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Ritual, settlement and land-use practices: Towards a social history of Neolithic though Medieval period Maski, southern India

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ABSTRACT

This article discusses the current outcomes of the Maski Archaeological Research Project (MARP), a multi-year investigation of the relationships among settlement and land-use practices, developing social differences and inequalities, and economic and ritual production in a 64 km^2 study area in the Raichur District of Karnataka. Here we discuss the results of MARP's systematic pedestrian survey, remote sensing, salvage activities, and excavation, which include 46 radiocarbon assays from both prehistoric and historic period contexts. These dates document a long chronology of differential burial practices spanning the middle of the Neolithic Period to the early Iron Age, and a diversity of settlement and land-use activities practiced during the Medieval Period. These data speak to the social and political significance of these activities and point to the historically complex character of landscape and place-making practices within the long-term social history of the Raichur Doab.

1. Introduction

The Maski Archaeological Research Project (MARP) has been documenting an extensive archaeological landscape in a 64 km^2 study region surrounding the multi-component archaeological site of Maski (Raichur District, Karnataka) since 2010 (Fig. 1). Archaeological remains around Maski have attracted the attention of archaeologists, historians, surveyors and geologists for more than 150 years. The 15 ha site of Maski is located along the eastern pediment slope of the Durgada Gudda inselberg hill on the western margins of the modern town of Maski. On the northern slope of the hill is the now famous version of the third Mauryan Emperor Asoka's (r. 268–232 BCE) Minor Rock Edict I, discovered by Beadon in 1915 (Krishna Sastry, 1915). Excavations by the Archaeological Survey of India in the 1950s demonstrated that the settlement at Maski extended from the Neolithic (ca. 3000–1200 BCE) through Medieval (ca. CE 500-1550) Periods (Thapar, 1957), while non-probabilistic exploration and excavation by others including Foote (1916), Munn (1934), Ahmad (1938), Yazdani (1938), Gordon and Gordon (1943) and Allchin (1954) pointed towards some of the diversity of archaeological remains on the Durgada Gudda hill and across the surrounding peneplain.

Since its inception, the MARP project has documented 271 archaeological sites and >9000 "off-site" low density artifact scatters across this study region's inselbergs, peneplain and river terraces through a combination of systematic surface survey, site mapping, remote sensing, surface feature and artifact attribute analyses, and most recently test excavations. Our research in the region surrounding Maski investigates how changes in settlement, agro-pastoral land use, craft production (e.g., metallurgical production) and ritual practices were related to novel forms of social difference and nascent inequalities, beginning during the Neolithic Period and Iron Age, and subsequently in the Early Historic (ca. 300 BCE -CE 500) and Medieval (ca. CE 500-1550) Periods when urban settlements, state polities, and empires developed across South India. Here we report the results of our research and discuss some of the long-term transformations in settlement organization and land-use practices (e.g., metallurgical, agro-pastoral, ritual activities) that contributed to the landscape history of the Maski region.

Our investigation of the Maski region's prehistoric archaeological record is evaluating the development of socially differentiated mortuary practices and land-use activities during the Neolithic Period and subsequent Iron Age (ca. 1200–300 BCE). In the 1980s, without the benefit of a significant record of radiocarbon dates, McIntosh (1985, 471) argued that northern Karnataka, and indeed Maski itself, provided the best archaeological evidence for the beginnings of the "megalithic culture", and most notably early megalithic mortuary practices in South India (see also Rao, 1988). Since that time, variation among megalithic

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monuments, their size, design and content, have become widely accepted empirical evidence for evaluating Iron Age social and political relations, and in particular those practices that constructed and maintained social differences and inequalities (cf. Moorti, 1994; Brubaker, 2001; Korisettar et al., 2001; Bauer and Trivedi, 2013; Bauer, 2015; Johansen, 2016; Bauer and Johansen, 2020). Yet the investigation of places where early variation in funerary rituals developed into the diversity of Iron Age megalithic mortuary practices has been less well pursued (but see Devaraj et al., 1995). Our research at MARP-79, a Neolithic-Iron Age cemetery, has recorded a deep chronology of differential mortuary practices, reconstructing how social differences were repeatedly instantiated in one place over the course of more than a thousand years, set within a changing landscape of settlement and land-use practices.

Our research is also reconstructing the historical role of human land use in shaping the ecologies of the region's inselberg landforms and surrounding peneplain, establishing the history of land use and its effects on the ecology and landscapes of the western Raichur District, in the land between the Krishna and Tungabhadra Rivers (the Raichur Doab region). Indeed, the Maski results also speak to the historiography of the Raichur Doab's fractious and contentious political history during the Medieval and Early Modern Period (CE 1550-1800), which historians have attributed to questionable assumptions about the doab's rich agricultural fertility and mineral resources (see discussion in Bauer, 2020, 2021). Here we discuss the results of MARP's systematic pedestrian survey, salvage activities and excavation, which include 46 radiocarbon assays from both prehistoric and historic period contexts. These dates document a long chronology of differential burial practices spanning the middle of the Neolithic Period to the early Iron Age, and a diversity of settlement and land-use activities practiced during the Medieval Period. Situating these results within the context of archaeological survey, remote sensing-based maps of landform and soil distributions, and historical scholarship, we provide inferences on how past spatial practices articulated with emergent forms of social distinctions throughout the long-term occupation in the region surrounding Maski.

2. Long-term settlement dynamics and land-use histories: Systematic survey at Maski

MARP has completed five field seasons and two study seasons, the majority of which included the intensive and systematic survey[1] of 35.2 km^2 (ca. 55%) of the 64 km^2 study region, documenting 271 archaeological sites and >9000 off-site artifact scatters (Johansen et al., 2021). The survey documents a regional landscape history in which dynamic socio-political practices involving settlement and land use led to increasing occupation and agricultural expansion, first during the Iron Age and Early Historic Periods, then later and more dramatically during the Medieval Period (Table 1).

Prehistoric settlement in the study area dates to the Neolithic Period and the Iron Age. Neolithic settlement in the study region consists of

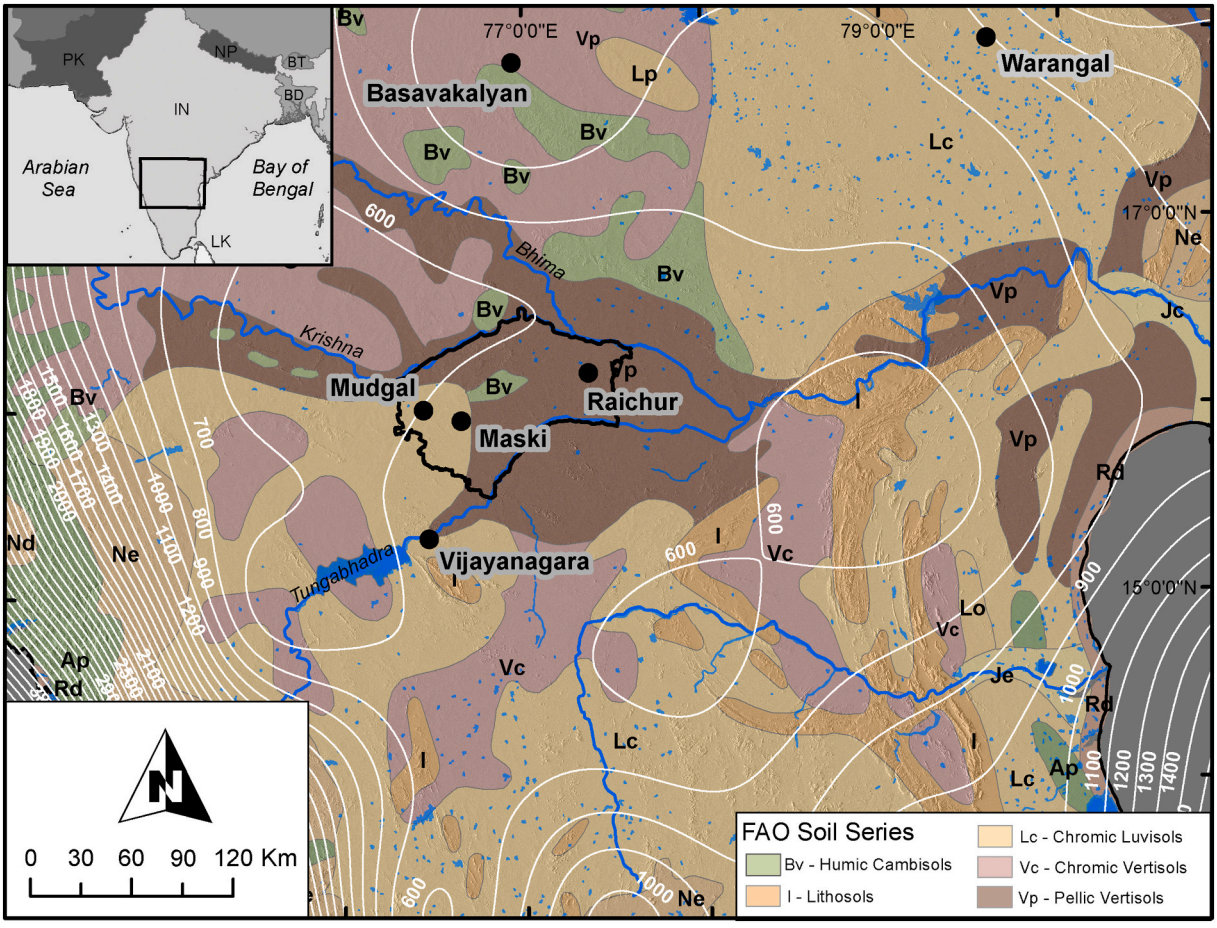

Fig. 1. Location map of MARP study area in Raichur District, (black outline) Karnataka, and other places noted in the text, overlain on generalized FAO soil series and 100 mm isohyets (modified from Bauer, 2021).

[1] For details on MARP's survey methods see Bauer and Johansen, 2019.

Table 1
The distribution of settlements by total number, occupied area, and average settlement size according to principal periods.

Period	Date Range	Number of Settlements	Total Occupied Area (ha)	Average Settlement Size
Neolithic	3000–1200 BCE	4	7	1.8
Iron Age	1200–300 BCE	15	14	1
Early Historic	300 BCE-500 CE	3	25	8.4
Medieval	500–1550 CE	13	55	4.3

several small occupations that include four settlements, one of which was recorded at the base of Thapar's (1957) excavations at Maski (MARP-97), and a number of occupied rock shelters. There are a comparatively higher number of settlement sites that are attributed to the subsequent Iron Age based on typical diagnostic surface ceramics. Iron Age sites also included a number of occupied rock shelters and constructed grazing terraces with further evidence of occupation. Most prehistoric sites are located on the region's inselberg hills and the Iron Age settlements are concentrated on and around the Durgada Gudda inselberg, where there are also a number of occupied rock shelters, modified hill terraces and expansive panels of rock art. The MARP data suggest that smaller agro-pastoral communities that were dispersed across the region's inselberg hills aggregated at a limited number of places during the subsequent Early Historic Period, creating fewer but larger settlement sites by the end of the first millennium BCE (Johansen and Bauer, 2015; Bauer, 2018; Johansen et al., 2021), a pattern observed elsewhere in northern Karnataka (e.g., Bauer, 2015) (Table 1).

The prehistoric inhabitants of the south Deccan established a mixed agro-pastoral economy, dry farming millets and pulses and herding cattle, sheep and goat, together with localized hunting and gathering of wild fauna and flora during the Neolithic Period (Bauer et al., 2007; R. Bauer, 2007; Fuller, 2003, 2005; Korisettar et al., 2001; Paddayya, 2001; Thomas et al., 2006; Sastri et al., 1984). Starting as early as 1900–1800 BCE some agro-pastoral communities in the wider region began to incorporate crops that were already cultivated in northern India, such as wheat and barley followed by hyacinth bean, then pigeon pea, and by the Iron Age, rice and some fruit tree crops (e.g., banana and mango) were being cultivated (Fuller et al., 2007; Kingwell-Banham and Fuller, 2012; Morrison et al., 2015; Roberts et al., 2016). MARP's survey documents several small to moderate sized Iron Age artifact scatters on the peneplain that may have been relatively isolated farmsteads, agricultural field stations or pastoral camps. The further distribution of low-density "off-site" Iron Age/Early Historic period ceramic scatters across the study region's peneplain (Fig. 2) also suggests the presence of dispersed agricultural activities and perhaps the manuring of fields—an apparent expansion of agricultural activities from those practiced during the Neolithic Period (Bauer, 2018; Bauer and Johansen, 2019; Johansen et al., 2021).

Many of the study region's Iron Age settlements and sites have surface distributions of iron slag, pointing to the region's earliest iron production activities. Of slags attributable to a particular stage of metallurgical production (i.e., smelting and smithing), those identified with smithing activities are predominant. In keeping with results from other regions (Johansen, 2014; Johansen and Bauer, 2018), MARP's survey results suggest that smithing was a far more socially widespread practice than smelting. This distributional pattern contrasts with our findings from the Medieval Period, when iron slags identified with smithing and smelting activities are found at a number of sites, suggesting that smelting was more widely practiced.

During the Medieval Period there is a significant increase in occupation, as well as in the number of inscriptions available for study.[2] The survey records an increase in the number of settlements, their total occupied area, and a wider distribution of sites and settlements on and around the Durgada Gudda inselberg and across the peneplain (Table 1). Moreover, there is a marked increase in medieval off-site artifact scatters that suggest, among other things, the extensive presence of agricultural field stations (e.g., Bauer, 2018) (Fig. 2). The largest Medieval Period site is a walled settlement (> 25 ha), known locally as Sulidhaba (MARP-102), and it is noteworthy that several of the inselberg sites during this period were also constructed with defensive walls (e.g., MARP-28, MARP-222). A number of 11th and 12th century stone inscriptions found near Sulidhaba that refer to the region as Mosangi point to investment in the area by the Western Chalukyas and suggest that Sulidhaba may have been a temporary or regional capital (Patil and Patil, 1998). Later medieval inscriptions attest to the importance of the Maski region (Mosage in a later inscription), describing Vijayanagara imperial land and village revenue grants and a tax remission in the 16th century (Patil and Patil, 1998; Thapar, 1957). Our initial test excavations demonstrate contemporaneous occupation of settlements on, and along the base of, the Durgada Gudda inselberg that date to the 12th through 14th centuries, during a large portion of which there is a distinctive gap in dated medieval inscriptions from the study region.

The Medieval expansion of settlement and agricultural practices is further documented by the survey's record of low-density artifact distributions (< 40 per hectare) across the region's peneplain contexts (Fig. 2). The distribution of these sherd scatters generally marks the extent of medieval agricultural activities. Further support for this inference can be observed in the distribution of check dams and step wells as well as discrete concentrations of ceramic water jars. The correlation of extensive, low-density artifact distributions with agro-pastoral land-use practices (e.g., manuring and fertilization) have been convincingly inferred by a number of archaeological studies elsewhere in the world, lending strong support to our interpretation of these data in the MARP study area (Bauer, 2018; Bintliff and Snodgrass, 1988; Wilkinson, 1989).

The diachronic analysis of low-density artifact distributions in relation to soil maps created through multi-spectral remote sensing classification of Landsat 8 data display a number of statistically significant spatial patterns from which we have been able to infer some of the dynamic ways peoples in the Maski region constituted agro-pastoral places (e.g., fields, pasture, water management) and practices amidst diverse assemblages of soils and other landscape features (Bauer, 2018; Bauer and Johansen, 2019). The distribution of Iron Age and Early Historic low-density ceramic scatters are located largely within the regur soil zone (i.e., dark, moisture retaining, clay-rich loam vertisols), yet during the Medieval Period they are more equally distributed across both the dark clay loams and the red, sandier lithosols and luvisols (Bauer, 2018). We also observe that low-density concentrations of iron slag are distributed primarily among the red sandy soils. This pattern points to dispersed metalworking practices, most likely smithing, and suggests that the dark soils were being preferentially used for agricultural production (Bauer, 2018). These distributional patterns demonstrate chronologically sensitive differences in land-use practices that result in the deposition of low-density artifact scatters (e.g., the manuring and fertilization of agricultural fields); the data demonstrate a significant expansion in agricultural production in the Medieval Period, which came to include both black vertisols and those less water retentive red, sandy soils.

In 2018 MARP began a program of test excavations in the study area to learn more about the occupational history of the region. This was

[2] During the preceding Early Historic period there is only a single inscription from the study area, that of Ashoka's Minor Rock Edict I at MARP-1.

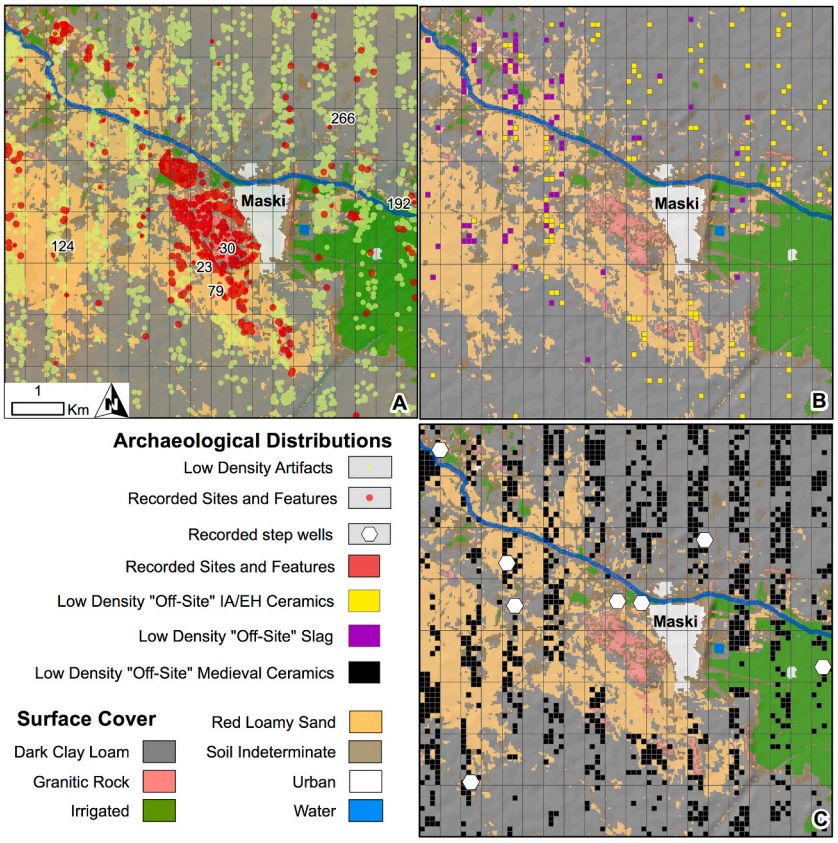

Fig. 2. Distribution of documented archaeological sites and "off-site' artifacts (A), "off-site" Iron Age/Early Historic sherds and iron slags (B), and "off-site" medieval sherds and wells (C) in the project area, including sites noted in text (modified from Bauer, 2018).

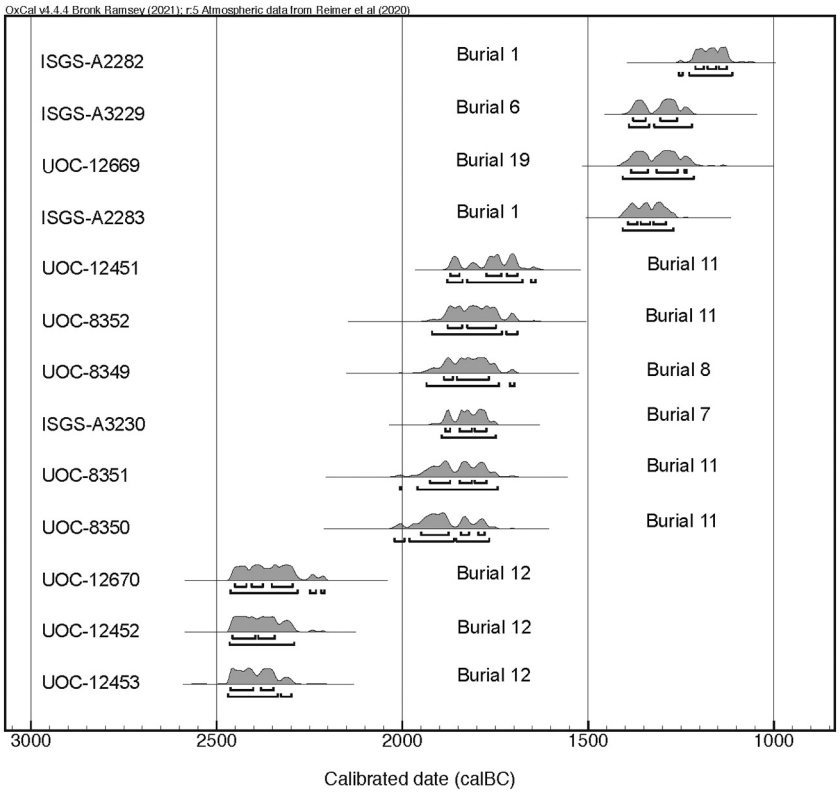

Fig. 3. Probability density distributions of all calibrated radiocarbon assays from MARP-79 (Reimer et al., 2020; Bronk Ramsey, 2021).

followed in 2019 by salvage excavations at a prehistoric and a medieval site that were under threat from quarrying and construction activities. We turn now to the results of this research beginning with excavation and salvage activities at a Neolithic-Iron Age cemetery, MARP-79, followed by a discussion of excavation at several Medieval Period sites in the study region.

3. MARP-79: a Neolithic-Iron Age Cemetery in northern Karnataka

During systematic survey MARP identified a 2-ha cemetery site on the western pediment slope of a small inselberg hill just south of the Durgada Gudda hill. Burials at MARP-79 were significantly disturbed by stone, sand and gravel quarrying pits, activities which have continued to destroy and disturb parts of the site over subsequent years. Burials containing human and animal skeletal remains, slipped, and slipped and polished ceramics, copper and iron objects, and ground stone lithics were observed scattered across open quarry pits and in exposed sections. There was considerable variation in the condition and preservation of these burials with some relatively well preserved and partially visible in section, while others had been quarried out to expose only the partial basal plan of the interment. Many others were so completely destroyed that little more than a few scattered fragments of bones and artifacts remained. In an effort to mitigate against the negative impact of these activities, MARP began recording these partially exposed, and rapidly disappearing burials in 2012 and 2014 followed by the complete excavation of three in 2018 and 2019 (Bauer et al., 2021). We have recorded 21 burials at MARP-79 of which we have dated seven with radiocarbon assays (Fig. 3).

Recording activities included taking photographs, drafting section drawings and the collection of artifacts, human remains and charcoal samples from exposed burials for future analysis (Bauer and Johansen, 2015; Johansen and Bauer, 2015). Two of the exposed graves, a stone capped pit burial visible in section with skeletal remains encased within a cist of ashy gray material (Burial 1), and an exposed partial skeleton with the remains of a similar surrounding ashy gray matrix (Burial 6) were dated to between the 12th and 15th centuries BCE, while a third, a simple pit burial exposed in section (Burial 7) (Bauer and Johansen, 2015), and a fourth, a partially destroyed sarcophagus burial (Burial 8) were dated to between the 19th and 18th centuries BCE (Fig. 3). Burial 12, another simple pit grave, exposed in section, contained a jar of a temporally diagnostic form of micaceous Neolithic pottery and dates even earlier. Combining the three dates from Burial 12 gives a 2σ calibration date range of between 2461 and 2304 BCE (agreement index = 110.3). Together these radiocarbon dates demonstrate that the cemetery was occupied at least as early as the 25th century BCE with continued use up to at least the 12th century BCE, and probably later (Fig. 3).

One recently exposed burial (Burial 11) was selected for salvage excavation given its still relatively well-preserved condition and immanent threat of complete destruction. Excavation exposed a 220 cm long grave pit that had been cut 70 cm into weathered granitic saprolite to form a flat, level base. A single set of skeletal remains encased in a cist of burned, light gray, ashy organic material and plaster lay extended on the base of the grave pit. The skeletal remains appeared largely articulated yet were friable and fragmentary with the skull resting on the cranial base, as opposed to the posterior occipital region, as expected if the body had been interred prone and intact at burial. This suggests the body was excarnated prior to burial, followed by a general re-articulation of the skeleton prior to being placed in a prepared cist constructed of organic and inorganic materials and then interred in the grave pit and burned (Fig. 4A). On the preserved southern side of the burial pit five globular slipped red ware jars had been placed in a row along the pit wall with four slipped and polished carinated bowls placed above or below the jars where they intersected with one another. Several charcoal samples were recovered from Burial 11 for which we have four radiocarbon assays (Fig. 3). MARP combined the four dates from Burial 11 which provide a 2σ calibration between 1883 and 1751 BCE (agreement index = 63.4). These dates correspond well with the early dates from Burial 7 and Burial 8, documenting a diversity of burial practices dating back to at least the early centuries of the second millennium BCE.

The excavation of Burial 19 exposed a large pit cut into granitic saprolite with a single excarnated skeleton interred in a cist or coffin made from burned and ashy organic materials (wood and perhaps reeds) and plaster resembling Burial 11, yet with a layer of tabular granite capstones laid on the top of the burial chamber in a manner similar to what we have observed in section for Burial 1 (Fig. 4B). The skeleton in Burial 19 had been excarnated with the skull placed upside down on the calvarium with the frontal bone and oculi facing the remaining skeleton; other bones were likewise displaced. Burial 19 also contained the partial remains of a medium sized mammal and an iron dagger together with >20 ceramic vessels, including large storage jars and a number of unrestricted vessels such as slipped and polished black ware bowls and dish-on-stand. A radiocarbon sample from Burial 19, has yielded a 2σ calibration between 1406-1216 BCE dating this grave to the end of the Neolithic Period and overlapping with those of Burials 1 and 6. The construction of Burial 19, its structural features, mode of interment, and grave inclusions documents important change and continuity in mortuary practices established by at least the 20th -18th centuries BCE (as observed in Burial 11).

Burial 20 was heavily damaged by quarrying and exposed in section showing a partial set of skeletal remains interred in a burial pit that had been cut into the saprolite and subsequently filled with cobbles and small boulders. At least two granite slabs lay above the body at the base of the layer of cobble and boulder fill above. Unlike Burials 1, 11 and 19, the skeleton was not placed in an ashy cist. There were several grave goods in the interment, including a copper bracelet and a necklace comprised of multiple carved bone pendants in variable states of preservation. The copper bracelet is strikingly similar to another recovered from Burial 6 dating to between 1389-1229 BCE (2σ calibration) (Bauer and Johansen, 2015). Burial 20 is noteworthy for the intentional incorporation of in situ granite boulders that define the extant western and southern edges of the burial pit and appear to predict, in part, the design of stone circle “megalithic” monuments that are a common feature of mortuary practices in the Iron Age. No charcoal was recovered from Burial 20.

4. Medieval period settlement history at Maski: Plain and inselberg contexts

The 2018 and 2019 field seasons also involved test excavations at a number of Medieval Period sites to learn more about the occupational history of the study region in later times. Our survey results demonstrate that medieval occupation in the study area expanded considerably from its Early Historic precursors both in the number and overall area of occupied settlements, together with peneplain agricultural activities we have inferred from the off-site low-density artifact distributions. The medieval expansion in settlement involved both a growth and diversification of occupational contexts on and around the Durgada Gudda inselberg, along the Maski River terraces and across the peneplain. Test units were excavated at the medieval settlement of MARP-23, a 13 ha site located along the southwestern base of the Durgada Gudda inselberg, and salvage activities were conducted on a long section exposed at the medieval settlement of MARP-30, a 3 ha settlement site located along the southern portion of the inselberg that has recently been damaged by road and building construction activities. Salvage activities at MARP-30 included section cleaning, profile drawings and the collection of sediments, artifacts and botanical samples. This was followed by the excavation of a test unit and additional profile documentation as further site destruction ensued at MARP-30. Test excavations were also conducted at several smaller sites (< 1 ha) documented on the peneplain during systematic survey, including what appears to be the

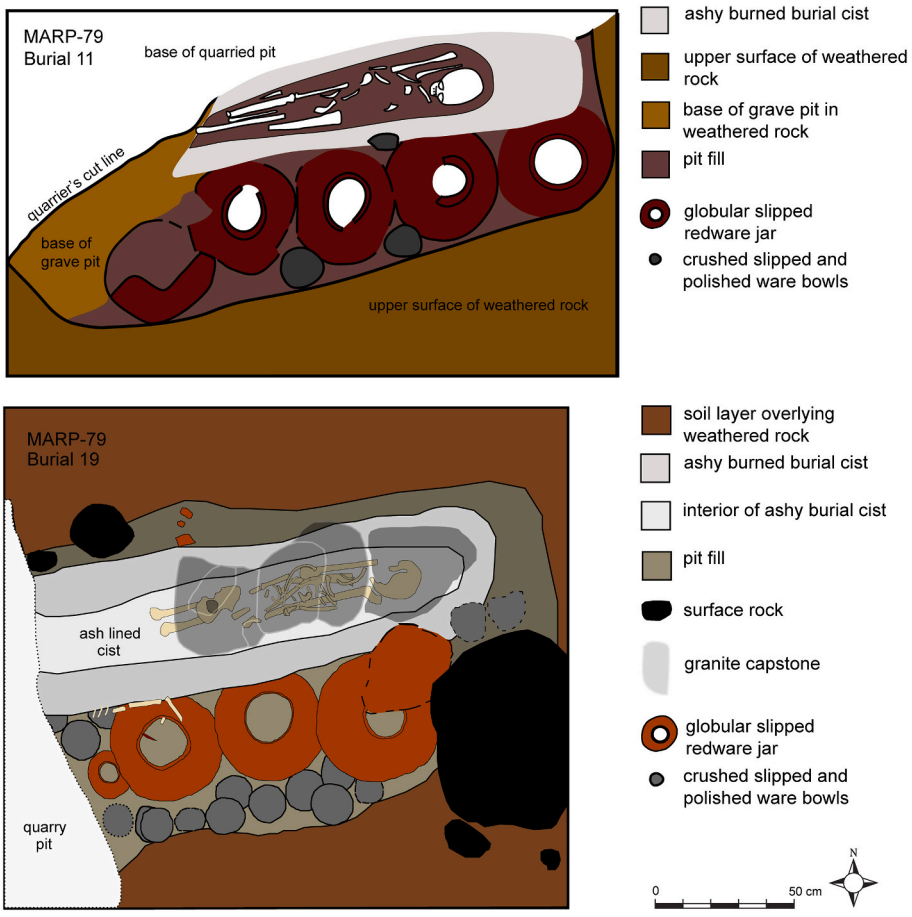

Fig. 4. Plan of Burial 11 (A: above) and Burial 19 (B: below) at MARP-79.

remains of a small farmstead at MARP-192 (discussed below). These excavations have enabled us to assess the chronology of Medieval Period occupation in the Raichur District and to contextualize regional settlement practices during this time of exceptional historical change.

4.1. *MARP-23: A medieval period settlement on the plain*

MARP-23 is a large (ca. 13 ha) Medieval Period settlement site at the southwestern base of the Durgada Gudda hill that was first noted by Ahmad (1938) simply as "traces of old settlement" on a map of archaeological sites observed or excavated by the Nizam of Hyderabad's Archaeology Department in the 1930s. The site was first recorded by MARP during survey in 2010 and was selected for test excavations in 2018. The surface of the site consists of a high to moderate density artifact scatter with the occasional remains of relict stone architectural features. MARP excavated two test units at the site. The first, TU1, a 2x2m unit, is located near to where the inselberg's pediment slope intersects with the peneplain and the second, TU2, a 1x1m unit, is located on the plain 100 m to the southeast. Both units were excavated through stratified domestic deposits to sterile granitic bedrock. Radiocarbon assays date the full range of occupation in each location, and these largely correspond with dates from the settlement at MARP-30 on the inselberg above and to the east.

Excavation at TU1 exposed the corner of a large circular well built of granite boulders and cobble elements, and a series of gravel and earthen extramural surfaces (Fig. 5A). The well was excavated into granite saprolite and bedrock. A mortar-lined footing supported a circular stone shaft at the interface of the well and the former ground surfaces in use during the Medieval Period. North and west of the well, excavation revealed several extramural surfaces constructed of compacted earth, cobbles and gravel built on sterile granite saprolite. The interior of the well was excavated to a depth of 260 cm, which did not reach the bottom of the Medieval Period well shaft. Four calibrated radiocarbon assays from the exterior of the well confidently date occupation between the early 13th century and late 14th centuries CE (Fig. 6). A single radiocarbon assay from fill within the well shaft has a "bi-modal" probability distribution which calibrates to between the early 14th or early 15th centuries at 95% confidence (2σ) due to the reversal in the IntCal20 calibration curve in the mid to late 14th century and suggests that the well was abandoned and accumulating silt by at least the early 15th century CE (Bauer and Johansen, 2019; Bauer et al., 2021).

The second unit, TU2 exposed a portion of a domestic structure with an occupation contemporaneous with both the well at TU1 and the settlement at MARP-30. Excavation of the 1 × 1 m unit exposed 60 cm of superimposed plaster surfaces abutting a curved packed mud wall to the northwest (Fig. 5B). The mud in the wall appears to have been specially prepared, perhaps having been levigated. In places the laminated plaster surfaces extended from the floor onto the surface of the rammed mud wall. The lower, better preserved, surfaces consisted of alternating layers of light gray plaster occasionally separated by thin layers of compact gray-brown sand loam, with granite gravel, charcoal and artifacts. These laminated surfaces were regularly re-plastered with what appears to be the periodic releveling of the floor. The room itself was built on a platform of compacted mud (9–14 cm thick) built directly over a sterile weathered granitic surface (i.e., saprolite); the platform underlies both the walls and floor surfaces. Floor and associated fill deposits contained a range of ceramic artifacts consistent with domestic contexts such as storage jars and serving vessels that included bowl and plate forms. These include classic medieval gray wares and black plain ware but also smaller proportions of slipped and polished wares (Johal,

Fig. 5. Photo of the upper coursing of the stone-lined well and its mortar-line cobble base in association with cobble and sherd-packed surface to north and west at TU1, MARP-23 (A: above); and photo of an exposed lower plaster surface with later replastered surfaces visible in section in the house structure at TU2 (B: below).

2021). The six radiocarbon assays from the house deposits demonstrate that it was occupied during the 13th and 14th centuries; however, two of these assays with very large error ranges point to the high probability of occupation prior to the turn of the 13th century as well (Bauer and Johansen, 2019) (Fig. 6).

4.2. MARP-30: A medieval settlement on the Durgada Gudda Inselberg

The settlement at MARP-30 consists of a large occupational area constructed across north, northeast, and east aspect slopes near the southern end of the Durgada Gudda inselberg (Fig. 2). The site has surface exposures of medieval ceramics and numerous extant and partially preserved room blocks, retention walls and pathways constructed of cut and uncut granite architectural elements (see also Fanthome, 2021). These architectural features extend upslope to a saddle where they intersect with another 3 ha settlement (MARP-28) with similar architectural features and surface ceramic assemblages. Portions of the southeastern part of the site have surface distributions of what appear to be more homogenous deposits of Iron Age slipped and polished wares. MARP previously documented several areas of the site, including a long 13 m section, that were dug out by road and building construction exposing several layers of stratigraphy, including core and veneer wall features and a number of associated extramural surfaces constructed of packed gravels, cobbles, and earthen materials. We documented and sampled exposed sections for sediment, botanical remains and artifacts. Calibration of radiocarbon dates from these deposits and the use of OxCal v4.3.2's Bayesian sequence function to integrate stratigraphic information from the profiles to constrain the probability distributions for the radiocarbon assays suggest that these deposits most probably date between the 12th century and sometime in first half of the 14th century, though these construction exposures did not expose sterile deposits (Bauer and Johansen, 2015, 2019) (Fig. 6). Ceramics from these deposits also include slipped or polished red wares and black wares, and less frequently slipped and polished black-and-red ware. In keeping with findings we have reported earlier (Bauer and Johansen, 2015; and see Johal, 2021) medieval ceramic assemblages at Maski are not restricted to the plain gray and black wares that had previously been thought to characterize ceramic wares during the Medieval Period (see Thapar, 1957).

In 2019 MARP excavated a 1x1m test unit adjacent to the 13 m construction cut to recover additional information about the chronology and character of these disappearing occupational deposits (Bauer et al., 2021). The test unit documented >2 m of occupational deposits before excavation was terminated due to safety reasons. These deposits are

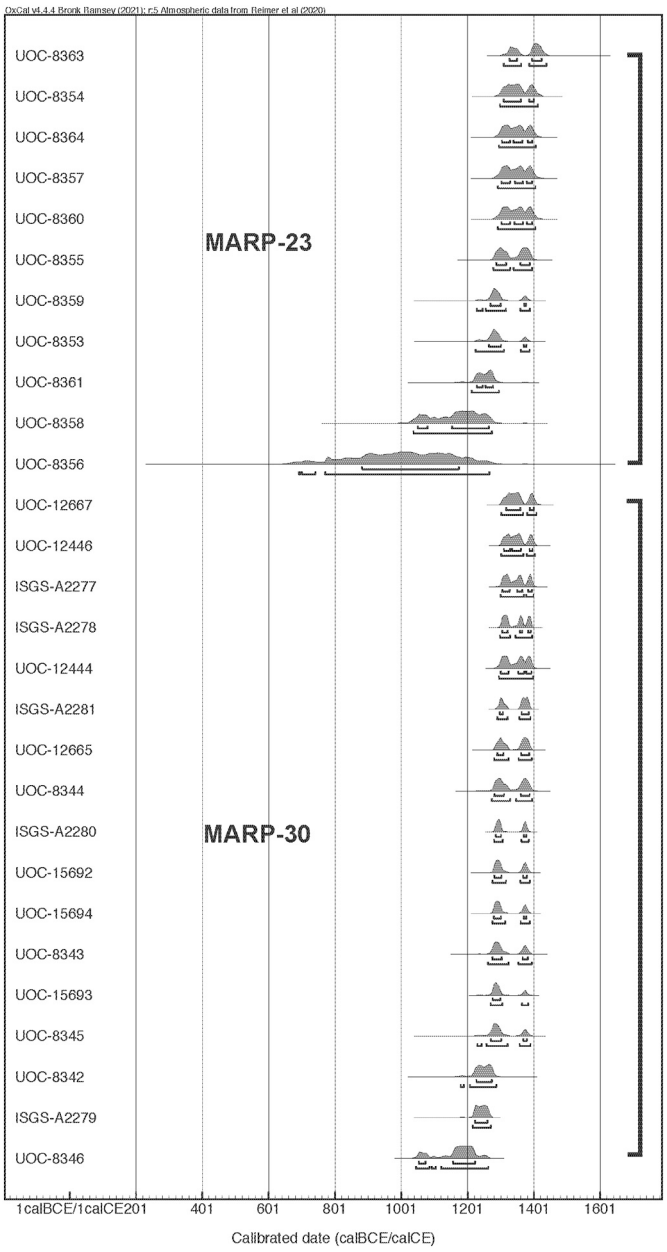

Fig. 6. Probability density distributions of all Medieval period calibrated radiocarbon assays from MARP-23 and MARP-30 (Reimer et al., 2020; Bronk Ramsey, 2021).

located in an area of significant Medieval Period occupation and excavation uncovered a sequence of stone walls, pits, surface features, and layers of fill together with stratified deposits of ceramics and other artifacts. The upper deposits of the test unit exposed faced stone masonry foundation walls with associated exterior surfaces and pit features with high concentrations of faunal remains and ceramics, most notably Medieval Period gray wares, together with plain black, buff slipped, brown slipped, red plain, and red slipped and polished wares. The upper and lower deposits of the excavation unit were separated by a thick layer of highly compact clay-rich loam used by the medieval inhabitants of the site to level the area and prepare it for construction. Beneath this layer of construction fill lower deposits included pit features containing ceramic assemblages predominated by slipped and polished red wares, black wares and some black-and red-ware. Radiocarbon assays of charcoal samples from the construction fill layer and those above suggest that this period of substantive medieval building and habitational activity took place during the 14th Century CE (Figs. 6). Five[3] radiocarbon assays from deposits beneath the layer of medieval construction fill date to between the 11th and 14th Centuries BCE, during the late Neolithic Period and early Iron Age (Fig. 7). Surface survey of MARP-30 had previously suggested Iron Age deposits across the southeastern part of the site and these radiocarbon assays from the test unit's lower layers corroborate these observations.

MARP documented a third stratigraphic section exposed by construction activities to the east of those previously recorded (the eastern exposed section) (Bauer et al., 2021). Here exposed archaeological deposits were superimposed on granite bedrock revealing the basal layers of occupation at this part of MARP-30. Three[4] radiocarbon assays (1911–1746, 1882–1697, 1495–1303 BCE 2σ calibration) date this exposure to between the 20th and 14th centuries BCE, further corroborating an early, prehistoric occupation at MARP-30 (Fig. 7).

4.3. MARP-192: A possible farmstead on the Peneplain

In 2018 MARP also conducted a program of investigation to evaluate the occupation and extension of Medieval Period land use on the peneplain. Test excavations in 1x1m units were completed at a limited number of sites (MARP-124, MARP-192, and MARP-266) on the peneplain that were identified as possible Medieval or Early Modern Period farmsteads or field stations during the survey (e.g., Bauer and Johansen, 2019; Bauer et al., 2021). All three sites are located in fields that were being actively cultivated and so these sites were at least partially disturbed by contemporary land-use practices. Deposits at these sites were all shallow and those at MARP-124 and MARP-266 were thoroughly mixed with 20th century materials and debris. Primary archaeological contexts were identified at MARP-192 where sterile deposits were reached at 50 cm below surface. Several stable ground surfaces with associated flat lying artifacts were exposed below the modern plough zone. Near the base of the excavations a more compact activity surface was exposed with associated Early Historic and early Medieval ceramic sherds and an ash lens that suggest a single or limited use hearth (Bauer and Johansen, 2019). Two radiocarbon assays of a sample of wood charcoal date this feature and its associated surface to between the fifth and sixth centuries CE (418–538 CE, 2σ calibration. The ceramic assemblage associated with the lower ground surfaces, hearth and compact activity surface is predominated by jars with very few bowls (Bauer et al., 2021). These deposits are consistent with expectations for a Medieval or Early Historic Period field station associated with a dispersed farmstead, providing solid corroborative evidence for agricultural land-use activities on the peneplain beyond the low-density off-site artifact scatters recorded by the MARP survey.

5. Discussion: landscape and social history on the Raichur doab

The results of MARP's research permit us to consider some of the transformations in social, economic and environmental practices that constitute the region's dynamic and complex landscape history. Beginning with the Neolithic Period, salvage activities and excavation at MARP-79 have dated some of the earliest contemporaneous variation in mortuary practices in South India. Radiocarbon assays from three graves dating to the 20th – 18th centuries BCE demonstrate significant distinctions in mortuary preparation and the earliest radiometric evidence for particular funerary practices— i.e., sarcophagus burial, ashy cists with excarnated skeletal remains and simple pit burial.[5]

The grave good assemblage from Burial 11, the best preserved of the early interments at MARP-79, included four carinated black slipped and

[3] Two of these assays are from the same sample.
[4] The earlier two assays are from the same sample.
[5] An earlier simple pit burial at MARP-79, Buria12, dates to the 25th–24th centuries BCE.

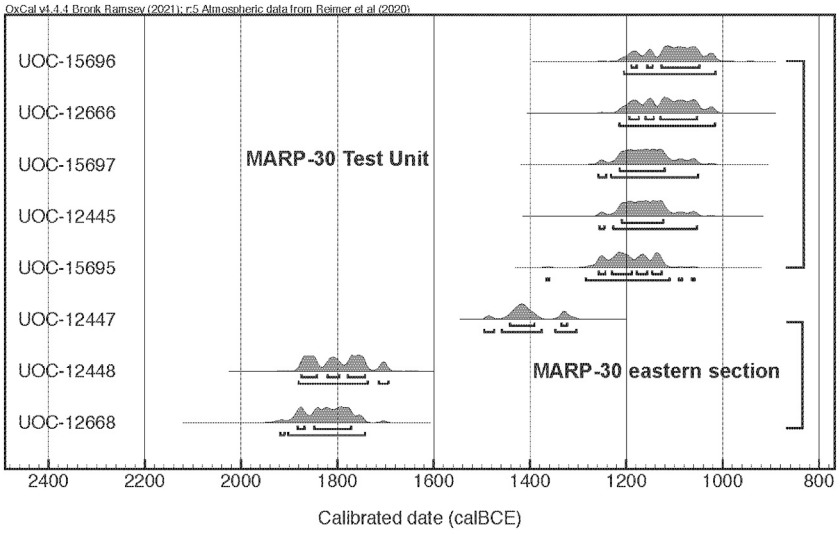

Fig. 7. Probability density distributions of all Neolithic Period and Iron Age calibrated radiocarbon assays from MARP-30 (Reimer et al., 2020; Bronk Ramsey, 2021).

polished ware serving vessels that are more commonly observed in Iron Age deposits, and are perhaps the earliest documented examples of this combination of surface treatment and vessel type. The inclusion of these open-mouthed, serving vessels in Burial 11 may suggest that mortuary practices involving the consumption of differentially valued cultigens was one means of producing late Neolithic social distinctions; differential methods of interment may have been another. If this is indeed the case, this group of burials from MARP-79 could be among the earliest evidence for emerging forms of social distinctions that developed from contemporaneous transformations in production strategies and consumption differences.

These novel burial practices appear to have incrementally developed into the more monumental mortuary practices of the ensuing Iron Age (Bauer and Johansen, 2015, 2020). Additional burials at MARP-79, including those with metal (iron and copper) grave goods and stone slabs that seal burial cists, some of which include radiocarbon assays dating approximately to the early Iron Age (e.g., Burials 1, 6 and 19) (Fig. 3), demonstrate a long-term localized development in mortuary practices, and the persistent continuity of funerary activities at this place. As one example, Burial 19 exhibits a remarkable continuity of mortuary practices with those observed in Burial 11 (i.e., the excarnation of skeletal remains, interment in a burned ashy coffin made of plaster and organic materials, the inclusion of large, slipped ware jars and slipped and polished serving vessels), while displaying novel features, such the capping of the burial chamber with large stone slabs and the inclusion of an iron dagger along with partial remains of a sheep or goat (Fig. 4). Burial 20's construction in a circular outcropping of in situ surface boulders filled with a deep stone cairn packing above a burial cist capped by a line of stone slabs further anticipates the more established mortuary practices of the Iron Age (e.g., stone cairn packing, stone slab cists and stone circle graves).

Important changes in prehistoric agricultural practices are also documented at a regional scale by the results of MARP's systematic survey. The distribution of low-density off-site artifact scatters provides the earliest evidence for agricultural fields, manuring practices, workstations and possibly small farmsteads. These date to the Iron Age or Early Historic Period when small, and in some cases, quite dense artifact scatters are first observed on the peneplain, primarily in areas of the black, moisture-retaining, regur soils. Agriculture in northern Karnataka begins in the Neolithic Period, first with the domestication of a south Indian suite of drought-resistant millets and pulses that grow in both the red sandy soils and the black clay-rich regur soils, followed by the cultivation of non-local cereals— wheat and barley by 1900–1700 BCE, and pulses including hyacinth bean and pigeon pea by approximately 1600–1400 BCE, and then rice, cotton, and tree crops such as banana and mango by at least the middle Iron Age (800–600 BCE) (Asouti and Fuller, 2008; Bates et al., 2022; Boivin et al., 2018; Fuller, 2003; Fuller, 2006; Fuller et al., 2007; Morrison et al., 2015; Roberts et al., 2016). In contrast, MARP's data for Neolithic site and off-site artifact distributions suggest that regional settlement occupation was fairly low intensity at this time and there is limited evidence for farming on the peneplain.

Several of the new and nonlocal crops (e.g., wheat, barley, rice, cotton, banana) incorporated into prehistoric agricultural practices in northern Karnataka likely involved adjustments to planting and harvesting seasons, and new water management strategies, including more significant use of the moisture-retentive regur soils. These developments may have led to very significant changes in the scheduling of seasonal agricultural labour and social relationships (Bauer et al., 2007; Bauer and Johansen, 2019; Fuller, 2005; Johansen, 2019; Roberts et al., 2016) as well as new forms of cuisine, the latter suggested by changes observed in ceramics, such as the increasing variety in small slipped and polished serving vessels by 1400–1200 BCE (Sinopoli, 2016). MARP's distributional patterning of Iron Age or Early Historic Period archaeological sites and low-density artifact scatters suggest some correspondence between expanding use of the dark, moisture-rich soils of the peneplain for farming and the increasing expansion of new non-local crops documented elsewhere in northern Karnataka, many of which have higher water needs (see also Bauer and Johansen, 2019).

MARP's survey data point to an overall growth in settlement locales during the Iron Age, a pattern that is generally corroborated by both survey and excavation results to the south in the Benekal Forest Reserve (e.g., Gaggioli et al., 2021; Bauer, 2015) and near the Tungabhadra River (e.g., Morrison et al., n.d). However, Roberts et al. (2016) have documented a decline in settlement in the region around Sanganakallu, ca. 200 km southwest of the MARP study region, following the appearance of slipped and polished ware ceramics in settlement contexts that date to the terminal Neolithic. Roberts et al. (2016, 590–595) argue that increasing stress on water resources from less drought resistant crops like wheat and barley, introduced to the region during the second millennium BCE, together with a period of increasing aridity, led to the abandonment of some regions of persistent Neolithic occupation with less reliable perennial water resources in the late centuries of the first millennium BCE. While the Maski region, like the Tungabhadra River corridor, is located in a more well-watered area of Roberts et al.'s precipitation modelling than the Sanganakallu region, our radiocarbon assays from MARP-79 and MARP-30 may point to some regional reorganization of settlement practices around the turn of the first millennium BCE. Our current radiocarbon assays from exposed and excavated

burials at MARP-79 document mortuary practices up to the 'conventionally' understood beginnings of the Iron Age (ca. 1200 BCE) and the prehistoric deposits of the test unit at MARP-30 have thus far yielded assessments that date to the late Neolithic Period and the early portion of the Iron Age (e.g., 1206–1015 BCE, 2σ calibration) (Figs. 3 and 7). While we must stress the limited nature of these data to date,[6] and that the Medieval Period occupation at MARP-30 may have removed later Iron Age deposits in leveling the area for the building foundations we exposed in the limited test unit (1x1m), it is important to consider the possibility that some site and regional abandonments may have taken place at this time. Yet to reiterate, the wider patterning from the survey data, albeit with less precise temporal control, shows a higher number of settlement locales attributable to the Iron Age and an expansion in land-use activities on the clay-rich areas of the peneplain over the course of the Iron Age and Early Historic Periods.

Settlement numbers appear to contract during the Early Historic Period, yet overall settlement area, and ostensibly population, increases with the occupation of MARP-97, the large 15 ha site excavated by Thapar (1957) and Yazdani (1938) (Table 1). In the Medieval Period, settlement expands considerably both in numbers of sites (across the inselberg and peneplain) and settlement size, most notably with the occupation of Sulidhaba, the large (ca. 25 ha), and at least partially fortified site on the plain of the Maski River just north of the Durgada Gudda inselberg. Social differences in the production of settlement places and land-use practices develop important new dimensions in the Medieval Period and archaeological data from MARP's survey and excavation activities are elucidating and expanding upon text-based interpretations of political and environmental histories in the Raichur Doab, and indeed, of South India as a whole.

Concurrently occupied medieval settlement communities at MARP-23 and MARP-30 are socially significant for differences in both their location relative to the fortifications of the Durgada Gudda inselberg and architectural materials used to construct domestic and other contexts at both places (Bauer and Johansen, 2019). Survey and mapping at MARP-30 and MARP-28, located on the southern portion of the inselberg, have recorded extensive distributions of domestic and defensive architecture constructed of cut and unmodified granite elements (see also Fanthome, 2021). On the other hand, excavation at MARP-23 on the exposed pediment slope and peneplain, has identified a domestic structure constructed of mud and plaster, which is consistent with surface survey of the site that recorded very few examples of stone-built architecture. As we have discussed elsewhere (Bauer, 2019; Bauer and Johansen, 2019), the differences in building practices and materials, associated labour requirements, and topographic emplacement strategies created two very different settlement landscapes, with potentially profound implications for residents at each location given the robust inscriptional record of extensive and violent conflict in the wider region between the 11th and 16th centuries CE (Kadiri, 1962; Murari, 1976; Patil and Patil, 1998). Medieval inscriptions document an alarming regularity of warfare on the Raichur Doab between the Western Chalukyas and the Chola Empire during the 11th century, including a battle at Maski in CE 1021 documented in a Tamil inscription installed in the Rajarajesvara temple in Thanjavur by the Chola king Rajendra I (Murari, 1976; Thapar, 1957; Bauer and Johansen, 2019). In the 13th century when both MARP-23 and MARP-30 were occupied, feudatories of the Yadava's and the Kakatiya's (with capitals in Devagiri and Warangal) occupied Mudgal and Raichur—respectively, west and east of Maski—followed by repeated invasions and incursions from the Delhi Sultanates in the early 14th century (Eaton and Wagoner, 2014; Eaton, 2019; Bauer and Johansen, 2019). The apparent abandonment of both MARP-23 and MARP-30 during the 14th century thus seems to have taken place at time of heightened tensions in the region, which were exacerbated further in the latter part of the 14th century by conflict between the Bahmani Sultanate and the Vijayanagara Empire, both of which laid claim to the Raichur Doab (e.g., Murari, 1976; Eaton, 2019; Eaton and Wagoner, 2014). Within this socio-political environment, residents of settlements at both MARP-23 and MARP-30 would have been palpably aware of the social distinctions and practical implications to occupying mud-walled houses on the plain and residential terraces behind stone walls and defensive constructions on the hill (see discussions in Bauer, 2019; Bauer and Johansen, 2019).

It is of further interest that archaeological evidence for significant occupation in the 13th and 14th centuries CE at MARP-23 and MARP-30 date to a time of profound silence in the epigraphic record associated with the Maski area. Dated medieval inscriptions from the Maski area are largely donative in character and date to either between the 11th and 12th centuries or to the first half of the 16th century (e.g., Bauer, 2020; Bauer and Johansen, 2019). Several Western Chalukyan rulers are mentioned in the early period of inscriptions, while those of the Vijayanagara Empire predominate the later period (Patil and Patil, 1998). In both periods inscriptions suggest claims over the region by either Chalukyan or Vijayanagara rulers. Two coins recovered by Thapar (1957, 16), one from the surface and another from upper levels of excavations at MARP-97 (Maski) date to the early 14th century when the epigraphic record was silent, yet when occupation at MARP-23 and MARP-30 was still ongoing. Thapar attributes these coins to the Delhi Sultans Qutb al-Din Mubarak Shah Khalaji (r. CE 1316–1320) and Ghiyath al-Din Tughluq (r. CE 1320–1325). These coins suggest that other Medieval Period sites on and around the Durgada Gudda inselberg may also have been occupied during the 13th and 14th centuries as well (e.g. MARP-88, MARP-97; MARP-102, MARP-222). The presence of coins from the Khalaji and Tughluq Sultans during this break in the local epigraphic record may also suggest the possibility that the region was administered, for a time, by rulers or governors for whom temple patronage, the support of Brahmana communities, and other donative activities, were no longer important, or at least not deemed significant enough to commission an inscription (e.g., Delhi Sultanates, their feudatories, and the Bahmani Sultanate). Regardless, the MARP survey and excavation data clearly establishes occupation at Maski during a time when sources commonly deployed by historians are silent, underlining the methodological importance of engaging corresponding data sets in order to construct a more robust landscape history during the Medieval Period.

MARP's systematic survey also documents agricultural land-use practices that allow us to infer further socially significant differences among Medieval Period residents of the Maski region, or "Mosageshima" as one later Medieval inscription calls the region (Patil and Patil, 1998; Thapar, 1957). As we have discussed elsewhere (Bauer, 2018; Bauer and Johansen, 2019), the Maski data attest to a significant expansion in agricultural activities during the Medieval Period, yet the remote sensing and spatial analysis of the study region demonstrates that this expansion of agricultural activities did not happen uniformly on water-retentive or irrigated soils. In fact, MARP's off-site data documents a Medieval Period expansion of agricultural activities to un-irrigated, less water-retentive, red sandy soils and the sparse distribution of irrigation features demonstrates that there is comparatively little evidence for extensive irrigation infrastructure across the study area. It is very likely that the differences between the red sandy soils and the black clay-rich soils —most notably their differential properties of water retention and fertility in this semi-arid context— was meaningful to Medieval Period residents of the region. This differential valuation of soil type can be inferred from medieval inscriptions in the surrounding Raichur Doab that describe the donation of land to temples, and suggest that black soil was preferred to red, especially for the cultivation of particular highly valued crops (e.g., rice) (e.g., Bauer, 2020, 2021). The differential social value of red and black soils meant that while some people farmed crops

[6] Note, for instance, at MARP-79 that we were unable to obtain a C14 assay from Burial 20, which, based on form and artifact assemblage, we expect may be later than the burials that we have thus far been able to assess with radiocarbon assays.

on more fertile and hydrated lands, with important economic and ritual uses, others were consigned to plant and plough in dryer, more environmentally marginal contexts, a situation likely to have had significant implications for existent and emergent relations of inequality on the Raichur Doab (see Bauer, 2020, 2021).

6. Conclusion

The Maski Archaeological Research Project is revealing the complex and entangled character of long-term settlement and land-use practices with developing social differences, inequalities, and economic and ritual production in the Raichur Doab. Systematic survey and remote sensing results have documented intriguing multi-period patterning between sites, off-site artifact scatters and the region's diverse soils and geomorphological features that point to reconfigurations in settlement, ritual activities, and land-use practices that coincided with transformation in social relationships and the experience and perception of place. Salvage activities and test excavation at several sites have been interrogating and refining our understanding of these relationships and MARP has amassed the Maski region's first 46 radiocarbon assays, as well as recovering important artifacts and organic remains from Neolithic, Iron Age and Medieval Period deposits. This work has recorded the earliest evidence for a suite of mortuary practices through which Neolithic Period inhabitants of the region instantiated social differences at a time when new, non-local cultigens were first integrated into south Indian agricultural production. MARP's work at this early cemetery is also empirically demonstrating the incremental development of these early mortuary practices into the “megalithic” commemorative-memorial activities and monumental forms of the succeeding Iron Age. Excavation and salvage activities have further revealed contemporaneous occupation at two medieval settlements around Maski where significant differences in the design, location and building materials of residential contexts suggest meaningful social distinctions and possible inequalities of access to labour, resources and place among resident communities. These Medieval Period archaeological contexts also document a time when Maski's inscriptional record is conspicuously silent, filling an important gap in the region's social and political history. Further research will continue to explore Maski's unique archaeological landscape with multidisciplinary research aimed at elucidating the role of settlement, land use and ritual in the region's long term social history.

Declaration of Competing Interest

None.

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References

Ahmad, K.M., 1938. Appendix D: note on the excavation and survey of pre-historic sites in the Raichur District of Hyderabad. In: *Annual Reports of the Archaeological Department of H.R.H.* the Nizam's Dominions 1934-1935, pp. 28–31.
Allchin, F.R., 1954. The Development of Early Cultures in the Raichur District of Hyderabad. Unpublished Ph.D. Dissertation. London University.
Asouti, E., Fuller, D.Q., 2008. Trees and Woodlands of South India: Archaeological Perspectives. Left Coast Press, Walnut Creek.
Bates, J., Wilcox Black, K., Morrison, K., 2022. Millet bread and pulse dough from early Iron age South India: charred food lumps as culinary indicators. J. Archaeol. Sci. 137 https://doi.org/10.1016/j.jas2021.105531.
Bauer, R.L., 2007. Animals in Social Life: Animal Use in Iron Age South India. VDM Verlag, Saarbruken.
Bauer, A.M., 2015. Before Vijayanagara: Prehistoric Landscapes and Politics in the Tungabhadra Basin. American Institute of Indian Studies and Manhoar, New Delhi.
Bauer, A.M., 2018. Remote sensing soils and social geographies of difference: the landscape archaeology of Regur from iron age through medieval period northern Karnataka, Southern India. J. Field Archaeol. 43, 31–43.
Bauer, A.M., 2019. Urbanism and the temporality of materiality on the medieval Deccan: Beyond the Cosmograms of social and political space. In: Alt, S., Pauketat, T. (Eds.), New Materialisms Ancient Urbanisms. Routledge, London, pp. 194–217.
Bauer, A.M., 2020. Ritualizing land and cultivating distinctions: medieval period donative practices and a political ecology of the Raichur Doab. In: Hartmann, J.-U., Albery, H., Ray, H.P. (Eds.), South Asian Rituals in Archaeological Context: Power, Presence, and Space. Routledge, London, pp. 233–237.
Bauer, A.M., 2021. Archaeological context and archival content: historical Archaeology and medieval period donative practices on the Raichur doab, southern India. Mediev. Hist. J. 24, 17–55.
Bauer, A.M., Johansen, P.G., 2015. Prehistoric mortuary practices and the constitution of social relationships: implications of the first radiocarbon dates from Maski on the occupational history of a South Indian 'type site'. Radiocarbon 57, 795–806.
Bauer, A.M., Johansen, P.G., 2019. The Maski archaeological research project (2010-2018): initial results from a multi-period interdisciplinary project on the Raichur Doab, Karnataka, India. Curr. Sci. 117 (1), 46–56.
Bauer, A.M., Johansen, P.G., 2020. Making megaliths and constituting collectives: politics, places, and historicity in prehistoric South India. In: Ray, H.P. (Ed.), Knowledge Traditions of the Indian Ocean World. Routledge, London, pp. 102–126.
Bauer, A.M., Trivedi, M., 2013. Contextualizing megalithic places: survey, mapping, and surface documentation in the environs of hire Benakal (Koppal District, Karnataka). Man and Environ. 38 (2), 46–61.
Bauer, A.M., Johansen, P.G., Bauer, R.L., 2007. Toward a political ecology in early South India: preliminary considerations of the sociopolitics of land and animal use in the southern Deccan Neolithic through Early Historic Periods. Asian Perspect. 46, 1–38.
Bauer, A.M., Johansen, P.G., Siddaiah, Gavi, Gopal, R., 2021. The Maski Archaeological Research Project (MARP): Comprehensive-cum-Consolidated Excavation Report for the 2018 Excavation Season and 2019 Salvage Excavation. (F.No.T.17011/239/2018/EE). Unpublished report submitted to the Government of India, New Delhi.
Bintliff, J., Snodgrass, A., 1988. Off-site pottery distributions: a regional and interregional perspective. Curr. Anthropol. 29, 506–513.
Boivin, N., Fuller, D.Q., Korisettar, R., Nayak, A., Petraglia, M.D., 2018. The emergence of agriculture and pastoralism in the northern Maidan region of South Deccan, South India. In: Korisettar, R. (Ed.), Beyond Stones and More Stones, vol. II. Mythic Society, Bengaluru, pp. 95–126.
Bronk Ramsey, C., 2021. OxCal 2020 version 4.4. https://c14.arch.ox.ac.uk.
Brubaker, R., 2001. Aspects of mortuary variability in the south Indian Iron age. In: Bulletin of the Deccan College Post-Graduate and Research Institute, 60–61, pp. 253–302.
Devaraj, D.V., Shaffer, J., Patil, C.S., Balasubramanya, K., 1995. The Watgal excavations: an interim report. Man and Environ. 20, 57–74.
Eaton, R.M., 2019. India in the Persianate Age 1000–1765. Allen Lane, United Kingdom.
Eaton, R.M., Wagoner, P.B., 2014. Power, Memory, *Architecture*. Oxford University Press, Oxford.
Fanthome, E., 2021. Politics beyond Imperial cores: spatial production in the peripheries of medieval South India. Mediev. Hist. J. 24, 92–129.
Foote, R.B., 1916. Prehistoric and Protohistoric Antiquities of India. Leeladevi Publications, Delhi.
Fuller, D.Q., 2003. Indus and non-Indus agricultural traditions: Local development and crop adoptions on the Indian peninsula. In: Weber, S., Belcher, W. (Eds.), Indus Ethnobiology. Lexington Books, Lanham, pp. 343–396.
Fuller, D.Q., 2005. Ceramics, seeds and culinary change in prehistoric India. Antiquity 79, 761–777.
Fuller, D.Q., 2006. Agricultural origins and Frontiers in South Asia: a working synthesis. J. World Prehist. 20, 1–86.
Fuller, D.Q., Boivin, N., Korisettar, R., 2007. Dating the Neolithic of South India: new radiometric evidence for key economic, social and ritual transformations. Antiquity 81, 755–778.
Gaggioli, A.M., Bauer, A.M., Morrison, K.D., Lycett, M.T., 2021. Early water management in South Asia: geochronology and micromorphology of rock pools and small-scale water catchment features in Karnataka, India. Geoarchaeology: An Int. J. 36, 780–788.
Gordon, D.H., Gordon, M.E., 1943. The cultures of Maski and Madhavpur. J. Royal Asiatic Soc. Bengal IX 3, 83–98.
Johal, M., 2021. Matter of time: ceramics and historicity in medieval South India. Mediev. Hist. J. 24 (1–2), 171–206.

Johansen, P.G., 2014. Early iron-working in Iron age South India: new evidence for the social organization of production from northern Karnataka. J. Field Archaeol. 39 (3), 256–275.
Johansen, P.G., 2016. The South Deccan iron age: antecedents to early historic Andhradesa. In: Willis, M., Shimada, A. (Eds.), Amaravati: The Art of an Early Buddhist Monument in Context. British Museum Press, London, pp. 12–22.
Johansen, P.G., 2019. On the cusp of social change: iron working and cattle keeping at Bukkasagara at the onset of the south Indian Iron age in northern Karnataka. Archaeol. Res. Asia 18, 55–67.
Johansen, P.G., Bauer, A.M., 2015. Beyond culture history at Maski: land use, settlement and social differences in Neolithic through Medieval South India. Archaeol. Res. Asia 1, 6–16.
Johansen, P.G., Bauer, A.M., 2018. On the matter of resources and techno-politics: the case of water and iron in the south Indian iron age. Am. Anthropol. 120 (3), 412–428.
Johansen, P.G., Bauer, A.M., Gangadhar, T.S., Gopal, R., 2021. The Maski Archaeological Research Project (MARP): Comprehensive-cum-Consolidated Exploration Report for the 2010, 2012, 2014 and 2015 Field Seasons (F.1/8/2009-EE). Unpublished report submitted to the Government of India, New Delhi.
Kadiri, A.A., 1962. Epigraphia Indica: Arabic & Persian Supplement, 53-57.
Kingwell-Banham, E., Fuller, D.Q., 2012. Shifting cultivators in South Asia: expansion, marginalisation and specialisation over the long term. Quat. Int. 249, 84–95.
Korisettar, R., Venkatasubbaiah, P.C., Fuller, D.Q., 2001. Brahmagiri and beyond: The Archaeology of the southern Neolithic. In: Settar, S., Korisettar, R. (Eds.), Indian Archaeology in Retrospect: Prehistory Archaeology of South Asia. Manohar, New Delhi, pp. 151–237.
Krishna Sastry, H., 1915. The new Asokan edict of Maski. In: Hyderabad Archaeological Series, 1, pp. 43–45.
McIntosh, J., 1985. Dating the south Indian megaliths. In: Schotsmans, J., Taddei, M. (Eds.), South Asian Archaeology 1983. Istituto Universitario Orientale, Naples, pp. 467–493.
Moorti, U.S., 1994. Megalithic Culture of South India: Socio-Economic Perspectives. Ganga Kaveri Publishing House, Varanasi.
Morrison, K.D., Reddy, S., Kashyap, A., 2015. Agrarian transitions in Iron age southern India: social and environmental implications. In: Lefèvre, V., Didier, A., Mutin, B. (Eds.), South Asian Archaeology and Art 2012. Turnhout, Brepols, pp. 185–196.
Morrison, K.D., C.M. Sinopoli, K. Wilcox Black, M. Trivedi, A. Bauer, M. Lycett, S. Haricharan, J. Bates, S. Reddy. From the Southern Neolithic to the Iron Age: a View from Kadebakele, in R. Korisettar (Eds.) Beyond Stones and More Stones, Volume 3. Mythic Society, Bangalore. In press.
Munn, L., 1934. Section B—economics. Dealing especially with the ancient gold mining activity of the area, with suggestion for further development. J. Hyderabad Geol. Survey I II, 77–104.
Murari, K., 1976. The Calukyas of Kalyani. Concept Publishing House, Delhi.
Paddayya, K., 2001. The problem of ashmounds of southern Deccan in the light of Budihal excavations, Karnataka. Bull. Deccan College Post-Graduate Institute 60–61, 189–225.
Patil, C.S., Patil, V.C., 1998. *Inscriptions of Karnataka Vol.* IV*: Inscriptions of Raichur District.* Directorate of Archaeology and Museums, Mysore.
Rao, K.P., 1988. Deccan Megaliths. Sundeep Prakashan, New Delhi.
Reimer, P., Austin, W., Bard, E., Bayliss, A., Blackwell, P., Bronk Ramsey, C., Butzin, M., Cheng, H., Edwards, R., Friedrich, M., Grootes, P., Guilderson, T., Hajdas, I., Heaton, T., Hogg, A., Hughen, K., Kromer, B., Manning, S., Muscheler, R., Palmer, J., Pearson, C., van der Plicht, J., Reimer, R., Richards, D., Scott, E., Southon, J., Turney, C., Wacker, L., Adolphi, F., Büntgen, U., Capano, M., Fahrni, S., Fogtmann-Schulz, A., Friedrich, R., Köhler, P., Kudsk, S., Miyake, F., Olsen, J., Reinig, F., Sakamoto, M., Sookdeo, A., Talamo, S., 2020. The IntCal20 northern hemisphere radiocarbon age calibration curve (0–55 cal kBP). Radiocarbon 62, 725–757.
Roberts, P., Boivin, N., Petraglia, M., Masser, P., Meece, S., Weisskopf, A., Silva, F., Korisettar, R., Fuller, D.Q., 2016. Local diversity in settlement, demography and subsistence across the southern Indian Neolithic–Iron Age transition: site growth and abandonment at Sanganakallu-Kupgal. Archaeol. Anthropol. Sci. 8, 575–599.
Sastri, T.V.G., Kasturi Bai, M., Prasada Rao, V.J., 1984. Veerapuram. Birla Archaeological and Cultural Research Institute, Hyderabad.
Sinopoli, C.M., 2016. Ceramic change and ceramic use in late prehistoric South India: The evidence from Kadebakele (Koppal District, Karnataka). In: Lefèvre, V., Didier, A., Mutin, B. (Eds.), South Asian Archaeology and Art *2012*. Turnhout, Brepols, pp. 291–304.
Thapar, B.K., 1957. Maski 1954: a chalcolithic site of the Southern Deccan. Ancient India 13, 4–142.
Thomas, P.K., Deshpande-Mukherje, A., Shobha, V., 2006. Faunal assemblages from Kanenur, Kaveripura and Kannifere: iron age/ early historic sites in Karnataka. Man and Environ. 31, 75–80.
Wilkinson, T.J., 1989. Extensive sherd scatters and land-use intensity: some recent results. J. Field Archaeol. 16, 31–46.
Yazdani, G., 1938. Appendix B: note on the excavations at Maski. In: *Annual Reports of the Archaeological Department of H.E.H.* the Nizam's Domains 1934-35, pp. 22–24.