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term paper

i am writing my term paper on the appearance of bipedalism and larger brain size in the hominid line. first i will discuss what a hominid is and then go into the evolution that lead to bipedalism and larger brain size. in my term paper i will be citing from online websites. the word hominid is used to describe the evolutionary pattern of modern humans. it is the line of ancestors leading to the dawn of modern humans that we are today. many changes had to take place which lead to our upright posture and larger brain size that enables us to design computers and for me to be able to type on the laptop. the story of the hominid line is really a story about us.

the hominin line is believed to be 6-7 million years old. branching off from hominin. with the hominin line we began to see more and more adaptations for bipedalism appearing. the earliest ancestor in the hominin line is considered Orrorin tugenensis. Orrorin was the earliest ancestor that displayed bipedal characteristics. altho it is believed orrorin was still arboreal it could still walk upright. it is believed climbing was still a major part of its life the fact that its femur was so fairly similar to ours is a good indication of it being bipedal and the age of the fossils show it is the earliest hominin so far. they lived about 6 million years ago.

after the Orrorin Tugenensis it is believed that ardipithecus ramidus was next in the hominin evolutionary line. the earliest fossils were dated at about 4.4 million years ago so it seems they came after Orrorin tugenensis. they were not well adapted to bipedalism altho they did live on the ground. and they were believed to be quadrupedal in the trees. because they lived in forested areas it suggests that bipedalism did not come from the savannahs like previously thought by paleoanthropologists. they also had a small brain size apparently being compared to a chimpanzee's brain size in my research on www.talkorigins.org. to me this is an important step in the hominin line. we are just beginning to walk more and

altho we do not have the full time bipedalism and larger brains, bipedalism is now a option to be full time.

the next stage in our evolution is australopithecus. they existed about 4 to 1.7 million years ago. from my research they had a very chimpanzee like look to there skull but there were differences that made australopithecus stand out. firstly there jaw shape is said to be between an ape and human like shape, but their leg and hip bones were very human like which leaves no doubt in the minds of paleoanthropologists that they were bipedal.they also began to become closer to modern human height with males standing at 5.0' ft tall. altho they stil hand larger hands and fingers and there is still some debate over if there were still arborial of it was "evolutionary baggage" as talkorigins.org puts it. not only their bipedal nature is significant but also their larger brain size. coming in at about 375 cm 3 to around 550 cm 3, definitely not the 1350 cm that us as homo sapien sapiens enjoy but still we begin to see a trend upwards beginning with bipedalism.

as the australopithecus line continues we see many modern human characteristics begin to appear. the jaw for example went from ape like to human like. the brain size began to slowly creep up as well settling on a decent 530 cm3 average in australopithecus robustus. and the canine teeth also began to shrink to closer the size that modern humans are at with australopithecus africanus. altho technically not in the family homo a lot of paleoanthropologists consider them very important in the evolution of modern humans to where we are today. we definitely begin to see an interesting blend of characteristics that lead to modern humans.

about 2.4 million years ago the homo habilis appeared. because of the evidence of tools that were found with the skeleton remains of homo habilis it gained the nickname "handy man". the brain sizes in homo habilis are 500 to 800 cm3 with an average of about 650 cm3. so quite a lot larger than any bipedal individual before on our evolutionary line. the brain size can also explain the tools used by homo habilis. it is currently believed that homo habilis was capable of rudimentary speech altho we have no way of knowing whether they could talk altho it is definitely interesting that the brain size was capable of it.

another very important evolutionary step was homo erectus. with homo erectus came larger brain sizes and much more efficient walking. homo erectus were clearly very good at upright walking there also appears to be a found around the world which in itself is a interesting because it shows that they were being to be very adaptable to their environment which is of course advantageous to their survival.they also began finding more and more complex tools and some evidence that they used fire with homo erectus suggesting that the brain size was leading to increased complexity and cognitive ability.

with the bump in intelligence we likely began to use stones as tools and saw their benefit to break things and to kill animals. as more and more of our ancestors began to carry tools around they needed free hands to carry them with, so the need so bipedal locomotion arose. before then we were most likely brachiators or would climb and swings from trees with our arms.obviously brachiation needs both hands and you can't effectively carry anything with you as go travel so we began to stand upright similar at first to chimpanzees when they stand on two feet. as it became more advantageous to carry tools and to use bipedal locomotion to travel distances we begin to see some evolutionary changes happening in our skeleton to be able to cope with stress of walking.

altho many articles point to upright walking to a source of pressure for our lower spines that are still evolving to develop with pressure of our upper body now being placed right above it. walking on two feet do have its advantage. mainly energy. the way a human adult walks conserves about 65% kinetic energy just in the swing motion of our hips and knees. the added benefit as well is that now we have a upright view of the environment and can now carry tools with us as we go. to me this helps explain why we begin to see rapid migration out of africa into the rest of the world, mainly because now we could efficiently.

with upright walking we begin to see some slight brain capacity increases. the initial increase most likely came from tool usage at first but it did not evolve strictly from upright bipedal locomotion. national geographic has a great article about it that goes into greater depth into the subject called “the downside of upright” written by jennifer ackerman. altho we do only see it happen after we had bipedal locomotion it wasn't until 2 million years after

our ancestors began to stand up right that we began to notice a rapid increase in cranial capacity

according to humanorigins.si.edu called “bigger brains: complex brains for a complex world” and whose author is oddly not mentioned altho i did really enjoy the article that talks about brain and how. human brain sizes increased rapidly with the climate changes happening around the world. since homo erectus was beginning to spread more globally it makes sense that as the climate began to fluctuate during the ice age different regions were affected differently and would experience cooling and heating up so larger brains would be needed to constantly adapt to the every changing environment. humans also began to interact more with each other during this time so we start to see a development of culture or a community began to happen among humans.

so in conclusion we saw how with more upright walking we began to evolve slightly bigger brain capacity needed for tool making because we now had free hands but we did not see a rapid growth in brain size till the climate began to change forcing us to interact more with each other and to develop new ways of dealing with the ever changing climate such as tools.

references:

http://www.talkorigins.org/faqs/homs/species.html

http://humanorigins.si.edu/human-characteristics/brains

http://ngm.nationalgeographic.com/print/2006/07/bipedal-body/ackerman-text