ZIBELINE INTERNATIONAL™ PUBLISHING

JOURNAL OF ROCK ART (JRA)

DOI: http://doi.org/10.65098/jra.01.2025.63.71

E-ISSN: 2976-2421 (Online)
CODEN: JRAOCQ

RESEARCH ARTICLE

STUDY ON THE DATING OF HUMAN-FACE PETROGLYPHS "LOCATED ON ADJACENT ROCK SURFACES" IN THE XILIAO RIVER AND AMUR RIVER BASIN

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ARTICLE DETAILS

Article History:

Received 20 March 2025
Accepted 25 April 2025
Available online 28 May 2025

ABSTRACT

The Human-face petroglyphs of "located on adjacent rock faces" is a unique type of Human-face petroglyphs, which is distributed in the Xiliao River basin of Inner Mongolia and the Amur River basin of Russia. From their distribution characteristics, production techniques and type characteristics, there is a close relationship among these Human-face petroglyphs. The Human-face petroglyphs discovered in the Xiliao River basin exhibit a remarkable chronological continuity, with their production chronology traceable to the Baiyin Changhan phase of the Xinglongwa Culture, which dates back approximately 7000 years BP. This lineage extends through the early Zhaobaogou Culture and Hongshan Culture, and continued until the late Hongshan Culture. In the Far East region of Russia, the Human-face petroglyphs first appeared during the Maleshevo Culture period around 6000 years BP. Following an incubation phase within the Maleshevo Culture context, developed greatly in the subsequent period of the Voznesenskoye Culture. A series of studies suggest that this type of Human-face petroglyphs likely spread from the Xiliao River basin in Inner Mongolia to the Amur River basin in Russia.

KEYWORDS

Xiliao River, Amur River, Human-Face Petroglyphs, Age

1. INTRODUCTION

Human-face petroglyphs is a widespread rock art subject in the Pacific Rim and have been found in the Xiliao River Basin in Inner Mongolia, China, and the Far East region of Russia. One particular type of rock art is the Human-face petroglyphs "located on adjacent rock faces", which are found in both regions. This type of human face image is produced on two adjacent faces in a single rock using the method of percussing or grounding, and making the entire Human-faces appear as if they have been folded in a symmetrical manner. In addition, it should be noted that this type of petroglyph was made entirely on separate boulders; furthermore, the Human-faces in the Amur River basin (see the note 1) are located on the banks of the river, whereas the area around the Baimiaozi Mountain rock art, although currently a sandy area, is likely to be a remnant of an ancient river course. In other words, at the beginning of the production of petroglyphs, the two environments were the same. Due to the variety of types of Human-face petroglyphs, it is impossible to carry out accurate dating of all types of petroglyphs in their entirety. This paper focuses on a comparative study between the Human-face petroglyphs of the Xiliao River and those of the Far East region of Russia, therefore, this study focuses on refining the characteristics common to both, and dating on this basis. The ages of various types of Human-face petroglyphs are now discussed one by one according to the cross-dating method.

2. HISTORICAL REVIEW ON THE CHRONOLOGICAL STUDY OF HUMAN-FACE PETROGLYPHS IN THE XILIAO RIVER AND AMUR RIVER BASIN

The most important issue in the study of rock art is the age of it. Only when the age of the rock art is clarified can we further discuss the ethnicity of the creators, the purpose, and the cultural significance of the rock art. Chinese and Russian scholars have discussed the age of Human-face petroglyphs in this region from their own archaeological materials.

2.1 Historical Review on the Dating of Human-Face Petroglyphs in the Xiliao River Basin

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Cite The Article: Bo Xiao, Jing Che (2025). Study on the Dating of Human-Face Petroglyphs "Located on Adjacent Rock Surfaces" in the Xiliao River and Amur River Basin. *Journal of Rock Art*, 4(1): 63-71.

Figure 1: Distribution Map of the Human-Face Petroglyphs of "Located on Adjacent Rock Surfaces" in the Xiliao River and Amur River Basin

1. Baimiaozi Mountain; 2. Sikachi-Alyan

The dating of Human-face petroglyphs in the Xiliao River basin has been much discussed in the academic community. Tian Guanglin and other researchers have divided the rock art in the Yin River and Yingjin River Basin into two periods: "The first period of rock art is about between 6,500 to 3,500 years ago, corresponding to the period of the Hongshan Culture to the Lower Xiajiadian Culture; the second period rock art is about between 3,500 to 2,000 years ago, belonging to the works of the Upper Xiajiadian Culture period" (Tian et al., 1993). Wu Jiacai divided the development of Chifeng rock art into three phases: "The first phase is the Baimiaozi Mountain rock art, which is mainly exaggerated, and it belongs to the Neolithic Age; the second phase is the Heitoushan rock art, which is mainly abstract, pictographic and ideograms, and it belongs to the period from the Hongshan Culture to the Xiaoheyan Culture; and the third phase is the Heitou Mountain rock art, which is mainly large freehand, and it belongs to the Bronze Age to the Iron Age"(Wu, 2009). Sun Xiaoyong roughly divided the Human-face petroglyphs of Xiliao River into three periods, "The first period of Human-face petroglyphs uses the grounding technique, including the two sites of Baimiaozi Mountain rock art and Jianyan Mountain rock art (i.e., Xiaofeng Mountain - author's note), which date from about 7,000 to 4,000 years ago; the second period mainly uses indirect pecking and grinding technique, and then slightly grinding technique, with the traces of its striking points are in the form of tiny wedges, with well-proportioned and regular sizes, which may be made with metal tools or sharp and sturdy stone tools, embodying progressiveness. It includes the two rock art sites of Hongshan rock art and Sanzuodian rock art, which are about between 6,000 to 4,000 years ago; the third period mainly uses the percussing (敲击) method, and uses metal tools or may still be made of stone tools. From the aspects of the making technique, modeling, or stylistic features, all appear more rough and hasty, and appeared along with various animal rock art, including the Heitou Mountain rock art, Yakhai Mountain, Yin River, Yingjin River Basin, and Baicha River Basin, dated to about 4,000-3,000 BP" (Sun, 2019). In addition, Zhu Lifeng divided the Human-face petroglyphs in the Xiliao River basin into four periods: "The first period is about 8,000 to 6,500 years ago in the Xinglongwa Culture and Zhaobaogou Culture, and the Human-face petroglyphs of this period have the typical style emphasizing the concentric circles of the eyes, with a relatively small scope of development. In this period, the images are simple and serious expressions of divinity, and face-tattoos begin to appear, which is the early stage of the Human-face petroglyphs in the Xiliao River basin. The second period is the Hongshan Culture period from about 6500 to 5000 years ago, in which the area covered by the rock art was gradually expanded, and several relatively fixed modeling paradigms such as the curved eyebrows that are connected together, the vortex pattern eyes, the awned outline, and the multiple wrinkles were evolved; the third period belongs to the Xiaoheyan Culture and the Lower Xiajiadian Culture period which is between about 5000 and 3300 years ago, in which the core area of the rock art began to shift to the south and spread out to a bigger area, and patterned stylized features such as human face fish pattern, star-shaped earrings, triangular noses, tree crowns, square outlines, and wave curved outlines appeared; the fourth period is between about 3300 and 1000 years ago, and the Human-face petroglyphs continued to appear new changes under the influence of Eastern culture, Western culture, and Central Plains culture, such as the continuous arcs on the outline, elaborate facial tattoos, "Kun" Hair Style, and hat ornaments, with a clearly increased decorative intent, showing a tendency towards secularization" (Zhu, 2017).

2.2 Review of the Research History on Human-Face Petroglyphs in the Amur River Basin, Russia

The dating of Human-face petroglyphs of the Amur River basin is mainly done by Russian researchers. The first person to discuss the type and age of the Human-face petroglyphs in this region was A.P. Okladnikov. In his book "Petroglyphs of the Lower Amur", published in 1971, he classified the Human-face petroglyphs in this region into eight types based on the shape of their outlines: oval, ovate ovals, heart-shape, trapezoid, rectangular with an oval top, monkey shape or skull shape, and incomplete outlines. His view is that the Human-face petroglyphs in the basin are dated to between 5,000 and 6,000 years ago (A.P. Okladnikov, 1971). Later, in 1977, he published the paper "Interaction of Pre-Historic Cultures of the Pacific Region (based on rock art)", and further revised his view to advance the age to the Middle Stone Age or early Neolithic age, the absolute age is roughly about 5000-4000 BC (A.P. Okladnikov, 1977). As new information became available, later researchers came to a different understanding. E.A. Okladnikova found that all the Human-face petroglyphs were designed in the shape of a skull, and she divided them into seven groups according to the way in which the subject was depicted by comparing the Human-face petroglyphs from the Amur River basin with those of the northwestern coast of North America. These include heart-shaped silhouettes and different types of eyes. This typological approach succeeded in revealing what Asians and American people have in common in their worldview (E.A. Okladnikova, 1979). In reality, not all Human-faces are characterized by skull shaped features.

Regarding the cupule Human-faces without outlines, D.L. Brojansky

in his article "Anthropomorphic images in the Neolithic art of Russia's Primorsky Territory" corresponds them to the Poisman Culture and dates them to 6,500-5,000 years ago. I.A. Ponomareva, in the article "A study on Human-face petroglyphs in the Lower Amur Basin (Chronological Issues)", deduces the Human-face petroglyphs from the lower Amur River and Ussuri River basin to the Late Neolithic period and associates them with the local Maleshevo Culture (5280-4340 BP) and the Voznesenskoye Culture (4300-3700 BP) (I.A. Ponomareva, 2012). In her 2018 paper "Continuity in the Rock Art Tradition of the Siberian Lower Amur Basin" she synthesized Human-face petroglyphs from the lower Amur River basin with archaeological culture and climatic staging and produced a detailed chronological developmental sequence table of rock arts. However, because some key information had not been published at the time, the chronology was not perfect enough. Later, the chronological table was further refined by the author in her 2021 book, "Change and Continuity in the Prehistoric Rock Art of East Siberia: An Archaeological and Anthropological Exploration into Ethno-Cultural Identity, Belonging, and Symbolism."

It should be noted that the ^{14}C dating data of Russian researchers usually mix pre-calibrated and post-calibrated data, whereas the ^{14}C dating data of Chinese archaeology are usually calibrated, which leads to an easy error when we compare the two. Therefore, in this paper, the corresponding Russian dating data are converted into calibrated data, and then compared with the relevant Chinese dating results.

It can be seen that Chinese and Russian researchers are basically in agreement in their opinions that the main part of the Human-face petroglyphs in their countries belongs to the Neolithic period. However, it must be noted that the unfamiliarity of the scholars of the two countries with each other's materials has led to the limitations of the results of all these researches; at the same time, the above researches have not paid enough attention to some newly unearthed archaeological materials, and therefore the origin and evolution of some similar cultural phenomena are not very clear. From the point of view of age, distribution characteristics and types, there exists a close connection between the Human-face petroglyphs in Inner Mongolia and the Far East region of Russia, so it is necessary to be put together for systematic research.

3. THE HUMAN-FACE PETROGLYPHS OF "ON ADJACENT ROCK FACES" IN THE XILIAO RIVER AND AMUR RIVER BASIN

A special type of Human-faces has been found in the Xiliao River basin and the Far East region of Russia. This kind of Human-faces is made at the edge of the rock, showing half a human face on each of the two neighboring rock faces. This special way of composition is probably intentional by the creator and related to some particular concept.

This type of petroglyph is found in abundance in the Far East region of Russia, all of them are located at the Sikachi-Alyan rock art site in the lower Amur basin. The petroglyphs were all created on rocks along the riverbanks, most Human-faces are exist separately, and a few Human-faces coexist with other images. In addition to two images on the same rock (Figures 3.2, 2; Figure 3.2, 5), the remaining images are on separate rocks. One of the images is located on an irregular rock at the Site 1 of the Sikachi-Alyan rock art (Figure 2, 1; Figure 3.2, 1). The petroglyph was made near the base of the rock and is almost symmetrically distributed on two adjacent rock faces. The image has an outline and uses circles to indicate the eyes, creating a nose and mouth, and has lines that resemble whiskers at the jaw. The image in the upper right of the profile and one eye have flaked off. The other five images are all located at Site 2 of the Sikachi-Alyan rock art. The second image is in an inverted position, on two adjacent rock faces at the base of a rock that is almost perpendicular to the ground. In fact, the rock is likely to have been displaced by seasonal flooding over a long period of time, and the image seen now should be the result of an inversion under the thrust of the flood. This phenomenon is often seen in rock art of the lower Amur River. Therefore, the image should have originally been located on the upper part of the rock and represented a frontal rather than an inverted image. The Human-faces has an outline, which is partially flaked off at the top, with two larger rounded fossae for the eyes, two smaller oval fossae for the nose, and a downward-curving broken line for the mouth, with both ends of the broken line intersecting the facial contour; in addition, there are two parallel lines extending outward and upward above the eyes, with the ends of the lines intersecting the outline (Figure 2, 2). The third image also has an outline, which is slightly concave inward above the outline, forming a heart-shaped structure. Additionally, this image represents the eyes with a circle and a small rounded fossa to represent the eyeballs, while the mouth is represented by two horizontal lines that are long at the top and short at the bottom (Figure 2, 3; Figure 3.2, 6). It is also important to note that unlike the previous image, which is located on a rock face that is almost perpendicular to the ground, this image is located on two inclined rock faces. The image has been blurred due to long-term erosion by flowing water.

The fourth image is on a long strip of rock by the river, which is partially submerged in water (Figures 3.2, 2-3). Looking down one can see a human face figure in the shape of skull at the top of the rock. This image also uses circles to represent the eyes, small rounded fossae for the eyeballs, and two dots connected by a line for the mouth; the style of the nose is more realistic, with a high bridge and two small rounded fossae for the nostrils. In addition, there is a face without outlines on the two adjacent rock faces at the base of this rock, which has been soaked with water for a long time, and after the river receded, the human face figure was buried in the silt, therefore, it is necessary to remove the silt before the petroglyph can be seen. This image is a face without outline figure with two distinct cupules for the eyes, a short vertical line for the nose, and a nearly elliptical circle for the mouth (Figure 3.2, 5). The fifth human face figure is more particular. The junction of the adjacent rock face on which it stands has been exfoliated to form a more complete plane, and the human face figure is made on this exfoliated rock face. This human face figure has outline, with deeper rounded fossae for the eyes and mouth, two curved lines for the eyebrows, and a line extending downward below the right side of the face (Figure 3.2, 4; Figure 3.2, 7). There is also a deer image on one of the planes where the human face figure is located, and the ribs of the deer are clearly visible. This artistic style is also known as "skeleton style", "X-ray perspective style", "X-ray style", etc., which are all different expressions of the same style. Scholars generally believe that this style has a close relationship with shamanism. E.G. Devlet pointed out that "the rock art of the God-Man Unity in the perspective style was not intended to illustrate the body, but was intended to express a state of the shaman as a medium of death and rebirth, and this concept was passed down, and later, the shaman's costume was decorated with motifs of this style" (E.G. Devlet, 2001). A.P. Okladnikov also points out that "this 'skeleton' style has its origins in the artistic traditions of the Taiga forest tribes from the end of the 2000 BC to the early 1000 BC and has the closest relationship with shamanistic ideology" (A.P. Okladnikov, 1974); Burchard Brentjes argues that "both human face figures and 'skeletal' style rock art created by tribes settled along the Amur River are all reflections of shamanism" (Burchard Brentjes, 1999).

At present, only two such petroglyph sites have been found in the Xiliao River basin at Baimiaozi Mountain. The northern source of the Xiliao River is the Xilamulun River, which flows through Baimiaozi Mountain from the north, and both rock art sites are located on separate boulders in the sandy hinterland. This boulder is very similar to the rock "Turtle Rock" where the rock art of cupules is found in Anshan City, Liaoning Province. One of the rock art sites is also known as the "Giant Potato Rock" because of its resemblance to a giant potato. The image is 290cm long, 82cm wide and 142cm high, and includes about 14 human face figures and 19 images consisting of cupules (Figure 4, 3). The Human-faces are located on a side of the rock to the southeast and can be roughly divided into three groups, upper, middle and lower. The upper group consists of nine images, all but one of which have no outlines. One image in the center is particularly prominent; the Human-face has a heart-shaped outline, with circles for the eyes, small rounded fossae for the eyeballs, and a vertical line extending downward from the downward concavity in the middle of the top of the outline to indicate the bridge of the nose, with small rounded fossae attached to the left and right sides of the vertical line to indicate the nostrils. In addition, there are ten short lines on the lower jaw, possibly indicating teeth. It should be noted that this Human-face has six small cupules within the facial contour, which are symmetrically distributed on both sides of the face. This Human-face is the largest in size, has the deepest manufacturing marks, and is in the most striking position, and it can be clearly felt that the maker carried out the work with extremely strong religious emotions (Figure 4, 3c).

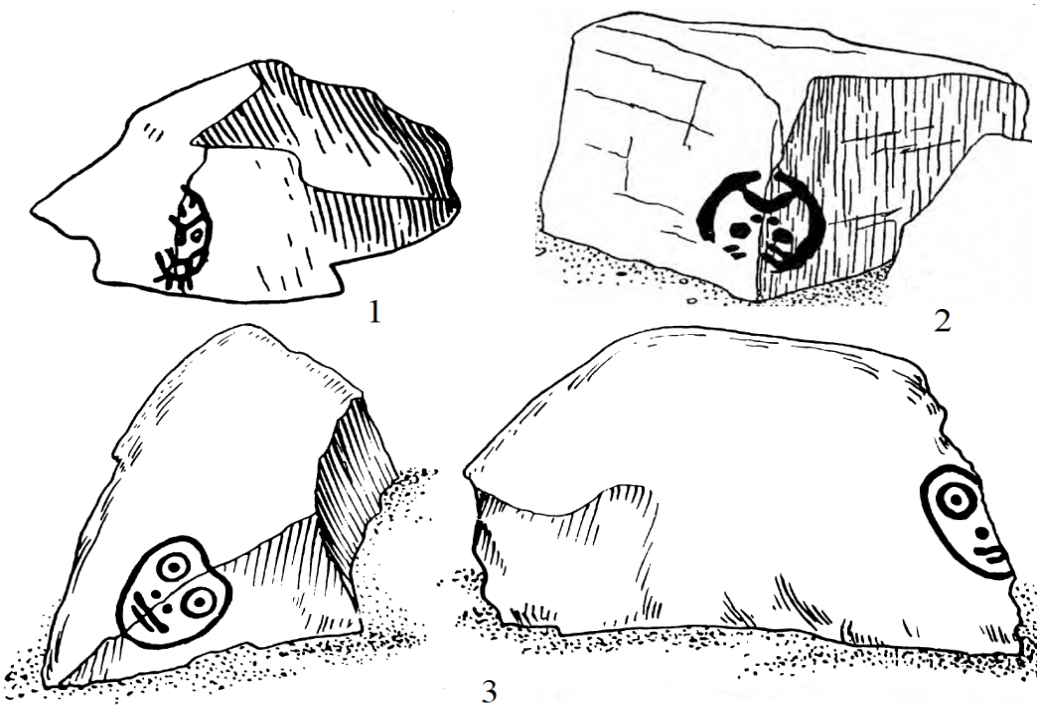

Figure 2: Images Made on Two Neighboring Rock Art Surfaces in the Sikachi-Alyan Rock Art

1、2. Site 1; 3. Site 2 (From: Laskin, A.P., 2015. Petroglyphs of Sikachi-Alan: historical and cultural context and state of preservation. Dissertation for the degree of Candidate of Historical Sciences. Institute of Archaeology of the Russian Academy of Sciences, Pp. 332, 342, 454.)

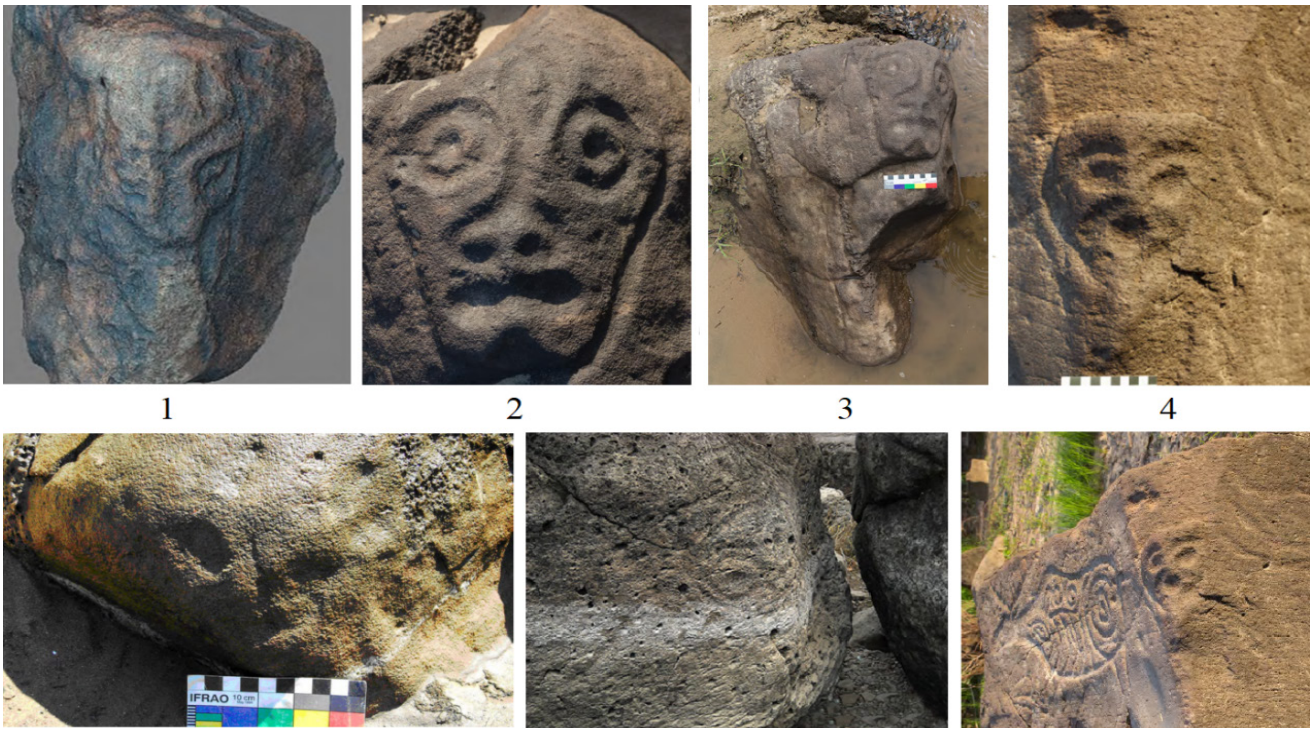

Figure 3: Images Made in Two Adjacent Rock Surfaces in the Sikachi-Alyan Rock Art Site

1. site 1; 2-7. site2 (From: Laskin, A.P., 2015. Petroglyphs of Sikachi-Alyan: Historical and Cultural Context and State of Preservation. Dissertation for the Degree of Candidate of Historical Sciences. Institute of Archaeology of the Russian Academy of Sciences, Pp. 333-530.)

The other four human face figures are located on the lower side of the image. Three of these images are already very close to the lower edge of the rock. The images all have heart-shaped outlines, and the overall composition is similar to the faces with facial outlines in the upper part and the giant Human-face petroglyphs in the middle. In the lowest part of the rock there is a Human-face located on two adjacent rock faces, with a small circle above the heart-shaped outline; the figure has oval eyes, the tail of the eye is upturned, the eyeballs are indicated by horizontal lines, and there are upturned arcs at both ends between the eyes and the mouth, which end in the outline of the face, and some teeth have fallen out seriously (Figure 4, 1; Figure 4, 3d). The other image is highly similar to it (Figure 4, 3e). Scholars generally believe that all of the cupules are located on the upper rock face, and it is widely believed by researchers that such images represent astrological signs. Additionally, the cupules

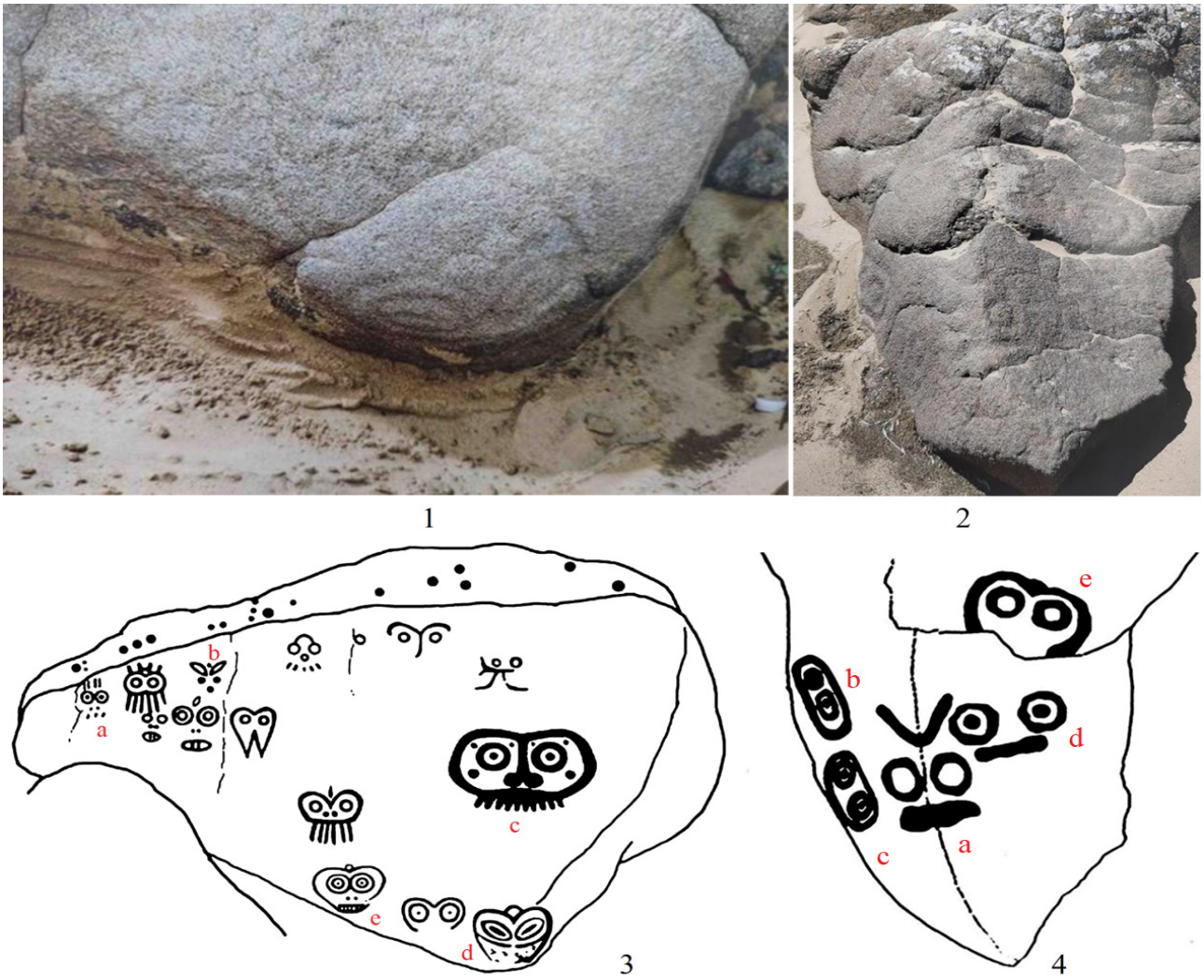

Figure 4: The Images Made on Two Adjacent Rock Surfaces in the Xiliao River Basin Rock Art

1～4. Baimiaozi Mountain (4.1; 4.2; 4.4 From: Zhou, Y.S., Wu, J.C., 2022. Chifeng Rock Art (Three volumes) (Volume II). Beijing: Science Press, Pp. 263,273; 4.3 From: Zhu, L.F., 2017. Research on Human-face petroglyphs of Northern China from the Perspective of the Pacific Rim. Beijing: China Social Sciences Press, Pp. 224.)

form part of the composition of the Human-faces (Figures 4, 3a-3c). This suggests that there may be some potential connection between the cupules and the Human-face petroglyphs. All of the petroglyphs are made by the abrade technique, with deep abrasions, well-made but severely corroded, and the general conclusion is that their chronology belongs to an earlier period among the Human-face petroglyphs in this region.

Another rock is 115cm high and 85cm wide, containing five Human-faces, all of which were made by the percussion method (Figure 4, 2; Figure 4, 4). One of the Human-faces is located in the middle of the two intersecting rock faces; it is also at the center of the top view of the entire rock face (Figure 4, 4a). The eyes are indicated by circles, the mouth by a horizontal line, and the eyebrows by a broken line extending upward above the eyes. The Human-face is evenly divided into two parts by the intersecting lines of the rock face. In addition, there are four other Human-faces on both sides of the rock face. On one side, there are two faces with facial outlines that are basically the same composition. Both of them use oval-like shapes to represent the human face, and circles or ovals to represent the eyes, with eyeballs inside the eyes, and the two images are in close positions, so they should be from the same period (Figure 4, 4b; Figure 4, 4c). The figures on the other side belong to different type. One of the images without outline, with circles for the eyes, round concaves for the eyeballs, and short horizontal lines for the mouth. This image is close to the center image and has a similar shape to it, especially the outlines of the eyes and mouths are almost consistent (Figure 4, 4d). The other face with facial outline is located farther away, and although on the same side as the face without outline, it is actually located on two different rock faces due to the fracture of the rock face (Figure 4, 4e). Because of the age being too long, all of the above images are damaged and cannot be seen clearly.

4. THE HUMAN FACE CULTURAL RELICS OF "ON ADJACENT ROCK FACES" IN THE XILIAO RIVER AND AMUR RIVER BASIN

This type of composition is also found in archaeological unearthed relics. Only one artifact with such images has been found in the Far East region of Russia. A relief human head made of basalt was found at the site of Goncharka-1, which belongs to the Osipovka Culture, with facial features symmetrically distributed on two backward folded adjacent planes (Figure 5). Accordingly, I.A. Ponomareva deduced that such Human-face petroglyphs in this region are from the period of the Osipovka Culture and date back to between 13,300 and 10,300 years ago (I.A. Ponomareva, 2021). In fact, there are significant differences between this human head figure and the Human-face petroglyphs, and there are few similarities in composition. First of all, from the view of production technology, the former used the shallow relief technique, with the features presented in the form of relief; while the petroglyphs are all produced on the rock plane, with the features mainly presented in the form of silhouettes, which belong to two different production techniques from the former relief images. In addition, there are technical differences among the

Human-face petroglyphs. Some of them are made with shallow marks (Figure 3, 1; Figure 3, 6), while others are made with deeper marks (Figure 3, 2; Figure 3, 4). This suggests that the Human-face petroglyphs themselves have a chronological relationship and were not made in the same period. Next, in addition to the characteristic that they were made on adjacent rock faces, the Human-face petroglyphs of such districts also have other characteristics, such as a "skull-shaped" or "heart-shaped" contour, tattooed faces, nostrils and so on. Human-faces in the Far East region of Russia with the above-mentioned characteristics belong mainly to the Maleshevo Culture and Voznesenskoye Culture of the Go rinsky stage. This has been intensively studied by I.A. Ponomareva (I.A. Ponomareva, 2018). And again, from the point of view of the preservation of the petroglyphs, the difference between the petroglyphs and the surrounding areas is not obvious. Therefore, it is difficult to draw a direct analogy between the Human-faces in the petroglyphs and this human head relief image, and then conclude that the petroglyphs can be dated as early as 10,000 years ago. Finally, this human head figure is an isolated case, and under the principle of not using an isolated case as a valid argument, it is also difficult to date the Human-face petroglyphs in this region to the period of the Osipovka Culture. In summary, we believe that such Human-faces of the Far East region of Russia belong to the Malyshevo Culture (4260-2900 BC) and the Go rinsky stage of the Voznesenskoye Culture (3000-2600 BC).

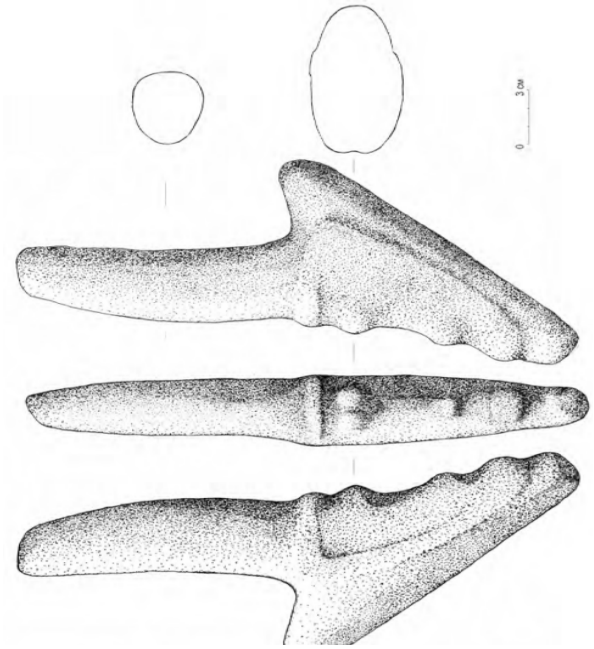

Figure 5: Stone Head Figure of Osipovka Culture (From: Shevkomud, I.Ya., Yanshina O.V., 2012. Beginning of the Neolithic in the Amur Region: Goncharka-1 settlement. St. Petersburg: MAE RAS. 2012. Fig. 52. Pp. 117.)

Many Human-faces made on adjacent rock faces have been found in the Xiliao River basin. One of them was unearthed at the Nanwanzi Site in Ongniud Banner belonging to the Xinglongwa Culture, which is of the Baiyin Changhan type. There are two human figures standing side by side behind the F2 stove in the north of the Nanwanzi Site (Figure 6, 1). The artifacts were inverted and nearly flat when they were excavated which suggests they were originally stuck and standing in the ground. The two figures protrude eyebrows (or superciliary arches) and lips on the face, with a preliminary judgment indicating a man and a woman. The eyes and mouth of the female stone figure are made of clamshell eyes and teeth (Inner Mongolia, 2017). It is dated to more than 7000 years ago.

It should be noted that similar compositions are found frequently in the Hongshan Culture. Three of them are from the Banlashan cemetery and include both stone and jade carriers (Figure 6, 2; Figures 6, 8-9). Sample M41: 1, stone head figure, sandstone texture. The forehead is high and slightly convex at the top, which should be the crown, there is a band of decoration on the overhead hanging down to the back of the head. The ears are carved in a semicircle, the eyes are made in relief in the shape of willow leaves, with the outer corners turned upward. The cheekbones are raised, the nose is raised in the shape of a triangle, the two nostrils are shallowly carved, the lips are tightly closed and slightly raised, and the corners of the mouth and the lower jaw are carved with a number of whiskers (Figure 6, 2) (Xiong, Fan, Wu et al., 2017). Sample M12: 1, Jade Pig Loong. jade-green color, the color is light green, slightly yellowish. The loong's body is curled like a ring, with the head and tail separated like a Jade Jue. The ears are long and erect, the eyes are round and slightly bulging, the muzzle is convex forward, the nostrils on both sides are slightly open, and the mouth is closed. Five widely shaded lines are engraved between the forehead and the nose, three shaded lines between the eyebrows are connected with the orbital line, the nose consists of two shaded lines, and the mouth is one shaded line (Figure 6, 8) (Xiong, Fan, Wu et al., 2017). Sample T0407②B: 3, bust stone figure. The texture is yellow-brown coarse sandstone. The body is flattened and carved in the round. The left side of the head is blurred due to severe weathering. It has a wide forehead with a circle of grooves carved on the top of the head resembling a crown. The nose is high, like a hawk 's nose, the right eye is rounded and convex, the ear has become difficult to see due to weathering, and the lower jaw is rounded and convex (Figure 6, 9). The cemetery belongs to the Late Hongshan Culture, with a corrected date of 5,465-5,345 years ago (Xiong, Fan, Li et al., 2017).

In addition, five jade artifacts with the above characteristics were found at the Niuheliang site (Figures 6, 3-7). Among them are two jade comb back ornaments which have two human (animal) heads and three holes. Sample 79M1: 4, it's body is long strips with one animal ear carved in the round at each end, and a face that is symmetrical and folded inward, lying almost on two adjacent planes (Figure 6, 3). The head of the animal has a bulging forehead, a nearly triangular facial profile, the short ears have an arc shape and stand diagonally, and a slightly upturned muzzle. The orbits are represented by a diamond shape made by bas-relief using reducing technology, and the eyeballs are each represented by a shaded line in the orbits. The details of the features of the two animal heads are also different; one of the animal head muzzles is very upturned, and an ear is lower and inwardly affixed, while the other animal head muzzle is wider, with the upturned trend not being obvious. Three larger circular holes are drilled side by side in the center of the vessel. Sample N2Z1M17: 1, the color is white, polished smooth throughout. Symmetrically carved on both sides. Each end of the body of the artifact is carved with a human head, which has a crown on it, the crown shaded with short diagonal lines, a frontal projection, slightly concave face, round eyes, a large nose, the tip of the nose is rounded, the mouth is slightly open, the jaws are long, and the bottom of the jaw slightly outward. In the center of the body, three round holes of equal size and equidistant arrangement are made using the opposite drilling technique, it with a thinner bottom, which should be the tenon, and three smaller holes are drilled on the tenon (Figure 6, 7).

The two Jade Pig Loong are basically the same as those excavated from the Banlashan Cemetery in the previous section. Sample N2Z1M4: 2, jade-green color, the color is light green, slightly yellowish. The body of the artifact is finely polished, smooth and rounded. The Loong's body is curled like a ring, with the head and tail separated like a Jade Jue. The body is flat, round and thick, and the holes are drilled on both sides. The edges of the holes are polished which is round and smooth, and a single hole is drilled in the back; the hole is not regular enough. It is animal head shaped, the big ears are short and erect, and there are short angular ridges between the ears from the middle of the forehead to the top of the head. The eyes are round and slightly bulging, the muzzle is convex forward, there are nostrils, and the mouth is open. The forehead and muzzle are carved with multiple shaded lines, with fewer and deeper shaded lines on the muzzle, as two under the nose and three above the nose (Figure 6, 4). Sample N16M14: 3, one Jade Pig Loong. The body is flat, round and thick, curled in an oval shape, cut between the head and tail, with the head and tail close to each other, leaving a distinct cut mark in the notch. The head is large, with a slightly convex forehead, two rounded standing ears slightly flared out, and the tip of one ear smoothed. There is a ridge between the ears, and the face is carved in shaded lines with rounded eyes, mouth, and folds of the muzzle, and its muzzle projecting forward. The nostrils are oblong and have three

folds at the top and bottom. The mouth is tightly closed, and the neck is pierced with a round hole (Figure 6, 5). In addition, many similar Jade Pig Loong have been found at the Niuheliang Site.

In addition, there is another piece of jade, which is not made on the two adjacent folded planes but has a very important role in understanding the composition of the above image. Sample N2Z1M26: 2, a piece of jade decorated with two animal (owl) heads. Yellowish-green in color with localized white blemish spots, finely ground. The body is in the shape of a flat plate and the edges are thin. It can be divided into front and back. Each end of the front is carved with an animal head that is symmetrical and resembles an owl. The animal's head has standing ears, and there is a protruding tip that rises in the middle of the forehead; the eyes are oval, and the mouth extends downward from the upper and lower sides, with the corners of the mouth rounded. The middle part of this artifact is hollowed-out; on both lateral sides, six tile-groove patterns were executed using shallow relief technique, with one set of raised flanges decorations created along each outer edge. Each set comprises three individual flanges, and a half hole is drilled in the edge of the upper part of one side of the flange. The flanges on both sides exhibit an apparent diagonal symmetry (Figure 6, 6). We find that by folding this jade vessel decorated with two animal heads in the center, it can form the shape of the Jade Pig Loong described earlier. For the convenience of narration, the concept of "split-unfold" can be introduced. Han Ding has discussed the concept of "split-unfold" in detail: "The so-called 'split-unfold' can be understood as the two processes of 'splitting' and 'unfolding'. The so-called 'split-unfold' can be understood as the two processes of 'split' and 'unfold'. First of all, 'split': Imagine a side view of a real animal, and then imagine a sharp blade dissecting the animal from the tail end along the spinal line forward to the neck; in this way, the animal will form a complete head and a 'two-sides' body. Second, 'unfold': First put the animal head in the middle of the front view, and then unfold the two bodies and put them horizontally on both sides of the head. In this way, the middle is a frontal view of the animal's head, and the left and right are symmetrical side views of the body. As a whole, "split-unfold" is the process of transforming a three-dimensional animal image into a two-dimensional image, and ensuring that all parts of the animal's body are fully displayed on a two-dimensional plane is "a naive and interesting attempt before the emergence of perspective painting" (Han, 2022). In fact, we can also consider this image as the result of splitting-unfolding the aforementioned jade vessel decorated with two animal heads and Jade

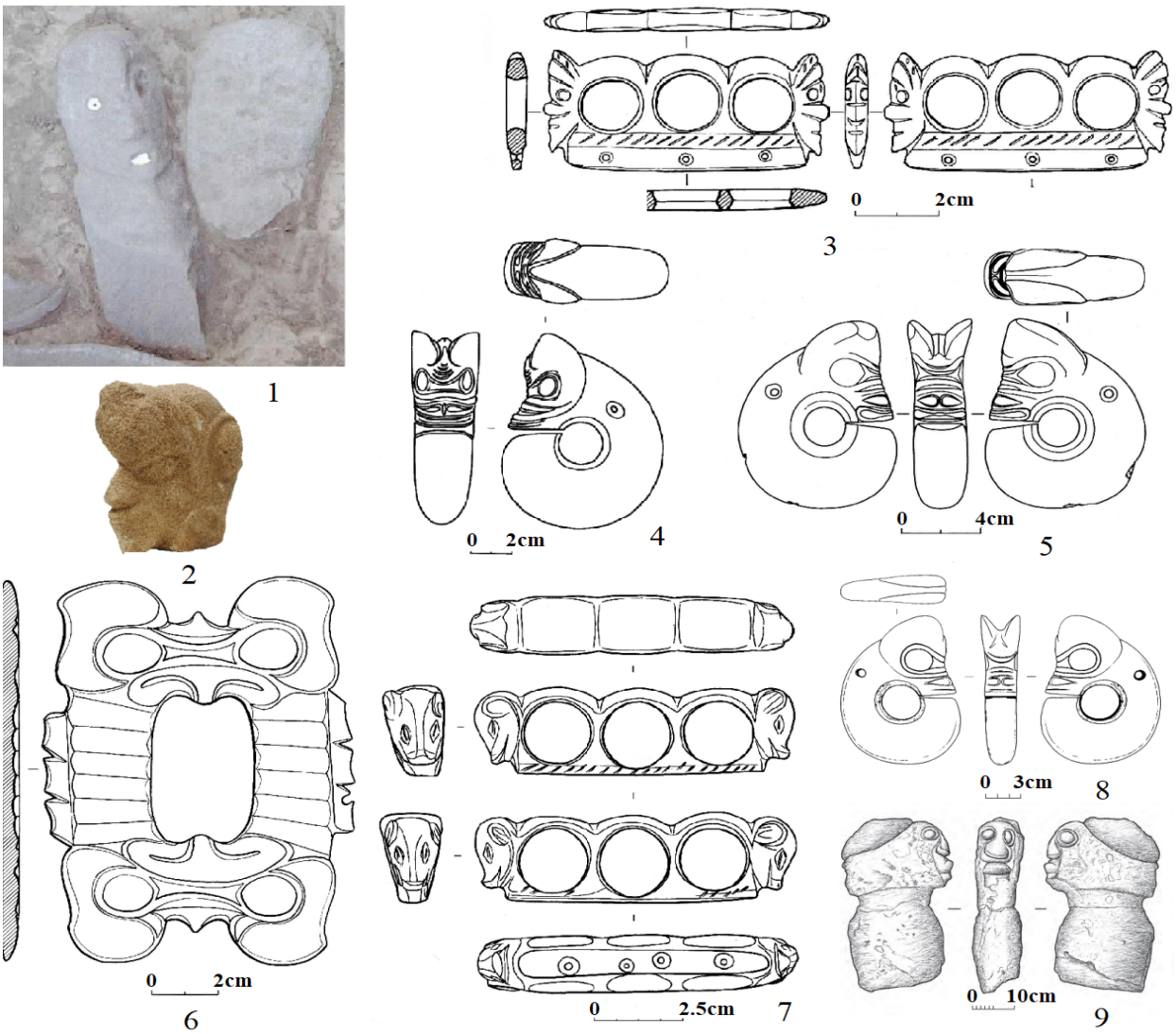

Figure 6: Images Made on Two Adjacent Planes of Cultural Relics Unearthed in the Xiliao River Basin

1. Xinglongwa Culture stone human figure 2, 9. Hongshan Culture stone human figure 3-8. Hongshan Culture jade (1. Nanwanzi site; 2, 8, 9. Banlashan cemetery; 3-7. Niuheliang site) (6.1From: Inner Mongolia, I.C.R.A., 2017. Review of Archaeological Discoveries of the Institute of Cultural Relics and Archaeology, Inner Mongolia Autonomous Region. Steppe Cultural Relics, (1); 6.2,6.8 From: Xiong, Z.L., Fan, S.Y., Wu, Y.L. et al., 2017. The Excavation of the Banlashan Cemetery of the Hongshan Culture in Chaoyang City, Liaoning. Archaeology, (2); 6.3-7 From: Liaoning, P.I.C.R.A., 2012. Niuheliang: Excavation Report on a Hongshan Culture Site (1983-2003) (Volume I, Volume II). Beijing: Cultural Relics Press, Pp. 77-425; 6.9 From: Xiong, Z.L, Fan, S.Y., Li, D.X. et al., 2017. The Banlashan Cemetery of the Hongshan Culture in Chaoyang, Liaoning. Archaeology, (7).)

Pig Loong. Although the image details and presentation are different, the underlying cultural significance is largely the same.

The human faces in jade of Xinglongwa Culture and Hongshan Culture are much more closely related to the Human-faces in petroglyphs. First of all, both of them are made on a flat surface. The images of Xinglongwa Culture and Hongshan Culture often use the method of bas-relief by reducing to show the images of humans or animals, which is the same as the way of making rock arts. Secondly, some of the motifs on the Jade Pig Loong are also found in petroglyphs, such as teeth motifs, tattooed faces motifs, and eyes in the shape of water beads, indicating that the two are highly related.

It can be seen that the Human-face petroglyphs located in the adjacent petroglyphs were found in the Xiliao River basin and the Far East region of Russia. Such Human-faces in the Xiliao River basin appear in the middle and late stages of the Xinglongwa and Hongshan Cultures, dating from about 5000 to 3000 BC. After comprehensive analysis, we believe that the Human-face petroglyphs in the region should belong to this period. As for the latter, although I.A. Ponomareva deduced it to be the period of Osipovka Culture, the analysis of this paper suggests that it mainly belongs to the Maleshevo Culture (4260-2900 BC) and the Go rinsky stage of the Voznesenskoye Culture (3000-2600 BC), i.e., 4260-2600 BC.

It should be noted that the determination of its age is mainly through comparing the unearthed relic images with rock art images, which is also known as the indirect dating method. Besides, some scholars also try to use the direct dating method, i.e., using natural science methods to date rock art. Among the dating of petroglyphs, the most effective and commonly used method is microerosion analysis. One of the most famous cases is the microerosion dating of the Xiliao River rock art carried out in 2015 by Prof. Tang Huisheng and Robert.G.Bednarik who is the president of the International Federation of Rock Art Organisations (IFRAO) in Australia, and Giriraj Kumar who is the Secretary General of Rock Art Society of India (RASI). Including the results of microerosion dating of a face with a facial outline at the Xiaofeng Mountain rock art site show that it is dated to about 4730+1400/-810 years ago, which belongs to the Late Neolithic period and is comparable to the age of the Hongshan Culture or a little bit later than it (Figure 7). This image is heart-shaped internally and has oval-like outlines externally, similar to a number of Human-faces of the lower Amur River basin. This further suggests that most of the Human-face petroglyphs of the Xiliao River basin and the Far East region of Russia all belong to the Neolithic period.

Figure 7: Xiaofeng Mountain Rock Art in Chifeng City (From: Tang Huisheng et al. The 2015 Rock Art Missions in China. Rock Art Research, 2018 (1).)

5. CONCLUSION

Through the above studies, it can be found that the creation motives of some Human-face petroglyphs in the Xiliao River basin are obviously similar to the rock art of the Far East region of Russia, which is particularly fully reflected in the specific way in which the Human-faces are made at the intersection of adjacent planes of natural boulders. This similarity allows us to compare the Human-face petroglyphs of Xiliao River basin with rock art of the Russian Far East, and furthermore, the qualitative analysis of the dating makes this comparison more convincing. In addition, many artistic features of the decorative tradition of Human-face petroglyphs from the Far East region of Russia have been found in the Xiliao River basin human face figures, which indicates that the rock art of the two regions mentioned above most likely comprised a larger rock art system, and the former is probably a spatial extension of the latter. Based on the analysis of archaeological excavated materials and the results of microerosion analysis, we can roughly establish a chronology of Human-face petroglyphs in the Xiliao River basin and the Far East region of Russia. In fact, the creation custom of Human-face petroglyphs in the Xiliao River basin has a history of up to 8,000 years, and with the exception of the Human-face petroglyphs located on neighboring rock faces described in this paper, various types of Human-face petroglyphs are generally older than those of the Far East region of Russia, and Human-face petroglyphs in the above area are likely to be related to the historical development of the "ancient culture, ancient city, ancient state" in Northeast China (Xiao and Wang, 2022).

ACKNOWLEDGEMENT

This paper is result of "Major Program of the National Social Science Foundation of China "Digital recording and comparative research on rock art in Southwest China and Southeast Asia" (Approval Document No.:24&ZD313)"; is result of "Research on the Chinese Rock Art Studies." (Approval No.:22JZD032) of "the Ministry of Education's major research projects in philosophy and social sciences."; and also, is result of "The Comparative Study of Chariot Petroglyphs in Northern China and Central Asia" (Approval No.:2023QGRW018) of "the Guangxi Scholarship Fund of Guangxi Education Department (GED)".

ANNOTATION

Note 1: The Amur River and the Heilongjiang River are the same transnational river. In this paper, in order to distinguish the different countries where the river is located, the part within Russia is called the Amur River, and the part within China is called the Heilongjiang River.

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