



HAL
open science

Lithic Technology Research in China and the Impact of the French School: History and Perspectives

Yudian Zhou

► **To cite this version:**

Yudian Zhou. Lithic Technology Research in China and the Impact of the French School: History and Perspectives. Collectif. Hiatus, lacunes et absences : identifier et interpréter les vides archéologiques, session Le poids de l'histoire des sciences et l'hégémonie européenne en préhistoire (H. Forestier et V. Zeitoun dir.), Société préhistorique française, 2023, 29e Congrès préhistorique de France. hal-04021414

HAL Id: hal-04021414

<https://hal.science/hal-04021414v1>

Submitted on 9 Mar 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Open licence - etalab

Lithic Technology Research in China and the Impact of the French School: History and Perspectives

La recherche en technologie lithique en Chine et l'impact de l'école française : histoire et perspectives

Yudian ZHOU

Abstract: Paleolithic research in China took off during the interwar period, following pioneering French work in North China. In 1920, for the first time in China, Father É. Licent found three chipped stones from the loess layers in Qingyang, northwest of the country. The following years were marked by the discovery of many sites under the leadership of a Franco-Chinese team made up, on the French side, of É. Licent and P. Teilhard de Chardin. Some of these sites have since become prestigious international references for prehistory and paleoanthropology, such as Choukoutian (Zhoukoudian), Salawusu, Nihewan and Shuidonggou. One of the founders of the Paleolithic discipline in China, W. Pei, even obtained his doctorate in France in 1937 at the Institut de paléontologie humaine (IPH), under the direction of H. Breuil, then “Pope of Prehistory”. This also explains the strong academic and disciplinary link between China and France: a long common scientific history that continues today in collaboration with the Muséum national d’histoire naturelle (MNHN) and some French universities.

Following major social and political upheavals that marked New China between 1949 and 1978, scientific exchanges with Western countries came to a halt. During this period, research in prehistory regained autonomy, independence and refocused around morpho-descriptive studies of lithic industries. It was not until the last two decades of the twentieth century and the reopening of China to the West that French researchers could be invited again and transmit the theoretical and practical contributions of the Schools of A. Leroi-Gourhan (Paris 1) and J. Tixier (Paris 10-Nanterre).

Nearly twenty years have passed, and the impact of the French School is still relevant in the field of lithic technology with the use of key concepts such as “*chaîne opératoire*”, the “diacritical diagram”, “conceptual sketch”, “raw material economy” and “*débitage* economy”. More recently, the “techno-functional analysis” developed by É. Boëda (Paris 10-Nanterre) has been applied to Chinese industries dating between 2.5 Ma and the Middle Holocene (Longgupo, Guanyingdong, Maomaodong, bifacial assemblages, Hoabinhian, etc.). The application of this method has helped clarify the diagnosis of sometimes very controversial issues; that is why the French school has gained solid credit in the Chinese academic landscape.

However, if the community of Chinese lithicians has generally well accepted the concept of “*chaîne opératoire*”, the same is not true for the general orientation of technological studies “*à la française*” which are not unanimous. A lively scientific debate has emerged in recent years between “quantitative” researchers and a new generation of “qualitativists” on topics as varied as: the relevance of the choice of methods and their interests in the diagnosis of the stone artefacts. The exceptional reservoir of Paleolithic sites and the large pool of prehistorians in China today relaunch a stimulating discussion of an epistemological order which rediscovers the conceptual contribution of the lithic technology inherited from the French school and its field of application in East Asia.

Keywords: technological method, French school, chipped stones, lithic technology, *chaîne opératoire*, French impacts.

Résumé: Les recherches paléolithiques en Chine ont pris leur essor dans l’entre-deux-guerres, à la suite des travaux pionniers français en Chine du Nord. En 1920, pour la première fois en Chine, le père É. Licent trouve trois pierres ébréchées dans les couches de loess

à Qingyang, au nord-ouest du pays. Les années suivantes sont marquées par la découverte de nombreux sites sous la direction d'une équipe franco-chinoise composée, côté français, d'É. Licent et de P. Teilhard de Chardin. Certains de ces sites sont devenus depuis de prestigieuses références internationales en matière de préhistoire et de paléanthropologie, comme Zhoukoudian (Choukoudian), Salawusu, Nihewan et Shuidonggou. L'un des fondateurs de la discipline paléolithique en Chine, le professeur W. Pei, a même obtenu son doctorat en France en 1937 à l'IPH, sous la direction de Breuil, alors « pape de la préhistoire ». Cela explique également le lien académique et disciplinaire très fort entre la Chine et la France : une longue histoire scientifique commune qui se poursuit aujourd'hui en coopération avec le Muséum national d'histoire naturelle.

À la suite des grands bouleversements sociaux et politiques qui ont marqué la Nouvelle Chine entre 1949 et 1978, les échanges scientifiques avec les pays occidentaux se sont interrompus. Durant cette période, la recherche en préhistoire a retrouvé son autonomie, son indépendance et s'est recentrée autour des études morpho-descriptives des industries lithiques. Il faut attendre les deux dernières décennies du xx^e siècle et la réouverture de la Chine à l'Occident pour que les chercheurs français soient à nouveau invités et transmettent les apports théoriques et pratiques des écoles d'A. Leroi-Gourhan (Paris 1) et de J. Tixier (Paris 10-Nanterre).

Près de vingt ans ont passé et l'impact de l'école française est toujours d'actualité dans le domaine de la technologie lithique avec l'utilisation de concepts clés tels que « la chaîne opératoire », « le diagramme diacritique », « le schéma conceptuel », « l'économie de la matière première » et « l'économie du débitage ». Plus récemment, « l'analyse technofonctionnelle », développée par É. Boëda (Paris 10-Nanterre), a été appliquée à des sites chinois datés entre 2,5 Ma et l'Holocène moyen (Longgupo, Guanyingdong, Maomao-dong, industries bifaciales, Hoabinhien, etc.). L'application de cette méthode a permis de clarifier le diagnostic de questions parfois très controversées ; c'est pourquoi l'école française a acquis un solide crédit dans le paysage académique chinois.

Cependant, si le concept de « chaîne opératoire » a été généralement bien accepté par la communauté des lithiciens chinois, il n'en va pas de même pour l'orientation générale des études technologiques « à la française » qui ne font pas l'unanimité. Un vif débat scientifique a émergé ces dernières années entre les chercheurs « quantitatifs » et une nouvelle génération de « qualitatifs » sur des sujets aussi variés que : la pertinence du choix des méthodes, leur intérêt dans le diagnostic des artefacts en pierre. L'exceptionnel réservoir de sites paléolithiques et l'important vivier de préhistoriens en Chine relancent aujourd'hui une discussion stimulante d'ordre épistémologique qui redécouvre l'apport conceptuel de la technologie lithique héritée de l'école française et son champ d'application en Asie orientale.

Mots-clés : méthode technologique, école française, pierre taillée, technologie lithique, chaîne opératoire, impact français.

INTRODUCTION

The origin and development of Chinese Archaeology are closely related to China's historical and political context in the 20th century. One often-discussed issue about the history of Chinese Archaeology is the contribution of foreign researchers and intellectual inputs from western countries in the past century. Since the 1980s, due to geopolitical reasons and the late development of Chinese Archaeology, learning from western countries became a strategic choice for China, and many young students and researchers were sent overseas for academic exchanges and even systematic training. North America and Europe were two principal destinations for them. The acceptance of modern methods and theories helped Chinese Archaeology become more international and open to different schools and paradigms, especially on the international scientific scene. Here, we only focus on the lithic technology research in China and the French impacts as a case study.

Currently, two systems have substantial impacts on the research orientations of lithic technology in China. Historically, the opposition of these two systems is a legacy that is undoubtedly to be found in the opposition displayed between F. Bordes (France) and L.R. Binford (USA) in the 1960s and 1970s concerning the interpretation of the Mousterian (Binford and Binford, 1966; Bordes and Sonneville-Bordes, 1970). Actually, the opposition between

the methods and theories of Europe and those of the other side of the Atlantic is translated into a binary opposition: “qualitativist” versus “quantitativist”.

The first system is the French *chaîne opératoire* approach (or French School), and the second is the Anglo-Saxon quantitative/statistic method. Our article aims to review and evaluate the impact and relevance of the “French school” on lithic studies in the Chinese academic landscape. We try to explain why this approach has been successful and attractive to Chinese lithicians. And more discussions will focus on the current attitudes of Chinese researchers towards the French method, including both positive and negative aspects. Finally, we will provide some perspectives on the lithic technology research in China.

1. A BRIEF HISTORY OF SINO-FRENCH COLLABORATIONS IN THE PALEOLITHIC RESEARCH IN CHINA

1.1. 1920-1949: Establishment of Chinese Paleolithic Archaeology by French researchers

Chinese Paleolithic Archaeology has a French origin. In 1920, the discovery of three *in situ* stone artefacts from the Loess Plateau in Gansu Province by the French

priest É. Licent ended the viewpoint that “China has no paleolithic culture” at the time (Barbour et al., 1927). Later, he and P. Teilhard de Chardin discovered and excavated Shuidonggou and Salawusu in 1923 and Nihewan in 1924 (Licent and Teilhard de Chardin, 1925), they established a new discipline of Paleolithic Archaeology in China. These efforts led to the publication of the book *Le Paléolithique de la Chine* in 1928 (Boule et al., 1928). At the same time, the excavation of the Zhoukoudian (Choukoutian) site was initiated by the Swedish geologist J.G. Andersson in 1921 to search for animal fossils. Later, the excavation aimed to find ancient human fossils. Finally, human fossils, stone tools, and fire ashes were all discovered in 1930, and their work began to turn to Paleolithic research, rather than just looking for animal and human fossils (Liu and Hou, 2012). In 1928, W. Pei, who had just graduated from the Department of Geology of Peking University, came to Zhoukoudian for excavation. During his excavation in 1929, he paid attention to collecting stone tools and fire-use evidence. In 1931, W. Pei excavated in the “Pigeon Hall” of Zhoukoudian and found thousands of stone artefacts. He believed that they were produced by Peking Man at the time. But this was doubted by many of his colleagues. In this context, H. Breuil, a French authority in prehistory, was invited to Peking and Zhoukoudian in 1931 to confirm these discoveries. W. Pei also conducted experiments to compare the anthropogenic and natural traces on artefacts with those from the archaeological context and finally defined the anthropic nature of the lithic assemblages. He concluded, “it becomes evident therefore that in northeastern Asia at this remote age man, as represented by *Sinanthropus*, both knew the use of fire and had already mastered the technique of the manufacture of crude stone artefacts.” (Pei, 1932, p. 137). In 1935, W. Pei was accepted by H. Breuil to study Paleolithic Archaeology in France at the Sorbonne University, the title of his PhD thesis is *Le Rôle des phénomènes naturels dans l'éclatement et le façonnement des roches dures utilisées par l'homme préhistorique* (Pei, 1937). W. Pei returned to Peking after graduation in 1937 and became a leading figure in Paleolithic research in China. W. Pei's academic training under the direction of H. Breuil in Paris and technical analysis of the stone artefacts from Zhoukoudian, and systematic experiments on hard rocks made him the most well-known Chinese researcher on the international stage. Another important figure of Chinese Paleolithic Archaeology, L. Jia was also strongly influenced by the thoughts of P. Teilhard de Chardin, as he later said that P. Teilhard de Chardin taught him a lot, and he became one of his assistants. In 1998, at the age of 90, L. Jia said with great affection, “P. Teilhard de Chardin is one of my most beloved teachers” (Yang, 2018).

So, at the very beginning, the foundation of Chinese Paleolithic research was built in a very scientific way by high-quality researchers. French prestigious researchers played an important role in training young Chinese researchers and made many great discoveries that attracted worldwide attention (Liu and Hou, 2012).

However, this academic connection was disturbed and suspended after the Japanese invasion and the foundation of New China.

1.2. 1949-1998: The absence of Sino-French academic exchange in Paleolithic study

Like many disciplines, the academic exchanges and collaborative programs between China and western countries were interrupted during the first 30 years of New China. Chinese Paleolithic Archaeology experienced a period of rich discoveries and independent research. Prof. W. Pei and Prof. L. Jia directed the development of this discipline during this period. Some younger researchers were trained, and more excavations were conducted across the country. Still, multidisciplinary research was carried out at Zhoukoudian in the late 1970s, such as chronometric dating, paleoenvironment and paleoclimate studies, and site formation process study (Guan, 2011).

In the last 20 years of the 20th century, China began to open its door to the western world with which it will have to dialogue, evaluate, criticize, and synthesize to apply “western methods and theories” in its own way to the Chinese context. The “New Archeology” current and new perspectives for archaeology from North America were firstly introduced to Chinese researchers, such as modern excavation methods, experimental archaeology and use-wear analysis (Zhang, 2002; Li, 2017; Gao, 2020). During the same period, the concept of “*chaîne opératoire*” was introduced to Chinese researchers for the first time, but by northern American researchers (Chen, 2001; Chen and Shen, 2009). Multidisciplinary research and modern excavation methods were practiced in some important sites in the framework of Sino-American collaboration programs in the early/middle 1990s, such as Dongguotuo in northern China (Schick et al., 1991) and Panxian Dadong in southern China (Miller-Antonio et al., 2004). It could be said that the direct and concrete “French impacts” in Paleolithic research were nearly absent in China during this period.

1.3. 1999-2021: Return of French researchers to China and their impacts

Since 1999, French researchers have begun to return to China for scientific propose, and this trend has lasted until now. The French School of lithic technology study started to show its impacts on Chinese Paleolithic research in the past 20 years. The impacts were realized in several different ways, levels and domains, ranging from excavation programs to lithic analysis.

First of all, excavation and research programs were launched under the Sino-French collaboration framework. Three projects have significant influences among Chinese researchers. They include the Yunxian Man Program in Hubei Province, which was under the direction of H. de Lumley from Muséum national d'histoire naturelle (MNHN) and T. Li from Hubei Institute of Archaeology. The site, which yielded two craniums of *Homo erectus*,

was comprehensively studied and dated, and the lithic artefacts were studied with a typo-technological method. *Le site de l'homme de Yunxian* was published in 2008 (Lumley and Li, 2008).

The second important site excavated is Longgupo in Chongqing, one of the earliest prehistoric sites in East Asia. É. Boëda from Paris 10-Nanterre University and W. Huang and Y. Hou from the Institute of Vertebrate Paleontology and Paleoanthropology (IVPP) of the Chinese Academy of Sciences in Beijing, co-directed the excavation. Longgupo proposed a major scientific challenge because it was part of a double controversy: paleoanthropological with the question of the nature fossil remains (human?) and that of the lithic artefacts. That is why the site has been re-excavated with modern field and dating methods and the lithic remains re-interpreted by detailed analyses through a morpho-techno-functional method to demonstrate and confirm their anthropogenic nature (supported with multiple pieces of evidence: stratigraphic, taphonomic, analogic, experimental and technic). A special issue of *L'Anthropologie* published the results of this research in 2011 (Boëda et al., 2011; Boëda and Hou, 2011a and 2011b). Moreover, a translated Chinese version of this issue is also on the way to publication.

The third Franco-Chinese project focuses on the Bose sites, which yielded bifacial industries dating to the early Middle Pleistocene. It is a research project rather than excavation, and again under the direction of H. de Lumley. The Chinese side includes G. Xie from Guangxi Institute of Archaeology and X. Feng from Beijing Union University. This research program lasted more than ten years. And the final result on the lithic industries was published in 2020 (Lumley et al., 2020).

The second indicator that could manifest the French impacts on Chinese lithic studies is training PhD students by French professors. This is an academic indicator that is probably the strongest and most important because it marks an event in the transmission of knowledge. Four young scholars specializing in lithic technology were awarded a French PhD degree during the past 20 years, including P. Zhang, X. Feng, Y. Li, and Y. Zhou. The former two are ancient students of the MNHN, both under the direction of H. de Lumley, while Y. Li was directed by É. Boëda. Y. Zhou is also graduated from the MNHN but directed by H. Forestier (table 1). These Chinese researchers play an important role in the present academic and diplomatic exchanges and scientific collaborations in the Paleolithic research between the two countries.

Thirdly, French specialists in lithic technology were often invited to China to analyze lithic assemblages, participate in seminars and conferences, and give lectures, short courses, and knapping experiments. They include É. Boëda, H. Forestier, P.-J. Texier, H. de Lumley, J. Pelegrin, J. Jaubert... French students even have finished their PhD thesis or postdoc in China, such as É. Bodin and L. De Weyer. The most frequent visiting researchers in the last few years include É. Boëda and H. Forestier.

At last, increasing scientific publications on lithic technology by the above-mentioned Chinese researchers and their French collaborators could also prove French impacts. From 2008 to 2021, during 13 years, about 39 articles and books have been published, about three articles each year. Among them, 65% are of Sino-French co-authors, and the rest are finished by Chinese researchers. And these publications involve more than 20 archaeological sites, most of the sites located in southern China, and their age ranges from the Early Pleistocene to the Early Holocene (fig. 1).

Thanks to the increased Sino-French academic exchanges in the past 20 years, Chinese researchers and students could again receive the latest developments in Paleolithic research and lithic analysis from the French School. This allows them to make their methodological choice and various ways of thinking with more options besides the Anglo-Saxon method and further yielding more facts than theory.

However, the introduction of French School into the Chinese academic landscape also produced some problems that may cause debates and doubts towards French School. The French theory and methods are relatively new for Chinese researchers, but the French School has a very good reputation in Paleolithic research globally, with many Chinese followers. However, not all the followers were well trained in a French way, their understanding and application of French approaches were sometimes not profound, and misunderstandings also occurred. Moreover, Chinese students and researchers also learned a lot from northern American paradigms. The French-Anglophone divide in lithic research (Shumon, 2019) may become the conflict among Chinese researchers trained in the two camps, which would become an emerging problem in Chinese academia.

2. CURRENT ATTITUDES OF CHINESE RESEARCHERS TOWARDS THE FRENCH APPROACH

In the past 30 years, Chinese researchers learned widely from different thoughts and schools in the world. Chinese students, who got their PhD degrees in foreign countries, brought back advanced theories and methods and put them into practice during the excavation, analysis of the materials and publication of the results. Thus, different schools in lithic technology research coexist in China, which is very positive for the scientific community and the content of the discussions on the material. Although the *chaîne opératoire*, and as a whole, the qualitative approach, including technological and techno-functional aspects (Boëda, 2013; Inizan et al., 1995), are very successful methods for many Chinese researchers; and they have more and more followers among Chinese younger generations actually, yet the French method is also suffering from negative and suspicious comments. Recent debates on “Chinese Levallois tech-

Name	Year of defense	Thesis director	Thesis title
Pu Zhang	2001	H. de Lumley	Technologie et typologie de l'industrie lithique des zones M, N et O de la Baume Bonne, à Quinson (Alpes-de-Haute-Provence).
Xiaobo Feng	2005		Stratégie de débitage et mode de façonnage des industries du Paléolithique inférieur en Chine et en Europe entre 1 Ma et 400 000 ans : culture de l'Homme de Yunxian et Acheuléen européen : ressemblances et différences.
Yinghua Li	2009	É. Boëda	Étude technologique de l'industrie lithique du site de Guanyindong, dans la province du Guizhou, sud-ouest de la Chine.
Yuduan Zhou	2021	H. Forestier	Diversity and Homogeneity: The Lithic Technology in Southwest China from the Late Pleistocene to Early Holocene and Its Implication to Southeast Asia Prehistory.

Table 1 – List of Chinese students who received their PhD degrees in prehistory from French institutions since 2000.
Tableau 1 – Liste des étudiants chinois titulaires d'un doctorat obtenu dans une institution française depuis l'année 2000.

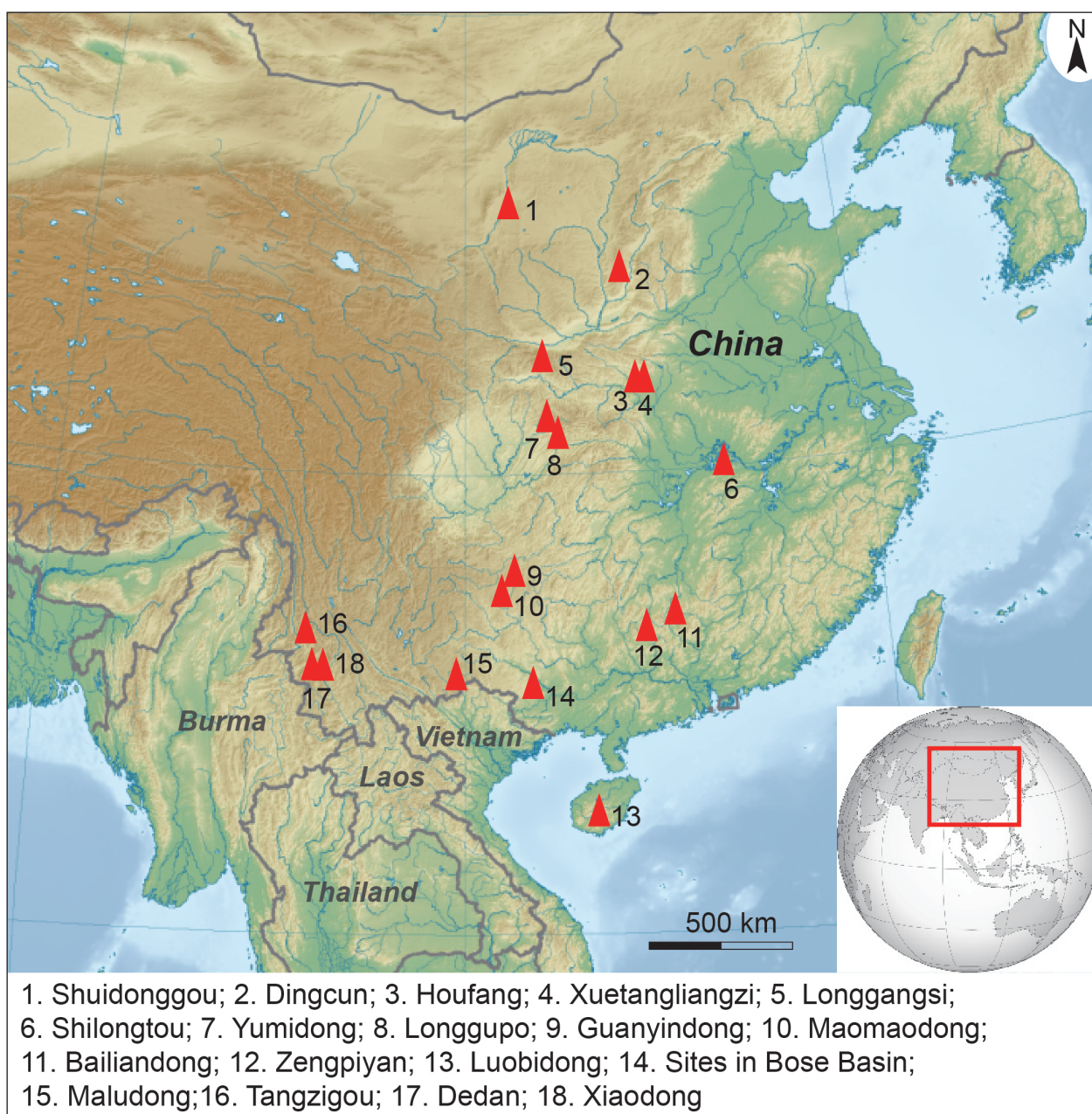


Fig. 1 – Chinese sites studied during Sino-French cooperations.
Fig. 1 – Sites chinois étudiés lors des coopérations sino-françaises.

nology” could demonstrate that misunderstandings of the technological approach exist among Chinese researchers and its followers (Hu et al., 2019a; Li et al., 2019).

2.1. The acceptance of the French approach

Since the *chaîne opératoire* approach was one part of the imports of foreign archaeological theories and thoughts in China in the 1990s-2000s, and it was claimed by some young Chinese researchers as the cutting-edge theory in the Paleolithic research in western countries. So Chinese researchers should learn this theory and practice this advanced theory to improve their research qualities (Chen, 2001; Li et al., 2008; Chen and Shen, 2009). This positive attitude towards the *chaîne opératoire* approach made the typological analysis become a label of an outdated method. Technological analysis is becoming a “fashion” in the lithic study among Chinese researchers (Pei, 2015). “*Débitage*” (“debitage/flaking”) and “*façonnage*” (“shaping”), two key concepts in the technical analysis, are now more and more used by Chinese researchers (see Hou, 2017; Li et al., 2019b; Deng et al., 2020; Zhou et al., 2020; Yang et al., 2021; Yue et al., 2021). Other concepts such as “*chaîne opératoire*”, “diacritical sketch”, “raw material economy” and “*débitage* economy” are successfully applied as shown in some references (see Yue et al., 2020; Yang et al., 2021; Zhao et al., 2021). It would be proper to say that the French approach is replacing the pre-existing typological method in lithic studies in China. The application of this method has helped to clarify the diagnosis of sometimes very controversial issues, such as “Chinese Levallois,” or “anthropic nature of Longgupo artefacts” as mentioned before.

2.2. Misunderstandings and critiques of the French approach

When a research paradigm becomes a fashion, imitations by its followers will appear. This is also the situation that we encountered towards the French approach among some Chinese researchers. On the one hand, this phenomenon proves the acceptance of the *chaîne opératoire* method among them; on the other hand, due to limited systematic training in technological analysis, misunderstandings and misuse of the concepts and methods also occurred. For example, some imitations provide diacritical sketches and put arrows to present the knapping direction of the scars on artefacts, while they are not real technological readings to understand the intentions of the knappers. This kind of imitation is very superficial and not an accurate understanding and application of the method. Thus it may cause doubts and misunderstandings. The debate about the “Chinese Levallois” at Guanyingdong cave is an exemplary manifestation of this misuse and misunderstanding of the “technological reading” and “technological analysis” (Hu et al., 2019a and 2019b; Li et al., 2019a and 2019c).

Another form of misunderstanding causes critiques of the French approach. In an article published online

in 2019 in *Acta Sinica Anthropologica*, the authors say: “based on the technological reading, É. Boëda created the new techno-functional approach, this approach divides the core flaking into two stages, i.e., core preparation and blank production... the core classification method based on the techno-functional paradigm has taken the morphological characteristics of the core into consideration [...] but this classification method has its problems... it is very subjective when defining the flaking method [...]” (Li and Li, 2021, p. 197). It is striking that these authors confused technological analysis and techno-functional method, and they criticized their Chinese and French colleagues without understanding their research method (cf. purpose, objective and mode of reading). How ridiculous! In fact, these opponents only caricature it (reduction sequence) because they do not want to understand it or argue against it, which amounts to a major epistemological error. And their critiques are similar with some obsolete comments on the *chaîne opératoire* from Anglophone researchers and those who advocate the quantitative method (see Bar-Yosef and Van Peer, 2009), while ignoring that the concept is, first of all, a dynamic and general attitude towards artefacts rather than a concrete method to analyze the materials (Zhou and Li, 2021). Moreover, the lithic technology method takes lithic assemblage as a dynamic and integrative system. A focus on a tiny number of “typical” or “techno-type” artefacts could not give us reliable results about the intention of the knappers, not to mention defining the lithic industry (Li et al., 2019).

Anyway, it is difficult to reconcile these people, but it is part of the general criticism of a method or a thought system which, when it is effective, disturbs and makes people talk: those who do not understand or do not want to understand it due to lack of work. Indeed, “entering the analytical process” requires an effort to read and decipher the pieces. The Chinese technologists understand that, to practice Technology, it is necessary to have many years of practice on the archaeological materials and experiments, unlike the statistical typology, which requires only a few weeks. So, the investment degree in lithic analysis signs the difference and distance of these approaches, and the different expectations of the results. Are we looking for the same thing? We think not...! This is why they are incomparable and irreconcilable.

3. PERSPECTIVES

Three points may be expected for further lithic technology study in China.

Firstly, a new generation of Chinese lithicians is growing thanks to the Sino-French exchange programs in different aspects of Paleolithic research since the 2000s. Chinese young students are increasingly interested in the French way of lithic studies, which would be important for further continuous Sino-French collaborations and the maintenance of French impacts. We currently witness the changing research paradigm from Typology to Tech-

nology among Chinese researchers. So with the growing up of this new generation, Chinese lithic materials could be better described, defined and interpreted, and Chinese researchers will become more international, and thus international academic exchanges would be facilitated.

Secondly, the misunderstandings about the French approach should be clarified by real Chinese lithicians. The debates about the *chaîne opératoire* should not be confined to the conceptual level, and it should stand on its effectiveness. So, Chinese researchers are expected to use the method to resolve concrete questions to evaluate its capacity and limit.

Thirdly, more Sino-French programs are expected in the academic exchanges and analyzing the materials. As a long tradition that lasted for nearly a century, the Sino-French academic exchange benefits both sides, and it would be a win-win to maintain this tradition and relation, as proved by history, but also by a common sensitivity for the philosophy of Technology. The Chinese and the French have similarities from a philosophical way since they consider of equal importance to the intelligible as to the sensible. China and France certainly have more in common than one might think from a philosophical point of view.

At last, a new trend could be observed, the Sino-French collaborative programs are not limited in China but is part of an inter-Asian network initiated by Prof. H. Forestier, Dr. V. Zeitoun and Prof. F. Sémah. Since the prehistory of South China and Southeast Asia has many common topics, Southeast Asian prehistoric sites should also be considered for the collaboration work, and this is what we have been doing in recent years (see Forestier et al., 2021 and 2022; Li et al., 2021).

Acknowledgments: The author wants to thank the organizers of the 29e Congress of the French Prehistoric Society and the convenors of session C, H. Forestier and V. Zeitoun, not only for their invitation to participate in the conference but also for their suggestions to improve the manuscript. Thanks to Prof. Yinghua Li, who reads the first draft of the article, for her constructive advice.

Yudian ZHOU

Associate Professor of Wuhan University.
School of History, Archaeological Institute for
Yangtze Civilization, Wuhan University
430072 Wuhan, China.
zhouyudian@yeah.net

REFERENCES

- BARBOUR G.B., LICENT É., TEILHARD DE CHARDIN P. (1927) – Geological Study of the Deposit of the Sanganho Basin, *Bulletin of Geological Society of China*, 5, p. 263-281.
- BAR-YOSEF O., VAN PEER P. (2009) – The *Chaîne Opératoire* Approach in Middle Paleolithic Archaeology, *Current Anthropology*, 50, p. 103-131.
- BINFORD L.R., BINFORD S.R. (1966) – A Preliminary Analysis of Functional Variability in the Mousterian of Levallois Facies, *American Anthropologist*, 68, p. 238-295.
- BOËDA É. (2013) – *Techno-logique et technologie : une paléo-histoire des objets lithiques tranchants*, Prigonrieux, @rchéo-éditions.com, 264 p.
- BOËDA É., HOU Y. (2011a) – Étude du site de Longgupo. Synthèse, *L'Anthropologie*, 115, p. 176-196.
- BOËDA É., HOU Y. (2011b) – Analyse des artefacts lithiques du site de Longgupo, *L'Anthropologie*, 115, p. 78-175.
- BOËDA É., HOU Y., HUANG W. (2011) – Introduction à l'étude du site de Longgupo, *L'Anthropologie*, 115, p. 8-22.
- BORDES F., SONNEVILLE-BORDES D. [DE] (1970) – The Significance of Variability in Palaeolithic Assemblages, *World Archaeology*, 2, p. 61-73.
- BOULE M., BREUIL H., LICENT É., TEILHARD DE CHARDIN P. (1928) – *Le Paléolithique de la Chine*, Paris, Masson, 138 p.
- CHEN C. (2001) – The “*Chaîne Opératoire*” and the Changing Paradigm of Paleolithic Research, in T. Deng and Y. Wang (eds.), *Proceedings of Eighth Annual Meeting of the Chinese Society of Vertebrate Paleontology*, Beijing, China Ocean Press, p. 235-244.
- CHEN H., SHEN C. (2009) – *Chaîne Opératoire* in Lithic Analysis: Definition, Concept, and Applications, *Acta Anthropologica Sinica*, 28, p. 201-214.
- DENG W., LIU S., WU Y., LIU T., LI W., WANG Y. (2020) – A Preliminary Report on Excavation at the Huangmenyan Cave 2 of Qingtang Site, South China in 2016, *Acta Anthropologica Sinica*, 39, p. 64-73.
- FORESTIER H., ZHOU Y., AUETRAKULVIT P., KHAOKHIEW C., LI Y., JI X. (2021) – Hoabinhian Variability in Mainland Southeast Asia Revisited: The Lithic Assemblage of Moh Khiew Cave, Southwestern Thailand, *Archaeological Research in Asia*, 25, 100236.
- FORESTIER H., ZHOU Y., VIALLET C., AUETRAKULVIT P., LI Y., SOPHADY H. (2022) – Reduction Sequences During the Hoabinhian Technocomplex in Cambodia and Thailand: A New Knapping Strategy in Southeast Asia from the Terminal Upper Pleistocene to Mid-Holocene, *Lithic Technology*, 47, 2, p. 147-170.
- GAO X. (2020) – Seventy Years of Exploration: A Review and Prospect of Chinese Paleolithic Archaeology, *Weekly Chinese Cultural Relics*, published on 6th September, p. 5.
- GUAN Y. (2011) – Chronology of Zhoukoudian Discoveries and Excavations, *Fossils*, 4, p. 6-7.
- HOU Y. (2017) – Preface, in Y. Li (ed.), *Lithic Technology: Theory and Practice*, Beijing, Social Sciences Academic Press, p. 1-2.
- HU Y., MARWICK B., ZHANG J., RUI X., HOU Y., CHEN W. (2019a) – Robust Technological Readings Identify Integrated Structures Typical of the Levallois Concept in Guanyindong Cave, South China, *National Science Review*, 6, p. 1,096-1,099.
- HU Y., MARWICK B., ZHANG J., RUI X., HOU Y., YUE J. (2019b) – Late Middle Pleistocene Levallois Stone-Tool Technology in Southwest China, *Nature*, 565, p. 82-85.
- INIZAN M., REDURON-BALLINGER M., ROCHE H., TIXIER J. (1995) – *Technologie de la pierre taillée*, t. 4, Meudon, CREP, 199 p.
- LI F., LI Y., GAO X., KUHN S.L., BOËDA É., OLSEN J.W. (2019a) – A Refutation of Reported Levallois Technology from Guanyindong Cave in South China, *National Science Review*, 6, p. 1094-1096.
- LI S., LI H. (2021) – A Pilot Analysis of the Classification Method of Cores in the Early Paleolithic, *Acta Anthropologica Sinica*, 40, p. 194-207.
- LI Y. (2017) – *Lithic Technological Analysis: Theory and Practice*, Beijing, Social Sciences Academic Press, 476 p.
- LI Y., HOU Y., ERIKA B. (2008) – A Brief Review of Lithic Technological Study in France, *Acta Anthropologica Sinica*, 27, 1, p. 51-65.
- LI Y., BOËDA É., FORESTIER H., ZHOU Y. (2019c) – Lithic Technology, Typology and Cross-Regional Comparison of Pleistocene Lithic Industries: Comment on the Earliest Evidence of Levallois in East Asia, *L'Anthropologie*, 123, p. 769-781.
- LI Y., HAO S., HUANG W., FORESTIER H., ZHOU Y., LI H. (2019b) – Luobi Cave, South China: A Comparative Perspective on a Novel Cobble-Tool Industry Associated with Bone Tool Technology during the Pleistocene-Holocene Transition, *Journal of World Prehistory*, 32, p. 143-178.
- LI Y., LAM T. M. D., DANG H. S., LI F., FORESTIER H., ZHOU Y. (2021) – A New Technological Analysis of Hoabinhian Stone Artefacts from Vietnam and its Implications for Cultural Homogeneity and Variability between Mainland Southeast Asia and South China, *Asian Perspectives*, 60, p. 71-96.
- LICENT É., TEILHARD DE CHARDIN P. (1925) – Le Paléolithique de la Chine, *L'Anthropologie*, 25, p. 201-234.
- LIU Y., HOU Y. (2012) – The Contribution of French Scholars to Chinese Paleolithic Archaeology and the Progress of Research on Its Related Sites, *Wenwu Chunqiu*, 4, p. 3-10.
- LUMLEY H. [DE], LI T. (2008) – *Le site de l'homme de Yunxian : Quyanhekou, Quingqu, Yunxian, Province du Hubei*, Paris, éditions du CNRS-éditions Recherche sur les civilisations, 589 p.
- LUMLEY H. [DE], XIE G., FENG X. (2020) – *Les industries lithiques du Paléolithique ancien du bassin de Bose*, Paris, CNRS Éditions, 328 p.

- MILLER-ANTONIO S., SCHEPARTZ L.A., KRKANAS P., HOU Y., HUANG W., BEKKENT D. (2004) – Lithic Raw Material Use at the Late Middle Pleistocene Site of Panxian Dadong, *Asian Perspectives*, 43, p. 314-332.
- PEI F. (2015) – Reconsideration of the *Chaîne Opératoire*, *Acta Anthropologica Sinica*, 34, p. 55-67.
- PEI W.C. (1932) – Notice of the Discovery of Quartz and Other Stone Artefacts in the Lower Pleistocene Hominid-Bearing Sediments of the Choukoutien Cave Deposit, *Bulletin of the Geological Society of China*, 11, p. 110-147.
- PEI W.C. (1937) – *Le rôle des phénomènes naturels dans l'éclatement et le façonnement des roches dures utilisées par l'homme préhistorique*, thèse de doctorat, université de la Sorbonne, Paris, 75 p.
- SCHICK K., TOTH N., QI W., CLARK J.D., ETLER D. (1991) – Archaeological Perspectives in the Nihewan Basin, China, *Journal of Human Evolution*, 21, p. 13-26.
- SHUMON H. (2019) – *The French-Anglophone Divide in Lithic Research, A Plea for Pluralism in Palaeolithic Archaeology*, PhD thesis, Leiden University, Leiden, 469 p.
- YANG D. (2018) – Salawusu River, Reading You in the Hands, [on line] <https://www.163.com/dy/article/DTNAGQME-0514BCFS.html>.
- YANG S., WANG F., XIE F., YUE J., DENG C., ZHU R. (2021) – Technological Innovations at the Onset of the Mid-Pleistocene Climate Transition in High-Latitude East Asia, *National Science Review*, 8, p. 1-11.
- YUE J., LI Y., ZHANG Y., YANG S. (2020) – Lithic Raw Material Economy at the Huayang Site in Northeast China: Localization and Diversification as Adaptive Strategies in the Late Glacial, *Archaeological and Anthropological Sciences*, 12, p. 1-14.
- YUE J., YANG S., LI Y., STOROZUM M., HOU Y., CHANG Y. (2021) – Human Adaptations during MIS 2: Evidence from Microblade Industries of Northeast China, *Palaeogeography, Palaeoclimatology, Palaeoecology*, 567, 110286.
- ZHANG S. (2002) – Advances in Chinese Paleolithic Archaeology in the Past 20 Years and Some Comments, *Quaternary Sciences*, 22, p. 11-19.
- ZHAO C., WANG Y., GU W., WANG S., WU X., GAO X. (2021) – The Emergence of Early Microblade Technology in the Hinterland of North China: A Case Study Based on the Xishi and Dongshi Site in Henan Province, *Archaeological and Anthropological Sciences*, 13, p. 1-16.
- ZHOU Y., JI X., LI Y., FORESTIER H., JABLONSKI N.G., DING S. (2020) – Tangzigou Open-Air Site: A Unique Lithic Assemblage during the Early Holocene in Yunnan Province, Southwest China, *Quaternary International*, 563, p. 105-118.
- ZHOU Y., LI Y. (2021) – A Review and Reflection on Paleolithic Typology and Technology, *Archaeology*, 2, p. 68-80.