REWRITING CIVILIZATION BASED ON SCIENTIFIC REVOLUTION: CURRENT RESEARCH FINDINGS FROM ARCHAEOLOGICAL SITES IN INDONESIA

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ABSTRACT

The research on civilization in Indonesia has been conducted since 1800s. Around 1970s, there was theory regarding Out of Africa stating that ancient human was from Africa then spread to all over places in the world. Besides, around 1980s there was opinion theory regarding Out of Taiwan which stated that modern human culture spread from Taiwan to South East Asia. Different research findings then are considered anomaly and barely accepted as science. Revolution could occur when the new different evidences from previous science are found. The findings of archaeology from last ten years in Indonesia have some potential to trigger scientific revolution.

KEYWORDS: archaeology, prehistory, civilization, scientific, revolution

INTRODUCTION

In science, there is a term called ‘truth’. Truth is the result of various thoughts and reliable researches. Scholars in general have also accepted the term ‘truth’. Science fundamentally evolves, for some other scholars keep trying to test the truth. On the one hand, the process of testing the truth can strengthen the truth itself. On the other hand, there is a possibility of finding the weakness of truth which leads to more effort of finding new truth.

Philosophy is one of the disciplines that specifically discuss truth. Irmayanti Budianto states that the work of science is leading to the justification of methodology and scientific paradigm. Scientific paradigm is a model which becomes the basic guidance for thinking of and planning research (Budianto 2005: 24). The aim of scientific paradigm is to find truth, yet the nature of truth, as stated above, is not absolute. Meanwhile, the orientation of theory or approach could bring in new theory. However, theory can also be confronted or thwarted if new fact is found. Theory, the orientation of theory or approach, is a part of methodology which is applied by the scholars to find truth. Philosophy specifically the philosophy of science has triggered every person including scholars to be critical. According to Budianto, the act of questioning or not merely accepting the existing matters such as theory and views is a sample of critical attitude (Budianto 2005: 27-28). At the same time, the philosophy of science itself is also developing.

Thomas Kuhn in 1962, having his critical attitude, proposed Scientific Revolution (Kuhn 1970). Revolution could occur if new proves which are different from the previous ones were found. Meanwhile, other sciences have undergone different developments, one of which is triggered by the perspective of critical attitude and the way of responding to such attitude. The archaeologist who develops archaeology also tries to implement the thoughts of Scientific Revolution. Paul Martin by considering the views of Thomas Kuhn, have discussed the revolution
of archaeology from the traditional to the new movement (Martin 1992).

The development of archaeology in the world is generally slower than other disciplines. Specifically, the development of archaeology in Indonesia, including the theory and truth, is also considered slow. Archaeology as the discipline which aims to reconstruct human civilization has developed since 1800s. From that era to the end of 1980s, this discipline had undergone some developments and resulted in some truths. Around 1970s, theory of Out of Africa was already known. This theory states that the oldest people in Africa spread to all around the worlds. Besides, there is also the theory of Out of Taiwan which states that the culture of modern human beings spread from Taiwan to the world including Indonesia. The findings of the next researches are mostly relevant with those views or theories. Different research findings then are considered anomaly and could be barely accepted as science.

The research findings of archaeology in the last decade in Indonesia are potential to bring in scientific revolution. One of the findings is Gunung Padang Site which has been studied since 1914, yet the researches from 2012 to the present have resulted in extremely different conclusion. Aside from that, the current research findings in the archaeological sites in Indonesia have to be discussed more deeply, for it could lead to the rewriting of world civilization map.

PROBLEMS AND METHODS

The research findings which are discussed in this paper are the discoveries in Sangiran Site, Maros Site, Gunung Padang Site and Batu Naga Site all of which came from the Prehistoric Age or period when humans had not discovered letters. Generally, the periodisation of the Prehistoric Age based on technology is divided into four: Palaeolithic, Mesolithic, and Neolithic. Palaeolithic Age had developed from 2 million years ago to 40,000 years ago. Mesolithic Age had developed from 40,000 years ago to 10,000 years ago and was the peak of stone-tools production to 5000 years ago. Paleometalic Age developed from 5,000 years ago to the period humans discovered letters.

Before 1980s, the theory of Out of Africa had developed; this stated ancient human in Palaeolithic Age in Indonesia were the offspring of those in Africa. Before 1980s, the cave paintings during Mesolithic Age in Europe had been acknowledged as the oldest archaeological finding. Meanwhile, in Indonesia, the cave paintings were assumed to be younger. The early Neolithic Age, according to the experts, was located around Middle East, while other areas in other parts of the world were expected to be younger. In Indonesia, specifically, Neolithic Age, according to the experts, came from outside Indonesia; for instance, the theory of Out of Taiwan which was widely known. The religion system which was developed during Paleometalic Age and acknowledged the mythical animal such as dragon was expected to come from China, while the dragon in other parts such as Indonesia were considered as Chinese influence. The problem discussed in this paper is related to the difference between those previous views and the view derived from the current research findings in Prehistoric Age in Indonesia.

This paper is the result of archaeological research using either no excavation and excavation. Steve Roskams states, that by method other than or before excavation can be done aerial photography, field-walking/pedestrian survey, shovel test pits or devoting, documentary references, previous excavations, ground-based remote sensing, drilling cores or augering, digging evaluation trenches (Roskams 2001: 40-62). Analysis conducted with wear analysis primarily to
determine the context and laboratories analysis especially to determine the age of the findings. James Deetz states, that dating methods divided into two categories: relative dating and absolute dating (Deetz 1967: 23). Sharer and Ashmore states, that absolute dating can use in example obsidian hydration, dendrochronology, radiocarbon, potassium-argon, argon-argon, uranium series, and calendrical (Sharer and Ashmore 2003: 311). Renfrew and Bahn specifically explained that radiocarbon measures the decay of the radioactive isotope of carbon (14C) in organic material (Renfrew and Bahn 1991: 490).

This paper is the result of a literature-based research or documentary references for all prehistorical sites in Indonesia. For the sites in Sangiran, Maros, Gunung Padang, and Batu Naga the writer conducted field-walking/pedestrian survey in those sites. For Gunung Padang Site the writer conducted aerial photography, field-walking/pedestrian survey, shovel test pits or devoting, previous excavations, ground-based remote sensing, drilling cores or augering, and digging evaluation trenches. In Gunung Padang Site and Batu Naga Site, excavation and laboratory analysis are used to understand the absolute dating or chronology of those sites. Excavation is of one archaeological method to collect data by digging the ground to find archaeological finding. Meanwhile, to know the age of archaeological finding used Carbon (14C) test in laboratory.

DISCUSSION

In this part, the current research findings in some prehistorical sites are discussed deeply. This paper begins with the discussion of the older sites and the younger ones respectively.

Sangiran Site

Sangiran Site or known as Sangiran Area is quite wide, around 8x7 m², and located in Central Java, at the border of Sragen Regency and Karanganyar Regency. This site is found in 1934 by G.H.R. von Koenigswald. The fossils of Homo erectus, from the period of 1 million years ago are quite a lot in this area. Up to the present, there have been 100 individuals of Homo erectus around the world, which are in Africa, Europe and Asia including Indonesia. Sangiran is renowned in the world since more than 50% individuals of Homo erectus in world were found in this site (Widianto and Simanjuntak 2009: 65).

Within the genus of homo, the view before 1990 generally stated that there was one species during every age of which chronology as follows: started by Australopithecus then Homo habilis, Homo erectus, Homo sapiens. The old genealogy of evolution is then formulated to be more complicated by Bernard Wood, of which the main point is that there must have been at least one species in the group of Homo habilis and Homo erectus during the same age (Bellwood 2000: 54-55).

The types of Homo habilis was not found outside Africa up to the present. Meanwhile, Homo erectus was not only found in Africa but also in Europe and Asia including Indonesia. Next, Homo sapiens was found in almost all parts of the world including in America and Australia. Therefore, there is a big paradigm which is Out of Africa, among which was believed by Louis Leakey in 1960s. Out of Africa or also called Replacement Theory states that the ancestors of human came from Africa then spread to all around the world. Different paradigm from Out of
Africa is Multiregional Evolution. This view was proposed by Alan Thorne and Miford Wolpoff which stated that there was regional continuity: *Homo erectus* from each area became *Homo sapiens* in their respective areas. Two primary models of modern human evolution can be more understood by looking at the picture drawn by C. Stringer (Bellwood 2000: 73-74). Since mid-1980s, those two models had been competing and seemed facing no end. However, most of the scholars was more supportive to Out of Africa along with the evidences (Widianto and Simanjuntak 2009: 13).

The notice on the discovery of fossils in Liang Bua, Flores, East Nusa Tenggara in 2004 received many responses from all around the world. Joint team from Indonesia and Australia studied the prehistorical cave and found at least 7 individuals and some stone tools. One of the individuals which then called LBI was 106 cm. This fossil then triggered debates: whether it was *Australopithecus afarensis, Homo erectus, or Homo sapiens*? The debates on this fossil which later called *Homo floresiensis* considered the existing theories. *Homo floresiensis* is not categorized as *Australopithecus* (Widianto and Simanjuntak 2009: 35-36).

The discoveries of *Homo erectus* in Sangiran which are more than half of *Homo erectus* in the world and the discovery of *Homo floresiensis* seemed to need more analysis using different approach. This approach surely has not yet become a fixed theory like *Out of Africa*. The approach that needs to be applied still refers to the Evolution Theory which states that everything develops from the simple form to better and complicated ones. Would it be possible to propose a view stating that each area has *Australopithecus*? Each *Australopithecus* became *Homo erectus* and *Homo sapiens* in the respective area. This view could be tested, considering there are many fossils found in Indonesia. The new view is expected to send some new spirit to boost the effort of finding science related to ancient humans and the origin of modern human.

### Maros Site

One of archaeological findings which attract scholars is rock art or cave painting. Cave paintings actually spread equally in every part of the world, yet the renowned ones are limited. One of the famous cave paintings is located in Altamira cave in Spain. In Indonesia, cave paintings are situated in South Sulawesi, Southeast Sulawesi, Maluku, Papua, East Kalimantan and South Sumatera.

Cave sites in Maros and Pangkep can also be called as area, considering the width and the number of archaeological sites in South Sulawesi Province. Since 1950s, cave paintings in the area which spread in the form of karst mountain along Maros Regency and Pangkep Regency began to be studied by C.H.M Heeren-Palm and van Heekeren. E.A. Kosasih has also studied cave paintings of humans and hand stencil pictures. Besides, Kosasih compared objects and drawing techniques of cave paintings in South Sulawesi and those in Thailand and Philippines including cave paintings in France and Spain (Kosasih 1986, 1987). The absolute dating of cave paintings in South Sulawesi has not been discovered, yet it is assumed from the beginning of Neolithic Age. Peter Bellwood who have done many researches on Austronesia states that the movement of Austronesian culture spread from Taiwan to some destinations in South East Asia one of which is Indonesia through Sulawesi, or known as the view of *Out of Taiwan* (Bellwood 2000). Migration from Taiwan took place about 6000 years ago and reaching Sulawesi about 3500 years ago (Widianto 2010: 125).
Joint team from Indonesia and Australia in 2014 reported the research findings which was the absolute dating of cave paintings in Maros used uranium series. The oldest cave painting of human hand stencil is around 40,000 years old. These research findings show that cave paintings in South Sulawesi are as old as those in West Europe. Before this research, the oldest cave paintings are said to be located in West Europe (Aubert et al. 2014).

Based on the survey conducted by the writer in Maros and Pangkep, there are still many caves in those two regencies. Inside the caves are paintings of various forms including boat. This distribution of archaeological sites shows that there had been many people doing activities in those areas at certain given time. Then the next research related to boat opens an opportunity to bring in scientific revolution in migration and maritime sector.

**Gunung Padang Site**

Gunung Padang Site situated 1000 meters above the sea is located in Cianjur Regency in West Java. This site had been visited and recorded by some Europeans, but it was officially recorded in ancient notes in 1914 by N.J. Krom in Rapporten van de Oudheidkundige Diens. Krom wrote report on Gunung Padang Site which he thought to have four terraces. It is necessary to note that since 1914, this site had appeared to be forgotten. Then, in 1979, three local people reported to the government that there might be prehistorical site in their area. After the survey, it was Gunung Padang Site that were recorded by N.J. Krom in 1914. Researches then were conducted by some archaeological institutions; one of the findings stated that there were 5 terraces with the stairs in the north area. This site is Megalithic structure which is stepped pyramid located on the top of hill around 1.5 hectares.

Gunung Padang Site until 2012 had never been studied using absolute dating. Thus, the chronology of this site refers to the view of Robert von Heine Gerder who divided this megalithic structure into Old Megalithic and Young Megalithic. According to Robert von Heine Gerder, as cited by Soejono, Old Megalithic was supported by people used Austronesia language which left archaeological finding in the form of dolmen, stepped stone, stone road, stone wall, stepped pyramid (punden berundak) of 2500-1500 BC. Young Megalithic was around 1000 BC or around 3000 years ago which left archaeological finding in the form of stone coffin, sarcophagus, and stone vessel (Soejono 1984: 206).

In 2012, the writer also conducted research in Gunung Padang Site until 2016. Some new findings are as follows. This site actually does not only occupy the top of hill but also has man-made stone structure at the four sites of the hill to the foot hill. Having this form, the width of Gunung Padang Site is 25 hectares or almost 20 times wider than the width from previous research (Akbar 2013: 181).

The new finding which is considered different from the previous research is the chronology or the age of this site. If the previous research had not used absolute dating, then the research from 2012 conducted several absolute dating tests using carbon dating method (14C). Carbon dating test is applied to samples found after excavation and done in National Nuclear Energy Institute (Badan Tenaga Nuklir Nasional) in Jakarta. Based on the excavation, there are two cultural layers marked by the structure of the stone: The First Cultural Layer which is the layer found until 2 meters below the ground and The Second Cultural Layer which is around 4 meter below the
ground. The result of absolute dating based on the sample of findings is that the First Cultural Layer is around 500 BC, while the Second Layer Culture is 5200 BC or 7200 years ago (Akbar 2013: 253).

The First Cultural Layer and the Second Cultural Layer of Gunung Padang Site are the structure arranged with big stones which in the archaeology are called megalithic. The oldest megalithic relative date is assumed to be 4000 BC. Meanwhile, the pyramid structure in Egypt is around 2500 BC. The stone structure in Gunung Padang Site, according to R.P. Soejono, is called stepped pyramid (Soejono 1982: 87). Based on the latest research in Gunung Padang Site, it can be proposed that the oldest megalithic structure is situated in Indonesia.

Batu Naga Site

Batu Naga Site is located at the top of Pojok Tiga Mount in Kuningan Regency, West Java. The writer named this site Batu Naga, for the main discovery in this site is dragon sculptural relief on the menhir which is the dominant sculptural relief on the stone. The local people have known the discovery of scratched stone called Batu Tulis since 1980s, yet it has not been fully identified. In 2012, the writer conducted research in Batu Naga Site by using survey, excavation, and 14C absolute dating analysis in laboratory. Besides, comparative study is conducted between this prehistorical site and that in China, India, and West Europe.

Dragon is a mythical animal which is associated to China. Nevertheless, dragon can also be found in India, Europe, and other areas in the world. Dragon in China has several characteristics such as having beard, limbs, and fin attached along the back. The characteristics of dragon in India are using crown on the head and jewellery on the ears or neck. Meanwhile, dragon in Europe is generally described as a flying animal because it has wings.

The dragon sculptural relief in Batu Naga Site, based on the result of analysis, has some different characteristics from those in China, India, and Europe. Dragon sculptural relief in Batu Naga Site does not have limbs. It also does not use crown and jewellery on the ears or neck. It does not have wings either.

Batu Naga Site is a stepped pyramid which was commonly made during prehistorical age. When the writer was doing excavation, the left over of charcoal was tested using absolute dating which shows the age of 2000 BC or 4000 years ago. Thus, dragon sculptural relief in this site is considered old and different from other forms of dragon in other parts of the world. It can be concluded that the dragon figure in Batu Naga Site was not necessarily influenced by the Chinese, India, or West Europe Civilization (Akbar 2017).

CONCLUSION

The research on civilization is still ongoing. However, the conclusion on civilization has not undergone any changes till 2000s. Archaeological researches conducted in Indonesia at some sites from different periods in Prehistorical Age have actually brought in different conclusions compared to the previous researches. However, the different research findings are still considered anomaly, for they are different from the existing mainstream view. In this case, scientific revolution goes very slowly. Meanwhile, the scientific revolution of other disciplines and studies
have gone quickly and numerous.

The research findings on the archaeological sites in Indonesia in the last decade show that Indonesia have many sources of science and knowledge. If these sources are continuously studied intensively through multidiscipline and inter disciplines methods, then they potentially change the world civilization map. The writing of research findings related to civilization is still ongoing. One of important matters to keep researches conducted seriously and produce scientific revolution is to grow critical attitude. The critical attitude should be applied on one’s own research and others’ researches although those researches have been considered reliable in the current scientific map.

REFERENCES


