

XV.—Hesiod and Aratus

HOWARD N. PORTER

YALE UNIVERSITY

An important development in the hexameter form in Callimachus, Apollonius, and their successors is the relative restriction, when compared with the Homeric norm, in the use of words ending with a long syllable in the arsis of the third, fourth, or fifth feet. Only Aratus resists this historical development and, in fact, varies from Homer in the opposite direction. In this his practice is very close to Hesiod's. It is suggested that Aratus was influenced by the older poet in his feeling for the cadence of the line, and that Callimachus may have had in mind metrical matters, the wide use of lines of a typically Hesiodic pattern, when he compared the two poets in his well-known epigram (29, Mair) on the *Phaenomena*.

For this brief discussion of Hesiodic influence on Aratus, with especial reference to hexameter structure, I take as my text the first four lines of the *Phaenomena*:

Ἐκ Διὸς ἀρχώμεσθα, τὸν οὐδέποτ' ἀνδρες ἑώμεν
 ἄρρητον· μεστὰι δὲ Διὸς πᾶσαι μὲν ἀγναιί,
 πᾶσαι δ' ἀνθρώπων ἀγοραί, μεστή δὲ θάλασσα
 καὶ λιμένες· πάντα δὲ Διὸς κεκρήμεθα πάντες.

These are the lines of a poet speaking as prophet and seer. They set the mood for the whole song, a mood of antique, megalithic, simple piety which contrasts strongly with the wit and grace of the contemporary hymns of Callimachus.

Callimachus himself, sensitive to this contrast, said of the *Phaenomena*, 'Ἡσιόδου τό τ' αἶσμα καὶ ὁ τρόπος, "Of Hesiod are the song and the manner."' Modern scholars have defined various ways in which this is true.² Hesiodic are the deep religious feeling and mantic pose of the poet, the choice of subject matter, pastoral, not heroic, and the method of interweaving subject matter, myth and proverb.

In beginning his work with a hymn rather than with a statement of the scope and intent of the poem, the normal epic custom, Aratus was influenced by Hesiod, as Pasquali has observed.³ We may

¹ Epigram 29, ed. Mair, *Loeb Classical Library*.

² K. Schütze, *Beiträge zum Verständnis der Phaenomena Arats* (Diss. Leipzig, 1935) 43-50 and *passim*. G. Kaibel, "Aratea," *Hermes* 29 (1894) 82-92.

³ *Orazio Lirico* (1920) 113-117.

possibly have, in the Διός — Διός — Διός of lines 1, 2 and 4, a direct verbal echo of the Δία — διὰ — Διός of *Works and Days*, lines 2, 3, and 4.⁴

Hesiodic also are some of the devices of sound and rhythm used in our text. Bethe has discussed the remarkable verbal architecture of these lines.⁵ Particularly noteworthy is the repetition of words and vowel sounds with the identical syllable now in the arsis of the foot, now in the thesis: πᾶσαι⁹: πᾶσαι², πάντῃ⁵: πάντες¹², ἀγυιαί¹²: ἀγοραί⁷.⁶ This type of verbalism is a feature of some of the most characteristic passages of the *Works and Days*:

382 ὦδ' ἔρδειν, καὶ ἔργον ἐπ' ἔργῳ ἐργάζεσθαι;

391 f. — γυμνὸν σπείρειν, γυμνὸν δὲ βοωτεῖν,
γυμνὸν δ' ἀμάειν;

25 καὶ κεραμεὺς κεραμεῖ κοτέει καὶ τέκτονι τέκτων;

26 καὶ πτωχὸς πτωχῷ φθονέει καὶ αἰοιδὸς αἰοιδῷ.

In these passages Hesiod may have made literary use of a stylistic feature of folk proverbs. Somewhat different is the use of the same device in *Works and Days* 3–8, and especially in lines 5–7,

ῥέα μὲν γὰρ βριάει ῥέα δὲ βριάοντα χαλέπτει,
ῥεῖα δ' ἀρίζηλον μινύθει καὶ ἄδηλον ἀέξει,
ῥεῖα δέ τ' ἰθύνει σκολιὸν καὶ ἀγήγορα κάρφει.

In prooimia the use of assonance of this sort to give added solemnity of tone was traditional.⁷ Compare, for example, the lyric prooimion of Terpander:⁸

Ζεῦ πάντων ἀρχά,
πάντων ἀγήτωρ,
Ζεῦ, σοὶ σπένδω
ταύταν ὕμνων ἀρχάν.

Here, in the space of four short lines, comprising only twenty syllables in all, the poet introduces three verbal pairs. While it would be rash to assert categorically that Aratus copied Hesiod in this verbal device — the trick is too common throughout Greek poetry

⁴ On the pun see E. Norden, *Agnostos Theos* (Leipzig, 1913) 259, note 1.

⁵ *Die Griechische Dichtung* (Wildpark-Potsdam, n.d. [circa 1924]) 295.

⁶ For an explanation of the numerical system here adopted to refer to the various positions in the hexameter see note 14 below.

⁷ Norden, *op. cit.* (see note 4) 258.

⁸ Fragment 1, *PLG*⁴, volume 3, page 8.

for that — nonetheless we may say that it is characteristic of the Hesiodic genre in which Aratus is composing.⁹

In the matter of rhetorical metric, i.e., the study of the positions occupied by sense-pauses, Wilamowitz has drawn attention to the fact that the sense-pauses here do not correspond with the line-ends.¹⁰ Aside from this, the most striking characteristic of our passage is the appearance of sense-pauses or phrase-divisions after the arsis of the fourth foot, illustrated clearly in line 3, and foreshadowed in line 2. This usage, while not uncommon in Homer, may fairly be claimed as Hesiodic, as Paulson's figures for punctuation in this position show.¹¹ (One line in 32 in Homer, one line in 14 in the *Works and Days*.) Figures for the Alexandrians are one line in 25 in Aratus and one in 55 in Apollonius. In Callimachus, although there are nine cases of punctuation in this position in the hexameter hymns (939 lines), not one of them marks a real phrase-division but all are commas before or after repeated words or vocatives.¹² On a purely statistical basis Aratus might seem to be simply agreeing with the earlier poets in general, yet that his use of lines such as *Phaenomena* 3 (which exhibits the most conspicuous feature of the rhetorical metric of the *Works and Days*) was due to Hesiodic influence is suggested by the fact that while Apollonius, the Homer of his day, uses such lines much less frequently than Homer, and Callimachus never uses them, in the *Phaenomena* they are used with a more than Homeric frequency.

More fundamental to the hexameter than the positions occupied by sense-pauses is the poet's choice of metrical word-type, i.e., words of an iambic, dactylic, choriambic, etc., scansion, and their localization, i.e., the positions occupied, by these word-types in the line.¹³ Professor O'Neill has demonstrated the remarkable uniformity with which Homer, Hesiod, and the Alexandrians observe

⁹ Aratus, as befits an Alexandrian, is more consciously elaborate than Hesiod in the use of this device; cf. *Phaenomena* 443–449, where words and syllables repeat and weave back and forth like the coils of the Hydra.

¹⁰ *Hellenistische Dichtung*, 2 (Berlin, 1924) 262.

¹¹ J. Paulson "Studia Hesioidea. I," *Lunds Universitets Årsskrift* 23 (1886–87) 48–49.

¹² The figures for Callimachus and Aratus have been compiled from the edition of A. W. and G. R. Mair, those for Apollonius from the edition of R. C. Seaton, both of the *Loeb Classical Library*.

¹³ In this I follow E. G. O'Neill, Jr., "The Localization of Metrical Word-types in the Greek Hexameter: Homer, Hesiod, and the Alexandrians," *Yale Classical Studies* 8 (1942) 105–106. My great indebtedness to this important study will be apparent throughout this paper.

certain basic rules of the hexameter which tend to concentrate all word-types except very short words (υ, -, υ υ) in but two or three of their possible positions. These rules, to state them briefly, are (1) a strong tendency to avoid word-ends in positions $3\frac{1}{2}$ and 4 unless preceded by a word-end in 2 or 3,¹⁴ (2) an absolute avoidance of word-ends in position 6 unless preceded by a word-end in 5 or $5\frac{1}{2}$, and (3) a rigid avoidance of word-ends in $7\frac{1}{2}$ unless preceded or followed by a word-end in 7 or 8.¹⁵ Within the framework of these universal laws the poet has a considerable degree of freedom in the choice of the different permissible verbal patterns. Lines one and two of the first book of the *Odyssey* violate no metrical rule, yet are constructed of very different elements. In line one every word except the monosyllabic *ᾶς* ends with a short syllable *in thesi* while in line two, from the second to the fourth foot, the words end with a long syllable *in arsi*. The fact that both lines satisfy the basic requirements of the hexameter form does not, however, imply that each had the same metrical effect. The opposite is clearly true, for some poets clearly and consistently favor the first of these two patterns, while others admit both freely. It is in the relative preferences for verbal patterns that we must look for indications of metrical individuality, genre characteristics, and influence of poet on poet.

To return now to our text, the first four lines of the *Phaenomena*, we may observe in them, I believe, certain usages and preferences characteristic of Aratus, and of Aratus only among the Alexandrians. The first line exhibits a pattern similar to that of the first line of the *Odyssey*, with word-ends at the favored "thesis" positions, $5\frac{1}{2}$ and 8. Lines 2, 3, and 4, however, all contain words ending at positions 5 and 7, and lines 2 and 3 words ending at position 9. To show the extent to which the use of elements which produce these word-ends is characteristic of the *Phaenomena* we must examine all the evidence and not depend on the analysis of a single short passage. Where we do not understand the underlying phonetic realities of a metrical system, only rigidly statistical analysis can carry conviction.

¹⁴ I adopt that numerical system for referring to the various positions of the line in which the syllabic elements of the line are given consecutive numbers from 1 to 12, the arses bearing the odd numbers, the theses the even. In dactylic feet the dissyllabic theses are numbered $1\frac{1}{2}$ and 2, $3\frac{1}{2}$ and 4, etc. (O'Neill, *op. cit.* [see note 13] 113).

¹⁵ This negative formulation of the rules of the hexameter does not pretend to embrace all the metrical phenomena of the line. For a fuller statement of the rules, see H. Fränkel, "Der kallimachische und der homerische Hexameter," *NGG* (1926) 197-229.

TABLE I

	Iliad	Odyssey	W&D	Aratus	Callimachus	Apollonius
Word-ends in position 5 only	372	387	479	445	260	331
Word-ends in position $5\frac{1}{2}$ only	497	490	361	422	575	536
The element $\overset{5\frac{1}{2}}{\sim}$	117	114	134	126	168	133

We may begin with word-ends in position 5. In table I figures are presented for the total occurrences of word-ends in 5, the "masculine caesura," which are not followed by a word-end in $5\frac{1}{2}$, of word-ends in $5\frac{1}{2}$, the "feminine caesura," which are not preceded by a word-end in 5, and of the occurrence of the element $\overset{5\frac{1}{2}}{\sim}$, i.e., of lines with both "masculine" and "feminine caesura."¹⁶ It is apparent that there was a tendency to favor word-ends in $5\frac{1}{2}$, a tendency that increased in strength greatly as time went on. Only Hesiod and Aratus are out of line. They quite clearly form a special group by themselves.

Very significant also and highly characteristic is the combination of a word-end in 5 with a word-end in 7 (penthemimeral and heptemimeral caesura), illustrated in all three of the lines of our text that have a word-end in position 5. In a poem in which these positions are favored we naturally expect wide use of the elements $- \overset{7}{\sim}$ and $\sim \sim \overset{7}{\sim}$ which enforce a word-end at 5 and produce one at 7. Figures for the two elements taken together are *Iliad* 129, *Odyssey* 154, *Works and Days* 245, *Phaenomena* 242, Callimachus 105, *Argonautica* 150. The agreement between Hesiod and Aratus is striking. It appears that the text from which we took our start is typical of the *Phaenomena* as a whole in this respect, with one line (in this case the third) in four, as in the *Works and Days*, using the elements $- \overset{7}{\sim}$ or $\sim \sim \overset{7}{\sim}$, while Callimachus admits these elements in only one line in ten.

¹⁶ All figures in this paper for word-types or word-ends are presented as the number per 1000 lines. For Homer I have compiled figures from the 1000 lines beginning with the first line of Book 5 of the *Iliad* and *Odyssey* and then averaged the results with the figures presented by O'Neill (*op. cit.*, see note 13) for the first 1000 lines of each poem. Hesiod is represented by the first 800 lines of the *Works and Days*, raised to the scale of 1000. For the Alexandrians I have used O'Neill's figures, reducing, however, the figures for Aratus, which O'Neill presented for all the 1152 genuine lines of the *Phaenomena*, to the scale of 1000.

TABLE II

	Iliad	Odyssey	W&D	Aratus	Callimachus	Apollonius
Total word-ends in position 5	489	501	613	571	428	464
Per cent followed by $\overset{5}{\cup}$	24%	22.7%	22.8%	22%	39.2%	30%
Per cent followed by $\overset{7}{\cup\cup}$	26%	30.7%	40%	42.4%	24.5%	32.3%

This large number of spondaic and anapestic words ending in position 7 constitutes a major and essentially metrical agreement in technique of composition between Aratus and Hesiod.¹⁷ Table II perhaps makes this more clear. In it are presented figures for the total number of lines with word-ends in position 5, the percentage of such lines in which the word-end in 5 is followed by the element $\overset{5}{\cup}$ and the percentage in which the word-end in 5 is followed by the elements $\overset{7}{\cup\cup}$ and $-\overset{7}{\cup}$. This table demonstrates, I believe, that the proportion of the combination of word-ends in positions 5 and 7 is greater in Hesiod and Aratus than the total number of word-ends in position 5 would lead us to believe.

TABLE III

Word-ends in position 7

Iliad	Odyssey	W&D	Aratus	Callimachus	Apollonius
460	478	561	495	470	412

In the case of position 7 (table III) the situation is obscured by special factors. Although Hesiod and Aratus have the highest number of word-ends, as one would expect on the basis of the figures for the elements $-\overset{7}{\cup}$ and $\overset{7}{\cup\cup}$, Hesiod is markedly the higher of the two. Aratus with 495 word-ends here is only slightly higher than Homer while Callimachus, with 470, is unexpectedly high. This results from the low use of the element $\overset{7}{\cup\cup}$ in Aratus and its high use

¹⁷ That the phenomena here observed are essentially metrical in character, and not an accident of subject matter or vocabulary should not need demonstration. It is a truism of metrical studies that the vocabulary of the hexameter poems is the product of the metrical requirements of the hexameter form. It follows that an individual poet's vocabulary is the product of his individual feeling for the cadence of the line. The fact that $-\overset{7}{\cup}$ and $\overset{7}{\cup\cup}$ rise and fall together in all texts should prove this (see O'Neill, *op. cit.*, tables 6 and 7).

in Callimachus.¹⁸ The frequent occurrence of $\upsilon \text{ } ^7$ in Callimachus, more or less proportionate to his number of word-ends in position $5\frac{1}{2}$, is surprising in view of his low number of $- \text{ } ^7$ and $\upsilon \text{ } ^7$.¹⁹ The explanation must lie in the necessity of avoiding word-ends in position $7\frac{1}{2}$, Hermann's Bridge. After a word-end in position $5\frac{1}{2}$ the only possible words and combinations, apart from combinations of very short words, are $\upsilon \text{ } ^7$, $\upsilon | - \text{ } ^8$ and $\upsilon - \text{ } ^8$ or a still longer word. All three are high in Callimachus.²⁰ The fact that he manages to work in the element $\upsilon - \text{ } ^8$ in one out of every six lines is eloquent testimony to the power of the form to create vocabulary. Callimachus was, then, forced to the frequent use of the element $\upsilon \text{ } ^7$ although it produced a long final syllable *in arsi* in the central part of the line. He used it with one rigid restriction, however — just as the preceding word must end with a short syllable *in thesi* in position $5\frac{1}{2}$, so the following word must also end with a short syllable *in thesi* in position 8, $9\frac{1}{2}$, or ten. The elements $- \text{ } ^9$ and $\upsilon \text{ } ^9$ together occur in his work only once in a hundred lines.

TABLE IV
Word-ends in position 8

Iliad	Odyssey	W&D	Aratus	Callimachus	Apollonius
623	608	593	578	668	614

Passing over word-ends in position 8 (table iv), where Aratus and Hesiod have the lowest number, as one might expect, and Callimachus the highest, if we turn to table v, where the figures for word-ends produced by elements longer than $\text{ } ^9$ in position 9 are given, we see that here Aratus, while having a radically higher total than his fellow Alexandrians, agrees with the earlier poets in general and is not particularly Hesiodic. The *Phaenomena* has a few more word-ends here than the Homeric norm, the *Works and Days* a few

¹⁸ O'Neill, *op. cit.*, table 4. Iambic words are low in all positions in Aratus. Figures for all positions are *Il.* 442, *Od.* 397, *W&D* 425, Aratus 243, Callimachus 396, Apollonius 355. The percentage (64.6) of Aratus' iambic words in position seven is actually higher than that of any other poet except Callimachus.

¹⁹ Figures for $\upsilon \text{ } ^7$ are *Il.* 245, *Od.* 236, *W&D* 261, Aratus 156, Callimachus 257, Apollonius 220.

²⁰ O'Neill, *op. cit.*, tables 4, 8, and 11.

TABLE V
Word-ends in position 9

Iliad	Odyssey	W&D	Aratus	Callimachus	Apollonius
167	164	156	172	72	134

less. The figures for the elements $\cup \cup \overset{9}{-}$ and $- \overset{9}{-}$ are significant, for these word-types not only produce a word-end in position 9 but follow one in position 7. They are *Iliad* 69, *Odyssey* 63, *Works and Days* 80, *Phaenomena* 78, Callimachus 10, and *Argonautica* 25. Callimachus' treatment of position 9 is similar to his treatment of position 7. Just as there he liked word-ends only if not preceded by a word-end in position 5, and if not followed by a word-end in position 9, so in position 9 he admits with any freedom only word-types which are preceded by words ending in neither position 5 nor 7. Of his 72 cases of word-ends at position 9, 44 are the elements $\cup - - \overset{9}{-}$ and $\cup - \cup \cup \overset{9}{-}$ which follow a word-end *in thesi* in position $5\frac{1}{2}$ and preclude a word-end in position 7, though even these show a decline from the early hexameter.²¹ Aratus on the other hand actually has more combinations of word-ends at 7 and 9 than Homer and agrees closely with Hesiod.

To summarize, Callimachus, when compared with the Homeric norm, shows a decline in all word-types ending at positions 5, 7, and 9, with the exception of the element $\cup \overset{7}{-}$ discussed above. This decline is strongest in word-types and combinations which produce word-ends at two of these relatively unpopular positions.²² This

²¹ Fränkel, *op. cit.* (see note 15) 222, says, "die Verse ohne Hephthemimeres und ohne Bukolische Zäsur bei ihm (Callimachus) auch nur in zwei Varianten vorkommen: *ἐπερχομένην ἐδέχοντο* und *Ποσειδάωνος ἑταίρῃ*. Also um der Gleichmässigkeit willen, um die Form seiner Verse straffer zu binden, schränkte er die Mannigfaltigkeit der Ablauftypen ein; nicht aber, weil er an dem doppelten männlichen Einschnitt Anstoss genommen hätte." This view of Callimachean practice, while sound in general, in this instance ignores the important fact that words of the *ἐπερχομένην*-type show a sharp decline from Homer while those of the *Ποσειδάωνος*-type show an equally sharp rise. Figures for $\cup - \cup \cup \overset{9}{-}$ are *Il.* 61, *Od.* 70, Call. 44; for $\cup - \cup \cup \overset{9}{-} - \overset{9}{-}$ are *Il.* 22, *Od.* 28, Call. 40. It is by means of observing the relative preferences for the different admitted verbal patterns that the basic scheme underlying all Callimachus' variations from Homer becomes apparent.

²² This view differs from that of Meyer, who discovered the avoidance by Callimachus of the double "masculine caesura" in positions 5 and 9, and 7 and 9 (W. Meyer, "Zur Geschichte des griechischen und des lateinischen Hexameters," *SBAW, phil. Kl.* [1884] 988), in that it regards the avoidance of combinations of word-ends as the result of a general and more basic tendency to avoid all word-ends in these positions.

development is not peculiar to Callimachus. Apollonius tends to agree with him, though varying less sharply from Homeric practice, as does Theocritus, while Quintus Smyrnaeus and Nonnus carry the same tendencies much further.²³ Only Aratus resists this historical development of the hexameter form and, in fact, varies from Homer in the opposite direction. Callimachus, as Professor Fränkel has told us, accepted the more common Homeric verbal patterns for his own use and rejected the less common. But Aratus had a different model. His ear is attuned to the Hesiodic harmonies and he accepts as normal and correct those usages which were characteristic of his master.²⁴

Callimachus, a nice critic, gave high praise to the *Phaenomena* though his own practice in composition was so different. He could not, for example, have written lines 2 and 3 of the text from which we took our start. He also said 'Ἡσιόδου τό τ' αἶσιμα καὶ ὁ τρόπος. Here, of course, he is, in a sense, exaggerating. The poem and the manner are not purely and simply Hesiodic. Aratus is of his own time (Alexandrian) and is, in significant part, himself. But he is strongly Hesiodic and I think that it is clear that Callimachus had in mind, or may have had in mind, along with other more specific stylistic characteristics, metrical matters, the wide use by Aratus of lines of a typically Hesiodic cadence, in making his comparison.

Professor O'Neill recently examined the question of the possible metrical relationship between Hesiod and Aratus, using essentially the same material, and came to the conclusion that there was none.²⁵

²³ Figures for the elements $\underline{\underline{v}}\underline{\underline{v}} - \frac{7}{-}$ and $\underline{\underline{v}}\underline{\underline{v}} - \frac{9}{-}$ are:

$\underline{\underline{v}}\underline{\underline{v}} - \frac{7}{-}$ Theocritus 115	Quintus 54	Nonnus 52
$\underline{\underline{v}}\underline{\underline{v}} - \frac{9}{-}$ Theocritus 41	Quintus 31	Nonnus 8

The figures for Theocritus are from O'Neill, *op. cit.*, tables 6 and 7; those for Quintus have been compiled from the first 1000 lines of his epic, *Posthomeric*; those for Nonnus have been compiled from the first 1000 lines of the *Dionysiaca*.

²⁴ A scrap of biographical evidence may be relevant here. Aratus, so Suidas tells us (s. v. "Ἀρατος), was a pupil of the grammarian Menecrates of Ephesus. Menecrates wrote an *Ἐργα* (*E.M.*, s. v. ἡθμός) and a work on astronomy (Schol. Eur. *Rhesus* 529). Of Menecrates Varro says, "(scripserunt) easdem res etiam quidam versibus, ut Hesiodus Ascreaeus, Menecrates Ephesius" (*R.R.* 1.1.9). It may have been from him that his pupil Aratus learned the complicated art of composing hexameters.

²⁵ *Op. cit.* 132: "Aratus is not particularly Hesiodic but resembles Callimachus more than he does any of the early texts." O'Neill's figures for Hesiod were compiled from the *Works and Days* and, to make up 1000 lines, the first 170 lines of the *Shield of Heracles*. As the *Shield* is very similar metrically to the *Works and Days*, his figures are valid for the *Works and Days* considered by itself.

It will be necessary, in defense of the position adopted in this paper, to examine, briefly, his arguments.

Professor O'Neill's first point was that in the percentages of localization of the various metrical word-types, i.e., the percentage of the total number of occurrences of each type in the two or three preferred positions for that type, there is little agreement between the two poets.²⁶ This, while true, is irrelevant. In concentrating on the question of the percentage of the total occurrences of each word-type in the different possible positions, Professor O'Neill has neglected the important question of the choice of word-type. In using this approach to the problem no metrical differences at all would appear between a poem composed wholly of lines of the pattern,

Πηλαγόνων ἐλατῆρα, δικασπόλον οὐρανίδησι,

and one composed of lines of the pattern,

πλάγχθη, ἐπεὶ Τροίης ἱερὸν πτολίεθρον ἔπερσε,

as each would be composed exclusively of "localized" elements. What Professor O'Neill's figures do prove is that there is no relationship between the poets in the extent to which they observe rules common to all the hexameter poets. One would hardly expect Aratus to observe to exactly the same degree rules closely adhered to by the bard of Ascrea himself. In general all the bookish and deliberate Alexandrians were more punctilious in metrical observances than were the earlier poets.

Professor O'Neill's second point was presented in his discussion of tables for the relative frequency of word-beginnings and word-endings.²⁷ While recognizing similarity between Hesiod and Aratus in that they both show an exceptionally high frequency of word-ends with a long syllable *in arsi* and a low frequency of word-ends with a single short syllable *in thesi*, he pointed out that the two poets differed strikingly in their use of words ending with two short syllables *in thesi*, Aratus having much the higher number. This is a point of some moment and we must consider in more detail the elements which produce this difference. Words ending with two short syllables occur for the most part in positions 2, 8, and 10. In position 2 the only type that can end with two short syllables is

²⁶ *Op. cit.* 119.

²⁷ *Op. cit.* 127 and tables 36 and 37.

the element $- \cup^2$ (only words longer than $-$ or $\cup \cup$ were included in these tables). It occurs much more often in Aratus than in Hesiod. In position 8 the larger number of words ending in two short syllables in Aratus is the result of a greater use of the element $\cup - \cup^8$, for neither $- \cup^8$ nor words of six *morae* show any sizeable increase over Hesiod. The element $\cup - \cup^8$ was a great favorite with all the Alexandrian poets. Aratus with 130 cases is lower than Callimachus (171) and Apollonius (167) but much higher than Hesiod in whom $\cup - \cup^8$ occurs 86 times. In position 10 the increase in words ending with two short syllables in Aratus results from a larger use of the element $- \cup^{10}$, for longer words ending in 10 are high in both Hesiod and Aratus. The difference in the number of words ending with two short syllables in Hesiod and Aratus is thus the result of a larger use in Aratus of the elements $- \cup^2$, $\cup - \cup^8$, $- \cup^{10}$. In no case is the increase demonstrably the result of metrical factors, for there is no check provided by the similar behavior of other word-types ending in the same place, as there is in the case of words ending with a long syllable *in arsi* in position 5 for example, where all important word-types ending there in Hesiod and Aratus are high.

The differences between Hesiod and Aratus, however, no matter how much we may minimize them, remain and are a factor to be considered. But surely, in questions of the relationship of art-forms, similarities are not cancelled out by dissimilarities. A substantial area of unquestionably metrical agreement between the two poets has been demonstrated. This agreement is in no way affected if the two can be shown to vary in their preferences for verbal patterns in the beginning or end of the line or in other particulars.²⁸

Strong evidence that the hexameter of Hesiod and Aratus was basically similar, and distinct from that of Homer, Callimachus and Apollonius, is to be found, I think, in Professor O'Neill's own table for the relative frequencies of quantitative groups.²⁹ No similarity

²⁸ No effort is made in this paper to discuss Aratus's metrical idiosyncracies or the Alexandrian elements in his hexameter. For a rather doubtful special rule followed by Aratus in the first half of the line see J. Arnolds, *Studia metrica de poetarum graecorum hexametro epico* (diss. Bonn, 1913) 5 f.; but on this see Fränkel, *op. cit.* (see note 15) 225, note 2. If I have not discussed the relative preference for word-ends in positions 2 and 3, the first of Fränkel's three caesurae, it is because Hesiod does not vary from Homer here nor can any significant developments be traced in the later hexameter.

²⁹ *Op. cit.* table 34.

between the two poets can be observed in the frequencies of words of one or two *morae* (∪, -, ∪∪). Such words, however, have little metrical character of their own. Nor is any correspondence to be observed in word-types of seven or more *morae* (∪-∪∪- etc.). These word-types are comparatively rare and their large use in Aratus is possibly the result of subject matter and vocabulary. However, in the frequencies of words of three (-∪, ∪-), four (- -, -∪∪, ∪∪-, ∪-∪), five (- -∪, ∪∪-∪, ∪--∪, ∪-∪∪), and six (- - -, -∪∪-, ∪∪--∪, - - -∪, ∪∪-∪∪) *morae*, Hesiod and Aratus agree strikingly. I repeat from Professor O'Neill's table the figures for the percentage of all words in each text that occurs in each of these quantitative groups.

<i>Morae</i>	<i>Il.</i>	<i>Od.</i>	Hes.	Arat.	Call.	Apol.
3	17.3	17	11.4	11.1	15.6	16
4	18.4	20.1	23.9	26.8	21.8	19.5
5	12.8	13.2	11.4	10.8	14.7	15
6	9	8.3	9.7	10.8	8.9	10.9

In each of these groups, comprising in all nearly 60% of the words in each text, and including all the words that are both long enough to have a definite metrical character and short enough to be of frequent occurrence, Hesiod and Aratus stand together in sharp contrast to the other four. Only in the case of words of six *morae* is the contrast not clear, for there Apollonius, who is prone to the use of long words generally, agrees with Aratus rather than with his normal companions. In the percentage of word-types in the group of four *morae*, Aratus and Hesiod are the two highest, but Aratus is markedly the higher of the two. An examination of the occurrences of the individual types in the group shows that this discrepancy is to be explained by the larger use in Aratus of the element -∪∪ in positions 2 and 10, as noted above.

The metrical significance of these figures lies in the fact that all words in the groups of 3 and 5 *morae* must begin or end with a single short syllable. In the percentage of the total number of words in these two groups taken together the *Iliad*, *Odyssey*, Callimachus, and Apollonius vary only one percent — from 30.1% in the *Iliad* to 31% in Apollonius. Hesiod and Aratus are low in both groups and the percentages of their total number of words in the two groups are: Hesiod 22.8% and Aratus 21.9%.

In the groups of 4 and 6 *morae*, on the other hand, only the element $\upsilon - \upsilon$ begins or ends with a single short syllable. This element is, however, comparatively rare and is of lower occurrence in Hesiod than in Homer and of very low frequency in Aratus.³⁰ In the percentage of their total number of words in these two groups, Hesiod with 33.6% and Aratus with 37.6% are high — the discrepancy again to be explained by the larger use of $- \upsilon \overset{2}{\text{—}}$ and $- \upsilon \overset{10}{\text{—}}$ in Aratus — while all the other texts are lower. Here Homer (*Il.* 27.4%, *Od.* 28.4%) does not agree so closely with Callimachus (30.7%) and Apollonius (30.4%) as in the percentages for words in the quantitative groups of three and five *morae*. The difference is perhaps to be explained by the larger use of longer words in all the Alexandrian poets and by their smaller total number of words.

Such comprehensive figures as these obscure many variations in the treatment of individual positions and of individual word-types. Nevertheless, even when all possible qualifications are made, I have no hesitation in seeing in them confirmation for the conclusion reached by our more selective but less comprehensive method of comparing texts; namely, that the radical metrical differences between Aratus and contemporary and subsequent hexameter poets can best be explained by reference to his model, and that Aratus, as in so many other respects, was influenced in his feeling for the cadence of the line by the practice of Hesiod.

³⁰ *Op. cit.* table 35.