Very short stature of individuals from Dvin (Armenia): detailed anthropological and paleopathological analysis *

• Anahit Yu. Khudaverdyan, Nura G. Hakobyan, Aghavni S. Zhamkochyan •

Institute of Archaeology and Ethnography, National Academy of Science, Republic of Armenia

Address for correspondence:

Anahit Yu. Khudaverdyan
Institute of Archaeology and Ethnography,
National Academy of Science,
Republic of Armenia
E- mail: akhudaverdyan@mail.ru

Bull Int Assoc Paleodont. 2020;14(2):102-121.

Abstract

This article is about unusual individuals of the 9th–11th centuries from Dvin (Armenia), among which traces of delay of growth processes were revealed. The paper analyzes individual features of craniological, cranioscopic, odontological, osteological and paleopathological characteristics of two individuals. The research of bones of the skeleton showed presence of serious pathologies, unrepresentative for so young age, related to excessive exercise stresses. Harris lines, or growth arrest lines are clearly seen on X-ray images of two diaphyses of tibial bones. Another marker of growth delays (enamel hypoplasia) is also found in the individuals.

Keywords: Armenia; Dvin; IX–XI centuries; paleoanthropology; craniology; odontology; osteology; paleopathology

** Bulletin of the International Association for Paleodontology is a journal powered by enthusiasm of individuals. We do not charge readers, we do not charge authors for publications, and there are no fees of any kind. We support the idea of free science for everyone. Support the journal by submitting your papers. Authors are responsible for language correctness and content.*

Introduction

Skeletal dysplasia is irregular growth of the bones from disorders or abnormal growth of the growth plates that causes short stature and disproportionate limb size—what we commonly call dwarfism. There are over 200 different types of dwarfism. A child with dwarfism is born 1 per 25,000 births. A dwarf or little person is an adult whose height is less than 4 feet 10 inches (147 cm). Since the earliest times dwarfism has been the most commonly depicted human physical disorder, found in Egypt, Greece, and in the Roman world, in a large part of the period of Predynastic Egypt (about 3000 BC) until the end of the Roman Empire (Vth century AD) (1). Dasen (1, 2) traces the depiction of dwarves throughout history and also provides an overview of different types of dwarfism. She shows that dwarves often had a special place in Mediterranean societies (2). A special role was played by the dwarf who served the function of a court jester. Most probably this idea came from Mesopotamia to Egypt and then to ancient Greece and Rome. The main place of work of the dwarf-jester in those countries was the court but on special occasions, mainly during Olympic games also feasts and orgies (3). Dwarfs partook in many activities in the household and in society as a whole. In pictures they are shown to perform many different tasks, including jewellery making, animal and pet handling, fishermen, keeper of the wardrobe, supervisor of clothing and linen, as well as entertainers and personal attendants (4). Dwarf men may appear in the company of both men and women, which is unusual. This may imply that the dwarf was not seen as a full man. Female dwarfs have been linked to nursing and child-care, and may have assisted during childbirth (4). The animals are usually dogs or monkeys, and are shown being led in a leash by the dwarf. Male dwarfs were also often shown in connection to clothing and jewellery making. In Rome the focus was on the spectacle of dwarfs. They were popular slaves showing the wealth of their Roman masters, and they were popular gladiators in the arena, sometimes brought home by wealthy women after training to participate in erotic games (5). Roman writers such as Cicero determined that, “It matters greatly to the soul by what body it is placed; for there are many conditions of the body that sharpen the mind, and many that blunt it” (6, p. 30). Thus there is an idea of deformity as divine punishment.

The earliest case of chondrodystrophic dwarfism was found in an Italian Late Upper Paleolithic burial (10,000 BP) (7), a few cases have been reported in ancient Egyptian skeletal remains (8, 9); Imperial Age (I-II century A.D.) from Rome (10) and more recent examples of achondroplasia of Medieval Age have been described in Poland, Hungary, and Wales (11-13).

There is no evidence for dwarfism is don’t exist in ancient Armenia, thus skeletal remains provide the most objective and informative evidence of this genetic disorder. The earliest biological evidence for dwarfism in ancient Armenia dates to a Late Bronze and Early Iron Ages. The analyzed skull originates from grave 4 of the cemetery of Artsvakar located in the Gegharkunik province, Armenia (14). The skeletal remains of No.4 from the Artsvakar site, albeit incomplete provide important clues to the paleopathological diagnosis of dwarfism. Some craniofacial features (small skull, bulging forehead, depression of the nose) and area surrounding the foramen magnum in the present case, are consistent with a diagnosis of dwarfism (perhaps, achondroplasia), although the missing of more diagnostic districts, such as the bones of the limbs and spine, precludes a definitive diagnosis. Although it was difficult to assess the sex due to the abnormal skull morphology and missing skeletal elements, several features suggest that this individual was very likely a male, who reached a maturus aged (14).

Examination of the burials from the Antique cemetery site (Beniamin, burial 221) showed a second skeleton of dwarf (16). Pelvic morphology suggests that the remains are of a woman, aged 40–45 years. The skull was missing. The bones are all gracile, slender, and shorter than normal but in proportion with each other. Comparison with a dataset of the population from Beniamin with a dwarf-female from burial 221 shows that she was significantly shorter than the mean of the female population of that period. The femoral length is about 357 millimeters or 75 percent of the expected length. The purpose of the present paper was to review anthropological features and health status of two individuals living of the 9th–11th centuries on the Ararat Province of Armenia. Modern scientific tradition ascribes much importance to the morphological, including X- ray anatomical studies of the skeleton bones in the context of growth disorder processes, its development and adaptation, etc. In order to provide most information on the material in question, it is useful to scrutinize the skeletons, as any kind of information may be of great value. We mainly aimed at a detailed fixation of the

Figure 1 Skull №1 from Dvin.

Figure 2 Skull №2 from Dvin.

morphological features of the skeleton bone structure and the teeth.

Material and Methods

Anthropological material of two individuals, distinguished by some traces of growth disorders was found in the Cathedral of St. Gregory during clean-up operations (archaeologists N.G. Hakopyan, A.S. Zhamkochyan). The bones of the individuals were carelessly lying over the surface at a height of about 40-50 cm. These are probably the reburial of the remains that had appeared to be in the construction zone of the cathedral.

The age-at-death and sex of adults were assessed through the use of multiple indicators: morphological features of the pelvis and cranium were used for the determination of sex (17, 18); a combination of pubic symphysis (19, 20, 21), auricular surface changes (22), degree of epiphyseal union (18), and cranial suture closure (21) were used for adult age estimation.

Next, a series of standard measurements are taken of the bones and teeth (23, 24, 25, 26, 27, 28), and the presence and absence of “non-metric traits” (29, 25-28).

Skeletons were subjected to a careful macroscopic investigation for pathological lesions. Cribra orbitalia, a descriptive term for porotic hyperostosis lesions of the orbit, were identified as pitting of the compact bone varying in size from capillary like impressions to coalescing outgrowths (30). The orbital roof was examined macroscopically for evidence of pathological change. Each orbital roof is recorded as a single unit with cribra orbitalia noted as present, absent or unobservable. Lesions are recorded following the grading system defined by Stuart-Macadam (30) (types 1–5).

Calculus was noted where mineralized plaque can be seen adhering to the tooth surface (31). Calculus was recorded on an individual tooth level stating the location and severity of the formation. The location was recorded as supra- or sub-gingival based on the location of the deposit (on the crown or the root) and on the characteristics of the calculus (31). The severity was recorded as slight, medium or considerable

deposition following Brothwell (32). Diagnosis of hypoplastic defects refers to Hillson (31) for description of linear and pit-shaped interruption in the enamel formation. Enamel hypoplasia is recorded on individual tooth level.
In the current study the femur and tibia were exposed to a radiographic study. The study of the internal structure of the bones of individual 2 was carried out in the Republican Medical Center "Armenia".

Figure 3 The right lateral incisor is "premolar", interruption groove, cusp of Carabelli (point 1-2).

Figure 4 Clavicles of the individual №2.

Results

<u>Craniology</u>

Individual 1.

The skull belongs to a adolescent of about 17 (±2) years at the time of death. (Figure 1). The upper wall of the left orbit and the supraorbital part of the coronal bone were postmortem broken. There was a complete fusion of the lateral parts of the occipital bone with the body and a partial closure of the occipital-main synostosis. On the skull the third left molar didn't reach its final position among other teeth, whereas the right one was deep in the alveoli. The upper third molars absence is present. The skull of the individual is characterized as brachycranic with a large transverse and longitudinal index that is on the low end of the norm. It is absolutely low and relative to the altitude-transverse index. The parameters of the length and width of the skull base are on the border of very small values. The occiput is of medium width with a small arch and chord. The external occipital protuberance is poorly developed, and in the lateral norm the occiput is rounded. The parietal arch and chord are very small. The mastoid is moderately developed. The forehead is of medium width. The frontal-transverse index is middle - mesozem. The frontal archs and chords are of medium size. The glabella and superciliary arches are moderately developed, and molar arches are very thin. The top of the skull is of a spheroidal shape. The cranial sutures are serrated. The zygomatic diameter is very small. The length of the face (as well as that of the skull) is also small. The face is low and small by the upper breadth and very small at a zygomaxillary points. At the upper level the horizontal profile angle is weakened, whereas in the middle it is quite strong. The upper facial index falls into the category of mésos, which indicates the upper mid-facial profile. Both the nasal height and the nasal breadth are very small (beyond the norm).The nasal index is small (leptorinia).The dacryal width is very big, whereas its height is small, the dacryal index is small as well. The simotic width is medium, whereas its height and index are small. Likewise, the area of noseband may be characterized as flattened. The anterior nasal spine protrudes is middling. The orbits are of medium height, narrow. The palatal breadth goes beyond the lower limit of the norm. The length and breadth of the alveolar arch are very small. The projection length of the lower jaw is medium. The angles are deployed, the ramus mandible is small. Both the angular width and the frontal one are small. The tuberosity on the external surface of the angle (the reposition of the mastication muscle, m. masseter) and the internal surface of the angle (the reposition of the internal wing muscle m. pterygoideus medialis) is distinctly discerned on both sides. The symphysis is of medium height, the body is short, massive and thick, Table 1.

Individual 2.

The cranium is heavy and belongs to a twenty-two-year-old man (±2) (Figure 2). The skull relief

Figure 5 Enthesopathy on the pelvic bones, pubic symphysitis.

Figure 6 Facets of the rider.

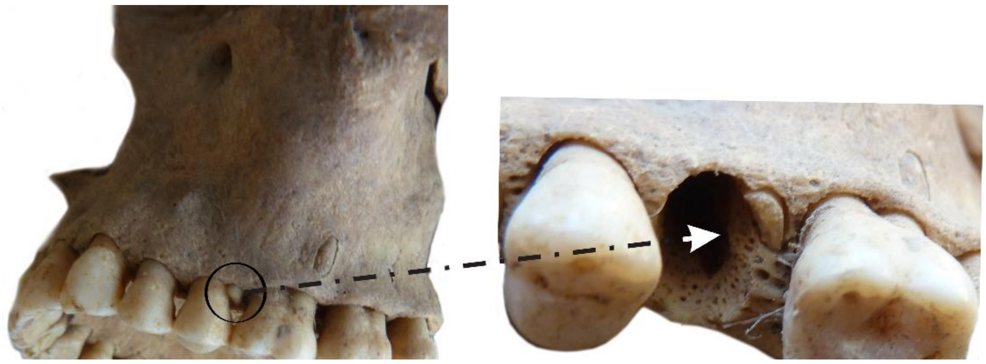

Figure 7 Dental invagination.

is poorly developed. The dental system is completely formed and in a good state. The skull of individual is also brachycranic with a small transverse and longitudinal index that is on the low end of the norm. It is very low and the height transverse diameter index is on the edge of very small and medium values (metriocrane).The high-rise longitudinal index is big (gipsicran). The height-breadth index of the skull base is on the edge of small and very small values. The occiput is of small width with a very small arch and a chord. The external occipital protuberance is poorly developed and in accordance with the lateral norm, the occiput is rounded. The parietal arch and chord are very small in size. The mastoid process is moderately developed. The forehead is very narrow and the fronto-transverse index is middle- mesozem. The frontal arches and chords are small in size. The upper part of the brainpan is turquoise-shaped and sharply narrowed in the temporal region. The cranial sutures are serrated. The zygomatic diameter is on the low line of the norm. The facial part of the skull is mesognate,low. The horizontal facial profile angles fall into the category of small size, i.e. the face of the Caucasoid standards is well profiled. The upper facial index falls into the category of leptins.Both the nasal height and weight are small. The nasal index is small in size (leptorinia). The dacryal height is big, whereas its width is small in size and the dacyral index is very big. The symotic width is small, whereas its height and index are wide.

The anterior nasal spine protrudes strongly. The lateral edges of the piriform opening extend downward, forming clearly outlined fossae that separate the frontal part of the nasal tenon. The orbits are narrow and not wide (mesoconcha). The palatal breadth is deep and on the low line of the norm, whereas the palatal length is small. The length and breadth of the alveolar arch are very small.The projection length of the lower jaw is on the edge of very small and small values. The angles are developed, the ramus width is small. The tuberosity of the external and internal surface angle is distinctly expressed on both sides. Both the angular width and the frontal one are small. The symphysis joint is not high; the body is very short and thick, Table 1.

Cranioscopy

It is of great importance to take into account the kinship relations between the individuals found in Dvin. Ten of the nineteen studied discrete-

Figure 8 The initial stage of the formation of vertebral hernias or Schmorl's nodes.

Figure 9 Osteophytes on the tops of the spinous processes.

Figure 10 Periostitis appears of the tibia.

varying markers are found in both individuals. No traces of twenty six discrete-varying signs are discovered on either skull. The lateral edge of the frontal process of zygomatic bone is straight(spina processus frontalis), and the transverse palatine suture (sutura palatina) is П-shaped. The unstable foreman and the venous blood passing (foramina zygomaticofacilia, foramina parietalia, foramina mastoidea, canalis condyloideus), the incisive suture (sutura incisive), the frontal process of the temporal bone (processus frontalis squame temporalis) and the processes extending from the inferior surface of the jugular processes (processus paramastoideus) are marked on the skulls. The zygomatic bone (os japonieum) separated by the suture regarded as an eastern as feature linkable to East Asian populations, sign was distinguished in both individuals.

In individual 1, the supraorbital foramen (foramina supraorbitalia), the frontal foramen (foramina frontalia), the pterygospinous process (pterygospinosum),narrowing of the H-shaped pterion (stenocrotaphia)and the occipital condyle bipartitum (condyles occipitalis bipartitum) are detected, too. In individual 2, the temporal process of the frontal bone (processus temporalis ossis frontalis), the narrowing of the X-shaped pterion (stenocrotaphia),the suture bones in the scaly suture (os wormii suturae squamosum), the inserted bone in the parietal notch (o spost squinosquamosum) are found, Table 2.

Odontology

The shape and the degree of their attrition corresponds to the individual's age and psalidodontie character of the bite. The observed dental asymmetry is more noticeably marked in individual 2 than in individual 1.

Individual 1.

The maxillary first and second molar, as well as the right lateral incisor, canine, the premolar and the first and second molars were examined. The mandibular central incisor, the left mandibular incisor and the first and second premolars were missing. The crown diameter of the maxillary and mandibular molars range from very small to large quantities size and only in one case (M2) the width of the crown (VL) exceeds its length. According to the average module, in both rows

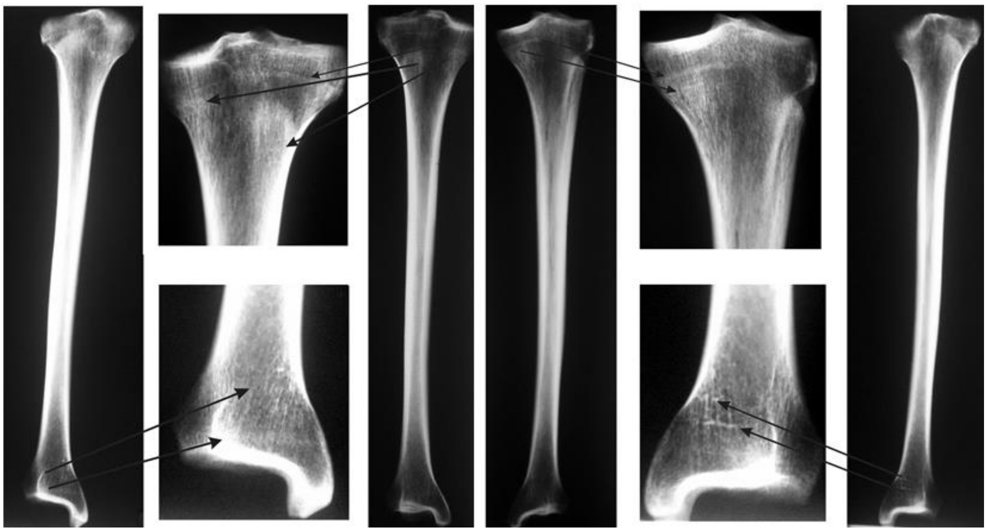

Figure 11 Harris lines.

Figure 12 The femoral diaphysis is curved.

M1-M2 (9.38 upper), M1-M3 (9.56, lower) the individual is clearly inclined to microdontism that is particularly typical of South European forms. The crown height of the maxillary second molars fall into the category of big values. In the area of crown extent, the formula M1>M2> M3>is fixed with the reduction in the area of the last mandibular third molar.
The comparison of the mesiodistal and vestibulo-lingual dimensions of the mandibular first and second molars revealed the following regularity. According to vestibulo-lingual diameter (90), the size of the third step-index is bigger than the one calculated by the mesiodistal diameter (83.64). The data on the pan-paper distribution of the values of the third molar cited by A.A Zybov (25, table 28), enable us to conclude that in most modern populations of its size,calculated by mesiodistal indicators, are greater than the one calculated by vestibule-lingual indicators. It may testify to the fact that in the considerable part of the globe, the evolutionary tendency to reduce the size of the second molars was to a greater extent covered by the tooth transverse diameter rather than the longitudinal one. In comparison with the mesiodistal diameter of the individual from Dvin, the reduction of the vestibule-lingual diameters of the mandibular second molars probably reflects the variability of the individual rather than the conservatism of the morphogenetic processes on the studied territory.
The shape of the right lateral incisor is "premolar" (Figure 3). The corono-radicular furrow on the incisor is mesially shifted, and it cuts off the lingual tubercle from the mesial marginal ridge fitting it there. The furrow separating the lingual tubercle stretches along the root (interruption groove). The shovel shape is mostly pronounced on the lateral incisor. On the right canine a poorly discernible vestibular shovel-shape is noted, and a triangular fossa is fixed at the level of the third medium lingual surface. The dimensions of the vestibular tubercle on the maxillary first premolar are bigger than those of the lingual (type 2).
According to the Zybova (26) scale, the odontoglyphic crown pattern ranges between 4 and 6 points. The lingual and vestibular tubercle

have approximately the same dimensions on the second premolars. The odontoglyphic crown pattern is rated 4. Both the metacone (point 2) and hypocone (point 4) of the first molars are slightly reduced. The cusp of Carabelli is fixed on the first molars (point 4). The shape of the first paracone furrow can be observed on the maxillary first molar. The morphological characteristics of the second molars are the three tubercles, arranged in a chain (metacone-paracone-protocone). The whole crown is narrow, ellipse-shaped, flattened, the hypocone is missing. The tubercles are displaced in the diagonal direction of the dentition, and the cusp of Carabelli (point 1-2) has a rudimentary form. All the three roots are merged, the length is the same (14 mm). The overall height of the tooth (along the outer edge of the mesial root) is 19.2 mm. The enamelstainon the maxillary first molar is rated 4.

The mandibular central incisor is not shovel-shaped, however,a slight increase in the marginal ridges of the lingual surface can be observed on canines (point 1). The mandibular first right premolar has 4 cusps (point 6), the inter-cuspal furrow of the left premolar has a lingualtwig dividing the lingual half of the tooth into two parts, forming a three-cusped type (point 5). The second left premolar has 3 cusps. The mandibular first molars have 5 cusps, the crown pattern has the shape of Y. The anterior and posterior fovea are present on the first molars and a slight lingual shift of the occlusion shape is observed. A distal trigonid crest used to be here(the crest is formed by the distal crests of the protoconid and metaconid) (on the left and right tooth respectively).Among the additional features, variant 2med (II) and the anterior fossa in the mesial section are noted here. The second molars have four cusps and the pattern has the shape of X. The third left molar is strongly reduced (3 cusps) with the crown pattern that has the shape of Y. The enamel strain on the first and second molar is rated 5 points.

Individual 2.

All the teeth of the upper and lower jaw were explored. Tooth dentition of the individual is four-angled (quadrangular), the frontal part of the dental arch is flattened and the entire dentition has a trapezium shape.Both the mesio-distal and vestibule-lingual (table 3) sizes of the molars fall into the category of vary small and small values, and the only exception is M1 (average). The crown height is very low. According to vestibulo lingual diameter the size of the third molar is slightly higher (92) than that of mesio-distal (90, 91). This proves that the reduction rate of the longitudinal and transverse sizes of the second molars' crowns is approximately the same. In the area of crown extent, the modern formula M1> M2>M3 is fixed with the reduction in area of the maxillary third molar.

The lingual surface of the central and lateral incisors was erased. The degree of the cited shovel-shaped incisors cannot be stated. One can observe rotation of the left lateral incisor and moderately expressed marginal ridges on the lingual surface (score 2). There is no reduction of the crowns of the maxillary lateral incisors. The marginal ridges are missing on the lingual surface of the canine teeth. The sizes of the vestibular tubercle on the maxillary first premolars are slightly larger than those of the lingual one (score 2). The lingual and vestibular tubercles on the second premolars are approximately of the same size. The furrow pattern of the maxillary premolar masticatory surfacehas a low level of differentiation. The first maxillary molars are not reduced. Additional morphological details are missing. On the second molars, the hypocone is strongly reduced (score 3+), and the metaconus is markedly reduced (score 30). The wisdom teeth are evidently more reduced. The enamelstain is rated 4 on the first and second molars.

One can observe rotation of the mandibular central incisor and crowding of the lateralone. In the mandibular incisors the marginal ridges of the lingual surface were missing, whereas they were slightly expressed in the canine teeth. The first premolars were not differentiated, the second ones have a 3–tubercular structure. The first mandibular molars havea5-tubercular structure with a "Y" crown-pattern. The second molars have a 4-tubercular structure with the crown pattern "X" on the right tooth, on the left tooth one can see the pattern "+" and a simplified morphology that doesn't have any additional tubercles orridges. The third right molar is 4-tubercular with an "X" crown pattern. The anterior fossa is highlighted in the mesial section from among additional features. The enamel stain on the vestibular side of the lower molars is rated 4.

Osteology

Individual 2.

One can observe some asymmetry: the left clavicle are slightly longer than the right one, whereas the right collarbones are slightly thicker (Figure 4). The upper scapular edge is of a horizontal or almost a horizontal shape, the upper angle slightly rises over the scapular notch (point 1).The scapular spine, becoming thinner over the base, sharply thickens and further remains more or less the same along its entire length (point3). The glenoid cavity of the scapula is of a pyriform shape. The transition from the upper edge of the scapula to the edge of the scapular notch is quite distinct, but the notch is shallow (point 2). According to the absolute dimensions, the humerus is characterizedby the values of all the signs that go beyond the lower line of the norm. The value of the massiveness index falls into the gradation of small values. The supracondylar process(processus epicondyloides) of the right brachial bone is fixed on the inner crest of the body above the medial condyle.The structure of the upper part of the diaphysis of the ulna is normal,the section does not have a specialized form - eurolining. The size of ulna and radius is on the low end of norm.The ulna and radius are also in all dimensions characterized by values that go beyond the lower line of the norm.

The sacrum is homobasal. The degree of the individual's sacral curvature is 15,16mm which is considerably lower than the group averageof an adult (18-24) (33). The length of the femur (left) also extends beyond the lower line of the norm.The section of the femur is characterized by hyperplatimeria. The patella has the shape of a large oval. Eight facets are observed on the articular surface (medial and lateral parts). The tibias are characterized by small values of the longitudinal dimensions. According to platycnemic index,eurikemiais characteristic both for the right and left sides, i.e. the upper section of tibia is expanded in the transverse direction. The transverse section of tibial diaphysis is a rectangle of an irregular form. The posterior body surface is practically divided into two surfaces- posterior-medial and posterior-lateral (point 4). An even curvature of the lateral condyle (point 4) is observed in sagittal plane. There is an additional articular area on the lower articular surface of the tibia. The reconstruction of body proportions on the basis of the dimensions of the skeleton bones revealed the following trends: the intermembral index goes beyond the lower line of the minimum valueswhich testifies to the elongation of lower limbs with regard to the upper ones. The values of the tibia-femoral index go beyond the highest line of intergroup variation: i.e. the individual had the long tibia, the maximum value of the shoulder-femoral index is also observed. The minimum value of the humeral pointer is observed, i.e the present individual has a very short forearm. The values of the radiohumeral pointer for the right and left sides fall into different categories (brachicercia /right/, mesaticercia /left/). The tibial index goes beyond the lower line of the minimum values; i.e the forearm could be very short.

Now let's turn to the osteological length of the individual'slimbs. The osteological length of the upper limbs (H1+R1:453/ right, 466/ left/; H1+U1:475,5/right/, 480/left/, as well as the osteological length of the lower limbs (F2+T1:675; F1+T1:686; F2+ f1:666: F1+ f1:677) are located beyond the lower line of the intergroup variation.

S. Dupertius and D. Hadden's (24) formulas, worked out for undersized Caucasoid, were used to determine the intravital growth of an individual. It is common knowledge that formulas for determining the length of various bones and the growth of dwarfs don't exist yet, therefore the formulas for people not having deviations in growth processeswere used. The present individual had a disproportionate dwarfism and a height of approximately 145 cm, Table 4.

Markers of Physical Activity (or activity-induced skeletal markers)

Traces of physical exertion are observed on the bones of the upper and lower limbs. The crest of the lesser tubercle, the intertubercular sulcus of the humerus and the deltoid tuberosity of the humerus are fairly well developed on the humeral bones. Suchlike development of the deltoid tuberosity of the humerus testifies to the strong development of the muscle of the same name which raises the upper limb up to a horizontal level and rotates the shoulder inward and outward which in its turn suggests a developed muscular shoulder.

On the whole, we can talk about the great significance of the working activities of the individual's muscles which raise and rotate the shoulder. The radial roughness is moderately (not weakly) developed on the radial bones which is the reflection of the corresponding development of the muscles bending its shoulder and forearm, i.e. muscles, taking part in lifting weight. The quadrate pronator muscle is attached to the distal-lateral crest that is well developed on both ulnar bones. There is also a well developed lateral edge of the inferior limb of radius (both bones) to which this muscle is also attached. Apparently, that individual had to support a heavy load above his head while working. The styloid process (of both bones) of the ulna is well developed; there is a powerful groove closer to the head of the ulna. The powerful ulnar styloid may also indicate the strength of the ligament us apparatus of the mid-carpal joint.

Traces of considerable functional load are fixed on the symphysis, on the pelvic bones. Traces of enthesopathy were formed at the attachment points of the superior pubic ligament (ligamentum pubicum superious) and the arcuate ligament of pubis (ligamentum arcuatum pubis). Bone lysis sectors are seen in the form of round holes with a diameter of 1-2 mm on the articular surfaces of the pubic bones (simphysis pubica), on the left one in particular (Figure 5).The reason for their appearance may be the pubic symphysitis which is part of the multicomponent ARS-syndrome (adductor, rectus, symphis) - a pathological condition of the tendon muscle complex that developed as a result of prolonged and similar loads associated with the asymmetric adductor brevis muscle of the thigh (musculus adductor longus et (or) brevis) and the distal part of the abdominis rectus muscle (musculus rectus abdomonis).The gait, requiring the body to tilt forward when fixing the tibia in a straight or bent position, may lead to trauma.

The intertrochanteric line, having the shape of a crest and strongly protruding above the bone shaft, is well developed on the dwarf's femoral bones. This is the attachment site of the ilio femoral ligament that suppresses the extension of hip joint and takes part in keeping the torso in a vertical position (34). The role of the ligament increases with the displacement of the hip-joint back, a thing which is highlighted as to the present individual. Poirier's facet is fixed on the proximal articular surface of the anterior femoral neck. The gluteal rough is sufficiently developed on the thigh bones and, consequently, on the gluteus maximus of both legs. On theneck of the left thigh there are the so-called "facets of the rider"- structures, developed as a consequence of many years of horse-riding (Figure 6). The posterior surface of tibia corresponding to the soleal line of tibia (the third head of triceps muscle of calf) is moderately (not weakly) developed. The relief on the posterior surface of both tibias corresponding to the soleus line (third head of the triceps tibia muscle) is moderately (but not weakly) developed. It doesn't protrude much above the body level but it is quite long, Table 5.

Pathology

Plagiocephaly (plagiocephalia, greek. πλάγιος"oblique", slanting and κεφαλή"head") of varying severity is revealed in both men (Figures 1 and 2). The asymmetry is right-sided without craniosynostosis.

Dental calculus is fixed on the teeth of both mandible.The formation of dental calculus has a complex etiology and to a large extent depends on the nature of the consumed food.

Individual 1.

Porotic hyperostosis (cribra orbitalia) on the upper wall of the left orbit are barely discernible (point 1). A strong form of the linear enamel hypoplasia is localized on all the incisors, canines, premolars, molars at approximately the same distance from the enamen-cementum junction. Such a position of defects excludes the possibility of their simultaneous occurrence as a result of a severe episodic stress and testifies to the presence of a physiological malfunction in the body, resulting in systemic violations of calcification processes.

Dental chipping is related to microtrauma and therefore a reflection of biting force and potentially diet. An dental chipping was on the right side of the maxillary first molar and mandibular first premolar. Chipping also may be due to blunt force, or an eventual result of wear. No traces of caries were observed.

Individual 2.

On the right side of the frontal bone (closer to the temporal line), a trauma from an impact with a blunt object was revealed (length 8.2 mm, width 1.5 mm).This trauma is accunted for by a direct hit on the part of an attacker, standing face to face with the victim.The trauma was received long before the individual's death.

Quite many pathological changes were detected in the individual's dental system. Dental invagination ("tooth within tooth") (Figure 7) is present on the skull. The macroscopic analysis clearly demonstrates the 3A form of this developmental anomaly in the second left premolar.This anomaly is one-sided. Enamel and dentin are visible and have the shape of a drop or a bulb. A small dental chipping (1.5 mm) with smooth edges on the cutting edge, was detected on the upper right medial incisor. The appearance of the chip might be accounted for by the necessity of biting off threads. A weak form of the linear enamel hypoplasia was detected on some teeth (I1, I2, P2, I1, C, M2, M3/ right) which is a sign of abstemious diet (during the growth of these teeth). No caries is detected.

The shape of the individual's thorax is conical, i.e. its lower part is wider than the upper one, the ribs are slightly inclined. No decrease in the height of the bodies was detected in the vertebral region. However, the thoracic vertebrae are damaged (T 2, 4-6, 10-11) – the initial stage of the formation of vertebral hernias or Schmorl's nodes (Figure 8). A central location of the intervertebral hernias is observed.

Weakly developed osteophytes are revealed along the body edges and on the tops of the spinous processes (Figure 9). Multiple exostoses are fixed on the tooth-like process of the second cervical vertebra. Changes in the bone tissue of the individual under study are accounted for by a severe physical exertion. The present diseases of the spine, coupled with the degree of the muscular relief development, enables us to assume that the individual was systematically subjected to an intense physical exertion.

Almost all the bones of the postcranial skeleton are characterised by the presence of osteoporosison the end sections of the long bones; porosis is also fixed on the pelvic bones, too. X- ray images also record many structural disorders in bone and cartilage tissues, a manifestation of osteoporosis in particular

It is of importance to highlight one more peculiarity of pathology spread in an individual. Periostitis appears in almost all the parts of the skeleton (sternum, long bones of the upper and lower limbs, on the pelvic bones and on the vertebrae) (Figure 10). The traces of periositis testify to an extensive inflammatory process in the body.

With the help of the tibia radiography several zones of stunting are outlined, among them- Harris lines (Figure 11), which are the consequences of impaired development of cartilage, caused by stunting in childhood and adolescence under the influence of unfavorable factors of exogenous and endogenous nature.

The femoral diaphysis is curved in the anteriorly direction (arcuation begins in the upper third) (Figure 12). Factic changes of the skeletal system are very often observed by dwarfism (35).

Discussion

Owing to the paleoanthropological research, we have learnt about the antropological type, the peculiarities of physical development, and the pathologies of two individuals from Dvin. The distribution of ceratin genetically determined (discretely varying) signs allows us to admit the presence of a certain kinship relations between the individuals. Unfortunately, because of the lack of bones of the postcranial skeleton of individual 1, we can only state microcephaly. Microcephaly is a condition in case of which the head is small, and it directly depends on the small size of the brain. The brain develops up to a certain point, however, because of the small size of the skull, its development slows down. The disease may be accounted for by the infections with measles, chickenpox or cytomegavirus; genetic disorders are not excluded. Porotic hyperostosis is also observed in the individual 1. The porotic hyperostosis is formed in childhood and is most often associated with iron deficiency anemia which develops in the chronic course of infectious and parasitic diseases . However, slight symptoms of cribra orbitalia don't always serve as a manifestation of the adaptive reaction to anemia, but they may emerge in the local inflammatory processes. Owing to the paleoanthropological research, we have learnt about the antropological type, the peculiarities of physical development, and the pathologies of two individuals from Dvin. The distribution of ceratin genetically determined (discretely varying) signs allows us to admit the presence of a certain kinship relations between the individuals. Unfortunately, because of the lack of bones of the postcranial skeleton of individual 1, we can only state microcephaly. Microcephaly is a condition in case of which the head is small, and it directly depends on the small size of the brain. The brain develops up to a certain point, however, because of the small size of the skull, its development slows down. The disease may be accounted for by the infections with measles, chickenpox or cytomegavirus; genetic disorders are not excluded. Porotic hyperostosis is also observed in the individual 1. The porotic hyperostosis is formed in childhood and is most often associated with iron deficiency anemia which develops in the chronic course of infectious and parasitic diseases . However, slight symptoms of cribra orbitalia don't always serve as a manifestation of the adaptive reaction to anemia, but they may emerge in the local inflammatory processes (15, 30).

Individual 2 is characterised by pituitary dwarfism. The most probable diagnosis in the light of the obtained data, is the dwarfism of Laron (or Laron syndrome). The disease is typical of children born from closely related marriages; growth inhibition occurs in the postnatal period. In the case of a normal torso length, the body build of a dwarf is disproportionate (shortening of the humerus, radus, ulnar bone and femur prevails).This is a kind of dwarfism caused by a

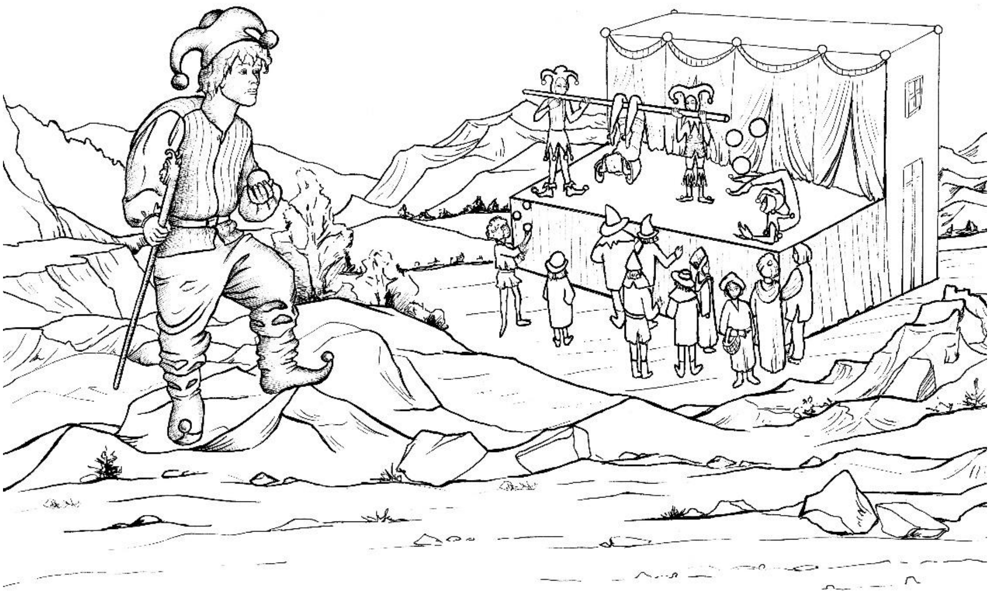

Figure 13 Graphic illustration of a dwarf (artist Ani Sahakyan).

congenital defect of the somatotropic hormone receptor (STH) gene (36, 37). STH of the anterior pituitary gland, more precisely its somatomedins, affect the production of an insulin-like factor in the liver, promoting the growth of the chondroplastic and periosteous bone and an increase of the skeleton size. Most individuals having the syndrome of Laron descend from the Semitic Middle East, the Mediterranean, as well as from South Asia (38, 39, 40, 41, 42). There also is evidence for Harris lines, evidence for linear enamel hypoplasia, which may suggest that there was evidence for periods of severe physiological stress as the result of malnourishment. Individuals suffering from malnutrition are more likely to have shorter long bones, potentially show delayed skeletal development (e.g., skeletal maturation lagging behind dental development, etc.), and potentially show evidence for osteopenia/osteoporosis (thin cortical bone, less trabeculae or decreased density/connectivity) (43,44, 45, 46). It is probably connected with the lack of vitamins in food intake or with the shortage of calcium in the environment or with the iodine deficiency and consequently with the lack of thyroid gland function (44, 45). The femoral diaphysis is curved, it testifies to rickets-a disease of a growing organism caused by metabolic disorder (first of all calcium-phosphorus metabolism), the main clinical syndrome of which is the lesion of the skeletal system(proper growth, bone mineralization, etc.) in the case of which the pathological process is localized, mainly around the epiphysial cartilage

The femoral diaphysis is curved, it testifies to rickets-a disease of a growing organism caused by metabolic disorder (first of all calcium-phosphorus metabolism), the main clinical syndrome of which is the lesion of the skeletal system(proper growth, bone mineralization, etc.) in the case of which the pathological process is localized, mainly around the epiphysial cartilage (15).

We assume that despite his small stature, the young man had regularly been carrying out actions associated with a great physical exertion. The Schmorl's nodes is formed because of considerable compressive load on the backbone mainly during the growth period. Probably he had constantly been lifting a long tree pole with a partner (up to a certain period of time until there arose problems with spine and pelvis), whereas the other partner (in the middle) displayed various tricks on the perch. However, he could have performed certain tricks, too. He was a horseman as well. The pelvic fracture of bones prevented him from keeping his back erect while walking. There also arose problems with the shin-bone. As far as the individual is young, such vividly expressed pathologies testify to an excessive and intensive load on the skeleton. Lameness, stiffness are the distinctive features of a person, being restored according to the skeleton under study (Figure 13). Performances with the participation of acrobats, dancers, musicians and singers are clearly and convincingly demonstrated in the Armenian medieval handwritten miniatures. In the Early Middle Age performances of histrions, equilibrists, jesters, both in courtyards and in private houses, were also popular. Individuals, in particular dwarfs, with various physical disabilities were among them. All the types of spectacular arts (dancing, singing, gymnastics, etc) were sometimes embodied in one person. Their program included the most complicated acrobatic and juggler performances, displaying their strength and dexterity.

One of the Byzantine writers of the Early Middle Age refers to a group of people from Egypt who put on performances in Arabia, Persia, Armenia and Georgia. "At that time people who mastered a wonderful art came to Constantinople. They descended from Egypt and displaced their art on their way to Arabia, Persia, Armenia and Georgia. Everything they did was extraordinary and wonderful; however, it wasn't a devilish obsession, but a natural activity that was the result of a long-lasting exercise. We will represent some of their actions without going into details. For example, taking two or three masts and placing them vertically into the ground, acrobats strengthened them with thin ropes. Climbing on them, one stood on the very top of the mast either on one leg, or on the other, then lifted both legs up, leaning his head against the top of the mast; afterwards, making an unexpected jump, he tightly grabbed the rope with one hand and clung to it, after which he quickly and continuously began to spin like a wheel. Another acrobat, having saddled a horse, urged it at a full trot and stood erect either on its neck or on the mone, constantly and boldly pawed the ground, posing like a flying bird. He suddenly jumped off the running horse, caught its tail and suddenly appeared on the saddle again. Or he descended the saddle from one side, easily got on it from the other side and rode the horse again. Showing such tricks, he kept on whipping the horse. Such tricks didn't always have a happy end, they ended up with harmful consequences; quite often these people dropped off and this ended up with death. More than 40 people left their motherland and only fewer than twenty acrobats in good health reached Byzantium" (47, p. 84-85).

Early images of dwarfs can be seen in Mohonjo-Daro (2600 BC) where they are presented in dancing poses (48). Many images of dwarfs are recorded on the ornamental dorways of the cave temples of Agantha, Ellora, Aurangabad and etc. The images of dwarfs in sculpture are folk characters performing a folklore function ("providing an outlet to ensure that it cannot be spoken" (49). By their origin they are associated with animistic beliefs of nature beliefs. Located in the border spaces of temples, their images act as a talisman, the main function of which is to ensure prosperity. The role of court jesters and theatrical actors entertaining deities with their acting, playing music, dancing, juggling, grimacing passed on to them as well It is rather difficult to carry out a historiographic review on the present topic using the materials discovered on the territory of Armenia, as historians and ethnographers (both domestic and foreign ones) have not practically touched upon the theme of dwarfs. I. Orbeli (50, p. 162) narrates about a dwarf found duringthe excavations of Amberd (Armenia, XIIc.). The remains of a man of about 45 along with a cap like a cockscomb and bones of a rooster- an inseparable companion of a jester of the East and the West, were discovered in an Amberd bath. Some part of the mandibular bone left side was missing which made the face curving and slanting. All the teeth of the individual's all the teeth were pulled out, probably intentionally. Moreover, the chin was operated on. Doctors, advising Orbeli, considered that a buffon couldn't keep his mouth closed during his lifetime as he always kept smiling. It is common knowledge, the trade of jesters and individuals having physical disabilities didn't occupy the last place in human trafficking which was carried out by european companies and their rights were related to human trafficking in XII-XIII centuries and they were introduced to the well-known framework of requirements and obligations imposed on the Venetian and Genase merchants by the kings of Small Armenia (50). The researcher admits that the man burried in the bath with his inseparable companion- the cock, was one of those wonders who had covered a long way from the Mediterranean to the slopes of Aragats in order to decorate the courtyard of the ruler of the unassailable castle Anberd.

Thus, having carried out a possibly thorough investigation of the remains of two individuals detected in the ruins of St. Gregory Cathedral, we assume that they could have been touring histrionics at the royal, princerly and ducal courts of Dvin.

References

1. Dasen V. Dwarfs in Ancient Egypt and Greece. Oxford Monographs on Classical Archaeology, Clarendon Press, 1993.
2. Dasen V. Dwarfism in Egypt and classical antiquity: iconography and medical history. Medical History 1988; 32 (3): 253–276.

3. Słowiński M. Błazen, dzieje postaci i motywu. Poznań, 1990.
4. Kozma C. Dwarfs in ancient Egypt. American Journal of Medical Genetics 2006; 140A (4): 303–311.
5. Adelson BM. Dwarfs: the changing lives of archetypal 'Curiosities'–and echoes of the past. Disabil. Stud. 2005; Q. 25 (3) N.PAG.
6. Sinclair J. The Quasimodo Complex: Deformity Reconsidered. In Donley C, Buckley S (Eds.) The Tyranny of the Normal. Kent State University Press, pp. 27–52, 1996.
7. Frayer WD, Macchiarelli R, Mussi M. A case of chondrodistrophic dwarfism in the Italian Late Upper Paleolithic. Am J Phys Anthrop. 1988; 75: 549-565.
8. Brothwell D. Major congenital anomalies of the skeleton: evidence from earlier populations. In: Brothwell D, Sandison A (eds.): Diseases in Antiquity: a survey of the diseases, injuries and surgery of early populations, Thomas, Springfield, IL, pp. 423-446, 1967.
9. Kozma C. Skeletal dysplasia in ancient Egypt. Am J Med Genet. 2008; Part A 146A: 3104-3112.
10. Minozzi S, Catalano P, Caldarini C, Fornaciari G. Palaeopathology of Human Remains from the Roman Imperial Age. Pathobiology. 2012; 79: 268-283.
11. Gladykowska-Rzeczycka J. Remains of achondroplastic dwarf from Legnica of XI–XIIth century. Ossa. 1980; 7: 71–74.
12. Farkas G, Nagy E, Kosa F. Skeleton of a dwarf from excavations Hungarian site, Acta Biologica Szegediensis. 2001; 45 (1–4): 79–82.
13. Sables A. Rare example of an Early Medieval dwarf infant from Brownslade, Wales. Int J Osteoarch. 2010; 20: 47-53.
14. Khudaverdyan AYu. A dwarfism skull: Excavated on the site of the Late Bronze Age and Early Iron Age cemetery at Artsvakar (Armenia). Journal of Paleopathology. 2016; 26 (2–3): 93–104.
15. Ortner DJ. Identification of Pathological Conditions in Human Skeletal Remains. Academic Press, 2003.
16. Khudaverdyan AYu. Palaeopathology of human remains of the 1st century BC - 3rd century AD from Armenia (Beniamin, Shirakavan I). Anthropological Review. 2015; 78 (2): 213–228.
17. Phenice TW.. A newly developed visual method of sexing the os pubis. Am J Phys Anthropol. 1969; 30: 297–302.
18. Buikstra JE, Ubelaker DH. Standards of data collection from human skeletal re¬mains. Fayetteville: Arkansas Archaeolog¬ical Survey Research Series, 44, 1994.
19. Gilbert BM, McKern TW. A method for aging the female os pubis. Am J Phys An¬thropol. 1973; 38:31–38.
20. Katz D, Suchey JM. Age determination of the male os pubis. Am J Phys Anthropol 1986; 69:427–435.
21. Meindl RS, Lovejoy CO. Ectocranial Suture Closure: A Revised Method for the Determination of Skeletal Age at Death Based on the Lateral-Anterior Sutures. Am J Phys Anthropol 1985; 68:57–66.
22. Lovejoy CO, Meindl RS, Pryzbeck TR, Mens¬forth RP. 1985.Chronological metamor¬phosis of the auricular surface of the ili¬um: A new method for the determination of adult skeletal age at death. Am J Phys Anthropol 68:15–28.
23. Alekseev VP, Debets GF. Kraniometriia: Metodika antropologicheskikh issledovanii [Craniometry: Methods of anthropological investigations], Moscow: Nauka, 1964. (in Russian)
24. Alekseev VP. Osteometriya (metodika anthropologicheskikh issledowanii)[Os¬teometry (methods of anthropological re¬search)]. Moscow: Nauka, 1966. (In Russian)
25. Zubov AA. Nekotorye dannye odontologii k probleme evoliutsii cheloveka i ego ras. In Zubov AA. (Ed.) Problemy evoliutsii cheloveka i ego ras. Moscow, pp. 5–122 1968a (in Russian)
26. Zubov AA. Odontologiia: (Metodika antropologicheskikh issledovanii) [Odontology: (Methods of anthropological investigations)]. Moscow: Nauka 1968b. (in Russian)
27. Zubov AA. Ethnic odontology. Moscow: Science, 1973.
28. Zubov AA. Metodicheskoe posobie po antropologicheskomu analizu odontologicheskikh materialov [A methodological manual on anthropological analysis of odontological materials]. Moscow, 2006. (in Russian)
29. Movsesyan AA, Mamonova NN, Richkov YuG. Programma i metodika issledovaniya anomalii cherepa [The program and method of research of anomalies of a skull]. Anthropology questions. 1975; 51: 127-150 (in Russian)
30. Stuart-Macadam PL. Anemia in Roman Britain: Poundbury Camp. In: H Bush,M Zvelebil, editors. Health in past societies: biocultural interpretations of human skel¬etal remains in archaeological contexts. Oxford: AR Internat Ser 567, pp. 101–113, 1991.
31. Hillson S. Dental anthropology. 2nd edition. Cambridge: Cambridge Universi¬ty Press, 1996.
32. Brothwell DR. Digging Up Bones. 3rd edition. Ithaca: Cornell University Press, 1981.
33. Roginskii YY, Levin MG. Antropologiia [Anthropology]. Moscow, Vysshaya shkola, 1978. (in Russian)
34. Kishsh F, Sentagogotai Y. Anatomicheskii atlas chelovecheskogo tela, vol. 1: Kostnaia sistema - sustavnaia sistema - myshechnaia sistema, 25 izd., Budapest, 1967 (in Russian)

35. Khudaverdyan AYu, Hakopyan NG, Zhamkochyan AS, Engibaryan AA, Hoganesyan AA. Anthropological characteristics of individuals of the IX–XI centuries from the monument of Dvin (Armenia) with growth disorders. Bulletin of Archeology, Anthropology and Ethnography. 2017; 3 (38): 73-99. (in Russian)
36. Riggz L, Milton DA. Osteoporoz: Etiologiia, diagnostika, lechenie. St. Petersburg, 2000. (in Russian)
37. Bykov NA. Tsitologiia i obshchaia gistologiia, St. Petersburg, 2001. (in Russian)
38. Rosenfeld RG, Rosenbloom AL, Guevara-Aguirre J. Growth hormone (GH) insensitivity due to primary GH receptor deficiency. Endocrine Reviews. 1994; 15: 369–390
39. Rosenbloom AL, Guevara-Aguirre J. Lessons from the genetics of Laron syndrome. Trends in Endocrinology & Metabolism. 1998; 9: 276–283.
40. Galli-Tsinopoulou A, Nousia-Arvanitakis S, Tsinopoulos I, Bechlivanides C, Shevah O, Laron Z.. Laron syndrome. First report from Greece. Hormones 2003; 2 (2): 120–124.
41. Besson A, Salemi S, Eble A, Joncourt F, Gallati S, Jorge AA, Mullis PE. Primary GH insensitivity (Laron syndrome) caused by a novel 4 kb deletion encompassing exon 5 of the GH receptor gene: Effect of intermittent long-term treatment with recombinant human IGF-I. European Journal of Endocrinology. 2004; 150: 635–642.
42. Laron Z. Laron syndrome (primary growth hormone resistance or insensitivity). The personal experience 1958–2003. Journal of Clinical Endocrinology & Metabolism. 2004; 89: 1031–1044.
43. Alvear J, Artaza C, Vial M, Guerrero S, Muzzo S. Physical growth and bone age of survivors of protein energy malnutrition. Arch Dis Child. 1986; 61: 257–262.
44. Dickerson JWT, Hughes PCR. Growth of the rat skeleton after severe nutritional intrauterine and post-natal retardation. Resuscitation. 1972; 1 (2): 163–170
45. Faridi MMA, Ansari Z, Tyagi SP. Skeletal muscle changes in protein energy malnutrition. J Trop Pediatr 1988; 34 (5): 238–243.
46. Fleagle JG, Samonds KW, Hegsted DM. Physical growth of cebus monkeys, Cebus albifrons, during protein or calorie deficiency. Am J Clin Nutr. 1975; 28 (3): 246–253.
47. Petrosyan E.Kh. Teatr v srednevekovykh armianskikh miniatiurakh. Yerevan, 2014. (in Russian)
48. Mackey E.J.H. Further Excavations at Mohenjo-daro: Being an official account of archaeological excavations at Mohenjo-daro, carried out by the Government of India between the years 1927 and 1931. Delhi, 1938.
49. Dandes A. Fol'klor: Semiotika i/ili psikhoanaliz. Moscow, 2003. (in Russian)
50. Orbeli I. Banya i skomorokh XII veka. In Pamyatniki epokhi Rustaveli. Leningrad, pp. 159–170, 1938. (in Russian)

Table 1. Measurements of the skulls from Dvin.

	Individual 1. ♂	***Individual 2.*** ♂
1.Maximum cranial length (g-op)	159,5	153,5
8. Maximum cranial breadth (eu-eu)	146	136,5
8:1.Cranial index	91,54	88,93
17. Height skull	130	126
17:1.High altitude longitudinal pointer	81,51	82,09
17:8.Altitude-transverse index	89,04	92,31
20. Height skull	122,5	118
20:1.High altitude longitudinal pointer	76,81	76,88
20:8. Altitude-transverse index	83,91	86,45
5.Length of the skull base	90	95,5
9. Minimum frontal breadth (ft-ft)	96	89
9:8.Fronto-transverse index	65,76	65,21
10.Maximal frontal breadth	127,5	114
12.Occipital breadth	107	100
29.Frontal chord (n-b)	111	100
30.Parietal chord (b-l)	103	96
31.Occipital chord (l-o)	89	86
11. Width of the skull base	119	119

26. Frontalarch	128	112
27.Parietal arch	113	113
28. Occiput arch	106	101
32.Frontal pronfile angle (n-m)	85	85
Frontal pronfile angle (g-m)	84	80
45.Bizygomatic breadth (zy-zy)	122	116?
48. Upper facial height	65,5	64
48:45Upper facial index	53,69	55,18
43.Upper facial breadth (fmt-fmt)	101?	96
46. Mid-facial breadth	83	88
60. Maxillary alveolar length (incision-alv)	48	51
61. Maxillo-alveolar breadth (ecm-ecm)	56	59
62. Palatal length (st-o)	39,5	42
63.Palatal breadth between the second molars (enm-enm)	27,2	27,8
63:62. Palatal index	68,87	66,191
55.Nasal height (n-ns)	46,5	49
54. Nasal breadth (al-al)	18,8	21
54:55.Nasal index	40,44	42,86
51.Orbital breadth (d-ec)	39,5	40,2
51a.Orbital breadth (ect-d)	36,5	36
52.Orbital height bicondylar width	34	32,5
52:51.Orbital index (mf)	86,08	80,85
52:51a.Orbital index (d)	87,5	90,28
MC. Maxillo-frontal chord	23	15
MS. Maxillo-frontal subtense	5,5	9
MS:MC. Maxillo-frontal index	23,92	60,0
DC. Dacryal chord	24,5	19,5
DS. Dacryal subtense	9,5	13
DS:DC. Dacryal index	38,78	66,67
SC (57). Simotic chord	8,8	7
SS. Simotic subtense	2,2	5
SS:SC.Simotic inde	25,0	71,43
72. Total facial angle	86	84
73.Mid-facial angle	87	81
74.Alveolar angle	88	88
75(1).Nasal protrusion angle	23	36
77. Naso-malar angle (fmo-n-fmo)	142	136
<zm.Zigo-maxillary angle (zm`-ss-zm`)	134	126

Table 2. Cranioscopic features of individuals from Dvin.

	Individual 1.	*Individual 2.*
Foramina supraorbitalia	+ /right/	-
Foramina frontalia	+ /right/	-
Foramina zygomaticofacialia	+	+ /right/
Os zygomaticum bipartitum	+ /right/	+ /right/
Spina processus frontalis	straight	straight /right/
Stenocrotaphia	H-shaped	X-shaped
Processus frontalis squamae temporalis	+	+ /right/
Processus temporalis ossis frontalis	-	+ /left/
Os Wormii suturae squamosum	-	+
Os postsquamosum	-	+ /right/
Foramina parietalia	+	+ /left/
Foramina mastoidea	+ /right, off seam/	+ /on and off seam/
Sutura palatina	П-shaped.	П-shaped
Sutura incisiva	+	+

Foramen pterygospinosum	+	-
Canalis craniopharyngeus	-	+
Condylus occipitalis bipartitum	+	-
Processus paramastoideus	+	+
Canalis condyloideus	+	+ /right/

Table 3. Dental features individuals from Dvin.

	IndividualNº 1		***IndividualNº 2***	
	Maxilla VL$_{cor}$			
	right	left	right	left
I1	-	-	6.5	6.5
I2	6.5	-	5.5	5.5
C	7.5	-	7.2	7.5
P1	8.5	-	8.2	8.2
P2	9.1	-	8.8	8.8
M1	10	10	10.2	10.2
M2	12	11	10	10.2
M3	-	-	10.2	9.2
	MD$_{cor}$			
I1	-	-	8	8
I2	7.2	-	6.8	6.8
C	7.5	-	7.5	7.5
P1	6.8	-	6.5	6.5
P2	7	-	6.5	6.5
M1	10	10	10	10
M2	6	6	9	9
M3	-	-	7	7
	H$_{cor}$			
M1	6	6	5	5
M2	8	8	5	5.5
M3	-	-	4.2	4.5
	MD$_{col}$			
M1	7.2	7.2	7.5	7.5
M2	5	5	7	7.2
M3	-	-	7	5.5
	MD × VL			
M1	100	100	102	102
M2	72	66	90	91.8
M3	-	-	71.4	64.4
	I$_{cor}$ (VL / MD) × 100			
M1	100	100	102	102
M2	200	183.34	111.12	113.34
M3	-	-	145.72	131.43
	m$_{cor}$MD + VL / 2			
M1	10	10	10.1	10.1
M2	9	8.5	9.5	9.6
M3	-	-	8.6	8.1
	Mandible			
	VL$_{cor}$			
I1	-	-	5.5	5.5
I2	5.8	-	5.5	5.8
C	7	7	6.8	6.8
P1	7.5	7.5	7.2	7
P2	-	7.2	7.8	7.8
M1	10	10	10	10

M2	9	9	9,2	9.2
M3	-	9	9,2	8.8
			MD_{cor}	
I1	-	-	5	4.8
I2	6	-	5.5	5.5
C	6.8	6.8	7	6.8
P1	7	7	6.8	6
P2	-	7	7	7
M1	11	11	11	11
M2	9.2	9.5	10	10
M3	-	9	9.9	9
			H_{cor}	
M1	6.1	5.8	5.1	5
M2	6.2	6.5	6	5
M3	-	5.5	5	5.5
			MD_{col}	
M1	8.9	8.9	9	8.2
M2	8	8	8.2	8.2
M3	-	7.8	7.5	8
			MD × VL	
M1	110	110	110	110
M2	82.8	85.5	92	92
M3	-	81	91.08	79.2
			I_{cor} (VL / MD) × 100	
M1	90.91	90.91	90.91	90.91
M2	97.83	94.74	92	92
M3		100	92.93	97.78
			m_{cor}MD + VL / 2	
M1	10.5	10.5	10.5	10.5
M2	9.1	9.25	9.6	9.6
M3	-	9	9.55	8.9

Table 4. Postcranial measurements of a skeleton №2 from Dvin.

	Individual right	**№2** left
Clavicula		
1. Maximal length	119	123?
6. Midshaft circumference	28	26
6:1 Robusticity index	23. 53	21.14
Scapula		
1. Morphological length	119	121.5
2. Morphological width	88.5	89.5
2:1 Form index	74.37	73.67
Os sacrum		
5. Top width	110	
2. Front height	99?	
6. Bending depth	15	
5:2 Latitude-altitude index	111.12	
6:2 Bending depth index	15.16	
Humerus		
1. Maximal length	263	266
2. Total length	259	262,5
3. Upper epiphysis breadth	40.2	40.2
4. Maximal midshaft breadth	52,8	53
7. Minimal midshaft breadth	48	48

7a. Midshaft circumference	51	50
7:1 Robusticity index	18.261	8.05
Radius		
1. Maximal length	190	200
2. Physiological length	189	190
4. Cross-section diameter	12	13
5. Sagittal shaft diameter	10	9.8
3. Minimal shaft circumference	34	34
3:2 Robusticity index	17.99	17.895
5:4 Cross-section index	83.34	75.39
Ulna		
1. Maximal length	212.5	214
2. Physiological length	87	1189
11. Sagittal diameter	9	9.9
12. Transverse diameter	12	12
13. Upper transverse diameter	12	12.2
14. Upper sagittal diameter	13	13,5
3. Minimal shaft circumference	28	29
3:2 Robusticity index	14.98	15.35
11:12 Cross-section index	75,0	82.5
13:14 Platyleny index	92.31	90.38
Femur		
1. Maximal length	-	364
2. Natural length	-	353
21. Condylar breadth	68.8	69
6. Sagittal diameter of midshaft	21	21
7. Transverse midshaft diameter	24.5	25
9. Upper transverse shaft diameter	27	27
10. Upper sagittal shaft diametere	19	19
8. Midshaft circumference	70	69
8:2 Robusticity index	-	19.55
6:7 Pilastry index	85.72	84
10:9 Platymery index	70.38	70.38
Patella		
1.Maximum height	33	-
2. Maximum width	37	-
1:2 Latitude-altitude index	89.19	-
Tibia		
1.Fulllength	319	322
2. Condylo-talar length	300.5	301.5
1a. Maximal length	323	325
5. Upper epiphysis breadth	62.5	63
6. Lower epiphysis breadth	37	37
8. Sagittal diameter at midshaft level	23	22
8a. Sagittal diameter at the nutrient foramen level	24,8	24
9. Transverse diameter at midshaft level	16.8	16.8
9a Transverse diameter at the nutrient foramen level	18	17.8
10. Midshaft circumference	62	62
10б. Minimal shaft circumference	54	54
9:8 Cross-section index	73.05	76.37
10b:1 Robusticity index	16.93	16.78
9a:8a Cross-section index	72.59	74.17
10:1 Robusticity index	19.44	19.26
Fibula		
1.Maximum length	310	313
1a. Medial length	305	307
4 (1). Upper epiphysis width	22	23
4 (2). Width lower epiphysis	21	21.5
2.Maximum width of the mid-diaphyseal	10	10
3.The smallest width of the mid-diaphyseal	9.8	9.8

4. The circumference of the mid-diaphysea	29	30
4a. The smallest circumference of the diaphysis	23	23
4a:1 Robusticity index	7.42	7.35
3:2 Secheniyaindex	98.0	98.0
Skeletal proportions and body length		
Brachial index (R1 : H1)	72.25	75.19
Tibio-femoral index (T1 : F2)	-	91.22
H1+R1/F1+T1 Intermembral index	-	67.94
H1+R1/ F2+T1 Intermembral index		69.04
H1:F2 Humero-femoralindex	-	75.36
Radio-tibial index (R1 : T1)	59.57	62.12
C1:H2 Clavicula-humeral index	45.95	46.86
Body length(by S. Dupertuis and D. Hadden) 84.898+1.072 (F+T) 87.543+1.492 (H+R)	- 134.34	154.57 135.64
Average	145.11	

Table 5. The recording system for musculoskeletal stress.

	Right	**Left**	**Right and left in total**
Humerus			
Crista tuberculi minoris, crista tuberculi majoris	2.5	2	2.25
Tuberositas deltoidea	2	2	2
Tuberculum majus, tuberculum minus	2	1.5	1.75
Margi lateralis, medialis et anterior Epicondili lateralis et medialis	1.5	2	1.75
In total	2	1.88	1.94
Radius			
Tuberositas radii	1.5	1.5	1.5
Margo unterossea	1.5	1.5	1.5
Processus styloideus	2	2	2
In total	1.5	1.62	1.56
Ulna			
Margo interossea, margo posterior	1	1	1
Crista musculi supinatoris	2.5	2	2.25
Tuberositas ulnae	2	2	2
In total	1.84	1.67	1.75
Femur			
Trochanter major	2	2	2
Trochanter minor	2	2	2
Tuberositas glutea	1.5	2	1.75
Linea aspera	1.5	1	1.25
Epicondili	2	2	2
In total	1.8	1.8	1.8
Tibia			
Tuberositas tibiae	1	1	1
Margo anterior, margo interossea	1	1	1
Linea m. solei, m. soleus	1	1	1
In total	1.13	1.13	1.13
Fibula			
The edges development	2	2	2