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The Tel Dan Inscription after 30 Years: A Fresh Look

Michael Langlois[1]

ABSTRACT: Three decades after the discovery of the Tel Dan stele, new imaging techniques allow for a fresh look at the inscription, starting with the script. This paper uses Reflectance Transformation Imaging (RTI) and digital tools to argue that fragments A and B feature two different, yet similar handwritings. These fragments were inscribed by two engravers or by a single engraver whose handwriting evolved. In any case, the placement suggested by the editors must be abandoned.

Keywords: archaeology, Aramaic, Tel Dan, epigraphy, palaeography, digital humanities, Reflectance Transformation Imaging (RTI), Iron Age, Israel, David, Hebrew Bible

INTRODUCTION

Some 30 years ago, in the summer of 1993, a large inscribed basalt stone fragment was discovered on the occasion of excavations conducted at Tel Dan by the Nelson Glueck School of Biblical Archaeology (NGSBA) of Hebrew Union College (HUC)–Jewish Institute of Religion in Jerusalem. It was speedily published (Biran and Naveh 1993) and acclaimed as the earliest mention of מלך ישראל "King of Israel" (l. 8) and בית דוד "House of David" (l. 9) in a ninth-century BCE Aramaic inscription.[1] Indeed, the Tel Dan stele was arguably one of the most important epigraphical discoveries since the Mesha stele for the study of ancient Israel and its neighbors.

A year later, two smaller fragments were discovered (Biran and Naveh 1995). The editors identified them as belonging to the same stele and labeled them as

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1 Shorty before the discovery of the Tel Dan stele, André Lemaire suggested that the expression בת דוד "House of David" was attested in a contemporary inscription, the Mesha stele, discovered in 1868 and written in the Moabite language (Lemaire 1994a). I was able to reach the same conclusion using new imaging and computational techniques (Langlois 2019).

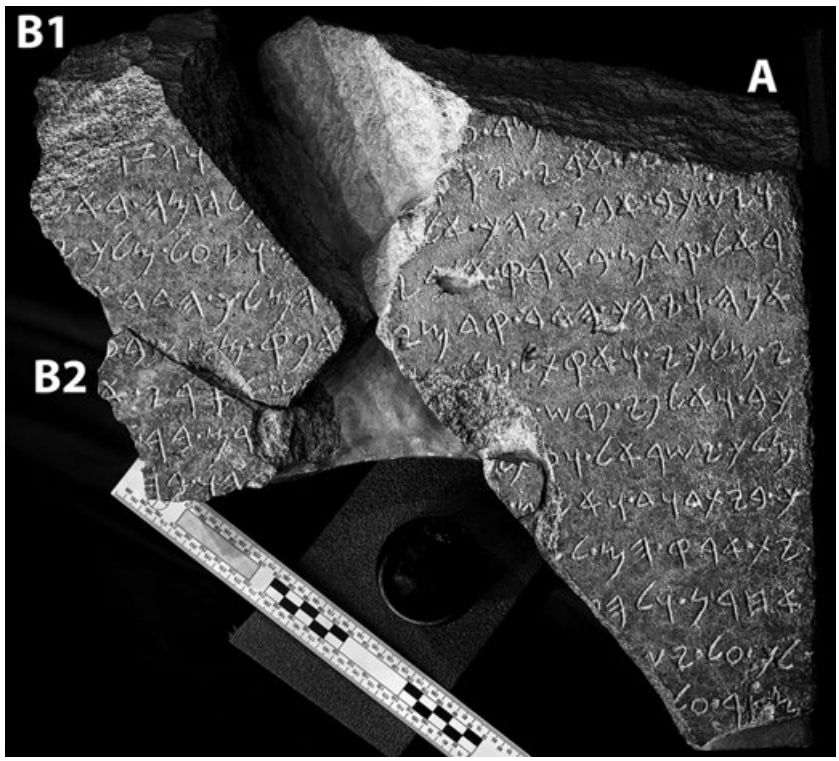

Fig. 1. The three Tel Dan fragments (A, B1, and B2) as joined by the editors (RTI photograph by Moshe Caine, with luminance unsharp masking and digital enhancement by Michael Langlois)

frags. B1 and B2, whereas the large fragment was labeled frag. A. They joined the three fragments, as seen in Fig. 1.

The three fragments were found in the same area under different circumstances. First, frag. A was discovered by accident on July 21, 1993 by excavation surveyor Gila Cook, who was finishing measurements in the eastern part of a large flagstone pavement in front of the outer gate in Area A (Biran and Naveh 1993: 81). Uncovering this pavement had begun a year earlier, in 1992. The tip of the fragment is visible in some of the photographs taken a year before it was found.

Frag. B1 was found the following season, on June 20, 1994, in a debris layer located south of a stone construction, 0.80 m above the pavement level 13 m to the northeast (Biran and Naveh 1995: 2). Ten days later, frag. B2 was found some 8 m to the north on June 30 by Gila Cook at the foot of a wall bordering the flagstone pavement, which had been cleared (Biran and Naveh 1995: 5).

To celebrate the thirtieth anniversary of this discovery, an international conference was organized by David Ilan and Yifat Thareani of the NGSBA-HUC;

it took place in Tel Aviv and Jerusalem on June 5–6, 2024. I was invited as the keynote speaker, and I thank them sincerely for this honor. I had never done first-hand research on the Tel Dan inscription, which gave me the advantage of taking a fresh look.[2] A few years ago, on the occasion of a conference celebrating the 150th anniversary of the discovery of the Mesha inscription, I showed how digital imaging techniques shed light on difficult readings, including the famous בת דוד "House of David" mentioned on l. 31 of the Moabite stone (Langlois 2019). I hoped that the same digital techniques would improve the reading and restoration of the Tel Dan stone. Here are my initial findings, which will be the starting point for a larger scientific project in collaboration with the organizers of the HUC conference and The Hebrew University of Jerusalem.[3]

DIGITAL RESTORATION AND RECONSTRUCTION

When an inscription is broken and fragmentary, it is tempting to fill in the blanks by imitating the writer's handwriting. This was done almost immediately after the publication of the Dan inscription. In 1994, Émile Puech famously offered a full reconstruction of entire lines accompanied by a hand drawing (Puech 1994). A few months later, when two more fragments were published (Biran and Naveh 1995), Puech (2020) retracted his reconstruction. This illustrates the need for guardrails when attempting such textual reconstructions. I discussed this problem twenty years ago, as I was beginning a research project on Aramaic fragments of the Book of Enoch and trying to delineate a sound methodology that would take advantage of digital tools (Langlois 2006).

Digitally sampling the writer's handwriting is indeed useful to assess the possibility of a given restoration when there is a lacuna in a fragment or when several fragments preserve parts of the same lines.[4] This supposes, however, that

2 Much was written on the Tel Dan inscription in the years that followed its discovery; for a summary, see e.g., Hagelia (2006; 2009). Since then, the *status quæstionis* has not significantly changed; see, e.g., recently Becking (2023). For the broader historical context, see, e.g., Hasegawa (2012).

3 I thank David Ilan and Yifat Thareani for encouraging me to publish my findings as soon as possible, and all the participants of the HUC conference for our fruitful conversations. Special thanks to Naama Yahalom-Mack, who suggested further testing and brought in Yoav Vaknin of The Hebrew University of Jerusalem to conduct paleomagnetic research on the Tel Dan fragments. Thanks are also due to the Israel Antiquities Authority and the Israel Museum, who made it possible for us to sample and image the fragments. Finally, I want to thank André Lemaire and the anonymous reviewers for their suggestions to improve this paper.

4 Schniedewind (1996) was the first scholar to use what he called an "electronically generated image" and a "computer-aided drawing" of the Tel Dan inscription, which, at the time, consisted of a "slight rotation of the fragments" and a handmade drawing.

the writer's handwriting is consistent and that there are no interlinear additions or intentional vacats, etc. With these limitations in mind, it is possible to virtually test for several placements of the fragments until we find the best candidate(s).[5]

I intended to do that with the three Tel Dan fragments; frags. B1 and B2, which were found later, physically join each other, but not with frag. A. The editors explained that "Fragments A and B cannot be joined in an obvious, unequivocal way" (Biran and Naveh 1995: 11). They tested for several placements until they adopted one that allows for frags. A and B to join on the back. Although this placement was "corroborated by three experienced restorers," the editors remained careful and labeled the new fragments "B1" and "B2" (rather than, say, "B" and "C"), which indicates that the physical joint between the two new fragments is certain, as opposed to the joint with the first fragment.

In order to test for various placements and restorations of the fragments, good digital imaging and sampling of the script is required. Various imaging techniques can be used to that effect. For instance, multispectral imaging is especially useful for ink inscriptions, including Aramaic (Eshel and Langlois 2019) and Hebrew (Langlois and Lemaire 2024), while Reflectance Transformation Imaging (RTI) highlights the smallest incisions on a carved inscription such as the Mesha stele (Langlois 2019). The basic idea behind RTI is not new; epigraphists have long known that, by moving a lamp around an inscription at varying angles, the orientation and depth of individual strokes can be emphasized or, on the contrary, disappear. Since letters are formed with strokes of various orientations—sometimes perpendicular—raking light must be moved around; no single photograph would suffice. One needs to take a series of photographs and alternate between them. This is what RTI basically does, but it goes further and compiles all these photographs into a computational model so that the user can virtually move the light around, add a second light, zoom in, and so on. Additional digital enhancement can be computed in order to virtually show the depth of the incisions or increase the relief of the inscription.

Bruce Zuckerman and Marilyn Lundberg conducted RTI on the Tel Dan stele. I used their images, together with other digital photographs, to study the fragments.[6] We decided to conduct a new RTI in September 2024 (see Fig. 1).[7] The results were consistent with the RTI produced by Zuckerman and Lundberg.

5 See, e.g., the various placements I tested for Dead Sea Scrolls fragments of Joshua 10 (Langlois 2011: 177–183).

6 Unless stated otherwise, the illustrations I composed for this article are based on the photographs by Bruce Zuckerman and Marilyn Lundberg, who kindly shared them with me for this project. Their work is, as always, excellent and very helpful for West Semitic epigraphy.

7 I thank Moshe Caine for his availability and professionalism in conducting this study.

Likewise, 3D scanning of the stele was performed in September 2024, and the preliminary results align with the RTI.

As advanced as they may be, digital imaging techniques are limited by the fact that the fragments are now glued together. Therefore, I examined the stele at the Israel Museum and its replica at HUC's Skirball Museum of Biblical Archaeology in Jerusalem. The replica was especially useful to examine the back of the fragments and the possible joint between A and B.

My examination confirmed that, as acknowledged by the editors, the joint between frags. A and B1 is far from certain. When I discussed this issue during the HUC conference, a restorer who glued the original fragments, as instructed by Biran and Naveh at the time, confirmed that frags. A and B1 do not really join, as opposed to B1 and B2. It is thus legitimate to test for other possible placements, which I did by virtually shifting the fragments one line at a time. For instance, Fig. 2 shows what happens if frag. A is moved down one line.

Fig. 2. Example of a virtual textual reconstruction of the Tel Dan stele after shifting the fragments

With this placement, frag. A l. 4′ can be followed by frag. B1 l. 5′ with a single letter in between, ו, to be restored as: בְּאַרְק.אֲבִי[.]וְ[וְ]אֶפֶּק "…in the land of my father. Then I went out…" The previous line, l. A.3′ = B1.4′, could, for instance, be restored to read something like: יְהָכ.אֱלַי[.]וְ[וְ]הַמְלֵכ.הֲדַד "…that he would go toward me, and Hadad made king…" Then, l. A.5′ = B1.6′, could, for instance, be restored: וַיְהָכ.הֲדַד.קֳדָמַי[.]וַי[וַי]לֹנ.אַסְרִי "And Hadad walked before me and my prisoner complained," or: וַיְהָכ.הֲדַד.קֳדָמַי[.]וַ[וַ]בֶן.אֱסָרִי "And Hadad walked before me and built the bonds of…"

Again, this is just an example to show that the fragments could easily be placed here. I am not saying that this is the correct placement; on the contrary, my point is that a given placement is not necessarily the right one just because we are able to offer a plausible restoration. In the case of the Tel Dan stele, I was able to propose many other placements that made sense, to the point that I stopped systematically testing for possible placements and textual reconstructions. In other words, the fact that the placement adopted by the editors allowed for a plausible restoration does not prove that it was correct. As a matter of fact, there is evidence to the contrary, as we will now see.

COMPARATIVE PALAEOGRAPHICAL CHART

Palaeographical charts are an essential element in an epigraphist's toolbox. The purpose is not only to document the overall silhouette of a letter, but to analyze its ductus as well, that is, the number of strokes that compose a letter, with their order, shape, and orientation. Palaeographical analysis should also examine how the script interacts with its environment, as a number of factors may influence a ductus, including the quality of the utensil, the smoothness of the surface, the letter that precedes or follows, the writer's health, and so on. Some writers are professional and consistent, while others lack training, experience, or care. One does not expect the same training and quality from a scribe writing a biblical scroll and a commoner taking notes on an ostracon.

Palaeographical charts are but a glimpse of a writer's handwriting, yet they can be helpful to visually identify some of these distinctive features and compare several scripts. They are traditionally hand-drawn, which allows the palaeographer to present what they think is the ideal letter shape or model that the writer is trying to reproduce. While such charts are handy, they are necessarily subjective and can be misleading. Thanks to digital imaging, it is possible to create palaeographical charts based on actual samples of each letter. Such charts are not as pleasing to the eye but are more accurate than the hand-drawn ones. Early in my career, I tried to "clean" the letters and "repair" them so the chart would look nicer. However, I eventually realized that I was falling into the same trap and what we need is a chart that is as faithful to reality as possible, even when

that reality consists of poorly shaped and damaged letters (see, e.g., Langlois 2016a; Eshel and Langlois 2019).

With this in mind, I prepared a comparative palaeographical chart for the Tel Dan inscription. The number of occurrences of each letter of the alphabet is limited on this fragmentary stele, which enabled me to include all of them. I put them in the order in which they appear (from right to left), and I did not alter them in any way. The result can be seen in Fig. 3.

This is not the first palaeographical chart of the Tel Dan inscription,[8] but it is the first time a synoptic comparative chart is presented.[9] A first look at this chart gives the impression that the letters on fragments B1 and B2 are a bit larger. This is often the case, albeit marginally: there is no significant difference in size, and this impression is mainly due to the fact that letters tend to be sharper and better executed on frags. B1 and B2 than on frag. A.

Selected Script Variations

Let us look at more specific script variations, starting with ב (Fig. 4).

The main difference is not the marginally larger size of letters on frags. B1 and B2, but in the elbow: whereas ב features a rounded, one-stroke descender on frag. A, the descender features two strokes on frags. B1 and B2, separated at an angle by an elbow (Fig. 5).

There are, of course, variations within each ductus: every ב on frag. A is unique, and so is every ב on frags. B1 and B2. Such variations are due to the fact that the ductus is an ideal model, a mental process that the writer has in mind and tries to execute, whereas each realization varies depending on a number of factors. What we observe here is more than a simple variation within a ductus; it is a change in the ductus. On frag. A, the engraver always intends to carve a rounded descender. On frags. B1 and B2, he never does so; he always intends to carve two straight strokes joined by an elbow. Why is that so?

An obvious solution would be that there are two engravers. Yet, the presence of two different ductūs does not always mean that there are two writers at work, as it is possible for a single writer to alternate between two ductūs.[10] In the case of cursive Aramaic scripts, I observed up to four different ductūs on the same inscription.[11] Indeed, some writers are more consistent than others. Could it be that the engraver of the Tel Dan stele was simply not very consistent? If so, he

8 See the charts prepared by Athas (2003: 97–163).

9 The need for such a chart was already pointed out by Aufrecht (2007: 68).

10 This was already the opinion of Starcky on the Aramaic stele from Sefire, which is one of the closest parallels to the Tel Dan fragments (Dupont-Sommer and Starcky 1958: 133).

11 See my description of four types of initial א by the same scribe (Eshel and Langlois 2019: 215).

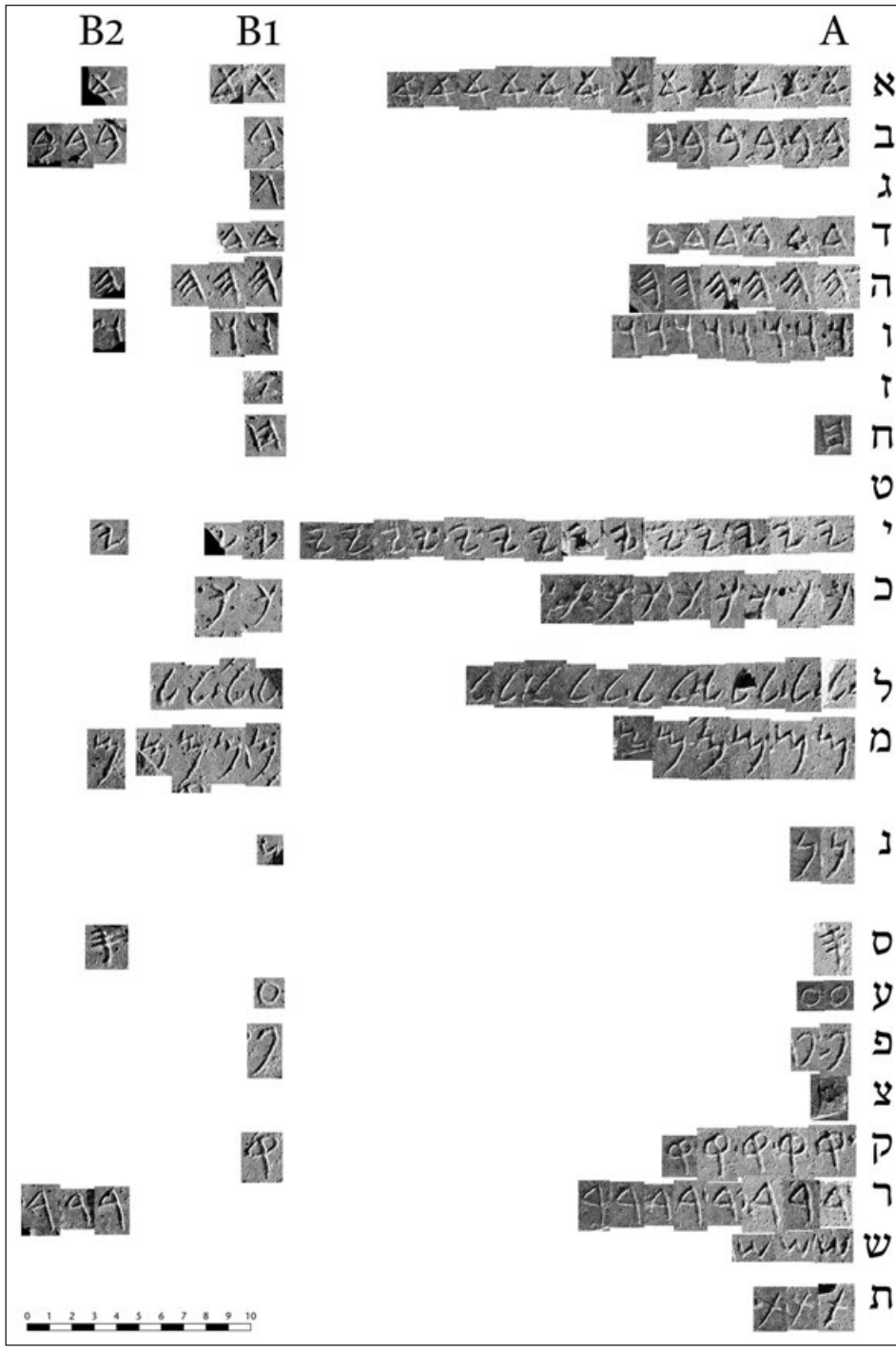

Fig. 3. Synoptic palaeographical chart of the three Tel Dan fragments

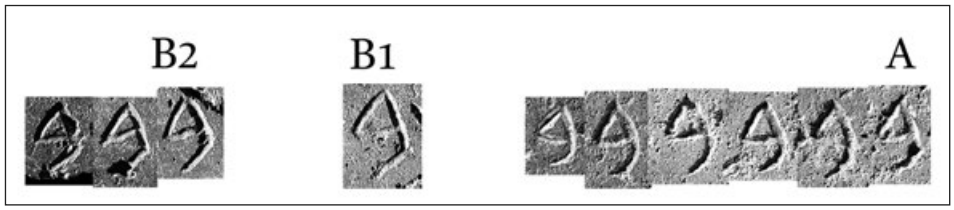

Fig. 4. Occurrences of ב on Tel Dan frags. A, B1, and B2

would definitely not be alone in that category.

Yet, when faced with an irregular or inconsistent writer, the change in ductus is likewise irregular, spread over different parts of the inscription. Here, on the contrary, the two ductūs are not spread across all fragments: a clear distinction is visible between frag. A, on the one hand, and frags. B1 and B2, on the other hand. Athas (2003: 139) thought that two ב on frag. A featured an angular elbow,[12] but the new, high-resolution close-ups presented here show this is not the case. My examination of the stele confirmed as much. For instance, Fig. 6 shows an RTI close-up of ב in frag. A l. 2′, with normal visualization.

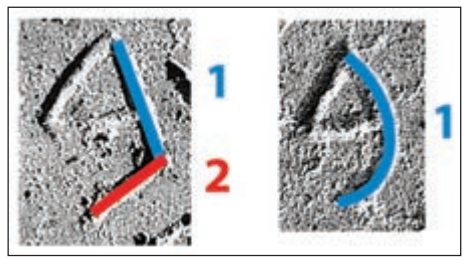

Fig. 5. The one-stroke rounded descender of ב on frag. A (in blue) compared to the two straight strokes (in blue and red) on frags. B1 and B2

What Athas perhaps mistook for an angular elbow is actually a hole in the stone; the descender is not composed of two straight strokes joined by an elbow, but is a single rounded stroke, as elsewhere on frag. A.

The difference in ductus between the fragments could easily be confirmed by a blind test, in which all occurrences of ב would be individually printed on cards. The stack of cards would then be scrambled, and epigraphists would be tasked with clustering the cards according to their ductus without knowing the origin of each letter. In the end, the two resulting stacks would correspond to frag. A and frags. B1+B2, respectively. This can hardly be a coincidence.[13]

12 They "hint at the vertexed-stem form of *beth*" according to Athas (2003: 139).

13 Such a clustering process has long been used in applied mathematics. For an example of its application to ancient Hebrew inscriptions, see Faigenbaum-Golovin et al. (2016).

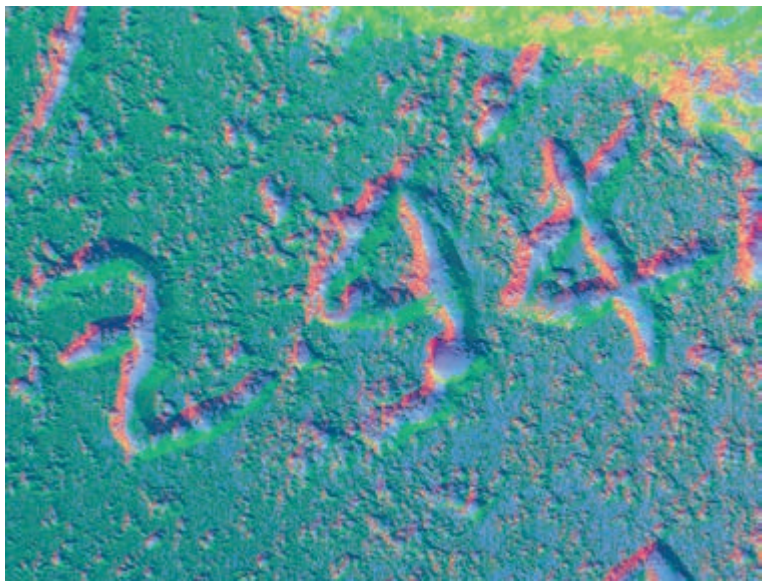

Fig. 6. RTI close-up of ב on Tel Dan frag. A l. 2′, with normal visualization

Fig. 7. Occurrences of כ on Tel Dan frags. A and B1

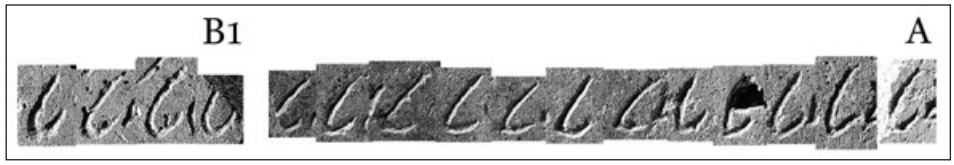

Fig. 8. Occurrences of ל on Tel Dan frags. A and B1

ב is not the only letter where differences may be observed. Other letters hint at a slightly different handwriting, although it is more difficult to characterize due to the limited number of occurrences. Another kind of difference may nonetheless be observed with כ (Fig. 7). Although there are only two instances of כ on frag. B1, both feature a longer, more refined descender than those on frag. A,

with an elegant curve at the end. The ductus is not as different as that of ב, but the fact that occurrences on frag. B1 are more sophisticated and better executed can hardly be a coincidence.

A similar observation can be made with ל (Fig. 8). As with other letters, ל is marginally larger on frag. B1, but the main difference is that its elbow is much more rounded, whereas all instances of ל on frag. A feature an angular elbow (Fig. 9). As a result, the base of ל on frag. A is sometimes flat. Athas (2003: 154) tried to reconcile the two ductūs by pointing out that some ל on frag. A also feature an upward base. However, even in those cases, the elbow is angular, as opposed to the generously rounded elbow of all ל on frag. B1. He likewise believes that the first ל on frag. B1 l. 3′ is angular and resembles a ל from frag. A. However, let us look at an RTI close-up (Fig. 10).

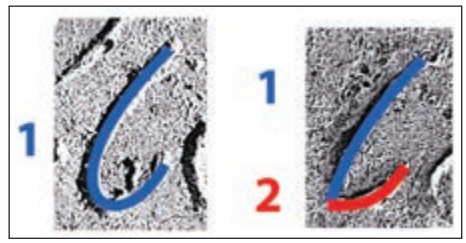

Fig. 9. The two-stroke ל on frag. A (in blue and red) compared to the one-stroke rounded ל on frag. B1 (in blue)

Fig. 10. RTI close-up of ל on Tel Dan frag. B1 l. 3′ after specular enhancement

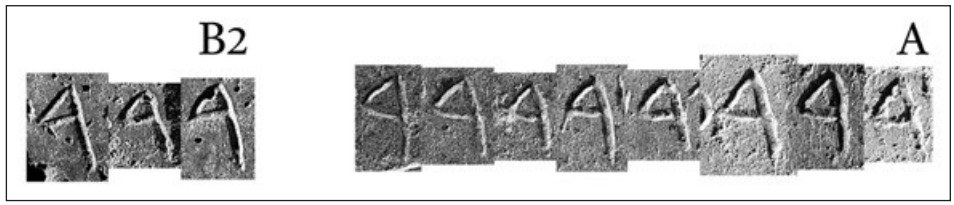

Fig. 11. Occurrences of ר on Tel Dan frags. A and B2

Athas perhaps mistook the hole in the stone above the base of ל for an angular ductus; in any case, RTI imaging confirms that this instance of ל, as all others on frag. B1, features a well-rounded elbow. This characteristic movement of the hand is reminiscent of the elegant, rounded descenders of כ observed above (Fig. 7). Furthermore, it is not an isolated phenomenon, as there are multiple occurrences of ל on both fragments. A pattern clearly emerges.

Another difference, this time with ר, can be seen in Fig. 11. The general ductus for ר is similar on both fragments; the three occurrences of ר on frag. B2 are more refined, but the main difference lies in the angle of the head (Fig. 12). On frag. A, the lower stroke (in red on Fig. 12) tends to be slanted downwards toward the descender or remains horizontal. On frag. B2, this stroke (in blue on Fig. 12) is slanted upwards, which produces a sharper, more elegant silhouette reinforced by a long, straight, slanted descender.[14] This difference in ductus is consistent with what was observed earlier: the script of frags. B1 and B2 is more refined than that of frag. A. Letters are better executed, to the point that even the groove is often neater. Note that these characteristics are shared by frags. B1 and B2, which happen to join physically. Again, this can hardly be a coincidence.

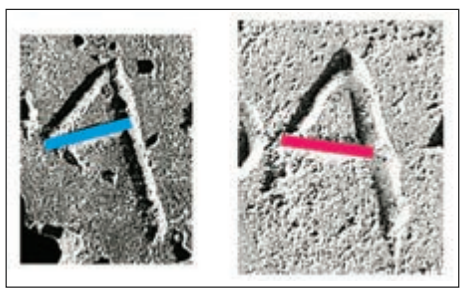

Fig. 12. The lower stroke of the head of ר on frag. A (in red) compared to frag. B2 (in blue)

LAYOUT OF THE FRAGMENTS

The better and more refined execution of letters on frags. B1 and B2 is further confirmed by an examination of the global layout of the fragments (Fig. 13).

14 Cryer (1995: 226) noted this difference and called them “pennants.”

Frags. B1 and B2 exhibit regular line inclination and spacing (represented by blue lines in Fig. 13), but the layout of frag. A (represented by green lines in Fig. 13) is less consistent, with the first seven or eight lines leaning downwards.[15] To illustrate this deviation, the expected baseline for the first seven lines of frag. A is represented in gray in Fig. 13. At the left edge of frag. A, the shift is up to 2 cm; after ca. 30 cm, the gray and green lines cross, meaning there would be a one-line shift if the engraver did not correct the course.

Such deviation is not uncommon in ancient inscriptions and is not a problem in itself. Here, the engraver was indeed able to correct course, gradually reducing inclination, line after line, and adjusting line spacing so that by l. 8′ or 9′, the problem has been solved.

What is striking here is the difference with frags. B1 and B2, which do not exhibit such deviation. With the placement suggested by the editors (Fig. 13), and even if one rotates them slightly (Schniedewind 1996: 77), we would expect to see the same course correction at work on these fragments, with a gradual reduction of inclination and adjustment of line spacing. Such is not the case here; even the line spacing does not match that of frag. A.

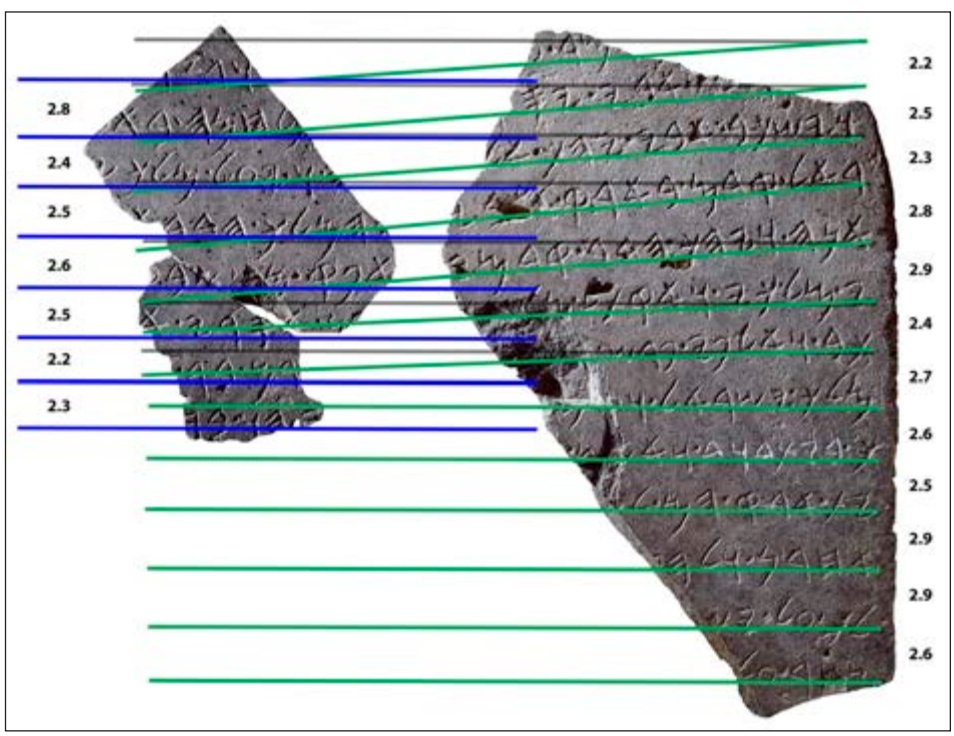

Fig. 13. Line inclination and spacing of the Tel Dan fragments

15 The inclination is more important than suggested by Athas (2003: 179).

ONE ENGRAVER OR TWO?

The evidence presented here is cumulative and conclusive. There is a definite change in handwriting between frag. A, on the one hand, and frags. B1 and B2, on the other hand. When the two new fragments were published in 1995, few scholars suggested that they were inscribed by another engraver, sometimes for the wrong reasons.[16] Yet, they were right in pointing out script differences. Thanks to new imaging techniques, these differences are easier to spot. Once it becomes clear that the script is different, it is hard to unsee it.

Does it mean that frags. B1 and B2 were engraved by someone else? Possibly so, although it must be emphasized that the two handwritings are very similar. If there were two engravers, they may have been trained at the same school. The handwriting of engraver A is less elegant than that of engraver B, but this is not unusual in ancient inscriptions. Likewise, engraver A had trouble maintaining line spacing, whereas engraver B did a better job.

This does not mean that these are two different inscriptions. The similarity in material, surface, size, line spacing, and ductus can hardly be coincidental. Paleomagnetic analysis confirmed that the magnetic field of frags. A and B1 is similar, and that they share the same orientation (Yoav Vaknin, personal communication). In other words, frags. A and B1 were likely cut from the same block with the same orientation. They belong to the same side of the same stele or perhaps to the same architectural project with, for instance, sister steles cut from the same block with the same orientation. They should not be studied as two unrelated inscriptions, contrary to what was suggested (Cryer 1995).

Since these fragments belong to the same inscription or project, it is possible that one engraver inscribed part of the inscription before handing the stylus over to a second engraver with similar handwriting, thus achieving a homogeneous result. If so, the placement adopted by the editors can hardly be maintained, as it is difficult to imagine that an engraver would write the beginning of lines while another engraver would write the end of the same lines. The two engravers would have to stand on each side of the stele and work at the same time. They would simultaneously inscribe the text using a model previously drawn by a scribe. The advantage of such an explanation is that it would defend the placement of the fragments adopted by the editors while accounting for the differences in execution. The problem, however, is the width of the stele: such a scenario would make sense for a large inscription on a wall, for instance, but with a stele that is less than 50 cm in width, as is the case here, there is little need—and little room—for two engravers to work simultaneously on the same lines.

16 Cryer (1995: 225–226), for instance, thought that there were more differences in ductus for ו, ה, מ, ע, etc. Becking (1996: 22) added ד and ח to the list of letters for which “comparable differences are observable.”

Alternatively, the proximity of the two handwritings allows for another hypothesis, namely, that all fragments were inscribed by the same engraver whose handwriting evolved for some reason. For instance, Athas (2003: 180–181) suggested that frag. A belongs to the top of the stele, which was harder for the engraver to reach. According to him, this would also explain the difference in ר (Fig. 11). If so, one wonders how tall the stele must have been, if it remained vertical (rather than placed horizontally) while being inscribed, or if the engraver had to use a stool, etc. Athas (2003: 19) imagines a stele with a height of ca. 1 m, slightly less than the Mesha stele. Yet, the latter does not exhibit the same problems at its top. For instance, let us compare ר at the top and bottom of that stele (Fig. 14). In both cases (ll. 3 and 31), the lower stroke of the head is slanted downward or remains horizontal, as in Tel Dan frag. A. Nowhere on the Mesha stele is this stroke slanted upward as in Tel Dan frag. B2. Therefore, I am not sure that the fragments' position on the stele would account for such script differences.

Likewise, it was suggested during the conference that the beginning of the lines would have been more difficult to reach if the engraver stood at the left-hand side of the stele. This would account for the less elegant handwriting of frag. A, which preserves the beginning of lines, whereas frags. B1+B2, which preserve the middle or end of lines, are better inscribed. Indeed, the position of the arm, wrist, and hand affects the execution of some of the letters. However, what we are observing here is more than that. It is a change in ductus. As explained earlier, the ductus is the ideal process writers have in mind when executing a letter. The actual outcome is never identical to the ductus, as it is influenced by a number of factors such as surface, utensil, training, health, context, etc. That is why every occurrence of a letter, even when penned with the same ductus in mind, is unique. If the palaeographical differences between frags. A and B1+B2 were simply due to the position of the engraver in relation to the stele, one could see differences in the execution of letters, but not a systematic change in ductus. Here, all ב on frag. A are penned with a rounded, one-stroke descender (with variations in execution), whereas all ב on frags B1+B2 are penned with a two-stroke descender featuring an elbow (Fig. 5). The length and angle may vary, but the scribe always intends to engrave an elbow, which is never the case on frag. A (Fig. 4). Some scribes are not very consistent and often switch between two or more ductūs. If this were the case here, we would expect to find the two kinds of ב on frag. A. What is remarkable here is that all occurrences of ב on frag. A follow one ductus, and all occurrences on frags. B1 and B2 follow another. Such a change can hardly be ascribed to the position of the letters on the line. A comparison with similar stelae, such as the Mesha inscription, confirms that there is no such consistent change in ductus between the beginning and end of lines.

Could the change in ductus be explained by assigning the fragments to different sides of the stele? Indeed, steles can be inscribed on several sides, although a comparison with such steles does not reveal a correlation between sides and

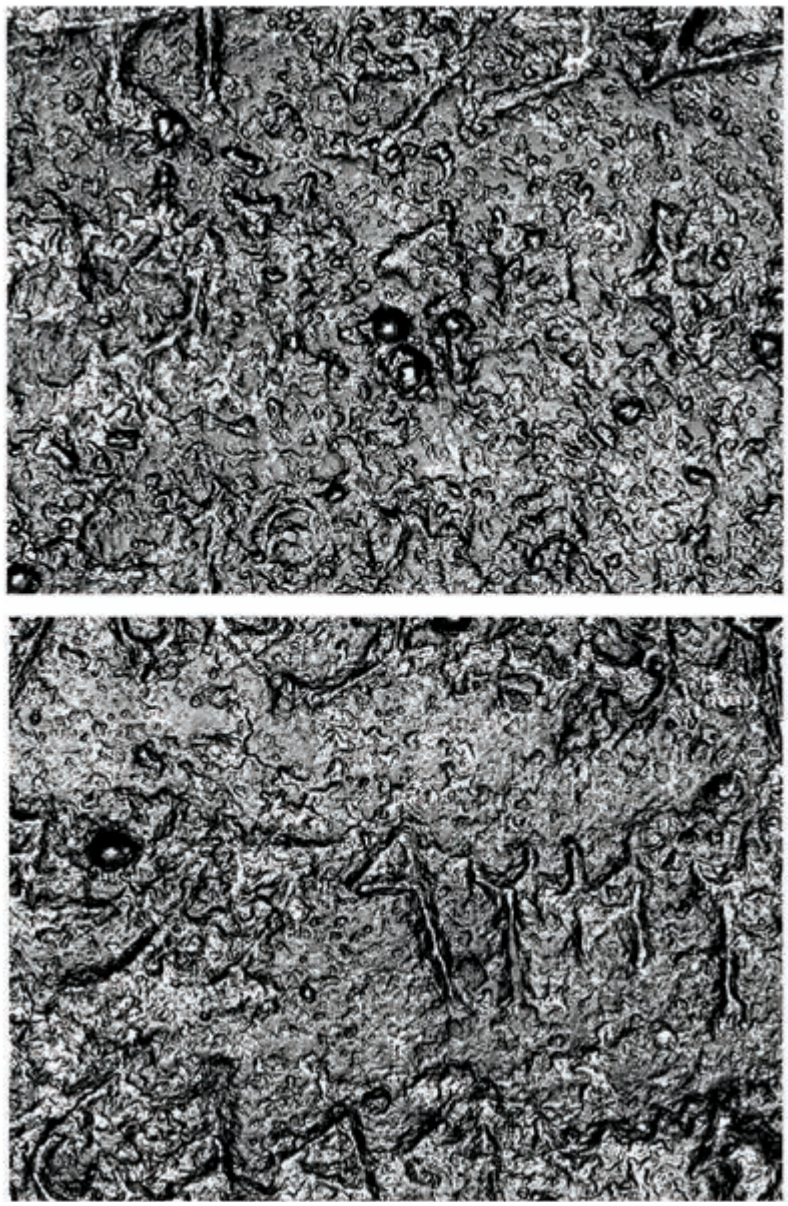

Fig. 14. RTI close-ups of ר on the Mesha stele (l. 3 on the top, l. 31 on the bottom) after specular enhancement

ductus. For instance, at least three sides of the Sefire stele were inscribed, and the question of multiple engravers was already raised by Ronzevalle (Dupont-Sommer and Starcky 1958: 6). However, this is not the same as suggesting that the same engraver switched to another ductus when he inscribed another

side of the stele. Furthermore, as noted above, in the case of the Tel Dan stele, paleomagnetic analysis of frags. A and B1 revealed that they have the same orientation and, therefore, cannot belong to different sides of the same stele (Yoav Vaknin, personal communication).

Other explanations may be considered. For instance, the engraver's physical condition and stylus may have degraded over time. He may have been tired at some point or perhaps became sick. Such gradual evolution of a script was recently evidenced in the Great Isaiah scroll.[17] If such a phenomenon is to explain the difference in ductus at Tel Dan, frag. A was probably engraved after frags. B1 and B2, as its script is less sharp and line spacing is less consistent.[18] Yet, I am not entirely convinced that these reasons would account for such a consistent difference in ductus.

Finally, the timing of these fragments' discovery and the fact that they were not found in the same spot led some scholars to suggest that they might be modern forgeries (Elgvin 2022: 14, n. 24). Indeed, the pristine surface of the stele and the clear mention of בית דוד "House of David" at a time when the existence of King David was debated may seem too good to be true. One could hypothesize that, after having forged and planted frag. A, the forger decided to forge two more fragments in order to give more credibility to this incredible discovery. The better execution of frags. B1 and B2 could be due to the forger's increased experience and skills. Modern forgeries have long plagued ancient Near Eastern research, and palaeography is often helpful in detecting forgeries.[19] In the case of the Tel Dan fragments, however, the difference in ductus between the fragments is not in itself evidence of forgery. The circumstances of their discovery must be further researched before concluding that they were forged and planted there.

CONCLUSIONS

The Tel Dan fragments exhibit the same material features but different, yet similar, scripts. The variation in ductus cannot simply be ascribed to a single, inconsistent

17 Popović et al. (2020) wrongly conclude that there are two scribes with almost the same handwriting. On the contrary, their data shows a gradual evolution of the script over several columns in the middle of the scroll (cols. XXVII–XXIX). Scribes do not switch seats gradually. Tiredness, on the other hand, perfectly explains why, after copying more than two dozen columns, a scribe's handwriting changes slightly and gradually.

18 A placement of frag. A below frag. B was suggested by Galil (2001) on literary grounds, assuming that the account on the stele is organized chronologically, which is not always the case.

19 See already Clermont-Ganneau (1885). More recently, see, e.g., Rollston (2003; 2014). I have been discussing possible forgeries since my doctoral dissertation (Langlois 2008: 14; Langlois 2016b; Davis et al. 2017; Elgvin and Langlois 2019).

engraver. On the contrary, the differences are consistent and systematic between frag. A, on the one hand, and frags. B1 and B2, on the other hand.

This either means that (1) they were inscribed by two engravers with very similar handwritings, who may have worked in the same school or workshop and took turns in inscribing the stele or sister steles, or (2) they were inscribed by the same engraver, whose handwriting evolved for some reason, e.g., health or fatigue, rather than his position relative to the stele.

In any case, this means that the placement suggested by the editors must be abandoned: frag. B does not continue the lines started by frag. A. This conclusion came as a shock to me. I had never done first-hand research on the Tel Dan stele, and I reached this conclusion independently, using new imaging techniques and digital tools.

This conclusion would be contradicted if there was a clear joint between frags. A and B, or if textual reconstruction of the inscription requires the placement adopted by the editors. However, it turns out that there is no real joint between frags. A and B1, and one can quite easily create a textual reconstruction with other placements. The cumulative evidence thus suggests that frags. B1 and B2 should be placed elsewhere.

Scholars have tried to solve linguistic and literary issues raised by the fragments' traditional placement for three decades. They have attempted to fill in the blanks, restore the lacunae, and reconstruct a global narrative for this inscription—including the identification of Israelite and Aramaean kings—when the fragments are simply not part of the same paragraph, perhaps not even the same column.

Additional research is now needed to better understand the relationship between these fragments:

– From a material perspective, the exact chemical composition and other physical properties must be examined in order to understand the exact origin of the fragments. The glue that currently holds the fragments together must be removed in order to test possible joints and produce new imaging, especially using 3D scanning.
– From an archaeological perspective, the findspots of the fragments must be studied in light of recent research on Tel Dan's spatial organization. New excavations could reveal the presence of more fragments in areas that have not been excavated yet, especially under the pavement or at the base of a wall. This would shed light on the stele's debated authenticity and origin.
– From a literary perspective, frags. A and B must be studied anew, bearing in mind that they do not preserve the same lines. Extensive restorations must await results from material or archaeological research. Literary reconstructions should refrain from assuming chronological order.

– From a historical perspective, we should beware of circular reasoning, as illustrated by the editors' reconstruction of the inscription. New research on biblical historiography (especially the Houses of Omri and Jehu) and the Aramaic presence in the region (especially the House of Hazael)[20] may shed light on the context in which these fragments were engraved.

With their extraordinary preservation and their mention of מלך ישראל "King of Israel" and בית דוד "House of David," the Tel Dan stele fragments are yet to reveal all of their secrets.

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20 Note that even before the discovery of frags. B1 and B2, André Lemaire had suggested that the Tel Dan inscription was to be ascribed to the reign of Hazael (Lemaire 1994b).

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