

Qualitativeassignment

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## Qualitative assignment

**Introduction**

The purpose of this paper is to reinterpret and evaluate existing archaeological debates based on the approach of scientific explanation. The target subject of this paper is about three different models explaining the starting point and origin of Upper Paleolithic period of Korea. This subject is directly related to my own dissertation, the study of stemmed points in Korean Peninsula. In the beginning of the thesis, I should have to mention about the topic and take a position. I believe that scientific approach enables neutral and reasonable evaluation. For this reason, I choose the debates for this paper.

The debates of starting point and origin of Upper Paleolithic period (MIS 3-2 transition) are most problematic and popular issue in the study of Paleolithic in Korea. Some people insist that emergence of blade (32,000 BP) is the starting point while others think stemmed point (35,000 BP) indicate the start. And the origin of Upper Paleolithic had been regarded as coming from Shuidonggou site located in northeast China. However, nowadays this concept starts to be rethinking. Since the dates of the similar sites in Korea were turned out be earlier than Shuidonggou (Seong, 2009). Therefore people have tried to find the new origin and they present the three different models. First model is in situ evolutionary one which is that blade, stemmed point and other Upper Paleolithic assemblages autonomously emerged in the South of Korean peninsula. Second one is migration model. From the north, not China but Siberia, and southern China, people came to the Korean peninsula with new stone tools. Last model is trade and exchange model mixing with migration one. Once people with new technology settled down in the north part of Korea and then give their knowledge or lithics to other group (C. J. Bae & Bae, 2012).

In this project, I would like to analyze those three different models based on archaeological evidence, perspective of human behavior, different scales of behaviors, apply several scientific approaches into the models, and reinterpret and evaluate the models.

The three models are introduced and supported in different articles: (1) In situ model

in an article, titled, “Emergence of a blade industry and evolution of Late Paleolithic technology in the Republic of Korea” (Seong, 2009), (2) Migration model in “Origin and pattern of the Upper Paleolithic industries in the Korean Peninsula and movement of modern human in East Asia” (Bae, 2010) and “The nature of the Early to Late Paleolithic transition in Korea: Current perspectives” (C. J. Bae & Bae, 2012), and (3) Combination model in “Current observations of the early Late Paleolithic in Korea” (Lee, 2013).

### **Archaeological evidence**

Main reason of the debates is that the related Korean archaeological records do not provide strongly perceived distinctive toolkit such as Aurignacian in Europe (Lee, 2013). Lithics, especially, blade industries are the key component of the models. Blade and micro blades and related tools such as stemmed points are regard as new technology of the period, the starting point of Upper Paleolithic, however, majority of lithics, core and flake tools, have been continuously used from the former period. Usage of raw materials, change in lithic assemblage, chronological sequence based on dating records, comparison with different excavation sites, stratigraphic aspect, genetic analysis of the Y-chromosome, and paleobathymetric variation, absence of Levallois technique are also used for building model. More specific arguments are followings:

- (1) In situ model: Based on indigenous behavioral evolution, Seong asserts that the change of using blade and blade tool is viewed as slow, frequency of using the blade industries is increased, and similar pattern of making stemmed points and then microblades can be seen are indicating evolutionary processes gradually. The main mechanism of his evolutionary background is that climate change had driven needs of new toolkits including projectile points and it causes consideration of raw materials. And due to uneven distribution of resource or quarry, hunter-gatherers' mobility and social networks were increased and it derived blade technology. Seong compares lithic assemblages of different cultural layers in one site (time difference) as well as ones of

different sites and infers with the results that different aspects of layers and sites indicates high mobility. If the aspect were common and stable, then it means that hunter-gatherers had no need to move. Chronological sequence shows that there was no significant change before 40,000BP but “gradual” changes, producing blades could be seen between 40,000 and 30,000BP at middle cultural horizons at Hwadae-ri, Hopyeong-dong, and Youngho-dong sites and these artifact types dominate the lithic assemblages from Yongsan-dong and Gorye-ri sites. From earlier cobble and pebble-tools such as choppers and polyhedrals dominated assemblages to endscrapers, burins, and backed knives and produced from relatively high quality vein quartz, the lithic assemblages were changed gradually. Not just for kinds of tools, ratios of blade to flake, large tool to small tool, and growing reliance on blade were also gradually changed (Seong, 2009).

- (2) Migration model: Bae’s model is based on combination of different foraging groups emigrating from Siberia and southern China. He points out absence of continuous behavioral evolutionary transition such as from Oldowan to Acheulean. And he presents genetic studies and paleobathymetric variation. The analysis of Y-chromosomes shows relationship between modern human in Korean peninsula and in southern China. Foraging groups of southern China could easily go to Korean peninsula through route of yellow sea because the two regions were connected at that time. About low completeness of early blades and relating tools, he asserts that new comers might have adapted to the local environment in the Korean peninsula by adopting the conventional technology of tool production instead of retaining their own tool making tradition of producing blades. Proper raw material takes risk and cost. And southern China also had flake-based lithic industries. He asserts that the blade technology came from Denisovan, in southwestern Siberia according to similarity of lithics with Korean blades (Bae, 2010).

- (3) Combination model: This model can be called as migration-trade interaction model or modified version of migration model. This model was originated from errors of other models. Lee argues that new technologies were introduced in Korean peninsula but they didn't change traditional assemblages. In other words, the blade toolkits were introduced, but did not immediately replaced pre/coexisting traditional assemblage. The traditional lithic industry, or full-fledged simple core and flake tool assemblages (SCFA) seems to reoccur around 100 ka and flourish until 30ka. During the blade period, the SCFA exhibits the general characteristics without a wide range of variation within assemblage. Like Bae's assertion(Bae, 2010), Lee thinks that evolutionary theory (in situ) does not make sense due to absence of any predetermined lithic strategies that require extensive preparation, such as Levallois technique. But he also questions Bae's migration theory. Because there is rugged mountain as natural barrier in Northern part of Korean Peninsula so it is hard to move in from north. In addition, the blade technology in Korea is not related with Homo sapiens which Bae thinks as foraging groups from southern China because the age of the oldest one in Eurasia is younger than 40 ka. It means that Homo sapiens, modern human might arrive in Korea much later (the analysis of hominine remains is practically impossible in Korea), but blade-technology based lithics was started before the period that the modern human arrived. However, he recognizes the possibility of migration in some point and trade interaction because of existence of obsidian and Arca shells which indicate long distance mobility (Lee, 2013).

### **Links between evidence and behavior**

About the advent of new technology, in other words, blade technology, the three models explain the same phenomenon in different ways. Evolutionary theory, migration, and trade are main frame of explanations of each model. These evolution, migration, and trade are broad range of human behavior and they contain small range of behaviors such as adaptation for surrounding environment, mobility, or subsistence pattern. Especially on this

specific research period, the starting point of Upper Paleolithic (MIS 3-2 transition), the term of “modern human behavior” is frequently used to depict similar pattern of subsistence, frequent mobility, and use low material.

Interesting point is that the three models explain introduction of incomplete blade toolkits and coexistence with traditional assemblages as the result of modern human’s ability of adaptation (evolution) (Seong, 2009) or long-distance mobility (Bae, 2010), or the result of combination with mobility and trade (not by modern human) (Lee, 2013). Without the common evidence of blade toolkit, Seong presents different aspect of sites and layer as evidence of mobility, effort for adaptation, and in situ development (Seong, 2009). Bae expects the migration from southern China and Siberia with generic evidence of modern human on the basis of the fact that one of main characteristic of modern human is highly mobile forager (Bae, 2010). Lee argues that the introduction of new technology by modern human’s migration or evolution is hard to believe due to the discordance between dates of archaeological record and ones of Homo sapiens. Therefore he thinks that the new technology was the results of combination of trade, some part of migration, and in situ-development based on adaptation for endemic environment of Korean peninsula (Lee, 2013). Both Seong and Lee recognize the existence of social network or mobility in Korean peninsula because of necessity of acquisition for fine-grain raw material and actual evidences such as obsidian from Mt. Baekdu, Kyushu, and Hokkaido sources (Lee, 2013).

### **Behavior at different scales**

Human behaviors depicted in the three models can be classified in two ways: worldwide range and regional range. I already distinguished the two ranges in the former chapter. For example, human’s evolution and migration are huge change in human history so these behaviors could belong to worldwide range or broad range of human behavior. Small range or regional range behaviors would be adaptation for surrounding environment, trade, mobility, and subsistence pattern. Combination and accumulation of these behaviors could become

the worldwide range. And the evidences of the behavior could be detected in archaeological data such as use of same raw material (Lee, 2013) and genetic similarity (Bae, 2010).

In addition, I perceive other category of classification of human behavior which is social network. On the basis of Korean peninsula, there are two types of network could be existed: network between indigenous foragers and outsiders and one among indigenous foragers. Seong's model is closed to the latter type (Seong, 2009), Bae's to former one (Bae, 2010), and Lee's to combination of the two types (Lee, 2013).

### **Explanatory model**

I do not think that Korean archaeologists employ methods of scientific explanation (SE) into their models because no clear approach of SE can be seen in their models. However, as most of archaeologists do, they use methods of SE without even recognizing them. For example, Seong's approach of the phenomenon of blade introduction seems to be influenced by Binford and Binford. They criticize typological approach like Bordes, focus on causations of assemblages and believe the difference of lithics came from certain functional reason (L. R. Binford & Binford, 1966). Seong regards that the reason of introduction of new lithic is for adaptation of changed environment. But I cannot conclude that Seong's model is only based on causality or functionalism. Because he also understands the introduction of new lithic with the worldwide range of modern human's behavior pattern, evolution (Seong, 2009). In addition, he scrutinizes all relating sites, considers each characteristic, and tries to find more proper explanation. I think this approach is similar with pragmatism (Fraassen, 1977) or Lipton's loveliest explanation (Lipton, 2003).

In the beginning of this project, I expected to classify the models within Wylie's classification which divides type of explanation into three: Epistemic theory of explanation, Ontic theories of explanation, and Pragmatic or erotetic theories of explanations (Wylie, 1996). However, like Seong's approach, I can recognize plural types of explanation in one model.

Bae's migration model is quite clear to apply SE. His approach based on theory of modern human's migration is similar with using "law-like" statement of Hempel and Oppenheim's (Hempel & Oppenheim, 1948). His main argue is that modern human migrate and it starts Upper Paleolithic so the case of Korea is not different (Bae, 2010).

Lee's model starts with questions about other's model. For example, even though the geological condition was reasonable to migration (low sea level), but Bae's model cannot explain a question "why" people moved. And he verifies other's evidence such as dating of modern human (Lee, 2013). I think his approach is similar with Glymour's or Hanon and Kelly which stress the importance of test and verification of hypothesis (Glymour, 1980). His combination model seems like the model of Inference to the Best Explanation (IBE) which tries to provide best understanding (Lipton, 2003).

### **Explanatory model and relevant philosophy of science literature.**

As I mentioned in the previous chapter, Salmon's causality, Hempel's DN approach, van Fraassen's pragmatism, combination of plural models, and Lipton's IBE can be seen in the three models. Here, I would like to briefly introduce these explanatory model based on Wylie's classification (Wylie, 1996).

Among her classification, epistemic theory of explanation is a "top-down" conception of explanation, and regarded as a function of the systematizing power of theory. It includes models of Hempel-Oppenheim, Friedman, and Kitcher. Hempel's model, in other words, explanation by unification is the approach to explain by providing unified accounts of wide ranges of phenomena. For example, a number of gas laws such as Boyle's law, Charles's law, Graham's law, etc can be explained by Newtonian physics. The explanation of unification uses the notion of covering law, which new archaeology arisen from, based on the concept that every bona fide explanation makes essential reference to at least one law of nature. But this approach has some limitation that the method of unification often contains the reduction of one domain of science and the reduction in the behavior science is more



problematic. For instance, the law cannot cover some specialties of each cases of archaeology such as functional explanation in evolutionary theory (???).

Ontic theory of explanation is a “bottom-up” approach, tries to reveal the mechanisms based on causality. Salmon’s model is included in this category. Salmon (1992) illustrates that causal explanation is to explain some phenomenon with finding and mentioning its cause. Its application into archaeological case needs to be taken in conjunction with recognition of the basic statistical character explanations. For instance, hunting strategy can be explained as a kind of ratio of yielding success (behavior science). More direct approach of causal explanation is to develop a theory of probabilistic causality. But it is not a simple, to make the theory valid, both contributory causes and counteracting causes should correspond to each other (Salmon, 1992). However, Salmon’s approach also cannot explain individual facts. There are some cases that the request for explanation is rejected and asymmetry revealed by the barometer (Fraassen, 1977).

Pragmatic or erotetic theory of explanations is a kind of family of theories, and closed to why-question rather than law-like statement. Van Frasseen asserts that scientific explanation is not pure science but an application of science to describe certain phenomena. Therefore, it should describe and explain individual cases and should be an answer of why-question (Fraassen, 1980).

In addition to Wylie’s model, there is another approach, inference to the Best Explanation (IBE). This approach also points out the weakness of methods of Hempel and Salmon and focuses on individual case such as pragmatic. IBE tries to find the most reasonable explanation, called “loveliest explanation”. The difference with pragmatic approach is more deepen why question such as why P “rather than” Q. Interesting characteristic of IBE is process of testing hypothesis using the notion of foil (Lipton, 2003). However, there are problems of judgments. We cannot judge whether loveliness explanation is really better likeliness one or not, and whether loveliness explanation can be matched with likeliness one (Barnes, 1995).

Besides, several combination models are suggested. Mostly they suggest combine two explanations of Hempel and Salmon but they place high importance on Salmon's. For example, Wylie agrees with advantage of Kitcher's unification and Renfrew's model and asserts that those approaches need ontic explanation (Wylie, 1996). Strevens also tries to combine those two approaches into one unified model named the kairetic account (Strevens, 2004). And Kuznar and Long say that archaeological explanations must use a combination of specific causal mechanisms and generalizable laws (Kuznar and Long, 2008).

### **Critique of three models**

To tell conclusion first, I think Lee's approach is the best explanation among three models. As his opinion, test of hypotheses, there is no evidence of existence modern human at the starting point of Upper Paleolithic in Korean peninsula (Lee, 2013). Seong misses the explanation why population was increased at that time despite of severe climate change or the explanation of sequence in his causal mechanism, so his adaption model is hard to accept (Seong, 2009). Bae cannot explain why foraging group of southern China moved to Korea rather staying in China (Bae, 2010). For these reasons, I prefer to Lee's approach, the combination model.

They overlooked delicate time gap between introduction of stemmed points (35,000 BP) and blades (32,000 BP). Stemmed points started earlier than blades and I think this time gap can explain the phenomenon as well as support in situ model. However, I don't think that blade was also made by indigenous people. This technology was use in more broad geological range so that migration or trade is also reasonable in some point, definitely after stemmed points. Therefore, I think Upper Paleolithic was started by indigenous people but the concept of blade technology came from outside of Korea.

### **Conclusion**

The main task of this project is to reinterpret and evaluate three models depicting starting point of Upper Paleolithic in Korean peninsula. Each model has proper

archaeological evidences and reflects human behaviors in different scales. Even though, the authors seem not recognize the approaches of scientific explanation, they still use the scientific approach under influence of reading archaeologists, Renfrew and Binford. I could succeed to find several kinds of scientific explanations in their models and could evaluate each model.

As a result, I think that Lee's combination model is reasonable to describe the period. Again, I do not know whether he considered the scientific explanation as frame of his model or not, his approach is quite reasonable. Testing (other's) hypotheses and recognizing foils of them are important points to evaluate as well as to build a model.

## Reference

Bae, C. J., & Bae, K. (2012). The nature of the Early to Late Paleolithic transition in Korea: Current perspectives. *Quaternary International*, 281, 26–35.

doi:[10.1016/j.quaint.2011.08.044](https://doi.org/10.1016/j.quaint.2011.08.044)

Bae, K. (2010). Origin and patterns of the Upper Paleolithic industries in the Korean Peninsula and movement of modern humans in East Asia. *Quaternary International*, 211(1?2), 103–112. doi:[10.1016/j.quaint.2009.06.011](https://doi.org/10.1016/j.quaint.2009.06.011)

Barnes, E. (1995). Inference to the loveliest explanation. *Synthese*, 103(2), 251–277. doi:[10.1007/BF01090049](https://doi.org/10.1007/BF01090049)

Binford, L. R., & Binford, S. R. (1966). A Preliminary Analysis of Functional Variability in the Mousterian of Levallois Facies. *American Anthropologist*, 68(2), 238–295. doi:[10.1525/aa.1966.68.2.02a001030](https://doi.org/10.1525/aa.1966.68.2.02a001030)

Fraassen, B. C. V. (1977). The Pragmatics of Explanation. *American Philosophical Quarterly*, 14(2), 143–150. Retrieved from <http://www.jstor.org/stable/20009661>

Fraassen, B. C. V. (1980). *The Scientific Image*. Clarendon Press.

Glymour, C. (1980). Hypothetico-Deductivism Is Hopeless. *Philosophy of Science*, 47(2), 322–325. Retrieved from <http://www.jstor.org/stable/187090>

- Hempel, C. G., & Oppenheim, P. (1948). Studies in the Logic of Explanation. *Philosophy of Science*, 15(2), 135–175. Retrieved from <http://www.jstor.org/stable/185169>
- Kuznar and Long. (2008). *Against the Grain*. Retrieved from [https://books-google-com.offcampus.lib.washington.edu/books/about/Against\\_the\\_Grain.html?hl=ko&id=H-TINNqkqPIC](https://books-google-com.offcampus.lib.washington.edu/books/about/Against_the_Grain.html?hl=ko&id=H-TINNqkqPIC)
- Lee, H. W. (2013). Current observations of the early Late Paleolithic in Korea. *Quaternary International*, 316, 45–58. doi:10.1016/j.quaint.2013.03.025
- Lipton. (2003). *Inference to the Best Explanation*. Retrieved from [https://books-google-com.offcampus.lib.washington.edu/books/about/Inference\\_to\\_the\\_Best\\_Explanation.html?hl=ko&id=O52CAgAAQBAJ](https://books-google-com.offcampus.lib.washington.edu/books/about/Inference_to_the_Best_Explanation.html?hl=ko&id=O52CAgAAQBAJ)
- Salmon, W. C. (1992). Explanation in Archaeology: An Update. In L. Embree (Ed.), *Metaarchaeology* (pp. 243–253). Springer Netherlands. Retrieved from [http://link.springer.com.offcampus.lib.washington.edu/chapter/10.1007/978-94-011-1826-2\\_10](http://link.springer.com.offcampus.lib.washington.edu/chapter/10.1007/978-94-011-1826-2_10)
- Seong, C. (2009). Emergence of a Blade Industry and Evolution of Late Paleolithic Technology in the Republic of Korea. *Journal of Anthropological Research*, 65(3), 417–451. Retrieved from <http://www.jstor.org/stable/25608225>
- Strevens, M. (2004). The Causal and Unification Approaches to Explanation Unified? Causally. *Noûs*, 38(1), 154–176. doi:10.1111/j.1468-0068.2004.00466.x
- Wylie, A. (1996). Unification and Convergence in Archaeological Explanation: The Agricultural ?Wave-of-Advance? And the Origins of Indo-European Languages. *The Southern Journal of Philosophy*, 34(S1), 1–30. doi:10.1111/j.2041-6962.1996.tb00809.x