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## PATHOLOGICAL MANIFESTATIONS ON PALEOANTHROPOLOGICAL MATERIAL FROM RURAL BURIALS OF 14<sup>th</sup>—16<sup>th</sup> CENTURIES FROM THE TERRITORY OF POLOTSK LAND

*The results of paleopathological study of osteological material obtained during archaeological excavations of rural burial grounds of the 14<sup>th</sup>—16<sup>th</sup> centuries, located on the territory of Polotsk land. In total, 72 individuals from three cemeteries were examined (Ives, Biruli and Dolgoe). The purpose of the work is to identify and analyze pathologies and nonspecific reactions of the body, determined on bone material.*

*The study identified the most typical for the rural population of the studied burial grounds pathology and trauma — degenerative changes of the spine and joints, skull injuries, abscesses, caries, periodontitis, non-specific reactions of the body (porotic hyperostosis, cribra orbitalia, enamel hypoplasia, vascular reactions).*

**Keywords:** *rural population of the Belarusian Dvina region of 14<sup>th</sup>—16<sup>th</sup> centuries, osteology, paleopathology, degenerative-dystrophic changes, injuries, dental pathologies, non-specific reactions of the body.*

**Introduction.** Paleopathological studies of the rural population of the Belarusian Dvina region of the 14<sup>th</sup>—16<sup>th</sup> centuries significantly enrich the knowledge about the living conditions, providing material about the most characteristic diseases of the past centuries that existed in the studied region. The bioarchaeological direction is an actual vector of development of the anthropological science of Belarus. The research results supplement the anthropological database with data on the lifestyle of ancient people, highlight regional features, and contain information about factors that had a direct impact on the occurrence and development of diseases among the rural population.

For the first time in Belarus, the paleoanthropological direction was developed by I. Salivon. In the 1960<sup>s</sup> and 1970<sup>s</sup>, under her leadership, excavations of rural burial grounds of the 18<sup>th</sup>—19<sup>th</sup> cen-

turies were carried out in different regions of Belarus in order to collect and study the structural features of the bone remains of the population of this period. Based on the comparison of these materials with the data of previous researchers on the population of the 11<sup>th</sup>—13<sup>th</sup> centuries, the continuity of the main racial characteristics of the anthropological type in time is noted, the direction of epochal structural variability of the skeleton in general and the size of the head over the last millennium is traced (Цягака і інш. 2006, с. 37, 38).

An actively developing and promising area of modern paleoanthropology is the reconstruction of the type of physical activity and motor activity of ancient people associated with their occupation. O. Marfina's research of postcranial skeletons from burial mounds of the 12<sup>th</sup> century in Drutsk, Vitebsk region revealed pathological structural changes in the bone system and traces of injuries (Марфина 2015, с. 71).

A significant contribution to the study of the dynamics of the anthropological composition of the Northern region of our country was made by the research of an anthropologist from Polotsk, O. Yemelyanchik. New arrivals of a large volume of paleoanthropological material from the Polotsk land of the 10<sup>th</sup>—14<sup>th</sup> centuries allowed it to prove the heterogeneity of the population during this period. Of particular interest are the paleoecological works of O. Yemelyanchik, dedicated to determining the frequency of occurrence of the marker of anemic stress (cribra orbitalia; Марфина 2016, с. 71).

**Materials and methods.** The material for paleopathological research was the osteological collection of Polotsk State University (Belarus). Its formation was started in 2010, when the ar-

Sex and age composition of the studied individuals of 14<sup>th</sup>—16<sup>th</sup> centuries

Burials	Male	Female	Adults of unknown gender	Children	Total
Ives	12	7	2	7	28
Dolgoe	2	5	15	9	31
Biruli	6	3	3	1	13
Total	20	15	20	17	72

archaeologist V. Cherevko conducted archaeological excavations of rural burial grounds in the village of Ives and Dolgoe (Glubokoye district). In the following years, the burial ground near the village of Biruli (Dokshytsy district).

The sex and age composition of the studied series is shown in table.

Ives (14<sup>th</sup>—16<sup>th</sup>). Burial ground near the village of Ives (Glubokoye district, Vitebsk region). Graves were marked with stone plates. Some of the boulders had carved crosses on them, and there were no burial mounds (Чараўко, 2011, с. 5). During the study period, 28 burials of medium preservation were identified. The grave goods indicated that the period of existence of the burial ground is limited by the 14<sup>th</sup>—16<sup>th</sup> centuries (Чараўко 2016b, с. 21; 2012, с. 10; 2011, с. 5; 2013, с. 5; 2014, с. 19).

Biruli (14<sup>th</sup>—16<sup>th</sup>). The kurgan-zhalnik burial ground near the village of Biruli in the Dokshytsy district is located on the shore of lake Medzozol, and includes both burial mounds and ground burials with stone linings of later times. In 2011, the research of the Biruli burial ground was carried out by archaeologists A. Voitekhovich and V. Cherevko. During the excavations, 5 burials were discovered, of which four were found without inventory. Burial 5, which has an inventory (an earring), was dated to the 14<sup>th</sup>—16<sup>th</sup> centuries (Чараўко 2012, с. 6—8).

Dolgoe (14<sup>th</sup>—18<sup>th</sup>). The burial ground is located about 0.2 km northeast of the village of Dolgoe. During the excavations that were carried out in 2015, the archaeologist discovered 29 burials. There were no grave goods. The study revealed that part of the burial ground functioned in the 15<sup>th</sup>—18<sup>th</sup> centuries (Чараўко 2016a, с. 177). At the same time, A. Voitekhovich conducted excavations of a mound with late medieval intake burials (8 burials). Analysis of burials in the complex makes it possible to date them to the beginning of the 16<sup>th</sup> century. In general, 13 burials of good preservation were investigated on the site (Вайцяховіч 2012, с. 33, 34).

Osteological material from the graves of Ives and Biruli was studied by the O. Yemelyanchik. The assessment of traumatic injuries and stress indicators, such as cribra orbitalia, caries, hypoplasia of tooth enamel was given. Based on the

measurement of skulls, a characteristic of the anthropological features of the rural population was compiled (Емельяничук, 2012). Also, O. Yemelyanchik in his article presented the results of paleodemographic research of the Ives and Dolgoe burial grounds (Емельяничук 2017).

The degree of preservation of osteological material was determined according to the method of N. Mamonova (Мамонова и др. 1989, с. 51—53). The gender and age of adult individuals were defined using a comprehensive method to identify structural features of the skull and pelvic bones (Buikstra, Ubelaker 1994, p. 18, 20).

When determining the biological age of adult individuals, the degree of obliteration of the cranial sutures, as well as the degree of the teeth abrasion, was taken into account. However, using that feature may be erroneous, since the odontological material is not well preserved in the collection (Piontek 1996, s. 151). The age of children was determined by the degree of development of the dental system using the scheme of D. Ulebaker (Buikstra, Ubelaker 1994, p. 51). If the postcranial skeleton was preserved, the degree of ossification of the skeleton was taken into account (Piontek 1996, s. 148).

The paleopathological study was carried out using a complex method developed by paleopathologists A. Buzhilova (Buzhilova 1998) and D. Buikstra and D. Ubelaker (Buikstra, Ubelaker 1994). In addition, the study recorded cases of manifestation of markers of physiological stress, namely, porotic hyperostosis, cribra orbitalia, enamel hypoplasia, vascular reaction.

To obtain reliable frequency numbers, the preservation of the skeleton for each group of pathological conditions was taken into account. For diseases of the spine, the safety of vertebral bodies and articular processes was at least 50 %. For traumatic skull injuries, individuals with a preserved skull without a lower jaw were allowed. For caries, the safety of molars in at least one of the jaws was taken into account. When calculating cases of inflammatory diseases of the dental system (abscesses and paradontopathies), individuals who had at least one of the jaws preserved were taken into account. For porotic hyperostosis, the preservation of the cranial vault was important. At the same time, an osteological material with preserved orbital parts of the frontal bone was used for cribra orbitalia. Enamel hypoplasia was accounted for among individuals with the majority of teeth in one of the jaws. Skeletons with preserved brow arches were used to assess the prevalence of vascular reaction.

**Results and discussion.** Among the ancient rural population represented by the burial grounds of Ives, Biruli and Dolgoe, the following pathological changes of the spine and joints were registered: degenerative changes of the vertebral bodies, Schmorl nodes, spondyloarthrosis and spondylosis of the vertebrae, systemic joint



**Fig. 1.** Traces of degenerative changes on the vertebral bodies (Ives)

lesions and osteoarthritis of the hip joint. Their appearance can be associated with both the natural process of wear and tear of the body and with intense physical activity that affects the skeletal system of a person throughout his life.

Degenerative lesions of the spine can manifest as dystrophic change in the intervertebral disc and adjacent vertebral bodies (Жарков 1994, с. 16). Traces of degeneration of vertebral bodies were found in the rural population from the burial ground of Ives and Biruli (fig. 1). There were 11 cases (11/20) of mostly mild to moderate development. Traces of the disease were detected in the buried at the age of 30—50 years, pathological changes were more often registered in men.

The study also recorded herniation of the vertebral bodies (Schmorl's nodes). Schmorl nodes are formed when the vertebral plate is damaged, and the compressed cartilage penetrates the body of the neighboring vertebrae and forms a hernia. Schmorl nodes are extremely common, especially in the lower thoracic and lumbar regions, and are easily recognized in the skeleton as depressions on the vertebral surfaces (Waldron 2008, p. 45). In addition to serious physical exertion and injuries, the occurrence that pathological changes may be associated with the loss and weight of the human body (Trzciński 2017, p. 308). The presence of traces of hernias of vertebral bodies were detected in 7 individuals (7/20) from the Ives and Biruli burial grounds, in men of 30—50 years old.

The study of the ancient population also revealed traces of spondyloarthritis. Spondyloarthritis is a dystrophic lesion of the arch-process joints that develops in the same sequence of morphological changes as in osteoarthritis of the peripheral joints (Крутько и др. 2013, с. 7). On osteological material, spondyloarthritis lesions represent porosity, bone deformation, erosion and development of osteophytes in the area of arch-process joints. Degeneration of the facet joints of the vertebrae can lead to a hernia of the vertebral bodies that are under pressure from the altered bone articular surface (Ortner, Putschar 1981,



**Fig. 2.** Spondyloarthritis of the facet joint of the vertebra (Ives)

p. 555). Degenerative-dystrophic changes in the joints of the facet vertebrae were registered in the rural population of the Ives and Biruli burial grounds. A total of 8 cases (8/20) of spondyloarthritis were recorded (fig. 2), the majority of cases — in the male, aged 30—50 years.

The study showed the presence of a specific spine disease — deforming spondylosis. In case of disease, the vertebral bodies are soldered by narrow arched brackets, sometimes only partly ossified (Рейнберг 1963, с. 348). The disease most often is a result of chronic overload of the spine, causing tears in the peripheral parts of the fibrous ring of intervertebral discs in the area of their attachment to the edge of the vertebral body (Рохлин 1965, с. 55). In the Ives and Biruli burial grounds, pathological changes were detected in 8 individuals (8/20; fig. 3). Among them, 6 men, one woman and one individual whose gender could not be determined. At the time of death, all were over 30 years old. The presence of such



**Fig. 3.** Spondylosis of the lumbar vertebrae with subsequent ossification (Biruli)



**Fig. 4.** Indented injury with signs of healing (Dolgoe)

changes indicates serious disorders in the spine, which in turn could lead to the functioning problems of the musculoskeletal system.

During osteological examination, traces of degenerative pathology of the hip joint, coxarthrosis, were also recorded. Gradually, as the arthrosis progresses, pain and limited mobility in the joint increase, and lameness appears (Герасименко 2007, с. 28). It is known that various conditions predispose to the development of hip arthrosis, including congenital hip dislocation, displacement of the femoral epiphysis, and Legg-Kalve-Pertes disease (Waldron 2008, p. 38).

Traces of osteoarthritis of the hip joint were recorded in a 30—40-year-old man from Biruli.

A special case of degenerative-dystrophic changes in the joints was identified during the

study of osteological material from the graves of Ives and Biruli. In 3 individuals, namely men of 30—50 years old, traces of the costal-transverse joints osteoarthritis were found. The deforming arthrosis of these joints, which in some cases causes the back pain, is particularly often in adulthood and in the elderly age. By this disease, the marginal bone growth can reach significant sizes on the head of the rib and on the transverse process of the vertebra (Рохлин 1965, с. 50).

In the course of the study, the analysis of injuries to the skull and postcranial skeleton was carried out. D. Ortner suggested that the cause of injuries in ancient populations may be the following factors: war, violence within the family, human activity during harvest or hunting, intentional and unintentional injury in the course of ritual actions, as well as physiological factors that could lead to bone fractures, such as senile osteoporosis (Ortner 2003, p. 119).

The study of the osteological collection revealed the presence of antemortal injuries and post-traumatic changes in all three burial grounds. A total of 3 cases (3/32) of skull injuries were identified. Injuries were localized on the frontal, parietal and occipital bones. In one case, the zygomatic bone was damaged. According to the nature of the damage, there are two groups. The first is chopping or cutting damage — 1 case (Biruli). The second one is depressed fractures — 2 cases (Ives — 1, Dolgoe — 1; fig. 4). The study revealed postcranial skeletal injuries with signs of healing. They are fractures with displacement of the radius (Ives) and fibula (Biruli). Injuries were recorded in two men over 40 years of age.

An indicative aspect of the health status and morbidity of the ancient population is the presence of diseases of the dental system.

One of the important indicators of the population's health is the presence of caries — a local pathological process that manifests itself after teeth eruption, with demineralization and softening of the hard tissues of the tooth, followed by the formation of a defect in the form of a cavity. The cause of its occurrence is a cariogenic situation on the surface of a sensitive tooth during prolonged fermentation of sugars food by enzyme forming microorganisms of dental plaque (Леус, Горегляд, Чудакова 2002, с. 67, 68).

Dental surfaces that are susceptible to potential caries include occlusal surfaces; smooth crown surfaces, including mesiodistal (interproximal) surfaces that come into contact with other teeth and buccal-lingual surfaces; and the root, which may be directly affected by caries after a gum and supporting bone recession. Each of these surfaces has a different cariogenic potential, so when combined with oral bacteria and diet, they cause different patterns of caries (Ortner 2003, p. 590).

Caries was registered in 14 people (14 cases out of 35 individuals; fig. 5) and was mainly localized on the molars of the upper and lower jaws,

affecting various tooth surfaces. Traces of the disease were present on the teeth of both men and women aged 9 to 50+ years.

The subsequent development of caries can lead to the defeat of the pulp and the spread of inflammation inside the dental canal. In this case, bacterial invasion causes rapid necrosis of the vascular network of the canal and soft tissues, spreading the necrosis process to the top of the root and surrounding spongy bone, causing a periapical abscess (Aufderheide, Rodriguez-Martin 1998, p. 403). On the craniological material, the consequences of an abscess are recorded in the form of caverns (cavities) located in the area of the roots of one or more adjacent teeth. An acute abscess, acting on the soft tissues surrounding the tooth, penetrates through the bone to the soft tissues, thus forming an opening. In some cases, there are serious consequences and the disease becomes potentially life-threatening (Waldron 2008, p. 242). Acute inflammatory processes were registered among individuals of all burial grounds. Paleopathological examination of jaws revealed the presence of 9 cases (9/43) of periapical abscesses in individuals aged 30—50 years.

The general state of health, peculiarities of hygiene habits, and dental pathology determine the condition of the periodontal tissue that surrounds the teeth. These diseases have a common name — periodontopathies. The origin and causes of these diseases in the anthropological literature are primarily considered as general markers of adverse environmental conditions (Козар 2010, с. 115, 116). In the process of identifying pathologies of the dental system, 19 cases (19/35) of periodontal disease were recorded. Pathological periodontal changes were equally present among both men and women aged 18 years and older.

The development of teeth is controlled by a genetic factor and environmental conditions that are relatively independent of those factors that affect the development of the jaws. Because of this independence, the sizes of the two types of structures may not match. Insufficient space for teeth leads to crowding of teeth (Ortner 2003, p. 598).

Some diseases can leave unspecific signs of stress on the bones and teeth. This is typical for individuals with injuries and degenerative pathologies, as well as for certain infectious diseases and nutritional deficiencies (Cohen, Armelagos 1984, p. 15, 16).

The emergence of difficulties in diagnosing the manifestations of physiological stress, represented by porotic hyperostosis (cribra orbitalia), and the multifactorial development of signs of enamel hypoplasia and vascular reaction causes a number of difficulties in the process of studying them. These changes can be attributed to non-specific reactions of the body that indicate unfavorable living conditions (Бужилова и др. 1998, с. 16).

Among the rural population of the Belarusian Dvina region of the 14<sup>th</sup>—16<sup>th</sup> centuries, the fol-



**Fig. 5.** Manifestations of extensive carious lesions, traces of abscesses (Ives)

lowing manifestations of stress conditions were recorded: porotic hyperostosis, cribra orbitalia, enamel hypoplasia, vascular reaction on the superciliary arch. Porotic hyperostosis is characterized by symmetrically located lesions of the cranial vault, which can be fixed on the frontal and parietal bones, less often occipital. In the process of changes, areas of the skull thicken due to the compaction of the diploid layer, and the surface plate on the contrary is thinned, which leads to the appearance of porosis (Aufderheide, Rodriguez-Martin 1998, p. 348). In childhood, diploe contains red bone marrow, so it is believed that the expansion of this space is a result of the body's need to produce and store more red blood cells in the event of anemia (Lewis 2007, p. 111, 112). During the study, traces of porotic hyperostosis were recorded in 10 individuals (10/49) from the graves of Ives, Biruli and Dolgoe. Mostly lesions were localized on the parietal bones of the skull. In most cases, stress markers were recorded in the male aged 18 to 50 years.

A specific manifestation of porotic hyperostosis is cribra orbitalia. Currently, there are a number of hypotheses among paleopathologists about the factors contributing to the formation of this stress indicator in the form of porosity in the upper inner region of the orbits. Walker and colleagues suggest that cribra orbitalia is the result of megaloblastic anemia acquired by infants as a result of the synergistic effect of depleted maternal vitamin B12 stores and unsanitary living conditions that contribute to additional nutrient losses from gastrointestinal infections during weaning (Walker et al 2009, p. 119).

At the same time, paleopathological studies have shown that such morphological changes could be caused by other diseases: inflammation of the skull bones (periostitis, osteitis and osteomyelitis), inflammatory processes of the scalp or



Fig. 6. Cribra Orbitalia (Ives)



Fig. 7. Enamel hypoplasia (Biruli)

nasal cavity, paranasal sinuses, eye socket (Ortner 2003, p. 120).

Cribra orbitalia as nonspecific stress marker was found in 21 individuals from the graves of Ives, Biruli, and Dolgoe (fig. 6). In most cases this stress marker affected either both or only the left eye socket. When assessing the intensity of these lesions were assigned to the porotic and cribrotic type. In 7 cases (7/10), lesions were detected in children 3–15 years old, as well as in 6 cases in women aged 18–50 years, 4 cases among men 20–40 years old, and 4 cases in individuals of indeterminate gender older than 50 years (adults — 14/43).

The manifestations of enamel hypoplasia in the population provides valuable information about the general state of health of the population and the stress that it experienced at an early age. Enamel hypoplasia — uneven development of the thickness of the enamel cover, which occurs due to insufficient calcification during the formation of the tooth (Бужилова 1998, с. 102). The feature has the form of transverse lines-furrows

of various depths that encircle the tooth along the perimeter (transverse hypoplasia) or pits located on the surface of the tooth enamel (point hypoplasia; Козак 2010, с. 133).

The appearance of enamel hypoplasia has several reasons associated with negative environmental factors. First, there is the likelihood of prolonged breastfeeding, which is common in low-social groups. With this type of nutrition, children have hypovitaminosis (lack of vitamins and trace elements), which leads to the formation of enamel hypoplasia. Second, hypovitaminosis, characterized by generally poor and irregular nutrition of the population. Also, another possible cause is seen in the consequences of rickets. This disease is caused by a lack of vitamin D, which is produced by the body under the influence of ultraviolet light, and also comes with products rich in this vitamin (Бужилова 2005, с. 51).

Besides it, enamel hypoplasia can be formed due to fever, birth trauma, congenital syphilis, low birth weight, severe malnutrition in childhood, rickets and hypocalcemia, tuberculosis, zinc deficiency and intrauterine malnutrition due to insufficient nutrition of the mother (Lewis 2007, p. 105).

Enamel hypoplasia was recorded in 4 individuals (4/37) from all three burial grounds (fig. 7). In two men 30–50 years old, one child 10–11 years old, and one individual of unknown gender 20–30 years old.

Pathological changes in the brow ridge («orange pill») registered in the ancient rural population have several causes. According to M. Schultz's vascular reaction is a consequence of infection of the bone (ostitis) in purulent frontitis and ethmoiditis (inflammation in the frontal sinus and ethmoid cells). Another reason for these changes, not only on the brow arches, but also on the zygomatic, temporal and other bones of the skull, may be chronic skin irritation from parasite bites and, as a result, inflammation of the periosteum (Козак 2010, с. 173).

Along with this, according to A. Buzhilova, specific changes in the brow are associated with the impact of low temperatures on the human body (Бужилова 1998, с. 104, 105).

During the study of the ancient population, 9 cases (9/40) of the «orange pill» appearance were registered in individuals from the graves of Ives, Biruli and Dolgoe. Traces of the reaction were recorded in the area of the brow ridges and along the edge of the zygomatic bone. Stress occurred mainly in men aged 30–50 years. This indicates an active daily activity of the male population. Women, most likely, were in more comfortable conditions, or wore hats that reduced the possible impact of cold on the body.

**Conclusions.** Analysis of the bones of the postcranial skeleton of the ancient rural population of the Belarusian Dvina region showed that the nature of the spread of diseases of the spine

and the degree of joint wear is associated with the impact of physical exertion on the body. The type and location of injuries on skeletons in the study populations indicate that some men were involved in armed or domestic conflicts, while the possibility of domestic injuries and accidents is not excluded. Traces of pathological changes in the dental system of individuals of all the studied burial grounds indicate the prevalence of this group of diseases among the ancient rural population. Caries, abscesses of the jaw and traces of periodontal disease are the result of an unbalanced diet and a lack of vitamins. During the study of the rural population of the 14<sup>th</sup> and 16<sup>th</sup> centuries, specific signs were discovered that indicate the existence of physiological stresses due to a number of factors. The causes or factors of stress the most important were: lack of vitamins and minerals, which is most keenly felt at an early age, various inflammatory and infectious diseases that weaken the immune system, as well as the social and climatic conditions, of the population life.

## ЛІТЕРАТУРА

- Бужилова, А. П. 1998. Палеопатология в биоархеологических реконструкциях. *Историческая экология человека. Методика биологических исследований*. Москва: Старый Сад, с. 87-146.
- Бужилова, А. П., Козловская, В. М., Медникова, М. Б. 1998. *Историческая экология человека. Методика биологических исследований*. Москва: Старый Сад.
- Бужилова, А. П. 2005. *Ното сарпиенс. История болезни*. Москва: Языки славянской культуры.
- Вайцяховіч, А. В. 2012. *Справаздача пра археалагічныя даследаванні курганных могільнікаў ў Дошчыцкім раёне Віцебскай вобласці ў 2011 годзе*. Фонд археалагічнай навуковай дакументацыі Цэнтральнага навуковага архіва НАН Беларусі, с. 2844.
- Герасименко, М. А. 2007. *Остеоартроз*. Минск: БГМУ.
- Емяльянчык, В. А. 2012. Новые материалы по антропологии вясковага насельніцтва Полацкай зямлі XIV—XVI стст. В: Каваленя, А. А. (ред.). *Полацк у гісторыі і культуры Еўропы: матэрыялы Міжнароднай навуковай канферэнцыі, 22—23 мая 2012 г.* Мінск: ПДУ, с. 149-157.
- Емельянчик, О. А. 2017. Смертность сельского населения Беларуси XI—XIX вв. (по данным палеодемографии и исторической демографии). В: Саливон, И. И. (ред.). *Актуальные вопросы антропологии*. Минск: Беларуская навука, с. 20-33.
- Жарков, П. Л. 1994. *Остеохондроз и другие дистрофические изменения позвоночника у взрослых и детей*. Москва: Медицина.
- Козак, О. Д. 2010. *Кияни княжої доби. Біоархеологічні студії*. Київ: Академперіодика.
- Крутько, А. В., Байкалов, А. А., Маркин, С. П., Козлов, Д. М., Васильев, А. И. 2013. *Спондилоартроз*. Новосибирск.
- Леус, П. А., Горегляд, А. А., Чудакова, И. О. 2002. *Заболевания зубов и полости рта*. Ростов-на-Дону: Феникс.
- Мамонова, Н. Н., Романова, Г. П., Харитонов, В. М. 1989. Первичная обработка и определение антропологического материала в полевых условиях. В: Шелов, Д. Б. (ред.). *Методика полевых археологических исследований*. Ленинград: Наука, с. 50-84.
- Марфина, О. В. 2015. Палеоантропология Беларуси: полвека открытий. *Наука и инновации*, 1, с. 68—72.
- Марфина, О. В. 2016. Создание национальной антропологической школы в Беларуси. В: Дук, Д. У. (ред.). *Беларускае Падзвінне: вопыт, метадыка і вынікі палявых і міждысцыплінарных даследаванняў: зборнік навуковых артыкулаў III Міжнароднай навукова-практычнай канферэнцыі, 14—15 красавіка 2016 г.* Полацк: ПДУ, с. 117—127.
- Рейнберг, С. А. 1963. *Рентгенодиагностика заболеваний костей и суставов*. Москва: Медицина.
- Рохлин, Д. Г. 1965. *Болезни древних людей*. Ленинград: Наука.
- Цягака, Л. І., Салівон, І. І., Мікуліч, А. І., Марфіна, В. У., Поліна, Н. І., Гурбо, Т. Л. 2006. Антрапалогія. *Беларусы, у 11 т. 9*. Мінск: Беларуская навука.
- Чараўко, В. У. 2011. *Справаздача аб археалагічных разведках на тэрыторыі Глыбоцкага і Ушацкага раёнаў Віцебскай вобласці ў 2010 годзе*. Фонд археалагічнай навуковай дакументацыі Цэнтральнага навуковага архіва НАН Беларусі, с. 2878.
- Чараўко, В. У. 2012. *Справаздача аб археалагічных даследаваннях на тэрыторыі Дошчыцкага, Глыбоцкага і Ушацкага раёнаў Віцебскай вобласці ў 2011 годзе*. Фонд археалагічнай навуковай дакументацыі Цэнтральнага навуковага архіва НАН Беларусі, с. 1320.
- Чараўко, В. У. 2013. *Справаздача аб археалагічных раскопках на могільніку каля в. Івесь Глыбоцкага раёна Віцебскай вобласці ў 2012 годзе*. Фонд археалагічнай навуковай дакументацыі Цэнтральнага навуковага архіва НАН Беларусі, с. 1313.
- Чараўко, В. У. 2014. *Справаздача аб археалагічных раскопках на могільніках каля в. Жарнасекава Бешанковіцкага раёна, в. Івесь Глыбоцкага раёна і археалагічных разведках на тэрыторыі Бешанковіцкага і Полацкага раёнаў Віцебскай вобласці ў 2013 годзе*. Фонд археалагічнай навуковай дакументацыі Цэнтральнага навуковага архіва НАН Беларусі, с. 1353.
- Чараўко, В. У. 2016а. Археалагічныя раскопкі на могільніку каля вёскі Доўгае Глыбоцкага раёна ў 2015 г. В: Дук, Д. У. (ред.). *Беларускае Падзвінне: вопыт, метадыка і вынікі палявых і міждысцыплінарных даследаванняў: зборнік навуковых артыкулаў III міжнароднай навуковай канферэнцыі, 14—15 красавіка 2016 г.* Наваполацк: ПДУ, с. 170-177.
- Чараўко, В. У. 2016б. *Справаздача аб археалагічных даследаваннях на могільніках каля вёскі Доўгае, Васькавічы, Івесь Глыбоцкага раёна Віцебскай вобласці ў 2015 годзе*. Фонд археалагічнай навуковай дакументацыі Цэнтральнага навуковага архіва НАН Беларусі, с. 3350.
- Aufderheide, A., Rodriguez-Martin, C. 1998. *Human paleopathology*. Cambridge: Cambridge University.
- Buikstra, J., Ubelaker D. 1994. *Standards for data collection from human skeletal remains*. Arkansas: Arkansas Archeological Survey.
- Cohen, M., Armelagos G. 1984. *Paleopathology at the origins of agriculture*. Orlando: Academic Press.
- Lewis, M. 2007. *The bioarchaeology of children*. Cambridge: Cambridge University.
- Ortner, D. 2003. *Identification of pathological conditions in human skeletal remains*. Elsevier: Academic press.

Ortner, D., Putschar, W. 1981. *Identification of pathological conditions in human skeletal remains*. Washington: Smithsonian Institution Press.

Piontek, J. 1996. *Biologia populacji pradziejowych*. Poznań: Wydawnictwo naukowe.

Trzciński, D. 2017. High stature and body mass might affect the occurrence of Schmorl's nodes. *Anthropological review*, 80, 3, p. 301-311.

Waldron, T. 2008. *Paleopathology*. London: Cambridge University Press.

Walker, P. L., Bathurst, R. R., Richman, R., Gjerdrum, T., Andrushko, V. A. 2009. The causes of porotic hyperostosis and cribra orbitalia: a reappraisal of the iron-deficiency-anemia hypothesis. *American Journal of Physical Anthropology*, 139, p. 109-125.

## REFERENCES

Buzhilova, A. P. 1998. Paleopatologija v bioarkheologičeskikh rekonstruktsiakh. *Istoricheskaia ekologija cheloveka. Metodika biologičeskikh issledovanii*. Moskva: Staryi Sad, s. 87-146.

Buzhilova, A. P., Kozlovskaja, V. M., Mednikova, M. B. 1998. *Istoricheskaia ekologija cheloveka. Metodika biologičeskikh issledovanii*. Moskva: Staryi Sad.

Buzhilova, A. P. 2005. *Homo sapiens. Istorija bolezni*. Moskva: Iazyki slavianskoj kultury.

Vajciachovič, A. V. 2012. *Spravazdača pra archiealahičnyja dasledavanni kurhannyh mohilnikaŭ ŭ Dokšyckim rajonie Viciebskaj voblasti ŭ 2011 hodzie*. Fond archiealahičnaj navukovaj dakumentacyi Centralnaha navukovaha archiva NAN Bielarusi, spr. 2844.

Gerasimenko, M. A. 2007. *Osteoartroz*. Minsk: BGMU.

Jemialjančyk, V. A. 2012. Novyja materyjały pa antrapałohii viaskovaha nasielnictva Połackaj ziamli XIV—XVI stst. In: Kavalenia, A. A. (ed.). *Poľack u historyi i kultury Jeŭropy: materyjały Mižnarodnaj navukovaj kanferencyi, 22—23 maja 2012 h.* Minsk: PDU, s. 149—157.

Emelianchik, O. A. 2017. Smertnost selskogo naseleńnia Bielarusi XI—XIX vv. (po dannym paleodemografii i istoričeskoj demografii). In: Salivon, I. I. (ed.). *Aktualnye voprosy antropologii*. Minsk: Belaruskaja navuka, s. 20-33.

Zharkov, P. L. 1994. *Osteokhondroz i drugie distroficheskie izmeneniia pozvonocznika u vzroslykh i detei*. Moskva: Meditsina.

Kozak, O. D. 2010. *Kyiany kniazhoi doby. Bioarkheolohični studii*. Kyiv: Akademperiodyka.

Krutko, A. V., Baikalov, A. A., Markin, S. P., Kozlov, D. M., Vasilev, A. I. 2013. *Spondiloartroz*. Novosibirsk.

Leus, P. A., Goregliad, A. A., Chudakova, I. O. 2002. *Zabolevaniia zubov i polosti rta*. Rostov-na-Donu: Feniks.

Mamonova, N. N., Romanova, G. P., Kharitonov, V. M. 1989. Pervičnaia obrabotka i opredelenie antropologičeskogo materiala v polevykh usloviiakh. In: Shelov, D. B. (ed.). *Metodika polevykh arkheologičeskikh issledovanii*. Leningrad: Nauka, s. 50-84.

Marfina, O. V. 2015. Paleoantropologija Bielarusi: polveka otkrytii. *Nauka i innovatsii*, 1, s. 68-72.

Marfina, O. V. 2016. Sozdanie natsionalnoi antropologičeskoj shkoly v Bielarusi. In: Duk, D. U. (ed.). *Bielaruskaje Padzvinnie: vopyt, mietodyka i vyniki palavych i miždyscyplinarnych dasledavanniaŭ: zbornik navukovykh artykulaŭ III Mižnarodnaj navukova-praktyčnaj kanferencyi, 14—15 krasavika 2016 h.* Poľack: PDU, s. 117-127.

Reinberg, S. A. 1963. *Rentgenodiagnostika zaboľevanii kostei i sustavov*. Moskva: Meditsina.

Rokhlin, D. G. 1965. *Bolezni drevnikh liudei*. Leningrad: Nauka.

Ciahaka, Ł. I., Salivon, I. I., Mikulič, A. I., Marfina, V. U., Polina, N. I., Hurbo, T. Ł. 2006. Antrapałohija. *Bielarusy, u 11 t.* 9. Minsk: Belaruskaja navuka.

Čaraŭko, V. U. 2011. *Spravazdača ab archiealahičnych razviedkach na terytorii Hłybockaha i Ušackaha rajonaŭ Viciebskaj voblasti ŭ 2010 hodzie*. Fond archiealahičnaj navu-

kovaj dakumentacyi Centralnaha navukovaha archiva NAN Bielarusi, spr. 2878.

Čaraŭko, V. U. 2012. *Spravazdača ab archiealahičnych dasledavanniaŭ na terytorii Dokšyckaha, Hłybockaha i Ušackaha rajonaŭ Viciebskaj voblasti ŭ 2011 hodzie*. Fond archiealahičnaj navukovaj dakumentacyi Centralnaha navukovaha archiva NAN Bielarusi, spr. 1320.

Čaraŭko, V. U. 2013. *Spravazdača ab archiealahičnych raskopkach na mohilniku kala v. Iviš Hłybockaha rajona Viciebskaj voblasti ŭ 2012 hodzie*. Fond archiealahičnaj navukovaj dakumentacyi Centralnaha navukovaha archiva NAN Bielarusi, spr. 1313.

Čaraŭko, V. U. 2014. *Spravazdača ab archiealahičnych raskopkach na mohilnikach kala v. Tarnasičkava Biešankovičkaha rajona, v. Iviš Hłybockaha rajona i archiealahičnych razviedkach na terytorii Biešankovičkaha i Poľackaha rajonaŭ Viciebskaj voblasti ŭ 2013 hodzie*. Fond archiealahičnaj navukovaj dakumentacyi Centralnaha navukovaha archiva NAN Bielarusi, spr. 1353.

Čaraŭko, V. U. 2016a. Archiealahičnyja raskopki na mohilniku kala vioski Doŭhaje Hłybockaha rajona ŭ 2015 h. In: Duk, D. U. (ed.). *Bielaruskaje Padzvinnie: vopyt, mietodyka i vyniki palavych i miždyscyplinarnych dasledavanniaŭ: zbornik navukovykh artykulaŭ III mižnarodnaj navukovaj kanferencyi, 14—15 krasavika 2016 h.* Navapolack: PDU, s. 170-177.

Čaraŭko, V. U. 2016b. *Spravazdača ab archiealahičnych dasledavanniaŭ na mohilnikach kala viosak Doŭhaje, Vaškavičy, Iviš Hłybockaha rajona Viciebskaj voblasti ŭ 2015 hodzie*. Fond archiealahičnaj navukovaj dakumentacyi Centralnaha navukovaha archiva NAN Bielarusi, spr. 3350.

Aufderheide, A., Rodriguez-Martin C. 1998. *Human paleopathology*. Cambridge: Cambridge University.

Buikstra, J., Ubelaker D. 1994. *Standards for data collection from human skeletal remains*. Arkansas: Arkansas Archeological Survey.

Cohen, M., Armelagos G. 1984. *Paleopathology at the origins of agriculture*. Orlando: Academic Press.

Lewis, M. 2007. *The bioarchaeology of children*. Cambridge: Cambridge University.

Ortner, D. 2003. *Identification of pathological conditions in human skeletal remains*. Elsevier: Academic press.

Ortner, D., Putschar, W. 1981. *Identification of pathological conditions in human skeletal remains*. Washington: Smithsonian Institution Press.

Piontek, J. 1996. *Biologia populacji pradziejowych*. Poznań: Wydawnictwo naukowe.

Trzciński, D. 2017. High stature and body mass might affect the occurrence of Schmorl's nodes. *Anthropological review*, 80, 3, p. 301-311.

Waldron, T. 2008. *Paleopathology*. London: Cambridge University Press.

Walker, P. L., Bathurst, R. R., Richman, R., Gjerdrum, T., Andrushko, V. A. 2009. The causes of porotic hyperostosis and cribra orbitalia: a reappraisal of the iron-deficiency-anemia hypothesis. *American Journal of Physical Anthropology*, 139, p. 109-125.

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## PATHOLOGICAL MANIFESTATIONS ON PALEOANTHROPOLOGICAL MATERIAL FROM RURAL BURIALS OF 14<sup>th</sup>—16<sup>th</sup> CENTURIES FROM THE TERRITORY OF POLOTSK LAND

Paleopathology deals with the identification and research of diseases that are fixed on the osteological material of ancient people. This anthropological direction, using a variety of methods, answers the questions of the origin and spread of diseases in ancient populations. The results of such studies help to reveal the following aspects: the influence of the environment, and consequently the adaptation of a person to its changes,



professional occupations of the population, and related types of physical activity, diet, causes of physiological stress and the level of development of medicine.

The aim of the study is to assess the incidence of the rural population of the Belarusian Dvina region of the 14<sup>th</sup>–16<sup>th</sup> centuries by conducting a paleopathological study of bone material.

During the study, an anthropological examination of the remains of 72 people belonging to the rural population of the 14<sup>th</sup>–16<sup>th</sup> centuries was carried out. The osteological material was obtained during the archaeological excavations of three rural burial grounds in the Belarusian Dvina region-Ives, Biruli, and Dolgoe. During the research, special attention was paid to the identification and registration of paleopathological changes in bone material.

As a result, signs of the following groups of pathologies were identified: degenerative-dystrophic changes in the spine and joints, skull injuries, dental system pathologies (caries, abscesses, paradontopathies), non-specific reactions of the body (porotic hyperostosis, cribra orbitalia, enamel hypoplasia, vascular reaction).

As a result of the work performed to identify and interpret pathological changes, the main aspects reflecting changes in the health status of the ancient population due to a number of factors were identified: the manifestation of an active lifestyle of individuals, the influence of sanitary and hygienic conditions that existed in rural settlements of the studied period, and the supposed stressful situations to which the population was more or less exposed.

**Keywords:** rural population of the Belarusian Dvina region of 14<sup>th</sup>–16<sup>th</sup> centuries, osteology, paleopathology, degenerative-dystrophic changes, injuries, dental pathologies, non-specific reactions of the body.

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### **ПАТОЛОГІЧНІ ПРОЯВИ НА ПАЛЕОАНТРОПОЛОГІЧНОМУ МАТЕРІАЛІ З СІЛЬСЬКИХ ПОХОВАНЬ 14–16 ст. З ТЕРИТОРІЇ ПОЛОЦЬКОЇ ЗЕМЛІ**

Палеопатологія займається виявленням і дослідженням захворювань, зафіксованих на остеологічному матеріалі древніх людей. Це антропологічний напрям, використовуючи різноманітні методи, відповідає

на питання походження і поширення хвороб в древніх популяціях. Результати таких досліджень дозволяють виявити наступні аспекти: вплив навколишнього середовища, а отже, і адаптацію людини до її змін, професійні заняття населення і пов'язані з ними види фізичної активності, режим харчування, причини фізіологічного стресу і рівень розвитку медицини.

Мета дослідження-оцінити захворюваність сільського населення Білоруського Подвинья 14–16 ст. шляхом проведення палеопатологічного дослідження кісткового матеріалу.

В ході дослідження була проведена антропологічна експертиза останків 72 осіб, що належать до сільського населення 14–16 ст. Остеологічний матеріал був отриманий при археологічних розкопках трьох сільських могильників Білоруського Подвинья — Івесь, Бірюлі і Довгое. В ході досліджень особлива увага приділялася виявленню та реєстрації палеопатологічних змін в кістковому матеріалі.

В результаті були виявлені ознаки наступних патологій: дегенеративні зміни хребта і суглобів, травми черепа, патології зубощелепної системи (карієс, абсцеси, парадонтопатії), неспецифічні реакції організму (поротичний гіперостоз, крібра орбіталія, гіпоплазія емалі, судинна реакція).

В результаті проведеної роботи з виявлення та інтерпретації патологічних змін були виявлені основні аспекти, що відображають зміни стану здоров'я стародавнього населення, обумовлені рядом факторів: проявом активного способу життя індивідів, вплив санітарно-гігієнічних умов, що існували в сільських населених пунктах досліджуваного періоду, і передбачувані стресові ситуації, яким населення в тій чи іншій мірі піддавалося.

**Ключові слова:** сільське населення Білоруського Подвинья 14–16 ст., остеологія, палеопатологія, дегенеративно-дистрофічні зміни, травми, стоматологічна патологія, неспецифічні реакції організму.

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