Syllable and Segment in Latin. By RANJAN SEN. Oxford and New York: Oxford University Press, 2016. Pp. [xvi] + 296.

A revision of his D.Phil. thesis, Ranjan Sen's book is a learned, thorough, and original discussion of five phonetic problems of Latin (in traditional terms, the sound *l*, the *littera*-rule, *muta cum liquida*, anaptyxis, assimilation), from the perspective of a philologist well-informed about contemporary linguistics. The author combines methods and results of traditional Latin grammar[1] with theories and approaches of contemporary phonet-

1. E.g., Manu Leumann, *Lateinische Laut- und Formenlehre*[6] (Munich, 1977); Andrew L. Sihler, *New Comparative Grammar of Greek and Latin* (New York, 1995); Michael Weiss, *Outline of the Historical and Comparative Grammar of Latin* (Ann Arbor, MI, 2009).

ics.[2] The book will appeal to general linguists working in phonology and syllabification, comparative philologists, and classicists with interests in the sounds and history of the Latin language. This review is written by one of the latter, who has enjoyed and learned from S.'s discussion but has not always found it straightforward because of the amount of theoretical jargon, at times arduous to the uninitiated, and often used in place of traditional terms.

That said, S. is certainly aware of the "interdisciplinarity" of his approach as well as of his potential audience, and indeed in the introductory chapter (chap. 1) he provides the classicist with some basic knowledge of contemporary debates in diachronic phonology, and the modern phonologist with an overview of the sources of evidence for the speech and sounds of a dead language.

The first problem analyzed by S. in his book concerns the nature and behavior of *l* in Latin (chap. 2). Pliny the Elder already was aware that this sound changed according to its position, and this is confirmed by both synchronic and diachronic variation of the vowel preceding the *l*. For instance, short vowels before an -*l* at the end of a syllable (coda *l*) consistently "backed," that is, they developed into the back vowel *u* in the history of Latin (cf. *consul* < **konsel*, *volgus* ~ *vulgus*). Conversely, vowels preceding a syllable-initial *l*- (onset *l̄*) or a geminate -*ll*- did not "back" (e.g., *agellus*, not **agullus* or **agollus*; *facilis*, not **faculis* or **facolis*, vs. *facultas*), or they did so less consistently or to a lesser degree (e.g., *anculus* < **ambʰikʷolos* vs. *filiolus*, not *filiulus*). This different behavior is related to the velar quality of *l* (darkness), which "coloured" the preceding vowel, but varied according to position and phonetic environment. The body of the chapter (pp. 17–29) is an etymological analysis of Latin words featuring pre-*l* vowels, aimed to investigate the degree of "backing" (> *u* or > *o*) and the exceptions to backing; on the basis of this analysis and the grammarians' statements S. identifies a tripartite "scale of darkness" of the sound *l* according to the syllabic and phonetic context (*plenus* ~ *medius* ~ *exilis*). This scale is then interpreted with the lens of contemporary phonological theories (pp. 31–41), among which S. singles out the "equipollent features" approach as the one accounting for and corroborated by the results of his analysis. According to such an approach, each phonetic feature has a "+" and a "–" value (e.g., +voice vs. –voice), which have equivalent or equipollent phonological status; consequently, a sound is different from another not because of the presence vs. absence of one feature ("privative feature," e.g., *d* [voice] vs. *t* [non-voice]), but because *both* have a property that the other lacks (e.g., *d* [+voice] vs. *t* [–voice]). Privative features represent only a binary opposition (e.g., voice vs. non-voice), whereas equipollent features can also account for a third option, for example, Øvoice, meaning that the type of value (+voice or –voice) is assigned according to the phonetic context (underspecification).

Chapter 3 is dedicated to the so-called *littera*-rule, a sporadic and problematic sound change involving shortening of a vowel and gemination of the following consonant (*lītera* > *līttera*), which S. defines as "inverse compensatory lengthening." After an overview of previous scholarship and some preliminaries on Latin phonology, S. presents the results of his examination of all the Latin words in which the *littera*-rule may have occurred "from the earliest attestations of Latin to imperial times." Full details of this examination are found in the Appendix (pp. 204–30); in chapter 3 S. focuses on a selection of

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2. E.g., Darya Kavitskaya, *Compensatory Lengthening: Phonetics, Phonology, Diachrony* (New York, 2002); Juliette Blevins, *Evolutionary Phonology: The Emergence of Sound Patterns* (Cambridge, 2004).

thirty-five examples of *littera*-rule words, which could not be explained by alternative sound changes, such as spontaneous gemination in slang terms (e.g., *vessica*). These words are analyzed according to phonological environment, semantic category, stress, and chronology. In particular, three phonological patterns are identified: sequences featuring (1) *i/u* followed by *p/t/c* (e.g., *Iuppiter, futtilis, littera, succus*), (2) *a* followed by *m/r* (e.g., *flamma, garrire, parricida*), (3) *i/e* followed by *l* (e.g., *loquella, crocodillus*). These particular phonological features lead S. to formulate his original explanation of the cause of the *littera*-rule, against the traditional "moraic" notion of weight preservation, according to which the shortening of the vowel served to preserve the original weight after gemination of the following consonant (i.e., open syllable with long vowel > closed syllable with short vowel, e.g., *lī.t > lĭt-*). Citing Darya Kavitskaya,[3] S. argues that the Latin *littera*-rule is instead the "result of the phonologization of phonetic duration when the listener is no longer sensitive to the phonetic cause for that duration" (p. 67). That is to say, certain phonetic sequences presented features that made it difficult for the user to identify with precision their individual constituents (segmentation difficulty), thus causing confusion and variation, diachronically and/or synchronically. Features of this kind are identified in each of the three above phonological patterns, relying on results of contemporary phonetics. Pattern 1 accordingly features vowels that were too short to be interpreted as phonologically long (*i/u*), and thus were diachronically reanalyzed from long vowels in open syllables to short vowels in closed syllables (e.g., *ūt > ŭtt*). Conversely, pattern 2 features an extremely long vowel (*ā*) before a nasal or approximant consonant, in both cases producing a sound that could be synchronically interpreted as "either the end portion of the vowel or the beginning of the consonant" (p. 73). Similarly, in pattern 3 S. observes that "it is notoriously difficult acoustically to pinpoint the moment at which the vowel ends and the *l* begins" (p. 73). Important in this reconstruction is the (controversial and counterintuitive) assumption that in Latin closed-syllable vowels were longer than their open syllable counterparts, defended by S. in his previous work.[4]

Chapter 4 analyzes the syllabification of the sequence *muta cum liquida* (*t/d/p/b/c/g + l/r*, = TR in S.'s terms) in archaic Latin (fifth–fourth centuries BCE), on the basis of the type of reduction of the vowel preceding it. As S. recalls in section 4.2 (pp. 80–88), it is well known that in archaic Latin short unaccented vowels were exposed to a process of reduction (= "weakening" or "raising"), which varied according to the syllabic and phonetic context. In an open syllable, vowels merged into *i* (e.g., *cecidi < *kekadai*, vs. *cado*), except in the case of vowel assimilation (e.g., *anates* vs. *anites*) and before *r*, labial consonant, or velar/dark *l*, in which case they changed, respectively, into *e* (e.g., *cineris < *kinires), u/i* (i.e., Y, the *medius sonus*; e.g., *optimus/optumus < *op(i)temos*), and *o > u* (e.g., *consul < *konsel*). Conversely, in closed syllables they developed into *e* and *u* (cf. *perfectus < *perfaktos, euntis < *ejontes*). Since the syllabification of *muta cum liquida* is volatile in the history of Latin, syllables preceding this sequence could be either open or closed, and thus could display different kinds of vocalic reduction. Consequently, an etymological examination of vowels before TR in the (pre-)history of Latin can shed light on the syllabification of this problematic sequence. S. presents this examination in the body of the chapter (pp. 94–111), after an overview of previous literature (p. 88–

3. Darya Kavitskaya, *Compensatory Lengthening* (n. 2 above).
4. Ranjan Sen, "Reconstructing Phonological Change: Duration and Syllable Structure in Latin Vowel Reduction," *Phonology* 29 (2012): 465–504.

94). He analyzes evidence for fourteen different types of word formations, outlining for each type the vocalic and consonantal sounds involved, and the position of the morpheme boundary, which emerges as a key factor affecting the syllabification of TR. The results of this examination are displayed in a table (4.1), and are discussed in the following section. A few patterns in the data suggest open-syllable reductions whenever a morpheme boundary occurs before the cluster *muta cum liquida* (= tautomorphemic TR, e.g., *curric(u)lum* < **korse-klom*, *talitrum* < **talo-trom*), and closed-syllable reductions when it is within it (= heteromorphemic TR, e.g., *cerebrum* < **keras-ro-m*). This would in turn suggest the hypothesis that in archaic Latin *muta cum liquida* was heterosyllabic (e.g., *t.r, b.l*), unless a morpheme boundary occurred before it. This neat hypothesis, already proposed by Henry Hoenigswald,[5] is undercut by several exceptions, which display closed-syllable reduction (>*e*) in tautomorphemic TR. Some of these are justified by S. with a loss of morpheme transparency (e.g., *lateb.ra*), but others remain problematic (e.g., in particular *gene.trix* instead of **genitrix*). In the most original section of the chapter (pp. 117–19), S. tries to explain these forms invoking a "constrained r-conditioning," that is, an influence of the consonant *r* across the consonant *t*, in a phonetic environment featuring a preceding mid vowel (*e/o*) before a single intervening consonant and the absence of the consonant *c*. However credible this intricate explanation might be, S.'s framework (summarized at p. 119) would only be valid for archaic Latin, since by the time of Plautus "the default syllabification of TR changed from heterosyllabicity to tautosyllabicity," as S. remarks at the end of the chapter (p. 120), unless morpheme boundary intervenes (e.g., *ob.loqui*).

Chapter 5 focuses on the insertion of a vowel within a consonantal sequence *bl, pl, cl, gl* (e.g., *poclum* > *poculum*, **stablom* > *stabulum*); this sound change is traditionally known as anaptyxis and is designated by S. as "vocalic epenthesis." The body of the chapter (pp. 124–53) is an analysis of the evidence for anaptyxis/epenthesis in the four above phonetic patterns. Each pattern is offered an individual chronology and phonological explanation, excluding the pattern *gl*, which is recognized as an uncertain, minor phenomenon. Anaptyxis in *bl* was a regular and consistent phenomenon of archaic Latin, beginning in the fifth and settled by the middle of the third century. It occurred when *bl* was word-internal at the beginning of a syllable (internal onsets), and thus (as discussed in chap. 4) when *bl* was preceded by a morpheme boundary (e.g., **sta-blis* > *stabilis*); conversely it failed across morphological boundaries (e.g., *abluere* not **abuluere*), where *bl* was heterosyllabic (*ab.luere*), and also at the beginning of a root (e.g., *blandus*, *perblandus*). Anaptyxis in *cl* had a similar phonology (i.e., not affecting heterosyllabic *cl*) and was also regular and consistent, but had a later chronology, beginning in the fourth and being completed only by the middle of the second century, as shown by variation in early Latin (e.g., *poclum* ~ *poculum*, *periclum* ~ *periculum*, the latter standard in Terence). There were also forms in *cl* that resisted anaptyxis at all times, especially Greek loanwords (e.g., *Heraclitus*) and the oath *hercle*. Moreover, given its later chronology, the effects of anaptyxis in *cl* were soon countered by those of another sound change emerging in the late Republic, namely, syncope of short, prosodically weak vowels. This complicates the evidence and explains many classical Latin words in *cl* without anaptyxis (e.g., *ex-anclare* < *exanculare*, vs. *anclabris*). Anaptyxis in *pl* began even

5. Henry M. Hoenigswald, "Silbengrenze und Vokalschwächung im Lateinischen," in *Latein und Indogermanisch: Akten des Kolloquiums der Indogermanischen Gesellschaft, Salzburg, 23–26 September 1986*, ed. Oswald Panagl and Thomas Krisch (Innsbruck, 1992), 81–85.

later than in the previous environments (mid-third century) and features more problematic counterexamples, which S. endeavors to explain. Anaptyxis failed with root-initial *pl*, as expected (e.g., *perplexus*), and also in forms with *mpl* (e.g., *exemplo*; but cf. Plautine *extempulo*) and before a stressed heavy syllable (e.g., *disciplīna*) under the influence of syncope. Morphology may also account for blocking in forms such as *duplex* and *locuples*, as the endings *-plex* and *-ples* may have been felt by the speakers as distinct morphological units, analogous to roots. However, forms like *publicus* (<*poplikos) and *poples* would remain unexplained and therefore S. elaborates his own account, combining prosodic ("metrical") and syllabic factors. Accordingly, anaptyxis was blocked after a heavy-syllable stress (e.g., *símplex*) or a light-syllable stress at the beginning of a trisyllable (a "head of a well-formed trochee," e.g., *dúplicis*). This hypothesis is ingenious, but needs further qualifications to explain some counterexamples (e.g., *quadruplus*, *duplex*). In addition to this, S. argues against the traditional "analogical" explanation of *publicus* (// *pubes*) and reconstructs that *pl* in *poplikos was syllabified as *p.l* (heterosyllabic), under the influence of the relative rarity in Latin of word-initial *pli-* and the frequency of word-initial *li-* (word-based syllabification). Heterosyllabicity of *pl* would explain the later assimilation in **pop.likos* (*pl > bl*) and might be traceable also in *poples*; this reconstruction would also confirm the occurrence of anaptyxis in *pl* only in internal complex onsets, as for *bl* and *cl*. Influence of word frequency on anaptyxis is further explored in the last section of the chapter, where S. observes that anaptyxis in *cl* seems to have less affected very frequent words (e.g., *hercle*), whereas that in *pl* seems to have occurred earlier in *populus* than in the less frequent *manipulus*. Relying on predictions and results derived by models of lexical diffusion,[6] S. speculates that the change in *pl* was phonetically motivated and had a "fast speed" of diffusion, from more frequent to less frequent words; in contrast, anaptyxis in *cl* spread slowly from least to more frequent and was "structurally motivated," that is, introduced by analogy with anaptyxis in *bl* in similar suffixes (**-blom/-klom*). Again, the reconstruction is ingenious, but is undermined by the small size of the data corpus and some counterevidence (e.g., the frequency of *periculum* in Terence).

The last sound change investigated in the book is consonantal assimilation in archaic Latin, which S. discusses in chapter 6, re-elaborating material and results presented in a previous work.[7] The chapter—brief, theoretical, and not always lucid to the non-specialist—aims to contribute to a debate in contemporary phonological scholarship on the role played by syllable in consonantal phonotactics. S. analyzes evidence for four types of consonantal assimilation in Latin: voice (e.g., *nupsi* < *nub-sai), place of articulation (e.g., *occidere* < *obkaidesi), continuance (e.g., *quassi* < *quatsai), and nasality (e.g., *summus* < *supmos). He then identifies phonological patterns and explains them with reference to notions derived from contemporary articulatory theory. On this basis S. formulates a succinct, all-comprising rule for Latin assimilation: "Feature *x*, if poorly cued to a sufficient degree relative to an adjacent more robustly cued value of that feature, was assimilated to that value, where *x* is taken to range over [voice], [PLACE], [continuant], and nasal" (p. 185). That is to say (in simplified and "lay" terms)

    6. E.g., Matthew Y. Chen and William S. Wang, "Sound Change: Actuation and Implementation," *Language* 51 (1975): 255–81.
    7. Ranjan Sen, "Diachronic Phonotactic Development in Latin: The Work of Syllable Structure or Linear Sequence?" in *Handbook of the Syllable*, ed. Charles E. Cairns and Eric Raimy, Brill's Handbooks in Linguistics 1 (Leiden, 2011), 417–41.

that if a consonant was not distinct enough from an adjacent more distinguishable consonant, it assimilated to it. S.'s formulation complies with (and aims to corroborate) a "linear" theoretical approach, according to which it is the sequence of sounds, and not the syllable, that governs phonotactics and thereby phonological change.[8] Nevertheless, S. does not dismiss completely the syllable and its role in sound change. In the second part of the chapter he focuses on assimilation of sonorants (liquids *l r* and nasals *n m*), noting a different behavior in different syllabic contexts. Consonants adjacent to syllable-final sonorants do not undergo assimilation, as shown by voice contrast (e.g., *pontus* vs. *pondus*, *mulcere* vs. *mulgere*); conversely, consonants that precede syllable-initial sonorants are assimilated (e.g., *segmentum* < **sek.mentom*, *neglegere* < **nek.legesi*), unless in case of tautosyllabic sequences (e.g., *acri* vs. *agri*). This evidence allows S. to connect his analysis of (voice) assimilation with that of *muta cum liquida*, and emphasize the significant role of syllable (the phonological structure) in the actuation of sound changes, yet "one step removed" from the primacy of phonetics.

The non-primary significance of the syllable is indeed one of the main themes of S.'s work, and is highlighted in the final chapter, which integrates and reviews the results of the book and its methodology. S. notes that most of the phenomena analyzed (e.g., assimilation and compensatory lengthening) are consistent with a "reductionist" view of sound changes, which considers them as governed by "demands of speech production and perception alone." In the final section S. states to have demonstrated "both how phonetic research and phonological theory can shed light on a dead language, and, in turn, how Latin evidence can continue to illuminate problems in phonological theory" (p. 202). Professional phonologists will judge whether the second claim of this statement is accurate; as a classicist, I sometimes noticed that the Latin evidence was not as "philologically cleaned" as declared (e.g., too much credit is given to mostly medieval manuscripts of Plautus/Terence, and not enough to their metre) and I did not always see the relevance of all the phonological theory quoted. Nevertheless, S.'s first claim is certainly well-founded, and his book deserves praise for the systematicity, learning, and ingenuity of its original research.

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Giuseppe Pezzini
University of St Andrews

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8. See esp. Juliette Blevins, "The Independent Nature of Phonotactics Constraints: An Alternative to Syllable-based Approaches," in *The Syllable in Optimality Theory*, ed. Caroline Féry and Ruben van de Vijver (Cambridge, 2003), 375–403; Blevins, *Evolutionary Phonology* (n. 2 above).