A war loomed over the Pacific, the Dutch colonial government announced excavations on the site of a 14th-century Majapahit royal capital. On 14 May 1941, the Dutch colonial newspaper, De Indische Courant, turned its attention to a front-page news story, which we translate as follows (explanatory details are added between square brackets):²

“The Majapahit Royal Palace (Kraton). New Excavations—Our editor in Batavia reports: word has reached us that the Head of the Archaeological Service (Outheuwdijksing Dienst), Dr. W. Willems [1892-1942, in office 1936-1942], intends to instruct the Service’s pre-historian, Dr. W. Willems [1899-1964], to conduct excavations on the site of Kraton in the village of Sénaranejé near Maqajoang. The Javanese tradition has pinpointed this site as the spot where 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 J.J. Bernet Kempers [1900-72, in office 1947-53], published an inconclusive summary of the 1941 Kraton excavations in 1946. 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 [1886-1969, in office 1932-42, 1946-59], which offers new insights into the 1941 Kraton excavations.³ According to six letters exchanged between Willems, Van Orsoy de Flines and Stutterheim between 26 August and 30 December 1941, the excavator sent four boxes with sherds unearthed at the Kraton site to the ceramics specialist. Summarising his 29-page reports on the first two boxes in his letter to Stutterheim, Van Orsoy de Flines dated at least 92.1% 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 authorisedly 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 Kraton dig, concluding; “Het hele maakt nog meer dan Indruk van een rijke hofhouding, dan de vorige eulogy.⁵ Hence, Van Orsoy de Flines’ sherd analyses in September-December 1941 constituted the final piece of missing evidence which confirmed that Kraton—the royal palace site according to local Javanese oral tradition—positively dated to the Majapahit period (13th-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.⁶

**Calling attention to a recently found but hitherto undiscovered 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.**

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 Kĕ ḍaton remains.³ Most pertinently, however, the colonial government planned the 1941 excavations in a decisively concerted effort to refute Dr. Van Orsoy de Flines’ ‘hypotheses’ that the brick remains in Kraton (lit., Royal Palace) represented nothing more than a tani-woning [farmer’s dwelling] rather than the Menak Jinggo remains.² Most pertinently, however, the excavation plans were fully aware of the archaeological context of the 1941 Kraton dig, concluding; “Het hele maakt nog meer dan Indruk van een rijke hofhouding, dan de vorige eulogy.⁵ Hence, Van Orsoy de Flines’ sherd analyses in September-December 1941 constituted the final piece of missing evidence which confirmed that Kraton—the royal palace site according to local Javanese oral tradition—positively dated to the Majapahit period (13th-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.⁶

**“All sherds leave me with an even stronger impression of a prosperous royal household”**

In 1927, a team of archaeologists recently staged a dig in Kraton, the Jakarta Post English-language newspaper reported on 11 September 2008: “Researchers find capital city of Majapahit, but not palace.”⁷ So evaluating his reports 77 years later, Van Orsoy de Flines’ archaeological dating of the Siti Inggil terrace in Kraton 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 Kraton excavation plan in combination with a close reading of Prasapti’s description of the royal palace in the 1365 Old Javanese Ngarakrātāma eulogy.⁸ Hence, Van Orsoy de Flines’ sherd analyses in September-December 1941 constituted the final piece of missing evidence which confirmed that Kraton—the royal palace site according to local Javanese oral tradition—positively dated to the Majapahit period (13th-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.⁹

**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 Miski’s imagined sketch plan of sacred sites and water features, the distribution of 92 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 fieldwork the area shown in Miski’s sketch plans. Adopting Stuart Robson’s anthropological approach of community-based archaeology in his 1971 survey of Bélulu, 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 1.0 km around the Kidaton 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 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.

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, and about 150 wells comprising four to seven terracotta rings stacked on top of one another, and about 150 wells comprising four to seven terracotta rings stacked on top of one another, and about 150 wells comprising four to seven terracotta rings stacked on top of one another, and about 150 wells comprising four to seven terracotta rings stacked on top of one another, and about 150 wells comprising four to seven terracotta rings stacked on top of one another, and about 150 wells comprising four to seven terracotta rings stacked on top of one another. Both numbers seem excessively large. In Miski’s imagined sketch plan of “sacred sites for ancestor 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 264 square metres. So gradually became clear to us that these may have been a part of a public reserve 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. 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.8 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 depicted in Figs. 2-3 and medieval clay water pipes found on site in Trowulan, also depicted in Figs. 2-3 and medieval clay water pipes found on site in Trowulan, also depicted in Figs. 2-3 and medieval clay water pipes found on site in Trowulan, also depicted in Figs. 2-3 and medieval clay water pipes found on site in Trowulan, also. All this crucially important evidence was not available to later archaeologists.