

# reflections on metrics by computer

There is an English proverb which runs "one must learn to walk before one flies." Nowhere does this statement seem more apt than in the fields of meter and computers.<sup>1</sup> In the present state of metrical studies via computer scholars seem to be attempting to ignore all the work on meter in the modern era since the eighteenth century,<sup>2</sup> and, as it were, are beginning all over again.

The study of ancient meter in particular requires, by necessity, the use of statistics since we can learn nothing from recitation,<sup>3</sup> but in order for our statistics to be meaningful we need more than machines that will do percentage and probability calculations for us. We need the understanding of the basic terms which we are referring to in these statistics.

With this in mind, I wish to make some comments on a recent article by one of my colleagues, Professor R.R. Dyer in this Revue,<sup>4</sup> in so far as it concerns matters of meter. Professor Dyer points out (pg. 14) that the initial study of Homer using computers was done by J. T. McDonough, Jr. who worked out a scansion system for the whole of the *Iliad*.<sup>5</sup> Essentially Mr. McDonough's work is an index of words in the *Iliad* by rhythmic function, a listing of some 112.000 words.<sup>6</sup> What value was to be assigned to the frequency list of "any and all metrical word types in the *Iliad*"<sup>7</sup> is not indicated. Professor Dyer suggests that this data has "made clear

certain fundamentals of the Homeric hexameter," but those he indicates were known long before McDonough took on his *opus doctum et laboriosum* which is in part based on the work of Professor Howard Porter.<sup>8</sup>

What is most curious about McDonough's work and the paper of Professor Dyer is that nowhere is there mention of the starting point of all this analysis of Homer. I think it worthwhile to look again at what led Professor Porter, for example, to his work not so much to give credit as to hopefully indicate how far advanced the art is compared to what we can glean from McDonough and Dyer. In 1926 in the *Nachrichten* of the Göttingen Academy, Hermann Fränkel first published his essay, "Der homerische und kallimachische Hexameter."<sup>9</sup> As Fränkel ruefully points out in the introduction of his revised version, in spite of Giorgio Pasquali's praise (*Gnomon* 3, 1927, 241-47) that the work marked the beginning of a new era in the study of the rhythm of Greek spoken verse, by 1953 the impact of his work was decidedly insignificant within the scholarly world.<sup>10</sup> Pasquali stated that Fränkel taught us to read the hexameter — and he was right.<sup>11</sup> But what Fränkel intended was far more. He set out to show "dass und wie im griechischen Hexameter die Sinnesgliederung der Rede und die rhythmische Folge der langen und kurzen Silben aufeinander abgestimmt sind."<sup>12</sup> Basic to Fränkel's view of the hexameter is that it is a miniature strophe<sup>13</sup> made up of four (sometimes three) cola.

This is not the place to offer more of Fränkel's approach to the hexameter except to repeat the words of A. M. Dale on his work, namely that "it is an excellent thing to attune the ear to the positive phrases of the rhythm (of the hexameter) under (Fränkel's) sensitive guidance."<sup>14</sup> What is essential to realize is that for Fränkel (and for Porter) the cola in the hexameter are separated from one another by word-end, by caesura. Certain of

Fränkel's caesuras (and all three of Porter) have been recognized since antiquity : the trithemimeral, that *κατὰ τὸν τρίτον τροχαῖον*, the bucolica Porter, unlike Fränkel, regards the colon "normatively rather than literally a unit of meaning."<sup>15</sup>

However we wish to consider the colon for the moment we must consider what is meant by caesura. If we go back to an early modern definition we can begin to appreciate the problem. In his *Schediasma de metris Terentianis* (Amsterdam 1727<sup>2</sup>) pg. \*\*, Richard Bentley defines the caesura as follows : "Omne versuum genus habet *Caesuram* sive Incisionem; qua verbum terminatur, et vox in decursu paulum interquiescit." Caesura then has two requirements : word-end and the creation of a pause. Are these two requirements interconnected ? Bentley does not say.<sup>16</sup> Gottfried Hermann offered several definitions of caesura, defining it generally as the end of an *ordo metricus* (*Elementa doctrinae metricae*, Leipzig, 1816, 32 ff.), with as many caesuras in the verse as ends of the *ordines metrici*. In practical terms, as Drexler remarks,<sup>17</sup> this means a caesura can be assumed at every place in the verse, after every long or short. Hermann's other definition has been more influential (op.cit.5) : "caesura distinctius dicitur finis ordinis metrici coniunctus cum fine ordinis in vocabulis. Et quum ordines, qui sunt in vocabulis, nusquam certius finiantur, quam cum fine ipso vocabulorum, caesura censetur finiendo vocabulo in ipso fine ordinis metrici ... Quumque potior sit totius orationis, quam unius alicuius vocabuli finis, iis in versibus, in quibus utrovis modo incidi potest, non ex vocabuli, sed ex orationis fine aestimatur caesura. Itaque hunc versum Homeri non sic distinguimus : *πόντω μὲν τὰ πρῶτα | κορύσσειται, ἀντάρ ἔπειτα* sed sic : *πόντω μὲν τὰ πρῶτα κορύσσειται, | ἀντάρ ἔπειτα* (*Iliad* 4.424, reading τὰ *vulg.* for τε). Hermann adds that there is a "pausa in recitando facta" at the caesura, after which the recitation continues "novo spiritu sumpto."

Whatever we make of this last point, and it has been effectively denied that there is a caesural pause in Hermann's sense,<sup>18</sup> there is no doubt that two factors are involved in caesura on the basis of the above definitions, one based on the metrical flow of elements and one on the syntax (e.g., the syntactical pause in the *Iliad* line quoted above, marked by the comma).

To return to McDonough's categories of metrical word types we find that he is in a real sense accepting a definition of caesura indistinguishable from Hermann's first definition and Dyer also accepts this in his categories of compositional word types, without considering the difficulties inherent in a definition that excludes the syntactical element. For example in CWT (compositional word-type) 1 (-) of which Dyer indicates there are 18,252 we find that 5,957 or 32.6 per cent are of MWT 2 ( $// \text{—} /$ ). This is the highest percentage of any MWT fitting this CWT (see Dyer, *op.cit.* 20). In *Iliad* 1 we find some examples<sup>19</sup> :

- 45 // τόξ' / ὠμοισω ἔχων /  
 52 // βάλλ' / αἰεὶ δὲ πυραὶ /  
 29 // τὴν δ' / ἐγὼ οὐ λύσω /  
 84 // τὸν δ' / ἀπαμειβόμενος /  
 89 // σοὶ / κοίλης παρὰ νηυσὶ /  
 60 // ἄψ' / ἀπονοστήσειν /

Can it be seriously argued that there is a real similarity between these examples if we define our caesura in a meaningful way? <sup>20</sup> This is not to deny that these types could be grouped in a small number of classes. Further analysis would require comparison with prose texts to determine general use of monosyllables in Greek. Of course we cannot find a text in Homeric *Kunstsprache*, but early Ionian prose might offer some interesting comparisons. <sup>20a</sup> I cannot see what value such a table of listings can be as that given by Dyer on pp. 20-29. Nor do I see that these tables tell us anything new about the "compositional flow for any given word" (p. 29). Why, we may ask, is the name Agamemnon bound to appear as MWT 13 ( $\cup\cup\frac{6}{-}x$ ) and not as ( $\cup\cup\frac{4}{-}$ ) 84 or ( $\cup\cup\frac{2}{-}$ ) 134? Is it the *statistical* fact that of these types, type 13 appears 2050 times, while 84 appears only 119 and 134 only 7?

Furthermore we can well ask if the form  $\cup\cup\frac{4}{-}$  followed by punctuation has some significance. As long as we are dealing in words as entities countable and separate or grouped only according to metrical or rhythmical principles all sorts of truly interesting questions are left unanswered, however impressive our statistical tables and appendices may appear.

If we turn now to the matter of cola and juncture <sup>21</sup> we find that there is no consideration in the discussion of what a colon is. It is stated as proved by McDonough's data that the basic compositional entities in the hexameter fall into three of H. J. Mette's colon-types <sup>22</sup>: a unit like that created by the caesura *κατὰ τὸν τρίτον τροχαῖον*, a "penthemimeral" type; and a "post-bucolica" type (adonic?). No attempt seems to be made to determine the colon by any syntactic considerations, so that there is no way of knowing in what way these cola are defined. Surely we must ask for the proper comparisons with cola in language generally before arguing in the kinds of circles Dyer presents us with. <sup>23</sup> In her review of Fränkel, A. M. Dale indicates that she is still convinced the "the fundamental division of

the hexameter ... into 2 cola stands the test better than F.'s postulate of a fourfold line.<sup>24</sup> The computer is not likely to tell us more about the colon than we put into it. And here, as in consideration of caesura, both the work of McDonough and the projected research of Dyer seems to be seriously in danger of offering no results solidly founded in the λόγος of Greek meter.

In a valuable review of A. Dain's *Traité de métrique grecque*,<sup>25</sup> L.E. Rossi makes some observations of value in searching out the meanings of the terms with which we must deal. What distinction, he asks (p. 195), is there to be made between recited and lyric (sung) verse? A fundamental principle of Greek verse is that "in generale le incisioni (le fini di parola generalizzate) sono fondamentali solo nella strutturazione del verso recitativo, mentre non hanno peso, anche dove casualmente siano presenti, nel verso lirico." In recited verse the cuts are used to establish the boundaries of the cola which make up these verses. The junctures of the cola in lyric (p.196) occur for the most part in *synapheia*, in the body of the word. To state it another way, word-end is characteristic of recited cola, colon-caesura (to use Dale's term<sup>26</sup>) is the characteristic of lyric cola. By working with the contrasts of the two types set forth by Rossi perhaps we can in time come to understand the cola of the hexameter in relief against the cola of lyrics and perhaps in this way too arrive at some understanding of what colon actually means.<sup>27</sup>

Turning aside from questions of verse-structure and their realizations in language, I would like to say a few words concerning Professor Dyer's section on editing Homer (pp. 40 ff.). There is no doubt that the idea of a cooperative effort towards the development of a truly modern scholarly edition of Homer will in all likelihood be more than a single scholar can hope to do in a lifetime. A method of preparing data for some sort of SDI

(selective dissemination of information) program with a pilot project dealing exclusively with Homer seems an excellent notion. In the development of this idea, however, I believe that Professor Dyer is too closely bound by the format of the IBM 80-column card and its use with unit-record equipment. The elaborate coding procedures that he envisages will lead to endless trouble and the loss of items over and over again when codes are punched incorrectly by inexperienced, tired, and quite fallible human beings. The proof-reading involved in such a project, and the de-coding required of every user stand as tremendous obstacles to the success of this undertaking.

Perhaps a better suggestion would be to utilize what we now have : a computer equipped with magnetic tape without fixed record length. To use another computer acronym we should follow LILO (language in, language out). In this way the item could be entered in natural language, including a brief summary of the contents (along the lines of *L'année philologique* with its capsule abstracts) as well as what the contents concern (e.g., archaeology, metrics, etc.). Programs to scan such records for key-words could be developed and in this way complicated cross references could be eliminated. It would be necessary I suppose to decide on the *language* of these summaries, and in the face of present nationalistic trends, I am only too happy to leave such questions to a philological congress<sup>28</sup>. It might even have to be referred to the diplomats of UNESCO for solution. Whether such bibliographies would lead to more publication or, hopefully, less, remains to be seen.

James W. HALPORN,  
Indiana University

## NOTES

1. In a less complimentary way this is stated by the computer acronym GIGO (= "garbage in, garbage out").
2. Or the seventeenth century if we are to recognize the *lex Heinsiana* mentioned by R. R. Dyer, "Towards Computational Procedures in Homer in Scholarship", *Revue* 4, 1967, 15.
3. P. Guiraud, *Problèmes et méthodes de la statistique linguistique*, Dordrecht, 1959,<sup>7</sup> as quoted by L. E. Rossi, "Estensione e valore del colon nell'esametro Omerico", *Studi Urbinati* 39, 1965, 241 n. 11.
4. See f.n. 2 above.
5. So far as I can tell, the only published results of McDonough's work appeared as "Homer, the Humanities, and IBM", *Literary Data Processing Conference Proceedings* September 9, 10, 11, 1964, New York, 1964, 25-36. There were in addition a few newspaper articles in which it was reported that Mr. McDonough had "proved" decisively a) that Homer was an oral poet, and b) the unitarian view of Homer's *Iliad*.
6. McDonough, *op.cit.* 28.
7. *Ibid.*, 29.
8. I might mention that Professor Dyer indicates he was incorrect in ascribing the assignment of "metrical word-type numbers" to Professor H.N. Porter. I cannot find them in Professor Porter's published



work, "The Early Greek Hexameter", *Yale Classical Studies* 12, 1951, 3-63. Were they on Professor Porter's "hand-written ... index cards" (McDonough, op.cit., 27) ?

9. Pp. 197-229. Now reprinted in *Wege und Formen frühgriechischen Denkens*, Munich, 1960<sup>2</sup>, 100-126, with revisions and changes.
10. Op. cit., 100. Its greatest influence in Fränkel's opinion was on Porter's article (see above f.n. 8).
11. So Rossi (f. n. 3 above) 240. It should be mentioned in all fairness that since 1953 a good deal of attention has been paid to Fränkel's work.
12. Fränkel, 103.
13. Ibid., 113.
14. A. M. Dale "Greek Metric 1936-1957", *Lustrum* 2, 1957, 31. Pp. 30-32 offer a summary and criticism of Fränkel's work.
15. Porter (see f. n. 8 above) 25 f. n. 49.
16. For this observation and a good part of what follows I am indebted to the important article of Hans Drexler, "Caesur und Diaeresis", *Aevum* 24, 1950, 332-366. It must be pointed out, however, that Drexler confines himself almost entirely to Latin verse.
17. Op. cit. 333.

18. E. H. Sturtevant, "The Doctrine of the Caesura, a Philological Ghost" *AJP* 45, 1924, 329-350; R. Jacobsen, "Über den Versbau der serbokroatischen Volksepen", *Archives néerlandaises de la phonétique expérimentale* 8/9, 1933, 135-136.
19. Examples from Rossi (f.n. 3 above) 256.
20. Porter (f. n. 8, above) 24 f. n. 49 seems to deny the reality of the A-caesura in 1.52.
- 20a. Cf. E. H. Sturtevant, "On the Frequency of Short Words in Verse", *Classical Weekly* 15, 1929, 73-76 for some statistics. One method of handling such questions of prose and verse has been outlined for Latin by Louis Nougaret, *Analyse Verbale comparée du De signis et des Bucoliques*, Paris, 1966.
21. Dyer, op.cit. 21 calls this "inner metric", following O'Neill (see his f. n. 11, pg. 51). Porter, op. cit., 20 f. n. 42 quite rightly objects to the terms "inner" and "outer" metric as being neither descriptive nor sufficiently exclusive.
22. H. J. Mette, "Die Struktur des ältesten daktylischen Hexameters", *Glotta* 35, 1956, 7.
23. The obvious place to begin such a study is with a consideration of Eduard Fraenkel's basic papers on the subject : "Kolon und Satz I-II and Nachträge", in *Kleine Beiträge zur klassischen Philologie*, Rome, 1964, 73-139 and "Noch einmal Kolon und Satz", *SB Munich Heft* 2, 1965.

24. A. M. Dale (f. n. 14, above) 32. See also the comments of G. S. Kirk, "The Structure of the Homeric Hexameter", *Yale Classical Studies* 20, 1966, 86, 102-104. Kirk also adds (104) : "And there is always the question of what a colon is, what it implies."
25. L. E. Rossi, "La metrica come disciplina filologica", *RFIC* 94, 1966, 185-207.
26. A. M. Dale, *The Lyric Metres of Greek Drama*, Cambridge, 1948, 12 and 59, n. 2. In my review of H. Pohlsander, *Metrical Studies in the Lyrics of Sophocles* in *Classical Journal* 61, 1966, 180 I stated that the term "colon-caesura" was not so effective as J. D. Denniston's "overlap" (*Proc. Class. Assoc.* 42, 1945, 18-19, cited by Pohlsander, p. 147 n. 2), and added my own suggestion "colon-junction", since caesura belongs to another category of metrical phenomena. Since I am now inclined to use junction to indicate certain types of "diaeresis" (following H. Drexler, *Einführung in die römische Metrik*, Darmstadt, 1967, 22), to avoid confusion a new, hopefully self-explanatory, term should be coined.
27. I might note in passing that Dyer's comments on the declension of formulae (p. 30) go back to Victor Bérard (cf. A. Dain, *Traité de métrique grecque*, Paris, 1965, 54).
28. It would be interesting to see in this regard how the cooperation of France and the USA has worked on the projected volumes of *L'année philologique*.