CHAPTER VI

"NEOLITHIC" CULTURES OF INDO-CHINA, SIAM, MALAYA AND BURMA

Introduction

The cultures represented by a large number of stone tools, excavated mostly from caves and rock-shelters in the lime-stone massif of this region of South East Asia are usually designated "neolithic". Further implements have also been recovered from open air sites. Certain of these have been described as kitchen-middens, but most rank as surface finds in the fields. Their relationship with what may be called "the cave cultures" is not clear. As a whole, these stone tools are generally associated with the remains of a large number of animal bones, the animals mostly representing wild varieties of existing local species. Heaps of Melanian shells are frequent. There are, also, hearths associated with pottery in small quantities. So far cultivated food-grains have not been reported, nor textiles, but it may be that these have not been recognised. Wild berries occur plentifully. A tool with its base marked with little squares by cross hatching, found in various places, has been described as "bark-cloth beater".

These items hardly justify the appropriateness of the term "neolithic", the essential criteria of which "have always been held to be the domestication of stock, the cultivation of cereals, the making of pottery, and the manufacture of polished stone tools". (A History of Technology, London, 1954, p. 501). The domestication of animals and the cultivation of cereals were not practised at all by these South East Asian "Cave" dwellers, since the fauna and flora found in the caves are undomesticated and uncultivated. However, hand-made pottery is frequently found though only in very small quantities. It must, however, be noted that most archaeologists suppose that the pottery was imported from more developed areas. The stone tools are, also, not always ground. Some of

1 V. Gordon Childe in Man Makes Himself, Pp. 89-90 (See also Childe, 1953, p. 193), lays stress on, "a self-sufficing food-producing economy".
them are very poor in workmanship, being, in fact, only oval river pebbles, crudely chipped on one or both faces. Some, though still unground, are flaked by the same crude technique but have more regular forms. On account of this crudity and the absence of grinding some writers (Van Stein Callenfels & Evans, 1928) have called these cultures “palaeolithic”. But this term is hardly justifiable in view of the fact that all these cultures are known to be recent by their faunal association and other evidences which will be described later. Other authors (Heine Geldern, 1945, p. 130; M. W. F. Tweedie, 1953, Pp. 10-18) refer to the cultures represented by the crude industry as “mesolithic”, probably intending to imply a much earlier date for them. But as the following analysis will show, there is hardly any justification for such an assumption. Poor workmanship with recent associations is, no doubt, a common denominator of all these “cave cultures”. It is in contrast with them that we find, on the other hand, completely ground tools, as well as tools well-cut, probably made by a process of wire sawing, and regularly conforming to set shapes and proportions. The French archaeologists (Colani & Mansuy) have designated tools of the first class “Néolithique inférieur” and those of the second class “Néolithique supérieur”. But in between these classes of tools, we find some edge-ground implements, which are placed in the first category by these authors, who, thus, in fact, assume a sequence of three stages. This assumption is based entirely on typological grounds. No stratigraphic evidence has so far been produced to prove the validity of such a sequence. No distinct strata have been detected in the excavation of the deposits of these caves. It is true that the depth of finds has been quoted to prove the correctness of this alleged sequence, but no reliance can be placed on these figures.

One gathers the general impression that the food-collecting crude-tool users lived side by side with those who used ground and sawn tools of specialised types, as well as various types of hand-made pottery. This suggests that the latter must have been “self-sufficing food-producing” group of people. However, it must be admitted that it is difficult to distinguish the social elements of which these cultures are a product. The customary distinction of primitive peoples into “food-collecting” and “food-producing” societies is obviously useful, but the evidence on which such a distinction rests is often vague. In
South East Asia it is clear that the majority of the cave sites show a homogeneous culture pointing to a single occupation without any break.

On the other hand, a survey of the material produced by the sites in Indo-China indicates regional distributions. There are three cultural regions there which may be called (I) Hoa-binh, (II) Bac-Son and (III) Somrong Sen. These regional names have been used by former authors, following the lead of Mlle. Colani, to indicate periods. An examination of the excavation reports makes it plain that this chronology has no basis in fact. On the other hand, the reports establish the cultural distinction of these sites, which may be regarded as cultural centres. In almost all the Somrong Sen sites copper and bronze objects have been found. Edge-ground tools, which are the chief feature of the Bac-Sonian sites, also occur in the other regions, though as a minor feature. The question, therefore, arises as to whether "neolithic" is a correct designation for these cultures.¹

The following analysis and description of the objects concerned are based on the published reports of the excavations and explorations carried out in the mainland of South East Asia. They have also been verified as far as materials are available in the British Museum, Pitt Rivers Museum, Oxford, and Musée de l'Homme, Paris. In the account given here the terminology of the excavators has generally been kept so that reference can be made to the original reports, if necessary. Our main purpose has been: (i) to put together in one lace, as briefly as possible, materials scattered in various museums and journals; (ii) to make a systematic survey of the confused mass of materials hitherto unrelated; (iii) to provide a provisional classification which may serve as a guide to future excavators and explorers, and at the same time it is frankly admitted that the classification may need modification in the light of any new materials made available in future; and (iv) to outline the general course of the development of these

¹ Etienne Patte (1936, p. 283) prefers to call these cultures "néolithique" meaning thereby that these cultures were partly contemporary with Bronze Age. He writes, "Il n'en est pas moins vrai, qu'à titre de survie au moins, il y a des relations entre l'Indochine 'néolithique' et la Chine protohistorique. Pour toutes ces raisons, je suis persuadé, que la hache à tenon, et la on les civilisations qu'elle caractérise, sont néolithiques, le terme d' néolithique étant employé avec un sens plus ou moins élargi suivant le cas et pouvant s'appliquer à une de l'âge du Bronze."
cultures in chronological order as far as the present materials allow. It must, however, be admitted that more systematic work is necessary in this region, as well as in Southern China, before a clear picture of the “neolithic” cultures of this area can be given.

SECTION I

INDO-CHINA

As has been said, there are three important areas in Indo-China (See map no. 4), which have yielded materials belonging to the so-called “neolithic” cultures. The first area has its central point at Hoa-Binh, lying to the south-west of Hanoi. In its vicinity a number of caves have been discovered. Nine of them have been excavated and reported upon by Mlle. Colani (1927), who applied the term “Hoa-binhien Culture” to the assemblage of materials found in them. The second important area is the lime-stone massif in the neighbourhood of Bac-Son, north of Hanoi. Large number of caves have been explored, excavated and reported by Mansuy and Colani, who, in the same way, use the term “Bac-Sonien Culture”. The third area is round about Somrong Sen in Cambodia. Here a few kitchen-middens and some open air sites have been examined, but the greatest number of objects known from this area are surface finds. These three broad headings have been kept in the following description: viz.

I. Hoabinhian Culture.
II. Bacsonian Culture.
III. Somrong Sen Culture.

To these regions may be added a fourth: the provinces of Than-hoa, Qui-dat and Quang-binh in Annam. Its geographical position marks it out as meeting ground of the northern (Hoabinhian and Bacsonian) and southern (Somrong Sen) cultures, and this is amply borne out by the evidence of the materials discovered. Culturally speaking it does not form a separate zone by itself. Hence, no attempt has been made to mark it out as a distinct culture.

The materials used for chipped tools are local pebbles of volcanic rocks, generally of coarse grain, like granite, rhyolite, porphyrite, while for the ground
tools fine-grained rocks like “phtanite”, sileceous stone, basalt etc., have been used. Schist is rarely used.

I. Hoabinhian Culture

Mlle. Colani (1927) has distinguished three stages in the Hoabinhian Culture on morphological grounds: (a) Late, (b) Intermediate, and (c) Archaic. This classification takes into account the depth of the finds, but as the depth is not based on any intelligible stratification, it is clear that certain of the reported depths have been assumed to mark a stage in the development of the stone industries. Whether these three stages denote sequence in time or merely three facies of tool types will be discussed later. A complete description of the artifacts, found in the various caves, is given here cave by cave; but it must be confessed that Colani’s plates are very imperfect, the material being preserved in Hanoi.

Sao-Dong


The archaeological deposit here was about 2 metre thick. No stratification was recorded, but a succession of five artificial layers was postulated purely on morphological basis. But of these, the first and the last were admittedly sterile as far as human artifacts are concerned. The three others are described below from bottom upward:

Stage C: Archaic “period”:

In this stage only stone tools were found without any association with bone implements or pottery. The tools are made of large river pebbles crudely flaked on one or both faces. No trace of grinding has been detected and secondary retouch¹ on the edges have rarely been noted. On the basis of appearance and probable use these tools are classed here in two groups:

¹ The term “retouche” is generally used by French archaeologists in Indo-China. It probably signifies secondary working, a process which has been observed by us in the examples preserved in the Musée de l’Homme. The term retouch for the purpose of sharpening the cutting edge has not been found at all in our examination of any of these tools.
Group I:—This group includes what may be termed pebble choppers, made of large oval pebbles, sub-triangular, sub-rectangular, round or oval, with the cutting edge formed by chipping out one or more large flakes on one or both faces (pl. 24, nos. 1-4).

Group II:—This group includes hand-axes, Colani’s “coup-de-poing” (pl. 24, no. 6), amygdaloids (pl. 24, no. 7), ovals (pl. 24, no. 5), pyramids (pl. 24, no. 15) probably used as “perceuteurs” (arms for throwing). There are also scrapers, square (pl. 24, no. 14), or “demi-ellipsoide” (pl. 24, no. 16) in form. They are all core tools more or less chipped all over, although some retain traces of cortex.

All the tools, except the last one (pl. 24, no. 16) which bears secondary retouch, show crude chipping on one or both faces. This crude workmanship is the common feature of groups I and II, but the difference in the form and purpose of the tools is quite obvious. Technically speaking the forms of group II are better than those of group I; however, both types are found together and hence in point of time both must be taken to belong to one and the same period. We have here three types of stone tools; (i) Pebble choppers, (ii) Hand-axes, and (iii) scrapers. On the exceptional tool (pl. 24, no. 16), which Colani calls “hache courte”, she remarks, “Cette pièce a peut être glisse d’un niveau supérieur pendant les fouilles” (1927, p. 10). How far this statement is true, cannot be verified. But it is important to note that retouch is not absolutely absent in this stage. The amygdaloid hand-axe (pl. 24, no. 7) also shows retouch on only one side, and this is also the case with the pyramidal tool (pl. 24, no. 15) which shows retouch on the periphery of the base. Thus, to be exact we can put forward a further sub-classification of this group II:

II-a:—Hand-axes showing rough chipping and no retouch (pl. 24, nos. 5-6).

II-b:—Hand-axes with regular forms, Colani’s amygdaloid and pyramidal showing retouch (pl. 24, no. 7 and pl. 24, no. 15).

II-c:—Scrapers of crude workmanship without retouch (pl. 24, no. 14).

II-d:—Scrapers of regular form with retouch (pl. 24, no. 16).

The existence of certain hand-axes, retouched on only one side, throws doubt upon their function as hand-axes.
Stage B: *Intermediate "period":*

In this stage almost all the older forms continue, but the size is diminished and the forms are less massive. On the other hand, the workmanship is more precise and careful, and some of the tools show a marked symmetry. Edge-grinding occurs in a few cases. Some sherds of pottery have also been discovered. Most of the tools have received fine retouch all round. Once again the function of the tools retouched in this manner may be queried. These tools have been classed here in three groups:

*Group I:*—This group includes pebble choppers of Stage C, group I, but two developments can be seen: firstly, well developed flaking is the characteristic of this stage, very little cortex being left; and secondly, some retouch is found on the cutting edge (pl. 25, nos. 20-23).

*Group II:*—Using Colani's rather vague terminology this group may be said to include hand-axes, the so-called "coup-de-poing" (pl. 25, no. 25), well-shaped amygdaloid (pl. 25, no 26), ellipsoid (more appropriately extended ovals with flattened sides (pl. 25, no. 27), demi-ellipsoid (pl. 25, no. 34); discs (pl. 25, nos. 28-29), small points (pl. 25, no. 40) and scrapers (pl. 25, no. 35). Colani's small points show retouch all round, and therefore their function as points is also doubtful.

Pl. 25, nos. 26 and 27 recall in outline similar symmetrical types of the Bacsonian culture (compare pl. 25, no. 27 with pl. 31, no. 42) with the difference that the Bacsonian tools are edge-ground while here they are not. The so-called demi-ellipsoid tool has also its counterpart in the Bacsonian nos. 11 and 15 (pl. 29), which are also edge-ground. Hoabinhian pl. 25, no. 34 is retouched eccentrically on both faces and is rather a chopper than a hand-axe.

The main point to note is that Stage B marks an advance from Stage A, showing improvement in form and technique of manufacture. This may have been due to contact with the Bacsonian culture or such similarity, as exists, may be merely accidental. Group II may be sub-divided further into following sub-groups:

*II-a:*—Those tools which are improved forms of Stage C (pl. 25, no. 25), pl. 25, no. 35).
II-b:—Those which show resemblance with the Bacsonian tools (pl. 25, nos. 26-27, and pl. 25, no. 34).

II-c:—Entirely new types (pl. 25, nos. 28-29 & pl. 25, no. 40).

Group III:—This group includes ground tools which have no relationship at all with the types so far described. Pl. 26, no. 41 is probably a scraper. It has concave sides and convex cutting edge, the base forming a sector. Pl. 26, no. 42, has its parallel in the Bacsonian culture, pl. 31, no. 30, and seems to have been ultimately derived from that culture, if not actually imported from that region. These tools, which bring in the technique of grinding to this area, is very important in not only tracing the source of this technique but also fixing a chronological relationship with the Bacsonian culture.

Stage A: Late “period”:  
In this stage the pebble choppers were not found. Instead many new types appear. The number of edge-ground and partially-ground tools has also increased, and these establish a definite link with the Bacsonian culture. Here for the first time we meet with small tools, which are exceptionally well-formed. Some hand-made pottery bearing simple cord-marked decoration has also been found. Melanian shells as well as mammalian bones have been discovered. The tools have been arranged here under three groups:

Group I:—This group includes tools which are improved forms of those occurring in the earlier stages. Pl. 26, no. 46 continues the archaic form of hand-axe (pl. 24, no. 5) but is somewhat symmetrical being almost rectilinear in form with the sides retouched all round. Pl. 26, no. 47 is a well-made hand-axe which may have developed from the earlier type (pl. 24, no. 6 and pl. 25, no. 25), though the dimensions in this case are much reduced. This type is described by Colani as “Chellean”. Pl. 26, no. 48 marks another development. It is symmetrical in form with a thickened butt. Pl. 26, no. 49 is discoidal, worked flat, and is an improved version of pl. 25, no. 28. Pl. 26, no. 57 is a small version of the semi-circular scraper and is highly retouched.

Group II:—This group includes new types of tools which are small in dimension and of excellent workmanship. Pl. 26, no. 58 is a three-faced small point with thickened rounded butt. One of its faces shows the cortex. Pl. 26, no. 59 is
a very fine symmetrically worked tool, retouched all round, though the point seems to be broken. Pl. 26, no. 60 is another rectangular scraper with the sides finely retouched. Pl. 26, no. 61 shows fine retouch at the end and the sides. Pl. 26, no. 62 is described by Colani as crescent-shaped "hache courte". It is probably a knife, the convex edge being minutely retouched. Pl. 26, no. 63 is another unique tool, serving both as a scraper (or knife) and a point. The edge is slightly concave. Pl. 26, no. 64 is a triangular point with the sides and point worked. Pl. 27, no. 76 is a well-shaped pounding stone, the base of which is marked with red ochre.

**Group III:**—This group includes tools most probably derived from the Bacsonian culture. They are all ground. Pl. 27, no. 77 is triangular in form. It may be compared with Bacsonian pl. 32, no. 45. Pl. 27, no. 78 is an amygdaloid, a type well-known in the Bacsonian culture. Pl. 27, no. 79 is a very small tool, a smaller version of the Bacsonian, pl. 29, no. 10. Both of its faces are ground.

To sum up, the Sao-Dong stone industry shows a complex group somewhat variable in form:

1. The pebble choppers are met with only in stages C and B, but are absent in the last stage. The pebble tools of stage B show retouch at the cutting edge.

2. The hand-axes and scrapers continue through all the three stages, and irregular archaic forms along with regular shapes were found till the last stage though the better forms, symmetrically worked were predominant in the later stages.

3. Some new types like discs and points begin to appear from stage B, but they are markedly developed in the last stage.

4. Some of the tool types show resemblances with those of the Bacsonian culture, and it seems almost certain that the technique of grinding came to this place from the Bacsonian region as the ground tools are all of Bacsonian type. The ground tools begin to appear from stage B.

5. In the last stage we find another type of small, exceptionally well-made, tools.
6. Hand-made pottery is found in the last stage but not so profusely as in the Bacsonian sites. Some sherds have also been obtained in stage B. On the whole pottery is scarce in this culture.

7. The important point to note is that out of nearly 1000 tools, recovered here, only 11 showed grinding. This clearly indicates the "primitive" nature of the Sao-Dong industry. However, it need not be considered earlier in date on this account, a point which will be discussed later.

8. Red ochre was also commonly used here.

Whether we accept the artificial classification of this industry by Mlle. Colani into three periods, or not, the varying standard of workmanship is noticeable. In this variation, signs of evolution are clear.

X-Kham


As Mlle. Colani points out, "dans la grotte de X-Kham, comme a Sao-Dong il n'existe pas de stratification proprement dire." (p. 20). The archaeological deposit was about 1 metre thick. The finds here again fall into three stages:

Stage C: *Archaic "period"*:

Only stone tools have been found in this stage and, as at Sao Dong, they are here classed into two groups:

*Group I:*—This group includes pebble choppers of the type pl. 24, nos. 1-3. The workmanship is crude and no retouch is visible.

*Group II:*—This group includes hand-axes of the type pl. 24, no. 6, and Colani's pyramids of the type pl. 24, no. 15. Some new types appear in this cave. Pl. 24, no. 8 is described by her as having two points and being sub-tetrahedric in form. Pl. 24, no. 11 is described as "percuteur parallelopaedic" in form. Pl. 24, no. 12 is a "sub-rectangular percuteur". In this example the cutting edge is said to be crudely formed. Pl. 24, no. 13 is a sub-triangular point. Retouch is seen in the pyramidal tool, while the rough geometric forms are common to the Sao-Dong industry. No scrapers have been reported in this stage nor is there any trace of edge-grinding.
Stage B: *Intermediate "period"*:

In this stage also only stone tools have been found. No pottery and bone tools are reported. Pebble choppers are not found. The other two groups are represented.

*Group II*—This group includes hand-axes of the type pl. 25, no. 25, discs of the type pl. 25, no. 28, and "haches courtes" of the type pl. 25, no. 35. Other variants of disc and "hache courte" also occur. But the most important additional type is pl. 25, no. 30, worked into an axe form. It shows regular flaking on both faces.

*Group III*—This group includes a new type of ground tool, pl. 26, no. 45, a type occurring in the Bacsonian culture (pl. 30, no. 21 and pl. 32, no. 43). The present specimen, triangular in form shows regular shape and careful workmanship, the cutting edge being ground on both faces.

Stage *A: Late "period"*:

In this stage some new types of tools again appear and one bone implement was also found. No pottery is reported. The general characteristics correspond with Sao-Dong stage A. The tools have been classed here under three groups:

*Group I*—This group includes scrapers of the type pl. 26, no. 57.

*Group II*—This group includes 2 new types: a sub-triangular point (pl. 27, no. 70) is ground on one face. Colani says specifically that it shows traces of sawing on the other. A bone implement (pl. 27, no. 71) is worked both at the thicker end, which is rounded, and at the cutting edge which is ground on both faces. The small tools of Sao-Dong type do not occur here at all.

*Group III*—This group includes a small axe (pl. 27, no. 83), ground on both faces, and is of the type occurring in the Bacsonian culture (pl. 33, no. 58).

In general the stone industry of X-Kham agrees with that of Sao-Dong with the following exceptions:

1. The pebble choppers are not found here in stage B.
2. Hand-axes are absent in stage A.
3. A new technique of sawing appears in stage A, but Colani also points out
one tool of Sao-Dong as showing traces of sawing but unfortunately does not illustrate it.

It is also important to note that out of about 170 tools only 3 were ground, and out of these 2 are types derived from the Bacsonian culture, a point which confirms our conclusion that the technique of grinding came to this region from Bac-Son.

**Trieng-Xen**


No stratification was observed here. The archaeological deposit at some places is about 2 metre thick. The deposit contains numerous chipped stones, bone tools, shells of unionids and abundant remains of bones of animals, like elephant, rhinoceros etc. No pottery is reported. On the surface 3 or 4 completely ground axes were found but they have neither been illustrated nor described. The tools have been classified into 2 periods by Colani, corresponding to stages B and C. They are described here from bottom upward:

Stage C: *Archaic “period”*:

In this stage both stone and bone tools have been included. Along with the usual pebble choppers, hand-axes, scrapers and points we have here well-chosen hammerstones or rather pounders, one of which shows marks of use. The workmanship of the tools recalls that of Sao-Dong, stage C. They have been described here under two groups:

*Group I*—This group includes pebble choppers of the type resembling pl. 24, nos. 2-4.

*Group II*—This group is further divided into two sub-groups on the basis of material used.

*Group II-a*—This sub-group includes only stone tools. We have here hand-axes, choppers and points. The oval type of axe no. 5 (pl. 24) occurs, here and there are other varieties of the same type. One scraper with retouch makes a rough rectangle. Two new types are also found: pl. 24, no. 10 is a well-worked point and the other pl. 24, no. 9 is a small three-faced tool with rounded apex.
Group II-b:—This sub-group includes only bone tools. All of them are long spatulas, and though the cutting is still somewhat rough, they show smoothing of one or other face. Pl. 24, no. 17 is thin and crude with one face partly smoothed. Pl. 24, no. 18 is another long spatula, the sharp edge being concave. Pl. 24, no. 19 is trapezoidal in section and the edge is straight. This is the only cave where bone tools have been found at such a great depth. Their association with other tools described is clearly established.

Stage B: Intermediate "period":

In this stage as well stone tools, bone implements and pounding and grinding stones have been included. The tools vary a good deal.

Group I:—This group includes pebble choppers. Type nos. 20 and 23 (pl. 25) occur. A new type pl. 25, no. 24 is also found. All these pebble choppers show secondary working at the edge.

Group II:—This is again divided into sub-groups on the basis of material used:

Group II-a:—This sub-group includes stone tools. Here we have hand-axes of the type no. 35 (pl. 25) and new type of "pyramid" with a triangular base, pl. 25, no. 32; well-formed amygdaloidal axe of the type pl. 25, no. 26 and elliptical axe pl. 25, no. 27; semi-circular scraper of the type pl. 25, no. 35; triangular point, pl. 25, no. 33, which is an improved version of the one occurring in the earlier stage pl. 24, no. 10.

Group II-b:—This sub-group includes only bone implements. Pl. 25, no. 38 is a long spatula with almost regular sides, the edge being ground all round. Pl. 25, no. 39 is another such tool but one end is pointed and the blunt end is stepped. These bone implements are better worked and shaped than those of the earlier stage.

Group III:—This group includes beautifully ground axe, pl. 26, no. 44, which is obviously derived from the Bacsonian culture (compare pl. 30, no. 25).

To sum up, the stone industry of Trieng-Xen corresponds with that of Sao-Dong. The find of a Bacsonian type of ground axe again confirms the earlier conclusion that the technique of grinding was derived from that source. It is also important to note that out of about 170 tools only 3 were ground. Bone
implements form an important addition from the earliest stage, and they are skilfully smoothed from the beginning.

**M-Khang**

Reference: M. Colani, 1927, Pp. 31-35.

No stratification is noted here. The excavator points out that the lowest deposit was much disturbed, and hence it was not possible to separate the archaic period from the intermediate. The tools were, therefore described under two periods, Intermediate and Late, corresponding to stages B and A. The archaeological deposit is only 1 metre thick. Animal bones and Melanian shells were abundantly found here. Some potsherds are also reported. One bone implement was found. Rocks bearing cup-marks were noted in this region.

Stage B: *Intermediate “period”:*

The tools classed under this head have been found at two depths: one is reported as lying 1 metre below surface, and the other 70 cm. below surface. But both show a mixture of the earlier and later forms. The excavator is of the opinion that some kind of disturbance has caused this confusion.

Among the tools found 1 metre below the surface pebble choppers, hand-axes as well as scrapers occur:

*Group I:*—This group includes the archaic forms, pl. 24, nos. 1 and 4, as well as the improved form pl. 25, no. 22.

*Group II:*—This group includes the pyramid type, pl. 24, no. 15, disc type, pl. 25, no. 28, and a beautiful amygdaloidal type of hand-axe pl. 25, no. 26.

The tools found 70 cm. below surface also show a mixture of old and new forms.

*Group I:*—This group includes pebble chopper of the type, pl. 25, no. 24. Another rolled pebble said to be half chipped is not illustrated.

*Group II:*—This group includes a crude hand-axe of the type no. 6 (pl. 24), and another which is a variant of the type no. 11 (pl. 24). Pl. 25, no. 36 is a scraper with convex side worked. Another tool is similar to pl. 26, no. 41. One resembles the small ground tool, pl. 27, no. 79, which has been shown to be a miniature copy of the Bacsonian, pl. 29, no. 10.
Stage A: Late "period":

In this stage have been found some sherds of pottery, one bone implement and various stone tools. The pebble choppers are not reported.

*Group I*:—This group includes disc of the type, pl. 26, no. 49, and small scraper of the type, pl. 26, no. 57, which is ground. Another scraper, pl. 27, no. 72, is of rectangular form, all three sides being retouched.

*Group II-a*:—This group includes a well-shaped triangular hand-axe of the type, pl. 27, no. 77.

*Group II-b*:—This group has a bone implement, pl. 27, no. 73, one end of which is rectilinear, the other terminating in a broken point, which is in section thickened. One face, when found, was covered with Melanian shells and traces of carbon, probably soot.

It must be admitted that the division into periods given by Colani is not very clear. But the absence of pebble chopper in stage A is significant, and also the presence of small tools and well-made hand-axes in this stage is noteworthy. It is important to note that only 2 ground tools out of a total of 150 were found here.

**Som-Jo**


In this cave the surface finds are said to include 2 completely ground axes, not illustrated, and some remains of pottery, unfortunately not described by the excavator. It is clear, however, that pot-sherds were found profusely at this site. The stone tools are all of well-developed types. No pebble choppers have been discovered, and the hand-axes do not show the crude workmanship of stage C. On morphological basis the tools have been placed under two stages A and B.

Stage B: Intermediate "period":

In this stage discs showing fine retouch all round, which Colani calls "hache courte", and hand-axes have been found. They are classified here into two groups:

*Group II*:—This group includes a finely retouched disc, pl. 25, no. 31,
Another disc of the type, pl. 25, no. 29 was also found, and a third one which is said to be semi-elliptical. Colani’s “haches courtes”, which are probably scrapers, include the semi-circular type, pl. 25, no. 35, and also rectangular ones. One of them shows a little grinding.

Group III:—This group includes a ground hand-axe of triangular form, pl. 26, no. 43, the butt consisting of the natural cortex of the pebble. It resembles very closely the Bacsonian pl. 31, no. 35 which is obviously an unfinished tool.

Stage A: Late “period”:

In this stage small tool types are predominant, though axes and scrapers have also been found.

Group I:—This group includes a new type of scraper, pl. 26, no 55, which shows grinding at the edge.

Group II:—This group includes small tools of the types, pl. 26, nos. 58 and 59.

Group III:—This group includes another small tool of the type, pl. 27, no. 79, and a ground axe pl. 27, no. 84, which resembles the Bacsonian, pl. 32, no. 52.

The percentage of the ground tools is not known in this cave.

**Lang-Néo**


Here we have a rock-shelter and a cave. The archaeological deposit was not very deep. Chipped implements were numerous on the surface and the deposit having a depth of approximately 60 cm. Pebble choppers, hand-axes, ground tools, bone objects, pottery and Melanian shells as well as human remains were found here. But the excavator has not been able to distinguish various periods on the basis of the depths of recorded finds and hence she observes: “Malgré la présence de quelques pierres polies, on peut affirmer que les premiers troglobolds, les plus anciens occupants de la grotte et de l’abri, avaient une culture paléolithique primitive.... Après que la grotte et l’abri sous roche eurent cessé d’être la demeure permanente de sauvages antiques, ils servirent d’aisle durant les époques troublées. En route de grande mammifères se réfugient
assez souvent la nuit dans la caverne. Quand nous y sommes entrée pour la première fois, une fosse, en forme de berceau, avait été pratiquée dans les dépots de coquilles de Melaina; d'après les paysans, un cerf s'était creusé la un lit. Hommes et animaux ont complètement resté dans ce Morokkenmodding. Les objets préhistoriques gisant à une même profondeur n'appartiennent, le plus souvent, pas à la même période de l'industries lithique hoabinhienne.” (Pp. 38-39).

Colani's failure to arrive at usual stratification has resulted in a confused mixture of tool types which are assignable to different stages on the evidence of other caves. Hence the tools of this cave have been described here according to various types they belong to, and no attempt will be made to classify them under various stages.

**Type no. 1:**—This type has pebble choppers like pl. 24, no. 2 and pl. 25, no. 24.

**Type no. 2:**—Here we have included hand-axes and scrapers: coup-de-poing resembling pl. 24, no. 6, and another like pl. 25, no. 25. Another axe similar to pl. 24, no. 12. One is like pl. 26, no. 46; a rectangular scraper like pl. 24, no. 14, a truncated pyramid like pl. 24, no. 15, another retouched scraper like pl. 26, no. 60, a semi-circular scraper with concave base and one more rectangular type, pl. 26, no. 60, but bigger in size. We have also a pounder like pl. 27, no. 76 but bigger in size, and one more axe like pl. 27, no. 83 but not ground.

**Type no. 3:**—This includes discs like pl. 25, nos. 28 & 29, and pl. 26, no. 49.

**Type no. 4:**—This includes those tools which have close resemblance to Bacsonian tools: Pl. 27, no. 82 is a new type in the Hoabinhian region. It is a flat pebble ground on both faces of the cutting edge, and recalling the Bacsonian, pl. 31, no. 38. Pl. 27, no. 80 recalls the Hoabinhian pl. 27, no. 79. Pl. 27, no. 69 resembles the Bacsonian, pl. 29, no. 8. Pl. 27, no. 81 is a well-shaped bone implement with oblique edge, a close copy of the Bacsonian type. Another ground tool is similar to Bacsonian, pl. 31, no 41. One completely ground tool has not been illustrated by the excavator.

**Type no. 5:**—Here we have well-made small tools: A crescent-shaped scraper or knife, pl. 26, no. 62, a variant of the "hache courte", pl. 27, no. 79; another resembling pl. 26, no. 59.

**Type no. 6:**—This includes various types of points: No. 65 unillustrated shows fine retouch. Pl. 26, no. 66, which is also finely retouched, has curved sides.
Another is like pl. 26, no. 56. Pl. 26, nos. 67 and 68 are simple flakes showing grinding and also, according to Colani, traces of sawing. One more piece, not illustrated, is completely ground.

To sum up, this cave is important in so far as the various tool types known from other caves are all represented here. Furthermore some new types occur, which typologically fall in stage A. On the evidence of this cave alone Colani's classification into stages ("Periods") representing a time sequence entirely fails. Two points are made quite clear by the evidence produced: (1) pebble choppers do not occur in stage A, and (2) small tools are not met with in stages B and C. These two distinct types probably therefore belong to two distinct traditions. The ground tools, however, are derived from the Bacsonian region, the earliest being found in stage B. All these three stages are mixed up in this cave. Other points are noted below:

1. Out of 600 tools found here only 10 were ground, the majority of them being derived from the Bacsonian culture, clearly indicating the source of the technique of grinding.

2. Traces of sawing were detected in three tools in this cave.

3. Pottery was found in profusion.

Lang-Vo


In this cave remains of hearths were found at numerous places, and also Melanian shells. The archaeological deposit is said to be completely disturbed. Pottery was found. The flaked tools were predominantly present, though a few ground tools were also recovered. Colani says that the majority of the tools show traces of sawing. They are 17 in all. Some animal bones were also found. The tools apparently belong to a single period deposit, though some are very crude. They have been classed here under two groups:

Group II:—This group includes hand-axes and scrapers. Pl 26, no. 51 is a new type, semi-elliptical, very carefully chipped on both faces and finely retouched. The side intended for holding is oblique. Colani sees in it an attempt at sawing, but it appears to be only broken. The type recalls Bacsonian, pl. 29,
no. 11. Pl. 26, no. 52 is said to be "percuteur", asymmetric, very carefully chipped on both faces, the sides being sawn (according to Colani) and not ground. Pl. 26, no. 53 is a side-scaper made from a flat pebble, retouched on both the long sides. The narrow ends are slightly ground. Pl. 27, no. 74 is sub-rectangular, the cutting edge being flaked on both faces. The butt is narrow and unflaked, but signs of retouch are visible. Two finely worked axes of the type, pl. 27, no. 77, were, also, found here.

Group III:—This group includes the Bacsonian types of tools. Pl. 27, no. 86 is made from a flat pebble. It is finely retouched on both faces and the edge is ground, recalling the Bacsonian, pl. 32, no. 54. Pl. 27, no. 87 is another small tool of the same type, recalling the Bacsonian pl. 29, no. 13. These tool types suggest stage A.

Lang-Bay


In this cave only 7 chipped tools and 1 axe of the Bacsonian type were found. In a small cave within it a huge quantity of Melanian shells and some pot-sherds were discovered. No stratification was observed here, and no distinction into "periods" has been made. The tools are described under two groups:

Group II:—This group includes 2 pebble tools, probably end-scrapers, the edge being finely retouched; a hand-axe, pl. 26, no. 54, retouched all round; a "hache courte", pl. 27, no. 75, one face preserving the cortex.

Group III:—This group includes a well-made axe, pl. 27, no. 85, described as being of crystal rock. The butt is formed of the naturally rounded pebble while both faces show grinding. It is a variant of the Bacsonian pl. 32, no. 51. The tool types suggest stage A.

Ha-Bi

Reference: M. Colani, 1927, p. 53.

It is a small rock shelter. Some Melanian shells and a few chipped tools have been found here. Only four tools have been described: a narrow butt "percuteur", a side-scaper, a sub-triangular point and one Bacsonian type of
axe, pl. 27, no. 88. It is not ground but only retouched. It resembles the Bacsonian, pl. 32, no. 46, but is smaller. The industry suggests stage A.

**Conclusion**

Colani sums up the evidence of all these caves in the following words: “Des ncufl gisements préhistoriques décrits plus haut, sept seulement sont importants Sao-Dong, Lang-Néo, X-Kham, Trieng-Xen, Som-Jo, Lang-Vo, M-Khang. Les kjokkenmoddinger qu’ils renferment ont été les uns, trouvés la ou ils avaient été déposés (Sao-Dong, X-Kham, Trieng-Xen et M-Khang), sans qu’il y ait eu déplacement notable ou inclusions étrangères; tandis que les sutres ont subi quelques restenements, probablement différentes époques, accompagnés de rares apports plus ou moins récents.

“Dans ces quatre stations archéologiques, on peut constater que les objets travaillés par l’homme gisent dans le même ordre, les plus grossiers, plus grands et plus massifs, dans les lits profonds. Cela qui sont habilement façonnés plus petits et plus fins, se trouvent au voisinage de la surface. Non seulement les dimensions et la facture sont similaires, mais les formes se répètent. Entre ces types extremes so voient, dans les lits moyens, des types intermédiaires qui montrent que cette évolution s’est effectuée graduellement. Ces observations étant rigoureuses, indéfinitions pour ces quatre stations, ont une valeur incontestable. Pour la clarté de notre exposé nous avons catalogué les objets en trois groupes; ceux de la période archaïque, ceux d’uns périodes intermédiaire et ceux période moins ancienne. Pris dans un sens très large, ce classement est exact, il n’y a pas de limite, cela va sans dire, entre chaque périodes. En réalité le perfectionnement s’est fort probablement poursuivi d’une façon lente tet assez continue; des persistences se montrent parfois, tel ou tel type primitif se rencontre à un niveau élevé; de rares apparitions prématuées de modèles moins antiques se voient aussi.

“À Lang-Néo, à Som-Jo, à Lang-Vo, à Lang-Bay et à Ha-Bi, les instruments de Sao-Dong et des trois autres stations se retrouvent; on raisondes restenements, ils ne sont pas restés à leur place les couches superficielles contiennent entre autres des pieces anciennes le mobilier des depots profonds
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comprend quelques objects moins archaïques. Pour leur classement la stratigraphie ne peut pas entrer on ligne de compte, l'aspect et la facture doivent seuls être considérés." (Colani, 1927, p. 55).

These generalisations are calculated to substantiate Colani's postulates. No comparisons are made with the cultures of other areas. The main cultural features of Colani's stages are summed up below on the basis of our independent re-examination of her material.

**Technique of manufacture:**

(a) River pebbles and bones are the main materials chosen for the manufacture of tools. Bone tools are not very common. Only at one place, Trieng-Xen, they have been found down to the deepest level. However, the present review of the material has made it clear that the technique of working bone was known to the people of this region from the first stage.

(b) The pounding and grinding stones are well-chosen rounded or conical pebbles showing hardly any further working. They are common to all the levels and cannot be accepted as a criterion of any particular stage.

(c) The bone implements definitely show better workmanship than the pebble tools. It is noticeable that fine retouch is rare in the bone implements of stage C, where they are also very rare.

(d) The flaking of the pebble tools is coarse. In the case of pebble choppers the flaking is scanty and was probably done by block-on-block method. In stage C generally one face of the tools is flaked. Very rarely both faces show flaking. The shape of the tools is irregular and crude.

(e) The other group of tools, Colani's hand-axes and scrapers, is far more finished in appearance. The flaking, though coarse, is thorough, and an attempt is made to produce a definite form. These tools, which show secondary working, are definitely superior in form. One scraper, pl. 24, no. 16, is so much advanced that the excavator was led to doubt the depth at which it was actually recorded. The technique of "retouche" in order to give a proper finish to a tool is so rare in stage C that it could not have been locally invented. If the shapes, which show some regularity (compare amygdaloidal type), are any
indication of the source, the Bacsonian region is indicated as the channel of transmission of this finer technique.

(f) In stage B the flaking technique is still further improved. The forms show symmetry, and the result is technically more effective, especially in those tools which are bifacially worked and retouched.

(g) In stage B, again, we get ground tools, and the number of such tools increases in stage A. The majority of these are of Bacsonian type. There are very few local ground types. However, the percentage of ground tools is so low that it can be fairly well asserted that the technique of grinding was little known in this region. Such ground tools as there are, were most probably obtained from the Bacsonian area. The local products are poor imitations of these.

(h) The technique of sawing was still rarer. Only in one cave Lang-Vo the number of sawn artifacts was considerable. The product is far from satisfactory. So far no accurately-sawn tools of Pho-Binh-Gia (a) types of the Bacsonian region have been found in these caves. This technique is known only in stage A here.

(i) The appearance of small tools in stage A, which include fine points, "haches courtes" and scrapers, marks an intrusion of fresh cultural feature. Such small tools have also been found at Da-But in the province of Than-Hoa, Annam (E. Patte, 1932). This suggests that this technique came from the south, as also some other features did come from this southern region (See Section IV).

(j) In stage A pebble choppers are not found.

Pottery:

Hand-made pottery bearing cord-marked decoration has been found generally in stage A, though a few sherds were encountered in stage B as well. No evidence is available to show that the pottery was locally manufactured. Colani considers all the pottery to be imported.

Morphology:

It is important to note that we find here forms which are associated with a particular technique, and these forms continue as long as that technique is in use, e.g., the pebble choppers are all so small that they were probably held in hand and struck by a hammerstone. This type continues only unto stage B. The
oval hand-axe, pl. 24, no. 5, which may be a product of anvil technique, continues right up to stage A (compare pl. 26, no. 46) in the same crude form, though secondary working is noticeable in the latter example. There are other new types which are associated with the appearance of new techniques of fine retouch and of grinding. The small tools, "haches courtes", points and scrapers are confined to stage A. The ground tools, which have been found in stage A and B, show Bacsonian tool types. It may be said that the local culture remained "primitive" throughout in the sense that the local stone industry hardly shows any signs of evolution. It is only the appearance of new types of tools associated with fresh techniques of grinding and fine retouch that add to the variety of the culture.

What has been said above, may produce doubts as to the validity of Colani's classification into three periods. To begin with, this classification is not based on stratigraphy. The only distinction between them is the appearance of fresh techniques and forms which are comparable with those of the Bacsonian culture on the one hand and on the other with the stone industry from Da-But in Annam. Even if Colani's periods (stages) are accepted, they cannot be separated chronologically by any great length of time, as the evidence from the Bacsonian region shows (See Pp. 144 ff).

II. Bacsonian Culture

H. Mansuy has distinguished two periods of culture in this area: one he calls "néolithique inférieur". This is characterised by edge-ground tools. The second, he calls, "néolithique supérieur". This is distinguished by well-cut and completely ground tools. He supports this division by citing the depth of finds, at two places, Pho-Binh-Gia and Dong-Thuoc. All other sites are single period deposits and they can be assigned to one or the other group only on morphological basis. In the following analysis the stone industry has been classified into four general stages, A, B, C and D, and further sub-divided into groups according to the technique of manufacture and the general forms and appearance. The depth of finds recorded by Mansuy has also been taken into evidence.
Kéo-Phay


The archaeological deposit is only one metre thick and is composed of a single homogeneous layer of calcareous clay. Only stone tools have been found in this cave. No pottery is reported. The flaking technique is crude and rough. The tools show large deep flaking recalling the technique used in stage C in Hoabinhian culture. Secondary retouch has been profusely used to produce regular forms. Only two implements show edge-grinding. Compared with the Hoabinhian, the industry is still “primitive”, in the sense that the predominant feature is that of unground tools which are large and crudely flaked. But no pebble chopper has been found in this deposit. This industry is assigned here to stage D, and the tools have been divided into two classes.

Class I:—This class is characterised by implements with coarse flaking. They fall into two sub-classes:

Sub-class I-a:—In the illustration these have been included under Group I. Here we have coarsely flaked hand-axes, approximating to well-known forms. Pl. 28, no. 1 has been described by Mansuy as an elliptical tool showing regular form. Pl. 28, no. 2 is irregular. Pl. 28, no. 3 is described as semi-elliptical with its butt irregular. Pl. 28, no. 4 is described by Mansuy as a coup-de-poing resembling a “Chellean” type.

Sub-class I-b:—In the illustration these have been included under Group II. This includes scrapers, pounding and grinding stones of generally well-chosen pebbles, pyramidal or conical in shape and some incised schistose fragments and polishers. The scrapers are generally semi-circular and frequently retouched at the edge. Some of them are made of flakes, and in the two examples illustrated (pl. 28, nos. 5 and 6) the bulb of percussion is further flaked, a method which is very frequent in Malaya, where they have been called “Debu” scrapers from the type-site of Gua Debu, where they were first recognised (H. D. Collings, 1936, Pp. 5-16). Pl. 28, no. 7 is another scraper showing profuse retouch at the edge.

Class II:—In the illustration these have been included under Group III. The chief characteristic is edge-grinding. Pl. 29, no 8 is a narrow butt edge-ground
axe, the edge being almost median produced by bifacial grinding while the main body shows massive flaking. Pl. 29, no. 9 is an unfinished tool with a notch on one side of the butt and a shoulder on the other a little lower down. It is profusely retouched at the edge probably prior to receiving further grinding. The type is entirely new. Pl. 29, no. 10 is a remarkable tool of altogether new type, having parallel sides, flat butt and convex ground edge. This is the only tool of its kind known at Kéo-Phay. The regularity of its straight sides suggests that probably it was cut in the fashion of the advanced tools in Pho-Binh-Gia (a) (See Pp. 134-35). Another elongated type of edge-ground tool with regular sides was reported in a later exploration (Mansuy, 1925).

To sum up, Kéo-Phay industry is mainly represented by flaked tools and scrapers. Ground tools are rare, but it must always be remembered that the available material is very scanty.

**Dong-Thuoc**

Reference, H. Mansuy, 1924.

In this cave molluscs and animal bones were discovered. Pottery was rare, but pot-scherds decorated with basket pattern (4 sherds have been illustrated by Mansuy, 1924, pl. XIV, 4-7) were found. Two levels were distinguished by the excavator though no stratification was recorded. The materials distinctly belong to two distinct groups. The one at the top is termed here **Dong-Thuoc (a)**, and that found at the bottom is called **Dong-Thuoc (b)**. They are described here from bottom upward:

**Dong-Thuoc (b)**

No pottery is associated with these tools. The flaking technique is still coarse recalling that of Kéo-Phay, though some signs of better workmanship are apparent. All tools are edge-ground. The following types occur:

Pl. 29, no. 11 is described as a semi-elliptical hand-axe (probably broken) showing coarse flaking. It shows skilful retouch on the sides. The cutting edge is ground.

Pl. 29, no. 12 is described by Mansuy as an elliptical hand-axe, a little irregular
in form, coarsely flaked, and showing grinding at the cutting edge. This type is also known from the Hoabinhian culture of stage A and B (pl. 24, no. 5 and pl. 26, no. 46).

Pl. 29, no. 13 is another tool of almost rectangular shape with its butt broken. It is completely ground on one face. Technically this tool is more advanced than others of this group. The regularity of its straight sides and the high degree of grinding marks it out as unique in this group.

Pl. 29, no. 14 is a long unfinished tool of the same type as the Kéo-Phay type, pl. 29, no. 9. It has a narrow butt, shows slight grinding at the edge and retouch at the sides.

Pl. 29, no. 15 is semi-elliptical in shape with crude workmanship and slightly ground edge.

Pl. 29, no. 16 is a crudely worked flake, probably a scraper.

All these tools belong to Class II. Typologically they may be sub-divided into three sub-classes:

Sub-class II-a:—Elliptical and semi-elliptical axes which are only edge-ground, the sides being retouched, deep flaking being still apparent on the body.

Sub-class II-b:—The flake scraper, pl. 29, no. 16.

Sub-class II-c:—The elongated axe, pl. 29, no. 14, which continues the Kéo-Phay type, pl. 29, no. 9. The rectangular shaped axe, pl. 29, no. 13, shows regular sides and a high degree of grinding. It has been doubtfully placed in this sub-class, though it recalls the technique of Class III.

**Dong-Thuoc (a)**

All these tools were found in association with pot-sherds, and there is, no doubt, that they belong to one and the same complex. The stone industry belongs to Class III, i.e., completely ground tools. Typologically they fall into two sub-classes:

Sub-class III (a-i):—The distinguishing feature in this sub-class is that besides being completely ground, the tools show perfect angles straight sides which could hardly have been achieved except by wire-sawing probably used with an abrasive. But no such instrument has been found in this cave, or indeed elsewhere. The rarity of these tools in the caves suggests that they were probably imports.
Pl. 30, no. 17 is a shouldered tool of regular and long variety according to the terminology adopted in chapter IV. Pl. 30, no. 19 is another type of tool trapezoidal in shape, also found in Yunnan (See pl. 17, nos. 9 and 10). It has unifacially ground cutting edge. Pl. 30, no. 20 is similar to no. 19 but is narrower.

Sub-class III (a-ii):—In this sub-class we have two tools, one, pl. 30, no. 21, a narrow butt axe with sloping sides and convex cutting edge produced by bifacial grinding, and the other, pl. 30, no. 18, which is smaller and mutilated.

The difference between the sub-classes III (a-i) and III (a-ii) is marked. The latter can be produced only by flaking and grinding, but the former needs the additional use of the sawing technique. By the process of grinding on a flat but hollow grind-stone, as appears to have been the general practice here, one can get regular sides, but the corners are generally rounded as in pl. 30, nos. 18 and 21 or in the Hoabinhian B. III and A. III tools. The perfect angles that we find in the Bacsonian pl. 30, nos. 17, 19 and 20, with straight sides, could hardly have been achieved by grinding alone. It has been suggested that they are copies of metal types and that the angles were probably sawn. The whole question will be discussed later. With these tools pottery has also been found.

Thus Dong-Thuoc (b) tools are marked by edge-grinding and coarse flaking; Dong-Thuoc (a-ii) is characterised by complete grinding; and Dong-Thuoc (a-i) shows a further process of sawing in its straight sides and perfect angles as well as grinding of the faces. The reports make it clear that both Dong-Thuoc (a-i) and (a-ii) were found together and hence contemporary, though the relation of Dong-Thuoc (b) with them is not clear. When we compare the tools of this cave with those of Kéo-Phay, we notice a similarity of technique and forms in the tools of Kéo-Phay and Dong-Thuoc (b), the only difference being that the latter have all their tools edge-ground, while Kéo-Phay has produced only four ground tools. Whether this difference is due to time-lag or is only a local feature, it is very difficult to say. But in this connection we should remember the Kéo-Phay tool, pl. 29, no. 10 and Dong-Thuoc, pl. 29, no. 13. The regularity of their sides and their forms mark them out as unique, and there is, no doubt, that they belong to the same type.
Provisionally we can speak of following groups of tools on the basis of the predominant features:

Stage D . . . Kéo-Phay group.

Stage C . . . Dong-Thuoc (b) group.

Stage B . . . Dong-Thuoc (a-i) and (a-ii) group. In the chart given at the end of this chapter (p. 148) this group has been called Pho-Binh-Gia (a).

But whether these groups, here arranged under different stages, can be referred to different periods, it is hard to say. The point can only be decided when all these groups of tools are related to a definite stratigraphical sequence. The present classification is put forward as a guide for reference in planning future excavations.

Naché

Reference: H. Mansuy, 1925 a, Pp. 11-12.

The archaeological deposit was not deep. It was full of shells, numerous rhyolite flakes and stones bearing traces of grinding. No pottery has been reported. Almost all the tools are edge-ground. The tool types correspond with Dong-Thuoc (b), and belong to class II. They are described below:

Pl. 30, no. 22 is made of a flat pebble with its convex cutting edge bifacially ground and the butt being slightly narrowed.

Pl. 30, no. 23 is another axe made on a flake, roughly flaked, only the cutting edge being ground.

Pl. 30, no. 24 is a unique specimen of bone, a faceted axe with the cutting edge produced by bifacial grinding. The butt is broken transversely.

Pl. 30, no. 25 is described as an elliptical axe (properly speaking oval in form) with its small cutting edge ground almost straight. Both the faces are flat. Another axe (Mansuy, 1925 a, pl. VII, 1) of this type is rougher, and Mansuy says that it shows deep flaking scar on the body. It does not seem to have received any grinding.

Pl. 30, no. 26 is another axe of similar type made of volcanic rock. Its proportion compares well with the type of Kéo-Phay axe, pl. 28, no. 1.

Pl. 30, no. 27 is an elongated axe with a narrow pointed butt, ground only at the edge. It recalls a tool of the next series (See pl. 32, no. 53).
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Pl. 30, no. 28 is a small narrow axe, made of a pebble, with unifacially ground cutting edge, face being still rough. Another axe similar but with truncated butt is illustrated by Mansuy (1925 a, pl. VII, 3).

Mansuy also illustrates one so-called semi-elliptical axe (Mansuy, 1925, a, pl. VII, 7), and another made on eroded pebble, slightly retouched, (Mansuy, 1925 a, Pl. VIII).

The bone axe (pl. 30, no. 24) is an important feature of this cave. Pl. 30, no. 26 recalls the previous Kéo-Phay tool (pl. 28, no. 1), while another (pl. 30, no. 27) points to the next series, i.e., Pho-Binh-Gia (a).

Binh-Long


It is stated that the surface of the deposit was covered with fine earth and "recent" objects. Nearby, to the east, shell deposits were noticed. In these shell deposits were found remains of hearths, incised pebbles and ground axes. Pottery was abundant. The tool types correspond with Dong-Thuoc (b), and belong to class II. They are described below:

Pl. 31, no. 29 is a big axe, almost rectangular in shape, showing rough flaking on the body, the cutting edge produced by bifacial grinding. There is another similar axe but smaller (Mansuy, 1925 a, pl. XIX, 4).

Pl. 31, no. 30 is made on an elongated pebble with rounded butt, the cutting edge produced by unequal bifacial grinding.

Pl. 31, no. 31 is a flake tool, which Mansuy describes as a "ciseau" (chisel). The cutting edge is ground.

Pl. 31, no. 32 is also described as a "ciseau", made from a pebble. It has curved faces and convex ground edge.

Pl. 31, no. 34 is an ovoid pebble without any retouch, only the narrow end being ground to a pointed edge.

Pl. 31, no. 35 is one of several examples of unfinished tools, which Mansuy describes as showing fine retouch.

Pl. 31, no. 36 is described as a "ciseau" made of schist. It is very narrow, with a rounded butt, and is ground all over.

Pl. 31, no. 37 is made of a triangular flake ground on both faces.
Pl. 31, no. 38 is described as an oval axe with its narrow end being ground.
Pl. 31, no. 39 is an unfinished flake tool with no trace of grinding.
Pl. 31, no. 40 is a flake, median ridged, with retouched sides.
It will be seen that the use of the term "ciseau" for pl. 31, nos. 31 and 35-37 is hardly defensible. It may also be noted that this type of tools is the chief characteristic of the next series, Pho-Binh-Gia (a) (See below).

Vo-Muong

The tools here correspond with Dong-Thuoc (b) in so far as the axes have regular sides and are ground only at the cutting edge, but coarse flaking recalls the workmanship of Kéo-Phay tools. The presence of cord-marked pottery is noted in this deposit, though it is alleged that it was found in disturbed layers. The tools belong to class II.
Pl. 31, no. 42 is an oval tool somewhat elongated, with its cutting edge produced by unequal bifacial grinding.
Pl. 31, no. 41 is similar but with almost straight sides.
Another axe, described as amygdaloidal type is illustrated by Mansuy (1925 a, pl. XVI, 2), still another of semi-discoidal type (Mansuy, 1925 a, pl. XVII, 9). A few side-scrapers of Kéo-Phay type were also found.

Pho-Binh-Gia

Reference: H. Mansuy, 1924; 1909, Pp. 531-43; 1925 a, p. 23.
Mansuy has described finds from this cave in three places. In his first publication he did not distinguish the tools, found, into "néolithique inférieur" and "néolithique supérieur". But in his second account he separated them in this fashion on typological basis. It is apparent that there is no evidence either of stratigraphy or of depth to prove that the one class came later than the other. They have been found together and hence they have here been assigned to stage B, to which also belongs Dong-Thuoc (a). The tools have been arranged here under two classes: Pho-Binh-Gia (a), which corresponds with Dong-Thuoc (a-i)
and belongs to class III, and Pho-Binh-Gia (b) which corresponds with Dong-Thuoc (b) and belongs to class II.

Class III: Pho-Binh-Gia (a):

This group includes accurately sawn and completely ground tools with unifacially ground cutting edge.

Pl. 32, no. 48 is a shouldered tool of regular and broad type according to the terminology adopted in chapter IV. One of its sides is little irregular.

Pl. 32, no. 49 is a facetted tool trapezoidal in shape.

Pl. 32, no. 50 is a triangular axe with unifacially ground cutting edge.

Class II: Pho-Binh-Gia (b):

This group includes edge-ground and completely ground tools with regular sides. The flaking techniques is not so crude as the earlier series. The tools have also been retouched profusely on flat surface.

Pl. 32, no. 51 is a long axe almost rectangular with a convex cutting edge. It does not show any grinding but is profusely retouched. It is said to have been found at the bottom of the deposit.

Pl. 32, no. 52 is similar but smaller and the cutting edge ground.

Pl. 32, no. 53 is similar but narrower and with almost straight cutting edge and pointed butt. Two more unfinished tools of this type were found. This is the type described as "ciseau".

Pl. 32, no. 54 has sloping sides, rounded butt and cutting edge produced by unequal bifacial grinding.

Pl. 33, no. 55 is another rounded butt axe, large in size, with regular sides and bifacially ground edge.

Lang-Van

Reference: H. Mansuy, 1925 a, p. 17.

In this cave cord-marked pottery in association with stone tools were found. They have been illustrated by Mansuy (1925 a, pl. XXII, 19-23). The tools do not show any trace of coarse flaking. The predominant type shows smallness of size, regular forms, and all-over grinding. Typologically they belong to the
category of what has been called "ciseau" type. They fall in stage B, Pho-
Binh-Gia (b) group, and class II.

Pl. 33, no. 56 is similar to pl. 32, no. 53 but has a flattened butt. Pl. 33, no. 58
has slightly rounded butt. Pl. 33, nos. 57 and 59 are irregular with pointed butt,
no. 57 showing the cortex on the butt.

**Lang-Trang**


Here tools with coarse flaking have been found with others showing edge-
grinding. Along with them completely ground tools occur. Pl. 32, no. 43
recalls the workmanship of the completely ground tool, pl. 30, no. 21 from
Dong-Thuoc (a-ii). However, the majority of the implements in this cave
correspond with Dong-Thouc (b). They have been classified here under two
sub-classes:

Sub-class (a):—This sub-class includes the so-called sub-elliptical and sub-
rectangular types with regular sides showing coarse flaking (Mansuy, 1925 a,
pl. XXIV, 2-6). Another is a side-scaper (ibid, pl. XXIV, 7).

Sub-class (b):—This sub-class includes the completely ground axe, pl. 32,
no. 43, with wide rounded butt, curved sides and the cutting edge produced
by unequal bifacial grinding.

These two sub-classes really belong to two different stages, C and B, as adopted
before. As such a mixture occurs in more than one cave. To this complex a
distinct nomenclature, Lang-Trang, has been given by us. The caves have
been provisionally assigned to stage B. The tools belong to class II.

**Giouc-Giao**


This cave also shows a mixed group of tools: tools with coarse flaking of
Kéc-Phay type have been found together with edge-ground tools recalling those
of Dong-Thuoc (a-ii). Hence the cave belongs to Lang-Trang group. The stone
tools have been divided here under two sub-classes.

Sub-class (a):—This sub-class includes one example of the so-called
sub-elliptical axe of Kéo-Phay type, pl. 28, no. 3 and two scrapers. Pl. 32, no. 44 has its edge retouched. Pl. 32, no. 47 is more regular is shape.

Sub-class (b):—This sub-class includes the well-formed axe, pl. 32, no. 45. Pl. 32, no. 46 is a long tool apparently of “ciseau” type. It has regular sides and convex edge. Both these tools are completely ground.

Bo-Ky

Reference: H. Mansuy, 1925, a, p. 17.

This cave is very poor in tools. No pottery is reported. Only two types of tools have been found. Both of them are of Pho-Binh-Gia (b) type and belong to Class II. The cave belongs to stage B. One tool (Mansuy, 1925 a, pl. XXV, 10) is long, rectangular in shape, chipped unequally and the cutting edge produced by bifacial grinding. It resembles the Bacsonian, pl. 32, no. 51. Another is the so-called “ciseau” type (Mansuy, 1925 a, pl. XXV, 11) and resembles the Bacsonian, pl. 33, no. 56. One pounder, sub-pyramidal in shape, was also found.

Lang-Luc


There are here two caves, one lying to the east and the other to the west of Lang-Luc. Both the caves are poor in artifacts. No pottery is reported. The tools belong to the so-called “ciseau” type. One (Mansuy, 1925 a, pl. VIII, 3) is triangular. Pl. VIII, nos. 6 and 7 of Mansuy are similar to pl. 31, no. 36 and pl. 33, no. 56 respectively. The tools belong to Pho-Binh-Gia (b) group.

Co-Kho


The tool types of this cave are much diversified. Edge-ground tools are predominant showing both Dong-Thuoc (b) and Pho-Binh-Gia (b), and at the same time some tools recall Kéo-Phay workmanship in their coarse flaking. The cave belongs to Lang-Trang group. The tools are classified here under two sub-classes:

Sub-class (a):—Mansuy, 1925 a, pl. I.1 is the so-called long oval type of axe
recalling the Bacsonian, pl. 31, nos. 41 and 42. Mansuy, *ibid*, pl. III.2 is another oval hand-axe recalling the Kéo-Phay type, pl. 28, no. 2. Mansuy, *ibid*, pl. IX.8 is a side-scaper also of Kéo-Phay type, while Mansuy, *ibid*, pl. IX.9 is a semi-circular scraper.

Sub-class (b):—In this sub-class have been included both Dông-Thuôc (b) and Pho-Binh-Gia (b) types. Mansuy, 1925 a, pl. IX.3 is similar to pl. 33, no. 58; Mansuy, *ibid*, pl. IX.1 has truncated butt, while his pl. VIII.2 has straight edge and rounded butt, and his pl. IX.5 is very regular, but his pl. IX.4 is rough.

Hang-Oc

Reference: H. Mansuy, 1925 a, p. 20.

Very few artifacts were found here. One is a round side-scaper (Mansuy, 1925 a, pl. XXV.6), and the other (Mansuy, 1925 a, pl. XXV.5) is the so-called "ciseau" type of tool. Some pounders and polishers were also found. The cave falls under Pho-Binh-Gia (b) group.

Minh-Lé

Reference: Mansuy, 1925 a, Pp. 20-22.

There are two caves in the vicinity of this place and both show Pho-Binh-Gia (b) type. Mansuy, 1925 a, pl. XXIV.1 is an edge-ground tool, Mansuy, *ibid*, pl. XXIII.19 is an oval axe, and Mansuy, *ibid*, XXIII.7-9 are unfinished examples. But the so-called "ciseau" type is most predominant: Mansuy, *ibid*, pl. XXIII, no. 18 has rounded butt, no. 17 has pointed butt, and no. 2 is similar to the Bacsonian, pl. 33, no. 56, while his no. 3 is rectangular.

Khac-Kiem

Reference: H. Mansuy, 1925 a, p. 26; 1925 b.

This cave also produced Pho-Binh-Gia (b) types of tools. One side-scaper was also found, and another is similar to pl. 32, no. 53.
San-Xa


This cave has also produced Pho-Binh-Gia (b) types with artifacts similar to the Bacsonian, pl. 33, nos. 56 and 58. Some polishers were also found (Mansuy, 1925 a, pl. XIV).

Cou-Ke


In the vicinity of this place there are a rock-shelter and a cave. The artifacts found in the cave are slightly different from those found in the rock-shelter. The types include the typical forms of Kéo-Phay tools, Dong-Thuoc (b) and Pho-Binh-Gia (b). Both of them have been classed under Lang-Trang group.

Rock-shelter:—Mansuy, 1925 a, pl. II.2 illustrates a tool similar to Kéo-Phay, pl. 28, no. 1. His pl. X.4 is a rectangular variety of the “ciseau” type. Other types resemble pl. 32, nos. 52-53. Along with these have been found completely ground tools and cord-marked pottery.

Cave:—Mansuy, pl. V.2 is described as an amygdaloidal type of axe. It is similar to Kéo-Phay, pl. 28, no. 2. Other varieties also occur. One long tool resembles pl. 30, no. 27, but the butt is truncated. There is also a sub-rectangular side-scraper.

Lai-Ta


This cave has also produced Pho-Binh-Gia (b) types. The tools resemble pl. 32, nos. 52 and 53. There are two types of scrapers, an elongated type and an oval type, retouched all round.

Lang-Cuom


This cave has also produced Pho-Binh-Gia (b) types. One tool resembles
pl. 33, no. 58, another is like pl. 32, no. 52, a third like pl. 30, no. 27, a fourth like pl. 30, no. 24 and another a smaller variety of the last type.

**Ba-Xa**


There are two caves in the neighbourhood of this cave. Both show a highly developed type of tools similar to Pho-Binh-Gia (a), and hence are classed as stage B. In the deeper layers have also been found “haches courtes” carefully worked, one shell bracelet, bone objects and one terracotta disc. One noticeable type of tool is the facetted tool, trapezoidal in shape, similar to pl. 30, nos. 19 and 20. Another is the shouldered tool similar to pl. 30, no. 17. New types include two completely ground rectangular knives.

**Suam-Son**

Reference: H. Mansuy, 1925 a, p. 28.

This cave has produced a unique type of tool, pl. 33, no. 60, ground all over. It is a perfect specimen of the so-called “rounded axe” with proportions hardly comparable with any of the tools described so far. In its regularity and thickness it is much more advanced and seems to be of a much later date. It has been assigned to stage Λ.

**Summary & Conclusion**

A survey of the main sites in the region of Bac-Son has been given above. There are a few more sites recorded by Mansuy, but as they throw no new light on our problem, they have not been described here. In these cave excavations no stratigraphic evidence has been produced proving clear-cut periods in the development of Bacsonian tool types. Typologically the stone tools have been divided into three classes, each of them following distinct techniques of manufacture.

Class I includes tools which are made only by a simple flaking technique, though secondary retouch has also been used at the cutting edge and sides to
improve the forms. Retouch generally signifies secondary working as has been pointed out before (See p. 144). This is the characteristic of the Kéo-Phay industry, class I.

Class II includes tools which show additional use of the technique of grinding on a flaked core. According to the degree of grinding these may be sub-divided into two sub-classes: (II-a) those showing merely edge-grinding, a characteristic of the tools of Dong-Thuoc (b) group, and (II-b) those showing all over grinding to a greater extent including both faces. This is the characteristic of Pho-Binh-Gia (b) group. The tools of class I are naturally far better in form than those of class I. Some new types, like the so-called "ciseau" type, appear in this class. But the major differences of form and shape are due to the technique of grinding and the extent of grinding.

Class III includes tools which are of altogether new type. In their manufacture the technique of sawing was probably used. It is these tools which show grinding to the highest degree. It is not possible to derive them from the earlier two classes of tools. The chief features consist in the angularity of the corners and the straightness of sides together with unifacially grinding of the cutting edge. These types can be seen in Dong-Thuoc (a-i) and Pho-Binh-Gia (a). The rarity of these tools in the caves suggests that they were probably imports and this possibility should be borne in mind by future excavators.

It is fair to suggest that the tools of class II, which show more or less grinding, have been largely influenced by the tools of class III in so far as they have regular forms, some of them coming closer to the forms of class III. This influence of class III tools is noticeable in all the stages of the region of Bac-Son. At Kéo-Phay the tool, pl. 29, no. 10, is unique. It has no relationship with others found in this cave. In Dong-Thuoc (b) the tool, pl. 29, no. 13, is again unique in this cave. Both these tools would seem to belong to stage B. Their presence in stages D and C indicates that the comparatively inferior tools of these two stages were not far removed in date from those of stage B.

All these caves show a fairly homogeneous culture in their deposits, though the materials differ from one cave to the other not only in the types of stone tools but also in the variety of objects found, some producing only stone tools, others having pottery as well, while still others containing bone objects, terracotta
discs and bangles. It must, therefore, be admitted that the cave dwellers differed in their material needs and attainments. It is, also, obvious that we have not as much materials from some of the caves as we have from others. It must be admitted that the materials as a whole are scanty. However, the occurrence of crude tools in some caves need not prove them to be earlier in date. This conclusion is borne out by the group of caves, which we have termed Lang-Trang, which present features of Kéo-Phay, Dong-Thuoc (b) and Pho-Binh-Gia (b) together in one stratum, which is undisturbed and cannot be said to include materials of various dates. It is, therefore, reasonable to assume that while some of the cave peoples remained backward, others improved the forms of their implements and obtained a variety of other materials from elsewhere. There may be some time-lag in this process, but nothing more can be done at present than to distinguish the various groups as represented by the objects available to us. According to our analysis there are five groups leaving aside the late industry of Suam Son, which is distinct and characteristic:

(i) Kéo-Phay group.
(ii) Dong-Thuoc (b) group.
(iii) Pho-Binh-Gia (b) group.
(iv) Lang-Trang group.
(v) Pho-Binh-Gia (a) group.

In the table (p. 193) these groups have been arranged under different stages on morphological basis.

**Kéo-Phay group**

So far this is known only from the type site Kéo-Phay. It is represented only by stone tools. Leaving aside the unique tool, pl. 29, no. 10, and another edge-ground tool, pl. 29, no. 8, the Kéo-Phay industry is represented by hand-axes and scrapers, both these showing coarse flaking with some retouch. These tools are not ground at all. But they are regular in form. Technically they fall in line with Hoabinhian stage C, Group II industry, but there is no doubt that the Bacsonian tools are far better in form than the Hoabinhian. The chronological sequence of this industry in relation to other Bacsonian industries is not
definitely known. However, on the basis of morphological analysis this has been assigned to stage D.

**Dong-Thuoc (b) group**

This is named after the type site Dong-Thuoc, where it is found at the bottom of the deposit. The other caves, showing this industry, are Naché, Binh-Long and Vo-Muong. Cord-marked pottery has been found at Naché. Except for the edge-grinding and secondary retouch at the sides, the general appearance of the tools is rough in so far as they are formed by coarse flaking. But the appearance of the so-called “ciseau” type of tools at Binh-Long and Naché correlates this industry with Pho-Binh-Gia (b) on the one hand and on the other distinguishes it from Kéo-Phay. The evidence of depth at Dong-Thuoc cave has been advanced to prove an earlier dating for this group than Dong-Thuoc (a) or Pho-Binh-Gia (a). This group has been assigned to stage C.

**Pho-Binh-Gia (b) group**

This is known from the majority of the caves excavated in the region of Bac-Son. It is at present represented mainly by stone tools. At Pho-Binh-Gia itself it has been found in association with Pho-Binh-Gia (a), where along with the stone tools hand-made pottery bearing cord-marked decoration has also been found. At Lang-Van this type of pottery has also been discovered. But from the majority of the caves only stone tools have been recovered. The characteristic tool of this group is the so-called “ciseau” type. It is assigned to stage B.

**Lang-Trang group**

This is named after the type site Lang-Trang. It is also known from the caves, Giouc-Giao, Co-Kho and Cou-Ke. The stone tools are diversified in techniques and form. Only in the rock-shelter at Cou-Ke hand-made pottery bearing cord-marked decoration was found. The group has been doubtfully assigned to stage B, as the features of Pho-Binh-Gia (b) are, also found here.
Pho-Binh-Gia (a) group

This is fully represented in the cave deposit at Ba-Xa where the stone tools are associated with bone objects, pottery, bracelet and terracotta disc. This is, no doubt, a poor representation of this complex. However, the variety of the objects found is somewhat richer than those of the other caves. This group, as has been shown before, was found in association with Pho-Binh Gia (b) and hence is definitely contemporary with it. In Dong-Thuoc cave the sequence of this group is above Dong-Thuoc (b). Whether the difference is due to time-lag or to the peculiarity of this cave, cannot be definitely said. This group is placed in stage B.

Pottery

Pottery and terracotta objects have been found principally at Ba-Xa, while pot-sherds have been reported from a few other caves. All these are of one type. They are hand-made and bear simple cord-marked decoration. The scarcity of finds in a few caves suggests that they were imports.

Bone Objects

Ba-Xa cave alone has produced bone objects in some quantity. In other caves just one or two bone tools have been found. From Naché comes a well-made bone axe of rectangular form (pl. 30, no. 24).

Comparison between Hoabinhian and Bacsonian Cultures

The analysis of the cultural content of the Hoabinhian and the Bacsonian, given above, indicates that these two regions were connected throughout the period of tool manufacture. The Bacsonian culture was technically more advanced than the Hoabinhian, and the new tool types and techniques in the Hoabinhian were mostly derived from the Bacsonian, though at present there is no evidence available to show the source of the small tools which are found in the Hoabinhian and in Annam at Da-But. Bone tools are also not so common in the Bacsonian while in the Hoabinhian they have been found in all the stages.
It may be that we have to look to some other region for the source of these small tools and bone objects. Pottery is of the same type in both the regions, and though it is much more common in the Bacsonian than in the Hoabinhian, it has been suggested that they were probably imported.

The comparison of stone tools is given below stage by stage:

**Hoabinhian**

**Stage A. Group III**

<table>
<thead>
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<th>Bacsonian</th>
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<tr>
<td>pl. 27, no. 83</td>
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<td>pl. 27, no. 84</td>
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**Stage B**

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<tr>
<td>pl. 29, no. 13</td>
<td>Dong-Thuoc (b) group.</td>
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**Stage C**

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<td>pl. 27, no. 79</td>
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<tr>
<td>pl. 27, no. 80 is a variant of pl. 27, no. 79.</td>
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<tr>
<td>pl. 27, no. 81 is a bone tool bearing general resemblance with the Bacsonian type.</td>
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**Stage A. Group I**

<table>
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<tr>
<th>Hoabinhian</th>
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<tr>
<td>pl. 26, no. 51</td>
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<tr>
<td>pl. 26, no. 50 is derived from</td>
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</table>
Hoabinhian

Stage B. Group III

pl. 26, no. 42
pl. 26, no. 44
pl. 26, no. 43

Bacsonian

Stage C. Dong-Thuoc (b) group

pl. 31, no. 30
pl. 30, no. 25
pl. 31, no. 35

Stage B

pl. 30, no. 21
Pho-Binh-Gia (a)

Stage B. Group II

pl. 25, no. 36 amygdaloidal type.

Stage C

pl. 31, no. 42 Dong-Thuoc (b) group.
several not illustrated.

From the above comparison it is clear that most of the tools of the Hoabinhian, stage A, group III, are similar to those of the Bacsonian, stage B, Pho-Binh-Gia (b) and Lang-Trang groups, though there are a few which bear resemblance to stage C tools of the Bacsonian culture. The tools of the Hoabinhian, stage B, group III, correspond with those of the Bacsonian, stage C, Dong-Thuoc (b) group. There are some unground tools which also bear resemblance to the Bacsonian types. Generally speaking, only the ground tools in the Hoabinhian culture appear to have been derived from the Bacsonian, and the number of these derived ground tools is far greater than those ground types which are local to the Hoabinhian. It seems, therefore, that the technique of grinding came to Hoa-binh from Bac-Son along with these tool types. The association of these ground tools with coarsely flaked tools enables us to correlate the Hoabinhian culture with the Bacsonian. The comparison now finally brings out that stage A of the Hoabinhian was more or less of the same category as stage B of Bac-Son; and stage B of the Hoabinhian is linked up with stage C of Bac-Son.

The only difficulty arises with the so-called "archaic" tools in the two regions. The pebble choppers of the Hoabinhian culture have not been so far found in Bac-Son. But the group II tools, stage C of the Hoabinhian, show the same technique of manufacture as Class I, stage D of the Bacsonian, though the latter are better in form and finish. It seems that this coarse flaking technique
was most commonly used by these "cave men" before the technique of grinding and the process of wire-sawing were introduced into these regions from outside. From form and appearance only we are not able to establish a close link between the "archaic" tools of the Hoabinhian and Bacsonian cultures. But forms depend, generally speaking, upon the materials used and the extant technical tradition, except perhaps in the case of very specialised tools. In this stage such specialised tools are not to be found. We must rely on technical comparison for any similarity that we see in the "archaic" tools of these two regions which are knit together geographically. The same level of achievement in both the regions leaves little doubt that there cannot have been much difference in time between stage C of the Hoabinhian and stage D of the Bacsonian. The general similarity between the Hoabinhian stage C, group II and the Bacsonian stage D, group I is probably due to similarity of the technique rather than to actual borrowing.

Thus, it would seem that there is no evidence to show that the Hoabinhian culture was earlier in date than the Bacsonian culture in any of the stages, even if we believe with Mansuy and Colani that these stages evidence a time lag in evolution. On the other hand the evidence from Bac-Son makes it quite clear that both these cultures were contemporary with the types of tools showing a high degree of grinding as well as in process of wire-sawing, the predominant types being faceted tool and the shouldered tool. In other words, the Hoabinhian and Bacsonian cultures represent a stage which is "primitive" in character, but not necessarily early in date. Their chronology depends upon the dating of the two predominant types of tools, mentioned above, which are found sporadically in the caves of Bac-Son, and are known from a wider region in South East Asia, China and India.
### SEQUENCE IN THE HOABINHIAN CULTURE

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<tr>
<th>Stage</th>
<th>Sao-Dong</th>
<th>X-Kham</th>
<th>Trieng-Xen</th>
<th>M-Khang</th>
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### SEQUENCE IN THE BACSONIAN CULTURE

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<th>Dong-Thuoc</th>
<th>Pho-Binh-Gia</th>
<th>Pho-Binh-Gia</th>
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III. Somrong Sen Culture

The culture is named after the type site, Somrong Sen, where it was first discovered in 1876 by M. Roques. Actually this culture is typical of the Great Lake region of Cambodia, though its northern extension into Annam has also been traced by various scholars, notably Mlle. Colani, Mansuy, E. Patte and Fromaget. Recently M. Paul Lévy has made an intensive study of this culture in the region of Mlu Prei, especially three sites O Yak, O Pie Can and O Nari. M. Paul Lévy also adds a chapter which provides a comparative study of the materials.
The village of Somrong Sen lies in the province of Kompong-Long, and is situated on the right bank of Strung-Kinit, a tributary of the river Tonle-Sap. Lévy's sites lie further to the north. In all these sites only one archaeological stratum has been observed (See Lévy, 1943, p. 92, pl. LV; Mansuy, 1902, Pp. 6-7). However, Mansuy has attempted to distinguish two stages: (i) the period of fluviatile deposition, and (ii) 'le gisement préhistorique'. But all the artifacts in stone, bronze, bone, terracotta and shell as well as the pottery were found only in the second deposit. Hence for our purpose the fluviatile deposit, in which only shells, animal bones and heaps of fish bones were discovered, is of no significance as far as the study of artifacts at Somrong Sen is concerned. The shell remains and the animal bones of Mansuy's stage (i) are of the same category as those found in his stage (ii). He gives a list of the animal remains identified by him (1902, Pp. 24-25). Hence it is clear that the Somrong Sen culture represents one and only one period. The nature of this culture is thus defined by Mansuy:

"La station préhistorique de Somron-Seng représente l'épanouissement de la période de la pierre polie en Extreme-Orient. La perfection de l'industrie lithique, le fini dans l'exécution, la régularité des formes, la diversité d'adaptation de l'outil, tout aussi bien que l'absence de types intermédiaires, de formes de passage, reliant la période paléolithique aux temps néolithiques (autant qu'il est permis de recourir à l'emploi de ces termes en usage dans la préhistoire européenne), démontrent amplement que, depuis de longs siècles, l'homme était familiarisé avec le travail de la pierre. Cependant le bronze est rare, nous ne possédons que trois objets de ce métal qui nous ont été remis par les habitants; les fouilles importantes que nous avons fait exécuter ne nous ont fourni aucune pièce de ce genre. D'autre part, des haches avec soie d'emmanchement a section rectangulaire, forme considérée comme particulaire a l'Extreme-Orient, ont été signalées sur divers points aux Indes ....." (Mansuy, 1902, Pp. 6-7).

**Stone Tools**

Mansuy has distinguished six types of stone tools at Somrong Sen (Mansuy, 1902, Pp. 10-12):
Type 1: Shouldered Tool:

He defines, “Nous placons le premier groupe les haches ayant une extrémité appropriée à l'emmanchement et nettement séparée de la partie active.” This is the type which has been called Shouldered Tool in chapter IV. The different varieties of this type are illustrated on pl. 34, nos. 1-12. M. Paul Lévy calls this type “outils a tenon”, and places them under his general class “outils a section rectangulaire” (Lévy, 1943, Pp. 16-18). Pl. 34, nos. 13-16 illustrate examples from his book. All these tools have their cutting edge formed by unifacial grinding. There is, however, a great difference in the length of the tenon. Some are shorter than the body while others are much longer. Both regular and irregular types are also found here.

Type 2: “Hache” with unifacially ground cutting edge:

Mansuy defines, “Le second groupe comprend les haches dont le tranchant est obtenu sur chaque face par des courbes ménagées, sans linge de démarcation.” Here the stress is laid on the formation of the cutting edge which we have described as being formed by unifacial grinding, the grinding gradually curving to meet the faces on each side so that there is no line of demarcation. In other words, this is the class of tools which we have termed Curvilinear Type in chapter IV (See pl. 34, no. 17). Mansuy further points out that these tools are, in general, triangular in shape. Prof. Lévy illustrates 2 examples (See pl. 34, nos. 18-19) of this type, which he calls simply “hache” (Lévy, 1943, Pp. 11-12). Both these tools show chipping in their upper half, their cutting edge being wholly produced by grinding. This type of tools is well known in the Bacsonian culture.

Type 3: Adze blade or “bevelled” edge type:

Mansuy defines, “Le troisieme renferme les types dont le tranchant résulte d'un biseau plus ou moins oblique sur l'une des faces, ce type est de beaucoup le plus abondant.” Later Mansuy explains that in this type of tools the convex face of type 2 gets more and more sharp till it makes an acute angle with the cutting edge, which he describes as a “biseau”. The angle between the “biseau” and the face is about 50°. Pl. 35, nos. 20-25 (copied from Mansuy, 1923) illustrate this type. In point of fact this type of tools vary considerably in form as
well as in cross section. Prof. Paul Lévy calls them “herminette” (adze). Pl. 35, nos. 26-30 and pl. 36, no. 31 are examples from Lévy’s illustrations.

Type 4: “Hache” with bifacially ground edge:
Mansuy describes the type as follows: “Le quatrième réunit les instruments dont le tranchant est produit par la rencontre de deux plans obliques, un biseau se montrant sur chaque face.” Unfortunately he has not illustrated this type in detail, making the longitudinal section clear, though he says that the tools (Mansuy, 1902, pl. II, 1 and 2), which are thick and facetted, i.e. rectangular in cross section, do show his “biseau”.

Type 5: Chisel Type:
Mansuy describes, “Le cinquième est constitué par une série de petits instruments proportionellement longs et étroits, a sommet presque aussi large que le tranchant, nous considérons ces objets comme de véritables ciseaux; des formes intermédiaires les relient aux haches véritables.” These are rectangular or trapezoidal in cross section with the sides slightly convex. Pl. 36, nos. 33-36 illustrate this type.

Type 6: Gouge Type:
Mansuy describes, “Le sixième groupe comprend les gouges a tranchant creusé en gouttière.” Two examples of this type are illustrated (pl. 36, nos. 37-38). One important variety of this gouge type is the “gouge adze” or “pick adze” (the so-called beaked adze), illustrated on pl. 36, no. 41. No specimen of this type was found either at Somrong Sen or at Lévy’s sites. The present specimen comes from Bien Hoa in Cochin China and preserved in the Musée de l’Homme (no. 32.94.44). It is made of limestone.

From Longprao Mansuy illustrates one more type of tool, which is lozenge-shaped (pl. 36, nos. 39-40).

Prof. Paul Lévy does not follow Mansuy in his classification. His description is primarily based on the cross section. To a certain extent he also takes into account the function of the tools. He enumerates the following varieties: herminette, herminette-ciseau, outil a tenon, hache, ciseau and hache-ciseau.
Mansuy (1902, p. 23) gives the following number of tools found in his excavation:

- Hache avec soie d’emmanchement: 37
- Hache de type divers: 198
- Ciseau: 28
- Gouge: 29

It should be noted that all the “haches” figured by Prof. Paul Lévy show unequal bifacial grinding of the cutting edge, but this is a general characteristic of mainland South East Asia. Moreover, some of these axes are also of our curvilinear type (See chapter IV).

The materials used are schist, siliceous or metamorphic, and also what has been called “phtanite”. Quartz implements have also been illustrated by Prof. Paul Lévy (1943, pls. XI and XII). He also illustrates a few scrapers and knives (pls. IX and X). Other stone objects include grind-stones, hammerstones, discs, cylinders and polishers.

On the technique of manufacture Prof. Paul Lévy comments, “Les techniques de fabrication de ces outillages sont diverses. Nous les avons reconnues au passage a propos des outils a section lenticulaire et quadrangulaire. Il nous a paru que le façonnage par eclats et polissage était usité a propos des premiers et d’une partie des seconds (i.e. quelques-uns des outils a section trapézoïdale): sciage et polissage étant presque exclusivement pratiqués a propos des outils (en partie) a section trapézoïdale et rectangulaire.” (Lévy, 1943, p. 23).

It may be remarked that the stone tools of this culture are all highly developed. The crudely worked tools of Hoabinhian type are not found here at all. It is also noteworthy that only 2 edge-ground tools of Bacsonian type have been illustrated by Prof. Paul Lévy. The completely ground tools, which have been classified into six types by Mansuy, are here treated as falling into four main groups: (i) Facetted Tool, (ii) Shouldered Tool, (iii) chisel, and (iv) gouge. Prof. Paul Lévy has rightly pointed out that in the manufacture of tools with rectangular cross section the process of sawing was used. Out of these types the first three are also found in the Bacsonian culture, stage B, Pho-Binh-Gia (a) group, but no specimen has so far been reported from the Hoabinhian region. It may
also be noted that the tool types of the Somrong Sen culture vary more than those of the Bacsonian, and many new varieties are seen here for the first time. Moreover, these types common to both regions, are found only in Bacsonian stage B. Here in Somrong Sen region they are the only types known, except for 2 edge-ground tools and a few bronze implements.

Pottery

The richness of the Somrong Sen culture is evident from the abundance of the pottery found in all the sites. Pottery of this region, as preserved in the Musée de l’Homme, may be divided into two series. All of them are hand-made. None of them is painted, except that some of them show a dressing of haematite applied before firing. The firing in general is very poor.

*Series I:*—It consists of comparatively fine pottery, made of well levigated clay, that is to say, the pots are thin in section. They are usually decorated with incised patterns. Those which are dressed with haematite, show burnishing. They include only small sized bowls or cups with rounded or straight-sided body, with or without foot and almost rimless, though a few simple rims are present.

*Series II:*—It consists of comparatively heavy weight pottery of coarse body material, thicker in section, having no red dressing or burnishing. They fall into 2 groups.

*Group II (a):*—It consists of undecorated sherds or complete pots, three of them are crucibles (pl. 36, no. 42 is preserved in the Musée de l’Homme), one is a deep lipped bowl for pouring liquid (pl. 36, no. 44), another is a footed brazier. There are also numerous fragments of small bowls (pl. 36, no. 47).

*Group II (b):*—It consists of decorated pottery. The pots are mostly footed bowls (pl. 36, nos. 43, 45-46), storage jars, and globular vessels (pl. 36, nos. 48-49). One type is identical with the Duc-Thi earthen-ware jar (pl. 38, no. 25).

It is important to note that the decorations on these pots are entirely different from those appearing on the sherds of the Bacsonian and Hoabinhian cultures,
Besides the simple cord decoration, which is common with those regions, here we have incised geometric patterns as well as curved and wavy lines arranged in various formations. The whole decoration is certainly very sophisticated and quite distinct from the Hoabinhian and Bacsonian pottery. The nearest parallel is seen in the decorated pottery of the neolithic culture of South East China (Compare W. Schofield, 1938, pls. CVII-CXV; and Lin Hui-siang & others, 1938, pls. XLV-XLVI). Some of the forms are also identical (Compare Duc-Thi, pl. 38, no. 25 with the Fukien earthen-ware jar, Lin Hui-siang & others, 1938, pl. XLIV; the footed bowls are also paralleled at Shek Pek, Schofield, 1938, pl. CVI, nos. 1-3). These similarities suggest that the Somrong Sen cultural zone was directly in contact with the neolithic cultures of South East China, especially those known from the provinces of Che-Kiang, Fu-Kien and round about Hong Kong. Prof. Paul Lévy (1943, pls. XL-XLVII) has further compared the incised decorations occurring on the Somrong Sen pottery with the painted designs on the pottery of China and of western Eurasia.

**Bronze and Iron Objects**

Mansuy remarks, "Les rares objets en bronze nos stations préhistoriques ont été recueillis par les habitants, nous ne savons a que niveau on les a rencontrés." (Mansuy, 1902, p. 21). He enumerates one arrow-head (pointe de fleche), one small chisel (ciseau a section transversale semi-circulaire), one cylindrical rod and three bells. Prof. Paul Lévy also illustrates many bangles (pl. XXIV) both in sawn shell and in bronze as well as socketed splayed axes (pl. XXIII) and one saw. One iron chisel was found at O Pie Can.

**Other finds**

Numerous beads of shell and stone, terracotta discs bearing cross pattern, seal impressions, potter’s dabbers, shell bangles, pendants, ear-ornaments and bone fish hooks were found in many of the sites.

**Summary and Conclusion**

Somrong Sen culture represents a highly developed stage of the neolithic
period, in which completely ground stone tools were in use. However, Prof. Paul Lévy’s finds of metal objects in his sites and the existence of crucibles indicate that this stone culture was contemporary with the use of metals as has been said before. A few bronze objects and tools have been found in the sites representing this culture, and though their stratigraphic relation in most cases is not clear, it seems that metal was used in this culture though rarely. The stone tools are mainly of four types: (i) faceted tool, (ii) shouldered tool, (iii) chisels and (iv) gouges. There are also hammerstones, grinding stones, polishers, scrapers and quartz implements. Some of these types and their varieties only distantly resemble the well-cut tools of the Pho-Binh-Gia (a) group of the Bacsonian culture. The absence of the shouldered tool in Hoa-Binh suggests that this resemblance is not due to contact between the two regions. This suggestion is further supported by the difference of pottery types as well as from the variety of materials found in Somrong Sen but which are not known in BacSon or in Hoa-Binh. It would seem that the common tool types were derived from one common source. As far as the Somrong Sen culture is concerned, its tool types bear some affinity with the tools of the neolithic sites in South East China, especially with those of the so-called Hong Kong culture, known from Shek Pek and Wu-Ching in Fukien. It may be that a similar culture prevailed in the province of Kwang-Tung, though nothing about it is so far known. If this is true, the Bacsonian region, which is adjacent to Kwang-Tung, may have derived its well-cut stone tools from that Chinese province through the difficult hilly passages. This difficulty in communication may be responsible for the rarity of such stone tools in the Bacsonian culture.

So far as is known, the neolithic culture of South East China has produced evidence only for the sporadic use of metal. However, the bronze tools of the Somrong Sen culture show types similar to those found in Luang Prabang, Burma and Yunnan. Whether there was any connection with these regions is very difficult to say. The find of a gouge-adze at Bien-Hoa in Cochin China is worth noting. This type is so far not known from China, Bac-Son and Hoa-Binh, but it is widely spread in Laos, Siam, Burma, Malaya and Assam. Only one example is known from Japan. It is preserved in the British Museum.
Hand-made pottery has been found abundantly in the Somrong Sen culture, and, as has been said before, the ware and decoration indicate the source of their origin in South East China.

Harpoons and fishing hooks of bone and stone have also been found in these sites. Shell objects fashioned as ornaments are numerous. Stone beads were also found. Other objects included terracotta dabbers and seals.

The materials found here clearly indicate that the makers of this culture were stone-using agriculturists, and that they flourished at a time when the use of metal in this region was still rare (Mansuy & Fromaget, 1924, p. 7). The stone implements, pottery and other objects of this region can hardly be compared with those of Hoa-Binh and Bac-Son. A distant similarity of the stone tools of Somrong Sen and the accurately sawn implements of Bac-Son has been pointed out before, but, as has already been remarked, this similarity would seem to be due to a borrowing from a common source rather than to contact between these regions. As will be shown later, contact between the cultures of Hoa-Binh and Somrong Sen has taken place in Annam. The bronze tools of Somrong Sen contrast poorly with the highly developed bronze industry of Dong Son where the shouldered tool persisted. It may also be noted that the Dong Son bronzes have been found in association with pottery, coins and other materials datable to the Han period (Goloubew, 1929) but no such evidence has so far been found in Somrong Sen. E. Patte (1936, Pp. 299-304) has put forward arguments for an earlier dating of the Somrong Sen culture than the Đồng-Sonian on the basis of his comparative study of the bronzes of the two cultures. It must, however, be borne in mind that since there is no demonstrable continuity in the bronze objects from Somrong Sen and Dong-Son, it is, in fact, impossible to argue priority on the basis of a comparative study as Patte has tried to do. The date of the Dong-Son material cannot be certainly established from present evidence, though the long awaited publication of Dr. Janse’s excavations may throw further light on the problem. It can only be affirmed that Chinese material of the Han period gives one chronological fix in the Dong-Son culture, but the absence of Han objects from Somrong Sen cannot be adduced as evidence for the priority of the latter in view of the historical evidence for the southern boundary of Jih-nan being located well north of Cambodia. Similarly the fact
that communications between South and North Indo-China in the Han period are recorded as being maritime, there is no \textit{a priori} evidence in the Chinese against the co-existence of Somrong Sen and Dong-Son. It would seem that in view of the very limited archaeological material a case may be made for the priority of Somrong Sen, but that there is insufficient evidence to show that the neolithic cultures of South East China did not persist side by side with the true Chinese cultures coming from north. Only further excavation can resolve this crucial problem.

\textbf{IV. Haut Laos}

\textit{Luang Prabang}  

All the objects found here are surface finds. They were sorted and selected and later classified by Mansuy into 12 types. These include ground stone tools and bronze implements. The types in stone include shouldered tools, pl. 37, nos. 1-2 and nos. 6-7; the so-called bar-chisels, pl. 37, no. 3; facetted tool, pl. 37, no. 4; and the gouge adze, pl. 37, no. 5. Among the bronzes can be seen splayed axes of different varieties, pl. 37, nos. 8-10; fishing hooks, pl. 37, no. 11; and arrow-heads, pl. 37, no. 12.

\textbf{V. Annam}

Annam has been divided into three main provinces, under which the neolithic sites have been described by Colani: (1) the province of Quang-Binh, (2) the province of Qui-Dat, and (3) the province of Than-Hoa.

\textbf{The Province of Quang-Binh}

Quang-Binh is the chief town of Dong-Hoi which is in Central Annam. There are 3 rock-shelters containing neolithic materials, and one open air site.

\textbf{Minh-Cam}

Reference: Etienne Patte, 1923, Pp. 5-30

Two deposits have been distinguished by the excavator: the uppermost,
calcareous clay containing artifacts, and the lower shell deposit having no artifacts. Both have been attributed to the same period. As Patte points out, “Nous avons de bonnes raisons de croire a la contemporanéité des deux dépots . . . . Comme ces deux formations sont au même terrasse, pourrait-on dire nous pensons qu’elles sont, au moins, a peu prés contemporaines, et nous attributions le surcreusement a un phenomene d’érosion général du sans doute a un mouvement vertical du sol, plus probablement qu’a un changement de régime des eux car nous sommes bien prés du niveau de base.” (Patte, 1923, pp. 6-7). If the erosion, spoken of by Patte, occurred after the deposition of the archaeological materials, as seems likely, it may be possible to detect some of its signs in the tools themselves. At the same time it should not be very difficult to date this geological phenomenon on the basis of local changes in climate and fluctuations of the sea level.

Among the stonetoools are shouldered tools (pl. 39, no. 31) completely ground, pl. 39, no. 29, a chipped variety; pl. 39, no. 30 is another chipped axe-blade, symmetrically worked, one face is slightly concave formed by the removal of a large flake, and the other face is curving and shows retouch. Several shell beads of varying sizes were found (pl. 39, nos. 33-35). Other finds include a perforated kaunri (pl. 39, no. 36), a hexagonal pendant of ivory (pl. 39, no. 32) and other pendants of shell, one bead of green stone (pl. 39, no. 37) and plaques of shell and ivory. Numerous broken bones, some showing traces of use, were also found. The pottery is of very poor quality, but shows resemblances with that of the Somrong Sen culture.

**Bau-Tro near Dong-Hoi**

Reference: E. Patte, 1925, Pp. 5-33.

Tam-Toa is a small village at the entrance of Dong-Hoi. About 1800 metre north is a pagoda by the side of a lake called Bau-Tro. Near the pagoda is a deposit of dunes containing artifacts.

Among the stone objects found were many examples of shouldered tools (pl. 39, no. 43) and adzes (pl. 39, no. 38) formed by the technique of chipping. Blades and long flakes also occur (pl. 39, nos. 40-42). There are numerous remains of pottery fragments of a coarse fabric with incised ornamentation
familiar from the Somrong Sen culture. The type of pot, pl. 38, no. 26, is very common. Pl. 38, nos. 27 and 28 were found on the surface, no. 27 being paralleled at Shek Pek (Schofield, 1938, pl. CVI, nos. 1-3).

The cave of Hang-Rao


The cave of Hang-Rao is one day’s journey from Phong-Nha. The excavation here was carried down to 1m. 80cm. in depth. Three layers of “graviers” (gravel) separated by a layer of “limon” (clay) were recognised. The gravels produced mammalian bones of species which are still extant in this region. The debris of hearths on an agglomeration of shells (mollusc) contains fragments of pottery. These occur in all the layers. The stone tools are both chipped and completely ground. Pl. 39, no. 44 is said to be a flake chipped to make the tool. It shows no grinding. Pl. 39, nos. 45 and 46 are varieties of shouldered tools, completely ground, The pottery found shows the same characteristics of poor firing, coarse fabric and incised ornamentation as known from the Somrong Sen culture.

The cave of Khe-Tong


The cave of Khé-Tong is situated on the border of a principal route from Quang Binh to Khammon in Laos. This cave still serves as a shelter for the traders travelling between Laos and Annam.

Throughout the various layers (couches) distinguished by the excavators the stone industry and pottery are uniform. There is a great abundance of shouldered tools (pl. 39, nos. 48-50), both ground and chipped varieties. Flaked choppers (pl. 39, no. 47) are comparable with the Kéo-Phay type of the Bacosonian culture (pl. 28, no. 2). The pottery is ornamented with incised decorations.

In the opinion of Mlle. Colani all these sites in the province of Quang-Binh were refuge shelters as they all lie in thick forest in a mountainous region. She remarks that the people from Bac-Son and Hoa-Binh stayed here for sometime.
(Colani, 1930, Pp. 323-324). This conclusion is hardly justified by the evidence of the materials found in the caves. They definitely show a blend of the tool types from the Somrong Sen culture on the one hand and those of the Hoabinhian and Bacsonian cultures on the other. The pottery found in these caves definitely links up with the Somrong Sen culture. Hence it is possible that this was the region of the meeting of the cultures from the north and the south.

**The Province of Qui-Dat**

Qui-Dat is about 80 kilometre to the north-west of Dong-Hoi. There are three important stations which have produced materials comparable with the Bacsonian-Hoabinhian cultures. Colani also points out that three other caves show “néolithique supérieur”.

**The rock-shelter of Yen-Lac**


The rock-shelter lies to the north of Song Nan and east of the village of Yen-Lac. The archaeological deposit here varied from 75 cm. to 2 m. 50 cm. Here pot-sherds were found on top of a hearth, but these are considered by Colani to be later in date, that is to say of “hommes porteurs de néolithes”. Actually two completely ground tools of the facetted variety were found here (pl. 38, no. 1). These Colani considers to belong to a new wave of cultural contact.

The majority of the tools are of the Hoabinhian type. They include the following varieties. These have been illustrated on pl. 38.

No. 2 is said to be a “percuteur”, very irregular. Large flakes have been chipped off from the pebble. The butt end, which is slightly prolonged, retains the cortex.

No. 3 has a pointed working end. The original cortex of the pebble is seen on the broader part of the body, except at the pointed working end, which shows deep flaking. There are two more specimens of this type.

No. 5 is a rounded butt axe with a median cutting edge formed by the meeting of two large flakes. One side is irregular, while the other is slightly curving.
The cutting edge is much worn, the butt being markedly wide. In cross section it is lenticular. It recalls the bifacially ground type of axes, but the present specimen is unground.

Another example (Colani, 1930, pl. XLII.7) is coarsely chipped, and resembles Hoabinhian, pl. 24, no. 6.

Another very thick tool (Colani, 1930, pl. XLII.3) with a large rounded butt is similar to Hoabinhian, pl. 26, no. 42 and pl. 26, no. 50.

Colani’s semi-elliptical “hache” (Colani, 1930, pl. XLII.1), which is chipped on both faces with the cortex showing towards the butt end, is somewhat similar to Hoabinhian, pl. 24, no. 5.

No. 4 is described as “grande hache pointue”. It is triangular in shape with the butt retaining the cortex and the working end chipped.

A pounder or milling stone, made of a long schist pebble is illustrated by Colani (1930, pl. XLII.10). It is described as being heavily patinated.

One side-scraper similar to Hoabinhian, pl. 26, no. 53, is also illustrated by Colani (1930, pl. XLII.3).

Only two edge-ground tools were found. One “hache”, pl. 38, no. 6, has a thick butt showing chipping and a narrow cutting edge ground on both faces. Another “hache” (Colani, 1930, pl. XLIII.5) resembles Hoabinhian, pl. 26, no. 45. Both these edge-ground tools have parallels in the Bacsonian culture.

Bone Implements:—A bone tool, described as a very crude gouge was found near the surface, while another bone point was found far inside the cave. One implement is described as being of “bois de cervides”. There is, also, a fragment, which she calls a gouge. Another piece bearing a human figure is said to be a “spatule”.

The Cave of Kim-Bang


This cave is about 500 metre south of the village of Kim-Bang. The archaeological deposit was composed of calcareous clay in which were found “coquilles de Gastropodes”, bones and rolled pebbles. No edge-ground tool was reported, but three pieces showing marks of Bacsonian influence are said to have been found. These stones were stained red. The pot-scherds were scattered in various
places. Some sections show remains of hearths. The stone tools are of following types:

Pl. 38, no. 7 is described as "hache primitive". It has a thick rounded butt with large and deep flakes removed from the body. Another "hache" (Colani, 1930, pl. XLIII.8) crudely formed has one flake removed from the butt to facilitate gripping. The opposite end shows coarse flaking. One side-scraper is of the same type as Hoabinhian, pl. 26, no. 53.

Pl. 38, no. 9 is a grooved hammerstone, and is comparable with the Assam specimens (pl. 16, nos. 105-9). This is the only example so far known from this region.

Pl. 38, no. 8 is a bone implement.

The Cave of Xom Thon


It is about 300 metre from Song-Nan and about two hundred from Yen-Lac. From this cave were recovered some shells, rolled pebbles, bones of animals and stone tools. The latter is said to be similar to that of the above two caves.

Small Cave of Xom-Tham (no. 1)


This is situated at a higher level. The archaeological deposit consisted of very loose calcareous clay. On the surface were found numerous pot-sherds and rolled pebbles. Some pebbles showed human workmanship and some were stained red.

"Poicon en os", three complete pieces and one broken specimen were found (pl. 38, no. 16). One undoubted perforated canine tooth, one iron implement and one "pierre a cupule", which is an oval pebble bearing hollow marks (See below) were found.

Large Cave of Xom-Tham (no. 2)


It is situated 55 metres south-east of the preceding cave. The debris of hearths
is 80 cm. thick, containing Melanian shells. Some teeth of herbivores and unidentified calcined bones were also found. Other finds include milling stones, small discs of shell, four beads of blue stone, iron implements, one terracotta biconical bead, and decorated pottery. One shouldered tool (pl. 38, no. 15) is made of greenish stone. More than 378 crude shell discs (pl. 38, nos. 10-12 and 14) have been found here. Similar discs have also been found at Minh-Cam and at Ba-Xa. These are taken as currency by Colani.

The Rock-Shelter of Xom-Tham (no. 3)


It is situated very near the preceding cave. The objects found include 20 little discs, 125 middle sized discs and 3 of irregular shape, all in shell, 5 coloured beads and some iron implements were, also, found.

Pl. 38, no. 18, is made of iron, a long blade with a tang, apparently a spearhead, comparable to tanged or socketed spear-head from Malaya (Evans, 1931 b, p. 75, fig. 6). Pl. 38, no. 19 is a fish-hook of iron. Similar fish-hooks were found at Somrong Sen (Mansuy, 1902, fig. 13). Pl. 38, no. 20 is a rod, square in section, ending in a lance point.

In the opinion of Colani all these three caves were contemporary and the deposits therein are of the same time as the iron tools. "Les pieces en fer paraissent appartenir au meme temps que la reste des mobiliers".

The Rock-Shelter of Duc-Thi


It is situated 90 kilometre from Qui-Dat and 20 kilometre S.S.W. of Dong-Hoi. In this rock-shelter along with the neolithic tools were found pebbles of variegated colour, objects of shell, small and large discs, perforated cowries and pottery, "des tessons a decoration et én facture variées analogues a ceux des stations de Xom-Tham." One broken footed vase (pl. 38, no. 25), decorated with basket pattern, was found. Similar earthen-ware vases have been found in Fukien (Lin Huisiang & others, 1938, pl. XLIV). One shouldercd tool (pl. 38, no. 21) is made of fine green stone. It is ground all over. Pl. 38, no. 22 is a small chisel with two triangular lateral faces. Pl. 38, no. 23 is another chisel
broken at the working end. Large pebbles of sandstone with cupula (grands galets gréseux a cupules) were also found (pl. 38, no. 24). No metal was found here. But the pottery and the tool types definitely relate them to the same cultural grouping as those of Xom-Tham.

The Province of Than-hoa

This is the most northerly province of Annam touching the borders of Tonkin. On the Tonkin side lies the cultural zone of Hoabinhian, from which Than-hoa is separated by a calcareous chain. The river Song-Ma flows through this province. Numerous important prehistoric sites lie in the valley of this river. Only a few representative sites have been selected for description here. In all these sites stone tools and pottery were recovered. Occasional metal, bronze or iron, has also been found. The pottery is said to be “peu ancien”, but a few sherds illustrated by Colani and those preserved in the Musée de l’Homme are of the same category as that of the Somrong Sen culture. The material used for the stone tool is a greenish or greyish stone, called by Colani “roche éruptive”, obtained in the form of flat slabs. Consequently all the tools have a flattish appearance and in section they vary from thin to medium size. The tools were made mostly by the technique of chipping, a process which is common with that of the Hoabinhian culture, though a few edge-ground tools and rarely completely ground ones have also been found.

The Rock-Shelter of Lang-Bon


It is the most westerly of the sites situated on the right bank of the river Song-Ma. The objects found in this rock-shelter include as many as 2378 samples of bone and shell. Many of them were “coquilles de Melania”. The stone tools show careful chipping on one face only. There are not many variations in type. We have here “percuteur”, discs, “amygadaloides”, “haches courtes”, some crude side-scrapers, edge-ground tools of the Bacsonian type (pl. 40, no. 51), yellow and red pieces of stones apparently ferruginous, pieces of haematite, hammerstones of natural pebbles and numerous bone implements. Some completely ground tools and bicone beads are reported to have been near the surface, but these have not been illustrated.
The chipped tools have been called by Colani "paléolithes", probably on the
ground that they do not show any trace of grinding. Though some of the forms
represented here are typical of the Hoabinhian culture (Colani, 1930, pls. XLV-
XLVII), the chipping being coarse, still these tools do not merit the name
"paléolithe". It is probably owing to the nature of the material that the tools
show chipping only at the sides and cutting edge. On the other hand there
are some tools which definitely show the influence of the ground tool tradition.
One such tool figured here (pl. 40, no. 53) is preserved in the Musée de l'Homme
(no. 32.94.112). It is chipped on both faces at the marginal ends while the type
which comes closest to Colani's "amygdaloide", but its form has, no doubt,
been influenced by the beautifully ground neolithic axe.

Such influence can be traced even in the province of Hoa-Binh itself. One
such tool (pl. 41, no. 57) from the site of Lang-Vanh in the province of Hoa-
Binh is preserved in the Musée de l'Homme (no. 32.94.96). It is also made of a
flattish slab of "roche éruptive", and the cutting edge is produced entirely by
chipping on both faces, the tenon and greater part of the tool retaining the
cortex. In accordance with the terminology of Colani this tool should be called
a "paléolithe". However, she includes this site under the Hoabinhian culture
(Colani, 1930, p. 300). No one can mistake this tool, which is nothing but a
crude variety of the shouldered type.

Another tool (pl. 41, no. 58) comes from Da-Phuc and is preserved in the
Musée de l'Homme (no. 32.94.129) and is of the same material. It appears that
an older edge-ground tool has been reformed into a variety of the shouldered
tool simply by chipping at the shoulders. The site Da-Phuc is in the province
of Hoa-Binh and is treated by Colani as falling under the Hoabinhian
culture.

From the site of Lang-Bon some edge-ground tools have also been recovered.
They are called by Colani (1930, pl. XLVIII, 9-12) "protonéolithes". One of
them figured here (pl. 40, no. 51), preserved in the Musée de l'Homme (no.
32.94.124), also shows chipping at the sides, while the cutting edge is formed
by grinding. Another example, pl. 40, no. 52 (Musée de l'Homme no. 32.94.87)
shows the cortex on one face, while the other is chipped at the marginal ends.
The rectangular form of this tool suggests influence from the facettted tool type,
Among bone tools there are various forms: Colani's "gouge", pl. 40, no. 56; 'demi-hache", pl. 40, no. 54; and "petite-hache”, pl. 40, no. 55.

Caves at Dien-ha

These caves are situated less than 4 kilometres S.S.W. of Lang-Bon. Colani says, "L'outillage on pierre est purement paléolithique; il se compose de pilons, de percuteurs, de disques, de pieces atypiques. Aucun instrument en os." In other words only chipped stone tools have been found here. A few potsherds have also been reported. One iron tool (not illustrated) is said to have been found at a depth between 50 and 60 cm.

The Rock-Shelter of Chom-Dong

This is situated in a narrow valley through which flows a tributary of the Song-Ma River. There are two rock-shelters, western and eastern. In the western one were found (in the words of Colani), "quelques pierre taillées, deux haches polies l'une a tenon d'emmanchement; quelques tessons peu anciens". In the eastern shelter were found chipped stones, haches, haches courtes, percuteurs and 4 "haches bacsoniennes".

The Cave of My-Té

This cave lies to the north of Than-hoa, in the great massif separating Annam from Tonkin. The materials of this cave consist of:—
(a) "pieces néolithiques, hache polie, polissoires, tessons de ceramique,"
(b) "pierre taillées, objects atypiques, percuteurs, pointes, tranches de galets, haches, haches courtes, disques, racloirs."
Colani adds that the objects of the first category (a) have been found near the surface though she makes no stratigraphic distinction in the archaeological deposit.
Summary and Conclusion

Throughout the region of Annam, which lies in between two cultural zones, Hoabinhian on the north and Somrong Sen on the south, the archaeological finds demonstrate clearly the local traditions of both zones. Colani suggests that these sites were refuge centres, where the people from Hoa-Binh flocked probably when pressed by the arrival of new elements among them. This suggestion implies that chronologically these deposits are later in date than those of the Hoabinhian region. This supposition has no foundation at all. Probably it is dictated by the fact that along with the chipped tools in these sites completely ground tools have also been found. From a few sites metal has also been recovered. But some examples of tools from the sites (Lang-Vanh and Da-Phuc) in the Hoabinhian region itself have been cited before (Pp. 165-66) as showing close correspondence with the more advanced tool types in the Annam and Somrong Sen cultures. These tools suggest two things: (i) the Hoa-Binh region was backward in the sense that there the only technique practised was chipping; (ii) the influence of the Somrong Sen culture seems to have reached as far north as the Hoa-Binh region. This fact belies the assumption of Annam being the refuge centre. The evidence outlined above suggests that Annam was the meeting ground of the Hoabinh chipping technique and the culture of Somrong Sen with the techniques of grinding and sawing. But these two cultures may have existed side by side for part, at least, of their existence.
Section II

SIAM

Prehistoric research in Siam is only in its preliminary stage. Except for the work of Fritz Sarasin and his collaborators and chance-discoveries made by Van Heekeren and I. H. N. Evans, no serious attempt has been made to unravel the neolithic problem of this country. Surface finds have added some ground tools and shouldered tools to the Bangkok Museum. From these materials only a very rough outline can be given.

The presence of "prehistoric" caves in the limestone hills of Siam was long known. Fritz Sarasin (1933 a) writes, "The caves which abound in the limestone hills are not seldom quite beautiful, forming enormous domes adorned with mighty stalactites. Others are only like narrow passages, and still others are simply shelters with overhanging rocks. The prehistorian meets in Siam for his research work with very great difficulty that all the caves promising good results have been transformed into Buddhist sanctuaries. They usually contain only one enormous statue of the great teacher. Others, however, are richly decorated and contain a number of images and altars of offerings. Many of these sanctuaries have a floor made of stone slabs or of cement. Quite frequently a brick wall with a door closes the cave from the outside. Needless to say that in these sanctuaries it is absolutely forbidden to undertake any research work. Other caves serve as dwellings for hermits." (Sarasin, 1933 a, Pp. 172-73).

Sarasin's work can be divided into two parts: one, relating to the caves located in North Siam, and the other, those located in South Siam.

Evidence from the Caves in North Siam

At the foot of the cave not far from the village of Chom-Tong, 58 kilometres to the South of Chiengmai (See map no. 3), a tool described as coup-de-poing (pl. 42, no. 1) was found. No excavation was carried out here. This tool is made of rhyolite pebble, chipped only on one face while the other retains the cortex. The flaking technique is coarse similar to that of Hoabinhian stage C. The tool roughly recalls Hoabinhian, pl. 24, no. 6 but is somewhat broader.

The most important excavation was done in a cave called Tam-Pra, situated
to the west of the town of Chiengrai, near the boundary of Luang Prabang. It really consists of two caves, a principal one, now turned into a sanctuary, and a minor one, which was alone excavated. In the words of Sarasin, “Near the entrance of the cave a longitudinal ditch 2 metres long and 1 metre broad was cut out. The profile was a most simple one. A superficial layer, about 20 cm. deep was formed by sand mixed with fragments of bricks. Then followed a layer of about 80 cm. consisting of earth coloured gray by ashes. In the upper part of this layer some sherds of plain and cord-marked pottery were found, a little deeper a certain number of crude implements of palaeolithic character, made from rhyolite and other eruptive rocks, also some round pebbles having been used as hammerstones, some lumps of red ochre and some broken bones of mammals. Beneath this gray deposit the earth became yellow, frequently mixed with fragments of limestone but without any sign of human workmanship. The rocky ground of the cave had been reached at the depth of 1.60 m. A second ditch, perpendicular to the first one, made the following day, gave the same poor results.” (Sarasin, 1933 a, Pp. 175-76). From this description the following sequence can be made:

**Sequence at Tam-Pra Minor Cave**

- **20 cm.** Sand mixed with bricks.
  - Plain & cord-marked pottery.
  - 80 cm. ↓ Gray earth ash-coloured.
  - Crude implements & round pebbles.
  - 60 cm. Yellow earth mixed with limestone fragments. No tools.
This section clearly gives two strata of human occupation: the middle one, when the "prehistoric" people occupied the cave, and the top stratum, consisting of brick fragments, presumably of Buddhist occupation. There is no evidence to show that the crude implements were earlier in date than pottery. But the presence of only a few sherds in the upper layers of the middle stratum does imply that pottery was very scarce in this culture. The tools are described below:

Pl. 42, no. 2 is a longitudinal pebble worked at the broader edge, made of green pebble of fine-grained diabase. Type same as Hoabinhian pl. 24, no. 1.

Pl. 42, no. 3 is a quadrangular pebble worked along two sides, made of green slate. Type same as Hoabinhian pl. 24, no. 14.

Pl. 42, no. 4 is a small disc of white chert, round in shape, with marks of use at the edge. Type same as Hoabinhian pl. 23, no. 28.

Pl. 42, no. 5 is a rounded pebble used as hammerstone. Many other examples of this type are known.

Pl. 42, no. 6 is a triangular-shaped stone having regular sides. On the lower side a cut piece is supposed to be grip mark.

Pl. 42, no. 7 is a small point of bone with base cut in the shape of a semi-circle. This cave also produced lumps of ochre, a certain number of bones of deer and a vertebra of crocodile. Shells were very scarce.

Evidence from South Siam

To the west of the little town of Rajburi there is a big cave, called Khao-Tam, situated at the foot of the rocky hill, now turned into a Buddhist sanctuary. Digging in one corner of the cave produced a rounded pebble tool.

An important sequence was found in a small rock-shelter above the bottom of the valley Tam Fa To. The archaeological deposit was a little disturbed. The sequence was as follows.

1. On the top fragments of bricks were mixed with superficial layers.

2. The pieces of plain, cord-marked, and basket-pattern pottery was found to a depth of 50 cm.

3. At the bottom were found lumps of red ochre, tools of limestone, a few bones of mammals, some marine shells and a great number of land-shells. The tools are described below:
Pl. 42, no. 8 is described as a knife blade from a long limestone. It has a concave cutting edge and a finger rest, the ends being chipped transversely.

Pl. 42, no. 9 is a point, made from a triangular limestone, much weathered. Type same as Hoabinhian, pl. 24, nos. 10 and 13.

Another crude scraper made of limestone resembles in its form with the scrapers from Tam Kradam (see below).

In a limestone hill, called Suam Cheng in the vicinity of Lopburi, there is a cave called Tam Kradam, in which excavation of the two nitches at the back of the cave proved very fruitful. In the words of Sarasin, "The soil of this part of the cave to the depth of 1 metre and more was literally filled with nummberless shells of Cyclophorus, intact or intentionally broken. The use of ochre was clearly shown by the red colouring of some of the stones; but the most welcome discovery was the fact that I found here quite a number of implements of decidedly palacolithic character made of rhyolite, green-stones and other eruptive rocks. Flakes and shapeless pieces of these rocks, without or almost without trace of workmanship, were plentiful in the deposit, bones of mammals very scarce. Like all the implements found in the other places, not a single one showed the slightest trace of polishing. Fragments of pottery were only found on the surface." (Sarasin, 1933 a, p. 178). The sherds are made of yellow ochre clay with much grit. One piece appears to be a fragment of what Tweedie (1953, Pp. 52-53) calls a "turn table", but which could be a footed vase. The following tools were found.

Pl. 42, no. 10 is a crudely chipped tool, made of a block of rhyolite, of oval shape, a rough pentagon. The anterior is worked into a point but is damaged. Another of a similar type but the base has a triangular form. Pl. 42, no. 11 is also of a similar type with a flat triangular base. These three implements have been worked on one face only like the so-called 'Sumatra' type of Malaya. They resemble the Malaya type, pl. 44, no. 3 from Gua Kerbau, but the latter is more developed. Similar specimens also come from the Hoabinhian culture.

Pl. 42, no. 12 is a thick pick-like point, made of rhyolite, much weathered, the base being an irregular rectangle, while the point forming a regular triangle. Type same as Hoabinhian, pl. 24, no. 13. Another point is in the shape of a leaf, only the upper part being chipped. There are several other points, being
simply sharpened flakes of rhyolite without any trace of secondary working. Pl. 42, no. 13 is one such point. Pl. 42, no. 14 is another crude point of limestone.

Pl. 42, no. 15 is a scraper, only the edge being worked. Such scrapers have also been found in the Hoabinhian culture.

Pl. 42, no. 16 is another point of limestone, besmeared on four sides with red colour.

The above description apparently makes three stages in the cave deposits of Siam, both in the north and south.

I. The top layer containing brick-bats most probably belongs to the Buddhist occupation.

II. A pottery-bearing layer.

III. A layer of crude implements.

It has been remarked earlier that the pottery-bearing layer does not make a clear-cut stratigraphic difference from that containing the implements. There is no evidence in these caves to show that pottery was made here and that it came into use after the crude implements had gone out of vogue. On the contrary the scanty finds of the sherds and the nature of the cultural level in the caves suggests that the pottery was obtained from more developed areas.

On the character of the stone industry Sarasin remarks, "The stone implements . . . . . present a purely palaeolithic character. Not the least trace of polishing is to be found on them. They are without exception very coarsely and primitively chipped. Their form is only approximately comparable with the skilfully executed implements of the classic palaeolithic cultures of Europe. One is even frequently tempted to look for their relation with pre-Chellean cultures. By a few coarse chips, perfectly natural stones have been transformed into primitive implements, using as little labour as possible. The "Siamian" as I shall provisionally call it, is a palaeolithic culture of the most primitive nature. It is a culture of hunters and collectors of food without the possession of any domestic animals and without the knowledge of agriculture." (Sarasin, 1933 a, p. 194). Technically this industry is in the same level as those of the earliest stages of the Hoabinhian and Bacsonian cultures, and a few resemblances, pointed out above, though they may be accidental, support the hypothesis that the cultural level of these cave dwellers was very low. But this "primitive" charac-
ter does not prove their long antiquity, nor the term “palaeolithic” is suitable for this industry. In all probability they were contemporary with the ground tools, to be noticed shortly, at least in their later stages, and it is probably from the latter culture that pottery and bone tools were derived. From the cave deposits it is clear that this “primitive” cultural life continued till they were superseded here by the intrusion of the Buddhist hermits. But what was the effect of this change in the cultural life of this whole region, cannot be answered at present.

One collection of ground tools has been described by I. H. N. Evans (1931 c). In a tin mine at Ban-Na (See map no. 3), Surat province, 5 stone “celts” and 2 pounders were found. The tools are described below:

Pl. 43, no. 17 is a gouge adze (or pick adze, the so-called beaked adze), 10.9 cm. in length, of yellowish stone, trapezoidal in section. Such gouge adzes are very common in Malaya.

Pl. 43, no. 18 is a faceted tool 6.6 cm. long, probably unfinished. It is of the type well-known from Malaya (compare pl. 51, no. 161).

Pl. 43, no. 19 is a type of splayed axe, 9.85 cm. long, again of the type well-known from Malaya (compare pl. 51, no. 157).

Pl. 43, no. 20 is a faceted type of tool with slight splaying at the cutting edge. It is of the same type as the Malayan tool pl. 51, no. 148 from Kuala Nyong.

Pl. 43, no. 21 is a broader example of splayed axe of the Malayan type.

Pl. 43, nos. 22 and 23 are two pounders with longitudinal flutings or grooves on their body. They show pecking marks. At this very site cord-marked pottery was found. It has also been described by I. H. N. Evans (1931 d). This pottery is of the same type as that found by Sarasin in the caves. Another find of five ground tools was made at Chong in South Siam (Evans, 1926). These implements are made of rhyolite.

Pl. 43, no. 24, no. 25 and no. 26 are faceted type of tools, identical with the Malayan examples (compare Tweedie, 1953, figs. 12-13). Pl. 43, no. 27 is a splayed axe of a slightly different variety, found in Malaya (Tweedie, 1953, fig. 10), Burma (See pl. 56, no. 24) and India (See pl. 7, no. 11). Pl. 43, no. 28 is a gouge adze of the type found at Kuala Nyong, Malaya (See pl. 51, no. 147).

These ground tools and the pottery belong to a developed neolithic culture,
and they bear closest relationship with the Malayan developed neolithic culture. The workmanship is similar to the ground tools of the Somrong Sen culture and the Pho-Binh-Gia (a) group of the Basconian culture, but the types represented here are slightly different. They fall in line with the Malayan examples.

Van Heekeren (1948) collected artifacts from the cave near Wan-Po in Siam (about 21 miles north-west of Bhan-Kao). They were found in association with "an agglomerate of sand, bone fragments, ashy material and fresh water molluscs." Pl. 43, nos. 29-31 come from this find. These are "crudely worked core implements chipped along one surface only, the ventral plane being flat and unworked." The workmanship of these tools are far better than those discovered by Sarasin in the caves. They also show some regularity of form. Pl. 43, no. 29 is of rectangular shape, and pl. 43, no. 31 is of almond shape. Pl. 43, no. 32 is a faceted tool of curvilinear variety, found in association with the piles of sand along Bhan-Kao railway. Van Heekeren reports many others of this type from this area. In the vicinity of Nom-Pladuk, near Ban-Pou, a beautifully ground shouldered stone tool was found. It had a broad rectangular section.

Technically these chipped tools of Van Heekeren compare well with the Kéo-Phay industry of the Basconian culture (See Pp. 128-29) on the one hand and on the other have relationship with the chipped tools of Malaya. The regularity of the forms suggests that they have been influenced by the forms of the ground tools, and hence they belong definitely to a different grouping from those discovered by Sarasin in the caves of north and south Siam. Provisionally we can speak of three groups of stone industry in Siam:

I. Coarsely chipped tools of irregular shape discovered by Sarasin in the caves.

II. Chipped tools of regular shape discovered by Van Heekeren.

III. Ground tools discovered by Van Heekeren and I. H. N. Evans.

These three groups do not imply any chronological differentiation. If the evidence from Indo-China and Malaya can be cited, one may suggest that these possibly represent three cultural groups in Siam.