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NEW AMS CHRONOLOGY FOR THE EARLY BRONZE III/IV TRANSITION AT KHIRBAT ISKANDAR, JORDAN

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ABSTRACT. We present the first Bayesian ^{14}C modeling based on AMS ages from stratified sediments representing continuous occupation across the Early Bronze III/IV interface in the Southern Levant. This new high-precision modeling incorporates 12 calibrated AMS ages from Khirbat Iskandar Area C using OxCal 4.4.4 and the IntCal 20 calibration curve to specify the EB III/IV transition at or slightly before 2500 cal BCE. Our results contribute to the continuing emergence of a high chronology for the Levantine Early Bronze Age, which shifts the end of EB III 200–300 years earlier than the traditional time frame and increases the length of EB IV to about 500 years. Data from Khirbat Iskandar also help direct greater attention to the importance of sedentary communities through EB IV, in contrast to the traditional emphasis on non-sedentary pastoral encampments and cemeteries. Modeling of AMS data from Khirbat Iskandar bolsters the ongoing revision of Early Bronze Age Levantine chronology and its growing interpretive independence from Egyptian history and contributes particularly to re-examination of the EB III/IV nexus in the Southern Levant.

KEYWORDS: AMS chronology, Bayesian modeling, Early Bronze Age, Khirbat Iskandar, Southern Levant, Jordan.

INTRODUCTION

Early Bronze Age Levantine society experienced a particularly dramatic transformation through the mid- and latter portions of the third millennium BCE. Following the construction of fortified settlements in Early Bronze II and III, southern Levantine society witnessed the pervasive abandonment of these communities across the region by the end of Early Bronze III and during Early Bronze IV (known alternatively as the Intermediate Bronze Age or Intermediate EB-MB) (D'Andrea 2014a, 2020; de Miroschedji 2014; Prag 2014; Greenberg 2019; Richard 2020). The prevailing archaeological narrative has emphasized a drastic shift from EB II-III agrarian town life to EB IV mobile pastoralism, influenced especially by Dever's model of EB IV seasonal transhumance between lowland winter encampments and upland summer settlements and cemeteries (Dever 1980, 1995, 2014). Traditionally, the timing and explanation of Levantine EB III town abandonment was attributed to the collapse of the Egyptian Old Kingdom, which was followed by fragmented political authority during the First Intermediate Period between about 2300/

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Figure 1 Map of the Southern Levant showing EB III and EB IV archaeological sites discussed in text.

2200 and 2000 BCE (see discussion in Sharon 2014). A reevaluation of EB IV society has stemmed from several related lines of investigation during the past three decades. The importance of EB IV sedentary agrarian communities has been illuminated through the reevaluation of regional survey data (e.g., Palumbo 1991, 2008) and excavations at a growing number of sedentary settlements (Figure 1). These excavations document EB IV villages at Tell Abu en-Ni'aj (Falconer and Fall 2019), Tell Um Hammad (Helms 1986;

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Table 1 Traditional and revised Early Bronze IV chronologies for the southern Levant. Traditional chronology based on Levy (1995: fig. 3); revised chronology based on Regev et al. (2012a).

Period	Traditional (BCE)	Revised (cal BCE)
EB IV	2300–2000	2500–2000
EB III	2700–2300	2900–2500
EB II	3000–2700	3000–2900
EB I	3500–3000	~3700–3000

Kennedy 2015), Khirbet al-Batrawy (Nigro 2006), Tell Iktanu (Prag 2011), Sha'ar Ha-Golan (Eisenberg 2012), Kfar Vradim (Covello-Paran 2020), and Horbat Qishron (Smithline 2002), including walled settlements at Dhahret Umm el-Marar (Falconer and Fall 2019), Khirbet Um al-Ghozlan (Fraser 2017) and Khirbet el-Meiyiteh (Bar et al. 2013). Evidence elsewhere shows that EB III settlement was followed by EB IV reoccupation at Hazor (Bechar 2017), Beth Shean (Mazar 2006), Jericho (Nigro 2003), Bab edh-Dhra' (Rast and Schaub 2003), possibly Megiddo (Adams 2017) and, most notably for this study, at Khirbat Iskandar in central Jordan (Richard et al. 2010; Richard 2020). Khirbat Iskandar has been a key site for the ongoing re-evaluation of EB IV settlement, based on its stratified evidence from EB III and IV, including the apparent re-use of EB III fortifications (Richard and Long 2007a, 2007b, 2009; Richard et al. 2010, 2018; Richard 2020) and possible construction of fortifications in EB IV (Richard 2016; D'Andrea et al. 2020).

Over roughly the last two decades, Early Bronze Age chronology has been revised drastically through site-specific and regional Bayesian radiocarbon modeling (Bronk Ramsey 2009a). This comprehensive revision shifts the constituent Early Bronze Age subperiods earlier, thereby disarticulating them from their previous historically-based conventions. Highlights of this high chronology include a start date for EB I well before 3500 cal BCE, a compressed one-century time span for EB II, and an earlier transition from EB II to III (2900 cal BCE) (Table 1) (e.g., Bruins and van der Plicht 2001; Golani and Segal 2002; Bourke et al. 2009; Regev et al. 2012a, 2014, 2017; cf. Nigro et al. 2019). These changes set the stage for the elucidation of the EB III/IV interface, which is being shifted 200–300 years earlier, based especially on analytically robust Bayesian models for the end of EB III occupation at Numeira, Khirbet Yarmouk/Tel Yarmuth, Tell el-Mutesellim/Megiddo, Khirbet Kerak/ Beth Yerah and Tell es-Safi/Gath (Regev et al. 2012b, 2014, 2019; Shai et al. 2014) and for the founding of the EB IV village at Tell Abu en-Ni'aj (Falconer and Fall 2019; Fall et al. 2021).

A major challenge of EB III/IV chronology building lies in the paucity of sites that offer both stratified occupations spanning the EB III/IV transition and AMS datasets suitable for chronological modeling. At the time of their influential revision of Early Bronze Age chronology, Regev et al. noted that "no sites currently exist where both EB III and EB IV/ IBA have been ^{14}C dated" (2012a: 559). This study addresses this challenge by presenting Bayesian modeling of a suite of 12 calibrated AMS ages from stratified EB III and EB IV levels in Area C at Khirbat Iskandar, Jordan. Our modeling solidifies the EB III/IV transition date as a key component of the emerging Early Bronze Age chronology, which disarticulates Levantine and Egyptian chronologies (e.g., Kutschera et al. 2012), and opens the door for independent assessment of Levantine EB III/IV settlement and societal dynamics.

EXCAVATIONS AT KHIRBAT ISKANDAR

The 2.7 ha *tell* of Khirbat Iskandar, Jordan lies in the lower reaches of the Wadi Wala, which drains west to the Dead Sea (Figure 2). Two initial trenches on the northeastern edge of the site were excavated in 1955 by Parr (1960). Subsequently, 15 seasons of field work, research and restoration between 1981 and 2019 have been directed by Richard and co-directors Long (since 1994) and D'Andrea (since 2015). Excavations in 32 5 × 5 m squares distributed in three locations on the *tell* (Areas A, B, and C) reveal stratified evidence of a permanently settled Early Bronze Age fortified community. The most recent excavations in 2019 investigated Areas B and C. The Area C excavations produced evidence from EB IV (Phases 1–3, from earliest to latest), which was stratified immediately above deposition from EB III (in four phases labeled Pre-Phase 1D, Pre-Phase 1C, Pre-Phase 1B, and Pre-Phase 1A, from earliest to latest) (D'Andrea et al. 2020). Pre-Phase 1D includes a burned layer that appears to correlate with a destruction layer overlying the latest EB III occupation identified thus far in Area B. This stratigraphic correlation situates the Pre-Phase 1 deposits in Area C in the latter portion of EB III. The Phase 1 ceramics include transitional EB III-IV vessel forms that place this phase very early in EB IV (Long 2010: 37; Richard 2010: 69–111, 272–273; D'Andrea 2014a: 133, 2016: 545, 2019: 66, 2020: 400), while the Phase 2 and 3 vessels incorporate attributes found typically at EB IV sites along the southern Jordan Rift (Long 2010: 63; Richard 2010: 69–111), including forms suggestive of later EB IV, especially in Phase 3, which is the latest EB IV phase at Khirbat Iskandar (D'Andrea 2014b: 157, fig. 9; 2019: 70–72, fig. 4; 2020: 409, fig. 22.4: 1, 3–5, 16, 17). Phase 3 architecture features a gateway to the settlement (Long 2010: 64-65), while the earlier phases reveal domestic areas that include broad- and long-room houses with associated domestic features. Most importantly for this study, the 2019 excavations show that the Area C stratigraphic sequence spans the EB III/IV interface at Khirbat Iskandar. Thus, chronometric evidence from the stratified occupational evidence in Area C at Khirbat Iskandar is particularly well-positioned to provide a high-precision determination of the timing of the EB III/IV transition based on modeling of AMS ages from a sequence of samples from contiguous EB III and EB IV strata.

MATERIALS AND METHODS

The context for all materials excavated at Khirbat Iskandar is identified according to Area (A, B or C), Square (numbered according to the grid of squares in each Area), Pail (numbered according to soil layers) and Locus (numbered in reference to three-dimensional features). During the 2019 Khirbat Iskandar excavations, archaeological sediments from contexts such as floors, ovens, pits, and mudbrick layers were processed by water flotation to recover plant macroremains. This study incorporates 10 new AMS ages along with two AMS ages from charcoal samples excavated previously from Area C, Square 2 (Long 2010: 43; Holdorf 2010: 267), which were analyzed at the University of Arizona Accelerator Mass Spectrometry Laboratory (AA-50178) and the University of Tubingen (lab number unreported).

We submitted 10 seed samples recovered in the 2019 excavations through flotation of sediment from Area C, Squares 6 and 8 for AMS ^{14}C analysis at the University of Georgia. These samples were pretreated using the standard laboratory methods of the Center for Applied Isotope Studies at the University of Georgia. Seeds were inspected under microscope and manually cleaned to remove superficial contaminants, followed by acid/alkali/acid (AAA) pretreatment as follows. Subsamples were treated in 1N HCl at 80°C, decanted, and rinsed

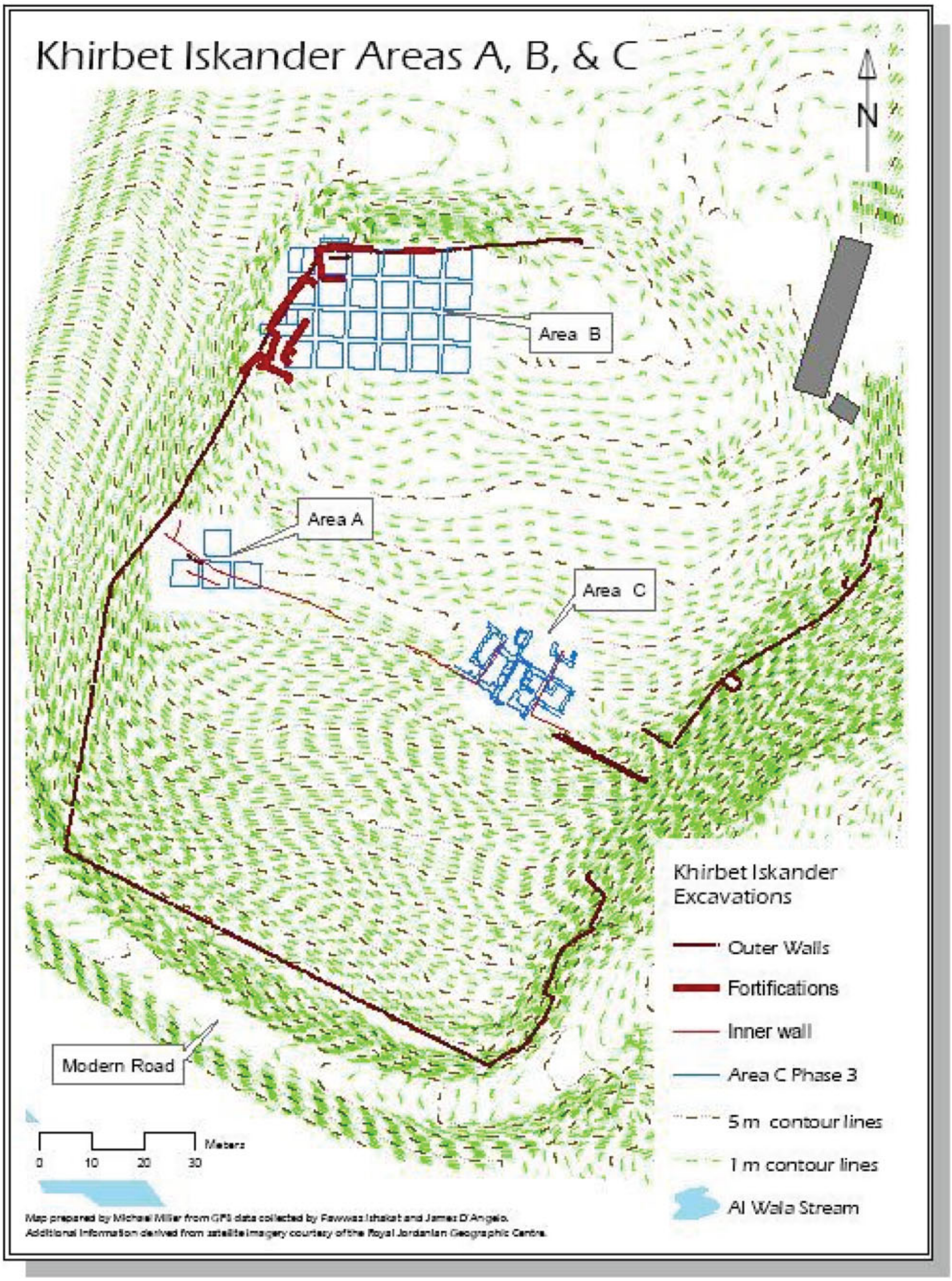

Figure 2 Topographic map of Khirbat Iskandar showing Excavation Areas A, B, and C. Modern buildings shown in gray. Figure courtesy of the Khirbat Iskandar Expedition.

with MilliQ water, then treated with 0.1 M NaOH at room temperature and rinsed to neutral with MilliQ water. The samples were treated with HCl a second time at 80°C for 15 min, rinsed repeatedly with MilliQ water, and dried at 105°C. Approximately 2–3-mg subsamples were encapsulated in tin, and the elemental concentrations (%C and %N) and stable isotope

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ratios ($\delta^{13}C$ and $\delta^{15}N$) were measured using an elemental analyzer isotope ratio mass spectrometer (EA-IRMS). Values are expressed as $\delta^{13}C$ with respect to VPDB and $\delta^{15}N$ with respect to AIR.

Each 2–3-mg subsample of pretreated material was combusted at 900°C in an evacuated and sealed quartz tube in the presence of CuO to produce CO_2. The CO_2 samples were cryogenically purified from the other reaction products and catalytically converted to graphite using the method of Vogel et al. (1984). Graphite $^{14}C/^{13}C$ ratios were measured using the CAIS 0.5 MeV AMS. Sample ratios were compared to the ratio measured from the Oxalic Acid I standard (NBS SRM 4990), and the results are presented as percent Modern Carbon (pMC). The quoted uncalibrated date is given in radiocarbon years before 1950 (years BP), using the ^{14}C half-life of 5568 years. The error is quoted as one standard deviation and reflects both statistical and experimental errors. The dates have been corrected for isotope fractionation using the $\delta^{13}C$ value.

All ^{14}C ages in this study were calibrated using OxCal v 4.4.4 (Bronk Ramsey 2009a) and the IntCal20 atmospheric curve (Reimer et al. 2020; van der Plicht et al. 2020). The analytical tools in OxCal 4.4.4 were used for Bayesian modeling of the calibrated dates. Bayesian analysis permits probabilistic modeling of calibrated ^{14}C determinations using prior stratigraphic information, and can accommodate the non-normally distributed probabilities of calibrated ^{14}C ages (Bronk Ramsey 2009a). The radiocarbon ages from Khirbat Iskandar were organized for modeling according to stratigraphic phases and in chronological order within phases, based on their uncalibrated AMS determinations. OxCal Agreement values (A, A_{model}) provide a means of assessing the reliability of the individual calibrated ages in Bayesian models and the quality of overall models. Values of A calculate the overlap of the non-modeled distribution for each calibrated age with its Bayesian modeled distribution, such that $A > 60$ approximates a value of $p < 0.05$ for a χ^2 significance test (Manning 2013: 496, fig. A5). Accordingly, values of $A_{model} > 60$ are used to identify statistically robust Bayesian models, and calibrated ages with $A \leq 60$ would be treated as statistical outliers and would not be incorporated in our Bayesian modeling (Bronk Ramsey 2009b).

RESULTS

Khirbat Iskandar provides a sequence of 12 AMS ^{14}C ages from six stratigraphic phases designated as EB III or EB IV on the basis of Area C stratigraphy and ceramic chronology (Table 2). These ages are reported in radiocarbon years BP (Before Present, with the present defined as 1950 CE) following international convention (Stuiver and Polach 1977). We modeled these ages in a chronological sequence of six stratigraphic phases: Pre-Phase 1D, 1B, and 1A (EB III strata), and Phases 1, 2, and 3 (EB IV strata), from earliest to latest, respectively. Modeled ages are presented in Table 3. Our optimal Bayesian model for Khirbat Iskandar (Figure 3; A_{model}=140.7) begins between 2600 and 2500 cal BCE (starting boundary 1σ range: 2585–2504 cal BCE; median = 2533 cal BCE) and ends around 2460 cal BCE (ending boundary 1σ range: 2469–2453 cal BCE; median = 2460 cal BCE). This model places the EB III/IV transition in Area C at or slightly before 2500 cal BCE (1σ range: 2515–2496 cal BCE; median = 2506 cal BCE).

We also modeled the calibrated seed and charcoal from Khirbat Iskandar as two contiguous phases in which the earlier Oxcal phase includes the five ages from the EB III strata (Pre-Phase 1D, 1B, and 1A), and the later Oxcal phase includes the seven ages from the EB IV strata

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Table 2 AMS radiocarbon results for seed samples (except when noted as charcoal) from Area C at Khirbat Iskandar, Jordan. Calibration based on OxCal 4.4.4 (Bronk Ramsey 2009a, 2017) using the IntCal20 atmospheric curve (Reimer et al. 2020). Stratigraphic phases in Area C at Khirbat Iskandar start with Pre-Phase 1D (the earliest, lowermost stratum) and end with Phase 3 (the latest, uppermost stratum). Samples are tabulated by phase and ordered chronologically according to conventional ^{14}C age within each phase. Context is indicated according to Square, Pail and Locus (e.g., Square 8N, Pail 167N, Locus 162N).

Lab sample number	Conventional ^{14}C age yr BP	Calibrated 1σ ranges yr BCE (probability)	Calibrated 2σ ranges yr BCE (probability)	Median cal BCE	Phase, archaeological context; material dated
UGAMS-53626	3920 ± 25	2467–2434 (26.0%) 2426–2403 (18.1%) 2380–2349 (24.2%)	2472–2337 (89.9%) 2325–2300 (5.6%)	2408	Phase 3, Square 8N, Pail 167N, Locus 162N; *Olea europaea* seed
UGAMS-53627	3930 ± 25	2470–2435 (28.6%) 2426–2403 (16.9%) 2380–2349 (22.8%)	2557–2541 (2.0%) 2489–2339 (90.0%) 2324–2302 (3.5%)	2415	Phase 3, Square 8N, Pail 166N, Locus 60N; *Olea europaea* seed
UGAMS-53622	3960 ± 25	2564–2534 (26.9%) 2494–2458 (41.4%)	2571–2517 (33.3%) 2501–2402 (54.6%) 2381–2348 (7.5%)	2480	Phase 3, Square 8N, Pail 159N, Locus 52N; *Hordeum vulgare* seed
AA-50178	3975 ± 43	2571–2515 (37.5%) 2502–2459 (30.7%)	2620–2606 (1.0%) 2583–2342 (94.1%) 2315–2310 (0.3%)	2495	Phase 3, Square 2, Locus 2043; Charcoal
Tubingen	3930 ± 60	2556–2543 (3.8%) 2488–2339 (58.8%) 2322–2303 (5.7%)	2575–2278 (90.6%) 2254–2207 (4.8%)	2411	Phase 2, Square 2, Locus 2030; *Olea* charcoal
UGAMS-53625	4070 ± 25	2662–2653 (3.8%) 2631–2570 (52.7%) 2519–2500 (11.8%)	2847–2812 (8.5%) 2744–2730 (1.3%) 2694–2687 (0.5%) 2677–2561 (67.5%) 2538–2492 (17.6%)	2604	Phase 2, Square 8S, Pail 170S, Locus 68S; *Triticum dicoccum* seed

(Continued)

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Table 2 (*Continued*)

Lab sample number	Conventional ^{14}C age yr BP	Calibrated 1σ ranges yr BCE (probability)	Calibrated 2σ ranges yr BCE (probability)	Median cal BCE	Phase, archaeological context; material dated
UGAMS-53624	4070 ± 25	2662–2653 (3.8%) 2631–2570 (52.7%) 2519–2500 (11.8%)	2847–2812 (8.5%) 2744–2730 (1.3%) 2694–2687 (0.5%) 2677–2561 (67.5%) 2538–2492 (17.6%)	2604	Phase 1, Square 8S, Pail 163S, Locus 79S; *Hordeum vulgare* seed
UGAMS-53630	4030 ± 25	2577–2557 (17.4%) 2542–2489 (50.8%)	2622–2596 (7.0%) 2585–2471 (88.4%)	2529	Pre-Phase 1A, Square 6, Pail 118, Locus 73/4; *Olea europaea* seed
UGAMS-53623	4060 ± 25	2626–2568 (47.0%) 2525–2498 (21.3%)	2839–2815 (4.3%) 2670–2553 (61.2%) 2546–2476 (29.9%)	2586	Pre-Phase 1A, Square 8S, Pail 178S, Locus 92S; *Hordeum vulgare* seed
UGAMS-53628	4020 ± 25	2573–2556 (15.6%) 2543–2511 (31.9%) 2506–2488 (16.4%) 2482–2476 (4.4%)	2618–2609 (1.6%) 2581–2468 (93.9%)	2527	Pre-Phase 1B, Square 6, Pail 113, Locus 73/4; *Hordeum vulgare* seed
UGAMS-53629	4070 ± 25	2662–2653 (3.8%) 2631–2570 (52.7%) 2519–2500 (11.8%)	2847–2812 (8.5%) 2744–2730 (1.3%) 2694–2687 (0.5%) 2677–2561 (67.5%) 2538–2492 (17.6%)	2604	Pre-Phase 1B, Square 6, Pail 115, Locus 75; *Hordeum vulgare* seed
UGAMS-53631	4050 ± 25	2622–2596 (18.1%) 2585–2566 (16.5%) 2531–2495 (33.7%)	2831–2823 (0.9%) 2664–2648 (2.4%) 2634–2473 (92.1%)	2568	Pre-Phase 1D, Square 6, Pail 136, Locus 86; *Hordeum vulgare* seed

Table 3 Bayesian modeled (calibrated) ages, stable isotope concentrations ($\delta^{13}C$, $\delta^{15}N$) and percent modern carbon (pMC) for samples from Area C at Khirbat Iskandar, Jordan. Modeled ages listed in stratigraphic order. Calibration and modeling based on OxCal 4.4.4 (Bronk Ramsey 2009a, 2017) using the IntCal20 atmospheric curve (Reimer et al. 2020). ND = not determined. NA = not available. *Statistical outlier not included in six-phase Bayesian models.

Lab sample number	Period	Phase	Modeled 1σ range yr BCE	Modeled 2σ range yr BCE	Median cal BCE	$\delta^{13}C$	$\delta^{15}N$	pMC
UGAMS-53626	EB IV	Phase 3	2471–2456	2487–2409	2464	–19.30	2.92	61.38 ± 0.19
UGAMS-53627	EB IV	Phase 3	2471–2457	2488–2408	2464	–19.36	3.20	61.32 ± 0.18
UGAMS-53622	EB IV	Phase 3	2472–2460	2491–2408	2466	–22.90	ND	61.07 ± 0.18
AA-50178	EB IV	Phase 3	2474–2458	2492–2408	2466	NA	NA	NA
Tubingen	EB IV	Phase 2	2491–2467	2508–2456	2479	NA	NA	NA
UGAMS-53625*	EB IV	Phase 2	2661–2500	2846–2491	2603	–22.94	1.04	60.22 ± 0.18
UGAMS-53624	EB IV	Phase 1	2511–2493	2522–2475	2502	–23.13	1.84	60.27 ± 0.18
UGAMS-53630	EB III	Pre-Phase 1A	2520–2498	2576–2489	2510	–22.73	6.07	60.54 ± 0.18
UGAMS-53623	EB III	Pre-Phase 1A	2519–2499	2580–2489	2510	–23.21	3.67	60.34 ± 0.18
UGAMS-53628	EB III	Pre-Phase 1B	2531–2501	2583–2496	2519	–22.73	ND	60.60 ± 0.18
UGAMS-53629	EB III	Pre-Phase IB	2530–2501	2606–2496	2518	–21.46	6.99	60.22 ± 0.18
UGAMS-53631	EB III	Pre-Phase ID	2581–2504	2625–2501	2528	–24.50	1.98	60.38 ± 0.18

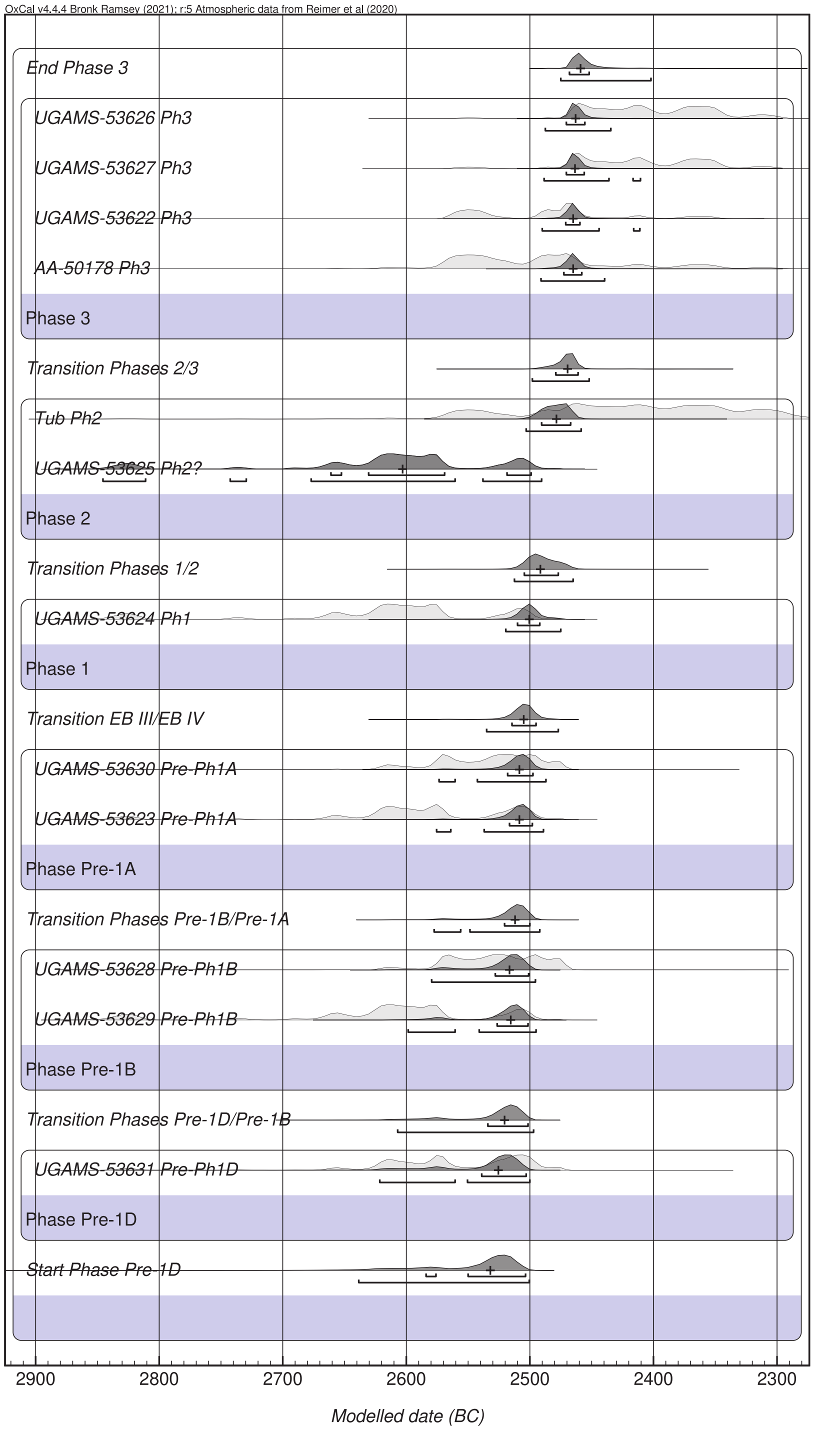

Figure 3 Bayesian model of AMS ^{14}C ages for seed and charcoal samples from Area C at Khirbat Iskandar, Jordan. Light gray curves indicate single-sample calibration distributions; dark curves indicate modeled calibration distributions. Calibration and Bayesian modeling based on OxCal v 4.4.4 (Bronk Ramsey 2009a) using the IntCal20 atmospheric curve (Reimer et al. 2020; van der Plicht et al. 2020). A_{model}=138.1; one statistical outlier: UGAMS-53625.

Table 4 Bayesian modeling of the EB III/IV transition in Area C at Khirbat Iskandar, Jordan. Calibration and modeling based on OxCal 4.4.4 (Bronk Ramsey 2009a, 2017) using the IntCal20 atmospheric curve (Reimer et al. 2020); *1 outlier: UGAMS 53625.

Bayesian model	Agreement value (A_{model})	Modeled boundary 1σ range (cal yr BCE)	Modeled boundary 2σ range (cal yr BCE)	EB III/IV transition (median age, cal yr BCE)
6 phases based on 10 seed ages + 2 charcoal ages*	140.7	2515–2496	2536–2478	2506
6 phases based on 10 seed ages*	135.0	2516–2496	2574–2480	2507
2 phases based on 10 seed ages + 2 charcoal ages	123.8	2525–2496	2577–2491	2512
2 phases based on 10 seed ages	114.8	2571–2497	2580–2491	2514

(Phases 1–3.) Ages within each Oxcal phase were ordered stratigraphically. This two-phase model once again estimates the EB III/IV boundary at or slightly before 2500 cal BCE (Table 4). As a further consideration, we assessed the modeling influences of the two charcoal ages from Phases 2 and 3, which model well with the other five EB IV dates in the two-phase model noted above. The individual calibration distributions for these two samples provide no indication of an "old wood" effect of inbuilt age (Dee and Bronk Ramsey 2014). All four models produce strikingly consistent determinations of the EB III/IV transition at Khirbat Iskandar at or slightly before 2500 cal BCE (see Table 4).

DISCUSSION

Bayesian modeling of the Pre-Phase 1 seed ages from Khirbat Iskandar correlates the lower strata in Area C with the tail end of Early Bronze III occupations at the best radiocarbon dated sites across the Levant. For example, seven seed ages from Tell es-Safi/Gath, in the Hebron region, model the end of its EB III occupation between 2680 and 2580 cal BCE (Shai et al. 2014), while a model of 17 AMS ages from Tel Yarmuth/Khirbet Yarmuk, in the foothills of the Shephelah, ends its EB III occupation about 2500 cal BCE (Regev et al. 2012b). Models that include further AMS ages from Numeira, Bab edh-Dhra', Tell es-Sakan, Hebron and Khirbet Kerak/Beth Yerah (Rast and Schaub 1980; Weinstein 1984, 2003; Regev et al. 2012a; Regev et al. 2019) also terminate EB III at each of these sites about 2500 cal BCE (Regev et al. 2012a). This substantial body of data represents a growing consensus that "… EB III ended *at the latest* ~2450, perhaps before 2500 BC" (Regev et al. 2012b: 505, emphasis original). Our modeling positions the Pre-Phase 1 ages from Khirbat Iskandar Area C at the very end of EB III, prior to 2500 cal BCE, in chronological accordance with this consensus derived from this wide variety of AMS-dated Levantine sites.

For comparative purposes, well-dated evidence for the beginning of EB IV in the Southern Levant features the seven-phase modeled sequence of 25 seed ages for Tell Abu en-Ni'aj (Fall et al. 2021), but is otherwise limited to three AMS seed ages from Khirbet el-'Alya

(Bar et al. 2013; Lev et al. 2020), the two earliest of four charcoal dates from Ein-Ziq (Avner and Carmi 2001; see also Dunseth et al. 2016) and the earliest one of three charcoal ages from Nahal Refaim (Segal and Carmi 1996). Another noteworthy site, Bab edh-Dhra', has five ages that correlate with Phases 2 and 1 at Tell Abu en-Ni'aj, late in EB IV after about 2350 cal BCE (Falconer and Fall 2021). In contrast, our modeling incorporates seven ages from a single area at Khirbat Iskandar that fit squarely within the modeled intervals for Phases 7 and 6, very early in EB IV at the outset of the Tell Abu en-Ni'aj sequence (Falconer and Fall 2021; Fall et al. 2021). These ages parallel the calibrated distributions for the early EB IV dates from Khirbet el-'Alya, Ein-Ziq and Nahal Refaim. Thus, Bayesian modeling of AMS ages from Khirbat Iskandar Phases 1–3 places the beginning of EB IV occupation in Area C at 2500 cal BCE, in keeping with the best-dated evidence for early EB IV occupations elsewhere in the Southern Levant.

Among the sites with deposition from both EB III and EB IV, chronological gaps have been inferred between these periods at Beth Shean/Tell el-Hosn based on ceramic chronology (Mazar 2012: 28) and at Hazor/Tell el-Waqqas and Jericho/Tell es-Sultan based on stratigraphy (Nigro 2003: 131, 138; Lev et al. 2021). Modeling of AMS ages from Hazor estimates the end of its EB III occupation by 2580 cal BCE, followed by "many decades of abandonment" prior to resettlement in EB IV (Lev et al. 2021). Six AMS ages support a model of subsequent EB IV occupation beginning after 2400 cal BCE and ending by 2200 cal BCE, based on 1σ boundary ranges (Lev et al. 2021: fig. 13). Thus, the evidence from Hazor leads to an estimate of the intervening EBIII/IV transition at this site between about 2600 and 2400 cal BCE, in general agreement with the high Early Bronze Age chronology. In this context, the new evidence of a radiocarbon-dated EB III/IV stratigraphic sequence at Khirbat Iskandar underscores the importance of sites with EB III and EB IV occupations that potentially document local continuity over the transition from late EB III into early EB IV (D'Andrea et al. 2020; D'Andrea 2021).

An alternative interpretation is offered by Nigro et al. (2019), who suggest a conventional end date for EB III about 2300 cal BCE, based on three charcoal ages from two excavation areas that model the end of EB IIIB occupation in Sultan Phase IIIc2 at or shortly after 2500 cal BCE (Nigro et al. 2019: table 7, fig. 12). They report no radiocarbon ages from the earliest EB IV stratum (Sultan Phase IIId1; Nigro et al. 2019: 235), and the two ^{14}C ages for charcoal samples from the latest EB IV stratum at Jericho (Sultan Phase IIId2; Nigro et al. 2019: table 8) were excavated in separate trenches by Kenyon (1981: 167, 214). The modeled 1σ distributions for these ages lie between about 2400 and 2250 cal BCE (Nigro et al. 2019: fig. 12), correlate with mid-EB IV Phases 4-1 at Tell Abu en-Ni'aj (Fall et al. 2021), and accord with a beginning date for EB IV about 2500 cal BCE, as attested increasingly at other Levantine sites.

In overview, the majority of comparative radiocarbon-dated evidence from Early Bronze Age sites in the Southern Levant stems from settlements with occupations that either end in late EB III or begin in early EB IV. Bayesian modeling of growing AMS datasets has narrowed the time frame for the EB III-IV transition to the mid-third millennium BCE. Khirbat Iskandar now offers a unique stratigraphically continuous sequence of 12 AMS ages from a single excavation area that spans the end of EB III and the beginning of EB IV, and provides a focused model of the EB III/IV transition about 2500 cal BCE. As Regev et al. point out, fixing this interface "at ca. 2500 cal BC forces reconsideration of the synchronism between Egypt and the Southern Levant that has far reaching implications for the history and chronology of both regions" (2014: 260). In particular, it "disconnect[s] the end of the

Early Bronze III period from the end of the Egyptian Old Kingdom" (Höflmayer et al. 2014: 540), and no longer supports a direct correlation of Egyptian political dissolution and Levantine town abandonment (see Regev et al. 2014).

CONCLUSIONS

Bayesian modeling of 10 new AMS seed ages plus two previous AMS charcoal dates from Khirbat Iskandar provides a new stratigraphically-based calculation of the EB III/IV transition in the Southern Levant. Our modeling is the first to be based on samples from a continuous stratigraphic sequence in a single excavation area from the end of EB III to the beginning of EB IV. We model the EB III/IV transition at about or slightly before 2500 cal BCE, which is 200–300 years earlier than assumed traditionally. These data contribute strategically to the continuing corroboration of a high chronology for the Early Bronze Age in the Southern Levant. The evidence from Khirbat Iskandar also emphasizes the importance of sedentary settlements in EB IV society, which hold the greatest promise of providing stratified seed samples for continued AMS dating and rigorous chronological modeling of this enigmatic period in Levantine prehistory. On a larger scale, further chronological revision will contribute to the ongoing "audit of the synchronisms between Egyptian and Levantine chronologies" (Regev et al. 2014: 261) and a correspondingly revised interpretation of Levantine social dynamics in the third millennium BCE.

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