict skull R to be best adapted to upright walking, since the class average was 0.29 which is closer to 0.3 than the averages for skulls L, H, and E.**

(5 points)

4. Concluding from the Phylogenetic Tree, list the species of your skulls. (3 points)

S = ***Homo sapiens***

E = ***Homo heidelbergensis***

R = ***Homo egaster***

H = ***Homo erectus***

L = ***Australopithicus afarensis***

B = ***Australopithicus boisei***

1. Concluding from the Phylogenetic Tree, what is the greatest number of hominins that coexisted? List the names of these species (your answer may include species that were not represented by skull specimens in this investigation). What is the approximate time period during which these multiple species coexisted? (5 points)

**The greatest number of species that coexisted is five, from approximately 1.8mya to 1.9mya.**

1. ***Australopithecus boisei***
2. ***Paranthropus robustus***
3. ***Homo ergaster***
4. ***Homo habilis***
5. ***Homo rudolfensis***

6. What trend(s) do you notice in the shape of the cranium as hominin evolution progress? Why do you think this trend occurred? Please cite evidence from your research in order to receive full points. (1-2 paragraphs, 8 points)

**If you compare data from the phylogenetic tree to the cranial capacity of these species, skull volume tends to increase as hominin evolution progresses. For example, skull L (2.7mya-4.0mya) has an estimated skull volume (ESV) of ~950 cm3, whereas skull S (0.16mya-present) has an ESV of ~1900 cm3. We also noticed that the cuboidal shape of skulls L, P, and G all had older time periods than skulls with a spherical shape, meaning that the cranium of younger species would be more spherical-shaped.**

7. Do a search for new research (published in 2020) on human evolution (either through the library or popular news sources). You can search for any specific topic related to human evolution that you are interested in. Cite your source (in correct format – 2 points), provide a summary of the “news” piece (1 paragraph, 5 points), and discuss what you learned in this news source (e.g., what is interesting to you or how it changed your perceptions, 1 paragraph, 5 points).

A study published in *Scientific Reports* details the findings of over 400 human footprints in the Late Pleistocene era, the largest known collection at the time the article was published (source). Using various measurements of the footprints, the authors were able to produce hypotheses about their direction of travel, walking speed, group size and composition, and body size, sex, and then determine that the group mainly consisted of females, giving more insite to the foraging behaviors of humans (Hatala et al., 2020).

What really interested me about this piece how many variables the authors were able to calculate simply by using the footprint dimensions and stride length. How they corrected for human evolution using data from habitual groups was also interesting because I didn’t realize how much they’d have to factor in evolution.

References

Hatala, K. G., Harcourt-Smith, W. E. H., Gordon, A. D., Zimmer, B. W., Richmond, B. G., Pobiner, B. L., Green, D. J., Metallo, A., Rossi, V., & Liutkus-Pierce, C. M. (2020). Snapshots of human anatomy, locomotion, and behavior from Late Pleistocene footprints at Engare Sero, Tanzania. *Scientific Reports,* *10*(1). https://doi.org/10.1038/s41598-020-64095-0