

Fig. 14. Pottery from Layer V of Catugan Shell-midden.

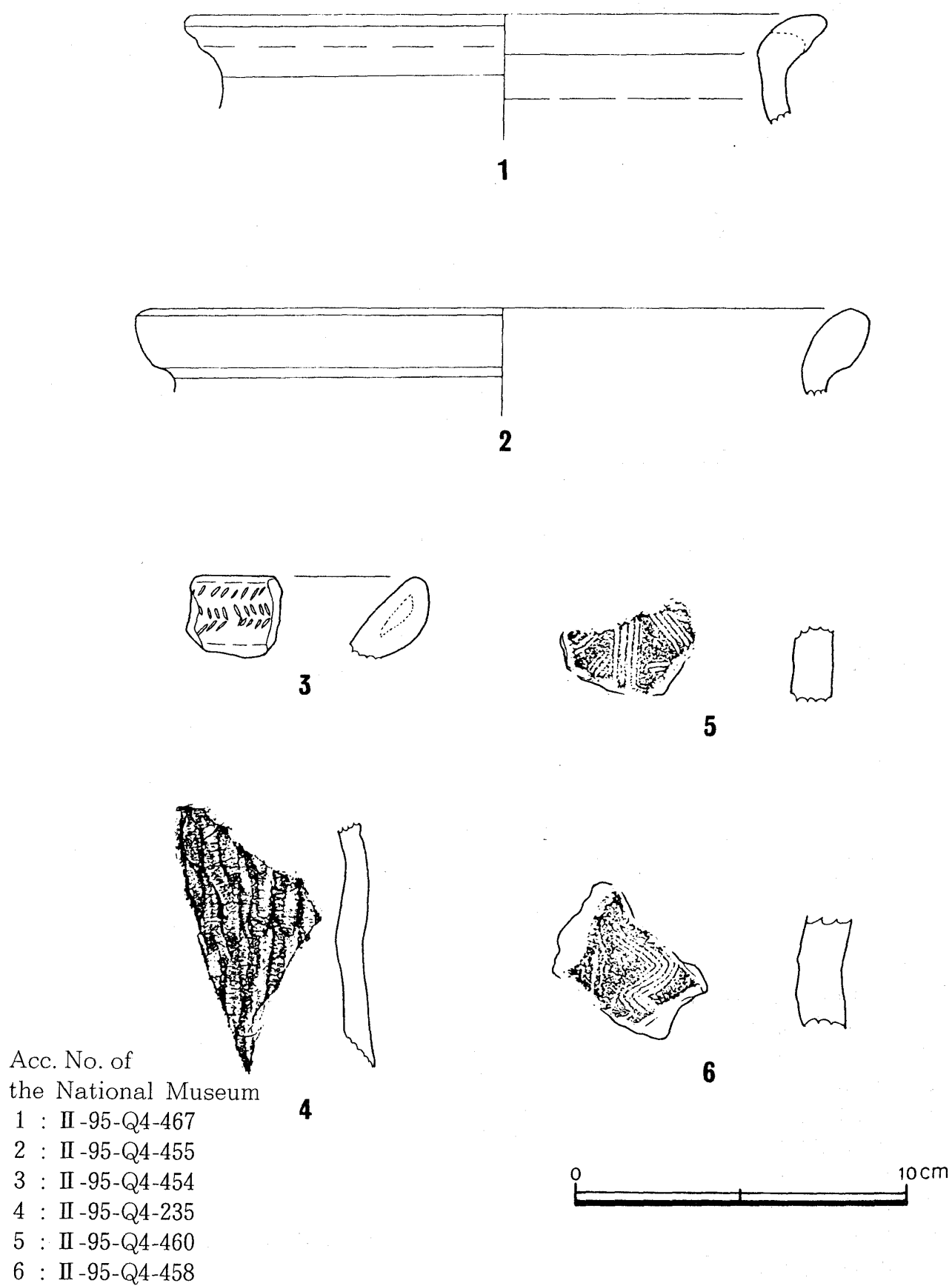


Fig. 13. Pottery from Layer IV of Catugan Shell-midden.

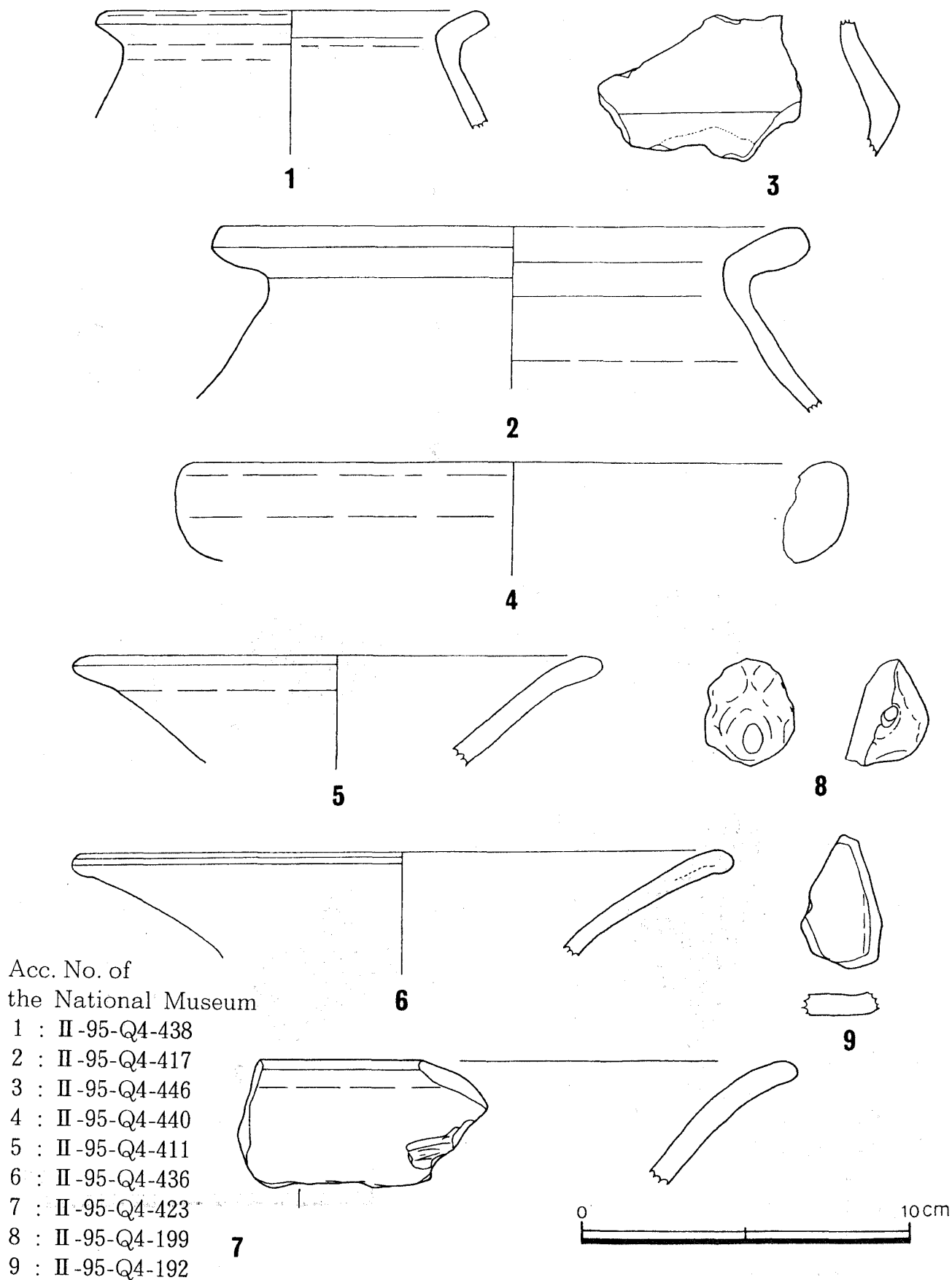


Fig.12. Pottery from Layer III of Catugan Shell-midden.

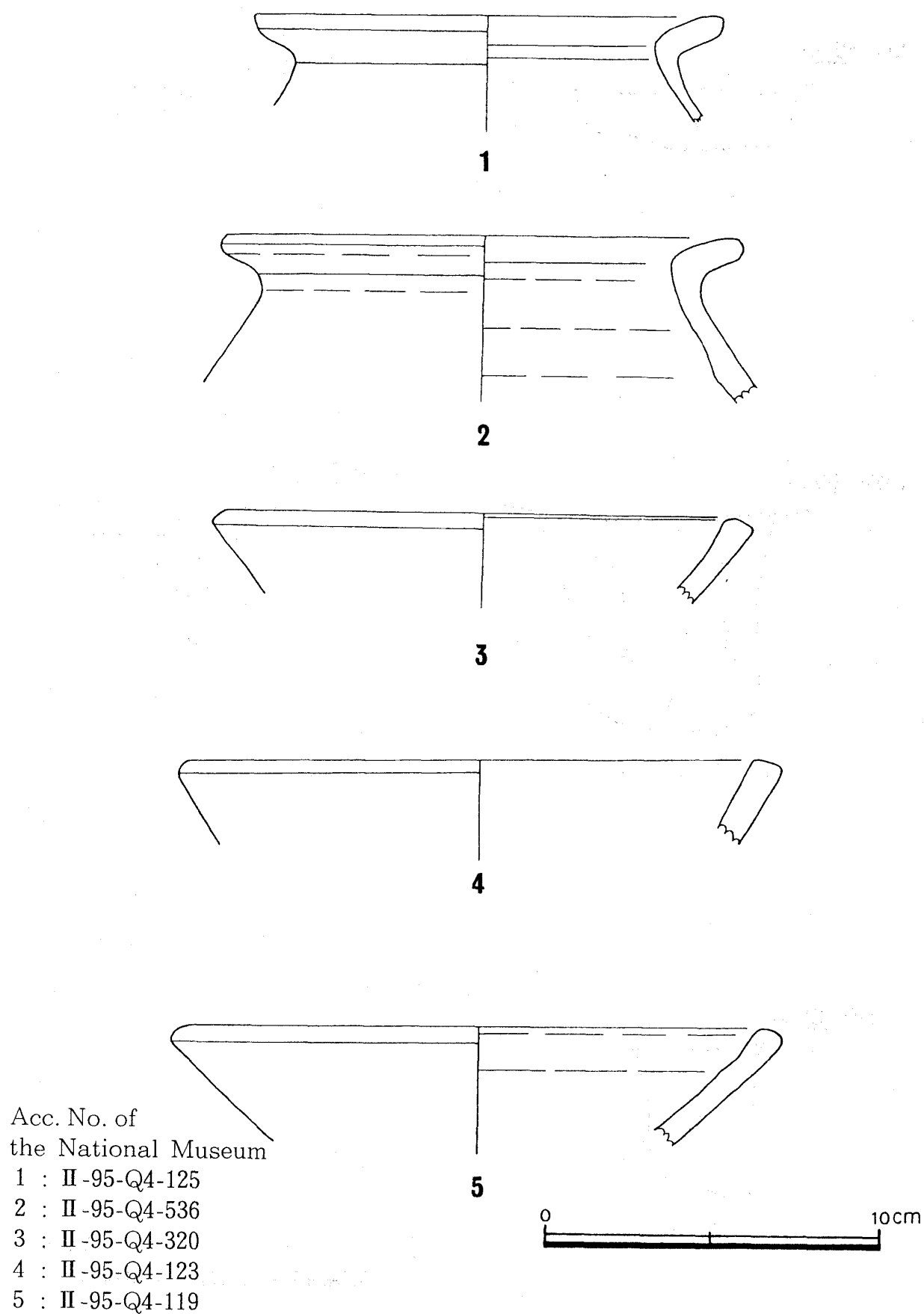


Fig.11. Pottery from Layer II of Catugan Shell-midden.

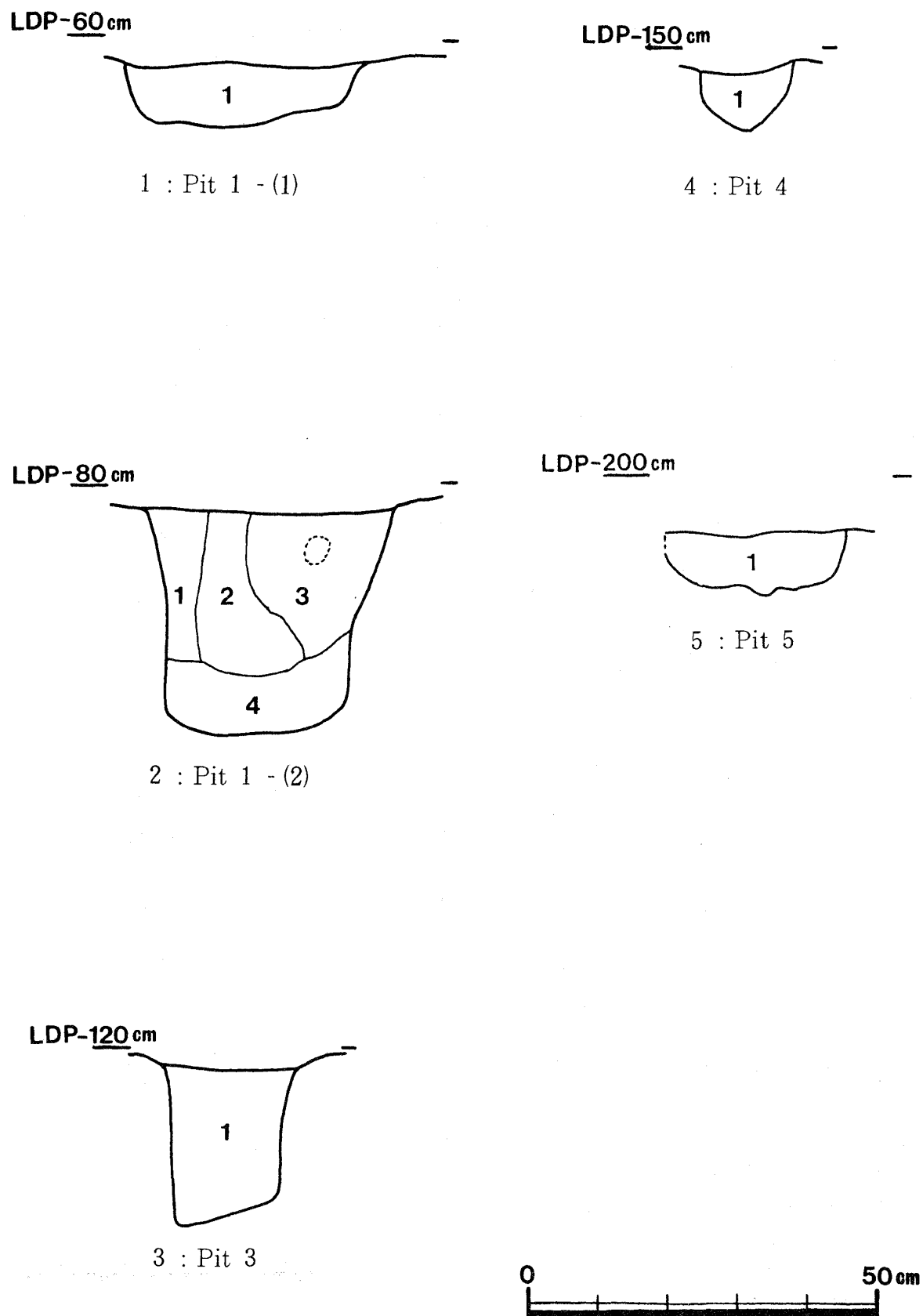


Fig.10. Soil Profiles of Pits of Catugan Shell-midden.

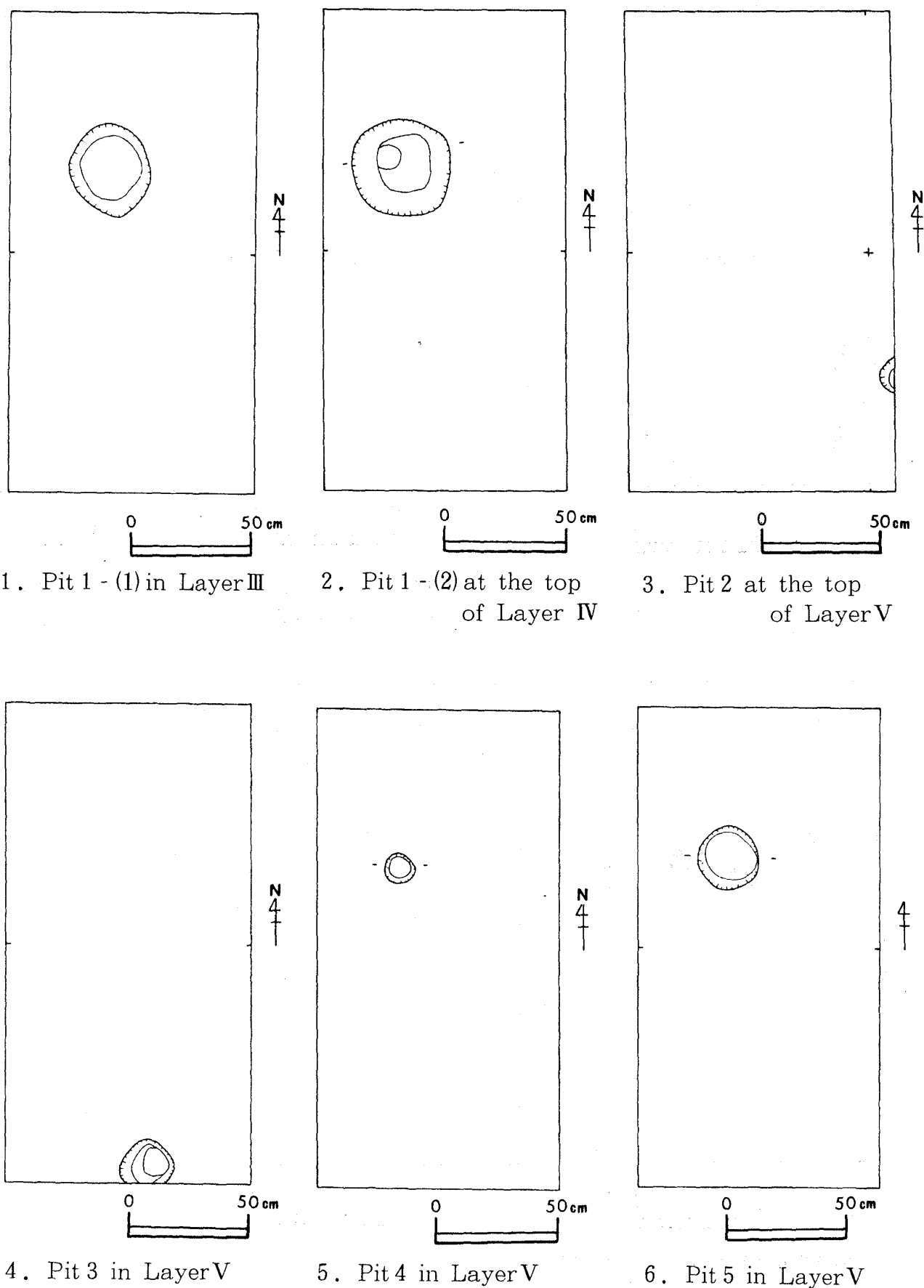
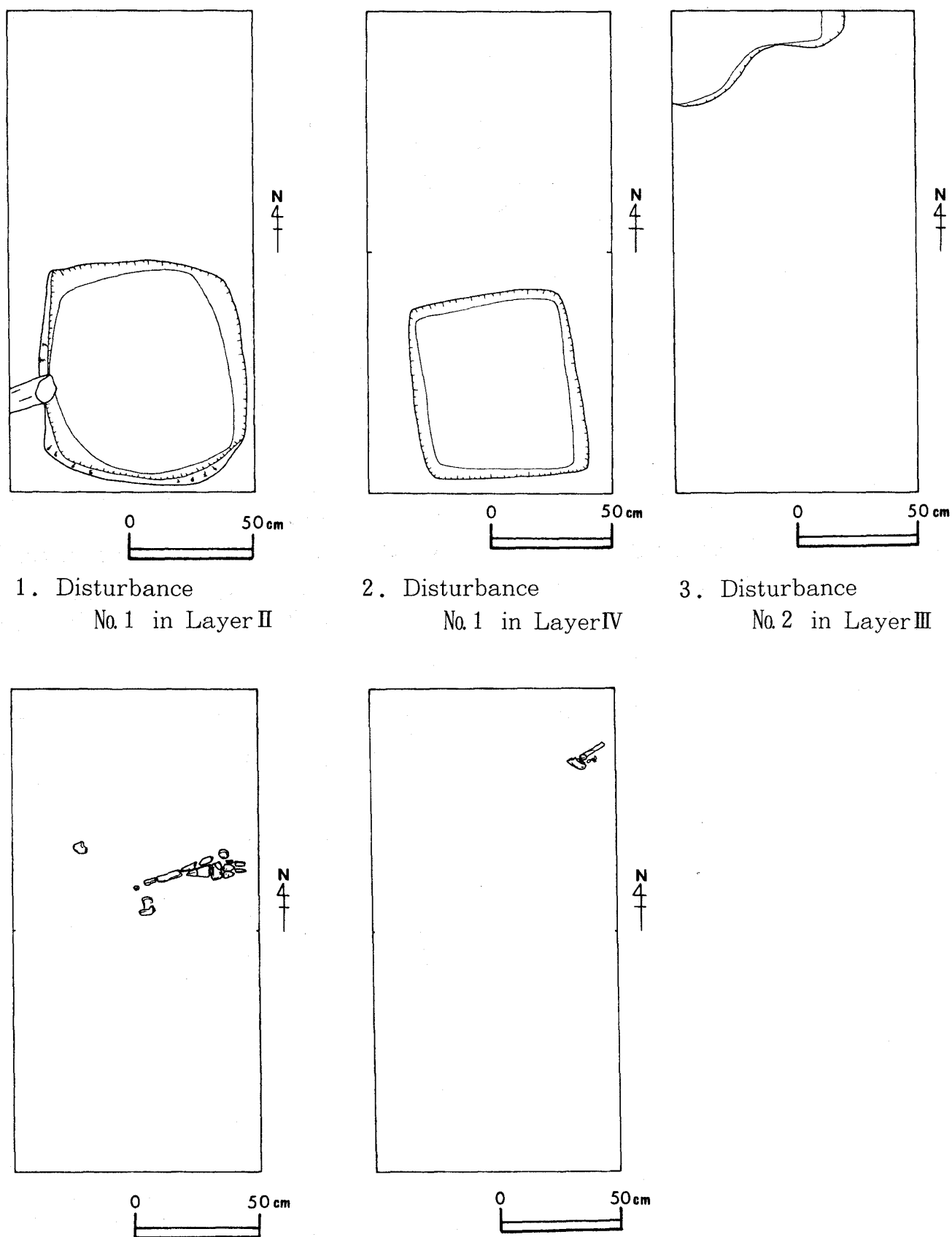


Fig. 9. Plans of Pits in the Excavated Square of Catugan Shell-midden.



1. Disturbance
No. 1 in Layer II

2. Disturbance
No. 1 in Layer IV

3. Disturbance
No. 2 in Layer III

4. Skeletal remains in Layer II 5. Skeletal remains in Layer II

Fig. 8. Disturbance (1~3) and Skeletal Remains (4, 5) in the Excavation Square of Catugan Shell-midden.

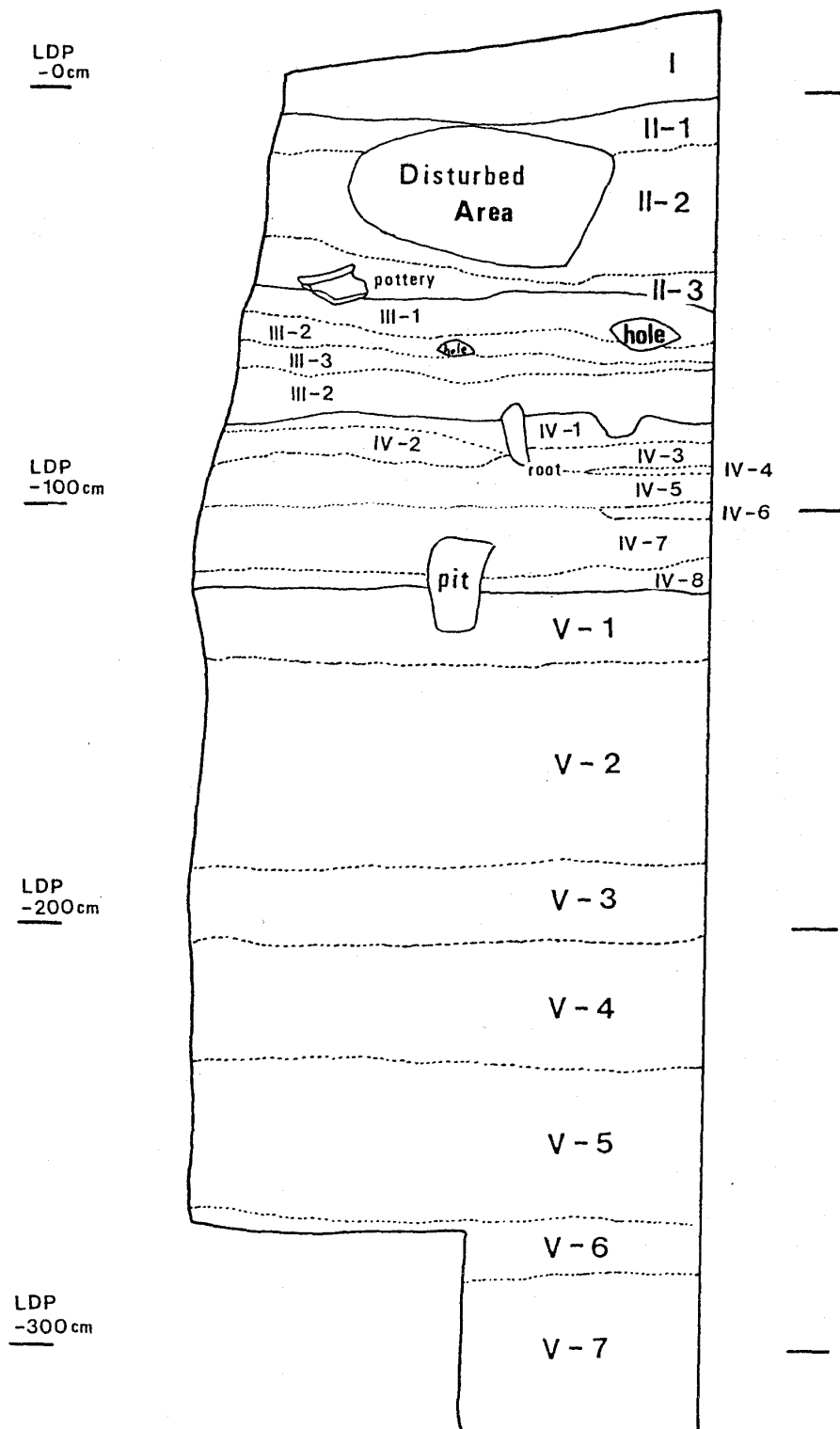


Fig. 7. Soil Profile of Catugan Shell-midden, (South Wall)

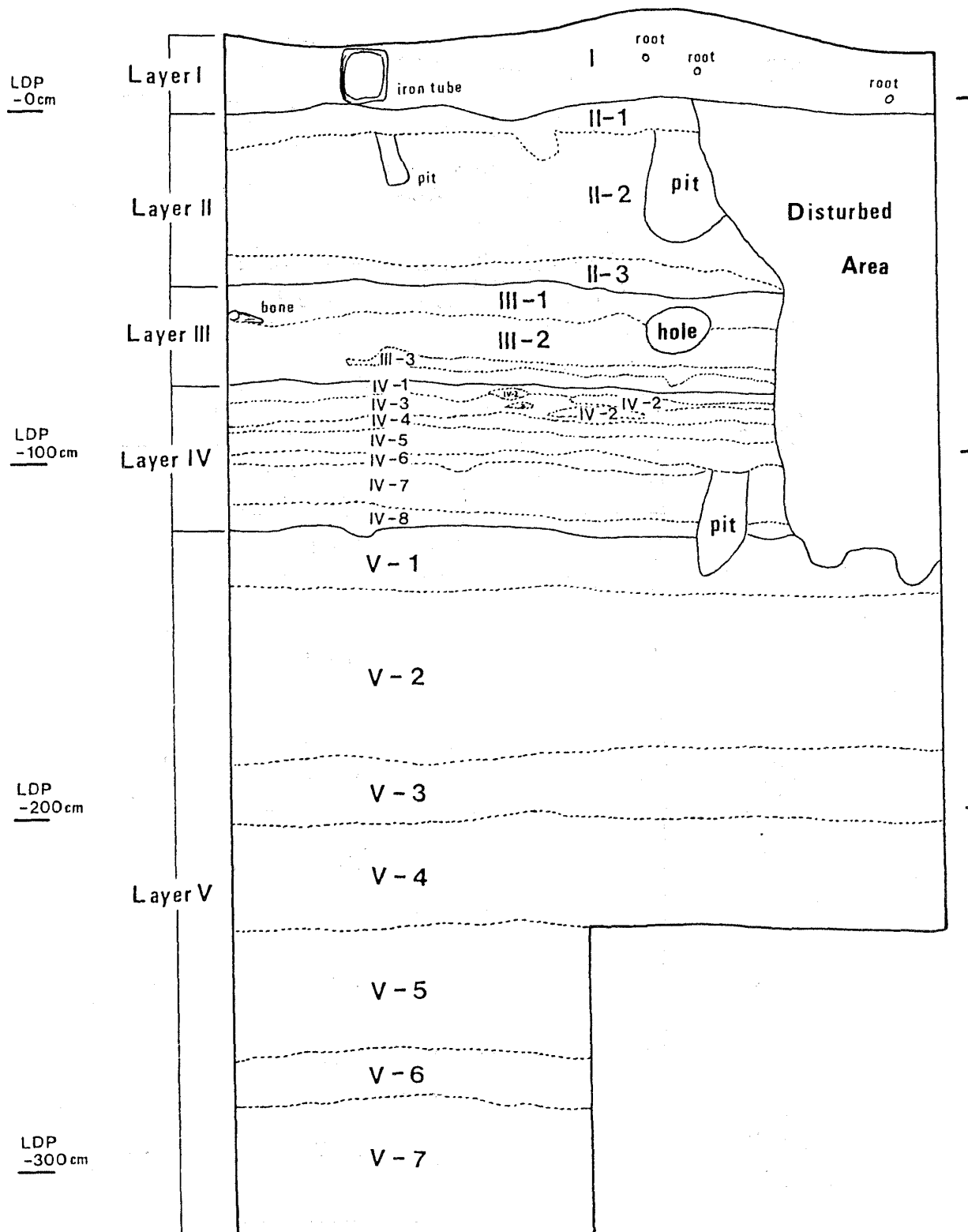


Fig. 6. Soil Profile of Catugan Shell-midden.
(West Wall)

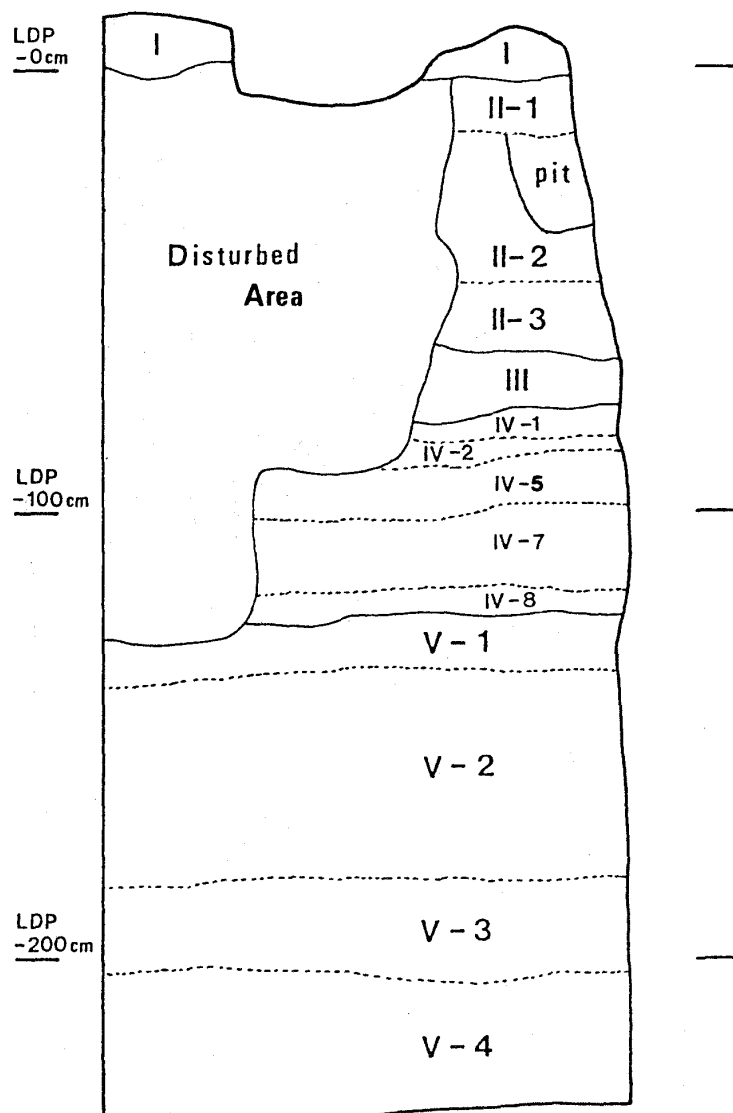


Fig. 5. Soil Profile of Catugan Shell-midden.
(North Wall)

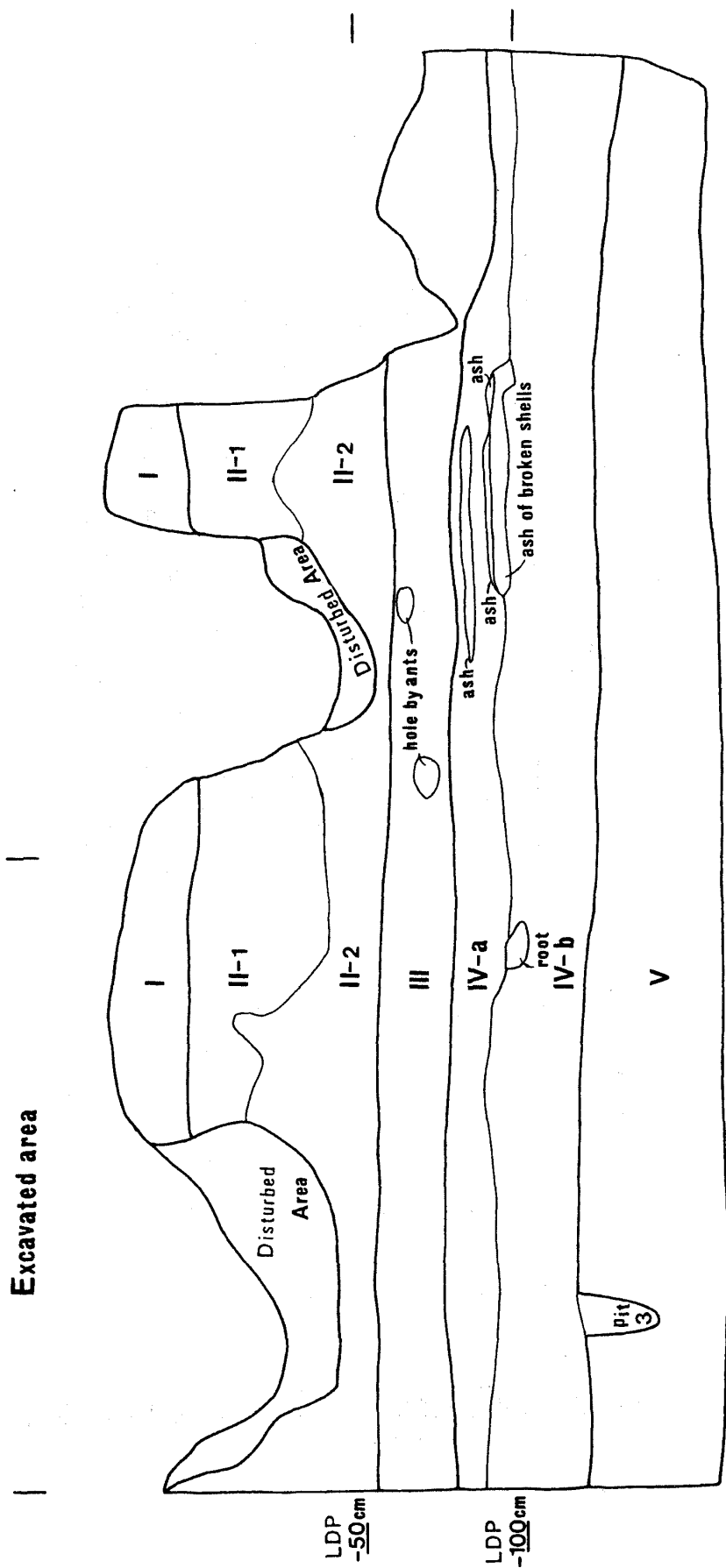


Fig. 4. Soil Profile of Catugan Shell-midden.
(East Wall)

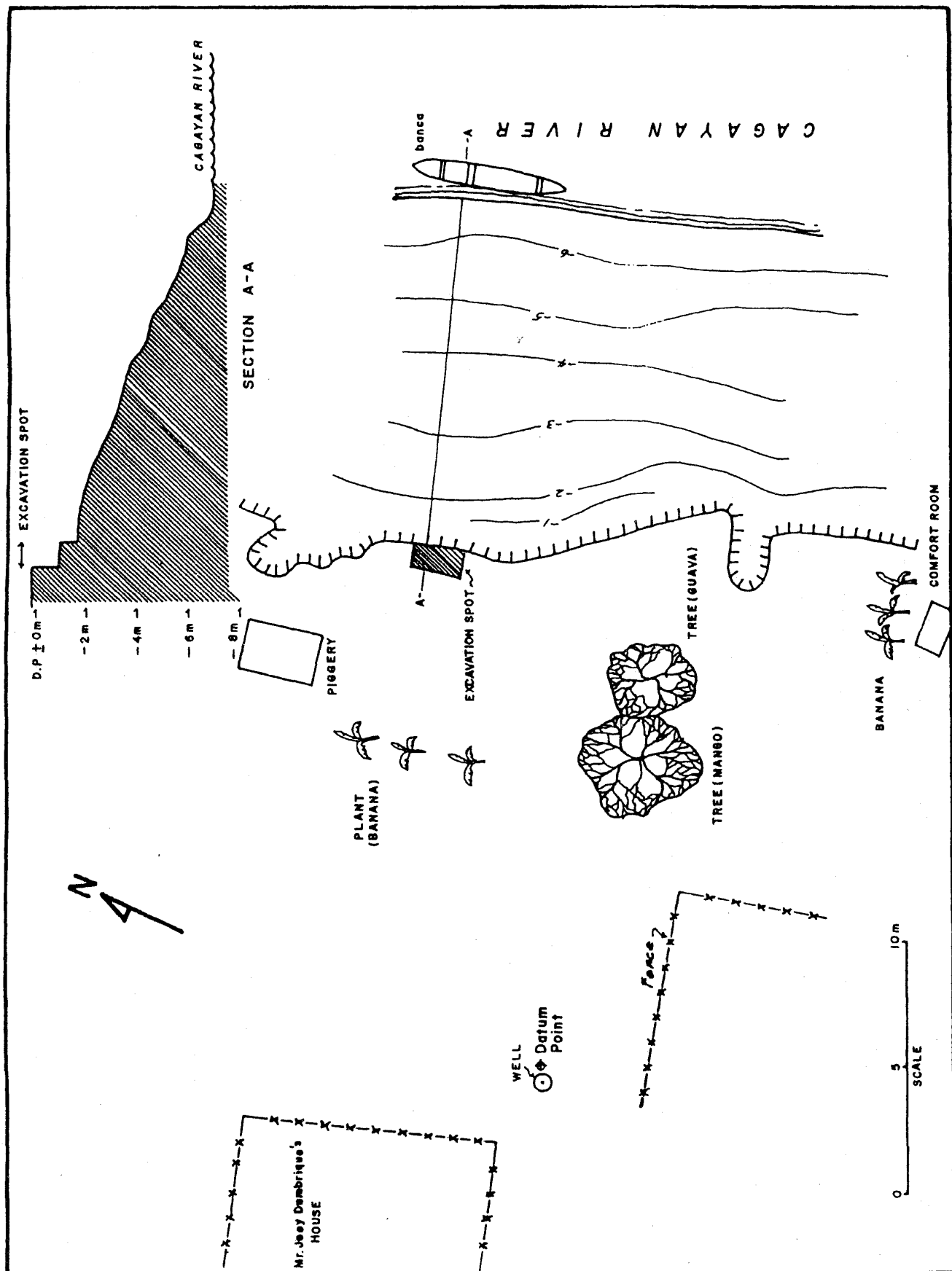


Fig. 3. Location Map of the Excavated Square in Catugan Shell-midden.

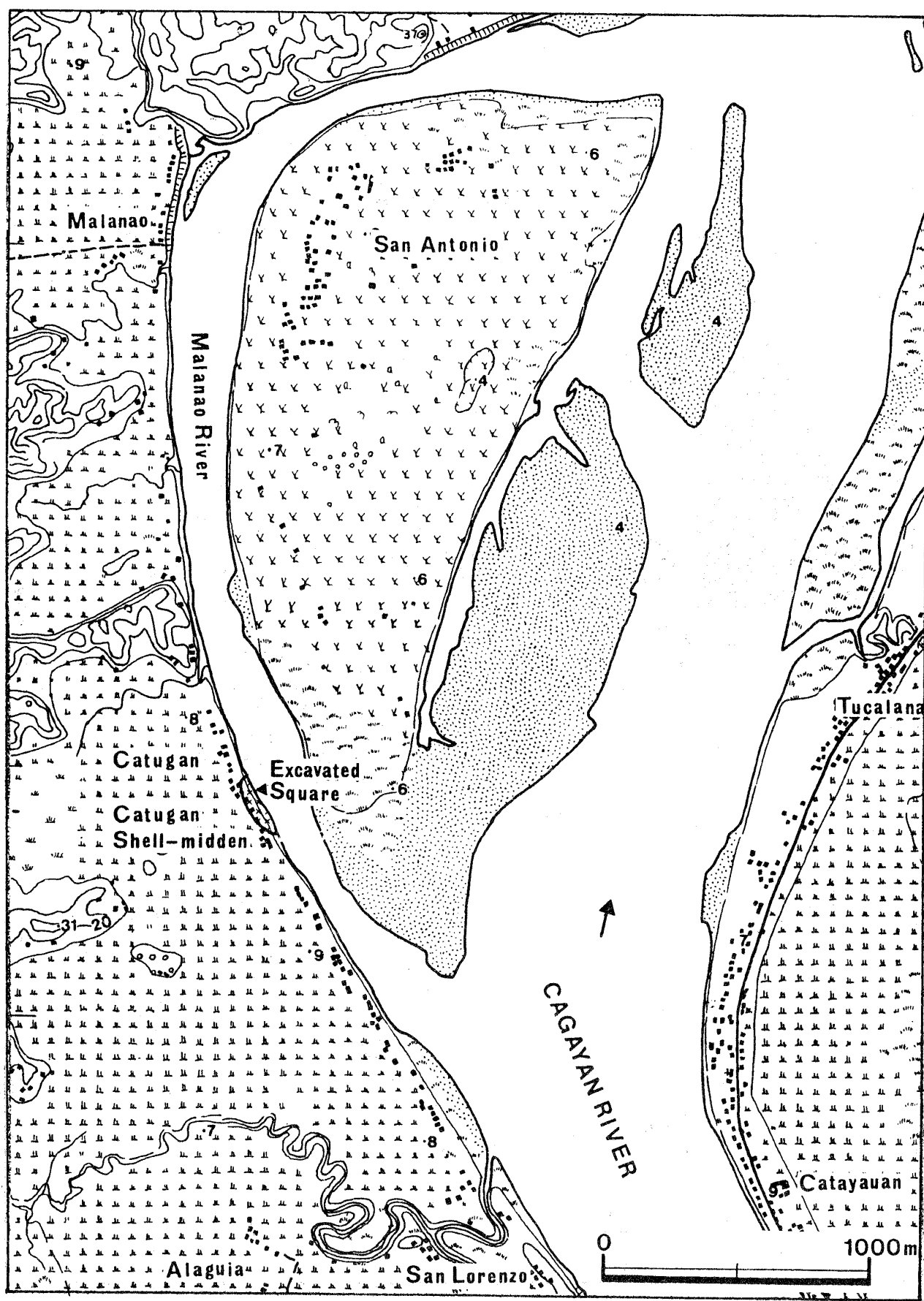


Fig. 2. Location Map of Catugan Shell-midden.

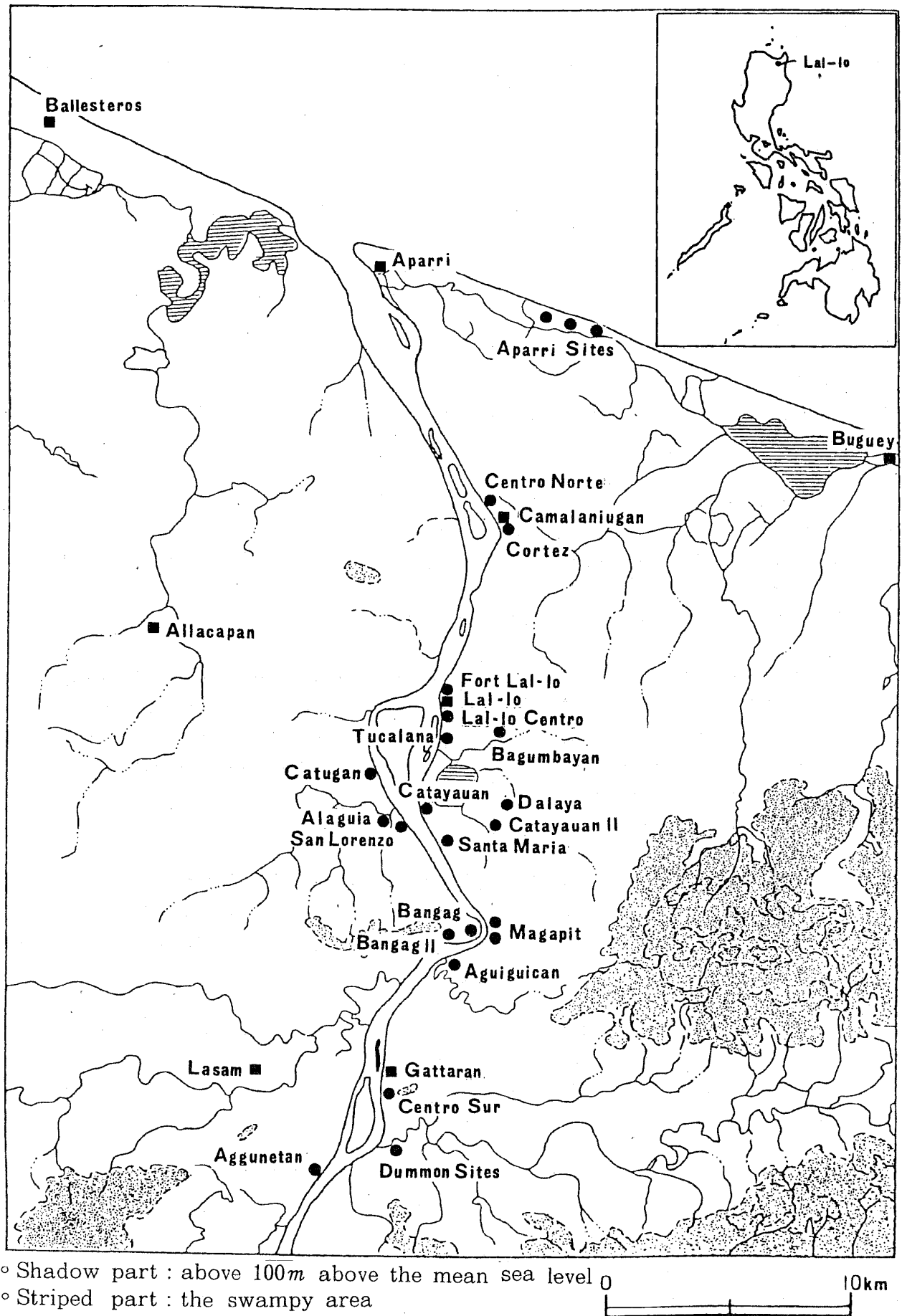


Fig.1. Distribution Map of Lal-lo Shell-middens.

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XV. Note

1. In eastern wall (Fig. 4), Layer II and Layer IV were divided into only two sub-layers (Layer II-1, II-2, IV-a, IV-b) and Layer III and Layer V were not divided into sub-layers because the profile of the eastern wall was made before the excavation.

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excavated square is 1 x 2 m. And the southern half part of the square was almost disturbed from the top surface up to -118cm. In spite of those conditions, the northern part revealed a well-stratified deposit from Layer I to Layer V. Each layer produced artifacts such as earthenware sherds. So characteristics of the earthenwares of each layer were clarified.

Bowls of the black pottery were found in Layer II and layer III. Then, the characteristic of the bowls of the black pottery in Layer II is an inward curved or a straight rim with a flattened lip. (Fig. 11 : 3, 4). The characteristic of the bowls of the black pottery in Layer III is an out-turned rim with the further out-turned lip (Fig. 12 : 5 ~ 7). One of important discoveries in our excavation is that black pottery bowls with an inward curved or a straight rim and the flattened lip is newer than black pottery bowls with an out-turned rim and the further out-turned lip.

The hump-like handle (Fig. 12 : 8) was found in Layer III. There are similar handles among materials by surface collections in Bangag I shell-midden site (Aoyagi and Tanaka 1985 : Fig. 4 : 15, 23, 24). It suggests that Layer III of Catugan shell-midden site and Bangag I shell-midden site were contemporaneous for some duration.

All earthenware sherds found in Layer V are red-slipped and plain. The same kind of red-slipped pottery was found in the soil layer of Clemente Irigayen Property site, Sta Maria shell-midden on the eastern side of the Cagayan River. Detailed comparative analysis of these red-slipped sherds are needed.

And we are waiting for the results of C14 dating.

I am sure that these results would contribute to the chronological study of sites within the lower reaches of the Cagayan River.

XIV. Acknowledgement

I would like to express my gratitude to the staff of the Archaeology Division of the National Museum of the Philippines, especially Prof. Wilfredo P. Ronquillo, the Chief of the Division, and Dr. Eusebio Z. Dizon, Curator of the Archaeology Division and the Chief of the Underwater Section of the Division, who always gave us a lot of support and suggestion to our research. And Mr. Angel P. Bautista, a Senior Researcher of the Archaeology Division who was a team leader of the team in 1996. And Miss. Amalia de la Torre, a Researcher of the Archaeology Division who correct my English.

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So it also belongs to the group of the black pottery. The mineralogical components of the temper are usually minute white particles and quartz particles and biotite flakes. The bottom sherd has 1 mm size and minute reddish brown particles.

Artifacts found in Layer IV (Fig. 13)

Earthenware sherds found in this layer are parts of jars and decorated vessels. Jars are divided into the black pottery (Fig. 13 : 1) and the brown pottery (Fig. 13 : 2 , 3). The earthenware sherd shown in Fig. 13 : 1 has the out-turned short rim. The angle of the neck is wide. And the tip of the lip becomes thin. The earthenware sherd shown in Fig. 13 : 2 has the thickened rim. The length from the neck to the tip of the lip is short. The outer part of the rim is thickened. And the earthenware sherd shown in Fig. 13 : 3 has also a thickened rim. Three rows of short line incisions are applied on the outer surface. The incisions of the first (the uppermost) row are applied from right to left and from up and down. Then the incisions of the second row are from left to right and from upper to down. Finally, the incisions of the third row are applied from right to left and from up to down. The three rows of incisions are interlocked as the each other.

The body sherds with designs are all grouped into the brown pottery category. The sherd shown in Fig. 13 : 4 has paddle impressed designs made by a grooved paddle. The width of the groove is about 4 mm. The firing condition is very good, because the body of the vessel is hard. The sherds shown in Fig. 13 : 5 , 6 have the comb-incised designs. These are brown pottery. They have a thick body. There are comb-incisions composed of four lines. The width of the comb is about 8 mm. The sherd shown in Fig. 13 : 5 has the vertical comb-incised lines used as dividing lines. And the curved comb-incised lines are applied in-between this, that is at the right and the left of the vertical comb-incised lines (Fig. 13 : 5). The sherd shown in Fig. 13 : 6 has the continuous curved comb-incised lines like a running water.

Artifacts found in Layer V (Fig. 14)

Earthenware sherds found in Layer V are all red-slipped pottery. This is a very important characteristic of the pottery in this layer. The pottery are grouped into parts of jars (Fig. 14 : 1~4) and parts of jars/bowls (Fig. 14 : 5 , 6).

The sherds shown in Fig. 14 : 1 , 2 are body sherds with a carination. These are probably assumed as the body sherds of jars. The sherd shown in Fig. 14 : 3 is a rim sherd of a jar. It is the out-turned and short but a little high rim. The tip of the lip is round. Meanwhile, the sherd shown in Fig. 14 : 4 has the inward curved and high rim. It has a groove at the inside of the lip. It is a trace of joining the clay. It is difficult to ascertain or conclude that the sherds shown in Fig. 14 : 5 , 6 are parts of jars or bowls. Because only the rim parts were found. These rims curved inward and has a thickened lip. Tempers of these six pottery are usually minute white particles, biotite flakes and quartz particles. All sherds found in this layer are affected by weathering. So the red-slip remains only partially on the surfaces of the specimens.

XIII. Concluding remarks

The excavation of Catugan shell-midden site was on a small scale level only. The size of the

cal components of the temper are usually minute white particles, quartz particles and biotite flakes. The specimen shown in Fig. 11 : 2 has the reddish brown particles which are probably hematite.

Bowls (Fig. 11 : 3 ~ 5) have straight or a little inward curved rims. The styles of the lips vary a little. The lips of the specimens in Fig. 11 : 3, 4 have flattened tips. The lip of the specimen in Fig. 11 : 5 has a round tip. The inner side of the lip of the specimen in Fig. 11 : 3 is a little bit thickened. The color of the specimen in Fig. 11 : 3 is black at the outer surface and the inner surface. In Fig. 11 : 4, the surface color of the specimen at both the inner and outer sides is brownish black. Therefore, both specimens are grouped into the black pottery category. Meanwhile, the specimen in Fig. 11 : 5 is brown at the inner side and dark brown at the outer side. So this pottery is grouped into the brown pottery category. The mineralogical components of the temper are usually minute white particles, biotite flakes and quartz particles.

Artifacts found in Layer III (Fig. 12)

Earthenware sherds found in Layer III are grouped into jars (Fig. 12 : 1 ~ 4), bowls (Fig. 12 : 5 ~ 7) and probable parts of bowls (Fig. 12 : 8, 9).

Jars have two types of rims : The out-turned short rim (Fig. 12 : 1, 2) and the thickened rim (Fig. 12 : 4). In Fig. 12 : 1, the outer side of the specimen is black, while the inner side from the neck to the tip of the rim is brownish black. The reconstructed diameter of the rim is 12cm. The specimen in Fig. 12 : 2 is brownish black at both sides. The reconstructed diameter of the rim is 18cm. So, the specimens in Fig. 12 : 1, 2 belong to the category of a black pottery. The outer surfaces of the specimens in Fig. 12 : 3, 4 are brown while the inner sides are dark brown. The specimen in Fig. 12 : 3 has reddish brown color at the outer surface, though most part of the surface is black because of the soot. The reconstructed diameter of the rim of the specimen in Fig. 12 : 4 is 20.2cm. The mineralogical components of the tempers are usually white particles, biotite flakes and quartz particles. Specimen shown in Fig. 12 : 4 has 1 mm and 2 mm size quartz particles.

Bowls found in this layer have the out-turned rim. The rim of the bowls in Fig. 12 : 5, 6 are further turned outward. The specimen in Fig. 12 : 5 has the brownish black color at both sides. The maximum diameter of the reconstructed rim is 16cm. In Fig. 12 : 6, the specimen has the black surfaces at both sides. The maximum diameter of the reconstructed rim is 20cm. The outer surface of the specimen in Fig. 12 : 7 is black, while the inner side is grayish brown. The maximum diameter of the reconstructed rim is about 30cm. These three sherds belong to the black pottery category. The mineralogical components of the tempers of these sherds are minute white particles, biotite flakes and quartz particles.

There are two kinds of sherds which are probably parts of a bowl : the hump-like handle (Fig. 12 : 8) and the bottom part (Fig. 12 : 9).

The size of the handle is 3.4cm long and 2.6cm wide. A hole was perforated horizontally at the point of 1.4cm below the tip of the rim (Fig. 12 : 8). The size of the hole is 7 mm x 4 mm. The height of the handle is 1.4cm. The surface color of the handle is grayish black at the outer side and black at the inner side. So, it belongs to the group of the black pottery.

The bottom sherd has a flat bottom (Fig. 12 : 9). The surface color is black at both sides.

in diameter (Fig. 9 : 3). The depth of this pit is 24cm and the bottom is pointed (Fig. 4). No artifacts were found in this pit.

Pit 3 (Fig. 9 : 4, Fig. 10 : 3)

It was found at the top of Layer V. It is located at the middle of the southernmost part of the square. The southern part of the pit was cut a little by the wall (Fig. 9 : 4). The plan of this is a distorted circle. The size is 22cm from the east to the west and 19cm from the north to the south. The depth is about 26cm. The soil layer is composed of broken shells with the brown soil (Fig. 10 : 3). The color is 7.5YR 4/3. Shells in the soil are almost broken. It contains a few charcoal fragments. No artifacts were found in this pit.

Pit 4 (Fig. 9 : 5, Fig. 10 : 4)

It was found in Layer V. It is located in the northwestern part of the square. The plan is round. The size is 13cm in diameter (Fig. 9 : 5). The depth is 9cm. The bottom is pointed (Fig. 10 : 4). The soil is brown (7.5YR 4/3). It contains charcoal fragments and light brown soil particles. No artifacts were found in this pit.

Pit 5 (Fig. 9 : 6, Fig. 10 : 5)

It was found in the lower part of the black band of Layer V. It is located in the northeastern part of the square. The plan of the pit is round (Fig. 9 : 6). The size is 25cm from the east to the west and 27cm from the north to the south. The depth is about 7cm. The bottom is almost flat (Fig. 10 : 5). The soil is dark yellowish brown (10YR 3/4) and contains charcoal fragments. It is also very sticky. No artifacts were found in this pit.

Among these pits, Pit 1 to Pit 4 are probably post holes. And Pit 5 is definitely not a post hole. Its function is unknown.

XII. Artifacts

Main artifacts are described by layer except the disturbed top soil (Layer I).

Artifacts excavated in Layer II (Fig. 8 : 4, 5, Fig. 11)

The most important findings in Layer II are the human skeletal remains. A broken mandible and a broken humerus and small fragments of bones were found in 30 to 40cm from the surface at the eastern part of the northern square (Fig. 8 : 5). Several bones of a leg were found in 50 to 60cm at the southeastern part of the same square (Fig. 8 : 4). These human bones were found in the shell layer and we could not recognize any kind of pit for the burial.

Earthenware sherds found in Layer II are grouped into jars (Fig. 11 : 1, 2) and bowls (Fig. 11 : 3 ~ 5). The jars and bowls are divided into two groups based on the surface color, namely : those with the black surface (Fig. 11 : 1, 3, 4) and those with the brown surface (Fig. 11 : 2, 5). I would like to describe the characteristics of these pottery based on groupings I made.

Jars have the out-turned and short rim (Fig. 11 : 1, 2). The specimen shown in Fig. 11 : 1 has black and polished surfaces at both sides. The reconstructed maximum diameter of the rim is about 14.7cm. Meanwhile, the specimen shown in Fig. 11 : 2 has brown surfaces at the inner and outer sides below the neck. The outer surface above the neck became black because of constant use. The reconstructed maximum diameter of the rim is about 15.5cm. The mineralogi-

square. A drainage pipe made of iron protruded from the western wall of the square. The cross section of this pipe is quadrangular. The pipe's width is 10cm. The size of the disturbance is 95cm from the north to the south and 85cm from the east to the west. Therefore, the original eastern wall of the square is very thin at this point. The depth is about 118cm. This reached the lower part of Layer IV. It contained more than one sack of broken glass bottles.

Disturbance No. 2 (Fig. 5, Fig. 6, Fig. 8 : 3)

This was found in the northwestern corner of the excavation square. The plan of it is the shape of a notched quarter of a circle. It has a length of 70cm and a width of 15cm and 40cm. The depth is about 1 m and 42cm from the surface. It reached up to the upper part of Layer V. The soil is well observed at the north wall of square (Fig. 5). The middle part contains many broken glass bottles.

The excavation of disturbance No. 1 was conducted prior to the excavation of the original layers. However, it is quite deep. Therefore, the disturbance was first dug before the each original layer was dug until to the same level of the disturbance No. 1.

The sampling spot was left at the northwestern corner of the square. Disturbance No. 2, especially on the western part, was almost at the same spot as the sampling spot. So this sampling spot was treated as part of the area of disturbance.

Pit 1-(1) (Fig. 9 : 1, Fig. 10 : 1)

This was found in the middle of Layer III. It is located in the northwestern part of the square. The plan is the distorted circle (Fig. 9 : 1) and the size is 34cm from the east to the west and 39cm from the north to the south. The depth of Pit 1-(1) is 10cm (Fig. 10 : 1). The soil is dark brown with broken shells. No artifacts were found in this pit.

Pit 1-(2) (Fig. 9 : 2, Fig. 10 : 2)

This was found at the lower part of Layer III and continued up to Layer IV. The plan is a distorted circle (Fig. 9 : 2). The size of the pit is 40cm from the east to west and 42cm from the north to the south (Fig. 9 : 2). The depth of the pit is 31cm. The soil is divided into four layers (Fig. 10 : 2).

Layer 1 is the brown soil layer with shells. The soil color is 7.5YR 4/3. It is very sticky and contains small clay particles. Majority of the shells are whole.

Layer 2 is the brown soil layer with shells. The soil color is 7.5YR 4/3, the same as Layer 1. This contains less shells than Layer 1. The shells are broken or fragmented.

Layer 3 is the shell layer with the brown soil. The color is 7.5YR 4/4. It contains more shells than Layer 1 or Layer 2 and it also contains the yellowish clay lumps, one of which is drawn in Fig. 10 : 2 by a broken line.

Layer 4 is a shell layer with the brown soil. The color is 7.5YR 4/4. It contains more shells than Layer 1 or Layer 2. It is harder than Layer 3. The lower part is divided into two: the round part is composed of brown soil, and the surrounding part of this is composed of shells (Fig. 10 : 2).

No artifacts were found in this pit.

Pit 2 (Fig. 4, Fig. 9 : 3)

This is found at the top of Layer V. It is located at the southeastern part of the square. The eastern half of the pit was lost. The plan of it is assumed to be round. The size is 15cm

LayerIV-4 : The fragmented shell layer with the yellowish brown silt.

LayerIV-5 : The fragmented shell layer with the black soil (10YR 2 / 1)

LayerIV-6 : The fragmented shell layer with the black soil (10YR 2 / 1)

LayerIV-7 : The fragmented shell layer with the yellowish brown loam soil (10YR 4 / 3)

LayerIV-8 : The shell layer with the brown soil (10YR 3 / 4)

LayerV-1 : The brown loam soil layer (7.5YR 3 / 4)

The upper part of this layer has lost its color a little bit.

LayerV-2 : The dark brown loam soil layer (7.5YR 3 / 4)

The color of the soil becomes blackish because of the presence of the organic materials. The boundary of the layer is not clear.

LayerV-3 : The brown loam soil layer (10YR 4 / 4)

The soil is very hard and sticky.

LayerV-4 : The brown loam soil layer (7.5YR 4 / 4)

The color of this sub-layer is lighter than the color of LayerV-3.

LayerV-5 : The dark brown loam soil layer (7.5YR 4 / 4)

The color of this sub-layer is darker than Layer V - 4 . This layer contains minute brown mineral particles and fragmented charcoal.

LayerV-6 : The grayish brown loam soil layer (7.5YR 5 / 1)

It contains dark brown mineral particles of 1 mm in diameter. This sub-layer is very hard and sticky.

LayerV-7 : The yellow loam soil layer (7.5YR 5 / 6)

This sub-layer contains also the dark brown mineral particles of about 1 mm in diameter.

XI. Disturbances and Features (Fig. 8~10)

Two types of features are described in this paper. The first ones are the disturbances which are the results of contemporary activities. And the others are pits found in Layer III, Layer IV and Layer V. So the disturbances are first described and then pits are described.

Disturbance No.1(Fig. 8 : 1, 2)

This was located in the southern part of the square (Fig. 8 : 1, 2). The plan of it is almost

size of shells are below 5 mm. There are many roots present. The iron drainage pipe is found in this layer.

Layer II-1 : The shell layer with soil (10YR 4/2)

The soil is very fine. There are both whole shells and fragmented shells. The percentage of the mixture of shells in this layer are above 50%.

Layer II-2 : The shell layer (10YR 4/2)

The soil color is the same as the color of Layer II-1. However, the percentage of the soil is very lower than Layer II-1. Shells of this sub-layer are almost whole pieces.

Layer II-3 : The shell layer with the blackish brown soil (10YR 2/2)

Soil of this layer is similar to that of the upper layer (Layer II-2).

However, this sub-layer contains many carbon fragments. So the color of the soil becomes darker than that of Layer II-2.

Layer III-1 : The brown silt soil layer with shells (10YR 4/6)

The mixture of shells is so irregular. There are several small holes in this sub-layer. Found in the holes are the soft and pink shells of eggs. According to the villagers, these are shells of snake's eggs.

Layer III-2 : The brown silt soil layer with shells (10YR 4/6)

The characteristic of this soil is similar to the soil of Layer III-1. But the percentage of the mixture of shells is higher than Layer III-1.

Layer III-3 : The brown silt soil layer with shells (10YR 4/3)

The characteristic of this soil is same as the soil of Layer III-1 and Layer III-2. But the percentage of mixture of shells in this layer is lower than Layer III-1 and Layer III-2.

Layer IV-1 : The shell layer with soil (10YR 3/4)

The characteristic of the soil is very similar to the soil of Layer III. Almost all shells are fragmentary.

Layer IV-2 : Ash layer

This is a burnt shell layer with ash. Some of the burnt shells became ashes. The fragmented shells are in powdery condition.

Layer IV-3 : Shell layer with the black loam soil (10YR 2/2)

The percentage of the mixture of shells in this layer is high.

excavation.

The loosened soil was sieved by using a 6 mm-mesh screen which was set up near the excavation square. The sieved soil was gathered on a large plastic sheet spread under the screen. A small amount of soil (i. e. in two 20x30 inches plastic bags) were collected for flotation.

The Datum Point (D.P.) was set up on the concrete wall of the well in Dumbrique Property. The provenance of the exposed artifacts was recorded (i.e. the NS and EW location and its Depth). After proper measurements and recording of observations, the artifacts were retrieved and placed in plastic bags with bagging slips with relevant information as to its provenance and other observations. The distributional map of artifacts were made in the field. After the excavation, soil samples of about 1 kg were collected from the western wall of the square for pollen analysis.

The number of workers were ; 2 persons for digging, 1 or 2 persons for dry sieving and bagging of soil for flotation and transporting the sieved soil to the river and 2 persons for water sieving (using 3 mm-mesh screen) in the river. Among these workers, at least one person is a National Museum Staff and others are local laborers and Japanese University students.

All photographs in the field were taken by me.

IX. Process of the excavation

The excavation had started on August 13, 1996 and ended on August 31, 1996. I would like to summarize the process of the excavation.

August 13 : The excavation had started. The exposed profile at the eastern cliff was cleaned and measured. After the grass on the ground was cut, 1 x 2 m square for the excavation was set close to the cliff.

August 14 : Excavation of Layer II. The human mandible and humerus were found in this layer in the eastern part of northern square. And bones of human leg were also found in the middle part of the square.

August 15 : The excavation of Layer II was finished. Proceeded to the excavation of Layer III immediately. The round pit was found in the northern part of the square.

August 21 : We started to excavate Layer V. The speed of the excavation became slow because of the hardness of the soil. The pottery sherds found in this layer were all red-slipped.

August 27 : We finished the measurement of the walls of the square.

August 31 : End of excavation. The square was backfilled with sacks filled with soil.

X. Stratigraphy (Fig. 4 ~ 7)

There are five soil layers noted (Layer I to Layer V). Layer I is humus and cultivated soil layer. Layer II and Layer IV are shell layers with soil. Layer III is composed of a soil layer with few shells. And Layer V is a loam soil layer. These five layers are basically deposited horizontally and artifacts were found in all five layers. The deposit from Layer II to Layer V are further divided into sub-layers¹. The details of these sub-layers are as follows.

Layer I : The black soil layer with shells (10YR 3/2)

This is a disturbed by cultivation. The percentage of the mixture of shells is low, about 7 to 10%. The shells in this layer are fragmentary and small. The

other is in the southern part which separates Catugan from San Lorenzo (Fig.2). The distance from the mouth of the northern creek to that of the southern creek is about 2150m.

The area facing the Malanao River is a long and narrow river bank. The level of the top of the river bank is about a little higher than 10m above the mean sea level. The hinterland west to the bank is mainly utilized as a rice field. The level of the area is about 8 to 9m above the mean sea level. The present settlement is located along the bank.

V. Location of Catugan shell-midden

The shell-midden is located along the bank in the northern part of the village. The distribution of shells in Catugan starts at the point of 400m south to the northern creek. It stretches 250m long (Fig. 2). The width of the shell-midden is not clear. It is probably shorter than the width of the bank. The average width of the bank is approximately 75 meters.

VI. Previous researches of Catugan shell-midden site

The first archaeological exploration of the Catugan shell-midden was conducted by Mr. Aoyagi, Mr. Ogawa, Mr. Larios and Tanaka in January, 1988 (Aoyagi, Aguilera, Ogawa and Tanaka 1989 : 105~106). Mr. Carlito Conciso and Mr. Innyon were the Team's guides. The team observed the stratigraphy at the eastern cliff of the site and took photographs. Surface materials were collected. It was observed that there are at least two shell layers with an intermediate soil layer in-between. The team had an impression that this site is an ideal site for the chronological study.

In August, 1995, this site was revisited by Mr. Aoyagi, Dr. Dizon, Mr. Ogawa, Mr. Toizumi, Ms. Garong and Tanaka. Human bones were found at the cliff of this site. The finding point of the human bones was recorded. So we also had a hope to find human bones in situ in this site.

VII. Preparation for the excavation

The archaeological excavation was planned to be conducted in the area where the human bones and several shell layers were found. The excavation square was set at the eastern cliff along the narrow path from the village to the banca's dock (Fig. 3).

The cliff which is about 2.5m, is exposed from the level of the village. The narrow path going down to the river was convenient for the project for sieving the soil and/or shells excavated. The site was named "Dumbrique site" after the name of the landowner, Mr. Joey Dumbrique. The excavated area is 2m from the north to the south and 1 m from the east to the west. The excavated area was set up along the cliff. So the longitudinal line of the square was set up N-13°-W.

VIII. Method of the excavation

The established 2 x 1 meter square was divided into two areas : a northern area (1 x 1 m) and a southern area (1 x 1 m). The natural soil layer observed at the cliff was followed in the excavation. An arbitrary level of 10cm was used for the vertical control of the excavation within the same natural soil layer. The curved scrapers and mason trowels were used for the

Museum are such a kind of researches.

However, shell-midden sites are not focused in other area in the Philippines. Therefore, intensive researches of shell-midden site in Lal-lo is very important for Philippine Archaeology. And the area is also important for Philippine Prehistory.

Mr. Aoyagi and Mr. Aguilera, Mr. Ogawa and Tanaka excavated Magapit shell-midden site in 1987 (Aoyagi, Aguilera, Ogawa and Tanaka 1988, 1991). The site revealed the rich earthenware sherds (more than 20,000 pieces) associated with quadrangular stone adzes. No metal objects and no porcelain were found in this site. Two C14 dates of 2800 ± 140 B.P. and 2760 ± 125 B.P. were obtained from the charcoal samples. And the same group also conducted the archaeological excavation in San Lorenzo shell-midden in 1988 (Aoyagi, Aguilera, Ogawa and Tanaka 1989). The site revealed broken sherds of Chinese ceramics like blue and white wares associated with a few earthenware sherds.

Mr. Ogawa and the Archaeology Division of the National Museum made the joint project of the research of Lal-lo shell-middens in 1995. Many Philippine archaeologists (Mr. Ronquillo, Dr. Dizon, Mr. Bautista, Miss. de la Torre, Mr. Orogo and others) and Japanese archaeologists (Mr. Aoyagi, Dr. Koike, Mr. Ogawa, Mr. Yonezawa, Mr. Sasa, Mr. Toizumi and Tanaka) joined in this research. In 1995, we excavated Santa Maria shell-midden site (Clemente Irigayen II Property). The site revealed that the two cultural strata (the shell layer and the soil layer). The pottery of the upper layer (the shell layer) are the black pottery and the brown pottery. The pottery of the lower layer (the soil layer) is the red-slipped pottery. This is to provide important data for establishing the cultural sequence in this area.

So we needed to excavate shell-midden sites in the western side of the Cagayan River for the comparative study. We selected Catugan shell-midden site for the excavation in 1996.

IV. Catugan village

Catugan is one of the villages of Lal-lo municipality in Cagayan province, northern Luzon. This village is located in the western side of the Cagayan River (Fig. 2). There is an island in the Cagayan River at this point. This island is called "Lafu Island". The Cagayan River is divided into two streams: the main stream is the Cagayan River, and the stream that branched out is the Malanao River. The length of the Malanao River is about 5000m, and the width is about 225m.

The Malanao River flows just the eastern side of Catugan. The Malanao River is not so deep. Sometimes we saw people gathering shells by using the method locally called "karwas". This is operated by several men who hold a net and walk backward in the shallow part of the river and kicking the sand of the bottom of the river so the shells can get into the net (Ogawa 1997: 131-132).

Majority of the inhabitants of this village are the Ibanags and the Ilocanos. For living, they are engaged in farming and fishing activities. Rice is grown in the western part of the village. In the southern part of Lafu Island, corn and peanuts are planted. Fishing is only a supplementary activity.

In Catugan, there are two creeks which run from the west to the east: One is located in the northern part of the village which separates Catugan village and Malanao village, while the

II. Historical background of Lal-lo

Lal-lo is one of the towns in the lower reaches of the Cagayan River (Fig. 1). Although it is a quiet town now, it was the political, military and religious center of northern Luzon during the early period of the Spanish era (Aoyagi, Aguilera, Ogawa and Tanaka 1986:51). Fort Lal-lo and Lal-lo Church tell us the prosperity at that time. Lal-lo Church played a role of a Diocese church from 1595 to 1839. Lal-lo was called "Nueva Segovia" during the Spanish era.

One of the famous products of Lal-lo is a fresh water bivalve shell called "Kabibi" (*Batissa childreni*). This shell can be collected only in Lal-lo, Camalaniugan and Gattaran. This is the dominant type of shell found in the shell-middens in this area. Our research in the lower reaches of the Cagayan River revealed 24 shell-midden sites. Excavations of these shell-middens would make possible to tell the long history of shell-gathering in this area and the people's subsistence and the daily life. I would like to review the history of the research of Lal-lo shell-midden sites and to locate our research in the stream of the history of the prehistoric research of the Philippines.

III. Previous researches of Lal-lo shell-middens

In 1971, a shell-midden site in Lal-lo was first discovered by Mr. Israel Cabanilla, a Museum Researcher and Mr. Yoji Aoyagi, a Museum Honorary Researcher. They were engaged in the archaeological project in Kalinga-Apayao Province at that time (Cabanilla 1972). In 1972, Mr. Cabanilla and Mr. Aoyagi conducted an excavation in Magapit, Lal-lo. They excavated two squares. One was located on the top of the hill and the other was on the slope of the hill. The excavation revealed polished stone adzes, stone beads, clay pendants, clay spindle whorls and bone tools (Cabanilla 1972, Aoyagi 1977).

Ms. Thiel conducted the archaeological excavation of Magapit shell-midden site (Loc. 2) in 1978 (Thiel 1987). She revealed many earthenware sherds and clay objects.

Mr. Aoyagi hoped to conduct an extensive study of these shell-midden sites. So he conducted explorations in Lal-lo for several times (Aoyagi 1983, Aoyagi and Tanaka 1985).

Mr. Orogo, Assistant Researcher of the National Museum at that time, excavated a shell-midden site in Camalaniugan in 1980 (Orogo 1980).

From 1985 to 1986, Mr. Ogawa and Mr. Aguilera conducted an intensive exploration. Then, they found 18 shell-midden sites mainly on eastern side of the Cagayan River (Ogawa and Aguilera 1992).

The discovery of these many shell-midden sites by them is one of markers in the history of the researches of Lal-lo shell-middens. Because this intensive exploration made a way to an intensive research of the specific area of the lower reaches of the Cagayan River.

It is indispensable to research a specific area intensively in order to establish the cultural sequence. The excavation of Tabon Caves by Fox in 1960's is one of the earliest such a kind of researches (Fox 1970). And archaeologists of the National Museum such Mr. Ronquillo conducted explorations and excavations of cave sites and rockshelters in Peñablanca, Cagayan from the middle of 1970's to the early 1980's (Ronquillo 1981). Now researches in Batanes islands (boat shape burials, jar burials and ijan) headed by Dr. Dizon (Dizon 1995) and researches in Calatagn, Batangas by de la Torre (de la Torre 1995) and others of the National

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田 中 和 彦

Preliminary Report of the Archaeological Excavation of
Catugan Shell-midden (Dumbrique Site),
Lal-lo, Cagayan, Philippines.

Kazuhiko Tanaka

I. Introduction

It is indispensable to excavate a well-stratified archaeological site for establishing a clear chronology of sites in the Philippines.

Fortunately, our excavation in 1995 in Santa Maria shell-midden (Clemente Irigayen Property Site), Santa Maria, Lal-lo, Cagayan revealed a well-stratified site. The site is composed of at least two main cultural layers (a shell layer and a clay layer). From this site, we have good data for establishing chronology of sites on the eastern side of the Cagayan River. In 1996, we wanted to collect the same kind of data from the western side of the Cagayan River. In order to do this, we decided to excavate Catugan shell-midden (Dumbrique Site). From previous explorations, we found that Dumbrique Site has at least two shell layers with an intermediate soil layer in between the shell layers.

The research team of Catugan shell-midden is composed of Mr. Eustaquio Larios, Jr., Museum Technician I, local laborers (Mr. Joey Dumbrique, Mr. Robinson Dumbrique, Mr. Adan Lana, Mr. Carlito Conciso and Mr. Willie Conciso) and several Japanese undergraduate students (Mr. Moritaka Sakurai, Mr. Tsutomu Koike from Tokyo University of Foreign Studies and Mr. Rintaro Ono, Mr. Shigeru Kashiwayama, Miss. Yuko Hirano, Miss. Chiaki Tomita from Sophia University) and me.

This research is a part of a joint project between Japanese archaeologists represented by Mr. Hidefumi Ogawa and the Archaeology Division of the National Museum of the Philippines. The archaeological study was supervised by Mr. Angel P. Bautista, Senior Researcher and zooarchaeologist of the National Museum and Mr. Hidefumi Ogawa. This is also a part of the project entitled "Excavation of Lal-lo Shell-middens" financially supported by the international research fund of the Ministry of Education in Japan (Represented by Mr. Hidefumi Ogawa, an Assistant Professor of Tokyo University of Foreign Studies, Project No. 07041006).