The impact of agriculture on the human skeleton history essay

History

Until 10, 000 years ago food was procured by hunting and gathering but then came the ‘ Neolithic revolution’ and with it the shift towards agriculture and sedentism. This shift did not take place instantly it occurred over many centuries. According to Schultz, A & Lavenda, R (1998, pp. 196-200) ‘ sedentism and domestication, separately and together, transformed human life in ways that still affect us today’. During the Holocene the weather became hotter and wetter and as a result of this animals and plants growth cycles were controlled and this replaced wild grown foods. Another important change was the domestication of animals which enabled people to use the animals to help with working the land and also with the animals being domesticated it meant that wild animals were timid enough to get near to and could therefore be used a s food source. Our adoption of agriculture meant that we started using ceramics to eat from, softer foods were eaten and there was a decrease in the intake of meat. An important factor to remember is that the food we eat and the way we eat it influences our physical appearance. There are many sites around the world where the shift from hunter gathering to agriculture has been found in the changes seen in the human skeletons found at these sites. A fascinating study by Battaglia (2009, p. 821)Found that Europe was colonised by modern humans about 40, 000 years ago and underwent a second colonisation wave during the Neolithic, with the spread of farming. The relative Palaeolithic and Neolithic contribution to the current European gene pool has been widely debated and is still under discussion. Battaglia, V et al (2009, p. 821)also spoke about the debate concerning the mechanisms underlying the prehistoric spread of farming to Southeast Europe and how it is framed around population

movement and cultural diffusion. The patterns of Y-chromosomal diversity among 1206 subjects from 17 population samples were analysed to try and find the involvement of local people during the transition to agriculture in the Balkans mainly from Southeast Europe. The Balkan Y chromosome was found to be consistent with a late Mesolithic time frame. Hence these Balkan Mesolithic foragers with their own autochthonous genetic signature were destined to become the earliest to adapt to farming as it was subsequently introduced by a cadre of migrating farmers from the Near East. This study shows the elevation of the role of migratory foragers with remote eastern Saharan ancestry. The Y-chromosome results show considerable biological evidence of complexity in the transition to farming in terms of the contrasting influences of pioneering agriculturalists and Mesolithic foragers. The affect on the skeleton in this case are shown in the way of chromosomes, as the changes and the mutations found in the chromosomes of the skeletons looked at within the study show the shift towards agriculture in this case one of the chromosomes was known as I-M423. In the days of the hunter gathering culture the populations were a lot smaller and an affect of the shift in to agriculture was an increase in population size, however according to Cochran & Harpending (2009, p. 65) this increase in population size meant that the rate it took for mutations to establish themselves also increased from hundreds of thousands of years to only 400 years. Cochran & Harpending (2009) then went on to say that with agriculture came a new way of life such as a change in diets, new disease, new societies and new benefits from long-term planning. So agriculture did bring a lot of solutions but also caused new problems. The increase in population helped speed up

human evolution and with this the population changed culturally and genetically and if this is true different forms of agriculture will have been adopted at different times. According to Papathanasiou (2005, p. 377) during the Neolithic the health of the human population and their lifestyle changed and according to sedentism. The crowding of communities enabled the spread of disease and infections as a result of long-term malnutrition, anaemia and growth disturbances. As plants were domesticated people had to start to rely on super crops such as maize, wheat and rice, which meant a lack of variety in the diet. The impact the iron deficiency had on the bones was shorter stature and growth arrest lines in the dentition and the long bones. After the softer arrangement of food and the way in which food is prepared there was change to craniofacial grascilisation, distinct tooth wear patterns and a decline in oral health, these changes all suggest a decline in health patterns because of the shift to agriculture. Larson, S (1995) stated that the shift from foraging to farming did have a significant positive affect on health and nutrition and also decreased work load, which in turn would have less stress on the human skeleton, however he also found that there was an obvious decline in oral and general health and this can be seen in the increased skeletal and dental growth patterns in prehistoric farmers compared with the likes of the foragers. As stated in earlier studies Larson, S (1995) also found that the changes in the way that food stuffs were prepared and the actual composition of the food that was being eaten helped to change the craniofacial and dental features. It was found that the robusticity as discussed earlier decreased as a result of the decline in mobility. Hence, Larson, S (1995) felt that these findings showed that the shift from foraging

to farming or being mobile to being less so had a specific part in the biological changes to the population within the last 10, 000 years. Therefore Larson, S (1995) argues that the shift to agriculture was not a positive one and that biological changes did not occur all together but instead parts of past societies were affected at different times and this can be seen between the male and female adult's dental health and activity patterns. Carrying on with the idea of malnutrition due to poor diet and in the case of this next study a lack of protein in the diet there is a significant difference seen in the human skeleton. A study by Sardi et al (2006) hypothesised about the craniofacial differences between farmers and hunter-gatherers at a site in the Argentine Centre-West and the fact that this was due to the change in diet that came about with the shift in to agriculture, which also supports the studies spoke about earlier. The results of the study in this case showed that the craniofacial size of farmers was smaller therefore a reduction in the amount of chewing and preparing food to be swallowed compared to the hunter-gatherers, this would be due to the fact that foods became a lot softer and the need to chew became less and all of this came about because of the change in the way food was produced. There were two factors found in conjunction with this study which are also interesting and link with the other studies findings which are that the farmers were found to have low protein content in their diets and they had a reduced circulation of the growth hormone due to having less mobility. Biological adaptation is an important point when it comes to agriculture as farmers tended to have a main food source which is usually one of the cereals cultivated like maize or wheat or rice and these are also known as super foods. According to Mcelroy, A &

Townsend, P(2004, p. 188) ‘ these are sometimes called super foods , not because they are superior but because a population is culturally and economically focused on a single staple. Where a single food dominates in this way, its nutritional limitations become the critical nutritional problem for the population’. In the New World the main cereal depended on was maize, however the populations that did come to depend on maize were found to have a disease called Pellagra, again this comes about because of the lack of protein as maize has only small amounts of amino acids lysine and tryptophan. This disease was found in South America and Southern Europe and the symptoms of this disease were rashes, diarrhoea and mental disturbance (Mcelroy, A & Townsend, P (2004, p. 189). Having looked at these various studies about the affect agriculture has had on the human skeleton, it definitely looks like the shift towards farming over foraging has definitely had a negative effect, an affect that is still progressing in to negativity as we now have convenience foods and more office type jobs which do not enable us to be mobile we are seeing that the main diseases that we are dying of today are the likes of heart disease, diabetes and obesity which are all basically based from sedentism. Also the nutrients we are consuming today within society are from our convenience food and are usually eating ‘ on the go’ as our lives are at such a fast pace we do not have time to cook ourselves a decent nutritious meal therefore increasing the amount of non-infectious diseases we will incur. As these diseases such as heart disease have developed over time and are getting worse instead of better it makes you wonder if we should not be thinking about going back to

our hunter-gatherer roots in an effort to make a shift towards a positive effect on the human skeleton.