New light on the archaeology of the Majapahit court capital

Amrit Gomperts, Arnoud Haag, Djoko Umbaran and Hari Subekti

Calling attention to a recently found but hitherto undisclosed 1941 report on the archaeological dating of the Majapahit royal palace site, we reflect upon the extent of the court capital in the 14th-15th centuries, and its Indian-styled sanitation and water management.

As war loomed over the Pacific, the Dutch colonial government announced excavations on the site of the 14th-century Majapahit court capital. On 14 May 1941, the Dutch colonial newspaper, *De Indische Courant*, turned insider information into front-page news, which we translate as follows (explanatory details are added between square brackets):[1] "The Majapahit Royal Palace (*Kraton*). New Excavations —Our editor in Batavia reports: word has reached us that the Head of the Archaeological Service (*Oudheidkundige Dienst*), Dr. W. Stutterheim [1892-1942, in office 1936/7-1942], intends to instruct the Service's pre-historian, Dr. W. Willems [1898-1964], to conduct excavations on the site of [Kĕḍaton in] the village of Sĕntonorĕjo near Mojoagung. The Javanese tradition has pinpointed this site as the spot where the royal palace of the great Majapahit Empire (1293-1520) once stood. Excavations were carried out there before [in 1930] but budgetary cuts halted these. Hopefully, the new excavations planned will provide certainty about [Kĕḍaton as] the site of the [14th-century] royal palace [because, in 1924] Maclaine Pont [1884-1971] suggested a different terrain as the location of the now vanished royal palace during the heyday of the Majapahit Empire, namely [the Menak Jinggo remains] near the village of Trowulan. However, many available facts and details argue in favour of the Archaeological Service's views".

Fig. 1: The 14th-century Siti Inggil site (now called Caṇḍi Kĕḍaton and Sumur Upas) in Kĕḍaton during the 1941 excavations. Willems took the photograph from the centre of the terrace looking towards the north-west. According to local Javanese oral tradition, the Majapahit kings granted audience to their senior officials here inside the royal palace. These historic brick structures were demolished during museum construction activities in July 2013 (© and courtesy of Erik Willems).

Belated triumph over pseudo-archaeology

Actually, the Dutch architect, H. Maclaine Pont, had already honestly acknowledged in 1927 that he had never even investigated the Menak Jinggo remains.[2] Most pertinently, however, the colonial government planned the 1941 excavations in a decisively concerted effort to refute the Dutch architect's other 1924 'hypotheses' that the brick remains in Kĕḍaton [lit., Royal Palace] represented nothing more than a *tani-woning* [farmer's dwelling] postdating the Majapahit period (Fig. 1).[3]

Just before his promotion to the *Raad van Indië* [Council of the Indies] during his last days in office as the Governor of East Java, Ch.O. van der Plas (1891-1977, in office 1936-June 1941), who took a keen interest in Majapahit history, personally authorised a huge budget of 20,000 Dutch East Indies Guilders (now approximately 300,000 Euros) for the excavations. From early July until mid December 1941, Willems unearthed some 750 square metres of the north-western and western parts of the Siti Inggil terrace in Kĕḍaton, a brick-lined earthwork measuring some 66 metres north-south by 56 metres east-west and some 2 metres in height where, according to local Javanese oral tradition, the Majapahit kings granted audience to their senior officials inside the royal palace (Fig. 1). After the archaeologist W.F. Stutterheim passed away in 1942, his successor, the art historian A.J. Bernet Kempers (1906-92, in office 1947-53), published an inconclusive summary of the 1941 Kĕḍaton excavations in 1949.[4] However, we recently found correspondence of the ceramics expert and former curator of the Royal Batavian Society of Arts and Sciences ceramics collection (now in the National Museum in Jakarta), E.W. van Orsoy de Flines (1886-1964, in office 1932-42, 1945-59),

Fig. 2: Medieval round brick-walled well located north-west of Kumitir village (© Arnoud Haag).

which offers new insights into the 1941 Kĕḍaton excavations.[5] According to six letters exchanged between Willems, Van Orsoy de Flines and Stutterheim between 25 August and 30 December 1941, the excavator sent four boxes with sherds unearthed at the Kĕḍaton site to the ceramics specialist. Summarising his 29-page reports on the first two boxes in his letters to Stutterheim, Van Orsoy de Flines dated at least 92.4% of 765 sherds —originating from Central, East, South-east and South China as well as from Tonkin, Cambodia, Thailand and Burma— to the 14th and/or 15th centuries. In his last letter to Stutterheim on 30 December 1941, the ceramics expert authoritatively dated nearly all sherds in the third and fourth boxes to the narrow period 1350-1500. Van Orsoy de Flines was also fully aware of the archaeological context of the 1941 Kĕḍaton dig, concluding: "*Het geheel maakt nog meer den indruk van een rijke hofhouding, dan de vorige zendingen deden*". In our contextually amended translation, "all sherds [in the last two boxes] leave me with an even stronger impression of a prosperous [Majapahit] royal household [on the Kĕḍaton site] than the previous [two] deliveries did". These words have not lost any of their actuality, because the site has now been entirely unearthed and partly destroyed (Fig. 1).

> **"All sherds leave me with an even stronger impression of a prosperous royal household"**

When a team of archaeologists recently staged a dig in Kĕḍaton, the *Jakarta* Post English-language newspaper reported on 11 September 2008: "Researchers find capital city of Majapahit, but not palace".[6] So evaluating his reports 77 years later, Van Orsoy de Flines' archaeological dating of the Siti Inggil terrace in Kĕḍaton will go into history as the only one ever undertaken, because the sherds excavated there in 1941 have seemingly been lost. Moreover, in July 1941, Stutterheim also reconstructed the layout of the Majapahit royal palace on the basis of the 1930 Kĕḍaton excavation plan in combination with a close reading of Prapañca's description of the royal palace in the 1365 Old Javanese *Nāgarakṛtāgama* eulogy.[7] Hence, Van Orsoy de Flines' sherd analyses in September-December 1941 constituted the final piece of missing evidence which confirmed that Kĕḍaton —the royal palace site according to local Javanese oral tradition —positively dated to the Majapahit period (14th-15th centuries), thus irrevocably refuting Maclaine Pont's 'hypotheses'. However, all this crucially important evidence was not available to later archaeologists. Consequently, the publicity-savvy Dutch architect's fantasies have dominated Majapahit-Trowulan archaeology for 94 years, leaving it with a lasting legacy of irrationality.[8]

Mapping habitation patterns

Invoking Maclaine Pont's 1926 plan of a make-believe Majapahit megalopolis covering a vast area of 150 square kilometres, John Miksic conjectures that the remains of densely settled clusters of the 14th and 15th centuries were spread over 100 square kilometres in

the Trowulan area and 'rough calculations' yield a minimum population of 200,000.[9] Both numbers seem excessively large. In Miksic's imagined sketch plan of "sacred sites and water features", the distribution of 42 medieval wells differs from previous mappings as well as our own earlier GPS data on 139 wells.[10] As stripping medieval brick remains has become part of the local Trowulan economy and the pace of site destruction has increased alarmingly in recent years (e.g., Figs. 1, 3 and 5), we decided to fieldwalk the area shown in Miksic's sketch plans. Adopting Stuart Robson's anthropological approach of community-based archaeology in his 1971 survey of Bědulu, the medieval capital of Bali, we scouted out the Trowulan region by actively engaging the Javanese villagers in our search for locally known *sumur kuno* [ancient wells].[11] In this manner, our team systematically combed an area of more than 75 square kilometres in two and a half years, tracing another 458 medieval wells. Our results, including wells that others had mapped previously, are shown in Fig. 6.[12] The highest density of wells for 50% of all of them appears within a circle with a radius of 1.04 km around the Kěḍaton hamlet, thus spatially confirming the Majapahit royal palace site as the centre of medieval habitation.[13] On the basis of the distribution of the wells mapped, we estimate that the extent of the Majapahit court capital including all the suburban and adjoining villages would have stretched over an area covering at the most 30 square kilometres. Using the population density data of East Javanese towns at the end of the colonial period, a maximum population of 25,000 seems realistic.

Fig. 3: Medieval round brick-walled well, 2.8 m deep, located north-west of Kumitir village. The Sanskrit *Kāśyapīyakṛṣisūkti* text (156-61) describes that the two flanking boulders (*śilākhaṇḍa*) below strengthen the structure of the brick-walled well. These brick remains were destroyed in November 2017 (© Arnoud Haag).

Fig. 4: Medieval rectangular brick-walled well south-east of Kumitir village. Note the high groundwater level at about 1.5 m below the surface (© Arnoud Haag).

Fig. 5: An Indian-styled medieval pit latrine [*jumblĕng*] comprising six terracotta rings [*jobong*] in Mutĕran village, which was destroyed in November 2017 (© Arnoud Haag).

Indian influences

On site, we mapped three types of medieval wells: about 350 round brick-walled wells, some 80 rectangular brick-walled wells, and about 150 wells comprising four to seven terracotta rings stacked on top of one another, each approximately 25 centimetres high (Figs. 2-5). The round brick-walled wells and those consisting of terracotta rings are undoubtedly medieval, but a few rectangular brick-walled wells might postdate the Majapahit period. On the royal palace site in Kěḍaton, we observed 51 round and rectangular brick-walled wells. No terracotta rings were found on sites known as funerary monuments [*caṇḍi*], which served primarily as sacred spaces for ancestral worship. According to the Javanese villagers, the 'wells' consisting of terracotta rings functioned as *jumblĕng* [pit latrines].

Discovered in 2013, we became aware of a hotspot of 33 wells, consisting of all three types and arranged irregularly in a small area spanning a mere 263 square metres. So it gradually became clear to us that these may have been part of a public place reserved for sanitary purposes, where many people gathered in the very centre of the medieval town. Such details are unknown from post-1500 court architecture in Java and Bali. Although water management figures prominently in South-East Asian archaeology, urban sanitation is virtually an unaddressed issue in the field. So we turned our eyes to the Indian subcontinent.

All this crucially important evidence was not available to later archaeologists

Indeed, wells with terracotta rings are known from all over India, dating back to centuries BC and in use until medieval times. Indian archaeologists refer to them as 'ring wells' and conclude that most of them were used as soak pits.[14] Since the groundwater level is quite high in Trowulan, often situated 1.5-7 metres below the surface during the monsoon season (Fig. 4), and leaky soak-pit latrines would have polluted the groundwater in such a densely populated urban environment, the Majapahit 'ring wells' probably would have functioned as sealed cesspits constructed well above the groundwater level (Fig. 5). Similar brick structures as shown in Fig. 1, round wells constructed from curved bricks as depicted in Figs. 2-3 and medieval clay water pipes found on site in Trowulan, also exist in India. Moreover, wells constructed from well-burnt bricks, water management and local water quality are important topics in the Sanskrit text on agriculture, *Kāśyapīyakṛṣisūkti* (Fig. 3).[15]

Prapañca's 1365 description of the Majapahit court capital also reveals influences from Sanskrit texts, for example, *catuṣpatha*, the central crossroads inhabited by spirits. More importantly, Prapañca's contextual use of the Sanskrit word *brahmasthāna* [Brahma's place], which is located on the *catuṣpatha*, goes back to Sanskrit texts on urban architecture and town planning, like the *Mānasāra* (c. 6th century) and the *Mayamata* (c. 10th century), denoting the conceptual centre of a settlement, a spot reserved for offerings, shrines or temples.[16] All this points to significant influences from ancient Indian town planning.

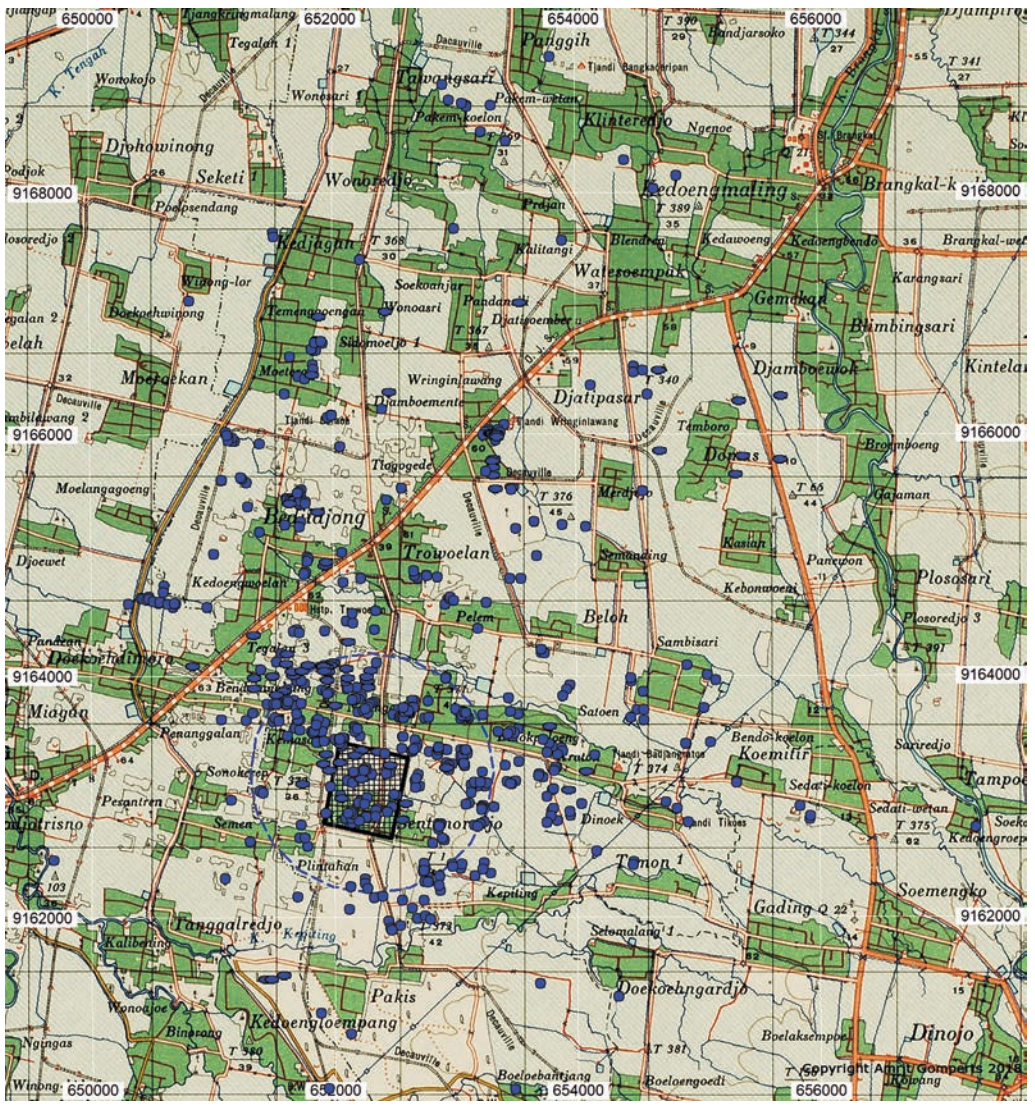

Fig. 6: The site of the vanished 14th century Majapahit royal palace (black rectangle) projected onto the 1941 topographic map of Modjoagoeng with added WGS84, UTM, zone 49M grids (white) appearing at intervals of 2000 m. The solid circles (blue) represent our own GNSS field data on 597 wells. The 81 solid ovals (blue) are now vanished wells taken from published mappings. The highest density of wells for half of all 678 appears within the large dashed circle (blue).

Amrit Gomperts amritgo@planet.nl
Arnoud Haag arnoudhaag@yahoo.com
Djoko Umbaran and **Hari Subekti**
are independent researchers.

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Notes

1 See http://www.delpher.nl/nl/kranten
2 Gomperts, A., A. Haag & P. Carey in collaboration with D. Umbaran. 2014. 'The Archaeological Identification of the Majapahit Royal Palace: Prapañca's 1365 Description Projected onto Satellite Imagery', *Journal of the Siam Society* 102, p.70 n.4.
3 Maclaine Pont, H. 1924. 'Madjapahit, Poging tot Reconstructie van het Stadsplan [...]', *Oudheidkundig Verslag*, pp.36-75, 157-99. Cf. Stutterheim, W.F. 1948. *De Kraton van Majapahit*. 's-Gravenhage: Nijhoff, p.5 n.14.
4 Bernet Kempers, A.J. 1949. *Oudheidkundig Verslag* 1941-1942, pp.44-5.
5 Arsip Nasional Republik Indonesia, Jakarta: archives KBG Dir 1095 & 1096.
6 See http://archive.fo/w8X7v
7 Gomperts, A., A. Haag & P. Carey. 2008. 'Stutterheim's Enigma: The Mystery of His Mapping of the Majapahit Kraton at Trowulan in 1941', *Bijdragen tot de Taal-, Land- en Volkenkunde* 164(4):411-30.
8 E.g., the highly imaginative 'Majapahit canal theory' which is based on scientifically unfounded claims, *ibid.*, note 7 Gomperts et al. 2008, p.421 n.5; *ibid.*, note 2 Gomperts et al. 2014, pp.72-3 n.8.
9 Miksic, J. 2012. 'Life among the Ruins: Habitation Sites of Trowulan', in Alexandra Haendel (ed.) *Old Myths and New Approaches: Interpreting Ancient Religious Sites in Southeast Asia*. Clayton: Monash University Publishing, p.160 Fig.10.1, pp.172-3.
10 *Ibid.*, note 9, Miksic, p.171 fig.10.9.
11 Robson, S.O. 1978. 'The Ancient Capital of Bali', *Archipel* 16, pp.75-89.
12 Gunawan. 1985. *Sumur dari Situs Banten Lama dan Trowulan*. Depok: University of Indonesia, Map 5; Mundardjito et al. 1986. *Rencana Induk Arkeologi Bekas Kota Kerajaan Majapahit, Trowulan*. Jakarta: Departemen P & K, p.64; Oesman, O. 1999. *Rekonstruksi Bangunan Hunian di Situs Kota Majapahit Trowulan, Jawa Timur*. Depok: University of Indonesia, figs.24-25; Yuwono, J.S.E. 2013. 'Menelisik Ulang Jaringan Kanal Kuna Majapahit di Trowulan', http://geoarkeologi.blog.ugm.ac.id/category/kuliah/, Map 2.
13 We computed the 50% circle using Rousseeuw, P.J. 1984. 'Least Median of Squares Regression', *Journal of the American Statistical Association* 79(388): 871; 'The resulting estimator can resist the effect of nearly 50% of contamination in the data.'
14 Pande, B.M. 1966. 'Ring Wells in Ancient India', *Bulletin of the Deccan College Research Institute* 25:207-19.
15 Wojtilla, G. (ed.) 2010. *Kāśyapīyakṛṣisūkti: A Sanskrit Work on Agriculture*. Wiesbaden: Harrassowitz.
16 *Ibid.*, note 2, Gomperts et al. 2014, pp.100-2, 108-10.