

THE USE OF IKU IN HITTITE TEXTS

H. Craig Melchert
University of North Carolina at Chapel Hill

I. INTRODUCTION

The Mesopotamian linear unit written with the sign GÁN (Sumerian *iku* = Akkadian *ikū*) is employed with some frequency in the Hittite texts of Boghazköy.¹ The Hittite equivalent is unknown to us, but we can determine from examples with phonetic complements that the word was an animate *n*-stem or *na*-stem: note nominative singular IKU-*aš* (KBo 1 42 iv 47), accusative singular IKU-*an* (KUB 33 98 iii 16), and dative-locative singular IKU-*ni* (KUB 36 12 iii 9).

To my knowledge, the only previous discussions of the use of IKU in Hittite are found in the works on the "horse-training" texts, in which IKU is a sub-unit of the DANNA (Akkadian *bī/ēru*), "mile." Hrozný² reckons with a "Neo-Assyrian-Babylonian" mile of circa six kilometers. Since 100 IKU = 1 DANNA, 1 IKU = about sixty meters.³ Potratz⁴ assumes a DANNA of about five kilometers, based primarily on the feasibility of the highest demands placed on the horses in the training texts. This would give a value of about fifty meters for the IKU. Kammenhuber⁵ chooses to retain the established value of the Mesopotamian DANNA, 10.7 kilometers (thus 1 IKU = 107 meters), although she concedes that some provisions of the Kikkuli training text would by this reckoning appear impossible. The discussions just mentioned all ignore other occurrences of the linear unit IKU in Hittite. When we take these instances into account, we find that none of the values for IKU suggested above can be accepted, and that the distances in the horse-training texts must be wholly recalculated.

1. The IKU is commonly used in Mesopotamia as an areal measure: see most recently Powell, ZA 62 (1973) 201-207. On this usage in Hittite see Riemschneider, MIO 6 (1958) 321ff. J. Sasson has called to my attention the fact that IKU as a linear measure is exceedingly rare in Akkadian texts. The only examples cited in the CAD are both Middle Assyrian, and one of those is in fact the Assyrian "horse-training" text (see Ebeling, Wagenpferde passim). Unfortunately, the latter gives no clue as to the concrete value of the IKU.

2. ArOr 3 (1931) 436-37.

3. The equation 100 IKU = 1 DANNA may be deduced from the horse-training texts themselves. See Hrozný, ArOr 3 (1931) 436-37; Potratz, Das Pferd in der Frühzeit (1938) 211ff.; and Kammenhuber, Hippologia Hethitica (1961) 123 note b, and 293.

4. Das Pferd in der Frühzeit 180f.

5. Hippologia Hethitica 300-302.

II. IKU OUTSIDE THE HORSE-TRAINING TEXTS

The most extensive use of IKU outside the horse-training texts has hitherto been overlooked. I refer to the Middle Hittite "Mešedi Instruction" (IBoT 1 36).⁶ Lines i 75 to ii 67 of this text describe the composition (order of march) of a royal procession with the king's chariot at its center. The opening section (i 75-ii 8) prescribes those who are to precede the king (LUGAL-*i piran huyanteš*). Their positions are indicated by the verb *ar-*, "stand." Lines ii 9-ii 43 describe how the king ascends the chariot and how those who accompany his chariot assume their positions. The last section (ii 44-ii 67) indicates the order of march for those who follow the king's chariot. Here the verb used is *iya-*, "march." I take the difference between *ar-*, "stand" and *iya-*, "march" to reflect the fact that those who precede the chariot take their places ahead of time. The king then ascends the chariot, the procession begins, and those who follow the chariot then fall in behind.

The measure IKU is used here to indicate the prescribed interval between each rank of marchers. The formula is: EGIR-*pa-ma-kan* (*namma*) *ištarna* 1 IKU *nu* X . . . *aranta/iyanta*.⁷ The phrase ending in IKU is a nominal sentence with the usual surface deletion of the verb "be" (note the following *nu* marking a new clause). Thus literally: "Behind there is (again) one IKU between. The X stand/march." In good English: "The X stand/march one IKU (further) back."

Thus in i 75-77 the *zinzinawileš*, accompanied by a BEL ERĪN.MEŠ, head the procession. They are followed by another rank, whose membership is uncertain,⁸ at an interval of one IKU: [EGIR-*pa-m*]a-*kan ištara[na]* 1 IKU *nu* 2 L[Ú.MEŠ . . .], "Behind there is one IKU between . . ." (i 78). This rank is followed in turn by two ranks, each consisting of two LÚ.MEŠ.LIM ŠERI accompanied by an UGULA LIM ŠERI and a NIMGIR.ERĪN (ii 1-4 and ii 5-8). Again the interval is in each case one IKU: [EG]IR-*pa-ma-kan namma ištarna* 1 IKU, "Behind there is again 1 IKU between," that is, "There is another interval of one IKU behind" (ii 5; ii 1 may be restored identically).

Beginning with ii 44, the ranks which follow the king's chariot are described, and again the interval of one IKU is prescribed: EGIR-*pa-ma-kan ištarna* 1 IKU . . . , "Behind there is one IKU between . . ." (ii 44, as also ii

6. On the dating of this text as Middle Hittite, see Otten apud Güterbock, 19^e RAI (1974) 311.

7. Jakob-Rost, MIO 11 (1965) 211, misses the sense of this expression entirely. Reading the sign GÁN as Hittite, she is forced into the *pis aller* of interpreting 1-*kán*, 2-*kán*, 3-*kán* as distributives: "singly, alone," "by twos," "by threes." However, -*kán* as a distributive marker in Hittite is pure invention. Furthermore, distributives do not make any sense in the context.

8. Based on the membership of the ranks which follow the king's chariot, which seem to parallel those which precede, one could restore i 78ff. after ii 7ff., that is, the rank would consist of 2 LÚ.MEŠ ŠUKUR accompanied by a GAL LÚ.MEŠ ŠUKUR and a NIMGIR.ERĪN.

47, 51, and 56). Between each rank of marchers there is thus prescribed an interval of one IKU.

Even allowing for a grandiose scale, it is patently absurd to give a value of 107 meters to one IKU. This would mean that there is the length of a football field between each rank! Even the smaller values of Hrozný (sixty meters) and Potratz (fifty meters) are highly unlikely. The soldiers in the procession have a protective as well as a decorative function (see lines ii 64-67 about the danger of allowing a stray bull or horse to break into the procession). It is therefore doubtful that the ranks would be permitted to be 150 to 180 feet apart. Note in particular that the first rank behind the king's chariot would be 150 feet from it.

If the passages just discussed suggest that the Hittite value of IKU is much smaller than previously supposed, the following lines (ii 60-63) seal the argument:

ŠA LIM ŠERI-ma kuiš ERĪN!ME[Š]-az⁹ nu takšulān tapūša /
išgarān harzi GÜB-laš GÜB-laz išgarān harzi (erasure) / ZAG-š-a
ZAG-az iškarān harzi arḫa-ma-aš 3 IKU iyatta / mān-ši piran-ma
kuwapi KASKAL-iš ḫatkuš n-aš anda paiz[z]i

"The troops which are of the *l.s.* hold (their spears) 'at ease' pointed to the side. The one on the left holds his pointed to the left, while the one on the right holds his pointed to the right. They march three IKU apart, but if the road ahead is (too) narrow for them somewhere, they go in (close ranks)."¹⁰

While the previous paragraphs prescribe the distance between each rank, this paragraph prescribes that between the left and right ends of each rank, which is normally three (!) IKU. Provision is made for places where the road is too narrow to allow this, in which case the ranks may close (*anda pāi-*). But even if this sort of procession was limited to royal thoroughfares, a normal distance of 150 to 321 meters (3×50 and 3×107 meters respectively) for the width of the procession is clearly impossible.

9. The autograph shows two wedges and a vertical (thus an UD) plus part of a vertical before the break. There also appear to be traces of two wedges above the break. The broken sign can hardly be anything but a MEŠ. It cannot be KAM, and an UD.KAM-az, "day" or "by day," would not fit the context in any case. I therefore propose to read ERĪN!ME[Š]-az. The sign ERĪN is defective only in that the vertical is single rather than double. ERĪN.MEŠ, "troops," is a collective in Hittite, hence the singulars in what follows, which I have translated according to the sense as plurals: *takšulān . . . harzi, arḫa . . . iyatta, mān-ši . . . n-aš anda paizzi*.

10. Jakob-Rost, MIO II (1965) 214, finds the entire paragraph obscure, especially the sense of *išgar-*. However, according to line ii 52, the LÜ.MEŠ LIM ŠERI are carrying spears. The verb *išgar-* is used with headgear and other objects which may be said to be "stuck on" or "attached to" the person. I therefore take the sense here to be that the soldiers hold their spears pointed out to the side (*tapūša*), with the butt end resting against the hip and with the arm extended. For a spear held in this configuration, the verb *išgar-* seems wholly appropriate. The past participle *takšulān* literally means "pacified, reconciled." Thus the spears pointed out to the side are in a primarily ornamental posture, as opposed to being held in a hostile attitude, ready to strike. Accordingly, I have translated *takšulān* freely as "at ease."

Furthermore, such a spreading out of the ranks would have defeated their protective function.

The passages from the Mešedi Instruction show that the value of the IKU in Hittite was much smaller than previously supposed, but they do not tell us what that value was. However, we do have a clue in the following lines from the Song of Ullikummi¹¹:

INA UD.1.KAM-ya-aš 1 AMMATU parkiškattari/[(INA
ITU.1.KAM-ma-aš 1 IKU-an)] parkiškattari

"And he grew one ell in a day, while he grew one IKU in a month."

Bearing duly in mind that we are dealing with a mythological text, we may make the hypothesis that 1 IKU = about 30 *ammatu*. Akkadian *ammatu*, "ell," equates with the Hittite *gipeššar*.¹² The Mesopotamian value of the ell is approximately fifty centimeters, or half a meter. Since this unit of measure is based on the human body, we may safely assume that the Hittite value is more or less the same. This leads to a value for the IKU in Hittite of fifteen meters (30 × .5 meters).

If we apply this value to the Mešedi Instruction, we now arrive at more reasonable distances. The interval between ranks is now one IKU, equalling circa fifteen meters, or about forty-five feet. The maximum width of the column is now three IKU, equalling forty-five meters or 135 feet. The scale of the procession is still quite grand, but these figures are at least plausible.

III. IKU IN THE HORSE-TRAINING TEXTS

Armed with the equations thirty *gipeššar* equals one IKU and one hundred IKU equals one DANNA, we now return to the horse-training texts. Kammenhuber¹³ lays some stress on the differences between the Kikkuli text written by a Hurrian and the "purely" Hittite horse-training text (by her enumeration the third horse-training text). In particular, the native Hittite text allegedly makes far easier demands on the horses in terms of distances run. The recalculated value of the IKU necessitated by the Mešedi text, and a closer look at the syntax of the Kikkuli text, reveal that the Kikkuli text and the native Hittite text are in fact not so different from one another.

The following is a typical description of the "running exercises" in the Kikkuli text¹⁴:

n-aš türiyazi n-aš 3 DANNA pennai / parahzi-ma-aš ANA 7
IKU.ḪI.A EGIR-pa-ma-aš / ANA 10 IKU.ḪI.A parahzi n-aš
arḫa lai

11. KUB 17 7= iv 23-24 = 33 98 iii 15-16, cited after Güterbock, JCS 5 (1951) 56.

12. See Kammenhuber, Hippologia Hethitica 270 with references.

13. Hippologia Hethitica 298ff.

14. KUB 1 13+ i 4-6; Kammenhuber, Hippologia Hethitica 54.

"He hitches them up and drives them out three 'miles,' of which he gallops them seven IKU, but (of the three miles) back he gallops them ten IKU, and he unhitches them."

This translation, which differs radically from that of Kammenhuber, calls for some comment. Kammenhuber¹⁵ assumes that the dative-locative construction with IKU (+ *anda*) in the Kikkuli text (instead of the expected accusative of extent) is to be laid to the account of the Hurrian author. This is true, but the dative-locative usage is not merely a free variant for the accusative, nor is it conditioned by the presence of IKU. The author of the Kikkuli text ordinarily uses the accusative of extent with IKU, just as with DANNA¹⁶:

n-aš 30 IKU.ḪI.A *pennai* / *paraḫzi-ma-[aš]* ANA 7 IKU.ḪI.A

"He drives them out thirty IKU, of which he gallops them seven IKU."

All cases of the dative-locative (+*anda*) occur when the distance galloped (with *parḫ-* or *lahlahḫešk-*) is specified *after the distance driven* (*penna-*). The meaning which the author is trying to express is that of a partitive: of the total distance covered, the horses are galloped a certain portion. The Hittite means of expressing this nuance is the adverb *anda* (often written ŠÀ.BA), "therein," with the meaning "thereof." This usage is in fact recognized by Kammenhuber herself in the native Hittite training text¹⁷:

n-uš tur[iyanzi n-at 3 DANNA] / [*zallaz*] *uwanzi* ŠÀ.BA 1 DANNA *waššanteš uw[a]n[zi]*

"They hitch them up, and they come three miles at a trot, of which they come one mile "clothed."

The Kikkuli construction ANA/INA IKU (*anda*) is based on a misunderstanding of the function of *anda* in this usage. Instead of taking *anda* correctly as an adverb "therein," with the meaning "thereof," the foreign author treats *anda* as a postposition "in," and puts the distance in the dative-locative: ANA/INA x IKU.ḪI.A (*anda*). Since the dative-locative by itself expresses location, the *anda* is usually dropped, leaving the usual form in Kikkuli: ANA/INA x IKU.ḪI.A. Thus the distances galloped in cases like those cited are not *in addition to* the distance driven, as Kammenhuber would have it, but rather are *included in* the distance driven.

On the other hand, Kammenhuber's translation ignores the consistent contrast between *penna-* and *unna-* in the Kikkuli text. The clear distinction

of *penna-*, "drive out" and *appa unna-*, "drive back" implies that the distance given under *penna-* indicates only the distance covered on the outward trip, while the distance back is left unexpressed (since it can be inferred to be always the same). However, when the subportion which is taken at a gallop is not the same on the trip out and back, these two distances must be specified (hence ANA 7 IKU.ḪI.A *paraḫzi* versus EGIR-pa ANA 10 IKU.ḪI.A *paraḫzi*).

This means that in the passage cited above, the horses are driven a total of six miles (three out and three back). Of this distance they are galloped seventeen IKU (seven out and ten back). Obviously, this grammatical reinterpretation implies that all the distances in the running exercises must be recalculated. I forego this step here and leave it to those with competence and interest in matters of horse training. I merely wish to demonstrate that the minimum and maximum demands placed on the horses in the Kikkuli text make as much, in fact more, sense with the value of IKU (and hence DANNA) which I have proposed than with those suggested previously.¹⁸

The horse-training texts themselves are silent about several matters which are relevant to judging the feasibility of the various distances to be run: the size of the horses, the number of horses per team, and the size and weight of the chariots used. We do know that in a burial site near Hattuša there have been found the skeletal remains of adult stallions measuring 1.5 meters (about 60 inches) to the withers.¹⁹ This figure accords well with other ancient descriptions, but suggests that the Hittite horses were small by modern standards. Egyptian reliefs of the Battle of Kadesh show Hittite chariots with two-horse teams.²⁰ As to the size and weight of the chariots, existing descriptions vary so greatly as to be of little help.²¹

According to the revised grammatical interpretation of the Kikkuli text given above, the two-horse teams are driven a total of ten DANNA on the first day of training, seven on the second day, and six on the third. Using the old value of 10.7 kilometers for one DANNA, this works out to 107, 75, and 64 kilometers respectively. While these figures are not impossible as feats of endurance, they seem excessively high for horses in the first days of training. More striking is the provision that the horses are not watered after the third day's run, which would be unthinkable after a distance of sixty-

18. The following section owes much to the kind assistance of Matthew Mackay-Smith, DVM, Medical Editor of *Equus*, Gaithersburg, Maryland; William R. Culbertson of the Cooperative Extension Service, Colorado State University; *Horse and Chariot* magazine, Idaho Falls, Idaho (for access to an article to appear by Mr. Lou Bach); Mrs. Judith Forbis, Lufkin, Texas; and my brother, Roland L. Melchert, Colorado Springs, Colorado. The number of unknowns involved makes definitive statements impossible, and final responsibility for the views expressed here is mine.

19. F. Hançar, *Das Pferd in Prähistorischer und Früher Historischer Zeit* (Vienna, 1955) 460.

20. Hançar, *Pferd* plate XXVIIIb.

21. Hançar, *Pferd* 491-92.

15. *Hippologia Hethitica* 80 note 17.

16. KUB 1 13+ iv 15-16; Kammenhuber, *Hippologia Hethitica* 70.

17. KUB 29 40 ii 2-3; Kammenhuber, *Hippologia Hethitica* 178-79.

four kilometers. With my value of 1500 meters for one DANNA, the first three days' total distances equal fifteen, ten and a half, and nine kilometers, respectively. These figures seem quite sufficient for the early days of training.

On the other hand, with my value of only fifteen meters for one IKU, the distances galloped in the first three days are quite short: bursts of seven and ten IKU (that is, 105 and 150 meters) on both the trip out and back. It has been suggested to me that the purpose of these short gallops was to develop sprinting ability (a desideratum in combat), while the longer driving distances built up endurance and stamina. Such short bursts of speed early in training are common practice among contemporary horsemen engaged in chariot racing in the western United States. Therefore, my proposed value of fifteen meters for the IKU and 1500 meters for the DANNA in Hittite usage produces plausible distances for the running exercises in the horse-training texts.

IV. CONCLUSION

There is one final confirmation of the validity of the new value proposed for the IKU. As the sub-unit of the DANNA, the native Hittite training text does not use IKU, but rather *gipeššar*. The distances attested for "gallop" (*parh-*) in that text are: 200, 300, 400, and 600 *gipeššar*. For Kammenhuber these figures show that this text is far less demanding than that of Kikkuli. But given the new calculation of thirty *gipeššar* = one IKU, these figures equate roughly to seven, ten, fourteen, and twenty IKU. The most frequently specified distances for the gallop in Kikkuli are precisely seven and ten IKU. This correspondence between the Kikkuli and native Hittite training texts can scarcely be a coincidence. It accords fully with the general interdependence of these texts and supports my recalculation of the Hittite IKU as being thirty *gipeššar*, equalling fifteen meters, which was originally made on the entirely independent evidence of the Ullikummi and Mešedi texts.