THE BABYLONIAN MUSICAL NOTATION AND THE HURRIAN MELODIC TEXTS

BY M. L. WEST

BETWEEN 1960 and 1970 a happy sequence of discoveries and correlations of cuneiform texts disclosed the existence of a coherent body of Babylonian doctrine regarding tunings of the lyre (or harp), and a musical notation reflecting this theory. The fragmentary hymns whose music was recorded in this notation about 1250–1200 BC are by far the oldest known examples of notated melody in the world.[1] These revelations have provoked a lively discussion, conducted partly in musicological but mainly in Assyriological publications. Only in the last few years has it shown some signs of flagging. It is not that all the problems have been solved, but rather that an impasse has been reached. On many important points there is a consensus. But on others, including the interpretation of the notation, widely divergent positions have been taken up.

At present we have four rival decipherments of the notation, each yielding entirely different results. It is the main purpose of the present article to propose a fifth which I believe to be superior to those advanced hitherto. It is impossible, of course, to extract more from a notation than was put into it in the first place. It may well be that this ancient oriental notation was only capable of expressing the basic outline of a melody, and that many details of execution went unrecorded. Nevertheless, if my interpretation is correct, it will bring us closer to an understanding of the nature of this music.

It is necessary to begin by summarizing what has been established to general satisfaction about the Babylonian musical system. I shall not rehearse the history of the discoveries or set out all the relevant texts. That has been done often enough, and those interested may seek out the particulars elsewhere.[2] Let us review the yield.

I would like to thank Dr Stephanie Dalley for help with some of the Babylonian texts mentioned in this article; Professor O. R. Gurney for bringing to my attention the article by T. J. H. Krispijn cited in note 9 below; and both of them for much vigorous discussion of these matters.

[1] Unless one counts the Old Babylonian text from Nippur, N 3354, which appears to detail successive notes and intervals to be played in accompanying a hymn to the divinized king Lipit-Ishtar (Anne Draffkorn Kilmer & M. Civil, *Journal of Cuneiform Studies*, xxxviii (1986), 94–98; Kilmer in *Nippur at the Centennial*, Philadelphia, 1992, pp. 101–12). This should go back to Lipit-Ishtar's reign, that is, the twentieth century BC. But as musical notation it is very defective, since it lacks all mensurational indications.

[2] See in particular: Anne Draffkorn Kilmer, 'The Strings of Musical Instruments: their Names, Numbers, and Significance', *Studies in Honor of Benno Landsberger = Assyriological Studies*, xvi (1965), 261–8; eadem, 'The Discovery of an Ancient Mesopotamian Theory of Music', *Proceedings of the American Philosophical Association*, cxv (1971), 131–49; eadem, Richard L. Crocker & Robert R. Brown, *Sounds from Silence: Recent Discoveries in Ancient Near Eastern Music*, Berkeley, 1976 (booklet and LP record); Anne Draffkorn Kilmer, 'A Music Tablet from Sippar(?): BM 65217 + 66616', *Iraq*, xlvi (1984), 69–80; Hans Martin Kümmel, 'Zur Stimmung der babylonischen Harfe', *Orientalia*, xxxix (1970), 252–63; François Lasserre, 'Musica babilonese e musica greca', *La musica in Grecia*, ed. Bruno Gentili & Roberto Pretagostini, Rome & Bari, 1988, pp. 72–95.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

We have learnt that there was a nomenclature for the individual strings of a nine-stringed instrument, for a series of intervals obtaining between one string and another, and for a series of tunings of the instrument giving different species of a diatonic octave. This nomenclature must have continued in use for well over a thousand years, and across a wide area, since the texts in which it appears range in date from about the eighteenth century BC to perhaps the fourth or third, and come from sites as far apart as Ur on the lower Euphrates, Ashur on the upper Tigris, and Ugarit on the coast of Syria. It is an attractive conjecture that the system went back to the remarkable Sumerian king Shulgi (22nd century), who, in a couple of the so-called hymns that celebrate his incomparable greatness and accomplishments, boasts of having established the theory of music, mastered various instruments, and 'designed their raising and lowering'(?).[3] We do not know what this raising and lowering consisted of, but parallel terms play a part in the later nomenclature of intervals and tunings.

The nine strings were identified by counting inwards from the front and back of the instrument towards the middle. Their names, listed in Sumerian and Akkadian in parallel columns, were: (1) Foremost; (2) Next; (3) Third Thin; (4) Fourth Small (Sum.), or Ea (is its) creator (Akk.); (5) Fifth; (6) Fourth of the Rear; (7) Third of the Rear; (8) Second of the Rear; (9) Rear, or (Sum.) First of the Rear. We shall have to consider later what the form of the instrument was, which end was called the rear, and at which end the highest and lowest noted were played.

The inward numbering is not unnatural. For the player it was easier to identify strings in this way than by counting from one end only. The seventh out of an array of nine, for example, was more readily identified as 'third from the end' than as 'number seven'. The nomenclature of the seven strings of the archaic Greek lyre (Fig. 1) offers an analogy.[4] However, in what follows it will be more convenient to number the strings straightforwardly from 1 to 9.

νήτη	bottom
παρανήτη	alongside–bottom
τρίτη	third
μέση	middle
λιχανός	forefinger
παρυπάτη	alongside–topmost
ὑπάτη	topmost

Fig. 1 Nomenclature of the strings of the archaic Greek lyre

Strings 8 and 9 doubled strings 1 and 2 at the octave. This appears firstly from the Old Babylonian 'tuning text', UET VII 74, where it is explained how to change from one tuning to another by retuning a particular string—normally one string, but 8 is retuned together with 1, and 9 with 2; and secondly from the somewhat later catalogue of intervals, CBS 10996, where all the intervals are defined in terms of

[3] Quoted by Aaron Shaffer, 'A New Musical Term in Ancient Mesopotamia', *Iraq*, xliii (1981), 79–83, at p. 82, together with two other passages from Shulgi hymns referring to his knowledge of positions for 'raising' and 'lowering' on certain instruments.

[4] I do not mean to suggest a historical connection, as some have done: Marcelle Duchesne-Guillemin, 'Survivance orientale dans la désignation des cordes de la lyre en Grèce?', *Syria*, xliv (1967), 233–46; eadem, 'Sur la restitution de la musique hourrite', *Revue de musicologie*, lxvi (1980), 5–26, at pp. 8–9; Lasserre, op. cit., at pp. 74–78.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

strings 1–7 only, but a more regular pattern emerges if the intervals 1:6 and 2:7 are interpreted as 8:6 and 9:7.

Fourteen intervals are listed, each with its own name and with specification of the two strings that define it. The names are mostly translatable, though hard to account for. Fig. 2 shows the list reduced to essentials. The two strings are here indicated simply by paired digits, 15, 75, etc.; the original has 'Foremost string and Fifth string, 1, 5', and so on. I have levelled the somewhat inconsistent spellings of the interval names to Old Babylonian forms.

15 *nīš gab(a)rîm*	raising of the counterpart
75 *šērum*	song (?)
26 *išartum*	straight/in proper condition (fem.)
16 *šalšatum*	third (fem.)
37 *embūbum*	reed-pipe
27 *rebûtum*	fourth (fem.)
41 *nīd qablim*	casting down of the middle
13 *isqum*	lot/portion
52 *qablītum*	middle
24 *titur qablītim*	bridge of the middle
63 *kitmum*	covering/closing
35 *titur išartim*	bridge of the *išartum*
74 *pītum*	opening
46 *ṣ/zerdum*	?

Fig. 2 List of intervals after CBS 10996

These interval-names appear in other texts, and they form the basis of the notation system. So they clearly constitute in some sense a 'canonical' list. They are arranged in pairs, as I have indicated by indentation in Fig. 2. The seven odd-numbered items have a different status from the even-numbered ones, being also used as the names of tunings. David Wulstan has called them the 'primary' intervals and the other seven the 'secondary' ones.[5] In this list the primary intervals are so arranged that the first string named progresses from 1 to 7. The other string is then either $n + 4$ or $n - 3$. As all the tunings are heptatonic (the octave counterpart of 1 or 2 being reached in seven steps), it is fairly clear that these primary intervals are all fifths or fourths. It is true that the interval 26, say, will not be the same in all tunings. But in the 'tuning text' this variation is expressed by saying that the *išartum* interval is 'pure' or 'not pure'. As Wulstan saw, this must mean 'concordant/discordant', that is, 'pure fifth'/'tritone'. So *išartum* properly means 'strings 2 and 6 tuned to a fifth'—otherwise it is not a pure *išartum*—and similarly with the rest. The Babylonian musician evidently had no term for a fifth or a fourth in the abstract, only for fifths and fourths established between particular pairs of strings.

The 'tuning text' is concerned with the accordaturas of an instrument identified by the Sumerian logogram ^{gis}ZÀ.MÍ, corresponding to the Akkadian *sammûm*. It contains a series of statements in the form, 'if the *sammûm*(-tuning) is X, and the Y interval is not pure, you tighten (or loosen) string N, and the Y will become pure'. The whole series can be reconstructed, and we can deduce the interval structures of all seven tunings. They turn out to be diatonic scales, in fact the scales corresponding to the octave species *a–a'*, *b–b'*, *c–c'*, *d–d'*, *e–e'*, *f–f'*, *g–g'*, only in each case extended to cover a ninth. That is why there are seven of them, no more and no less.

[5] David Wulstan, 'The Tuning of the Babylonian Harp', *Iraq*, xxx (1968), 215–28, at pp. 216 n. 3, 224.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

Such scales are naturally created when a lyre or harp is tuned by starting from a given string and tuning the rest one after another in an alternating sequence of rising fifths and falling fourths, or falling fifths and rising fourths. As H. M. Kümmel realized,[6] the seven tunings appear in the 'tuning text' and in other documents in a standard order, *išartum*, *kitmum*, *embūbum*, *pītum*, *nīd qablim*, *nīš gabrîm*, *qablītum*, that reflects the order of intervals in just such a tuning cycle (Fig. 3). The seven tunings each started from a different string. But whichever string he started from, the musician followed the circle round clockwise. Each tuning took its name from, or gave its name to, the initial interval established. For example, the *kitmum* tuning was the one where the musician started from string 6 and set up the *kitmum* interval of a fourth between it and string 3, then the *embūbum* interval of a fifth between 3 and 7, then the *pītum* interval of a fourth between 7 and 4, and so on.

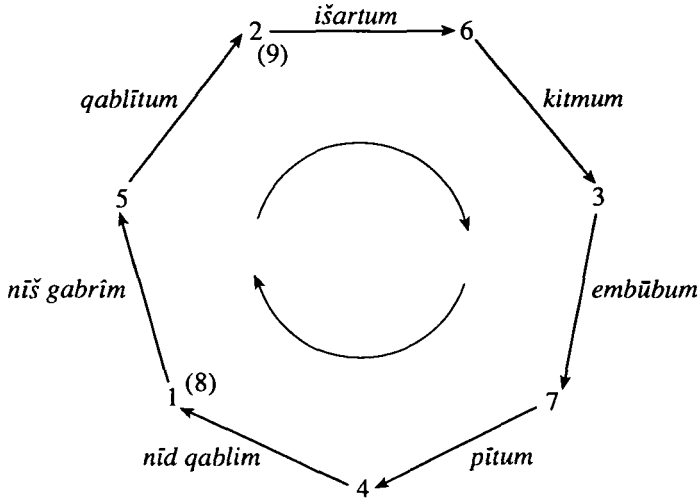


Fig. 3 The tuning cycle

The temperament of all these tunings, as they were regulated by perfect fifths and fourths, would have been the so-called Pythagorean, with tones of 204 cents (the difference between a perfect fifth, 702 cents, and a perfect fourth, 498 cents), and 'semitones' of 90 cents (the residue after two or three tonal steps had been made into the initial empty fourth or fifth). An 'impure' interval arose in each tuning between the last string tuned and the first. We have described it as a tritone, and it was in some cases indeed strictly equal to three tones, 612 cents, but in others (as, for example, in Fig. 4) to two tones plus two minor semitones, 588 cents.[7]

The 'secondary intervals' in the catalogue of fourteen, each paired with one of the primary fifths and fourths of the tuning cycle, are in every case composed of the

[6] Kümmel, as in n. 2.

[7] A note on the term 'Pythagorean' in this context. The first mathematical analysis of the diatonic scale, reflecting this temperament, was produced by Philolaus, a Pythagorean indeed but about a century after Pythagoras. It also appears in Plato's *Timaeus* (35b–36b), in the Euclidean *Sectio Canonis* (20), Eratosthenes (Ptolemy, *Harmonics*, 2. 14) and other writers. Ptolemy attests that citharodes actually tuned their lyres on this system (*Harm.* 2. 1 p. 44. 1 Düring, cf. 1. 16 p. 40. 4). See Andrew Barker, *Greek Musical Writings*, ii (Cambridge, 1989), 313–14, nn. 146, 149. But both Aristoxenus and Ptolemy recognize more than one type of diatonic, with steps of various sizes.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

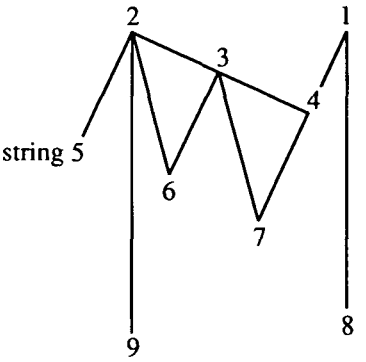


Fig. 4 The qablītum tuning

second note of the associated primary interval and the note reached after four further strings have been tuned. In five cases the interval is a major third; in the other two it is a diminished sixth, but in these cases the last string tuned is 1 or 2, and if we assume that 8 and 9 were tuned at the same time as 1 and 2, we obtain again major thirds with the second note of the initial interval.

What does this mean? Why do these thirds enjoy a special status and receive their own names? I would suggest that it is because they too had a part to play in the tuning process. To guard against any cumulative error of intonation in his successive ups and downs, the musician may have been taught to test the sixth string tuned against the second, to check that the interval sounded as it should. It was like fixing a spar across a potentially rickety structure. Fig. 4 illustrates this for the *qablītum* tuning.[8]

I now move on to more seriously controversial matters. I have set out the logic of the tuning system, referring to rising and falling intervals and identifying strings by number, but I have avoided any indication of whether string 1, the 'Foremost', sounded the highest note or the lowest. Much hangs on this, and most who have written on the subject have got it wrong. The truth is that string 1 sounded the *highest* note. Arguments for this view were put forward by Raoul Vitale in 1982, and it has now been proved correct by a new reading of the 'tuning text' that makes it clear which retunings were effected by tightening strings and which by loosening.[9]

The nomenclature of the strings itself gives a pointer. String 1 is 'foremost', while 6–9 belong to the 'rear'. String 3 is characterized as 'thin', and string 4 (under its Sumerian name) as 'small'. A small string, if it differs from a thin one, is presumably a short one. Thinness and shortness would both go with higher pitch, implying that the higher notes were to be found towards the 'front' of the instrument rather than the rear.

But what was the instrument in question? According to the tuning text it is the ^{giš}ZÀ.MÍ or *sammûm*. The exact identification of Sumerian and Akkadian names

[8] The name given to the 24 interval, 'bridge of the *qablītum*', might seem very apt in this regard. Unfortunately the only other 'bridge' in the list, *titur išartim*, is not paired with *išartum* but with *kitmum*. The rest of the names remain completely obscure. Nor can one see what rational principle governs the order in which the two strings of the secondary intervals are named. It cannot have mattered in practice which was sounded first in testing the intonation.

[9] Raoul Vitale, 'La Musique suméro-accadienne: gamme et notation musicale', *Ugarit-Forschungen*, xiv (1982), 241–63, at pp. 243–55; T. J. H. Krispijn, 'Beiträge zur altorientalischen Musikforschung. 1. Šulgi und die Musik', *Akkadica*, lxx (Nov.–Dec. 1990), 1–27, at p. 15.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

for instruments is a difficult business, and for a long time scholars were not clear whether the *sammûm* was a lyre or a harp. (Some of them, perhaps, were not too clear about the difference between the two things.) But over the last 30 years, opinion has hardened in favour of its being a lyre, and this is the interpretation firmly adopted in the great *Chicago Assyrian Dictionary*.[10] At the time when Sumero-Babylonian music theory was formulated, the word would presumably have denoted the large Sumerian type of lyre with its soundbox embellished at one end with the head of a bull or cow, suggesting that the soundbox itself represented the body of the animal; sometimes, indeed, it was furnished with four legs. The earlier examples of this instrument, as documented by remains from the tomb of Queen Pu-abī at Ur (*c.*2700 BC) and by the best artistic representations (*c.*2800–2200 BC), generally have eleven strings, but the 'Gold lyre', Iraq Museum 8694, may have had only seven or eight. The extant harps of this period have thirteen to fifteen strings. From later periods there are no surviving instruments, and depictions in art often show insufficient concern for detail to be reliable evidence for the number of strings. But there is an incised sherd from Larsa, of the early second millennium, with a very meticulous representation of a man playing a Sumerian-type lyre with eight strings.[11]

The 'bovine' lyre had a very obvious front and rear, the front being marked by the animal head, which faced away from the player. The strings were fixed either in a fan-like formation, with the middle strings slightly shorter than the outer ones, or roughly parallel, slanting back towards the player, with the shortest string at the front. (See Fig. 5.) In neither case is the difference in length between the longest and shortest strings very great, and the differentiation of pitch, extending over an octave

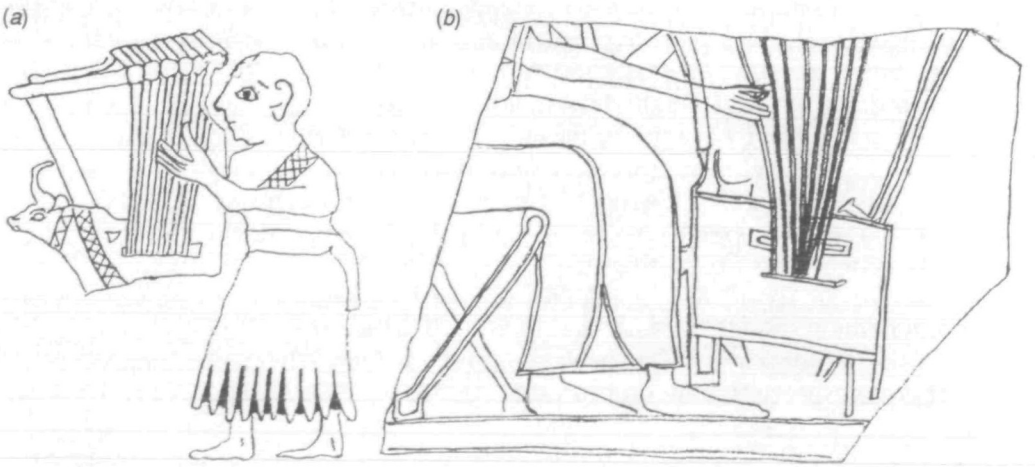


Fig. 5 Sumerian lyres

[10] For the evidence see especially Anne Draffkorn Kilmer's discussion in the *Reallexikon der Assyriologie*, vi (1980–83), 571–5, s.v. 'Leier'; T. J. H. Krispijn, op. cit., at pp. 6–7. Bo Lawergren & O. R. Gurney ('Sound Holes and Geometrical Figures. Clues to the Terminology of Ancient Mesopotamian Harps', *Iraq*, xlix (1987), 37–52) argue spiritedly for the harp, principally on the ground that a geometrical figure formed from four concave arcs is called 'ear of the *sammûm*' and bears some resemblance to the sound-holes depicted on certain vertical harps. But this is not the only possible explanation of the term, and some of the other arguments savour of special pleading.

[11] Fig. 5b, below; Baghdad, Iraq Museum T 688; Subhi Anwar Rashid, *Mesopotamien* (Musikgeschichte in Bildern, ii. 2), Leipzig, 1984, fig. 78.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

or more, must have been achieved mainly by differences of thickness and tension. But it would be perverse to assign the lowest pitch to the shortest string and the highest to the longest. Therefore the 'Foremost' string should be the highest in pitch.

This agrees with the implication of the 'Third Thin' and 'Fourth Small' strings. One may suspect that the nine-string nomenclature was in fact a modification of an earlier seven-string nomenclature in which string 4 was the middle string in a fanwise formation and actually the shortest string.[12] This would make it easier to understand its alternative name, *Ea-bānû*, 'Ea (is its) creator', which implies a note not arrived at through a tuning process but given as a starting-point. There may have been a stage at which tuning normally started from the middle string. Once again a Greek analogy may be adduced. The term μέση ('Middle') in Greek music usually denotes a degree of the scale, defined by the interval-structure of the scale being used, and it might occur high or low on the lyre's register. But originally it denoted the middle string of the seven-stringed lyre. It is also associated (in the Classical and Hellenistic periods, though not in the Roman period) with the tonal centre of the music, and regarded as the foundation of the tuning.[13]

As for the Third Thin string, it was no doubt so named to distinguish it from the Third of the Rear string, which in a fanwise arrangement would be of the same length. There was no need to qualify strings 1 and 2 as 'Thin', as their names Foremost and Next were sufficient to specify their positions.

The argument for string 1 being the highest in pitch and string 9 the lowest should have been clear enough even before it was proved by the new reading of the tuning text. Why, then, did nearly all enquirers proceed on the contrary assumption? Some of them seem simply to have taken it for granted that scales ascend (even though in the ancient Greek notation they descend). Others combined the lyre and the harp in their argument in an unfortunate way. Thus Marcelle Duchesne-Guillemin, if I follow her reasoning correctly, argued that (*a*) the bovine head (of the *lyre*) shows that the 'front' of the instrument is the end further from the player, (*b*) this end of the *harp* has the longer strings and therefore the lower notes.[14] Wulstan endorsed this argument, while expressing some reservation about the suggestion that the front strings of *lyres* were regularly the longest; but he assumed the *sammûm* to be a harp.[15] This consensus of the two musicologist participants in the debate imposed on others who had a better grasp of the archaeological material, so that we find Joan Rimmer writing: 'However, the fact that the strings designated "of the front" appear to be the lowest in pitch suggests that the tuning was that of a harp, not of a Sumerian type of lyre. On the reasonable assumption that the "front" of a bull lyre is the end away from the player which carries the bull's head or animal

[12] That there was an earlier seven-string system was conjectured by Wulstan as in n. 5, at pp. 222–3. But he took it to correspond to strings 2–8 of the later system, not strings 1–7.

[13] Cf. pseudo-Aristotle, *Problems*, 19. 20 & 36; Dio of Prusa, *Orat.* 51. 7 (ii. 174. 3 von Arnim); Varro frag. 282 p. 302. 32 Funaioli; R. P. Winnington-Ingram, *Mode in Greek Music*, Cambridge, 1936, pp. 4–9; M. L. West, *Ancient Greek Music*, Oxford, 1992, pp. 219–23.

[14] Marcelle Duchesne-Guillemin, 'Découverte d'une gamme babylonienne', *Revue de musicologie*, xlix (1963), 3–17, at pp. 6–9. She adds, 'il n'y a pas de raison de supposer qu'il en soit autrement dans le cas de la lyre type kithara, d'autant plus qu'il existe de ces instruments à joug oblique', here referring to an eccentric object at Philadelphia, which has been suspected of being an erroneous modern amalgamation of parts of a lyre and a harp; she ignores the normal lyres illustrated in her own figs. 1–2.

[15] David Wulstan, 'The Earliest Musical Notation', *Music & Letters*, lii (1971), 365–82, at p. 367 (where 'smaller' is evidently a slip for 'longer'), and as in n. 5, at p. 217.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

figure, the lyre's more forward strings are the shortest and highest in pitch, not the largest and deepest.'[16]

That problem is now cleared up. We can proceed in the knowledge that the scales played by strings 1–9 were descending ones. The seven standard tunings are to be interpreted accordingly. This means that the tuning drill (2–6–3–7–4–1–5–2) proceeded by falling fifths and rising fourths, building tones downwards from the initial notes to make 'Dorian' tetrachords or pentachords, in which the filling in of the empty fourth or fifth left a residual semitone at the bottom, not at the top as has generally been supposed.[17] The resulting scales, each expressed in its 'natural' key,[18] with strings 8 and 9 included, are: *išartum b–c′*, *kitmum f–g′*, *embūbum c–d′*, *pītum g–a′*, *nīd qablim d–e′*, *nīš gabrîm a–b′*, *qablītum e–f′*. Fig. 6 shows how they are constructed from the eponymous starting intervals.

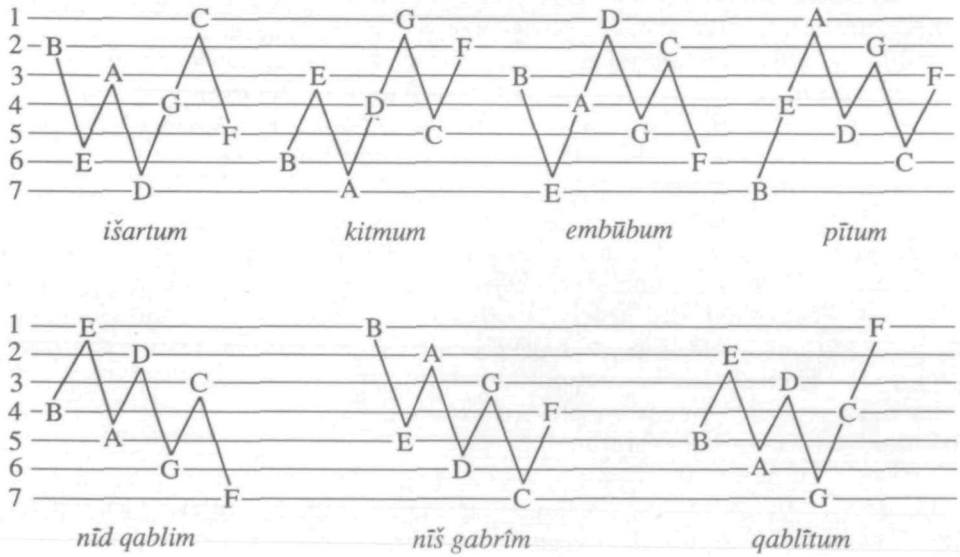


Fig. 6 The seven standard tunings

From the diagrams in Fig. 6 we can perhaps begin to make sense of certain of the names by which the different tunings were known.[19] Some of them seem to have derived their appellations from features of the initial steps of their tuning sequence. *Qablītum*, meaning 'middle', is the only tuning that starts from the middle string. In *nīd qablim*, 'casting down of the middle', the middle string is tuned by means of a falling fifth directly after the establishment of the initial 4–1 fourth. In *nīš gabrîm*, 'raising of the counterpart', 'counterpart' may refer to the octave relationship between strings 1–2 and 8–9; and the tuning starts from 1(8) and from the in-

[16] Joan Rimmer, *Ancient Musical Instruments of Western Asia in the British Museum*, London, 1969, p. 18; cf. her description of the lyre on page 13.

[17] Vitale, naturally, has things the right way round.

[18] That is, in 'white' notes. The note names are to be understood as merely relative; all the scales lay in the same register.

[19] Cf. Miroslav Karel Černý, 'Das altmesopotamische Tonsystem, seine Organisation und Entwicklung im Lichte der neuerschlossenen Texte', *Archiv orientální*, lv (1987), 41–57, at pp. 45–52.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

itial 1–5 interval proceeds directly to 2(9). *Pītum*, 'opening', is the one tuning that starts, not with an alternation of up and down, but with two rising fourths, spread expansively across the scale.[20] (Ideally, however, an explanation of *pītum* ought to be equally applicable to *kitmum*, 'closed'. The *kitmum* tuning does not seem any more 'closed up' in the above sense than several of the others.) Of the two remaining, *embūbum*, 'reed-pipe', may have resembled a scale typical of that instrument, while *išartum*, 'straight, in its proper condition', may have been considered as the most straightforward and ordinary of the set; it is placed first in the series.

Some light may also now fall on a curious passage in a commentary to a text of the astrological series known as *Enūma Anu Enlil*.[21] It concerns the ominous significance of a particular sort of thunder. The phrase explained is, 'if Adad (the storm-god) throws forth his voice like a *pitnum* (string/stringed instrument/tuning?)', and the commentary glosses this as *pitnu ša* ŠUB.MURUB$_4$, 'the *nīd qablim* tuning'. But in what way can thunder resemble a particular tuning? It does not sound at a definite series of pitches such that one might remark that it was thundering in the Dorian or the Lydian mode. It seems to me that the point of comparison must be, not the final scale produced by the *nīd qablim* tuning, but the up-and-down pattern of the tuning process itself. It will be seen from Fig. 6 that in the case of *nīd qablim* the pattern consists of a series of three peaks, decreasing in height. It makes an apt symbol for that familiar type of thunder-burst in which a terrific clap is followed by a couple of subsidiary ones of lessening power. If this is the right explanation, it may provide a particle of further confirmation for the decision that string 1 marked the top of the scale. For if it were at the bottom, the tuning sequence of *nīd qablim* would appear as the inversion of its profile in Fig. 6, namely as in Fig. 7: a series of dives from successively higher points. The pattern in Fig. 6 seems altogether likelier to have been picked on as a likeness of thunder. In support of this proposition I can cite the best-known thunderstorm in Western music, the one in the fourth movement of Beethoven's 'Pastoral' Symphony. Ex. 1 shows a relevant passage (bars 35–41) compact enough to be quoted, but a similar pattern, writ larger, can be found in bars 21–29.

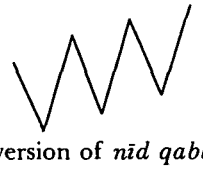


Fig. 7 Inversion of *nīd qablim* tuning

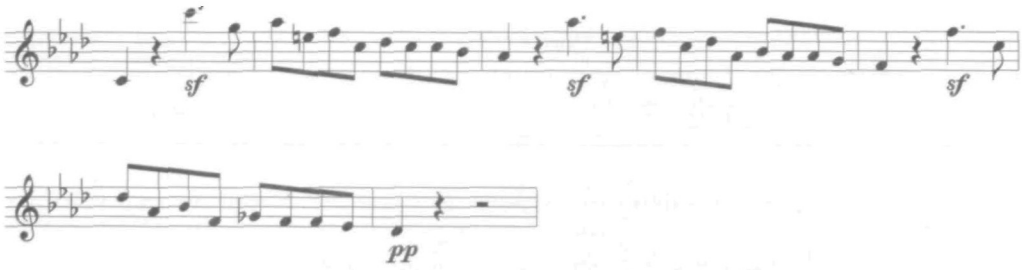
The seven standard tunings form a closed set. The diatonic octave can only have seven species, and these are they. The texts show that they had been comprehended in an integrated theoretical system. But we ought to wonder whether all seven enjoyed as equal a status in musical practice as they appear to enjoy in the theory; whether and in what sense they functioned as distinct modes; and whether there were also non-diatonic tunings that fell outside the scope of the theory.

[20] The related verb *petûm*, 'open', is used of the hand spread across the strings in making the interval (?) *pismu* 'covering' (= an octave?) in BM 65217 + 66616 (Kilmer, as in n. 2 (1984)): *rūṭu petât*, 'the hand-span is open'.

[21] Cited by Kilmer, as in n. 2 (1965), p. 263 with n. 19, and (1971), p. 135 n. 20.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

Ex. 1



The Middle Assyrian tablet VAT 10101, col. viii, lines 45–52, dating from the late second millennium BC, presents a census of a sizeable collection of Akkadian love-songs, classified by tuning (Fig. 8). The seven standard tunings appear in the standard order, and if line 52 is rightly restored, there were no others. I think we should assume that all these songs existed in written form with their musical notation, each with a colophon in which the tuning was specified, just as we find in the Hurrian hymn fragments. In the library where they were collected, they were grouped according to tunings, and the accountant or archivist obtained his figures by counting the texts in front of him. It seems, then, that all available songs (love-songs, anyway—dozens upon dozens of them) could be assigned to one of the seven standard tunings and were notated accordingly. And although we have not got a complete set of figures, we can see that in this song corpus some tunings were used much more than others. *Išartum*, *kitmum* and *embūbum* were represented by between 17 and 24 songs each, but *pītum* by only four.[22]

(45) 23 love songs in *išartu*, Akkadian
(46) 17 love songs in *kitmu*
(47) 24 love songs in *embūbu*
(48) 4 love songs in *pītu*
(49) [ ] love songs in *nīd qabli*
(50) [ ] love songs in *nīš gabrî*
(51) [ ] love songs in *qablītu*
(52) [Total . . . love songs,] Akkadian

Fig. 8 Song register, VAT 10101 col. viii, lines 45–52

The variety of tunings was no doubt connected with variety of mode. Each tuning created a scale with a distinctive sequence of tones and 'semitones'. But we cannot simply equate these scales with modes. We cannot identify a mode (even in its harmonic aspect, quite apart from whatever rhythmic or melodic figures may have been associated with it) without knowing something about the internal hierarchy of notes in the scale. We can reasonably assume that there was a tonal focus and a final

[22] Among the Hurrian hymn colophons, *nīd qablim* is discernible in four or five cases, and no other tuning in any. It looks as if the fragments come from the *nīd qablim* section of a larger archive arranged by tunings; we can make no inference about the relative size of the sections.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

related to it. What matters for modality is the pattern of tones and semitones surrounding these, not the pattern from the highest or lowest note in the piece. We cannot, for example, infer from the fact that a tune uses the white notes from *A* to *a* that it is in the minor mode: it may very well be in C major, or D Hypodorian. In the extant specimens of Greek music of the first centuries AD there is no fixed relationship between the octave species covered by the ambitus of a piece (which determines the tuning) and the mode as defined by the position of the tonic. So in Babylonian music, while we may suspect that various different modes were employed, only analysis of actual melodies will tell us anything useful about them. The one more or less complete melody available for analysis is by a Hurrian and had Hurrian words sung to it; but it was recorded in Babylonian notation and may have stood in a Babylonian tradition.

The fragments of tablets bearing notation were found in the royal residence at Ugarit, the modern Ras Shamra, on the north Syrian coast opposite Cyprus. They are about three dozen in number, many of them very small.[23] It seems that when the tablets were complete, they generally bore, first, a poetic text of hymnic character in the Hurrian language; then, marked off from it by a single or double horizontal rule, some lines of musical notation; and finally a colophon in Akkadian specifying the genre of composition ('this is a song, a *zaluzi* of the gods'), the tuning, the composer and the scribe. Four composers' names are preserved, Tapšiḫuni, Puḫiya(na), Urḫiya and Ammiya, and they are all Hurrian names; there are two scribes' names, Ammurabi and Ipšali, and they are both Semitic.

The notation consists mainly of Akkadian interval names from the standard list of fourteen (but in dialect forms), each one followed by a numeral sign: *qablīte 3 irbûte 1 qablīte 3 šaḫri 1*, and so on. The numerals do not normally go above 5, but in three places a 10 appears. In several fragments certain interval-names are qualified by Hurrian words meaning 'upper' or 'lower'.[24] Some other Hurrian words appear here and there, mostly without a numeral. Hurrian, a language with apparent East Caucasian affinities, is still very poorly understood, but meanings have been suggested for some of the words. Two of them, *etama*$^{?}$*šeani* and *ḫapšema*, may be Hurrianized versions of the Akkadian names of strings 4 and 5, *Eabānû* and *ḫamšum*. *Ḫapšema* at least may have been followed by a numeral in one passage (h. 12), so perhaps a single string was occasionally named instead of an interval. *Pentamma* and *paḫita*, used without numerals, may be directions for fingering: *pent-* probably = *pant-*, 'right hand' (but the suffix *-ma* may have a negating function), while *paḫ-* is attested as a part of the body which can be left or right, for example the forefinger.[25] *Kazae* may show the adverbial suffix *-ae*.[26]

[23] Emmanuel Laroche, *Le palais royal d' Ugarit*, iii (Paris, 1955), pp. 327–35 and pll. cviii–cix; *Ugaritica*, v (Paris, 1968), 462–96. The texts are designated h. (for Hurrian) 2–17, 19–23, 25–6, 28, 30, with the smaller fragments RS. 19.164 *g*, *j*, *n*, *o*, *p*, *r*, *t*, *w*, *x*, *y*, *aa*, *gg*. The most complete piece is h. 6, reconstituted from three fragments. A revised text of it was published in Manfried Dietrich & Oswald Loretz, 'Kollationen zum Musiktext aus Ugarit', *Ugarit-Forschungen*, vii (1975), 521–2.

[24] Perhaps to be included with these is]*-gi-eš-ša* 2 at h. 4. 9, since EŠ.ŠA is attested at Ugarit as a logogram for 'upper', and *-gi* may belong to *ešgi*, the form used in these texts for *išqu*.

[25] Laroche, *Le palais royal d' Ugarit*, iii. 331 n. 1, and 'Etudes hourrites: notation musicale', *Revue d'Assyriologie*, lxvii (1973), 124–9, at p. 128; Kilmer, as in n. 2 (1971), pp. 144–5; F. W. Bush, *A Grammar of the Hurrian Language* (unpublished dissertation), Brandeis University, 1964, pp. 72, 317–18. *-ta* is a directive suffix.

[26] Bush, op. cit., pp. 166–70.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

Pugarna has the peculiarity of standing where a numeral would be expected, following interval-names. The meaning of the stem *pug-* is obscure, but *-ar-* is known as a frequentative or durative suffix and *-na* as a mark of plurality;[27] so perhaps the word means something like 'repeating ad lib.'

The basic problem in interpreting the notation is to determine what the combination of interval-name and numeral is meant to signify. The first scholar who realized that this was musical notation, Hans Gustav Güterbock, considered—and rejected—the possibility that '*qablīte 3*', for example, denoted a threefold repetition of the *qablītum* interval (strings 5 and 2), or of the run of notes encompassed by it (5–4–3–2).[28] Neither alternative offered a satisfactory way of matching notes to the syllables of the text, and he found the melodies resulting from such interpretations unacceptable. He also dismissed as over-complicated the idea that '*qablīte 3*' might mean the third tone of the *qablītum* interval or scale. He left the matter without offering a positive solution.

David Wulstan, while admitting that 'at first sight the numbers may reasonably be supposed to denote repetitions', proceeds to reject this supposition, on the ground that the notation could then not express anything beyond a few fixed formulae, whether the interval-names stood for harmonic intervals (in which case 'the music was hardly worth writing down') or for melodic figures.[29] 'On similar grounds the theory that the interval-names were used to represent one note only . . . can be dismissed; in any case there would be no point in using both "primary" and "secondary" intervals.'[30] Having already decided a few pages earlier that the interval-names must represent 'melodic fragments after the manner of the neume', he argues that the numerals must express modifications of these neumes' basic patterns, on the principle that '*qablīte 3*', for example, means 'the first three notes from the sequence 5–4–3–2'. He offers two transcriptions of h. 6, one taking the string-numbers encoded in the interval-names to run in ascending order of pitch, the other conversely. He judges the latter reading to produce a far better result.

Various objections suggest themselves. In the first place it does not seem particularly natural that terms which denoted primarily tuning intervals of an open fifth, fourth or major third, and secondarily accordaturas of the whole instrument, should ever have been used to denote conjunct sequences, especially if in most cases these sequences were not coextensive with the original interval but merely started from one of its extremities. In some cases the numeral appended to the interval-name exceeds the number of scale degrees embraced by the interval; the number 10, which occurs in three places, cannot possibly signify a rising or falling run of ten notes, as that would go off the end of the scale.

As Wulstan himself observes, the notation as he understands it is not well suited to the expression of such a simple and (one would expect) frequent phenomenon as repeated notes. For a threefold repetition of note 5, for example, it would be necessary to write '*qablīte 1 qablīte 1 qablīte . . .*' But not only do we find nothing of this kind in the texts, we do not find *any* instance of the same interval-name appearing twice in succession. This fact, which Wulstan is unable to account for satisfactorily, is a powerful indication that repetitions are dealt with by means of the

[27] Ibid., pp. 109, 157–62.
[28] Hans Gustav Güterbock, 'Musical Notation in Ugarit', *Revue d'Assyriologie*, lxiv (1970), 45–52, at pp. 50–51.
[29] Wulstan, as in n. 15, at p. 376.
[30] Loc. cit.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

appended numerals. The interval-name never had to be repeated twice in succession because the first numeral did the job.

Finally, the melodies that appear in Wulstan's transcriptions have no perceptible shape or tonal centre, something we are entitled to expect even in an unfamiliar musical tradition. His first transcription involves a tritone interval at one point, and his second only avoids this by the paradoxical strategy of taking the string-numbers in descending order of pitch for the purpose of transcribing the 'neumes' while still assuming ascending order in setting up the tuning.

The next to propose a reading of the notation was Anne Draffkorn Kilmer, a scholar who has played an important role in publishing and interpreting the texts relating to music theory.[31] She accepts the obvious hypothesis that the numerators quantify repetitions, and she assumes that the interval-names stand simply for two-note chords. In her transcription, therefore, we find a two-part melody, every note being harmonized in thirds, fourths, fifths or sixths. She suggests that the upper part was the vocal line and the lower part the accompaniment. This interpretation has been publicized by means of a gramophone record.[32]

One's immediate reaction is scepticism at the notion of this kind of harmony existing in any ancient music.[33] Kilmer says blandly that it 'does not seem unreasonably out of line with evidence of heterophony in Egyptian and Greek sources . . . seems close to what can be inferred from Pseudo-Plutarch, chap. 19'. As far as Egypt is concerned, the hypothesis of heterophony rests on debatable interpretations of musical scenes in art. Hans Hickmann, who championed such interpretations, and whom Kilmer cites as her authority, in fact thought in terms of drone accompaniments, not parts moving in parallel.[34] As for the Greeks, they certainly had heterophony of a sort, as we can see from certain papyrus fragments and from references in Plato and later writers. What Plato suggests is a busy embroidery of the vocal line by the lyre. Other sources give the impression of a more frugal heterophony producing calculated discords here and there, as well as some concords.[35] But there is no evidence at all for anything comparable to the kind of two-part motion that Kilmer extracts from the Babylonian notation.

Another objection is that it would be odd to have a notation capable of expressing only chords and not single notes. It may be that some of the occasional terms such as *ḫapšema* did serve for single notes, but this is far from certain. There is a further problem. Kilmer constructs her vocal line from the higher note of each chord, that is, on her view, the one which corresponds to the higher-numbered string. But the nature of the interval-names available determines that this note must lie between strings 3 and 7. In other words the notation, as interpreted by Kilmer, is incapable of dealing with any vocal melody with a compass wider than a fifth. Considering that the whole system of tuning and nomenclature is based on a full heptatonic scale and an instrumental compass of a ninth, this seems a crippling limitation. Finally,

[31] Anne Draffkorn Kilmer, 'The Cult Song with Music from Ancient Ugarit: Another Interpretation', *Revue d'Assyriologie*, lxviii (1974), 69–82.

[32] Kilmer, Crocker & Brown, as in n. 2.

[33] Cf. David Wulstan's comments, 'Music from Ancient Ugarit', *Revue d'Assyriologie*, lxviii (1974), 125–8; Marcelle Duchesne-Guillemin, 'Les Problèmes de la notation hourrite', ibid., lxix (1975), 159–73, at p. 160, and eadem, 'Sur la restitution de la musique hourrite', *Revue de musicologie*, lxvi (1980), 5–26, at pp. 11–18.

[34] Hans Hickmann, 'Altägyptische Musik', *Orientalische Musik* (Handbuch der Orientalistik, 1. Abt., Ergänzungsband iv), Leiden & Cologne, 1970, pp. 138–40, 154–5. For a more cautious assessment see Lise Manniche, *Music and Musicians in Ancient Egypt*, London, 1991, pp. 30–32.

[35] West, as in n. 13, pp. 205–7.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

the melody that she arrives at for h. 6, while an improvement on Wulstan's, still does not avoid the tritone progression at the point where *nadqabli* (41) is succeeded by *šaḫri* (75), strings 4 and 7 being three tones apart in this tuning.

I turn now to Marcelle Duchesne-Guillemin's decipherment.[36] Rejecting Kilmer's chords, she returns to the view that each interval-name must stand for a succession of notes, either the two that delimit the interval or all those contained in it. She prefers the latter alternative as being 'beaucoup plus acceptable comme ligne mélodique qu'une suite de notes perpétuellement disjointes'. What about all the disjunctions between the end of one run and the start of the next? Her idea is that the numerals stand for additional notes that make a link between groups. By an alliance of Gallic logic with feminine intuition she determines that they oscillate between the penultimate note of the preceding run and an adjacent note.

It does not take much reflection to uncover the defects of this hypothesis. It gives us a notation that is unable to express the repetition of a note at all, and that could only have been devised for a musical tradition in which no note ever occurred twice consecutively. I venture to assert that no such tradition ever existed anywhere (before serialism). Moreover, since the sequence of interval-name and numeral prevails, so far as we can see, from start to finish of each piece, we should have to suppose that a composition always began with a rising or falling run of at least three adjacent notes, and never ended with one. Again, why did two runs never succeed each other without intervening notes?[37] One would expect this to occur quite often in the natural course of events; for example, a note-sequence such as *c d e f e d c* or *c d e d e f* would require such an analysis.

Finally there is the decipherment proposed by Raoul Vitale.[38] Like Duchesne-Guillemin, he takes the interval-names to stand for runs of between three and six notes, and produces an original interpretation of the attached numerals. His idea is that they signify the number of bars over which each note-run is to be spread. In this way he arrives at a total number of bars such that, on the assumption of three syllables to a bar, he is able more or less to fit the four lines of poetic text in h. 6, not indeed to the six lines of music but to lines 2–5, leaving lines 1 and 6 to be accounted for as an instrumental prelude and postlude.

This is ingenious but wholly unconvincing. Some of the objections raised against the previous theories apply here too. It is not explained why the same interval-name never occurs twice in succession. Repeated notes, isolated seconds, and intervals larger than a second, can only appear in this system at the junctions between note-runs, an extraordinary restriction of melodic freedom. Still harder to swallow is the principle that a given melodic figure (if the note-runs may be so called) may appear at up to six different speeds, on no discernible principle, so that the time value of a note may be anything from a third of a crotchet to a breve. Such variability is wholly uncharacteristic of ancient and ethnic music; and if it had existed, this would be a far from obvious way to set about recording it.

---

[36] Duchesne-Guillemin, as in n. 33 (1975, 1980); eadem, *Déchiffrement de la musique babylonienne* (Accademia dei Lincei, Quaderno 236), Rome, 1977; eadem, *A Hurrian Musical Score from Ugarit* (Sources from the Ancient Near East, ii. 2), Malibu, 1984.

[37] There is in fact one place, h. 21. 5, where an interval-name is not followed by a numeral: *n]a-at-kab-li ti-tar-kab-li 2 ti-ti-*[. This instance is so isolated that one must regard it as highly probable that the omission of a numeral was a mere accident.

[38] Vitale, as in n. 9, at pp. 255–63.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

We must return to the obvious assumption that the numerals represent repetitions—of something—it being their presence that made it unnecessary ever to repeat an interval-name. The question remains what the interval-name expressed, and what was repeated when the numeral was higher than 1.

Let us begin by asking whether the notation is essentially for voice or for instrument. As it is expressed in tuning intervals each involving two strings of the lyre, with some supplementary terms which may include references to 'right hand' and '(?)forefinger', the answer seems to be that it is for the instrument.

How was it played? The bovine lyre, the instrument with reference to which the Sumero-Babylonian musical theory and terminology were probably formulated, was played in the same way as the vertical harp, being plucked with both hands. Representations in art depict players with each hand plucking one string, which is sometimes shown pinched between index finger and thumb.[39] We cannot tell whether the two strings are meant to be being plucked simultaneously or in succession.

If the notation was devised for this type of instrumental playing, it is a natural supposition that the interval-names served to express the two notes sounded in association by the left and right hands. When a piece of music was written down, the scribe's task was to record, using the vocabulary provided by traditional music theory, the fingerings that he saw the musician applying to his instrument.[40]

Now, the left- and right-hand parts need not have been of equal status and density. We cannot suppose that the two hands simply took alternate notes of the melody, any more than we can accept Kilmer's idea that a two-part harmony prevailed throughout. The instrument's primary function will have been (as we know it was in Greek music) to support the vocal melody by playing in unison with it. But an accomplished string-player would not have been content for long just to pick out a single line. He will have added some kind of ornament. I suspect that the notation reflects this, though probably only very sketchily.

An important clue, I believe, has been overlooked. If we translate the interval-names into string-numbers—*qablīte* = 52, and so on—and (ignoring the repeat-numerals) set out the sequences that occur in the texts, a striking feature emerges. They appear as follows (a dash separates unconnected sequences in the fragmentary pieces):

(h. 2) 41. 75. — 35. 46. — 52. 13. — 46. 75.
(h. 3) 75. 46.
(h. 4) 35. 46.
(h. 5) 16. 27. — 24. 35.
(h. 6) 52. 27. 52. 75. 26. 35. 46. 75. 16. 27. 37. 16. 27. 41. 24. 35. 46. 75. 16. 27. 41. 75. 16. 75. 16. 75. 16. 27. 63. 52. 63. 52. 63. 52.
(h. 7) 52. 27. — 75. 16. — 41. 24. 35. — 16. 27. 63.
(h. 8) 85. 46. — 75. 46. 75. — 46. 27. 16. — 46. 75. — 37. 27.
(h. 9) 41. 13. 24.
(h. 10) 41. 75. — 41. 27. — 35. 46.
(h. 12) 37. 27.
(h. 13) 24. 63.
(h. 14) 41. 63. — 27. 41.

[39] See Rashid, as in n. 11, figs. 8 & 78; with vertical harps in Assyrian palace reliefs, ibid., figs. 145, 147, 151-2. Similarly with the Egyptian harp, cf. Manniche, as in n. 34, p. 27.

[40] That the musician and the scribe were different persons is shown by the colophons of the Hurrian texts.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

(h. 19) 41. 13. 24. — 46. 75. — 27. 37.
(h. 21) 35. 16. — 16. 27. 16. — 41. 24. 35. — 27. 16. 37. — 16. 37.
(h. 23) 75. 46. — 75. 46. — 27. 41. — 75. 46.
(h. 28) 75. 37. 27.
(RS 19.164 *n*) 27. 16.
(RS 19.164 *p*) 16. 37.

The striking feature is the frequency with which the *second digits* of successive intervals differ by one. For instance, in h. 6 we find the sequence (7)5 (2)6 (3)5 (4)6 (7)5 (1)6 (2)7. If we accept that 1 and 2 may stand for or subsume their octave counterparts 8 and 9, the frequency is greater still; for example, we have (3)7 (1)6 (2)7 (4)1 = 8. In fact no fewer than 62 progressions out of a total of 88, or 70 per cent, display this feature. The first digits show a similar relationship in only 41 cases, less than half of the total.

The explanation, I suggest, is that the second digits represent the main melodic line, in which movement was most often to an adjacent degree of the scale and comparatively seldom across a wider interval. The instances of wider intervals break down as follows: minor thirds, three; major thirds, four; fourths, one; fifths, four; fourth or fifth (depending whether string 1 is taken as 1 or 8), four. It is from the notes represented by the second digits, then, that we can recover the outlines of the basic (vocal) melody, and it is to these notes in particular that we should relate the numbers which specify whether notes are to be sounded once or more than once.

The first digits must also signify something, since we find 16, 26 and 46 all used in the same piece, and in five places 27 and 37 occur in succession. I have suggested that the two digits correspond to the player's two hands. If one hand played the main melody, the other's part will have consisted of accessory notes, perhaps especially notes used in launching the melody notes and played just before them in the manner of an acciaccatura. But there might well have been more elaborate improvised ornament that the notation was not equal to expressing.

Following our clue a little further, we hit upon a possible explanation of the Hurrian terms 'upper' and 'lower' that are sometimes appended to interval-names, especially to *šaḫri* = 75 (h. 4, 5, 10, 13, 19) but also to *irbûte* = 27 (h. 10) and *zirte* = 46 (h. 30). In three places we can see what preceded or followed an interval so qualified:

(h. 10) 41. 75 lower.
(h. 19) 46. 75 upper. — [75?] upper. 46.

Since 41 may stand for 48 (strings 1 and 8 may have been sounded together), and there is a strong tendency for the melody to proceed in conjunct motion, perhaps '75 lower' = 57; in other words, the 'melody' hand moved from string 8 to 7 and the other from 4 to 5. '75 upper' would be the normal 75 with the melodic emphasis on string 5, appropriate before or after (4)6, as in several of the other fragments (h. 2, 3, 6, 8, 23).

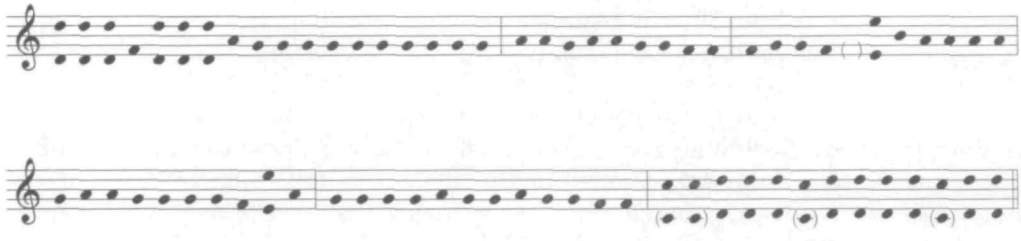
We remain completely in the dark concerning the rhythm of the music, the prosody and colometry of the Hurrian hymn texts, and the allocation of notes to syllables. In h. 6 there are approximately 137 syllables of text and approximately 72 notes given by the notation, so there was clearly no one-to-one match. We must reckon with various possibilities: that only part of the hymn was sung; or that it was strophic, the music being repeated with different words; and in the latter case that

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

some part of the music was purely instrumental. The schemes that have been proposed are all too speculative to be worth discussing.[41] It may be relevant that the double rule dividing text from music in h. 6 and a number of other fragments is stamped at each end with a sign that sometimes means 'twice' or 'ditto'; but from its position one would expect this to refer to the text above, not to the music following, which does not help at all.

In the circumstances there is no point in trying to make a performing version of h. 6. I content myself with a transcription of the melodic line, without rhythmic values (Ex. 2). The vertical dividers mark segments of the melody as indicated by the lineation of the tablet. The pitch level is of course chosen merely to avoid encumbering the transcription with sharps or flats, and is not meant to be taken in an absolute sense.

Ex. 2 Melodic line of Hurrian hymn (h. 6)



Where strings 1 and 2 (= the high E and D) are involved, I have assumed that they were sounded together with strings 8 and 9 respectively, as the low E and D clearly fit better into the general profile of the piece. It is tempting to suppose that it was played on a ten-stringed rather than a nine-stringed instrument, with string 3 too (= C) doubled an octave lower. In any case I should like to assume that it was the low C, D and E that were used in the vocal line. In that case the octave doubling that occurred intermittently in the accompaniment was a doubling of the lowest notes in the treble, not of the highest notes in the bass.

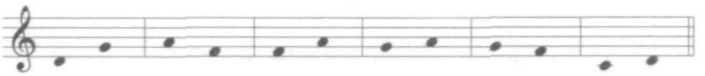
The melody thus elicited is structured according to perfectly intelligible principles. The piece begins and ends on the same note, and this note is avoided in between. The first line comes to rest on G, a fourth up from the lower D; the multiple repetition of the note emphasizes that a significant resting-point has been reached.[42] Each of the next four lines ends a tone higher or lower than the G, on a half-cadence that avoids a premature sense of finality. When the D returns in the last line it is set in relief by alternation with the C below it. An idea of the overall structure may be conveyed by a diagram which shows just the first and last notes of each line (Ex. 3).

[41] See Kilmer, as in n. 31, at pp. 75–81, and as in n. 1 (1976), at pp. 14–15; Duchesne-Guillemin, as in n. 33 (1975), at pp. 161, 164–7; Hans-Jochen Thiel, 'Der Text und die Notenfolgen des Musiktextes aus Ugarit', *Studi Micenei ed Egeo-Anatolici*, xviii (1977), 109–36 (a particularly earnest attempt); Vitale, as in n. 9, at pp. 257–9.

[42] Cf. lines 3 and 6. I suspect that the figure 10 which appears in line 1, and in h. 8 and 10, the maximum being otherwise 5, was used by convention to stand for multiple repetition that did not have to be strictly counted. In h. 6 the figure 10 is followed by the unexplained word *uš-ta-ma-a-ri*, which Kilmer, as in n. 2 (1971), at p. 145, suggests interpreting as Akkadian *uštamarri*, 'I make slowly', or *uštabarri*, 'I prolong', though the forms are anomalous.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

Ex. 3 Initial and final notes of each line of h. 6



The minor fragments show signs of similar patterns. Enough remains of successive line-beginnings in h. 7 and of line-ends in h. 8 to be worth quoting (Exx. 4–5). The note sequences in h. 7 in particular show parallels with those in h. 6. In h. 2, which started on E, none of the eleven following lines began with that note. (In h. 10, however, the first two lines both began with E.) The final in h. 22 is on D (as in h. 6), the two preceding lines having ended on A; h. 28 ended on F, the three preceding lines having ended on D, B and D, suggesting a role for C analogous to that played by G in the central part of h. 6.

Another interesting feature of the melody of h. 6 is that it is essentially pentatonic, the notes B and E being used only transiently. Hence E is omitted in the first line in the progress from D to G, avoiding a 90-cent semitone step, and at the beginning of the last line there is a jump from F to C/D touching neither E (semitone) nor B (tritone).

There is a marked difference in this respect between h. 6 and some of the other fragments, where (assuming that they are all in the *nīd qablim* tuning) B and E appear with fair frequency and emphasis. In h. 4, for example—one of the fragments that employs 'upper/lower *šaḫri*' and *ḫapšema*—there was an E five times in succession, and so too in h. 16; in h. 23 E four times in succession; likewise in h. 7, followed by a B (and for this fragment the *nīd qablim* tuning is certified); in h. 9 and 19 a threefold E followed by C B; h. 2 began E E A, and h. 10 with E E followed (if my suggestion about 'lower *šaḫri*' is right) by F; in RS 19.164 *t* and *aa* a threefold]*kabli* (E or B) occurs. I pointed out earlier that a common tuning does not

Ex. 4 Line-beginnings from h. 7

Ex. 5 Line-ends from h. 8

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016

necessarily imply a uniform modality. It is clear that the hymns in this *nīd qablim* archive did not all share the same tonal centre, mode and gradual hierarchy. This is further indicated by fragments in which the finals are preserved: h. 8 and 28 ended with a repeated F, h. 13 with B B C C, h. 14 with F E (E . .).

If one had had to make a guess at the nature of Near Eastern melody in the late second millennium BC, one might have speculated that it would be rather plain by comparison with later 'oriental' (Arabic–Persian) music, restricted in vocal compass, tonally stable, perhaps pentatonic in character, and proceeding predominantly by conjunct motion. For such seem to have been the features of the oldest Greek and Hebrew music for which we have any evidence. The Hurrian texts are separated from these by many centuries. But when one surveys the development and spread of musical instruments in the eastern Mediterranean and western Asia between 3000 and 500 BC, it appears natural to see the whole area as a cultural continuum, with much regional variety and individuality of musical practice but no fundamental antinomies. The life of instruments is to be measured in centuries and millennia, and the same is likely to be true of the musical styles associated with them.

We know at least that the technique of octave doubling on stringed instruments still flourished in the Near East in the fifth and fourth centuries. The Greeks regarded it as typical of the Lydian harp, which was very similar in form to the Assyrian vertical harp. Pindar fancied that the invention of the *barbitos*, the longer-stringed form of sympotic lyre, was inspired by the sound of the tall Lydian harp's 'contra-plucking' (ψαλμὸς αντίφθογγος), that is, the sound of the soft low strings that were doubled at the octave above. The dithyrambic poet Telestes spoke of Lydian song as being woven about with 'high-pitched twangings of harps', probably with reference to the reinforcement of low notes by doubling in the treble.[43] But we also hear of octave doubling on an oriental type of lyre, the type known as *phoinīx* or *phoinīkion*.[44] The name of the instrument indicates that it was of Phoenician provenance; Herodotus' statement that the horns of the Libyan antelope were used to make its arms suggests its currency at the Phoenician colony of Carthage.[45] It perhaps resembled the asymmetrical lyre with curly arms and curved yoke that is depicted on the Assyrian palace reliefs.[46]

We have seen that there was a continuous tradition of music theory in Mesopotamia from early in the second millennium (if not before) to late in the first. It is only to be expected that there should have been some continuity of musical style and forms.

[43] Pindar, Frag. 125 Snell–Maehler; Telestes 810 Page; cf. also Anacreon 374 Page, Sophocles, *Mysians*, fr. 412 Radt, Diogenes Tragicus 45 F 1. 9–10 Snell–Kannicht.

[44] Pseudo-Aristotle, *Problems*, 19. 14.

[45] Herodotus 4. 192. 1. Aristoxenus (fr. 97 Wehrli) listed it as a foreign instrument.

[46] Rimmer, as in n. 16, pp. 33–34 ('possibly of Phoenician or Syrian origin') and pll. xii, xv; Rashid, as in n. 11, figs. 145, 148, cf. 142, 150. The instrument is shown with from five to eight strings.

Downloaded from http://ml.oxfordjournals.org/ at Claremont University on October 16, 2016