

ABSTRACT

One of the features that distinguishes humans from all other primates is the presence of a symphyseal buttress, or chin, on the basal margin of the buccal surface of the mandible. The presence and purpose of this buttress has been debated for two hundred years, culminating at the end of the twentieth century, in two main branches of thought. Firstly, the adaptive hypothesis argues the chin appeared in humans as an adaptive response to changes in size and shape of the face and jaws. Through time the human face has steadily reduced in size becoming less prognathic, moving in under the cranial vault. The adaptive hypothesis argued that as the mandible reduced in size to accommodate these broader changes, a buttress at the mandibular symphysis, which was unnecessary in larger, ancestral hominids, became more prominent as a means of strengthening the anterior mandible against masticatory muscle stresses. The non-adaptive hypothesis, however, maintains the symphyseal buttress is merely an artefact of evolution and that it does not actually exist as an adaptive trait at all. Rather, as the alveolar growth field in the mandible receded more rapidly than the basal growth field below it, a knob of bone appeared between the two. They argue it has no adaptive significance, yet concede it may have developed a functional role since first appearing on the mandible of *Homo sapiens sapiens* (commonly referred to as modern *Homo sapiens*).

With the adaptive/non-adaptive debate in mind this thesis explores the principle that both arguments are based upon, and presents a model that suggests symphyseal buttresses, chins, should be more prominent in human populations that are on average small. Specifically, through time the human craniofacial skeleton has reduced in size and in response the basal section of the anterior mandible has become increasingly prominent, the model presented here argues the result of this process should be an increase in symphyseal prominence in smaller human populations - bigger chins in smaller groups.

The model is tested using samples of crania from human populations originating in Australia (Australian Aborigines); Egypt (Pre- and Late Dynastic periods); North America (African Americans, Aleutian Islanders, Caucasians, and Native Americans); South Africa (Sotho and Xhosa language groups); and the United Kingdom (Romano-Britons), and it demonstrates that populations which are, on average, smaller, do possess more prominent chins. There is also circumstantial evidence in support of a trend toward more prominent buttresses in the more gracile individuals within human populations (females).