

# Studies on the Presumed Cranium of the French Knight Bayard (1473?-1524)

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**Abstract:** We have studied by classic anatomical methods the presumed cranium of Bayard (1473?-1524), who was a famous French knight. This cranium is of male gender, aged of at least 50 years old, and of European origin. There are five main characteristics of this cranium : brachygnathy ; elevated height of the mandibular corpus ; a non-protruding and squared osseous chin (on the mandible) ; lepteny ; a long nose with a bump. All these five characteristics are effectively observed on the face of the official (that of Gariel) Bayard's drawing, which indicates that it is well the Bayard cranium. We have modelled, with the FaceGen programme, the characteristic deviation (of about ten degrees towards the left) of the nose point.

**Keywords:** Bayard (1473?-1524) Cranium, Anatomical Study, Comparisons with the Face of Bayard's Drawing, Deviation Towards the Left of the Nose Point, FaceGen Programme

The famous French "Chevalier Bayard" (1473?-1524), who lived at the transition between the Middle Ages and the Renaissance, had been known as "the knight without fear and beyond reproach" ; Bayard was considered at this period as the epitome of French chivalry (1).

His presumed cranium is at present kept in the Dauphin  Museum of Grenoble (France). A molar tooth was extracted from his mandible ; genomic DNA obtained from this tooth permits us to study the mitochondrial DNA (mtDNA) of Bayard , that corresponds to the mtDNA haplogroup of a today living male related (to 32 generations) to the Bayard matrilineal ascendance (2). The <sup>14</sup>C evidence dating (3) of one of the root of this tooth provides a date of calendar 1430-1510 years (at 95.4% of probability) interval, consistent with the mean date of 1486 for an individual who had started eruptions of his first molars.

In the present study we concentrate on some characteristics of the presumed Bayard's cranium, and on comparisons with some facial appearances of his most accurate drawing.

### Material and Methods

Classical studies in physical anthropology are realized on high-quality photographs (all from J. Viret, except that of figure 2) of various pieces of the presumed Bayard's cranium (these photographs are taken together with a millimetric ruler). The diverse measurements of European craniums of reference are collected from (4). A Bayard drawing was treated by an ameliorated version (<http://www.facegen.com/demos.htm>) of the FaceGen programme.

### Results and Discussion

Morphological observations establish that the cranium studied is that of a male ; among qualitative characteristics of the cranium are the followings : the frontal bone is flattened and sloped ; the gabellar zone is protruding ; the superior orbital edge is non-sharped and blunted ; there is a supra-orbital relief ; the iniac zone is protruding , nuchal printing is very marked ; the mastoid apophysis is long ; the temporal muscular line is well visible.

Concerning the age of the cranium , the palatine anterior suture is obliterated ; that shows that the age of death is at least of 50 years.

The cranium is of European ethnicity, notably because the nose width (estimated by projection) is of 3.1 cm, one characteristic of Leucoderms ; the palatine arch has a parabolic form , and the inferior border of the nasal cavity is definite and sharp (also, the nasal anterior spine is well marked).

There are five main characteristics of the presumed Bayard's cranium :

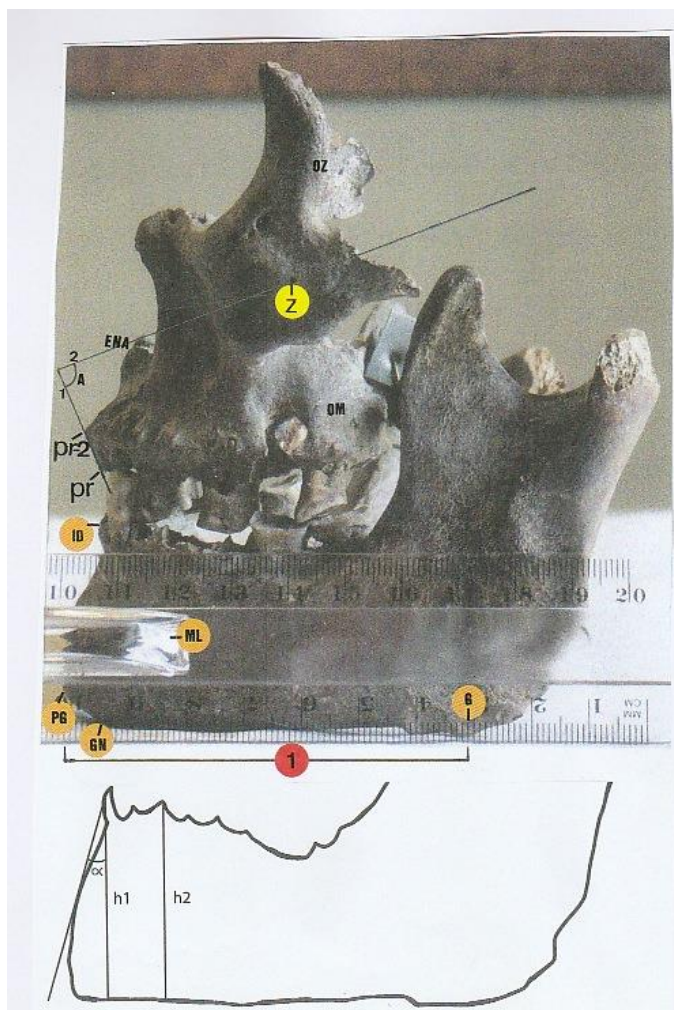
**1. Brachygnathy.** The length of the mandibular corpus (LMC), taken from the left side of Bayard's mandible (**Figure 1**), is the distance between the gonion and the progonion ; it is of 71 mm. This length (brachymandibular, at the limit of mesomandibular) is comparable to that of the value (77±4 mm) of the European mean in the population of reference.

That is a first characteristic of the Bayard mandible : *he had a short inferior jaw.*

**2. Elevated height of the mandibular corpus.** The height of the mandibular corpus, taken at the symphysis or at the foramen (Figure 1), is of 3.4 cm



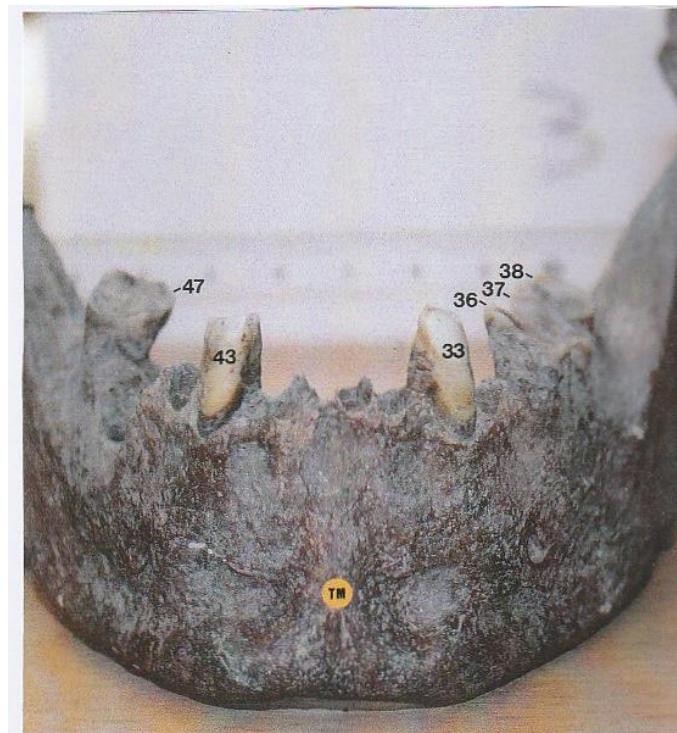
in both cases. The height of the Bayard mandibular corpus is so similar to that of the superior values (3.7 cm at the symphysis, and 3.6 cm at the foramen) observed for the European males in the population.



**Figure 1 :** Left osseous profile of the lower part of the presumed Bayard cranium. ML : mandibular length of the corpus ①; PG : progonion ; G : gonion ; GN : gnathion. Other indications concern the measurement of the facial maxillar angle (A). Below : outlines of the mandibular corpus ; h1 : height of the mandibular corpus at the symphysis ; h2 : height of the mandibular corpus at the foramen :  $\alpha$  : chin angle.

That is a second characteristic of the Bayard mandible : *he had an elevated inferior jaw.*

**3. A non-protruding and squared chin.** Figure 1 shows also that the chin angle ( $\alpha$ ) is of  $18^\circ$  only ; so the Bayard chin was flattened. **Figure 2** shows a frontal view of the Bayard mandible ; the osseous chin is squared and the chin triangle is well developed.



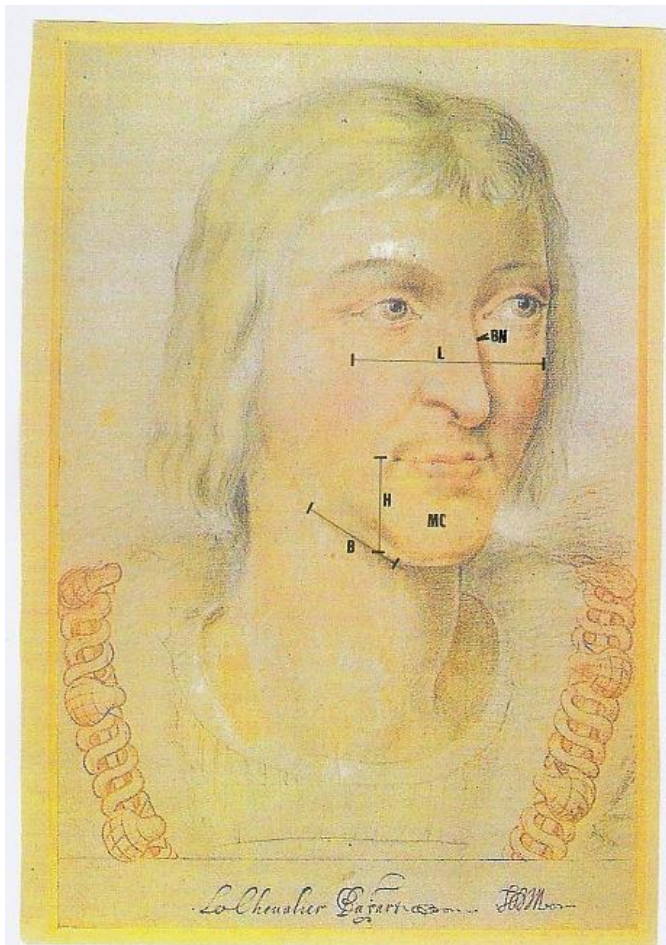
**Figure 2 :** Frontal view of the mandible. TM : chin triangle ; g : left gonion (numbers indicate teeth of the mandible).

That is a third characteristic of the Bayard mandible : *he had a flattened and squared chin.*

#### 4. Lepteny.

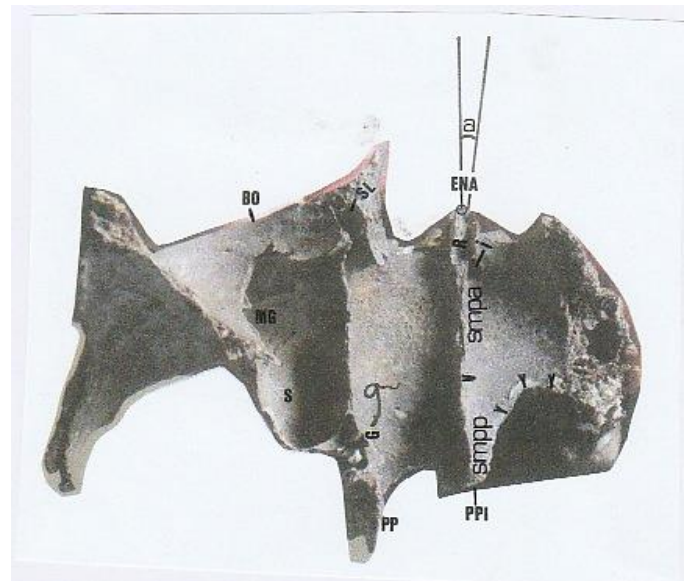
The bizygomatic left hemi-width of Bayard (**Figure 3**), measured at the highest extension of the intermaxillary suture, is of 5.8 cm ; by symmetry, it is deduced that the bizygomatic width (BZW) is of 11.6 cm.





**Figure 6** : The Gariel drawing of Bayard. B : brachygnathy ; H : elevated height of the mandibular corpus ; MC : squared chin ; L : lepteny ; BN : bump on the nose.

A marked osseous abnormality is visible on some bones of the inferior part of the face : **Figure 7** shows an upper view of the palatine blade. The nasal (cartilaginous, non-conserved) partition is inserted on rail located in the superior part of the maxillar bone ; but this rail is deviated towards the right by an angle of more than 8° from the line located in the vertical plane that cross the median palatine suture (at this level, the lower part of the nasal osseous partition of the vomer) and that of the intermaxillary suture.

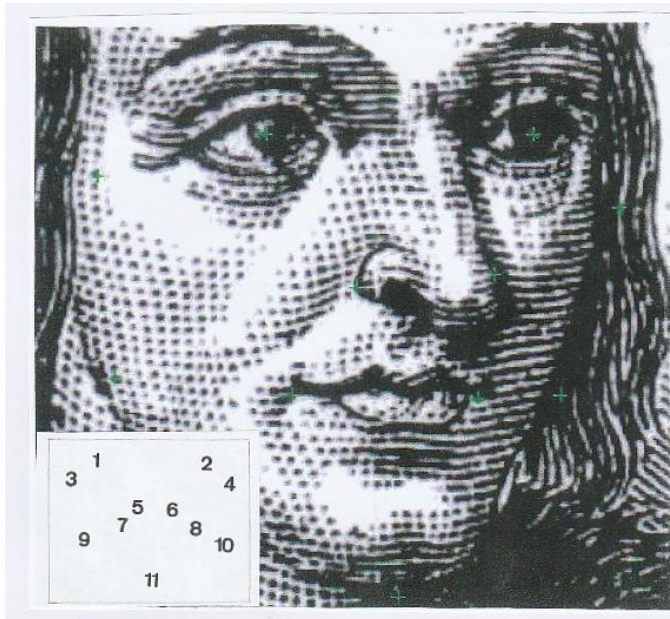


**Figure 7** : Endocranial view of the palatine blade. PPI : inferior pyramidal process of the palatine bone ; ENA : anterior nasal spine of the maxillar bone ; R : rail ; I : higher part of the opening of the incisive channel (right part) ; a : angle between the two lines between vomer insertion and the longitudinal axis of the rail. BO : orbital left border ; MG : left maxillar bone.

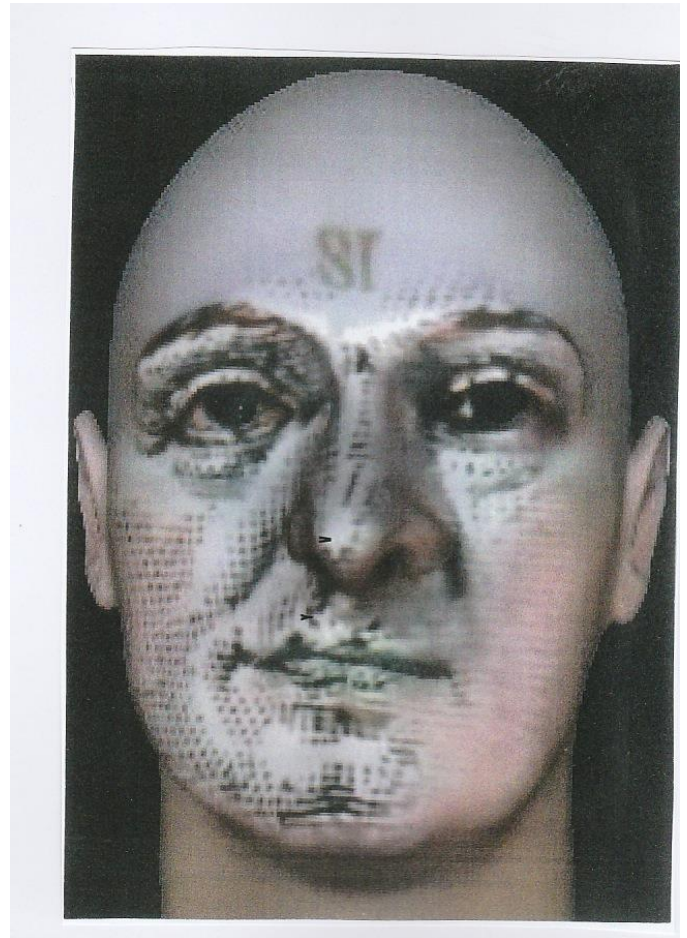
This abnormality in the orientation of the cartilaginous partition is certainly of a structural nature (i.e. non-accidental), because it concerns three neighbouring parts of the upper maxillar bone : the front of this bone , the rail, and the right aperture of the incisive channel.

It has the consequence that Bayard's nose is deviated for an angle of about ten degrees towards the left ; a well visible abnormality that must be observed on Bayard's face.

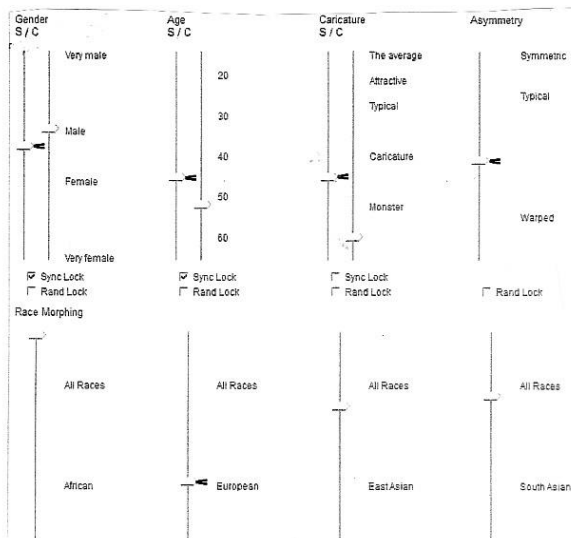
To modelize that, we have applied to another drawing of Bayard's face (the one by Perot) the FaceGen program. **Figure 8** represents the eleven points taken on this face. **Figure 9** summarizes results obtained on the face by the FaceGen program : the face is asymmetric and someone caricatured ; the age is about 45 years old in shape, and 50 years in texture ; the gender is that of a male and the race is that of an European.



**Figure 8 :** The points in green taken on the Perot drawing of the Bayard face (insert : positions of the eleven points). 1 and 2 : centers of the eyes ; 3 and 4 : the two external points of the zygomatic arches ; 5 and 6 : external borders of the nostrils ; 7 and 8 : corners of the lips ; 9 and 10 : the two external points of the chin ; 11 : the most inferior point of the chin border.



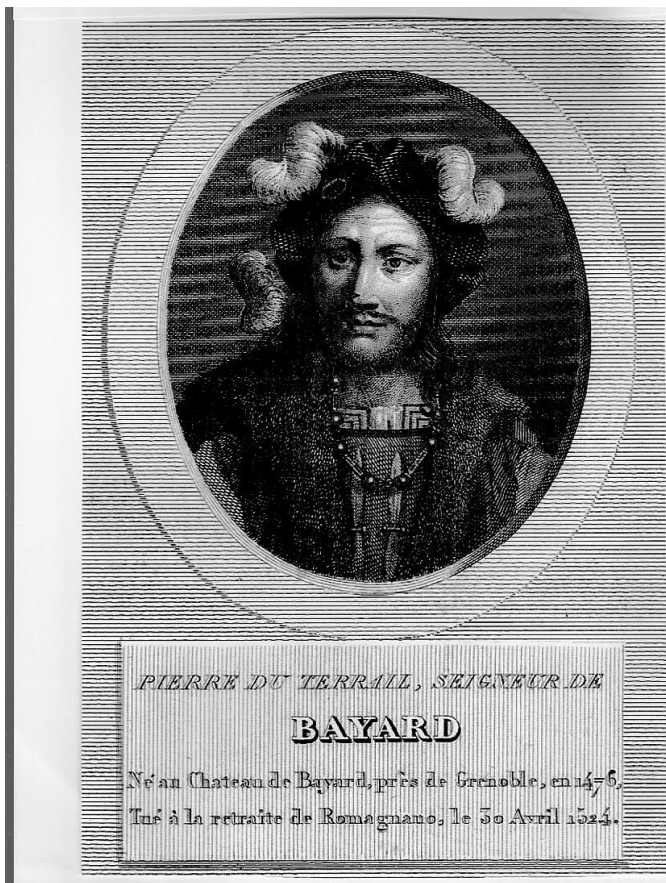
**Figure 10 :** Facial reconstruction by the FaceGen program. Arrows indicate deviations of the nose point (and, for a least distinctive fashion, of the splint of the superior labium).



**Figure 9 :** Results obtained on the face by the FaceGen program. S (shape) ; C (texture).

**Figure 10** shows the reconstruction of Bayard's face by the program. One can effectively see on it the deviation towards the left of the nose point.

In the facial illustration of Bayard (**Figure 11**) at the frontispiece of the historical Bayard book, the point of the nose is clearly orientated towards the left.



**Figure 11** : Bayard drawing at the frontispiece of his historical book. Arrow indicates deviation of the nose point.

### Conclusions

In the present paper we have realized by anatomical methods a study of the presumed cranium of the knight Bayard, and have compared it to the face of the most accurate Bayard's drawing.

Bayard's presumed cranium is that of a man, aged of at least 50 years, and of European origin. There are five main characteristics of the presumed Bayard's cranium : brachygnathy, elevated height of the mandibular corpus, a non-protruding and squared osseous chin, lepteny and a long nose with a bump. All these five characteristics are observed on the face of the official Bayard's drawing.

There is a marked osseous abnormality on the corresponding facial part of the cranium : an angle of about ten degrees toward the right between the lines of the rail where the basis of cartilaginous nose partition is inserted and that of the median palatine suture ; it must result a ten degrees deviation (towards the left) of the point of the nose. By application of the FaceGen program to the face of another Bayard's drawing, we have shown that such a deviation of the nose point is effectively observed.

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