Is the structure of your face *100%* determined by your genes? Or, can you change the bone structure of a person's face without surgery?

Here we have a 10 year old boy with a strong jawline and overall good looking face ...who went on to develop flat cheeks, a receded chin, a weak jawline and a slight hook in the nose by the age of 17. If this was the work of genes, why would they work hard to make a good looking face until age ten but slack off after that?

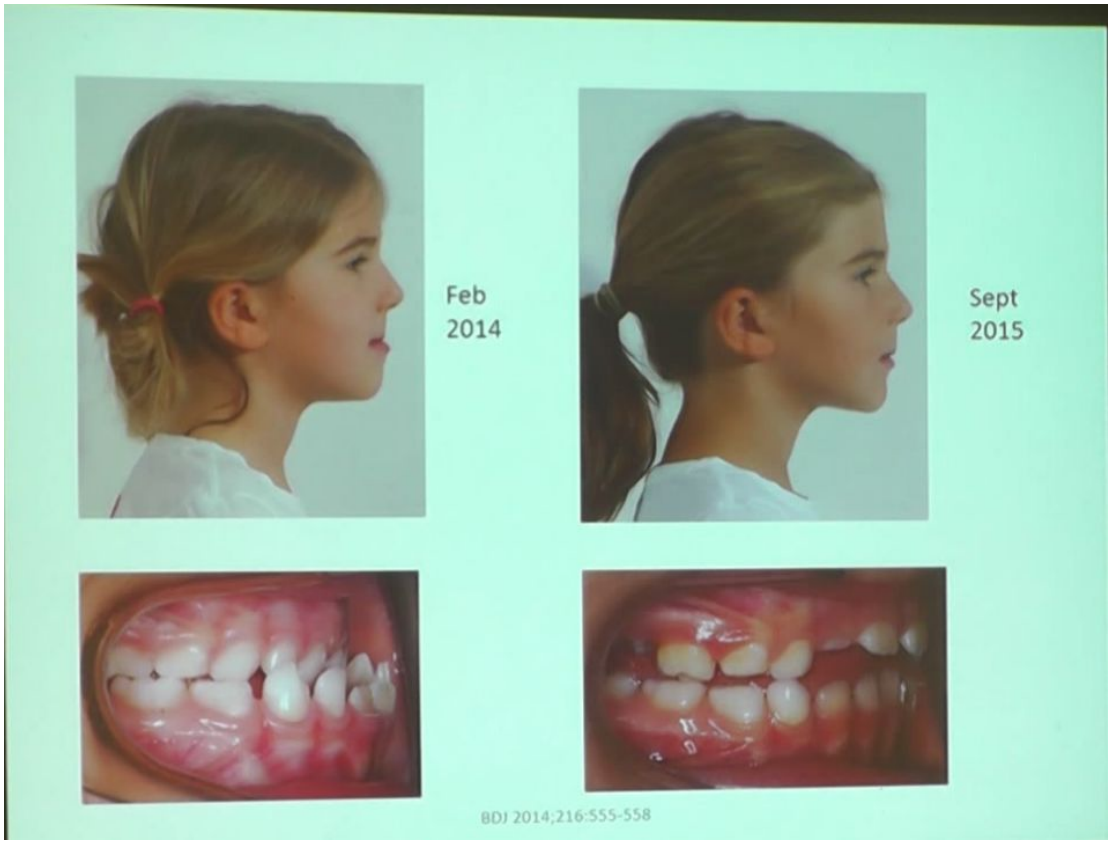
Well, right around age 10 the boy got a pet gerbil which he kept in his bedroom. He was allergic to the animal and his nose became stuffy and obstructed - forcing him to separate his lips, lower his tongue and open his mouth to breathe.

Next, take a look at these two brothers: Ben has a slightly flatter and longer face where Quentin's face seems to have grown more forwards rather than vertically. I think most would agree that Quentin's face is a bit more attractive. So did Quentin just get lucky and get the better genes? Probably not, because what's striking about these brothers is that they are identical twins, the only difference is one had traditional orthodontic treatment and the other was treated by Dr. John Mew with what's called an *Orthotropic* treatment.

Orthotropics and its principles are extensively discussed on the Orthotropics youtube channel by Doctors Mike and John Mew. Simply put, it is a method for achieving proper development of the face. Developed in 1966, the general goal is to guide the the upper and lower jaws to grow forwards.

Here's another example of Orthotropic treatment on a little girl where Dr. Kevin Boyd advanced the Maxilla - he got the bone of the midface to come forward, *without surgery*.

Here's another example from Mike Mew where the maxilla was brought forward, again without surgery. I think most would agree that both girls have achieved a better looking face.



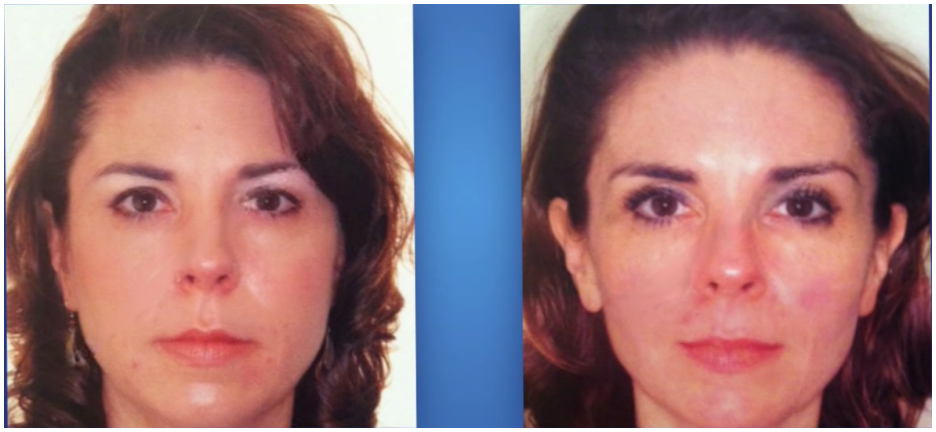
What makes this possible? Well, as these examples would suggest, the development of the facial skeleton is not *fixed*. The bones of the skull are held together by fibrous joints called sutures. The maxilla, the bone of the upper mouth is connected to the cranium and face by several sutures. And, the interesting part is that these sutures are not fused together. N*ew bone* can still be made at the sutures - *even in adults.* In fact, certain sutures do not begin to fuse until 68-72 years of age*, which is why the positioning of bones of the skull can be useful information in forensics and archeology.[R,R2,R3] As Dr. Felix Liao, author of Six-Foot Tiger, Three-Foot cage explains, "...***the potential for maxilla-facial redevelopment is alive even late in adult life***."
[**This statement comes from Vincent G. Kokich, "The Biology of Sutures" in Craniosynostosis: Diagnosis, Evaluation, and Management]*
Also see Age changes in the human frontozygomatic suture from 20 to 95 years. - "The human frontozygomatic suture undergoes synostosis during the eigth decade of life, but does not completely fuse by the age of 95 years."]

There are clear examples of structural change in an *adult*'s facial skeletons - when the nerves in the face have been damaged, the lack of muscle tone can morph the facial bones. Here is Mike Mew showing the shift in facial bones on a woman who was affected by a disease of the *muscles*. Not a disease of the bone, but an affliction to the muscles has morphed her facial skeleton this much. A more famous example is Stephen Hawking, who was afflicted with a

motor neuron disease, yet the bones in his face seem to have also changed drastically over the years.

So what about adults changing their facial skeleton for the better?

Here's one example from the Orthotropics youtube channel.



Here's another from Dr. John Mew's website.

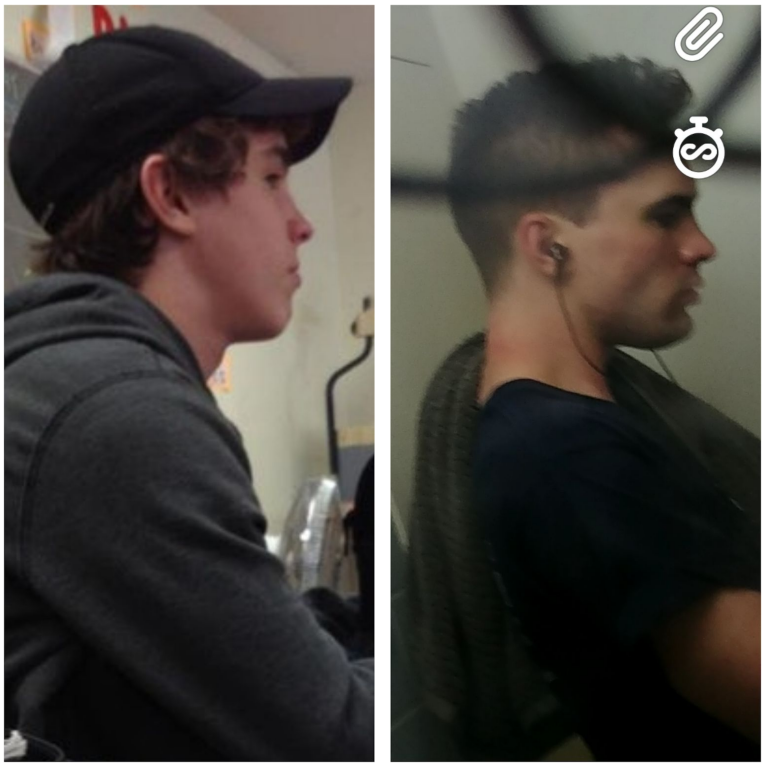
And, In this research article by Professor G. Dave Singh what they call "Facial Enhancement" has been achieved in a 19 and 26 year old by applying orthotropic principles for only 1 year. The 26 year old's eyeliner is giving her a bit of an advantage in the second photo, so let's cover that up. If you look closely, you'll see the 26 year old has a more pronounced jaw and the face has shortened and come forward a bit, which makes the midface appear fuller.

In fact, 12 adults participated participated in the study, and several facial angles were measured to track objective change in the face. They found significant changes in the labiomental and thyromandibular angles ...concluding that their approach "may enhance facial appearance non-surgically in adults."

OK, let's cut to the chase - How can we move the bones of the face around to have a better functioning, better looking face? Well, one simple way is to follow what John Mew calls the tropic premise: "*Rest the tongue on the palate with the lips sealed and the teeth in light contact for four to eight hours a day."* This might not sound like a big deal, but the tongue is a relatively big muscle and can exert plenty of force on the maxilla. It's plausible that having this large muscle press up and forwards on the maxilla for 8 hours a day and hopefully while you're sleeping, over a few years, this can make noticeable changes in the structure of the face.

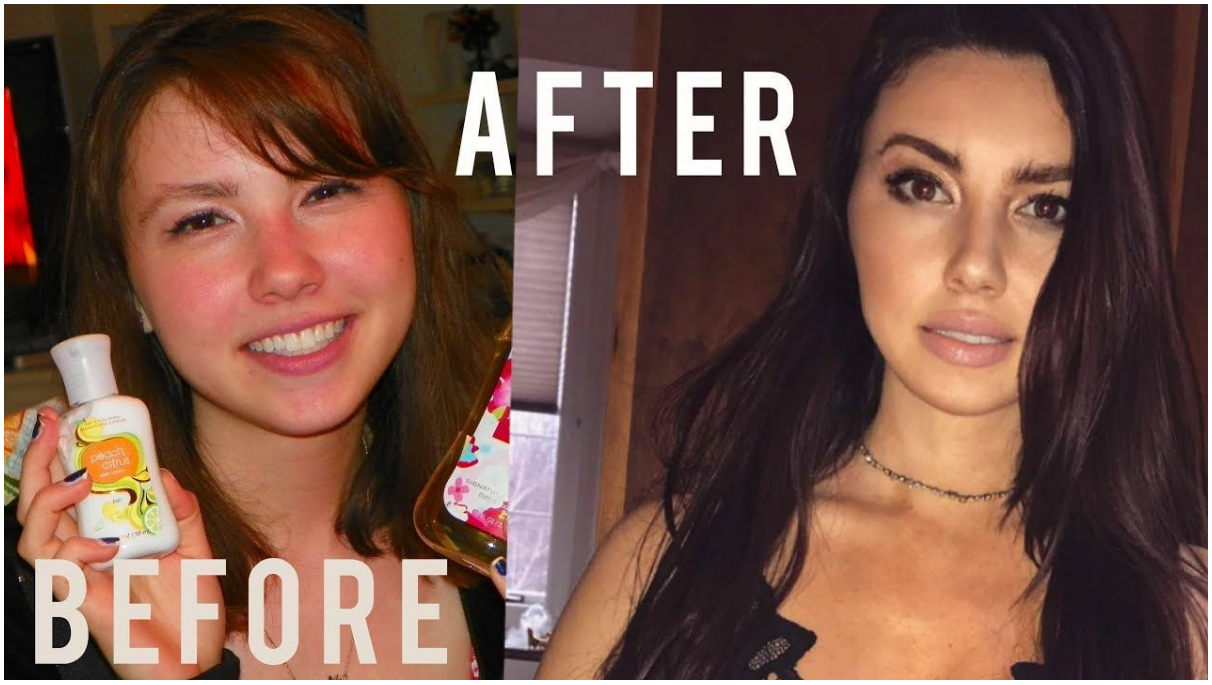
But hold on a moment -- these improvements I just showed you were made using appliances that fit in the mouth and exert the necessary forces on the skull required for facial change. It's been tough to find people who made improvements just by maintaining good oral posture over the years. But, I've dug up three examples. Each person seems to have started at a relatively young age, and I don't have many specifics they are worth looking at:

Here's a post on a forum of someone who was apparently 15 in the first photo, and 21 in the second. The angles are quite different, but if this is these are the same person… it's a drastic change even given 5 years. His face seems shorter, and his jawline and cheekbones are much more pronounced.



This is from youtube channel meaganxrose - the only information I have is that this picture on the left was taken 3 years before the one on the right and the apparent change in her face was achieved through tongue posture. She may have lost some weight as well, but her cheekbones and jaw appear more pronounced. (Here's her in a different video with better lighting and less

makeup)



One more example is youtuber AstroSky. He apparently began working on back and tongue posture when he was 16. Here are two pictures when he was around 16 or 17



and here's him at 18.

Here's him now at 22.


It's not shocking that the face would change from 16 to 22 years , but this is a particularly drastic change. His jaw is more defined and his cheekbones are more pronounced, suggesting that his

maxilla has come forward.

These three examples are again not the strongest pieces of evidence but they at least show that the face *can* change to some degree without appliances or surgery.

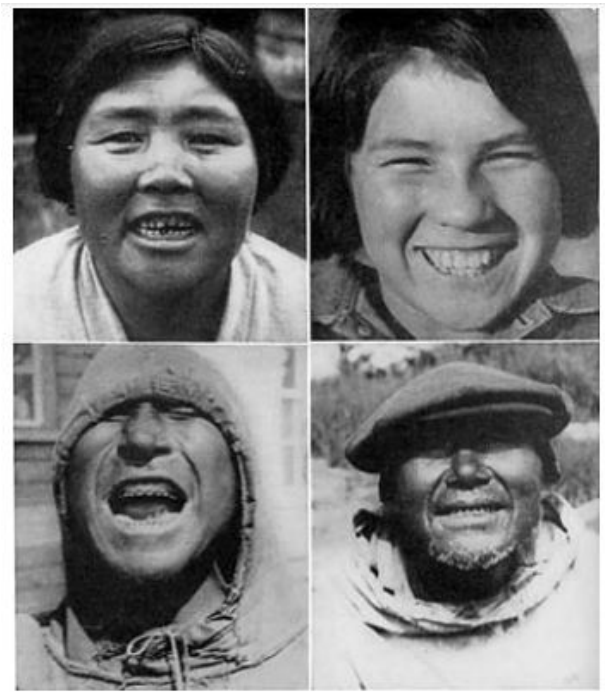
Another effect of having the tongue on the roof of the mouth is that - especially when young, it widens the dental arch, which helps to have straight teeth. Though I think most would assume that straight or crooked teeth are genetic. So if it's not genetic, what *causes* crooked teeth?

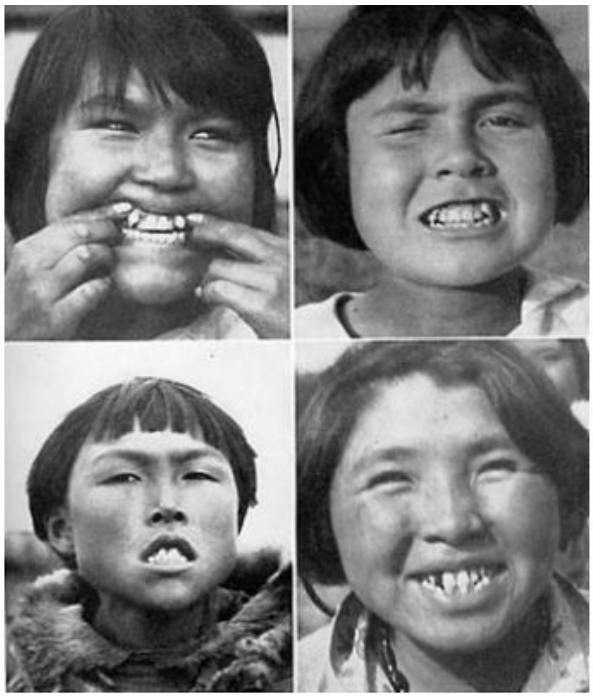
In this paper by Dr. Kevin Boyd, he states that "*dental caries (*as in cavities) *and malocclusion* (which means misaligned or crooked teeth) *while now highly prevalent public health diseases, are both surprisingly rare within the pre-industrial skeletal and pre-historic fossil records, and also seldom seen in many present-day nonwesternized cultures.*" This is very striking considering according to Proffit's 1994 Contemporary Orthodontics, 2/3rds of the US population has some degree of malocclusion - misalignment of the teeth. *Yet,* malocclusion with a *known* cause is listed as only 5% percent of the population. That leaves 60% of people with malocclusion for unknown reasons.

In 1939 an American dentist named Weston Price traveled around the world examining the oral health of both civilized groups living on modern foods and isolated groups living on native diets. He published his results in a book titled "*Nutrition and Physical Degeneration.*" What's most interesting is the pictures in the book.

-Here we have girls from isolated valleys of Switzerland and children from modernized districts of Switzerland.

-Here we have native Alaskan Inuit people, also called Eskimos, and on the right we have the first generation of children born after the parents adopted a modern lifestyle. There is some wear on the teeth, especially on this person, but they're ...straight.





-Here we have isolated native americans and the first generation native americans with a

modern lifestyle.

-Here we have people from islands in the southeastern pacific ...before and after adopting a modern lifestyle.

-Then we have Samoans, a tribe in Belgian Congo, Australian Aborigines and Andean Indians.
-Here we have two brothers from the Isle of Harris, the one on the left uses modern food, the one on the right native foods.

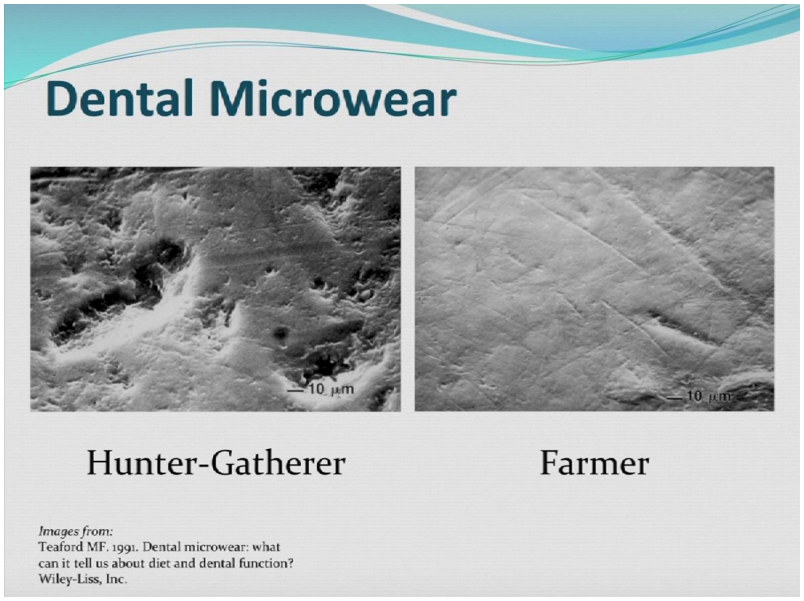
There are several more examples in the book of people living on their native diets with excellent teeth, and then people with similar genes living on modern diets with crooked and unhealthy teeth.

Paleoantrhopologist Daniel Lieberman reports in his book "Evolution of the Human Head" that "*...jaws and faces do not grow to the same size that they used to…*". And if we go back to these pictures, we notice that these people have relatively broad faces with broad dental arches. If you compare a prehistoric skull to a modern day skull, you'll find that we used to have far broader dental arches.

Biological Anthropologist Clark Spencer Larson says that agriculture instigated a fundamental change in human craniofacial growth and development. He highlights the use of cooking vessels as an impactful innovation because they allowed for humans to make very soft mushy food that required little chewing. He says such culinary adaptations resulted in fundamental changes in craniofacial growth and development, resulting in reduced robustness, increased malocclusion and increased tooth crowding. [*Adapted from this paper*]

So, where people were gnawing on very fibrous low calorie plant foods as well as raw and cooked meat, maybe having to chomp through skin, cartilage and sinew and using their teeth as tools, they could now make porridges and maybe some rudimentary stew that provided much more calories for less masticatory effort.

One piece of evidence for the significance of having to chew more and harder is the fact that the skulls found with good occlusion - with straight teeth are found with extensive *wear* on the teeth. As Rose and Roblee explain in this paper, "*Thorough analysis of dental data from the Armana Project has shown that Egyptian and most ancient teeth have extensive tooth wear with dentin exposure on the occlusal surfaces of even the youngest individuals. Malocclusion is rare in Amarna but very common in America; tooth wear is extensive in Amarna yet rare in America.*" Dental microwear analysis shows that hunter gatherers ate a diet that wore down their teeth more than farmers.



This would mean stronger masseter and temporalis muscles - the muscles in the face involved in chewing. Spending most of your day chewing on things hard enough to wear the teeth down to that extent could exert enough direct and indirect force to morph the facial skeleton and dental arch.

But there's an unexpected effect of having soft foods early in life that John and Mike Mew have talked about. The idea is that when a baby is weaning off breast milk, if they move onto *hard* foods, they would have to develop a different swallowing pattern - If you have a straw or bottle nearby you can test for yourself to see what I mean. Your swallowing pattern when you drink through a straw is different when you chew up something hard and then swallow it down.

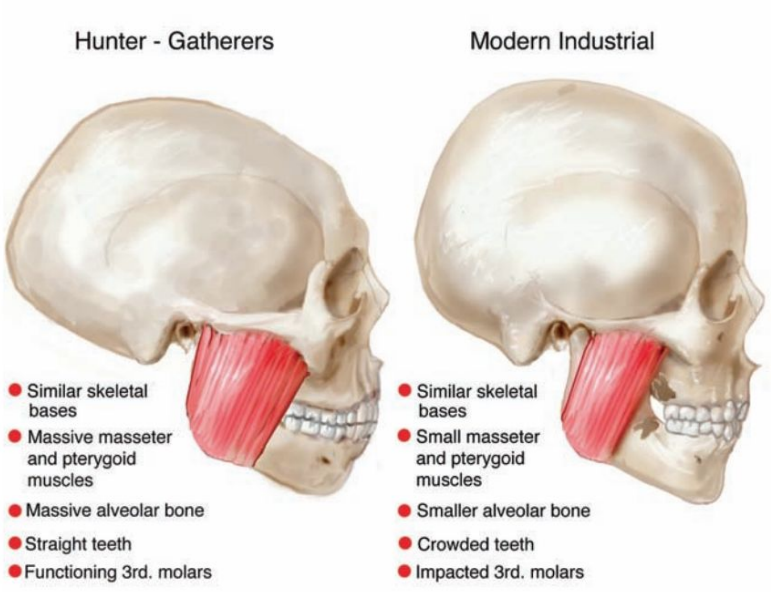
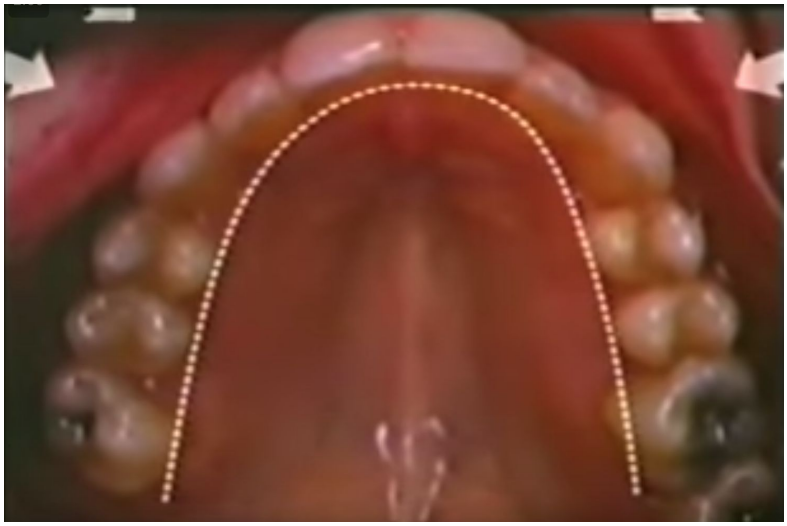


Figure 11 Drawing of a facial profile of a preagricultural skull and profile of a typical modern skull showing posterior location of alveolar bone and teeth (adapted from Carlson and Van Gerven[8] by William Winn).

So by weaning the baby onto soft foods that can be suckled down, the baby doesn't fully develop a proper swallowing pattern. The swallowing pattern you want to develop is where your tongue pushes tightly up against the palate to pull the food into the esophagus, you don't want to swallow with your tongue sucking on your teeth.

It's estimated that humans swallow around 600 times per day with about 2 pounds of force against the palate - this, as well as your resting tongue posture can affect the dental arch. Quite simply put if the tongue isn't exerting force on the roof of the mouth, thus pushing the teeth outwards, they can come to cave in. This develops a vicious cycle because if your dental arch is too narrow, it becomes difficult to keep the tongue on the roof of the mouth because there's no room for it.

The upper arch should form like this, thanks to the tongue pressing against the teeth, preventing the pressure of the cheeks from pushing them in.



But if the tongue isn't holding the teeth in place, the teeth can get crowded inwards:

One more piece of evidence for this idea is the work of Dr. Egil Harvold on rhesus monkeys, who, when left to their own devices will breathe through their noses with their lips touching and tongue resting on the soft palate, and they have straight, properly functioning teeth. A 1981 paper describes how Dr. Harvald blocked the nasal passage of monkeys with silicone nose plugs - this causes them to develop an open mouth posture with the tongue pulled down off the roof of the mouth. What happened?

The paper reports that "*the common finding was a narrowing of the mandibular dental arch and a decrease in maxillary arch length, causing an incisor cross-bite.*" Simply put - by pulling the tongue down and breathing through the mouth, the monkeys developed smaller dental arches and crooked teeth.