IRAW @ Bagan 2018 Field Season

Preliminary Report

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Excavation on Nat Yekan from Thet Soe Mountain

In 2018, a team of archaeologists from the IRAW@Bagan Settlement Archaeology Project under Dr. Gyles Iannone excavated the site of Nat Yekan. The excavation targeted the area on Thet Soe Mountain.

The excavation unit was located on grid site 2223 a and b. The excavation area included a safety wall, and the team worked to ensure the safety of the site.

The digging process involved the careful removal of layers of soil to reveal the underlying structures and artifacts. The team recorded their findings meticulously, including the locations of all artifacts and features.

The excavation area was divided into grids, and the team worked systematically to uncover the site. The excavation process was ongoing at the time of writing, and the team continues to work on the site to further understand the historical context of Nat Yekan.
Soil Horizon sub-type - 2009

Top plan Datum 2, Datum 1, 2, 3, 4, 5

Reservoir Wall Surface in top plan 2018

F/1a Munsell colour book Light Olive brown 2.5 YR 5/4

Excavation Unit 2018

Lining 223a-F/1a in Top plan Datum 1, 0. 2018 Reservoir Lining Dr. Gyles 2018
Surveying and Water Management

IRAW Research Team ကို ပေးထားသောအချက်များကို အသုံးပြုပါသည်။

Surveying အားလုံးကို တစ်ရပ်တစ်ချက်အဖြစ် Total Station အားဖြင့် GPS points ဖျင်သည်။ Elevation ပေးထားသောအချက်များကိုလည်း Survey ရရှိရင် အခြေခံချက်အဖြစ်ခေါ်သည်။ Survey များကို အခြေခံချက်အဖြစ် စီစဉ်ထားသော စီစဉ်ရေးသားမှုတို့ကို ထောက်ပါသည်။

Survey တွင် 2223 a နှင့် 2223 b အဖြစ် ချင်းများသည် ယူစဉ်များစွာ ဖြင့်မြောက်ပါသည်။

Summery

2223 a တွင် နုပိုင်နှင့် grid အဖြစ် ဖြစ်သည်။ unit များကို ပေးထားသော Surface layer ကို နေရာတစ်ချက်ပေးထားသော ဖြစ်သည်။ Level 2 ကို Cultural layer ဖြစ်သည်။

Conclusions

ယူစဉ်များနှင့် ပြောင်းလဲသည်။
2223 b-2 သုတေသီ survey တွင် သုတေသီ အတွက် အသုံးပြုသော စစ်သုတေသီ တစ်ခု site ဟင်းနှင့် အောက် recording form တွင် Site a သုတေသီ ပေးဆောင်သော စစ်သုတေသီတစ်ခု အခြေခံ၍ ထိုစစ်သုတေသီ အဖြင့် စစ်သုတေသီအဖြစ် ဖော်ပြနေသော စစ်သုတေသီသုတ်၍ စစ်သုတေသီ တခု Site a ပေးဆောင်သော စစ်သုတေသီတစ်ခု ဖော်ပြန်၍ GIS ပေးဆောင်သော စစ်သုတေသီ။
2223 a-1 unit
Surveying

2223 a-1 အခြေ ပေါင်းထည့်ခြင်း
Excavation on Ka Tat Kan from Thet Soe Mountain

Dr. Gyles Iannone
Dr. Scott Macrae
Kong Cheong

Munsell book 2223a 2223b-1 1x2 2223b-2 2x2

Dr Gyles Iannone
Keiko Lui
Ellie Tamura
Yuan Lucy Qin

2223b-2 2x2 2x2 1x2 2223b-2/a 2223b-1 1x2 2x1 1x2 2x1

Feature

Top plan

Rubbing-Stone

profile/section

photogrammetry

Feature
စီးပွားရေးအစိတ်အပိုင်းအားဖြင့် ဆောင်ရွက်ရန် အချိန်ကြားလာနေသော အခြေအနေသောစီမံခန့်ခွဲမှုကို အားလုံးနေရာမှ စီပေးနေသည်။

သို့စေတာ အစိတ်အပိုင်းအားဖြင့် ဆောင်ရွက်ရန် အချိန်ကြားလာနေသော အခြေအနေသောစီမံခန့်ခွဲမှုကို အားလုံးနေရာမှ စီပေးနေသည်။

၂၂၂၃ ဗီ-၁ (profile/section) အလုပ်သို့မဟုတ် (Top plan) အလုပ်သို့မဟုတ် (photogrammetry) တွင် စီပေးနေသည်။

၂၂၂၃ လောက်တို့၏ အကြီးအကျယ်ကို စီပေးနေသည်။

(၁) အလုပ်သို့မဟုတ် (photogrammetry) တွင် စီပေးနေသည်။
(1) Level (2) A Horizon ကမ်းခြေအရာသို့
(2) Level (3) E Horizon ကမ်းခြေအရာသို့
(3) Bedrock ကမ်းခြေအရာက သော့သတ်မှတ်ချက်ပြုသည်။ သော့သတ်မှတ်ချက်တွင် အရာကို သိသိသမိုင်းလေ့လာသည်မှ ပြသခြင်းဖြင့် သတ်မှတ်ချက်တွင် ပြသခြင်းဖြင့် သတ်မှတ်ချက်တွင် သတ်မှတ်ချက်တွင်

စိတ်ဝင်စားသောအတွက်:
အသိသိသာသိ
ဘုရားခေါင် 2223b-2 စွဲအဆိပ်အလျင်

ဘုရားခေါင် 2223b-2 စွဲအဆိပ်
თურისტული 2223b-1 აღკვრისადმი დუღვების

თურისტული 2223b-1 სახელის შიდა
ဂျီဒီပေါ် 2223b-1 ရာဇဝင်ရာဇဝင်ကျော်ကြားနှင့်များသောကြောင့်ပြုပြင်ကျင်းပသည်။

ကျော်စားသောကြောင့် များသောကြောင့်ပြုပြင်ကျင်းပသည်။
Excavation on Nat Yekan from Thet Soe Mountain

To excavate the archaeological site, the water tank called Nat Yay Kan (local name Kyauk Yay Kan), one Canadian group led by Dr. Gyles Iannone and a Myanmar group led by Dr. Pyiet Phyo Kyaw arrived Bagan at 28th April, 2018. Nat Yay Kan is situated at the top of the Thet Soe mountain, in the eastern part of Tuyin and between the mountain of Tuyin and Thakya and beside the highway-road of Nyaung Oo – Kyauk Padaung. Thet Soe mountain is above 1000 feet from the sea-level and located about 6 miles from the southeast of Bagan. Geography of Mount Thet Soe and geography of Mount Tuyin are related. Mya Kan is situated beneath both mountains. Firstly, the scholars survey the water pass way around Mya Kan to investigate the ancient water storage system, ditch, and the way of water fall down from the mountain to the Mya Kan. According to the ancient tanks of South East Asia, the scholars decided to excavated Nat Yay Kan having stone carving. The name of the excavation is IRAW@Bagan Settlement Archaeology Project. Firstly, the scholars survey two times before doing excavation. Excavation team includes 8 people from Canada and 11 people from Myanmar. Total is 19 members. Excavations were carried out at 2 sites; Nat Yay Kan and Kattat Kan located about 50 m from Nat Yay Kan. Depend on the 2223 pagoda near these sites, they gave the name of the sites. The name of the site of Nat Yay Kan is 2223a, and the name of site of Kattat Kan is 2223b. Among these two sites, we want to describe about the site of 2223a.

According to the surviving wall of the tank and the pass way of water, they speculate the water exist way (ditch) which may be situated upon the top of Nat Gayone pagoda (Naga Buddha). So, they decided to excavate upon Naga Buddha. They took a
center line of excavation unit on the top of pagoda. The name of first site of Nat Yay Kan is 2223a1 and took a grid of 2x4 square metres. Firstly, we cleaned up the unit of the site and made a roof and built up a safety wall. And then, we started the excavation on 4th May. The supervisor of 2223a is Mr. Kong F. Cheong and team member are Kathleen Foreword, Stephany Rivera, Paing Thet Phyo, Moe Sat Wathan, Hsu Thinzar Toe, Khin Kyi Phyu Thant and Kyaw Swar Win. Before starting the excavation, we checked up the string of the roof and drew the sketch of the surface layer and situation. When drawing the excavating unit, it needs to draw top plan and profile. Profile is the side view of the unit and top plan is the direct view of the unit. It needs to set up the 3 datum points for drawing. We drew the north south profile line of the unit facing to the East. And then, we start the excavation using the tools: trowels, hammers, brooms, buckets, shovels and hand picks. To find the tiny artifacts, we sifted the soil which has been excavated. We attained the ferric natural stone balls from sifting. Moreover, it has been found sandstone which has the shape tamarind from the unit of the site. We had a ceramic from sifting. Soil layer is the natural level type. And then we continued excavation to reach the different colour of the soil. And then it reached the level two of the layer of the soil on 6th May. The type of the soil level two is soil horizon and sub-type is A horizon. The supervisor suggested that the soil from the level two is backfill soil when the villager cleaned the tank. We set up another two datum points to be easier. We named each datum, as Datum 1,2,3,4,5. After the soil layer of level-2, it changed to another layer called feature 1a reservoir wall surface. The top plan of the Reservoir wall surface was drawn on 7th May. When we tested the soil of F/1a, using Munsell colour book, the colour is light alive brown 205 YR 5/4. When found ceramic, limestone and
ferric sandstone from F/1 layer. Then, we continued the excavation, and reached the Reservoir lining layer regarded as Feature /1a. And then, we drew the top plan of 2223a-F/1a and measure the height of the Reservoir Lining from 0 point of D1. We found the bullet from F/1a on 9th May. This bullet is a new one. Small limestone and shale layer were mostly found. Then, we found the mud layer on 9th May. And then, we measured and drew the profile of F/1a. On 20th May, Dr. Gyles Iaanone found the sandstone floor at the southeast of the unit. This sandstone bed or floor is whiter and harder than others. On 11th May, Dr. Gyles continued digging from the southeast of the unit where the sandstone bed is found, to the centre. Then other members made digging from the southwest of the excavation unit to reach the same level as where the sandstone bed was found. On 13th May, 2223a-F/1a was dug out. The datum 6 was erected to make easier drawing in Profile and Top Plan and it needs to be more accurate when taking centre line as the unit is deeper and deeper. The Profile was drawn facing east, based on the Datum 6 running north to south. On the same day, while surveying, Scott found a A.D. 11th century style headless Buddha statue from southwest of the Nat Yay Kan. On 14th May, The sandstone bed from the east of the unit, was continued to dig. From this feature 1b, a potsherd and a piece of mortar was found. Dr. Gyles pierced two iron bars at the northwest corner of the unit to know whether there is sandstone bed or not. On 15th May, team members measured the depth from the present layer to the Naga Buddha Image and it is 40cm. A potsherd was found from sieving on 15th May. On 16th May, the western part of the unit was continued to dig and compact natural clay layer and young sandstone layer were found. But no sandstone bed was found in the western part of the unit. An iron bar was pierced in the layer besides the southern wall, the sandstone bed is sloped down into the
lake. On 17th May, we did the adjustment of the unit walls and site cleaning. After that, the top plan and profile of the 2223a-1 F/1b was drawn. On 20th May, cleaning the rubbishes in the water tank and backfilling of excavated unit were done. The archaeology students from Dagon University led by U Than Htut helped in these works. Firstly, a plastic sheet was applied on the surface of the excavated unit. Then the excavated sandstones were put into that unit to have the soil strong. Finally, excavated soil lasted from sieving was put to the natural layer. In backfilling, to have nearly the same as the condition before excavation, sandstones and soil were put turn by turn.

Surveying and Water Management

Surveying is one of the researches of the IRAW@ Bagan Team. Taking GPS points and measuring elevation are included in surveying. From surveying, the drainage passages on Mt. Thet Soe were clearly seen. Some drainage ways were misled since sandstones were displaced by Forestry Department in the Upper Myanmar Green Project. Surveying in the north of the Nat Yay Kan was done up to the waterfall on 11th May. On 16th May, GPS points of the temple and the wall of the ponds located in the north of 2223b were recorded. Then, the pond at the U Phaung Pagoda and the pond near the Paw Taw Mu Pagoda were recorded. From these points, the drainage ways of ancient Bagan can be known.
Summary

2223a unit was excavated in 2x4 square metre grid. The surface layer is the natural layer and one potsherd was found in that layer. Layer 2 is the cultural layer and irony sandstones were mostly found. 2223a F/1a is the reservoir wall surface and one potsherd and a bullet were found. 2223a F/1b is the reservoir lining and it is assumed to be artificial. From the east of the unit to the centre, sandstone layers and mud layers were found in the west. From this F/1b, one piece of mortar and one potsherd were found.

Conclusions

Three groups in one team did the research at Pagan from 28\textsuperscript{th} April to 18\textsuperscript{th} May: one group in 2223a-1, another one in 2223b-1 and 2223b-2, and the last one in survey. The site supervisor filled the record form everyday. In 2223a-1, the artificial sandstone bed was found in the east and young sandstone layers in the west. The sandstone bed run to the centre line, above the Naga Buddha. The inclined sandstone bed was supposed to be because of the weight of the soil above or earthquake. The survey team leader found many ponds and drainage ways. These might be the water sources of the ancient Pagan. The ponds on the Mt. Thet Soe drain to the Mya Dam that is bottom of this mountain, step by step. Using GIS technology, the situation of those ponds was studied.
Fig (1) 2223 a-1 unit- before excavation

Fig (2) Excavation process at 2223a-1
Fig (3) Survey time

Fig (4) 2223a-1 – after excavation
Fig (5) backfilling after excavation at 2223a-1
Excavation on Ka Tat Kan from Thet Soe Mountain

Introduction

An excavation of Nat Yay Kan on Thet Soe Mountain was done in the place between Paw Taw Mu Pagoda on Tu Ywin Hill and U Phaung Pagoda. It took 20 minutes’ walk from Tu Ywin Monastery to Nat Yay Kan. The aim of excavation is to do a research on water resource usage, agricultural condition, social habitation and the former existence of pagoda, residence and buildings in cooperation with Trent University, Canada and Archeology Department.

Field trip started under the supervision of Professor Dr. Gyles Iannone, Dr. Scott Macrae and Myanmar scholar, Dr. Pyae Phyo Kyaw on 28th May 2018. On 29th and 30th May, Professor Dr. Gyles Iannone, Dr. Scott Macrae and Dr. Pyae Phyo Kyaw gave briefing on ways to excavate, examining the earth with the use of Munsell book, excavators and the goals and procedures on excavation.

Excavation procedure

Excavation on water supply resource management of ancient Bagan on Thet Soe Mountain was initiated on 1st May 2018. 3 trail pegging was done for excavation. Under the supervision of Professor Dr. Gyles Iannone and Dr. Pyae Phyo Kyaw, trial pit No. 2223a on Stone-Sculptured Dragon Pagoda (Musalainna) at the north west of Thet Soe Mountain Nat Yay Kan and No. 2223b-1 and 2 in the middle part of Ka Tat Kan which is 50 meters away from the east part of Nat Yay Kan and the northern brim.

For No. 2223b-1, 1x2 meter hole was made and for No. 2223-2, 2x2 meter hole was done by Team-B.

Supervisors         Saw Tun Lin and Dr. Nwe Nwe Moe
Members             Khin Lay Maung, Keiko Lui, Ellie Tamura. Yuan Lucy Qin
The excavation work began with trial pit No. 2223b-2 which is 2x2 meter on 4\textsuperscript{th} May. Findings on the excavation of soil No. 1, 2, 3 and 4 are as follows. Soil 1 is a type of soil whose superficial layer was the sandy soil. Soil No. 2 is whiter than earth and is harder. A few small stones were found in this soil. Broken pots were excavated on the south-east and south-west of the pit. These were small and red. Soil No. 3 started changing at the depth of 17 centimeters. At the same time, 2x2 meter pit transformed to 1x2 meter and is known as 2223b-2/a. The colour of soil No. 3 is brown and is the natural soil. A few pieces of broken pots were found in this soil. After digging 14 centimeters of soil No.3, No. 4 which was dark brown in colour was found.

On the 4\textsuperscript{th} day of excavation, on 7\textsuperscript{th} May, the bedrock of the lake was found. It is bright dark brown. Rubbing-stone which was made of sand stone appeared at the base layer. On 8\textsuperscript{th} May, profiling, drawing top plan, taking record on the detail information and having photogrammetry of pit No. 2223b-2 were documented.

A 1x2 meter pit was made in soil No. 2223b-1 on 9\textsuperscript{th} May. The findings on the excavation of soil No. 1, 2, 3 and 4 are as follows. The top layer of soil 1 is sandy soil earth. Soil 2 has the same colour, brown, and is not solid. Some pieces of broken pots were discovered on the south of the excavation area. They were small and red. Soil 3 started changing at the depth of 32 centimeters. It is brown and is a type of natural soil. On the north of the excavation was Feature. It was a man-made part and base layer was found at 50 centimeters depth. The bedrock layer is bright brown.

On the south of excavation was unspoiled. A 36x20x12-centimeter-sand stone was found in Soil 3 which was on the south of the excavation area. On the fifth day of the excavation, on 14\textsuperscript{th} May, the base rock layer was first found. A roof tile was discovered 131 centimeters away from West Datum line and 84 centimeters away from East Datum line. Profile, top plan, detail records and photogrammetry of Pit No. 2223-b 1 were done on 16\textsuperscript{th} May.

On 17\textsuperscript{th} May, under the approval of Department of Archeology and National Museum, superficially damaged rock bricks were recorded in Pit No. 2223b-1 and were piled separately. Within these damaged pieces, two black pieces of pot were found. The back wall was left undone.
On 18\textsuperscript{th} May, profile, top plan, detail records and photogrammetry of 2223 b-1 were fully accomplished.

On 19\textsuperscript{th} May, excavated pits were filled up together again. This process included laying the rain cloth and putting recorded papers. After that, layering the soil was implemented carefully to make the excavated area as near as possible to the previously untouched area. In this piling up process, students from Dagon University and those led by U Than Htut Oo, Lecturer, from Archeology Department came to help while observing the process.

Conclusion

In this research project, excavation was done one layer after another until the base systematically.

1. Surface layer,
2. Level (2) A Horizon,
3. Level (3) E Horizon, and
4. The existence of Bedrock were researched. Keeping records, categorizing and engaging in laboratory research for the excavated pieces of broken pots, items and soil are about to be continued.

\[\text{Dr Nwe Nwe Moe}\]

\text{Assistant Lecturer}
Pegging Pit No. 2223-b 2 before excavation

Pit No. 2223-b 2 after excavation
Pit No. 2223-b 1 after taking away the damaged layer of the wall on the north

Nat Yay Kan on Thet Soe Mountain Excavation Team