A Perspective on Vietnamese Prehistory Based upon the Relationship between Geological and Archaeological Data: Summary of an Earlier Article by Nguyen Duc Tam

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IN 1969, NGUYEN DUC TAM published in the *Vietnamese Journal of Historical Studies* a provocative article in which he offered a bold reinterpretation of Quaternary geology in Southeast Asia and discussed its relationship to the archaeological record in Vietnam. This work, entitled “Some Historical Periods Related to Quaternary Activity and Archaeological Characteristics and Rules in Vietnam and Southeast Asia,” raised a number of issues that merit further thought and discussion. Therefore, although specialists may find fault with some of his ideas, a brief summary of the perspective presented by Nguyen Duc Tam is offered here in English for the consideration of a wider audience.

During the lower Palaeolithic period human beings were already living on the plains of what is now Vietnam. The continental rock layer of this period is now buried from 100 m to as much as 240 m below sea level, but for the bulk of the long Palaeolithic period this surface was roughly at sea level and much higher than it is today. In front of the mountainous region of northern Vietnam today was a narrow zone with many hills (some of which, for example, are still visible as islands off the present coast of Hai Ninh). Here continental alluvium directly covered the weathered surface of the original hard rock, creating narrow strips of plain between the hills. To

Sketch Map of Shifting Coastline in Northern Vietnam

- Hypothesized coastline before the advance of the sea (Lower Paleolithic)
- Hypothesized coastline with the advance of the sea (Upper Paleolithic, Mesolithic)
- Present day coastline
- Present day oceanic plains, once covered by the sea

Fig. 1 The shifting coastline in northern Vietnam.
the east stretched a long and extraordinarily level plain, joining what is now Hainan Island with the present territory of Vietnam.

Toward the end of the Palaeolithic period the sea level began to rise. Water gradually covered the vast level plain to the east, creating the Gulf of North Vietnam, cutting Hainan Island off from the mainland, and producing a Gulf of Hanoi that extended over the central portion of the northern plain (see Fig. 1). As the sea continued to rise it covered the plains between the hills and reached the edge of the mountains, creating a series of small bays, archipelagoes, and islands. The sea continued to rise until it penetrated rather deeply into the continent (Fig. 1) and the territory that is now Vietnam lost all of its plains and spacious valleys. Tongues of the sea extended into the mountainous region to the west of the present-day plains.

Vestiges of this rise of the sea are still visible. Lines of seawater are observable on the base of limestone mountains in Nghe An, Ninh Binh, Hai Duong, Kien An, and Quang Yen, as well as on limestone islands in the Gulf of Ha Long. These water lines are 7 to 8 m higher than the present sea level and 3 to 4 m higher than the present surface of the plains. There are also still fields of sand in the plains; these were the ancient coastal marshes, now dozens of kilometers distant from the sea. The edge of the bases of the high mountain ranges to the west of the plains also reveals many large stretches of sand, the beaches of the former seacoast.

Most important of all in confirming this advance of the sea are the stratification data. The present plains were built upon the earlier surface by a layer of clay varying in thickness from 20-30 to 50-80 m. Most of this clay, which is widespread and easy to recognize, is of a very smooth type with a red-and-white-spotted coloring. It can be found in the northern plain (in Quang Yen, Bac Ninh, Bac Giang, Vinh Phuc, Son Tay, Phu Tho, Ha Nam, Ninh Binh, and Nam Dinh), in the plains along the coast of Hai Ninh, and in the Nghe An-Ha Tinh plain. The soil consists of accumulated deposits from the time when the sea covered this vast area, and contains the remains of sea mollusks, coral, and other forms of marine life. Similar fields of marine shellfish have been discovered in Hung Yen province [south-southeast of Hanoi, within the northern plain], and many archaeological excavations in the plains have encountered clay soil that is white or red-and-white. An excavation at Thieu Duong, several km northeast of Thanh hoa, found a sea mollusk (Ostrea edulis linne) at a depth of about 10 m. The plains of today are not alluvial plains deposited very gradually by rivers over a long period of time, but plains made from deposits of oceanic materials.

The stratum of oceanic clay within the region of the present-day plains may be dated within the Quaternary period because it is friable, lies on a horizontal plane, and contains a residue of partially decomposed vegetation appropriate to the Quaternary period. Based upon its thickness and estimated rate of accumulation, this layer would be associated with the middle or upper Quaternary period. In other words, it came after the early and middle Palaeolithic period of human development. The continental alluvium above it belongs to the current geological epoch.

Beneath that layer of oceanic clay in the plains of the northern and central regions of what is now Vietnam there is a layer of continental sand and gravel from Tertiary rock. This sand and gravel from rivers and streams of long ago created a huge alluvial plain that existed for a long time in the eastern portion of contemporary Vietnam before it was covered by the sea. Prior to the advance of the sea, conditions upon this
ancient alluvial plain must have been very favorable for human existence. There were many streams and rivers, and fruits and game were abundant amidst lush tropical vegetation. But no traces of the people who lived a hunting and gathering existence in this rich environment have been found anywhere on the plain for the simple reason that the plain upon which they lived has disappeared far below sea level and far beneath the surface of the much newer oceanic plains and their recent alluvial covering.

However, mystifying everyone, vestiges of human activity dating all the way back to the lower Palaeolithic period were discovered at Mt. Do near Thanh Hoa in 1960. No other sites have been found near there (or anywhere else on the plains) that are not of much more recent origin. But the discoveries at Mt. Do have some special characteristics. These unique vestiges of early Palaeolithic life in this area were found upon a large mountain in the midst of what we have determined to be newly formed oceanic plains some 22 km from the present seacoast. Mt. Do was created from diabase dating from the Triassic period, and these finds were located on the surface of the old topography at heights of from 20 to 80 m above the surface of the surrounding plains. The artifacts were made by people who lived upon the early plains and climbed the mountain slopes of 20 to 25 degrees to obtain the high quality rock that was most readily available there for the production of their simple stone tools.

When the sea advanced, these early inhabitants of the plains were forced back into the mountains to the west, and their living sites were completely covered over as the new sea floor was formed. Mt. Do remained as an island upon which some vestiges of human activity, traces of people who had formerly lived upon the surrounding alluvial plains, were preserved. Further cultural development took place in the mountainous regions where the people had to live during the long period when flatter land at lower elevations was covered by the sea. For those people, developments of the later part of the Palaeolithic period and the Mesolithic period took place in the mountainous regions while new oceanic plains were being created atop the old plains beneath the expanded area covered by the sea.

The older archaeological sites associated with the "Hoa Binh culture" are in areas above the plains, and many of them are located not far from what must once have been the seacoast, although far from where the coastline is today. The sites associated with the more recent "Bac Son culture," which many people feel belongs in the early Neolithic age, are also distributed mostly in the mountainous regions. But on the plains many sites from the Neolithic period proper and the Metal age seem to have appeared suddenly and in great numbers, which is precisely what one might expect if people were then spreading down from the mountains to the newly formed plains as the sea retreated.

The volume of Neolithic and Metal age archaeological materials found upon the plains is startlingly large, widely distributed, and characterized by technology that developed with such unexpected speed as to suggest that the Neolithic people descended to the plains rather quickly and that before this downward movement they had experienced a long development phase in the mountains, during which they had acquired a high level of technology. It is also significant that on the plains, the farther to the east the Neolithic traces appear, the more recent they are. Early Neolithic sites such as Quynh Van and Da But are along the mountainous edge of the plains, while the later Neolithic sites are spread out, extending almost to the present seacoast.
It is reasonable to conclude that the present-day plains did not begin to appear until the period of Bac Son culture, and that the powerful technological, economic, and general cultural development that followed is best explained in the context of a human descent into the newly formed plains and the transformation of these plains through a combination of human activity and natural processes. Let us look at the archaeological record from this perspective. In the past investigators have resorted to elaborate and improbable means of explaining the significance of shell mounds containing a high percentage of salt-water species located at a considerable distance from the sea. But they have been thinking of the seacoast as it is now. If one finds the remains of large numbers of sea creatures on the interior portion of the plains, as at Da But, it is simpler and more productive to assume that at the time people discarded them there the sea was nearby, and that one is investigating what was at a certain point in time a coastal community. Such archaeological data, properly interpreted, can help us to date the retreat of the sea with more precision.

Looking at the distribution of such kitchen middens in association with the archaeological characteristics of the sites near which they are found, we can estimate where the coastline of Vietnam was around the end of the Neolithic period. In particular, we can surmise that the sea still extended up the middle of the northern coastal plain nearly to Hanoi. When the sea began to recede, portions of the new oceanic plains were exposed earlier at some places than at others. Both geological and archaeological evidence suggest that this occurred particularly early on the upper half of the northern plain, perhaps around the transition from Hoa Binh culture to Bac Son culture. It was not until nearly the end of the Neolithic period, however, that a relatively narrow strip of habitable plain extended along the edge of the sea with natural conditions favorable for economic and technological development.

Even when the sea had receded considerably to the east, in central Vietnam and all around the perimeter of the northern plain, as the Neolithic culture was advancing into its later phase, there were still serious environmental constraints upon development, especially in regard to soil and water. The land would not yet have been completely dried out and there would still have been a lot of salt on the surface and in the soil. In addition, much of the area would have been vulnerable to severe flooding both by heavy rain and by brackish tidal water. Even today in central Vietnam salt water can intrude up rivers and streams for tens of kilometers into the continent, and in the northern plain the tide comes in as far as Hung Yen and Ha Bac.

One might expect that well into the Neolithic period the most common forms of vegetation on the plains would have been some varieties of myrtle, reeds, and mangrove—vegetation that could tolerate salty water but would bear little edible fruit. For such environmental reasons it was not until the later part of the Neolithic period that people began to come down from the mountains to the plains in rapidly increasing numbers. By then the problems had become less severe due to the further retreat of the sea, the length of time that had elapsed since some flat land had first been exposed, and the impact of earlier settlements.

Only in the later Neolithic period would conditions on the plain have permitted the task of clearing the plain and developing a plains economy, especially agriculture, to proceed in any major way. This observation coincides with the observation that vestiges of only the later Neolithic period and thereafter have been found in large numbers, and in very much greater and rapidly increasing numbers than the meager num-
ber of sites from the early and middle Neolithic periods. The process of vigorous development continued as the seacoast of today was formed by a continuing recession of the sea during the Metal age.

The plains of today may be divided into two zones. A zone of oceanic plains contains hills belonging to the former continental, weathered topography, and includes the plains of the central region, Hai Ninh, and the fringes of the northern plain. Here new alluvium is found only along the edge of the rivers and the rest is oceanic clay, with the tops of hills belonging to the older continental topography protruding here and there above the level surface.

The second zone consists of primarily oceanic plains with newer elements of continental agglomerated origin. This is the central portion of the present northern plain. Here, along the edge of the Red River, are new alluvial deposits up to several meters thick and no island mountains. But the entire northern plain of the present time is not a Red River delta just as the Thanh Hoa plain is not a Ma River delta. They are merely large pseudo-deltas. In geological terms the sea has receded only a little bit from the point to which it once advanced and this has occurred relatively recently. The weathering and agglomeration that have taken place since the retreat of the sea are still not great. Essentially, what has happened is that some narrow gutters have been created with a little alluvium around their edges. The Vietnamese plains of today are basically oceanic plains of recent origin.

This observation has great significance for the field of archaeology. It imposes a new and different set of assumptions about the characteristics, rules, and methods of archaeology in Vietnam. It suggests changes in where and how we look for certain kinds of sites in various localities, and it presents alternative interpretations of many characteristics of sites that have already been studied. The discovery and further refinement of geological-historical periods can help to resolve a number of difficulties for archaeology in particular and for historical research in general, and it can assist geological research at the same time.

**Note**

1. Through a radical reorganization and severe condensation of the somewhat long original article, this summary attempts to convey as clearly and accurately as possible the perspective on Vietnamese prehistory offered by Nguyen Duc Tam fifteen years ago. No effort has been made to revise or up-date the contents. The views are presented for their heuristic value. They do not necessarily reflect the subsequent thinking of Nguyen Duc Tam, my own ideas, or the opinions of the editors of either the *Journal of Historical Studies* or *Asian Perspectives*.

**Reference**

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