does not render linguistic units precisely. A series of graphemes that we would transliterate as *he₂-en-ğar* could be transcribed as *he.i.n.ğar* or as *he.n.ğar.Ø*, depending on one's view of grammar, but not as *he.en.ğar*.

2.5 Comparison of earlier and later systems

The differences between the nuclear early system and the fully developed second-millennium version of cuneiform can be illustrated by examples from a passage that is preserved in both versions. Here is a line from a third-millennium literary composition, followed by the manner in which the clichéd formula was written in Standard second-millennium Sumerian, a glossed version of the latter, and a translation (see Civil and Biggs 1966:12):

(2) *Third millennium* ᵈen-ki   isimud   gu₃   de₂
     Second millennium ᵈen-ki-ke₄ isimud-ra   gu₃   mu-un-na-de₂-e
     Transcription   Enkik.e   isimud.ra   gu.Ø   mu.na.de.e
                         Enkik-ERG. Isimud-DAT. voice-ABS. PREF.-DAT.-pour-NOM.
                         "The god Enkik says to [his vizier] Isimud"

An unusual writing in one such early text reveals that prefixes usually not expressed in writing could occasionally surface (Civil and Biggs 1966:3):

(3) *Third millennium* dur₃ gu₃-di   nab-sa₁₀-sa₁₀
     Second millennium dur₃ gu₃-di   na-ab-ta-sa₁₀-sa₁₀
     Transcription   dur   gudi.Ø   na.b.ta.sa.sa
                         ass   braying-ABS. PREF.-PRO.-ABL.-buy
                         "You should not buy a braying ass"

By the beginning of the second millennium BC, the Standard Sumerian orthography had been established that would be used, with only minor adjustments, down to the very end of cuneiform writing.

In addition to the word- and morpheme-centered manner of writing, there exists a less stable and less formalized way of writing the language syllabically. Texts of this type, which first appear in northern Babylonia and peripheral areas in Old Babylonian times, write out free morphemes by means of syllabograms rather than by means of logograms. Thus for example, the Standard Sumerian sequence *sipa ᵈur-ᵈnamma-ke₄ mu-na-an-šum₂* "he gave to the shepherd [king] Ur-Namma" is rendered as *si-pa ur-an-na-ma-ke mu-na-an-šu* in the so-called syllabic orthography. The five hundred or so texts of this type are mainly, but not exclusively, ritualistic.

3. PHONOLOGY

The phonology of the language is not well understood, and it is fair to say that it will never be fully recovered. There are many reasons for this; chief among them are the manner in which the language was encoded in writing, as well as modern misconceptions as to the nature of the script. Cuneiform was deciphered backwards, that is, it was first read in its latest incarnation, thousands of years after its origins. The Semitic Akkadian language was recovered first, and when Sumerian was discovered, it was read by means of sign values established for Akkadian. As a result, certain Sumerian phonemes that were not used in Akkadian were not initially identified. The repertoire of Sumerian phonemes currently

recognized still looks suspiciously close to the Akkadian repertoire; this may be due to chance, to our inability to recognize certain sounds, or to convergence of the two systems.

3.1 Consonants

The following chart presents the conservative current view of the Sumerian consonantal inventory.

(4) **Sumerian consonantal phonemes**

b	d	g	
p	t	k	
s	š		
z			
			h
m	n	ğ	
l	r	ř	

3.1.1 Stops

Ambiguities in the use of the cuneiform script to write Sumerian and Akkadian have led to many debates about the nature of Sumerian stops. Observing the behavior of certain loans from Sumerian into Akkadian, Gelb (1961:33) argued against voiced stops in Sumerian and suggested that the distinction was between voiceless aspirated stops ($/p^h/$, $/t^h/$, and $/k^h/$) and voiceless unaspirated stops ($/p/$, $/t/$, and $/k/$). Some have followed his hypothesis; Jacobsen (1957:92, n. 1) proposed that the opposition was between rounded and unrounded stops. There are serious flaws in these reconstructions, as noted by Rubio (1999a:141). For the present it seems most sensible to follow the traditional view and to argue for a voiced versus voiceless distinction. Civil (1973a:34) has observed that voiceless stops become voiced when they occur before an ending that begins with a vowel (*kalak/kalaga* "mighty"), although he also notes that the rule may have to be reversed.

The occurrence of a phonemic glottal stop /ʔ/ is uncertain. Spellings such as *sa-a* "cat" are commonly transcribed as *sa'a* (as if / saʔa/), but this is presently best seen as a Sumerological convention rather than a phonological claim.

3.1.2 Sonorants

Sumerian has both nasal and liquid phonemes. The evidence for phonemic glides is less straightforward.

3.1.2.1 Nasals

The writing system makes a clear distinction between /m/ and /n/. There is some uncertainty about their behavior in word-final position. Certain words ending in a nasal have a different consonant when followed by vocalic ending; thus *ezen* "festival" but *ezem-ma*. This variation may be interpreted as a change either of /n/ to /m/ before a vowel, or of /m/ to /n/ in word-final position.

The nasal /n/ also regularly becomes /l/ before /b/. This is commonly encountered in the verbal prefix chain when the prefix *nu-* is followed by *ba/i-* (written *la-ba-* or *li-bi₂-*), but also within words as in the ES *la-bar* (EG *nağar*) "carpenter." An unusual change of /l/ to /n/ before /g/ is found in early syllabic writings for the word *lugal* "king" (*nu-gal*). This,

however, may have to be interpreted as hypercorrection based on analogy with composites formed with *nu-* such as *nu-kiri₆* "gardener" and so forth.

The identity of the phoneme commonly written *ḡ* is somewhat problematic (see Krecher 1978). As Civil (1973a:61) has noted, it is regularly only found before the vowels /a/, /i/, and /e/; it has variously been described as a velar nasal, a labiovelar nasal or as a nasalised labiovelar, and has been represented phonetically by notations such as /ŋ/, /ŋm/, or /ŋg/ (Black 1990:107–108). One should not exclude the possibility that Sumerian at one point had more than one such nasal – retroflex, palatal, as well as labial – as is the case, for example, in certain Dravidian languages.

3.1.2.2   Liquids

Because of certain writing conventions, Diakonoff (1967:49) proposed a phonemic distinction between the lateral liquids /l/ and velar /ł/. This has not gained wide acceptance. The phonological status of /l/ and /r/ is difficult to determine, and there are examples of an interchange of these phonemes in final and medial position (Civil 1973c: 174).

3.1.2.3   Glides

Standard transliterations of Sumerian do not recognize the existence of glides. Third-millennium texts from Syria, however, provide spellings that suggest the existence of a labial /w/, a palatal /y/ (and possibly one or two other sonorants; see Civil 1984:80).

3.1.3   Other consonants

Because of certain writing conventions, alterations, loans, and syllabic spellings, other phonemes have been suggested over the years. Civil (1973a) has drawn attention to the alternation of [g] and [b] in certain words, concluding that these spellings represent a distinct phoneme, either the labiovelar /gʷ/ or /gb/. The most widely debated extra phoneme of Sumerian has been variously notated as /dr/, /dʳ/, /ř/, and, most recently as [tsʰ] (Jagersma 2002 [2005]). If the last-named is correct, it was an affricate that had disappeared early on from the language, but which in certain cases was reflected in historical spellings.

3.1.4   Apocope

It is generally assumed that word-final consonants are dropped, but it is unclear if this applies in all situations. Hence most CVC signs also have a CV transliteration: for example, the sign read as *šag₄* "heart" by some, is read as *ša₃* by others.

3.2   Vowels

The vowels of Sumerian correspond to those found in Akkadian:

(5)   Sumerian vowel phonemes

/i/   /u/
    /e/
        /a/

In Sumerian, however, unlike Akkadian, vowel length is not phonemic. Some have argued for the existence of a mid-back vowel /o/ (Lieberman 1979), but this has not found wide support. There is no evidence for the existence of diphthongs. In third-millennium texts

from the Syrian city of Ebla, certain words are unexpectedly written with final *-n*; this may be Semiticization or an indication of nasalization of final vowels in early Sumerian (Civil 1984:79).

3.2.1   Vowel harmony

Sumerian words show a very strong tendency towards vowel harmony, both within roots and morphophonologically, but the issue has never been analyzed in detail. Thus, many bisyllabic native words in the language repeat the same vowel: *kalam* "land," *piriḡ* "lion," or *murub₄* "center." Loans sometimes do conform to this tendency (e.g., *ugula* "captain, foreman" from Akkadian *waklu*), and sometimes do not (e.g., *akkil* "cry" from Akkadian *ikkilu*). Diakonoff (1983:87) thought that Sumerian had total vowel harmony, but as Boisson (1997:41) notes, no other language shows such a degree of harmony. It is probably safer to state that the language has a strong tendency towards harmony, but that the degree of the phenomenon may be masked by our transliteration system. There are many bisyllabic words with two different vowels, especially /a/ and /i/: for example, *agrig* "provider," *gisal* "oar," or *apin* "plow." There are also bisyllabic words with other vowel sequences: for example, *dedal* "ashes," *bugin* "bucket," or *ḡizbun* "banquet." Vowel harmony seems to operate strongly, but not totally, within the verbal prefix chain, but does not affect the stems, nor does it operate on nominal prefixes. Individual elements in compounds also retain their original vowels, as in *a₂-tuku* "benefit, profit."

3.3   Accent and intonation

Over the years there have been suggestions that Sumerian was a tonal language. The underlying assumption was that because the language had so many homophones, some additional distinctions were necessary, hence the tonal hypothesis. Many, but not all, Sumerian homophones are an illusion based on the system of transliteration (Parpola 1975). The only clearly identifiable prosodic feature is typologically predictable: rising phrase intonation to mark questions is sometimes expressed through the writing of additional vowels at the end of a clause.

4.   MORPHOLOGY

4.1   Word formation

Sumerian distinguishes between nominal and verbal bases. The controversial category of adjectives will be discussed below; here it is assumed that most adjectives are verbs. The only recent discussions of Sumerian word formation are those of Diakonoff (1967:51–54), Kienast (1975), Schretter (1993), and Attinger (1993:155–158). This is a modified version of their analysis. One should bear in mind that the form of Sumerian words is sometimes obscured by inconsistent transliteration (on the CVC ~ CV transliteration variation, see §3.1.4).

4.1.1   Basic Word Structure

Basic words were built on the following phonotactic patterns: (i) V (e.g., a "water".) There are few such roots. Most words transliterated as simple vowels are actually CV, such as *e₂*