

Lower Palaeolithic Industry of An Khe in Prehistoric Context of Vietnam and Region

Nguyen Khac Su¹, A. P. Derevianko², Nguyen Gia Doi³ et al.

¹ Vietnam Archeological Association.

² Institute of Archeology and Ethnography, Siberian Branch, Russian Academy of Sciences.

³ Institute of Archaeology, Vietnam Academy of Social Sciences.

Email: khacsukc@gmail.com

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Abstract: This paper systematically presents material from the investigations into, and excavations of, the Lower Palaeolithic sites of An Khe, Gia Lai Province, in central Vietnam. It defines the basic characteristics of the An Khe industry with its technical tools: choppers and chopping tools, trihedral picks, and bifaces - handaxes. Among them, the choppers are mainly from Asia, bifaces - handaxes appear in the western sites, while trihedral tools are characteristic of the Lower Palaeolithic period of An Khe, Vietnam. The An Khe industry is different from, and older than, the other Lower Palaeolithic industries currently identified in Vietnam, such as Nui Do (Thanh Hoa Province) and Xuan Loc (Dong Nai Province). It also differs from the typical European Acheulean industry. However, it has many similarities with the Baise industry in Guangxi, China, in terms of material, size, type and tool making technique. The An Khe industry may date back $782,000 \pm 20,000$ BP to $806,000 \pm 22,000$ BP. Its discovery has provided a lot of new material, leading to changes in the view on the oldest cultural and historical period of mankind in general and Vietnam in particular.

Keywords: Palaeolithic, An Khe, Acheulean, Baise, biface.

Subject classification: Archaeology

1. Introduction

In 2014, Vietnamese archaeologists discovered five Palaeolithic sites in An Khe Town [16, pp.47-65]. From 2015 to 2019, a joint archaeological programme was conducted between the Vietnam Institute of Archaeology and the Institute of Archaeology and Ethnography of the Siberian Branch, Russian

Academy of Sciences, in coordination with the Department of Culture, Sports and Tourism of Gia Lai Province. It resulted in the discovery of another 19 sites, four of which (at the time this paper was published) have been excavated, namely Go Da, Roc Tung 1, Roc Tung 4 and Roc Tung 7 (Map 1). The findings have provided a great deal of information on the Lower

Palaeolithic industry in An Khe in correlation with the region [8], [9, pp.3-21]. It includes a number of important issues such as: the theoretical line (Movius line) dividing the two industries of bifaces and choppers/chopping tools of the Old World (Africa, Asia and Europe); the formation of the Lower Palaeolithic industries in Southeast Asia; the psychological development of *Homo erectus* (upright man) as the early human species adapted to the environment; and how far Vietnam's history can be traced back. This paper is aimed at presenting additional analysis and discussion of such issues in the prehistoric context of Vietnam and the region.

2. The excavated sites

- The Go Da site is located in An Binh Ward, An Khe Town, 130 58'19.2" N 1080 39'05.1" E, and 421.5m above sea level. The site was excavated twice in 2015 and 2016 covering a total area of 94m². It revealed a cultural deposit with an average thickness of 25cm, composed of clay, grits, laterite, and on-site weathered granite. The excavation trenches uncovered a total of 111 lithic artefacts, including 17 pointed tools, 10 choppers, 26 scrapers, four hammer-stones, one pestle, six flake tools, 20 flakes, 27 cores and 21 tektites. One tektite sample was analysed using the 40K/38Ar dating method, yielding the date of 806,000 ± 22,000 BP.

- The Roc Tung 1 site is located in Xuan An Commune, An Khe Town, 14°02'25.3"N 108°40'82.2"E, and 443m above sea level. The site was excavated in 2016, 2017 and 2018, exposing a stratigraphy

with an average thickness of 35cm. Trench one excavated in 2016 covered an area of 88m². It contained 213 lithic artefacts (eight pointed tools, five choppers, six scrapers, one uniface, two hammerstones, 37 flakes and 27 cores) and 127 tektites. Trench two excavated in 2017 and 2018 with an area of 70m² had been preserved under a house built on the site. Using the K-Ar dating method the age of a sample of tektite recovered from this site was estimated to be 782,000 ± 20,000 BP.

- The Roc Tung 4 site is situated in Xuan An Commune, An Khe Town, 14002'2.7"N 108040'35.7"E, and 430m above sea level, has been excavated three times. The 2016 excavation covered an area of 88m² and unearthed 123 artefacts, including one uniface, eight pointed tools, six scrapers, two chopping tools, one hammerstone, 27 flakes, 41 retouched flakes and 127 tektites. The excavation a year later in 2017 exposed an area of 60m² and revealed 478 lithics, comprising 14 chopping tools, 10 pointed tools, 12 scrapers, one uniface, one biface, 19 core-like tools, 19 cores, 139 flaked pebbles, 209 flakes and 252 tektites.

The 2018 excavation was undertaken over an area of 100m², 40m² of which has been completed (at the time this paper was published). It yielded 1,811 lithics and 91 tektites, including 50 cores, 61 tools (22 choppers, 18 pointed tools, 15 scrapers, six tools with two concave edges and a point in between), 1,458 flakes and 242 chipped pebbles. The remaining 60m² of the trench has yet to be finished (at the time this paper was published). A structure was erected over the site to protect it from the elements.

- The Roc Tung 7 site is located in Xuan An Commune, An Khe Town, 14001'45.2"N

108041'11.3"E, and 438m above sea level. The site was excavated in two seasons, 2017 and 2018, covering an area of 40m². Its cultural deposit is 25cm thick, composed of white weathered granite, yielding 194 lithics (including nine chopping tools, five trihedral-sectioned pointed tools, four scrapers, seven core-like tools, one pestle, 14 cores, 76 retouched flakes, 78 flakes) and 97 tektites.

- Other sites: Apart from the four digs mentioned above, 19 other Palaeolithic sites have been found and examined using test pits. These include: nine sites named Roc Tung 2, 3, 5, 6, 8, 9, 10, 11, and 12 in Xuan An Commune; two sites, namely Roc Lon 1 and 2, in An Phuoc Ward; the site of Roc Huong in An Tan Ward; two sites, known as Roc Gao 1 and 2 in Ngo May Ward; two other sites, namely Roc Nep 1 and 2 in Cuu An Commune; as well as three sites referred to as Nui Dat 1, 2 and 3 in Thanh An Commune. A number of representative lithic artefacts discovered at these sites have been recorded such as bifaces, handaxes, pointed tools, triangular-sectioned pointed tools, scrapers, choppers, cores, chipped pebbles, flakes and so on that look similar to those discovered at the An Khe Lower Palaeolithic sites.

3. An Khe industry

The archaeological sites discovered in An Khe are distributed over hills and mounds at an elevation of 420-450m above sea level. This is a transitional zone between the highlands and coastal plains of central Vietnam. The terrain is fairly even, home to abundant and diverse fauna and flora as well as a plentiful source of lithic raw materials,

which would have been suitable for long-term occupation of prehistoric people.

The cultural deposit of An Khe is between 25cm and 40cm thick, covered by a layer of soil on the surface and granite beneath. It was produced by weathering from on-site hard-cemented laterised granite. Stone tools and extra-terrestrial broken tektites with sharp edges were noted in the deposit. The stratigraphy that contains vestiges of human activity in An Khe is comparatively intact. The collection of artefacts recovered from the An Khe excavations shows a homogeneity in terms of material, morphology and manufacturing technology, consistently typical of a Lower Palaeolithic stone tool industry- the An Khe industry. The An Khe industry is characterised by a complex of pebble tools, which are hard fine-grained rocks, mainly quartz and quartzite. The tools show the simple knapping techniques used by ancient humans with few signs of retouching. The typical tools include: bifaces, handaxes, pointed tools, triangular-sectioned pointed tools and choppers and chopping tools. In this complex the latter two types were prevalent in Asia, bifaces and handaxes were common in the Western Palaeolithic period, whereas triangular-sectioned pointed tools are most representative of the An Khe region.

- Handaxes are especially typical tools in the biface group, with two chopped sides, one tapering end and a handle that can be held by hand; and the two big sides were flaked to remove the natural cortex. They were made of flint, chert or quartzite, which typify the Lower Paleolithic. The most typical handaxes are from the Lower Paleolithic Acheulean industry, which

persisted until the Middle Paleolithic of the Mousterian industry. Archaeologists consider them as multifunctional tools that can be used for hunting animals, cutting meat and scraping skins/hides, digging for rooted food, searching for animals or finding water sources, chopping trees/plants, peeling-off tree bark, slaying prey and as cores for flaking. Bifacial tools have been discovered at almost all the Lower Palaeolithic sites of An Khe, although they are not numerous. They were found in various locations: Go Da, Roc Lon, Roc Gao, Roc Huong, Roc Tung 4, Roc Tung 7 and Roc Tung 10. Typical are the handaxes at Go Da, Roc Tung, Roc Gao and Roc Lon (Figure 1).

The An Khe handaxes are large in size, made of quartzite, typically javelin-shaped with tapered heads and round handles. The chopped traces are concentrated on two-thirds of the parts of their bodies, on both sides, running from the edge to the centre, creating a raised line from the head to the handle. The middle part is thick and tapers at the two edges. The chopped traces are small, interweaving with one another forming zigzag edges. The An Khe handaxes are fairly large with an average size of 20.7cm long, 11.9cm wide, 7.4cm thick and 1.9kg in weight.

- Tools that were chopped/flaked almost exclusively on one face (unifacial tools) are fairly numerous, and typified by those found at the Roc Lon, Roc Tung and Roc Huong sites. They are large, almost oval-shaped, quartzite pebbles chopped almost exclusively on one face, with the cortex intact on the surface of the opposite face. The chopped traces are concentrated at the edges and taper at the middle, forming a

useful convex edge. The other end would have been used as a handle. The two edges were chopped from the cortex side to the side where the cortex has been detached, with small traces interwoven with two accurate large ones. The body thickness gradually thins out from the handle to the head, with an almost flat oval body cross-section. On average the artefacts are 17.82cm long, 13.6cm wide, 8.4cm thick and weighing 2.3kg. Unifacial tools have been discovered in some Lower Palaeolithic sites around the world. The Soanian culture (India) possessed Lower Palaeolithic tools almost rectangular in shape. One side was more or less chopped to form a slant, the handle is large and the two sides are nearly parallel with almost rectangular cross-sections. These types of tools are called cleavers. Typical examples have never been found in the An Khe stone tools collection.

- Stone picks are high in number in the An Khe industry. Most of these picks are thin bodied (100 spec.), and the remaining 20 picks were fashioned from three-sided blocks, with three flat sides supporting a pointed end. Most of them are made of quartzite, while some large sized specimens are made of quartz. Those pebbles that already had two flat sides forming an obtuse angle had a further flat side created. For those with just one flat side, two additional flat ones were formed. The visible chopped traces are small, even and core-centred, in order to make a strong, pointed end with a large handle. The body cross-section is similar in shape to an isosceles triangle. The average size of the specimens is fairly large 19.80cm long, 11.90cm wide, 8.07cm thick and 2.32kg in weight (Figure 2).

- Choppers/chopping tools are high in number in the An Khe industry. Made of quartz or quartzite, they are large with oval bodies. The chopped traces are concentrated onto a narrow end on one side, from the cortex side to the other (in relation to choppers), or on both sides (for chopping tools). The chopped traces that form the blade are large and deep, while the other smaller regular traces form a convex blade edge. The other end with the cortex serves as a handle. Their bodies retain a fair amount of cortices. The average size of the artefacts is 19.2cm long, 11.7cm wide, 9cm thick and 2.4kg in weight. Apart from these types, the An Khe industrial collection includes knives, scrapers, chopping stones, cores, flakes and pebbles with chopped traces (Figure 3).

Regarding their age, the sample coded 15.GD.M4.L1-2 found in Go Da dates back to $806,000 \pm 22,000$ BP and the sample coded 16.RT1.H1.F6.L2.2 found in Roc Tung dates back to $782,000 \pm 20,000$ BP. This is according to the potassium-argon dating ($^{40}\text{K}/^{38}\text{Ar}$ dating) method conducted at the Laboratory of Isotope Geochemistry and Geochronology belonging to the Institute of Geology of Ore Deposits, Petrography, Mineralogy, and Geochemistry (IGEM RAN), the Russian Academy of Sciences [9]. Thus, the An Khe technique dates back to around 800,000 BP.

4. An Khe industry in relation to other Lower Palaeolithic industries in Vietnam

4.1. Nui Do industry (Thanh Hoa Province)

The Nui Do (lit. Do mountain) site was discovered in 1960, yielding three collections

in 1961, 1963 and 1968, amassing 2,684 artefacts in total. They were gathered from the eastern cliff of the site, at an altitude of 20-80m. Made of basalt, they include handaxes, coarse choppers, cleavers, draft artefacts, cores and flakes. The flakes account for over 95% of all stone tools, which are mainly Clacton, whereas Levallois flakes account for just 1.3-4.7%. The cores account for 2.7%, and the rest are handaxes, proto-handaxes, choppers and cleavers, accounting for less than 1%. There are seven large Nui Do basalt handaxes between 16.5 and 21.2cm long and weighing 1-2kg. Two sides are coarsely chopped with almost no retouching. They look like Acheulean handaxes (Figure 4). The Nui Do collection includes six proto-handaxes, with two coarsely chopped sides reminiscent of the handaxe style, but their forms are not standard. There are nearly 100 amorphic choppers made of basalt, each with one chopped side forming the blade and the other serving as a handle.

There are 22 cleavers found at the Nui Do site, with almost rectangular bodies and nearly oval/rectangular cross-sections, and small chopped traces on the blade and on one end. Regarding form, they look like draft quadrilateral artefacts from the Metal Age workshop sites such as those of Dong Khoi and Con Chan Tien near Nui Do. Most researchers consider Nui Do to be a workshop site of the Lower Palaeolithic population, equivalent to the Chellean and Acheulean industries of the Middle Pleistocene, which were dated to c. 400,000 BP [1], [6, pp.195-233], [22]. In the excavated trenches at the Nui Do and Nui Nuong sites, quadrilateral draft artefacts from the Early Metal Age were found. This has led some

researchers to surmise that the Nui Do site incorporates many periods and that it also served as a workshop for exploitation and preliminary production of quadrilateral axes in the Metal Age [3, pp.1-10]. The An Khe industry is very different from the Nui Do one. The first variation is in the use of raw materials. The Nui Do tools are fashioned from basalt, whereas the An Khe ones are formed from pebbles, quartzite, and quartz or silica clay. In terms of technology, flaking technology like Levallois technology or that of the Clactonian culture, and proto-handaxes and cleavers found at the Nui Do site, are virtually absent in the An Khe digs. In contrast, the bifaces and triangular tools found at An Khe have not been found at the Nui Do site.

While handaxes have been recovered from both sites, the difference in manufacturing technology and form is clear. The An Khe handaxes are shaped as javelins, with chopped traces concentrated on two-thirds of their length in almost two nearly straight sided edges, gradually narrowing at the pointed end. The other end with the cortex intact serves as a handle, while the two large sides were flaked and their cortices completely removed. On the other hand, the Nui Do handaxes are almost egg-shaped, with two convex side edges and no sign of retouched traces on their bodies. The ends of the Nui Do handaxes are mainly obtuse in angle; some are pointed, with large convex handles. In terms of tool geometry, the An Khe handaxes are to some extent different to, and older than, those of Nui Do. The latter closely resemble the typical Acheulean industry, whereas the An Khe handaxes echo those found in Africa.

4.2. Xuan Loc industry (Dong Nai Province)

The Xuan Loc site was discovered in 1968 and made public three years later by E.Saurin, from the Nhan Gia site (or Hang Gon 6) and the Dau Giay site in the Xuan Loc area (Dong Nai) [20, pp.2-22]. After 1975, Vietnamese archaeologists collected more stone artefacts from Sau Le, Suoi Da, Suoi Dat, Cam Tien, Cau Sat, Gia Tan and An Loc. They were found on the surface without any strata and considered to be from the same time period as the Nhan Gia and Dau Giay sites [7]. According to E.Saurin, at the Nhan Gia site three bifacial tools similar to typical Acheulean ones, five triangular tools, three multilateral tools, one pick, one scraper, one axe-shaped tool and one bola were unearthed, while at Dau Giay, one handaxe, two scrapers, one pick and one triangular tool were found. Among the three bifacial tools in the Nhan Gia site collection, the first one is 11cm long, 9.0cm wide and 4.2cm thick; the second one is 10.8cm long, 7.7cm wide and 3.8cm at the thickest point; and the third one is 10cm long, 6.2cm wide and 3cm at the thickest point. Each of the five triangular tools found at the Nhan Gia site has one side remaining with its natural basalt cortex; the other two sides are flatly chopped and have one pointed end. The first one is 15.8cm long, 9.8cm wide and 7.8cm thick. It was chopped at the two sides and formed similar to the handaxe from the Abbervillo-Acheulean period and is comparable to that of the Patjitanien industry (Java, Indonesia). The second one is 15cm long, 9.8cm wide and 7.0cm thick; the third one is 11cm long, 7.1cm wide and 5.2cm thick; the fourth one is 10.7cm long, 6.0cm wide and 4.5cm

thick; while the last one is 10.2cm long, 7.2cm wide and 4.3cm thick.

In the Dau Giay collection, in addition to the two choppers, there is also an oval-shaped handaxe made of basalt with two chopped sides. It is 10.7cm long, 6.7cm wide and 3.2cm thick. In terms of technology, the axe was better made than the same type found at the Nhan Gia site (Figure 5).

The Nhan Gia bifacial tools, according to E.Saurin, demonstrate classic Acheulean characteristics, whereas the Dau Giay handaxes belong to the Acheulean development period. In terms of geological dating, the artefacts were found in red-soil terrain, corresponding to the 35-40m topography of the Mekong River and date from Mindel to early Mindel-Riss, c. 650,000 BP. When compared to the Lower Palaeolithic industry of Southeast Asia, including the Nui Do site, E.Saurin thought that Xuan Loc was a Lower Palaeolithic site [20, pp.2-22].

In August 2016, in the Xuan Loc area investigation, the authors noticed that the known Palaeolithic collections were surface level with no strata. In terms of production technique and form, only one biface collected by Dao Linh Con from Sau Le hill in Xuan Loc area is similar to the bifacial tools previously revealed by E.Saurin, while the rest are almost all natural stone, without human manipulation. Xuan Loc axes and picks are completely different from the same tool types of the An Khe industry, not only in material and size, but also in form. The axes and picks from Xuan Loc are half the size as those from An Khe. The Xuan Loc handaxes are nearly oval in shape, with oval cross-sections and lens-

shaped lengthwise-sections. The Xuan Loc triangular picks show unclear chopped traces. What are referred to as “handaxes” from the Xuan Loc digs are the same as the nearly oval axes found at recent excavations in the Central Highlands and Tay Nguyen, at sites such as Lang Ga (Gia Lai), Buon Kieu (Dak Lak), Thon Tam (Dak Nong), Eo Bong (Phu Yen) and the C6.1 volcanic cave (Dak Nong). The 14C-dates of layers in the C6.1 volcanic cave, Krong No, Dak Nong, where axes made of basalt rock were found, show that the dates are from 6,090±25 BP to 4,680±20 BP [5, pp.90-92].

5. A number of Lower Palaeolithic handaxe industries outside Vietnam

5.1. Acheulean industry

The Acheulean industry was named after the town of Saint-Acheul in France, near Amiens, in the mid-terrain of the River Somme. The typical tools discovered are handaxes made of flint, with two chopped sides, a thin pointed blade, a wide and thick handle and flat body. They exist in many forms: triangular, heart-shaped, amygdaloidal, javelin-shaped, oval, disc-shaped, elliptical, etc.

The most typical configuration is javelin-shaped and the tool would have been used for chopping, cutting and digging (Figure 6) [18, pp.701-735], [19, pp.57-66]. In addition, tools of the Acheulean industry include Mousterian-style picks and flakes. In the middle period, Levallois flakes and bolas appeared. Handaxes older than Acheulean ones were found at the Chelles site, near Paris (France) together with Clacton coarse

flakes and the faunal fossils in the Abbeville stratum dated to the Upper Pleistocene. The earliest Acheulean industry tools were recovered from West Turkana (Kenya), which were dated to 1.76 mya by the geomagnetic method. Handaxes appeared fairly early in Southern Ethiopia (Africa), which were dated to 1.5-1.2 mya. The current viewpoint is that the Acheulean industry originated from Africa and then spread to parts of Asia, the Middle East and Europe around 1.5-0.8 mya. It had previously been acknowledged that the Acheulean industry expanded into Europe 0.5 mya, but recently handaxes found in Spain can be dated to about 0.9 mya. The Acheulean industry existed for a fairly long time and Acheulean-like handaxes aged several hundred thousand years have been found at some Eurasian sites.

Unlike the Acheulean handaxes, those of An Khe are fashioned from pebbles. Few cortices remain, while they are large in size with almost round handles. The Acheulean handaxes are made of sedimentary stones mainly silica. The cortices had been completely removed while the handles are thin and slanting. The An Khe handaxes have large chopped traces which have hardly been retouched, whereas the Acheulean ones include many small chopped traces, as well as regular evenly retouched traces. The An Khe handaxes consist of wedge-shaped lengthwise-sections and cross-sections nearly oval in shape, whereas the European handaxes include wedge-shaped, lengthwise-sections that are almost lens-shaped. Overall, the An Khe handaxes are not as standard compared to the typical Acheulean ones.

5.2. A number of other handaxes industries in Asia

In the Republic of Korea (South Korea) at the Chongokni Paleolithic site, the recovered tools are bifaces, handaxes, scrapers, picks, spherical stones, chopping-tools, knives and burins found in the 3m thick red-clay layer. The late Acheulean Chongokni handaxes might be dated within 300,000-130,000 BP, possibly coinciding with the Dingcun industry of China [2, pp.289-303]. Discoveries have been made on the Potwar Plateau in the northern part of the Punjab, northern Pakistan. Bifaces, picks, scrapers, cores, big and coarse flakes, especially cleavers, are typical of the Soanian culture of the Middle Pleistocene [14]. Regarding form, these cleavers and picks are different from those of the An Khe industry. In Southeast Asia, the oldest bifaces were found in Indonesia. According to T.Simanjuntak and his colleagues, the handaxes found in this region demonstrate the typical Acheulean industry, which are c. 0.8 mya, though the industry of choppers/chopping tools remain dominant [15, p.421].

Analysing the present data, it is thought that the appearance of the bifaces in Southeast Asia and Southern China is not associated with the penetration of Acheulean industry populations into this territory. The industry of bifaces in Southeast Asia, including Vietnam, is related fairly closely to, albeit it older than that of Southern China. Whether it is the self-evolution of the regional stone industry, which is concurrent and independent, or due to the contact with the inhabitants who were early adopters of handaxes in the Old Continent (present day Europe), needs further discussion.

6. Historical and cultural values of the An Khe industry

6.1. In relation to the beginning of Vietnamese history

The findings from the An Khe Palaeolithic sites changed the awareness of the history and life of the Vietnamese ancestors. In principle, history is seen to start when humans first appeared. It has commonly been understood that Vietnam's history began with *Homo erectus*. Fossils were discovered in Tham Khuyen and Tham Hai (Lang Son Province) dating back to 0.5 mya. However, with the findings at the An Khe Palaeolithic site, the history of Vietnam is determined to have begun earlier, about 0.8 mya. The inhabitants at that time have also been identified as *Homo erectus*. Consequently, An Khe is marked on the world map as one of the places retaining cultural traces of human ancestors. The An Khe toolmakers were, therefore, *Homo erectus* and hence the direct descendants of *Homo sapiens*.

With such results, we can add the An Khe industry to the map of the global biface industry. The map includes: the sites in Europe (0.5-0.6 mya); Ubeidlya (1.4 mya); Gesher Benot Ya'aqov (0.9 mya); Saudi Arabia (0.4 mya); Turkmenistan (Kazakhstan) (0.25-0.3 mya); Mongolia (0.25-0.3 mya); in India - Isampur (1.2 mya), Bori (Fig.10) (0.7 mya), Southern India (0.4-0.5 mya); in China - Pinling (0.9 mya), Yuanxian (0.9 mya), Lan Tian (0.8-0.6 mya) and Baise (0.8 mya) [8] (Map 2).

6.2. In regard to technical exchanges in the Lower Palaeolithic

In the settlement sites of An Khe, a large number of stone flakes, cores, choppers, stone materials, together with the assemblage of the tools, suggest that this area was where the tools were made, serving as workshop-settlement sites. This discovery changed the long-time held proposition that the Lower Palaeolithic population just made tools whenever they were urgently needed, and that they were all multifunctional. In fact, the An Khe stone tool industry consists of many types, fashioned from a choice of stone materials and forms pertaining to their functions. These tools might have been used in every-day life; for example, chopping bamboo, cutting meat, scraping skins/hides, digging soil to find prey for a living and so on.

The absence of Acheulean sites dating to 0.7-0.8 mya anywhere from the Near East to Vietnam and China precludes the idea that the bifacial technique was introduced into Eastern Eurasia by the second wave of migrants. The only feature linking the bifacial industries of Vietnam with the Acheulean is the presence of bifacially flaked tools. However, research by the authors shows that the bifaces of the An Khe industry are very different from those of the European Acheulean industry, as well as from other artefacts of that industry. The absence of cleavers or evidence of the Levallois technique at the An Khe site provides every reason to believe that the bifacial technique emerged in Vietnam and China owing to convergent evolution. The authors argue that in East and Southeast Asia, the technique evolved from a local pebble-flake

tradition, as evidenced by primary knapping, secondary reduction, and the entire technological and typological complex of the Lower Palaeolithic [9].

6.3. In regard to the theoretical Movius line - a look back over 70 years

For a long time, due to the absence of documents, many people believed in the theoretical boundary suggested by H.L. Movius in 1949 (the Movius line), referred to previously in this paper, which demonstrated the East in opposition to the West since the Lower Palaeolithic. Thus, handaxes were popular in the West, made of sedimentary rocks, in balanced form, created by formal chopping techniques, which demonstrated human progress and enthusiasm. However, in the East, the chopper-chopping technique, which existed for a long time and which depended on natural pebble forms, was viewed as conservative, sluggish, backward and making almost no contribution to mankind's advancement [12, pp.330-420], [13].

Over the last 70 years, hundreds of Palaeolithic sites have been discovered and studied in East and Southeast Asia. These have yielded a great deal of evidence, providing new insights into the evaluation of stone tool industries in Eastern Eurasia. During this period, researchers repeatedly analysed different aspects of the so-called Movius line, which involves both land masses, during international scientific symposia and in various scientific articles [17, pp.181-202], [10, pp.565-570], [11, pp.1,622-1,626].

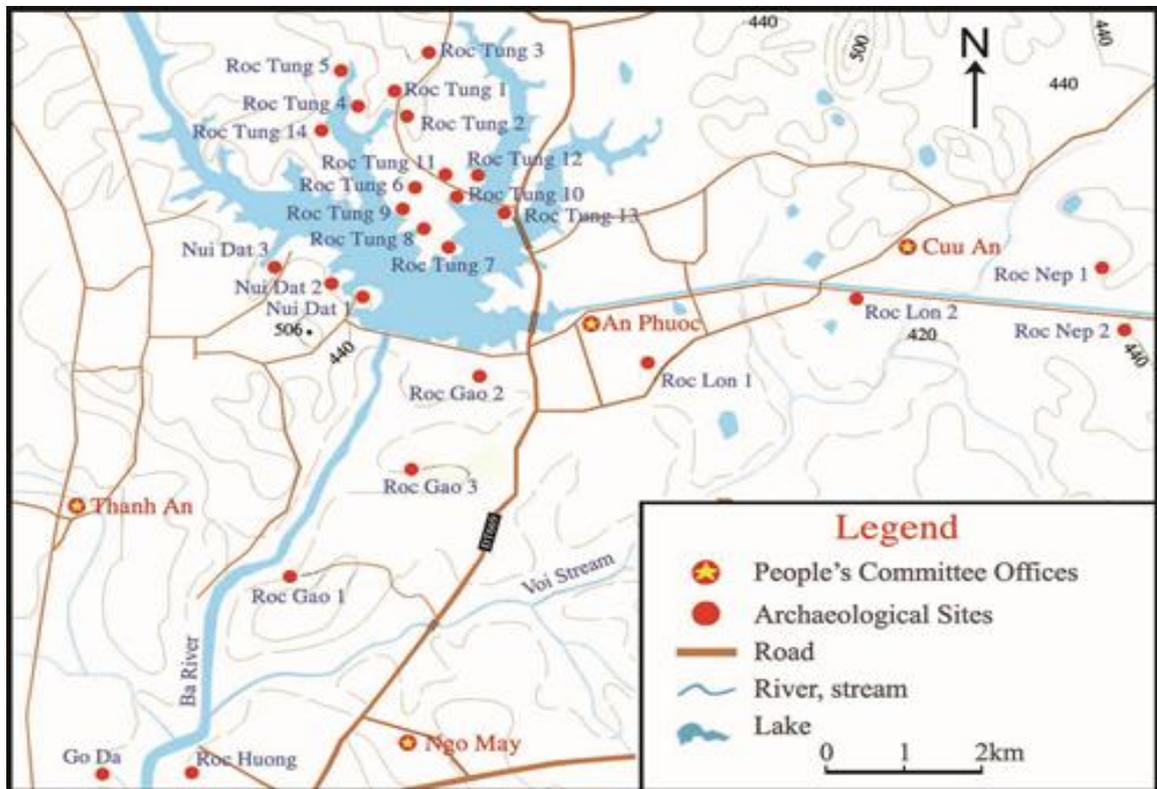
Both the An Khe industry (Vietnam) and the Baise industry (China) belong to the Pebble Tool Tradition, sharing certain similarities in relation to raw material type, technology and core tool type, particularly handaxes. Flakes from both industries are not representative of the European Clacton or Levallois techniques.

7. Conclusion

With this new archaeological discovery, the authors' point of view is that the bifaces including handaxes represent one component of the stone tool assemblages created by the Lower Palaeolithic people of An Khe (Vietnam) and the Baise Basin (China). These handaxes were to a certain degree distinct from their Acheulean counterparts through the duration from 1,000,000-120,000 BP. However, at the beginning, there was no absolute opposition between the East, which specialised in choppers/chopping tool production, and the West, which focused on handaxe manufacture. The typological differentiation is attributed to human adaptation to the natural environment including dependence on local sources of raw materials as well as the tools appropriate for the subsistence activities of hunting and gathering in each geographical subregion. It would be a serious mistake when arguing that those who manufactured handaxes represented the dynamic and advanced area, while those who produced choppers/chopping tools represented a conservative and backward one.

ILLUSTRATIONS

Map 1: Map Showing Location of An Khe Lower Palaeolithic Sites - Roc Tung 4 Site



Source: Author.

Figure 1: An Khe Handaxes



a. Go Da



b. Roc Tung



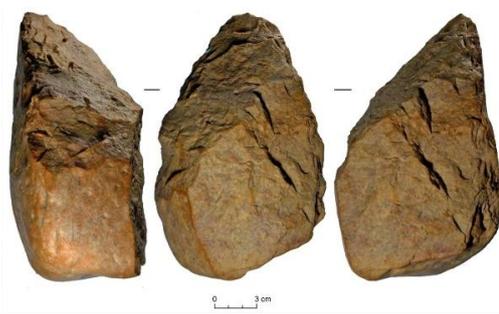
c. Roc Gao



d. Roc Lon

Source: Derevianko A.P., N.Kh. Su, Tsybankov A.A., N.G. Doi (2016), *The Origin of Bifacial Industry in East and Southeast Asia*, IAEA SB RAS Publishing, Novosibirsk.

Figure 2: The An Khe Triangular Picks



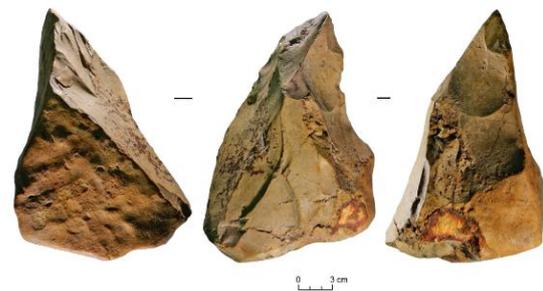
a. Roc Gao



b. Roc Tung 4



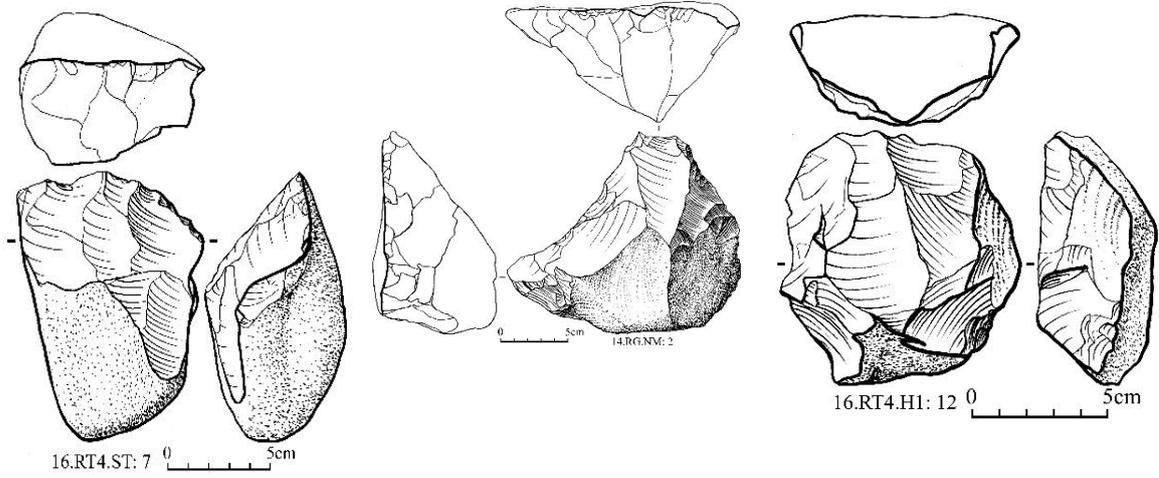
c. Roc Tung 10



d. Roc Huong

Source: Derevianko A.P., Kandyba A.V., Nguyen Khac Su, Gladyshev S.A., Nguyen Gia Doi, Lebedev V.A., Chekha A.M., Rybalko A.G., Kharevic V.M. and Tsybankov A.A. (2018), "The Discovery of a Bifacial Industry in Vietnam", *Archaeology, Ethnology & Anthropology of Eurasia*, Vol. 46, No. 3.

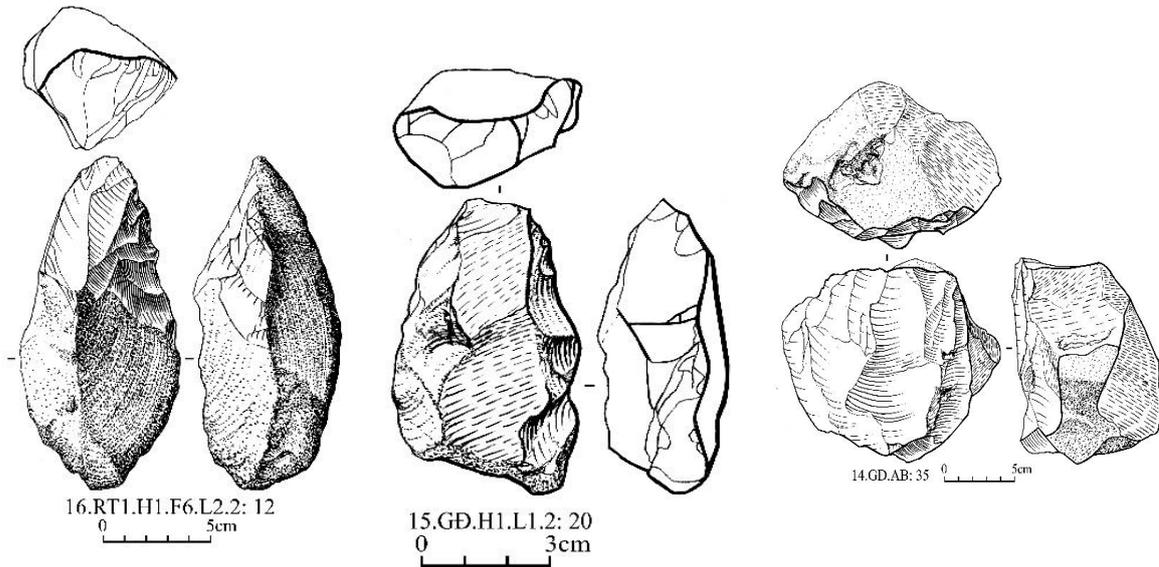
Figure 3: An Khe Stone Artefac



a. Chopper from Roc Tung

b. Scraper from Roc Gao

c. Scraper from Roc Tung



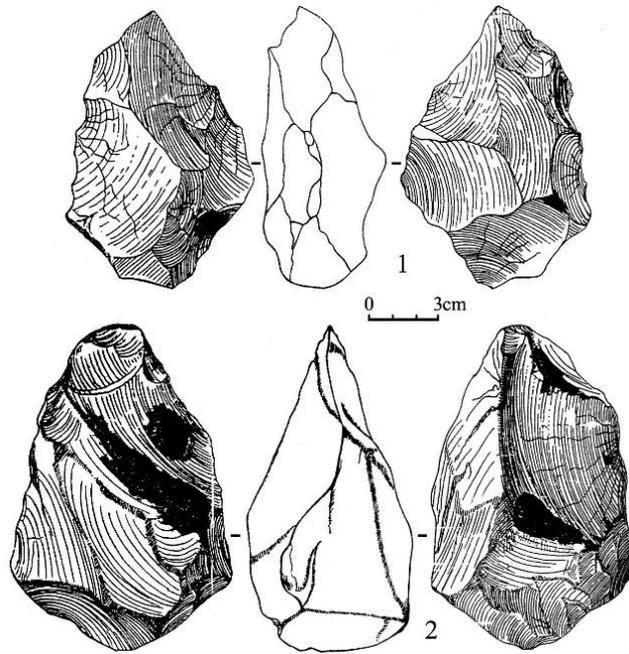
d. Knife from Roc Tung

e. Flake tools from Go Da

f. Cores from Go Da

Source: Nguyen Khac Su (2017), "An Khe Lower Palaeolithic Industry and Vietnam's Primitive Times", *Journal of Archaeology*, No. 2, pp.3-14.

Figure 4: Nui Do Handaxes



Source: Борисковский П.И. (1966), *Первобытное прошлое Вьетнама*, Москва-Ленинград.

Figure 5: Bifacial and Triangular Stone Tools from Xuan Loc



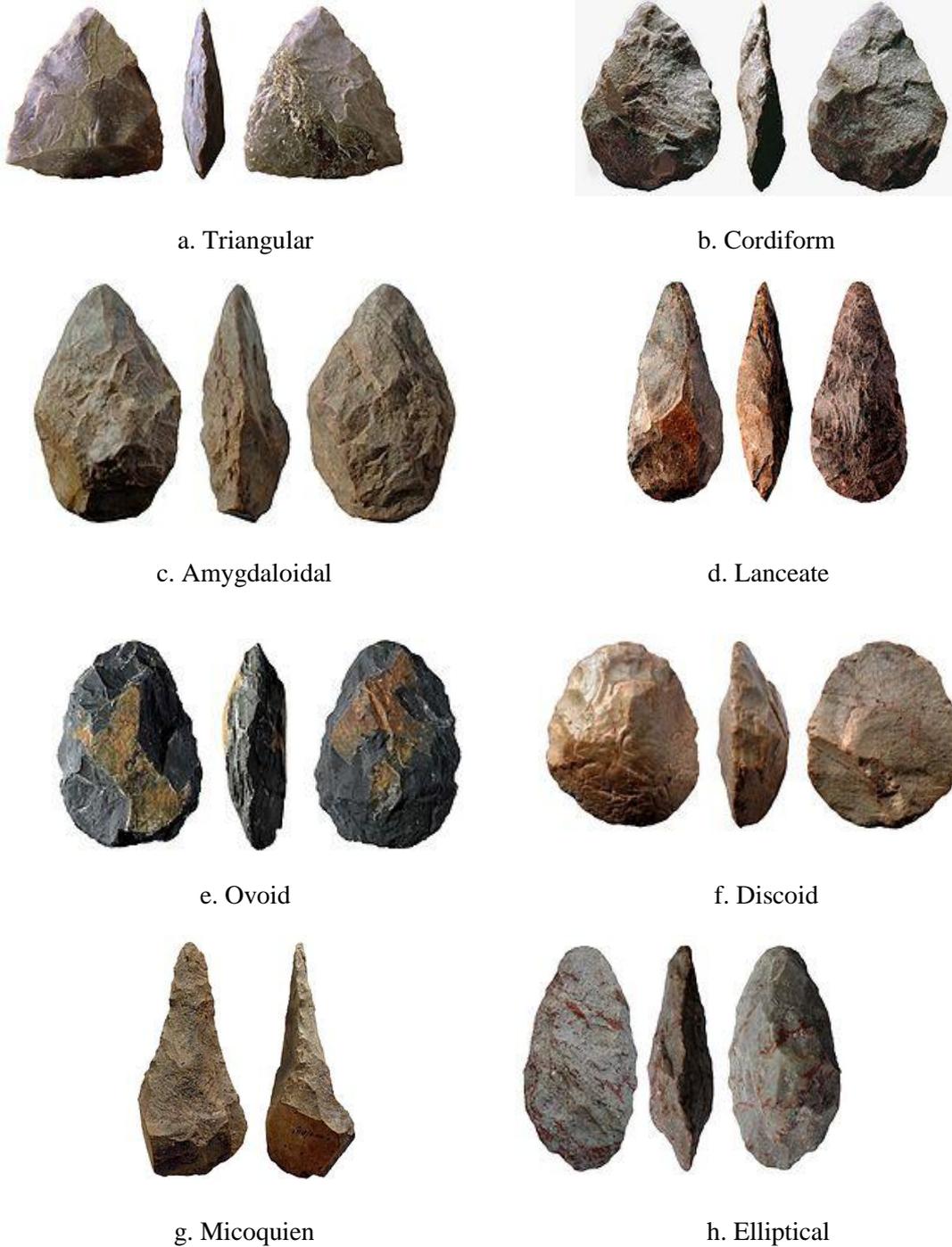
a. Bifacial tools of Nhan Gia

b. Triangular tools of
Nhan Gia

c. Triangular tools of
Dau Giay

Source: Saurin E. (1971), "Les Paléolithiques de environs de Xuan Loc", *Bulletin de la Société des Études Indochinoise*, Vol. 46, No. 1, pp.2-22.

Figure 6: Variety of Acheulean Handaxes



Source: Balout, Lionel (1967), "Procédés d'analyse et questions de terminologie dans l'étude des ensembles industriels du Paléolithique inférieur en Afrique du nord", *Background to Evolution in Africa*, Walter W. Bishop, J. Desmond Clark, eds, The University of Chicago Press, pp.701-735.

Figure 7: Baise Handaxes



Source: Phan Thanh Toan from Vietnam Archeological Association.

Map 2: Distribution of Handaxe Industries Outside Africa



Source: Derevianko A.P., N.Kh. Su, Tsybankov A.A., N.G. Doi (2016), *The Origin of Bifacial Industry in East and Southeast Asia*, IAEA SB RAS Publishing, Novosibirsk.

Note

¹The co-authors are S.A. Gladyshev and A.V. Kandyba from Institute of Archeology and Ethnography, Siberian Branch, Russian Academy of Sciences; Phan Thanh Toan from Vietnam Archeological Association; Nguyen Anh Tuan from Institute of Archeology, Vietnam Academy of Social Sciences; and Tran Dinh Luan from the Centre of Culture, Information and Sports of An Khe Town, Gia Lai Province. Language editor: Stella Ciorra.

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