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

Gérard Lucotte¹, Franz Jullien²

¹Institute of Molecular Anthropology, Paris, France
²Museum of Natural History, Paris, France

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 Dauphiné 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 genera) to the Bayard matrilineal ascendance (2). The 14C 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.

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.

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 gablellar 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 (brachymandibulary, at the limit of mesomandibulary) 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 symphisis 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 symphisis, 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; 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 symphisis; he: height of the mandibular corpus at the foramen; α: 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 (α) is of 18° 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.

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 inter-maxillary suture, is of 5.8 cm; by symmetry, it is deduced that the bizygomatic width (BZW) is of 11.6 cm.

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Figure 3: Frontal view of the lower part of the cranium. 3: bizygomatic left hemi-width. ENA: nasal anterior spine; Z: left zygomatic; PZ: left process of the zygomatic; M: left maxillar.

A better estimate of the BZW is from the measurement between the two zigions (Figure 4); this measure is of 12.1 cm.

Figure 4: The basis of the cranium. (3): bizygomatic width, between the two zigions (Z); AZ: zygomatic arches; V: vomer; O: occipital bone; TO: occipital hole.

That last measure is far more inferior to those of both (men and women) Europeans in the population (combined values 133.29 mm, S.D.: 9.19 mm). That is a fourth characteristic of Bayard’s cranium: it was very narrow at the facial level (that does not mean that it was elongated).

5. A long nose, with a bump. Figure 5A shows that the two nasal bones are kept (that of the left being less kept than the right one, because of a fracture at the naso-maxillar suture). The estimated length of the nasal bones (from the nasion to the rhinion) is of 11 cm, that corresponding to a long nose.

The fronto-nasal angle (fna) of the facial profile is the angle between lines of the forehead and of the nose; the measurement of this angle on the osseous equivalent of the Bayard left profile (Figure 5B) is of 37° (two degrees up to the upper limit of the norm); it must so correspond to an osseous nose protruding towards the front, with a bump.

Figure 5: A: frontal view of the superior part of the cranium. G: glabella; SM: metopic suture; N: nasion; S: fracture at the left fronto-maxillar suture; R: rhinion; M: right maxillar bone. B: lateral left view of the anterior part of the cranium. F: frontal bone; N: nasal bone; afn: fronto-nasal angle.

These five osseous characteristics are visible on the face of the Gariel drawing (Figure 6), that is generally considered as the most accurate Bayard’s drawing (5):

. Brachygnathy is visible as the short length of the right maxillar.
. The high vertical distance between the right extremity of the lower maxillar and the corresponding corner of the lips indicate the elevated height of the mandibular corpus.
. The chin is square.
. The horizontal distance between the two checkbones indicates lepteny.
. There is a 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 the rail located in the superior part of the maxillary 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.

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

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).

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 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.
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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