
MAPPING MAJAPAHIT: WARDENAAR'S ARCHAEOLOGICAL SURVEY AT TROWULAN IN 1815

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Old maps may exist for regions that identify now “lost” archaeological sites, and georeferencing will help archaeologists to relocate those sites.

— Sarah H. Parcak, *Satellite Remote Sensing for Archaeology*, 2009, p. 50.

On August 22, 1815, the lieutenant-governor of Java, Thomas Stamford Raffles (in office, 1811–16), ordered the army surveyor Captain Johannes Willem Bartholomeus Wardenaar (1785–1869) to make a plan of the site of the ancient capital of Majapahit at Trowulan (Illustration 1).² Wardenaar produced a map, a map legend containing brief

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² F. de Haan, “Personalialia der Periode van het Engelsch Bestuur over Java 1811–1816,” *Bijdragen tot de Taal-, Land- en Volkenkunde* 92, 4 (1935): 662.

descriptions of the monuments, and several drawings. He sent the originals to Raffles in late 1815 but did not keep a copy of the map.³ This map was subsequently considered lost. Wardenaar's own copy of the legend and three sheets with drawings were handed over to the Bataviaasch Genootschap van Kunsten en Wetenschappen (Batavian Society of Arts and Sciences) in 1879.⁴ The text of both Wardenaar's legend and his jotted notes on his drawings have been published by the mining engineer and pioneer of modern volcanology, Rogier Verbeek (1845–1926).⁵ Wardenaar's *Plan of Majapahit* was subsequently traced by the present authors to the Drake Collection of the British Museum.⁶ This collection also includes copies of a few plates sent by Wardenaar to the British lieutenant-governor.⁷ In this article, we will discuss the importance of the 1815 map for present-day archaeologists of the Trowulan site.

Wardenaar's Archaeological Survey of Trowulan in 1815

On the eve of the colonial annexation of the area, Lieutenant H. G. Jourdan prepared a report of the Wirāsābā and Japan districts, dated April 28, 1813, in which he described the site of the medieval court-city:

Majapait, the ancient capital of the eastern empire is situated in Wirosobo, at the distance of about eight or ten miles. The site is now overrun with a thick bamboo jungle and few traces of this once extensive city are now to be discovered: idols, which prove that the art of sculpture had attained some degree of perfection have been dug up at different times near the spot, and there are still the remains of an edifice evidently of Hindoo construction. The natives retain a kind of superstitious reverence for these relics, which they are unable to explain but do not attempt to conceal. They regard the idols as representations of evil genie whose favor it is necessary to conciliate.⁸

According to the dates on his drawings, Wardenaar was at Trowulan between October 5 and 7, 1815. However, it must have taken the engineer captain several weeks to survey the extensive Trowulan site, which at the time was covered by thick bamboo

³ W. R. van Hoëvell, *Reis over Java, Madoera en Bali in het Midden van 1847*, vol. 1 (Amsterdam: Van Kampen, 1849-54), p. 184.

⁴ *Notulen van het Bataviaasch Genootschap* 17 (1879): 111. The documents were kept in the archives of the Oudheidkundige Dienst (Archaeological Service) at Batavia in 1941. See W. F. Stutterheim, *De Kraton van Majapahit*, Verhandelingen van het Koninklijk Instituut voor de Taal-, Land- en Volkenkunde van Nederlandsch-Indië 7 ('s-Gravenhage: Nijhoff, 1948), p. 1, n. 3. But we have not been able to trace them in Jakarta.

⁵ R. D. M. Verbeek, "De Oudheden van Madjapahit in 1815 en 1887," *Tijdschrift voor Indische Taal-, Land- en Volkenkunde* 33 (1890): 1–15.

⁶ The present authors were able to consult Wardenaar's *Plan of Majapahit* at the British Museum on March 12, 2008. See http://www.britishmuseum.org/collectionimages/AN00477/AN00477148_001_1.jpg (Registration Number: 1939,0311,0.5.36). See also Gomperts et al., "De Veertiende-Eeuwse Javaanse Hofstad Majapahit," pp. 74–75, 77.

⁷ J. Bastin and B. Brommer, *Nineteenth Century Prints and Illustrated Books of Indonesia* (Utrecht: Spectrum, 1979), p. 340. Mrs. J. H. Drake, Raffles's great-great niece, donated Wardenaar's map to the British Museum in 1939, along with a number of other manuscripts relating to Javanese antiquities that Raffles had acquired during his lieutenant-governorship of Java (1811–16).

⁸ Lt. H. G. Jourdan, manuscript, "Report on Japan and Wirosobo," dated April 28, 1813 (London: British Library, India Office Library & Records, Mackenzie Private collection 21, pt. 10), p. 355.

and teak forests. As a military surveyor, he would have had use of contemporary instruments such as a surveyor's astrolabe, a plane table with an alidade, a compass, a sextant, and chains.⁹ The *Plan of Majapahit* at the British Museum is drawn on a scale of 1:12,000, and measures 42 by 35 centimeters. The spelling of names on the map suggests that this plan is an English copy, probably dating from late 1815 or early 1816.¹⁰

The geometrical faithfulness and planimetric accuracy of Wardenaar's original survey was evident to the present authors when we imported a digital scan of the *Plan of Majapahit* onto Google Earth and projected it as a half transparent overlay on top of a high-resolution satellite image.¹¹ Using GPS mapping software, we were able to georeference the *Plan of Majapahit* with coordinates of ground-control points taken with GPS receivers, thus verifying the positions of the remains on site (Illustration 2). These ground-control points and site identifications are marked in the present article with angle brackets <...>. The corresponding coordinates are listed in the Appendix. The absolute positioning accuracy of the plan is 54 meters with respect to ground truth.¹² The georeferencing also shows that the scale bar on the plan indicates *Rijnlandse Roeden* (i.e. Rhineland Rods) even though the plan itself states "Engl[ish] Roods."¹³

⁹ R. F. de Seijff, "Overzicht der Geographische en Topographische Verrigtingen Gedurende onze Heerschappij in den Indischen Archipel," *Natuurkundig Tijdschrift voor Nederlandsch Indië* 9 (1856): 353. Compare A. H. A. Hogg, *Surveying for Archaeologists and Other Fieldworkers* (London: Croom Helm, 1980). Wardenaar studied at the Marineschool—the Naval College (1782–1812)—at Semarang from 1798 to 1805, and he graduated as an ensign. See De Haan, "Personalia der Periode van het Engelsch Bestuur over Java 1811-1816," p. 661; and F. C. Oosten, "'Hear Instruction and Be Wise'; The History of the Naval College on Java in the Eighteenth and Early Nineteenth Century," *Mariner's Mirror* 55 (1969): 247–62. Teachers and pupils at the college specialized in training as marine hydrographers for VOC (Vereenigde Oost-Indische Compagnie, Dutch East Indies Company) service, producing all the Dutch hydrographic charts of Asian waters in the post-1782 period. See further C. J. Zandvliet, "VOC Maps and Drawings," http://www.tanap.net/content/voc/maps/maps_making.htm, accessed February 15, 2012.

¹⁰ On the British Museum *Plan of Majapahit*, "Trowulan" is given in the English spelling, but, both in the Dutch and English texts of Wardenaar's legend, the "u" is spelled according to contemporary Dutch language norms: "Trowoelan." See Verbeek, "De Oudheden van Madjapahit in 1815 en 1887," pp. 3–6. For further cartographical arguments, see Gomperts et al., "De Veertiende-Eeuwse Javaanse Hofstad Majapahit," p. 74.

¹¹ The Quickbird satellite image (resolution: 0.6 meter per pixel) available on Google Earth was taken on September 24, 2003 (scene number: 1010010002503301). The image was taken just after sugar cane was harvested. Cane is grown in major parts of Trowulan area, so that during the harvest, which occurs every eighteen months, the bare soils are visible.

¹² For the georeferencing of *Plan of Majapahit* depicted in Illustration 2, we used GPS mapping software (OziExplorer version 3.96.1c) and the GPS co-ordinates of nine ground control points <A, C, F, G, H, I.1, L, M.3 and N.1> with a first-order polynomial (i.e. affine) transformation. Our georeferencing of Wardenaar's plan shows no skew. The orientation of the north arrow on the georeferenced plan (359.5°) is consistent with the magnetic field declination for the region in 1815 (i.e. 0.5° west, see <http://geomag.org/info/declination.html>). However, the easting axis appears 3.8 percent compressed in comparison to the northing axis. For the estimation of the overall planimetric accuracy of the 1815 plan, we used 18 ground control points <A, B, C, D, E, F, G, H, I.1, K.1, L, M.1, M.2, M.3, M.4, N.1, N.2 and N.3>, their corresponding pixel positions in x and y coordinates on the digital scan available at the website of the British Museum, which has a resolution of 300 dots per inch (corresponding to 2.6 meters per pixel), and a least squares algorithm for first-order polynomial transformations. On *Plan of Majapahit*, the planimetric residuals in the northings (standard deviation: 22 meters; maximum residual: 50 meters) of the features are larger than in the eastings (standard deviation: 14 meters; maximum residual: 26 meters). The maximum circular residual amounts to 54 meters <E>.

¹³ Before the introduction of the metric system in 1816, the Dutch used measures referring to the *Rijnland* system in the Netherlands East Indies. By royal decree of February 18, 1808, one Rhineland Rod (Dutch:

Wardenaar's map legend contains fifteen items labeled A to P, with those listed A to H rendered in both Dutch and English. The remainder appear only in Dutch. For convenience, we present only the English version of items A to H here. We have translated the Dutch texts of legend items I to P and the notes on the drawings as published by Verbeek.¹⁴ We have not adopted Wardenaar's alphabetical order A to P, but instead follow a spatial arrangement in separate sections of the former royal capital. Nearly all the remains shown on Wardenaar's drawings are still extant and have been depicted in various publications. In the present article, therefore, we include only three plates: the site of Ménak Jinggā <K.1>, copies of Wardenaar's plates of the gate of Bajangratu <H>, and the vanished Caṅḍi Mutëran <A> (Illustrations 3–5).

The Vanished Fourteenth-Century Royal Palace of Majapahit

On the basis of what he knew about traditional Central Javanese courts, Wardenaar infers that the position of the vanished royal palace (*kěḍaton*) must have been to the south of the hamlet of Kěḍaton and the adjacent Siti Inggil (*Sittinggil*) terrace:

N.	"An elevated place named Siti Inggil—"high ground" usually in front of the place of the king's palace. It is high ... [illegible number] feet and [its sides] lined with baked bricks. On one of the corners there still stands a part of a pillar of the same bricks, probably as footings for wooden railings with which one might surmise it was [once] surrounded. The small red dot therein is a dry well [measuring] 1 foot 10 inches [58 cm] wide, 2 feet 9 inches [86 cm] long and 18½ feet [5.8 m] deep, called Sumur Windu by the [local] inhabitants."
(sub P.)	"... and one might therefore surmise that, in accordance with the lay-out generally adopted by the indigenous people, the king's palace would have been situated to the south of the aforementioned Siti Inggil, around the hamlet of Kěḍaton, whose name also denotes a king's residence."

In fact, Wardenaar's plan shows two adjoining hamlets of Kěḍaton extending over a larger area than the present-day settlement first shown on the 1879 topographical map. The hamlets exactly coincide with the area of the vanished *kěḍaton*, or "royal palace," in W. F. Stutterheim's archaeological reconstruction.¹⁵ Moreover, the Dutch architect and archaeologist Henri Maclaine Pont (1884–1971) was able to observe important remains of walls in 1925–26, which appear as the outer and inner palace

Rijnlandse Roede) converts into 3.767358 meters. One hour walking (Dutch: *één uur gaans*, French: *mille Hollandais*) corresponds to 1,200 Rhineland Rods. One Rhineland Rod equals 12 feet (Dutch: *voeten*). There are 12 inches (Dutch: *duimen*) in a Rhineland Foot. See G. J. Knaap, J. R. van Diessen, W. Leijnse, and M. P. B. Ziellemans, *Grote Atlas van de Verenigde Oost-Indische Compagnie/Comprehensive Atlas of the Dutch United East India Company, Volume II: Java en Madoera/Java and Madura* (Voorburg: Asia Maior, 2007), pp. 35, 352. Moreover, on the georeferenced plan depicted in Illustration 2, the northing axis is scaled 1:12,100. Therefore, we conclude that Wardenaar intended to draw his *Plan of Majapahit* in a scale of 1,000 feet per inch corresponding to map scale 1:12,000.

¹⁴ Verbeek, "De Oudheden van Madjapahit in 1815 en 1887," pp. 3–7. The legend and the notes on the drawings refer to the versions that Wardenaar kept for himself. We have not been able to trace a legend in Raffles's collection.

¹⁵ Gomperts et al., "De Veertiende-Eeuwse Javaanse Hofstad Majapahit," p. 73, figure 5; and A. Gomperts, A. Haag, and P. Carey, "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 (2008): 411–30.

walls in Stutterheim's archaeological reconstruction but which have all now vanished.¹⁶

The four sides of the rectangular Siti Inggil terrace were lined with a now vanished brick course. On the georeferenced map, the platform measures 55–60 meters east–west by 65–70 meters north–south. This corresponds to the actual situation on site <N.2, N.3, N.4>. Parts of the southeastern and the northwestern sides of the terrace have also now vanished. The terrace is about two meters higher than the surrounding area. On Wardenaar's plan, a footpath leads over the area of the Siti Inggil terrace, from the middle of the north side to the middle of the south side, and passes a site now known as Sumur Upas.¹⁷

Sumur Windu <N.1> literally means “Walled Well” and is a reference to the brick walls that line the interior of the well. Wardenaar's description “small red dot,” referring to Sumur Windu <N.1>, is represented by a small black rectangle <N.1> on the plan at the British Museum. Situated near the northeastern corner of the Siti Inggil terrace, it currently measures 1.50 meters north–south by 1.35 meters east–west, with a depth of some 7 meters to ground water level. When the Dutch notary Nicolaas van Meeteren Brouwer (1798–1831) visited Trowulan on June 21, 1825 just before the outbreak of the Java War, he noted that local tradition related that the last Majapahit king had vanished through this well.¹⁸ Furthermore, 4 meters to the east of Sumur Windu, there is a brick platform now called *Caṅḍi Kēḍaton*, which is also aligned on a north-south axis and measures 12.60 meters by 8.50 meters with a height of 1.58 meters, facing west.¹⁹ According to J. Knebel, a member of the *Oudheidkundige Dienst* (Netherlands East Indies Archaeological Service) who interviewed Mangoen Amidjaja, the Trowulan villager who was the guardian of these remains in 1907, a local tradition describes how the Majapahit kings used this platform as their royal seat while granting audiences to their senior officials.²⁰ From Kromodjojo Adinēgoro's 1899 report, we can infer that *Caṅḍi Kēḍaton* was still covered by soil in 1815.²¹ However, it seems unlikely that a well dating from this period would have been situated just four meters in front of such an important edifice as the *Caṅḍi Kēḍaton*.

¹⁶ H. Maclaine Pont, “De Historische Rol van Majapahit: Een Hypothese,” *Djāvā* 6, 4-6 (1926): 294–317; see map *Majapahitsche Restantenkaart* (Map of Majapahit Remains).

¹⁷ Sumur Upas is the name of a dry well that is situated some 24 meters to the south–southwest of Sumur Windu <N.1>. Wardenaar's mapping is sufficiently detailed to enable us to conclude that he did not confuse Sumur Upas with Sumur Windu.

¹⁸ N. van Meeteren Brouwer, “Dagverhaal van eene Reis door den Oosthoek van Java, in het Jaar 1825,” *Mnemosyne, Mengelingen voor Wetenschappen en Fraaije Letteren* 8 (1828): 304–5.

¹⁹ Mundardjito, ed., *Rencana Induk Arkeologi Bekas Kota Kerajaan Majapahit, Trowulan* (Jakarta: Departemen Pendidikan dan Kebudayaan, 1986), p. 131.

²⁰ J. Knebel, *Rapporten van de Commissie in Nederlandsch-Indië voor Oudheidkundig Onderzoek op Java en Madoera*, 1907, *Bataviaasch Genootschap van Kunsten en Wetenschappen* (Batavia/The Hague: Albrecht/Nijhoff, 1909), p. 66. See Gomperts et al., “Stutterheim's Enigma,” p. 419, figure 5.

²¹ R. A. A. Kromodjojo Adinēgoro, “Rapport van den Regent van Modjokërto en Djombang aangaande diens Voorloopig Onderzoek van Oudheden in het Gehucht Kēḍaton (Desa Trawoelan), Residentie Soerabaja,” *Notulen van het Bataviaasch Genootschap* 37 (December 1899): CIV–CVI, app. 16.

The Alun-alun Square

The Dutch word *passeerbaan* is a corruption of the Javanese word *paséban* denoting “a place where serving duties are performed while seated.”²² The latter could refer to a building, a yard, or a square. However, in the period 1600–1850, the Dutch used the word *passeerbaan* to refer specifically to the large square, or *alun-alun*, in front of courts and princely residences of Java. This is apparent from Stutterheim’s convincing explanation of the etymology of the Dutch-Indies *passeerbaan*²³ and from Javanese and Madurese town plans of the VOC period.²⁴ Wardenaar’s description clearly refers to a space, not a building:

P. “A barren and flat space of ground covered only with grass and a few small shrubs, from which one considers that the *Passeerbaan* was once situated here.”

Given Wardenaar’s description and the strict meaning of the Dutch colonial word *passeerbaan*, it is beyond doubt that the oral tradition refers to the location of the *alun-alun* square <P.1> of the now vanished royal capital. However, within the immediate vicinity of Wardenaar’s point <P.1>, Indonesian archaeologists have excavated the remains of medieval dwellings <P.2, P.3, P.4>. From our observations of the soil profiles on site, supported by detailed cartographical analysis, we conclude that the soils in an area immediately to the east of these remains have been excavated by colonial and present-day asset strippers to depths of 2–3 meters. There is more evidence pointing to the location of the *alun-alun* <P.1> in the Balinese historiographical chronicle *Kidung Pamañcangah*.²⁵

The Tank of Sègaran

Raffles describes the tank of Sègaran as follows:

Here the walls of the tank, upwards of a thousand feet in length and not less than six hundred in breadth, are quite perfect. They are of burnt brick and about twelve feet high. The whole area of the tank, when I visited it [in May 1815], was one sheet of beautiful rice cultivation, and almost surrounded by a noble forest of teak.²⁶

Wardenaar confirms that the tank was used for rice cultivation in 1815:

²² Stutterheim, *De Kraton van Majapahit*, p. 55.

²³ *Ibid.*, pp. 55, 57.

²⁴ Compare Knaap et al., *Grote Atlas van de Verenigde Oost-Indische Compagnie*, pp. 362–64, 377–78, 391–92, 401–2, 407, 410–11, 429.

²⁵ See further A. Gomperts, “More on the Archaeological Mapping of the Fourteenth-century Royal City of Majapahit Based on a Balinese Description in the *Kidung Pamañcangah*,” in *From Beyond the Eastern Horizon: Essays in Honour of Professor Lokesh Chandra*, ed. Manju Shree (New Delhi: Aditya Prakashan, 2011), pp. 63–73. See also A. Gomperts, A. Haag, and P. Carey, “Rediscovering the Royal Capital of Majapahit,” *Newsletter of the International Institute for Asian Studies (IIAS)* 53 (Spring 2010): 13, figure 3 #3 (available online at http://www.iias.nl/files/IIAS_NL53_1213.pdf).

²⁶ T. S. Raffles, *The History of Java*, vol. 2, 1978 reprint (Oxford: Oxford University Press, 1817), p. 54.

M.	"A dug-out tank lined with bricks called Sēgaran or the "Little Sea," people say that it was once 18½ feet [5.8 meters] deep with a floor of similar bricks, but now it is not more than 9 feet [2.8 meters] deep and the Trowulan villagers plant their rice here."
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On Wardenaar's plan, the tank of Sēgaran measures 365 meters long and 170 meters wide. This corresponds to the measurements given by Resident Hendrik Jacob Domis (1782–1842, in office, 1831–34) in his 1834 published report, in which his measurements are 1,200 feet (377 meters) by 545 feet (171 meters).²⁷ The tank was restored in the 1980s. Although Wardenaar's plan does not show a stream or canal feeding the rice paddies in the tank, Van Meeteren Brouwer confirmed the existence of such a stream in July 1825.²⁸ Indeed, since no bridges or crossing planks are marked on the engineer captain's 1815 plan, it seems clear that he excluded hydrological features of the Trowulan area when he did his survey.

Wardenaar describes a *speelhuisje*, a word that translates as "a small pleasure house in a garden."²⁹

O.	"An elevation—here are several stone footings for wooden pillars belonging to a house, one says that here the king's small pleasure/garden house (<i>speelhuisje</i>) once stood, there are also two stone pillars here, each approximately 8 feet [2.5 meters] high and 7 inches [18 cm] in diameter, [which] local inhabitants say would have been used for attaching the elephants."
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On site, three of these "elephant" pillars are still standing <O.2, O.3, O.5>, while the inhabitants indicated to us the spot where a fourth pillar once stood <O.4>. The four pillars mark the corners of an oblong-shaped area measuring some 75–77 meters north–south and 22–33 meters east–west. However, the dimensions of the pillars differ from Wardenaar's measurements: their height above ground is at present about 1.80 meters and the diameter of their irregular pentagonal to hexagonal sections range between 25 and 37 centimeters. Furthermore, in the center of the area marked by the four "elephant" pillars, at the spot of the *speelhuisje*, a small platform may have once stood on a slightly elevated spot, approximately one meter higher than the surrounding area <O.1>. According to the reverend J. F. G. Brumund (1814–63),³⁰ two inscribed stones showing the eight-pointed symbol of the Majapahit aureole, the heraldic emblem of the Majapahit royal family, were taken from this area near the Sēgaran tank to the house of the Dutch Assistant-Resident in Mojokerto. On site, we saw a few other small shaped rocks and footings within a radius of 30 meters from the elevated spot <O.1>, stones, which may have once belonged to the platform where the

²⁷ H. J. Domis, "Bijzonderheden betreffende Sourabaya en Madura," *De Oosterling, Tijdschrift bij Uitsluiting Toegewijd aan de Verbreiding der Kennis van Oost-Indië* 2 (1834): 90.

²⁸ Van Meeteren Brouwer, "Dagverhaal van eene Reis door den Oosthoek van Java, in het Jaar 1825," p. 304.

²⁹ W. Sewel and E. Buys, *Volkomen Woordenboek der Nederduitsche en Engelsche Talen/A Compleat Dictionary of Dutch and English*, vol. 2 (Amsterdam: Cornelis de Veer, 1766), p. 737.

³⁰ J. F. G. Brumund, *Indiana: Verzameling van Stukken van Onderscheiden Aard over Landen, Volken, Oudheden en Geschiedenis van den Indischen Archipel*, vol. 2 (Amsterdam: Van Kampen, 1854), p. 112.

Majapahit kings held seated audience with their prominent officials, thus enhancing the royal character of the spot.

Elephants are Indian symbols of kingship. The Sanskrit text *Arthaśāstra* 2.31.3 (c. third century CE) and the medieval Sanskrit architectural text *Mayamata* 29.171–175 reveal that the Javanese practice of keeping elephants with their feet attached to such stone pillars originates from India.³¹ Textual comparison between stanza 11.2 in the Old Javanese *Rāmāyaṇa Kakawin* and the parallel lines (10.9) in its Sanskrit prototype *Bhaṭṭikāvya* further reveals that such poles for attaching elephants (Sanskrit *alana*) must have already existed in Java at the time of the composition of the Old Javanese text, probably in the early tenth century CE.³² Furthermore, in the book of the second Dutch navigation to the East Indies in 1598–1600, there is a drawing that shows the king of Tuban seated on a small platform and surrounded by his nobles and tethered elephants during a royal audience with Dutch merchants on January 24, 1599.³³ The travel account both describes and depicts the feet of the royal elephants as being tethered with chains to the base of a pillar. Therefore, oral tradition may have correctly preserved the original purpose of the pillars near the *speelhuisje*. Furthermore, in his Old Javanese dictionary, P. J. Zoetmulder notes that the word *palimanan* refers to a “place where the king is seated in audience; probably not the seat itself; a pavilion-like construction or dais? The connection with *liman* [elephant] is not clear.”³⁴ Limitations of space do not allow us to present further arguments regarding the identification of the pillars and *speelhuisje* as the former Majapahit *palimanan*.³⁵ But it is quite possible to imagine the role played by the platform in relation to the tank. Majapahit kings would have displayed their kingship as symbolized by the four elephants while watching festivities performed on the great expanse of the Sēgaran tank.³⁶

Gajah Mada’s Residence

Wardenaar’s siting of the residence of the famous Majapahit prime minister (*patih*) Gajah Mada (in office, AD 1331–64), is unique in Trowulan history:

³¹ B. Dagens, *Mayamata: An Indian Treatise on Housing, Architecture, and Iconography* (New Delhi: Sitaram Bhartia Institute of Scientific Research, 1985), pp. 277–78.

³² S. Santoso, *Rāmāyaṇa Kakawin*, vol. 2 (New Delhi: International Academy of Indian Culture, 1980), p. 289. Compare O. Fallon, *Bhaṭṭi’s Poem: The Death of Rāvaṇa*, The Clay Sanskrit Library (New York, NY: New York University Press/JJC Foundation, 2009), p. 226–27.

³³ J. Keuning, *De Tweede Schipvaart der Nederlanders naar Oost-Indië onder Jacob Cornelisz. van Neck en Wybrant Warwijck 1598-1600*, De Linschoten-Vereeniging, no. 46, vol. 3 (The Hague: Nijhoff, 1942), p. 177, figure 20.

³⁴ P. J. Zoetmulder, with the collaboration of S. O. Robson, *Old Javanese-English Dictionary*, Koninklijk Instituut voor Taal-, Land- en Volkenkunde, vol. 1 (The Hague: Nijhoff, 1982), p. 1029.

³⁵ See further Gomperts, “More on the Archaeological Mapping of the Fourteenth-century Royal City of Majapahit,” pp. 69, 72.

³⁶ “We discover neither in Java, nor in any other country of the Archipelago, any of those enormous tanks of the southern part of Hindustan, on which the agriculture of whole provinces entirely depends.” J. Crawford, *History of the Indian Archipelago*, vol. 1 (Edinburgh: Archibald Constable, 1820), p. 352. In the tank of Sēgaran, the stored amount of water would have been too small for irrigation purposes, at most supplying an area of some 20 hectares of *sawah*. The abundance of ancient wells and the present-day use of shallow groundwater in the Trowulan area for domestic water supply, easily replenished by wet season rainfall and possibly inflow from the mountainous areas in the south, indicate that, in Majapahit times, potable water was most likely supplied from wells. However, the tank of Sēgaran may have been used as a supplementary source of water in case of drought or blocked canals or rivers.

G.	<p>“A gate called by the inhabitants Gapurā Jatipasar, almost ruined, as to be seen in the drawing.”</p> <p>Note in ink on the accompanying drawing: “Gapurā or gate of Jatipasar in the forest of Majapahit. Situated to the northeast of [the] Sēgaran. The orientation of the entrance is east-west, one says that this was the gate to the <i>dalēm</i> of the <i>pēpatih</i> Gajah Mādā. Surveyed on the 7th of October 1815 on the orders of Lieut.-Governor T.S. Raffles by Wardenaar.”</p> <p>Additional note in pencil: “Gate or Gapurā at Jatipasar in the forest of Bajangratu, situated about half an hour walking to the northeast of Majapahit. The orientation of the entrance is east-west. Surveyed on the 7th of October 1815.”</p>
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The gate near the village of Jatipasar became known as Caṅḍi Wringinlawang by the end of the nineteenth century. It is a *caṅḍi bēntar*, or split gate. Since its restoration in the 1990s, the two parts of the gate are now of equal height, 15.50 meters high,³⁷ but in the nineteenth century, the remains of the northern and southern parts were, respectively, 48 feet (15.1 meters) and 21 feet (6.6 meters) high.³⁸ Moreover, H. Maclaine Pont observed that the split gate formed the southwestern entrance to a complex. Its surrounding walls, measuring approximately 200 meters in an east-west axial direction and 150 meters north–south, have all now vanished.³⁹ Furthermore, in Mundardjito,⁴⁰ a detailed plan reveals thirteen medieval wells 200 meters to the southwest of the split gate within an area covering less than half of a hectare. So many wells in such a small area indicate a dense population living on the western side of the split gate in Majapahit times, but only four of these wells survive today. While Krom⁴¹ argues that the *caṅḍi bēntar* is an architectural feature unknown in the palaces or residences of pre-colonial Java, Wardenaar’s oral tradition testimony directly contradicts this. Since the engineer captain was almost certainly able to converse with the local Trowulan villagers in his mother tongue, Javanese, his testimony strikes us as being the more credible.⁴² From topographic interpretation of Prapañca’s description of Majapahit in *Nāgarakṛtāgama* 12.4 (1365 CE), we infer that Gajah Mada’s residence was situated in close proximity to the Caṅḍi Wringinlawang.⁴³

³⁷ Mundardjito, ed., *Rencana Induk Arkeologi Bekas Kota Kerajaan Majapahit*, p. 166.

³⁸ Van Hoëvell, *Reis over Java, Madura, en Bali in het Midden van 1847*, vol. 1, p. 174.

³⁹ H. Maclaine Pont, “Madjapahit: Poging tot Reconstructie van het Stadsplan, Nagezocht op het Terrein aan de Hand van den Middeleeuwschen Dichter Prapanca,” *Oudheidkundig Verslag* 1924: 58. See also map *Majapahitsche Restantenkaart* in Maclaine Pont, “De Historische Rol van Majapahit: Een Hypothese.”

⁴⁰ Mundardjito, ed., *Rencana Induk Arkeologi Bekas Kota Kerajaan Majapahit*, p. 166.

⁴¹ N. J. Krom, *Inleiding tot de Hindoe-Javaansche Kunst*, vol. 2 (The Hague: Nijhoff, 1920), p. 106.

⁴² Wardenaar’s father, Willem Wardenaar (1764–1816), was a Dutchman and Counsellor Extraordinary of the *Raad van Indië* (Council of the Indies). In 1800, he married his Javanese concubine, Johanna Margaretha Filius, which consequently allowed him to legitimize their children born previously out of wedlock. One of these children was Johannes Willem Bartholomeus Wardenaar, born at Sēmarang in 1785. See De Haan, “Personalia der Periode van het Engelsch Bestuur over Java 1811–1816,” p. 661; F. de Haan, *Priangan. De Preanger-Regentschappen onder het Nederlandsch Bestuur tot 1811*, vol. 1 (Batavia/’s-Gravenhage: Landsdrukkerij, 1910), p. 101; J. G. Taylor, *The Social World of Batavia: European and Eurasian in Dutch Asia* (Madison, WI: University of Wisconsin Press, 1983), pp. 95–96; G. H. von Faber, *Oud Soerabaia: De Geschiedenis van Indië’s Eerste Koopstad van de Oudste Tijden tot de Instelling van den Gemeenteraad* (1906) (Soerabaia: Gemeente Soerabaia, 1906), p. 123; and J. Hageman J.c.z., *Uit het Leven van Wijlen Johan Willem Bartholomeus Wardenaar* (Soerabaya: Kocken, 1869).

⁴³ Gomperts et al., “De Veertiende-Eeuwse Javaanse Hofstad Majapahit,” pp. 74–75. Compare Stutterheim, *De Kraton van Majapahit*, p. 102.

The Area to the Northwest of Trowulan

Most of the remains northwest of Trowulan on Wardenaar's plan, A to F, can be identified as Buddhist. Wardenaar's legend and notes read:

A.	"A temple of bricks called Caṅḍi Mutĕran by the inhabitants—according the drawing." Subtitle of the accompanying drawing in ink: "A decayed temple of bricks in the Forest of Majapahit called Caṅḍi Mutĕran. Surveyed on the orders of Mr T.S. Raffles, Lieut.-Governor, on the 5 th of October 1815 by Wardenaar."
B.	"A heap of bricks probably the ruins of a temple."

Since Caṅḍi Mutĕran had already vanished by the mid-nineteenth century when Van Hoëvell visited the ruins of Majapahit,⁴⁴ a copy of Wardenaar's drawing of the sanctuary is reproduced here (Illustration 3). The *caṅḍi* gives the impression of having once been a small Buddhist *stūpa* measuring some 2–3 meters wide and 5–8 meters high. After our initial georeferencing of Wardenaar's plan, we made an on-site search within a radius of 50 meters of the georeferenced positions of Caṅḍi Mutĕran and Wardenaar's "heap of bricks." A woman living nearby pinpointed two spots <A, B> and stated that a few years ago the soils there had been cleared to a depth of one meter and the medieval bricks sold. We subsequently identified two spots showing remains of red brick debris that may have been from the vanished Caṅḍi Mutĕran <A> and the "heap of bricks" on the satellite image available on Google Earth, which dates from September 2003. These coincide exactly with the pinpointed spots <A> and , respectively.

Wardenaar's report then goes on to describe Caṅḍi Brahu:

C.	"A temple built of bricks called Caṅḍi Brahu—as in the drawing." Pencil note on the back of the accompanying drawing: "The [temple] here shown is Caṅḍi Brahu, situated to the west of Caṅḍi Gĕdung and Caṅḍi Tĕngah, also of bricks. Very ruined, full of bats, surrounded by forests, big trees."
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Caṅḍi Brahu <C> was restored in 1990–95, and now has an elevation of 20 meters.⁴⁵ It probably represents a large *stūpa* with long stairs oriented to the west.⁴⁶ Van Hoëvell⁴⁷ states that, according to local tradition, the ashes of the royal family were kept in this *caṅḍi*, hence the name "Brahu," which originated from the Javanese word for "ash," *awu*. A Javanese nobleman from the Surakarta *kraton* visited Trowulan in the eighteenth century. His account appears in the Modern Javanese text *Sĕrat Cĕṅṅini* 20.1–28, dating from 1815. In the text (20.23), the construction of Caṅḍi Brahu is said to resemble that of a mosque.⁴⁸

⁴⁴ Van Hoëvell, *Reis over Java, Madura en Bali in het Midden van 1847*, vol. 1, p. 184.

⁴⁵ A. R. Kinney, M. J. Klokke, and L. Kieven, *Worshipping Siva and Buddha: The Temple Art of East Java* (Honolulu, HI: University of Hawaii Press, 2003), p. 173.

⁴⁶ A. A. Munandar, *Ibukota Majapahit: Masa Jaya dan Pencapaian* (Depok: Komunitas Bambu, 2008), p. 101.

⁴⁷ Van Hoëvell, *Reis over Java, Madura en Bali in het Midden van 1847*, vol. 1, p. 184.

⁴⁸ Kamajaya, *Sĕrat Cĕṅṅini (Suluk Tambangraras)*, vol. 1 (Yogyakarta: Yayasan Centhini, 1992), p. 53.

Wardenaar reports that Caṅḍi Gēṅtong had already fallen into decay by 1815:

D.	"A temple called Caṅḍi Gēṅtong, entirely ruined."
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The georeferenced position on Wardenaar's plan and a local farmer guided us directly to a structure on site that runs north–south. It consists of the remains of a brick wall some 10 meters long, which may have once been part of Caṅḍi Gēṅtong <D>.

Since the late nineteenth century, the two next *caṅḍi* in Wardenaar's list have both been named Caṅḍi Gēṅtong, but the engineer captain's plan and legend are quite clear about their original names:

E.	"A temple called Caṅḍi Gēḍung as in the drawing." The accompanying drawing is lost.
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F.	"A temple called Caṅḍi Tēngah, entirely fallen."
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Caṅḍi Gēḍung and Caṅḍi Tēngah are still extant remains, now confusingly called Caṅḍi Gēṅtong II <E> and Caṅḍi Gēṅtong I <F>, respectively. They both seem to be Buddhist *caṅḍi*, possibly representing a *maṅḍala-stūpa*.⁴⁹

Jākā Ḍolog

Jākā Ḍolog—literally, the “Plump Lad”—was the local name of an important historic statue that stands 1.65 meters high.⁵⁰ The statue portrays a Buddhist *Akṣobhya*—literally, “The Imperturbable One”—with his right hand touching the ground in emulation of the Lord Buddha's classic calling-the-earth-to-witness gesture (Skt. *bhūmi-sparśa-mudrā*). “However, the statue lacks all the customary bodily marks (Skt. *lakṣaṇa*) of a Buddha, such as the curly hair, the *urṇā* [circle of hair between the eyebrows] and the cranial protuberance.”⁵¹ On the orders of the resident of Surabaya, Adriaan Mauritz Theodore Baron de Salis (1788–1834, in office 1817–22), the statue was moved to Surabaya and placed in front of the then Residency House at Simpang in 1817, where barren Chinese women came to make offerings to the image to conceive children <I.2>.⁵² Wardenaar describes the original location of Jākā Ḍolog on the site of the former Majapahit court-capital as follows:

I.	"A stone statue of a man—called Jākā Ḍolog—as in the drawing, which stands on a small elevation. A few footings in stone for wooden pillars found here suggest that here was [once] a house or a small temple." Drawing with note in pencil: “Jākā Ḍolog in a <i>jati</i> forest on a small elevation [<i>sic</i>] N[orth]W[est] of the Sēgaran.”
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⁴⁹ Edi Triharyantoro and Koos Siti Rochmani, “Candi Gentong: Mandala Stupa Masa Majapahit,” *Cinandi: Persembahan Alumni Jurusan Arkeologi Universitas Gadjah Masa Kepada Prof. Dr. H. R. Soekmono* (Yogyakarta: Panitia Lustrum VII, Jurusan Arkeologi Fakultas Sastra, Universitas Gadjah Mada, 1997), pp. 186–91.

⁵⁰ See photograph in Gomperts et al., “Rediscovering the Royal Capital of Majapahit,” p. 12, figure 1.

⁵¹ J. Fonteijn, *The Sculpture of Indonesia* (Washington, DC: National Gallery of Art, 1990), pp. 54–55.

⁵² *Notulen van het Bataviaasch Genootschap* 10 (1872): 143.

On Wardenaar's plan, the diameter of the circular-shaped elevation measures some 25 to 35 meters. On the basis of the planimetric accuracy of the engineer captain's plan, the error calculus of our initial georeferencing with other identified points and the satellite image available at Google Earth, we were able to determine the coordinates of the original position of Jākā Ḍolog <I.0> to within an accuracy of 40 meters. We set out a circular search area within a radius of 65 meters from the georeferenced position <I.0>, and subsequently field-walked the search area with a GPS receiver. We were able to observe a slightly elevated spot some 25 meters long in an north-southern axial direction, some 20 meters wide and some 0.5–1 meter higher than the surrounding area, where we found a few old brick fragments on site <I.1>. It is the only elevation—as well as the only spot—where we observed fragments of brick within the search area. Hence, point <I.1> was the original site of the Jākā Ḍolog statue in October 1815. Moreover, within the immediate environs (25–50 meters) of Jākā Ḍolog's 1815 position, another recently discovered statue is testimony to this Buddhist environment. A local villager told us that she watched the excavation, in the early 1980s, of a tall (c. 1.8 meter) statue at point <I.3>, representing—what she described as—a “*dēwi*,” or goddess with bare breasts, standing with a child at her right leg and carrying another child in her left arm.⁵³ Such a description almost certainly points to the iconography of Hārītī, the Buddhist guardian goddess of children whom parents of prematurely deceased children worshipped.⁵⁴ We have gathered more evidence on site, but limitations of space do not allow us to discuss the full archaeological context of the Jākā Ḍolog statue in the present article. Instead, in two separate publications, we argue that Jākā Ḍolog represents an image of the legendary figure Bharada, who presided over the political division of Java in 1052 CE. Moreover, the statue <I.1> stood on the exact spot of the cemetery known as Awurare/Wurare/Murare/Lēmah Tulis/Lēmah Citra, evidence for which is available from newly accessible archaeological data.⁵⁵

Sites of Ménak Jinggā, Ratu Cēmpā, and Bajangratu

In the nineteenth century, the site of Ménak Jinggā was called Sanggar Pamalangan.⁵⁶ In Javanese, this denotes an elevated piece of land whose entrance is barred by cross beams. Wardenaar describes it as follows:

K.	<p>“A statue of a woman and a statue of a man sculpted in stone—called Ménak Jinggā as seen in drawing—it stands at a larger elevation than the aforementioned statue [i.e., Jākā Ḍolog, I]. Shards or fragments of black stones sculpted with figurative or flower motifs—like those belonging to a building—are present here in abundance. Undoubtedly, the entire elevation consists of similar stones belonging to a collapsed</p>
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⁵³ Personal communication, Ibu Iklima Nurul Waludin, December 12–13, 2008.

⁵⁴ See Fontein, *The Sculpture of Indonesia*, pp. 172–73, 200–1; and Lokesh Chandra, *Cultural Horizons of India*, vol. 4, *Studies in Tantra and Buddhism, Art and Archaeology, Language and Literature* (New Delhi: International Academy of Indian Culture and Aditya Prakashan, 1995), pp. 176–82.

⁵⁵ See A. Gomperts, A. Haag, and P. Carey, “Maclaine Pont and the Discovery of Bharada's Hermitage,” *Newsletter of the International Institute for Asian Studies (IIAS)* 58 (Autumn 2011): 4–5, available online at http://www.iias.nl/sites/default/files/IIAS_NL58_0405.pdf. See further A. Gomperts, A. Haag, and P. Carey, “The Sage who Divided Java in 1052: Maclaine Pont's Excavation of Mpu Bharada's Hermitage-Cemetery at Lēmah Tulis in 1925,” *Bijdragen tot de Taal-, Land- en Volkenkunde* 168, 1 (2012).

⁵⁶ Van Hoëvell, *Reis over Java, Madura en Bali in het Midden van 1847*, vol. 1, p. 177.

temple and by excavating this elevation one could surely discover the foundations or footings of this building. Furthermore, it was surrounded by a moat lined with bricks, of which a part can still be seen.”

Two drawings with a note in pencil: “These two heavily damaged statues are situated on an elevation in the Majapahit area east of Sēgaran, surrounded on all four sides by a moat lined with bricks—beyond doubt a temple of black stones [once] stood here at what is now the elevation.”

The two statues were removed from the site and are kept now at the museum Balai Penyelamatan, at Trowulan. A lithograph, showing the statues on site in the late 1840s, is shown in Illustration 4. The statue on the right represents a winged *rākṣasa*, 1.41 meters high, holding a small sword on his right hip, and the statue on the left a winged *kinnari*, a female celestial musician with her lower body in the shape of a bird. According to mid-nineteenth-century Trowulan oral tradition, the male and female figures are depictions of Ménak Jinggā and Dèwi Wahitā.⁵⁷ In the Modern Javanese text *Sērat Kaṇḍaning Ringgit Purwa*, we read the full story. “Damar Wulan defeats Ménak Jinggā, whose secret protector amulet *wēsi kuning* (literally, “yellow iron”), is betrayed by his wives Wahita of Baléga and Puyēngan of Bangkalan.” Given the chronological sequence of the events described, the text can be dated to the fifteenth century.⁵⁸ However, an even earlier date is also possible.

On Wardenaar’s 1815 plan, the male and female statues stood at the highest point of the elevation identified by the present authors as <K.1>. The smaller andesite stones with animals on the reliefs are still extant, but N. J. Krom states that they were already incomplete at the beginning of the twentieth century.⁵⁹ The brick-lined moat of the Ménak Jinggā site to which Wardenaar refers has now disappeared. In this context, Mundardjito mentions the remains of a now vanished covered water conduit immediately southwest of the elevated area.⁶⁰ Maclaine Pont saw important brick remains, measuring 100–150 meters in a north-south axial direction on the eastern side of Ménak Jinggā in 1925–26.⁶¹ Using these three references, we were able to trace the course of the 1815 brick-lined moat on a high-resolution satellite image and subsequently managed to identify three of its former corner points <K.2, K.3, K.4> on site.⁶²

Wardenaar further describes an important Islamic grave that Trowulan oral tradition associates with the Islamic wife of one of the last kings of Majapahit:

⁵⁷ J. Rigg, “Tour from Sourabaya, through Kediri, Blitar, Antang, Malang, and Pasuruan, back to Sourabaya [part 1],” *Journal of the Indian Archipelago* 3 (1849): 80–81.

⁵⁸ Th. Pigeaud, *Literature of Java*, Koninklijk Instituut voor Taal-, Land- en Volkenkunde, vol. 2 (Leiden: Nijhoff, 1968), pp. 361–62.

⁵⁹ Krom, *Inleiding tot de Hindoe-Javaansche Kunst*, vol. 2, p. 109.

⁶⁰ Mundardjito, ed., *Rencana Induk Arkeologi Bekas Kota Kerajaan Majapahit*, pp. 57, 61.

⁶¹ Maclaine Pont, “De Historische Rol van Majapahit: Een Hypothese,” see map *Majapahitsche Restantenkaart*.

⁶² The Quickbird satellite image (resolution: 0.6 meter per pixel) was taken on October 2, 2007 (scene number: 101001000738F301).

L.	"The large tomb. Here are several tombs. The most important one belongs to Ratu Cēmpā; according to the inhabitants, a princess from Sabrang or the opposite coast—and wife of one of the last kings of Majapahit. The orientation of this grave is south and north—like all graves of Mohammedans. This is why one assumes that this religion was already known at the time of the last Majapahit kings."
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Indeed, in Javanese Islamic graves, the bodies of the deceased are buried in a north–south direction, with the head to the north and the feet to the south. The gravestone of Ratu or Putri Cēmpā <L>, carries the Śaka year 1370, which converts into CE 1448.⁶³ Oral tradition tells of a queen originating from Cēmpā or Champa, the former Muslim enclave kingdom of the Chams in present-day southern Vietnam. Complementing oral tradition, *Sērat Kaṇḍaning Ringgit Purwa* tells us that her name would have been Darawati.⁶⁴ If this oral tradition is correct, she would have been one of the Majapahit queens or princesses. However, we have not been able to identify her in Noorduyn's genealogical table of the Majapahit royal family in the fifteenth century.⁶⁵ It should be noted that Islamic graves and cemeteries in Java are always erected on the boundaries of settlements, until such time as these expand and the cemeteries have become engulfed by the surrounding inhabited area. Therefore, it seems that the site of the grave of Putri Cēmpā was situated on the northern boundary of the royal capital in 1448.

Wardenaar gives no details of the gate of Bajangratu (see Illustration 5):

H.	"A Gate called Gapurā Bajangratu, vide drawing."
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Nearly all nineteenth-century reports testify that, according to oral tradition, the gate of Bajangratu had been cursed. Entering it was considered taboo.⁶⁶ The awesome curse apparently spared the gate from destruction. Bajangratu is a so-called *paduraksa*, or roofed gate, with six steps and an eleven-story top <H> rising to a height of 22 meters.⁶⁷ The orientation of the gate is 18°/198°.⁶⁸ The lintel with holes for door hinges reveals that the gate opened to the north (see Illustration 6). The reliefs depict scenes from the *Ramayana* and the story of Sri Tañjung mounted on her fish. Similar Sri Tañjung tales appear on reliefs of Caṇḍi Surowono and Caṇḍi Jabung, both of which are fourteenth-century remains. The shape of Bajangratu is quite similar to a gate at Caṇḍi Panataran dating from the fourteenth century.⁶⁹ Therefore, Bajangratu might

⁶³ L. C. Damais, "Études Javanaises: 1. Les Tombes Musulmanes datées de Trälāyā," *Bulletin de l'École Française d'Extrême-Orient* 48,2 (1957): 390, 407.

⁶⁴ Pigeaud, *Literature of Java*, vol. 2, p. 362.

⁶⁵ J. Noorduyn, "Majapahit in the Fifteenth Century," *Bijdragen tot de Taal-, Land- en Volkenkunde* 134, 2–3 (1978): 250–51.

⁶⁶ W. R. van Hoëvell, "De Reis over Java, in 1838, van den Gouverneur-Generaal van Nederlandsch Indië," 21,1–6 (1859): 475; and S. A. Buddingh, *Neërlands-Oost-Indië. Reizen over [...] Gedaan Gedurende het Tijdvak 1852-1857*, vol. 1 (Rotterdam: Wijt), pp. 324–25.

⁶⁷ A. J. Bernet Kempers, *Ancient Indonesian Art* (Amsterdam: C. P. J. van der Peet, 1959), plate 286.

⁶⁸ Mundardjito, ed., *Rencana Induk Arkeologi Bekas Kota Kerajaan Majapahit*, p. 97.

⁶⁹ Kinney et al., *Worshipping Siwa and Buddha*, pp. 170–71, 222, 235; and S. Soejatmi Satari, "Perkiraan Pertanggalan Gapura Bajang Ratu," *Pertemuan Ilmiah Arkeologi ke-II, Jakarta, 25-29 Pebruari 1980* (Jakarta: Proyek Penelitian Purbakala, Departemen P&K, 1982), pp. 241–52.

also date from the same period and could have been part of a former shrine. There exist different oral traditions, but they all tell us that the construction of the gate had not been finished and the residence not inhabited yet at the time of certain events, which can be dated to the late fifteenth century.⁷⁰ Krom,⁷¹ Stutterheim, and Bernet Kempers⁷² locate Bajangratu just outside and to the east of Prapañca's medieval court-capital.⁷³ On Wardenaar's map, there is no settlement near the gate. At the end of the nineteenth century, houses appear on the topographical maps. The hamlet immediately to the south of Bajangratu is called "Kraton," which literally means "Royal Palace" in Javanese. Such toponyms usually refer to sites where—according to local oral traditions—a royal residence once existed. Furthermore, the English scholar of Sundanese linguistics, Jonathan Rigg, who visited Trowulan in the 1840s, adds an important detail:

On the south side of this building may still be traced, amongst the underwood, the foundations of walls, as it were of enclosures or courts, but whether they conducted to a temple or to a great man's dwelling, it is now impossible to say.⁷⁴

Maclaine Pont observed important remains of adjoining walls adjacent to the east of the gate, measuring some 200 meters in a north-south axial direction, and parallel walls 140 meters to the north of the gate measuring some 300 meters east-west. These have all now vanished.⁷⁵ From these descriptions and the inclining heights adjacent to the south of the gate, we would conclude that a yard would have been in front of the gate, with another gate situated to the south of Candi Bajangratu, which led to the entrance of the shrine.

Wardenaar concludes his legend with this observation:

Furthermore, in the surroundings in the forests there are numerous heaps of brick pillars, once belonging to houses, walls or temples, beyond doubt there exist here several antiquities which have not yet been discovered in this inaccessible jungle.

The forest called Bejijong.

The road from Wirāsābā [present-day Mojoagung] to Japan [present-day Mojokerto].

Surveyed on October, the 7th, 1815 (signed by) Wardenaar.

The incomplete English legend ends: "Surveyed [signed by] C. My. [barely legible]." We have not been able to identify this individual.

⁷⁰ Rigg, "Tour from Sourabaya," p. 83; and Knebel, *Rapporten van de Commissie in Nederlandsch-Indië voor Oudheidkundig Onderzoek op Java en Madoera*, pp. 68–69.

⁷¹ Krom, *Inleiding tot de Hindoe-Javaansche Kunst*, vol. 1, p. 112.

⁷² Bernet Kempers, *Ancient Indonesian Art*, p. 94.

⁷³ See Gomperts et al., "De Veertiende-Eeuwse Javaanse Hofstad Majapahit alsnog op de Kaart Gezet," p. 74, map 7.

⁷⁴ Rigg, "Tour from Sourabaya," p. 83.

⁷⁵ Maclaine Pont, "De Historische Rol van Majapahit: Een Hypothese," see map *Majapahitsche Restantenkaart*.

Finally, the archaeological devastation visited on Trowulan within the area mapped by Wardenaar has largely involved the removal of subsurface structures. We estimate that at least 20 million cubic meters of earth with brick remains have been taken from the area since Wardenaar completed his survey in October 1815.

Conclusion

Wardenaar's plan gives us a unique cartographic image of the Trowulan landscape on the eve of the colonial exploitation of the area. The quality of his mapping and the reliability of his report reflect his qualifications as a graduate of the Sĕmarang Naval College and his professional career as an army engineer. Moreover, given that his linguistic skills allowed him to converse directly with the local Trowulan villagers in their Javanese mother tongue, one might even argue that the captain engineer was the first "Indonesian" archaeologist to conduct on-site research at Trowulan. Whatever he was, he was surely not a Dutchman from The Netherlands who resembled the heads of the Dutch East Indies Oudheidkundige Dienst, whose self-interested policies defined the field of Majapahit–Trowulan archaeology in the early to mid-twentieth century.

It is deeply regrettable that Raffles did not publish Wardenaar's map in his *History of Java* in 1817. Had he done so, the captain engineer's researches might have set Trowulan archaeology on a more secure footing for posterity. Even so, the rediscovery of Wardenaar's 1815 *Plan of Majapahit* offers us a new benchmark, opening a perspective on Indonesia's premier archaeological site in an era before the site destructions of the past two centuries. If the present article has any value, then, may it contribute to the implementation of a robust regime of archaeological site preservation so that future generations of archaeologists are not deprived of access to the glory that was pre-colonial Java.

Appendix: Site Coordinates of Identified Remains

The following list of site coordinates are either positions taken with GPS receivers (Garmin Foretrex 101 and GPSMAP 60CSx) on site or georeferenced positions of items shown on Wardenaar's *Plan of Majapahit*. The accuracies reflect estimated absolute circular accuracies of GPS readings or those of georeferenced points on maps and satellite images in relation to the verified ground truth.

Wardenaar's Legend	Authors' Legend	Site	Coordinates UTM WGS84 zone 49M
A	A	vanished Caᅇdi Mutĕran (see Illustration 3), as pinpointed to us by a villager	652029 9166246 ± 7 m
B	B	vanished pile of bricks, probably the ruins of a temple in 1815, as pinpointed to us by a villager	652031 9166215 ± 7 m
C	C	Caᅇdi Brahu (triangulation point S.723)	651646 9165991 ± 4 m
D	D	Caᅇdi Gĕntong, 10 meter-long brick wall foundations, oriented north-south	652044 9166009 ± 7 m
E	E	Caᅇdi Gĕdung, now called Caᅇdi Gĕntong II	652059 9165950 ± 7 m
F	F	Caᅇdi Tĕngah, now called Caᅇdi Gĕntong I	652027 9165891 ± 7 m

G	G	Gapurā Jatipasar, also called Caṇḍi Wringinlawang	653487 9166094 ± 7 m
H	H	the roofed gate of Caṇḍi Bajangratu	654315 9163241 ± 7 m
I	I.0	initially georeferenced position of the statue of Jākā Ḍolog before site survey (Gomperts et al., "De Veertiende-Eeuwse Javaanse Hofstad Majapahit," p. 77, appendix. 2, I)	651142 9164696 ± 40 m
	I.1	on site inferred original position of the statue of Jākā Ḍolog (Gomperts et al., "The Sage who Divided Java in 1052: Maclaine Pont's Excavation of Mpu Bharada's Hermitage-Cemetery at Lēmah Tulis in 1925," figure 5)	651154 9164682 ± 7 m
	I.2	current position of the statue of Jākā Ḍolog at Taman Apsari in Surabaya	692404 9196583 ± 7 m
	I.3	original position of a statue of the Buddhist goddess Hārīti, as pinpointed to us by a villager	651141 9164660 ± 7 m
K	K.1	highest point at the site of Ménak Jinggā, the original location of the statues seen in Illustration 4	652982 9164289 ± 7 m
	K.2	moat of Ménak Jinggā site, northeastern corner	653033 9164322 ± 7 m
	K.3	moat of Ménak Jinggā site, southeastern corner	653012 9164217 ± 7 m
	K.4	moat of Ménak Jinggā site, southwestern corner	652909 9164231 ± 7 m
L	L	Islamic grave of Ratu/Putri Cēmpā with the inscription Śaka 1370	652792 9164581 ± 10 m
M	M.1	tank of Sēgaran, northeastern corner	652684 9164507 ± 7 m
	M.2	tank of Sēgaran, southeastern corner	652620 9164135 ± 7 m
	M.3	tank of Sēgaran, southwestern corner	652449 9164167 ± 7 m
	M.4	tank of Sēgaran, northwestern corner	652518 9164536 ± 7 m
N	N.1	well of Sumur Windu in the northeastern corner of the Siti Inggil terrace	652215 9162964 ± 7 m
	N.2	Siti Inggil terrace, northeastern corner	652232 9162977 ± 7 m
	N.3	Siti Inggil terrace, southwestern corner	652150 9162915 ± 7 m
	N.4	Siti Inggil terrace, position of the now vanished northwestern corner, inferred on site from observing a 90° angle between <N.2> and <N.3> with a prismatic compass	652171 9162986 ± 7 m
O	O.1	center of the elevation where the "king's small pleasure/garden house" once stood	652402 9164364 ± 7 m
	O.2	northeastern stone pillar for attaching a royal elephant	652420 9164403 ± 7 m
	O.3	southeastern stone pillar for attaching a royal elephant	652410 9164331 ± 7 m
	O.4	spot of the recently vanished southwestern stone pillar for attaching a royal elephant, as pinpointed to us by a villager	652379 9164331 ± 7 m
	O.5	northwestern stone pillar for attaching a royal elephant	652398 9164403 ± 7 m
P	P.1	georeferenced position of the <i>Passeerbaan</i> , namely, the great square or <i>alun-alun</i>	652384 9163932 ± 30 m
	P.2	excavated site of Sēgaran II	652305 9164040 ± 7 m
	P.3	excavated site of Sēgaran V	652278 9163888 ± 7 m
	P.4	site of brick remains excavated in December 2008, east-west oriented	652306 9163986 ± 7 m



Illustration 1. Portrait drawing of J. W. B. Wardenaar, probably dating from the 1860s. Reprinted from Von Faber, *Oud Soerabaia*, p. 123.

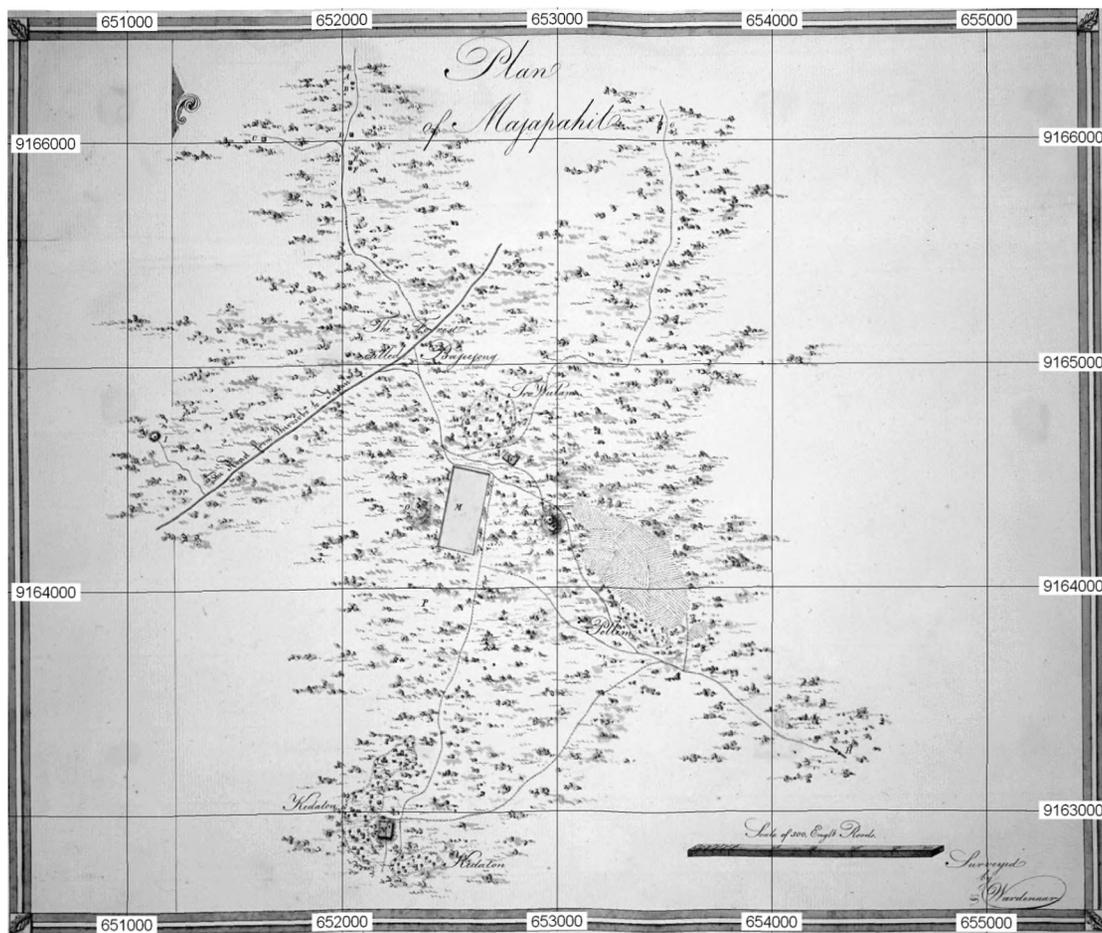


Illustration 2. *Plan of Majapahit*, being a copy of Wardenaar's original plan of 1815. The added gridlines appear at intervals of 1,000 meters and represent coordinates UTM (zone 49 M, WGS84). © Courtesy of the Trustees of the British Museum.



Illustration 3. Watercolor on paper of the vanished Candi Mutéran <A>. The text of the drawing reads "fecit Wardenaar." With reference to Verbeek "De Oudheden van Madjapahit in 1815 en 1887," p. 9, however, the drawing seems to be a copy made in England possibly by the well-known artist William Daniell (1769-1837). © Courtesy of the Trustees of the British Museum.



Illustration 4. Lithograph entitled "Ruïne van Modjo-Paid," by Jan Weissenbruch (1822–90). Reprinted from C. W. Mieling *Javasche Oudheden. Opgedragen aan Z. K. H. Prins Hendrik der Nederlanden* (The Hague: Mieling, 1852–56). See also Bastin and Brommer, *Nineteenth Century Prints*, p. 70, ill. 44, p. 167, n. 408, 411. The plate shows the male *rakṣasa* and female *kinnari* statues in situ at Ménak Jinggā <K.1> in the late 1840s. Did the statues face west?

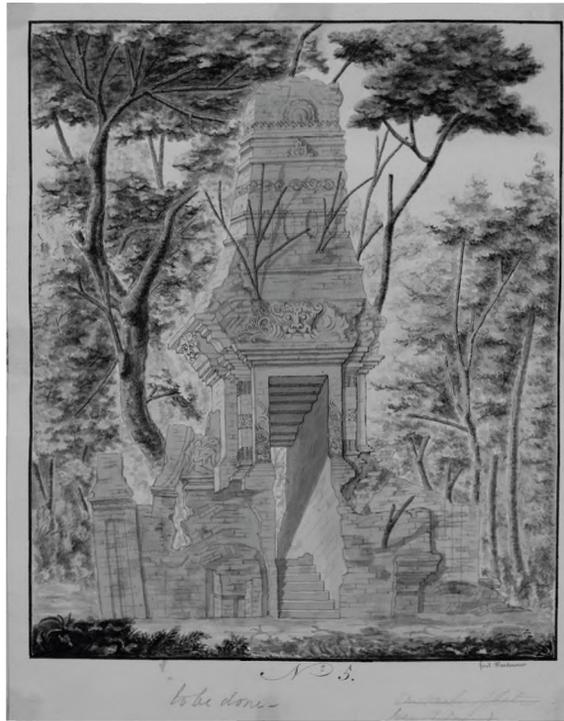


Illustration 5. Watercolor on paper of the gate of Bajangratu <H>. The text of the drawing reads “fecit Wardenaar.” With reference to Verbeek “De Oudheden van Madjapahit in 1815 en 1887,” p. 9, however, the drawing seems to be a copy made in England, possibly by the well-known artist William Daniell (1769–1837). © Courtesy of the Trustees of the British Museum.

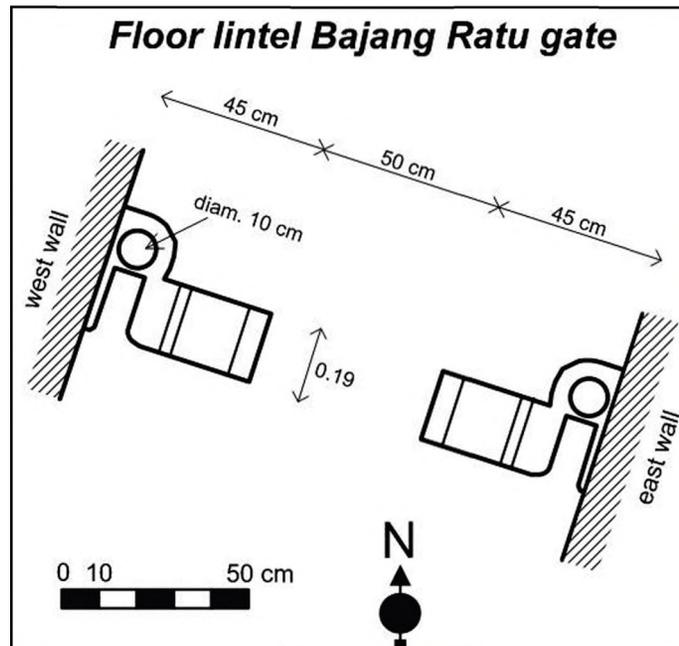


Illustration 6. Plan of door lintel of the gate of Bajangratu <H> (© Arnoud Haag).