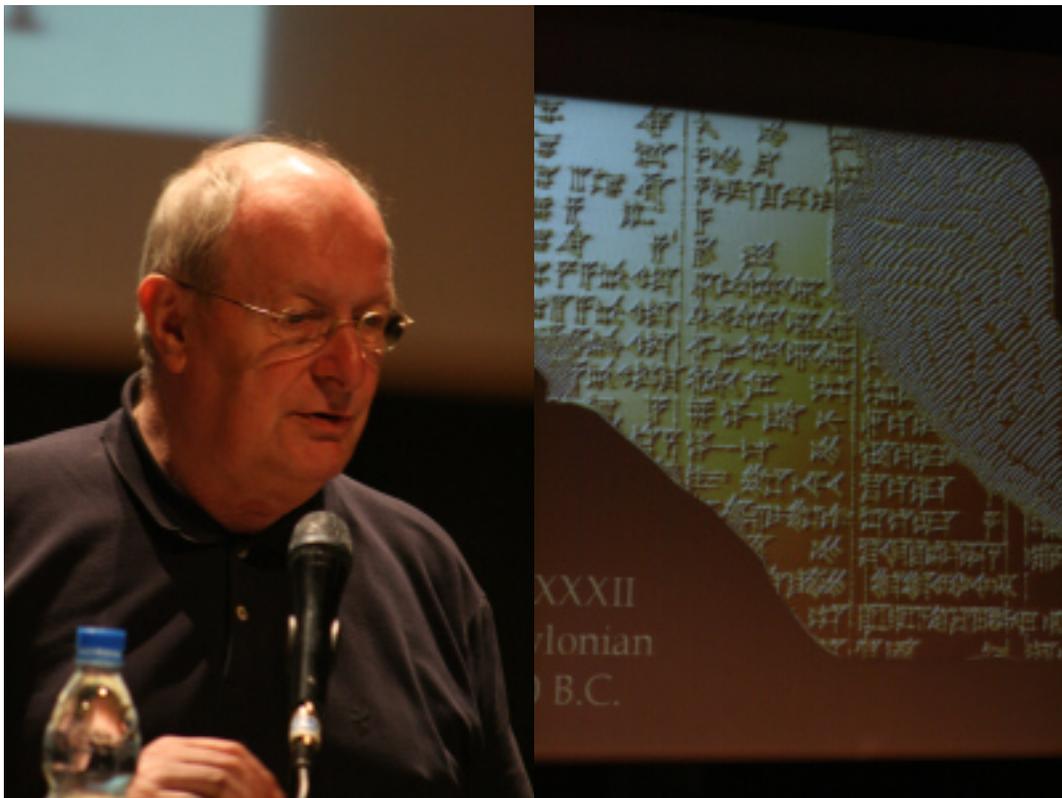


Foreword

Since the early sixties when studies in music theory of the Ancient Near East began, most of what was written arose from Assyriologists with some knowledge of music. As a consequence misconceptions were undisputably published and quoted. As a result, work from experienced music theorists were dismissed by Assyriologists who shielded behind the dictate that none of the music theory of the Ancient Near East could be understandable to the non-cuneiformist. It is time, half a century later, for academic music theorists to put an end to this sad state of affairs.



Musicology is a recent science, archaeomusicology even more so. It is a scientific subject which involves the study of acoustics, physics, mathematics, philology, ethnology, mythology and organology. I recall having a heated disagreement with a well known Oxford scholar of Assyriology whose criticism of my postulate rested on that she was fully competent having learnt the french horn at school. This is the problem.

There is now a new generation of very few young scholars dedicated to the archaeomusicology of the Ancient Near East. However, there is not, anywhere, a single appointed specialised teacher.

Evidence and inference in ancient theory texts

It was originally thought that Primitive Music must be distinguished from Ancient Music, because it has no concept of metrology. The two forms would stem from different schools of thought: Primitive Music would be the musical transposition of ideas unhindered by the burden of theory; Ancient Music would be the musical transposition of ideas conditioned by the quantification of intervals within a tonal system.

However, new considerations regarding the possibility that primitive music would have been consequential to the development of Ancient Music as well as persisting in its primitive form, to this day, under the possible form of folkloric music, have led to reconsideration of otherwise well established principles.

To start with, the axioms governing the thesis must be laid down.

1. Only the written number can emulate metrology.
2. Theory comes from metrology without which it would no be conceivable.
3. With metrology comes the principle of the standard with the development of units of length, mass and tension (volume and weight), all necessary for the quantification of pitch.
4. Standardised metrology of sound, which we shall from now on name tonometry, requires the mathematics of ratios, essential for the purpose of comparative metrology, which is mainly the study of intervals.

The principal intervals are the fourths and the fifths because these are the most obviously occurring, the fourth being easier to sing than the fifth but the fifth more naturally produced. The octave, on the other hand, is an interval which would not have been perceived the way we do, possibly because primitive melodies never expanded further than a sixth, on either side of a tonic, hence the precedence of pentatonism on other systems, in primitive music. The octave above would have

been perceived as the place '*where women and children sing*'. For us this would equate to singing in a higher register, which happened to be placed precisely one octave higher. It will be obvious that in the absence of tonometry, the notion of the octave (2/1), as indeed the notion of all other intervals, altogether, is one with which primitive musicians would not have had to consider, mainly for the reason that they would not have had any intellectual motivation for quantifying anything, generally, and anything musical, specifically. The Mesopotamian nomenclature of intervals has no word for the octave, as far as we know. However, in the light of well established intervals such as fifths and their reciprocals, the fourths; and both minor and major thirds with their reciprocals, the major and minor sixths, the absence of a well attested name for it is certainly a factor in favour of its presumed unimportance, or irrelevance, as a fundamental dyad.

It had been fairly well established that only ancient societies used fourths and fifths as their basic intervals on the basis that a fixed scale was impossible to quantify without instruments to define them[1] and that the fifths and the fourths are easily replicated on instruments for that purpose. The fifth is produced when two thirds of a string is plucked in relation to the full string, and the fourth is produced when three fourths of a the same string is plucked. However, it has been observed, more recently, that primitive music uses these fundamental intervals, not only to determine the tonal framework of individual themes, but that they are found, universally, to be consequential in the formation of scale systems.

Schneider[2] wrote that scales grow progressively in primitive vocal music out of fanfare-like formations or out of the elementary fourth and fifth relationships, which are found above or below a melody of narrowly restricted range. However, he was wrong[3] when he said, to the contrary of what had been established, that the very oldest instrumental tonal systems do not use natural fifths, as indeed in 1956, little did he know that only a few years later, the discovery of theoretical texts from the Ancient Near East would prove him wrong. Indeed the oldest musical theory shows, unequivocally, the usage of fifths, minor and major thirds, along with their reciprocals, and constituted the basic tonal framework for the music in the Ancient Near East. It must be said, however, that the primitive usage of tonal systems with natural fourths and fifths, could not have been quantified in primitive societies, and that therefore it remains established that theory can only arise from literate, therefore quantifying societies. Most ancient treatises, to the exclusion of ancient

Near Eastern theoretical texts, do not expand much on consonantal theory. They would have felt it axiomatic and therefore not worth mentioning. It remains that a variety of subtle intervals the Old Babylonian theorists might have listed could only have been calculated as variants from standard fifths and fourths. But the cyclical nature of the musical framework, makes it that one cannot expand or reduce any interval without any consequences on its reciprocal, hence the proeminence of symmetry without the hindrance of the restrictive diatonic heptatonic construction.

In primitive melodies, the tonal framework is built up entirely from natural consonances with the exception of some notes derived from the harmonic division of consonant melodic intervals. Sometimes, there is evidence of slightly shorter fifths or larger seconds, but these generally come from the imitation of some specific and 'unnatural' instrumental tuning: When the same melody is performed both *a capella* and then to the accompaniment of an instrument. The voice solo will always revert to natural intervals.

Schneider had further hypothesized a fundamental system of fifths starting from B-F-C-G-D-A-E-B-F which would imply enneatonic scale constructions based on alternation of fifths and fourths. An objection to this is that the starting note, the tonic, to a primitive composition would not be placed at either end of the tonal system but rather, in the middle of the ambit for the reason that the early composer would not think of his tonal system as one starting from the lowest or from the highest degree as he was not obnubilated by the concept of scalar construction. Indeed the reason why we perceive the bass note as the tonic is the consequence of theory, but in fact it is much more natural to place the tonic at the centre of a system. The primitive melody maker would start, naturally, with a note at the centre of his ambit, unless his composition required, for some special effect, that it started with a strident treble or a lugubrious bass. But generally, that a melody started by a central note from which it moved up and down from this axis, is axiomatic. This is probably what is at the origins of the inward Babylonian nomenclature of the strings: 1-2-3-4-5-4-3-2-1. This string nomenclature does not lend itself to an ascending or descending scale construction using alternation of ascending or descending fifths and fourths, but on the other hand it infers another and hitherto unknown method of construction which is based on the practice of primitive music.

The enneatonic, as well as the pentatonic paradigms are systems where the tonic note is at the centre of the system, unlike in the archetypical heptatonic model. This is what distinguishes them from one another. Penta- and enneatonism, which are both tonic-centric systems, found their source in Primitive Music whilst heptatonism is, exclusively, the product of theory. It is interesting to note that scholars opposing the present thesis, distinguish penta- from heptatonism despite of the fact that there is no written evidence for any pentatonic construction in any ancient treatise, whilst they object to the enneatonic construction in spite of the fact that there is unequivocal evidence for it. Should they persist in their argument, then, surely, they should perceive pentatonism as a heptatonic form because it uses some of the notes of heptatonism, excluding the presence of semitones. The accepted theory that the system employing five of the notes of the heptatonic scale be called 'pentatonic' is flawed because this would imply a precedence of heptatonism on pentatonism, which is absurd.

The insistence in finding heptatonism in all scale systems is the consequence of heptatonic subjectivism. Only centuries of usage makes it feel natural.

It is a current and persistent misconception that UET VII 74 lists strings from one to nine, where 1 would equate 8 and 2 would equate 9. It says, front string; next string; third, thin string; fourth string-created by Ea; fifth string, fourth behind string; third behind third; second behind string, and behind string, concluding with the formal conclusive statement: '9 strings', which to anyone's interpretation equates to 1-2-3-4-5-4-3-2-1 and not: 1-2-3-4-5-6-7-8-9, or 1-2-3-4-5-6-7-1-2. Therefore it is not scientifically acceptable to interpret the series as such because this is not what it is. If we assume that the central note was the tonic of the enneatonic system, then the central note should have been called 1 and not 5. However, this would be without taking in account that Primitive Music would not require any form of numbering. The ancient Babylonian theoreticians, on the other hand and whilst retaining the original system, would have found it logical to name the front string, 'string 1', and the back string 'back string' and that therefore the tonic-centric 'string-pitch' would be 'string 5'. It is possible that other systems would have coexisted. We would have had enneatonism; hendecatonism; tridecatonism, all tonic-centric, having sprouted from pentatonism and all extensively produced in the iconography.

It is time to introduce the flawed assumption of many Assyriologists that the names of strings should be differentiated from the pitch they produce. Primitive musicians would not have segregated the one from the other since there would be no reason for this. The separation of the pitch from the string that produces it is the consequence of theory without which the concept would be spurious. Also, if we assume that pentatonism ruled Primitive Music, then, with no modal arrangement arising from a fundamental system, the name of the string would indeed be inseparable from the pitch it produced. It is quite possible that each of the string-pitches would have had a supernatural value which might have survived in Sumerian with the naming of the 4 string as SA 4 TUR, 4 being the number for ENKI, which we find translated in Akkadian 'string made by Ea'.

The system to which the Mesopotamian cuneiform texts refer, especially with UET VII 74, may not be called 'scale', because this is precisely what it is not, and it would certainly not have been perceived as heptatonism, or as anything else by the early music makers of pre-literate Mesopotamian primitive music because they would never have thought about quantifying or measuring anything, because they would not have required it. Had they considered it to be heptatonic, they would have rendered it into a form inferring of such, but they certainly did not. It is unreasonable to assume, out of nowhere, that they would have thought about quantifying a music system in a manner which differed completely from the fundamentals of its earliest form. The Old Babylonian theoreticians would have had the task of transposing primitive music making of it a tangible, numerate-literate form. This is precisely what they did. We have the evidence of a system which is tonic-centric, hence its rendition as 1-2-3-4-5-4-3-2-1 and certainly not a system which inferred the heptatonic series of the ascending or descending 1-2-3-4-5-6-7, issued from the construction sequence of either 1-5-2-6-3-7-4, in the ascending or in the descending resulting, necessarily as ascending f-g-a-b-c-d-e or descending b-a-g-f-e-d-c.

The inward numbering infers symmetry. The model is one which starts with the tonic-centric note from which a fifth rises to the treble and a fifth falls to the bass; then a fourth rises from the bass and a fourth falls from the treble; then, a fourth rises from the bass and a fourth falls from the treble generating the standard 'so-called' pentatonic system as G-A-C-D-E-G-A, a perfectly tonic-centric symmetrical

system with seven notes spanning an enneachord. A larger model spanning the tridecachord with nine notes also exhibit symmetry: E-G-A-C-D-E-G-A-C. Now, enneatonism would consist in producing a falling fourth from E and a rising fourth from C thus producing tonic-centric enneatonic G-A-B-C-D-E-F-G-A, and tonic-centric hendecatonism as F-G-A-B-C-D-E-F-G-A-B where the symmetric location of tritones is obviously the reason for modal formation from the correction of the tritone to consonance. Tridecatonism, pentadecatonism and triacontatonism, as we see it as late as in the Assyrian period is evidence of the predominance of the tonic-centric system. It must be added that heptatonism as we understand it today implies the usage of eight notes where $1 = 8$ since the octave has crept, irregularly, into the concept. However, it is contended that the ambit of a system was integral part of it. Thus enneatonism would imply the usage of all of the notes of the system as is clearly seen in Hurrian H.6 where the 9 notes of the mode of *nid qibli* : E-D-C-B-A-G-F-E-D, are used, no more and no less.

Now comes the evidence and the inference that the quantification of the system stems from Sumerian Babylonian mathematics, or might it be that Sumerian Babylonian mathematics stem from music theory. Natural music intervals behave sexagesimally. Should a string measure 60 *ubanatu*, the fifth above it will be the ratio of $60:40 = 2:3$; the minor third will be $60:50 = 6:5$ the interval $50:40 = 5:4$ is the major third. The minor third $6:5$ plus the major third $5:4 = 2:3$. The reciprocal of the fifth $2:3$ is the fourth $3:4$; the reciprocal of the minor third is the major sixth; and the reciprocal of the major third is the minor sixth. Now, 60, is the number for god ANU, from which the enneatonic construction would start as described above. To this we must add that the ratios of string length behave in reciprocal relation to the ratios of frequency and that therefore the principle of symmetry in ancient constructions is unequivocally proven. These principal intervals of the fifth and the thirds, minor and major are unequivocally attested in text CBS 10996 confirming the thesis. This text lists fifths which are presumed to be descending and a complementary third, returning to the lowest pitch of the fifth *i.e.* B-E C-E. Interestingly, the ambit of the text is heptachordal. Without any octave, intervals of the ninth or any above the interval of the seventh. This would infer that the heptachord would have been a known quantity, as the iconography attests occasionally. However, there is no evidence whatsoever to attest that the resulting heptachord was constructed in the way we understand it today, and that therefore the symmetric tonic-centric

construction which I have explained above would be the most likely method. The Greek heptachord must now be mentioned as it also consists of an inward numbering system: 1-2-3-4-3-2-1 where 4 would stand as the tonic-centric pitch of the construction. This numbering does not give any evidence or inference regarding any other construction than the tonic-centric model. Therefore we can safely attest that UETVII, 74; CBS10997; H.6 and the Greek model have all the characteristics of the tonic-centric model. It may be that other patterns of construction existed alongside and the most recently recovered text, CBS1766 might constitute the only evidence so far.

CBS1766 has been thoroughly debated. But the essential resides in that:

1. The names of the strings are restricted to seven with a series of numbers from 1 to 7 equating to the names of the strings.
2. The names of the intervals do no longer appear - only their their number equivalence.
3. The numbers appear at the angles of a heptagonal star inscribed within two concentric circles.
4. A column in a table below the diagram confirms that the strings of the arcs building the heptagon indicate a process of alternating fifths and fourths which proves beyond doubt that it generated a heptatonic, ascending or descending system, as we conceive it in modern theoretical parlance.
5. The column has the following sequence: 2-6-3-7-4-1-5-2, e. B-E-A-D-G-C-F which is the descending scale of heptatonic B = b-a-g-f-e-d-c.

This is the first evidence of true heptatonism which therefore confirms the unequivocal construction of the tonic-centric model in penta, ennea, hepta, and of other symmetrical tonic-centric systems.

[1] Schneider, M., 'Ethnologische Musikforschung', 2. edition of Preuss and Trimborn, *Lehrbuch der Völkerkunde* Stuttgart, (1956).

[2] Schneider, M., The New Oxford History of Music, ANCIENT AND ORIENTAL MUSIC, p.14.

[3] *Ibidem*, p. 14.