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SCALE AND THE PAULINE EPISTLES
by The Rev. Dr. GEORGE K. BARR

All creative activity has its locus at an appropriate point within a wide scale spectrum. An engineer may design a minute silicon chip or an immense oil rig; an architect may design a doll's house, furniture for nursery school infants or a cathedral; Monet may draw a thumbnail sketch or paint vast canvasses of his lily pond. The difference is not only one of size, it is of scale. The "textures" of the works are different, that is, the size of the details. It is the size of detail which determines scale, not the overall size of the design. A block of flats is designed on a domestic scale, whether it is 50 feet long or a mile long. A cathedral bay remains on the same monumental scale when the rest of the cathedral has fallen down. A creative artist may carry out designs over a wide scale range in art, architecture, photography, engineering etc. Literature is no exception; it is an art form and the scale texture is reflected in sentence length. Scale, however, has gone unnoticed by stylometrists, linguists and literary scholars.

Human scale

Many dimensions are related to the human body - steps, handrail heights, door handle heights, ceiling heights in small houses. But cathedral ceiling heights of 100 feet and public building doors 20 feet high are not related to the human frame. Even in a 20 foot high door, however, the handle will be found at the three or four foot level. If it were halfway up as it is in a domestic door, no one would be able to reach it. There are therefore two categories of dimension of which one is related to the human frame: the other is monumental and is related to myth. Mythological understanding of human importance or of a higher level of being is reflected in monumentality. One building may contain elements of different scales. The gate house to a baronial mansion may have domestic windows and doors, but the battlements round the roof echo the details of the mansion house and reflect a mythological understanding of the importance of the owner.

Rudolph Otto's language describing the mysterium tremendum is often the language of scale. Words like "monstrous" and "grandeur" do not refer simply to size, but to the superhuman quality which in architecture is called monumentality. The numinous content in the writings of John Ruskin, St. Paul and James S. Stewart is often directly reflected in an increased average sentence length. The Pauline epistles contain mixtures of scale: a first theological half with a long average sentence length is often contrasted with an ethical second half which has a much smaller average sentence length. These parts are conceived at different scale levels.

Statistical stylometry

In statistical studies the element of scale has gone unrecognised. Where changes of scale occur, the statistician may report that the text is not homogeneous with regard to sentence length. That does not necessarily mean that more than one author is involved. Many texts have been found, in both English and Greek, in which dramatic changes of scale occur, mostly related to internal changes of genre or mood. These changes affect the average sentence length.

The statistician may say that the Pauline epistles cannot all have been written by one author because the average sentence length varies too greatly across the corpus. But if the first half of most epistles is compared with the second half, greater differences in average sentence length will be found than exist between epistles.

Block sampling of texts for statistical purposes may prove to be unreliable if blocks straddle the boundaries between sections written at different scale levels. This is almost unavoidable in the Pauline epistles.

The use of "modified full stop sentences" (MFSS) which divide the Greek texts at every full stop, colon and interrogation mark, does not respect the scale of the text. It results in loss of contrast and the destruction of scaling patterns inherent in the text. It creates a false system of stops which are given equal value, ignoring the essential nature of the colon which is a sign of continuity rather than of division. It may also give misleading data in measuring the occurrence of words as the first or second word in a sentence. There is, however, a substantial measure of agreement among editors
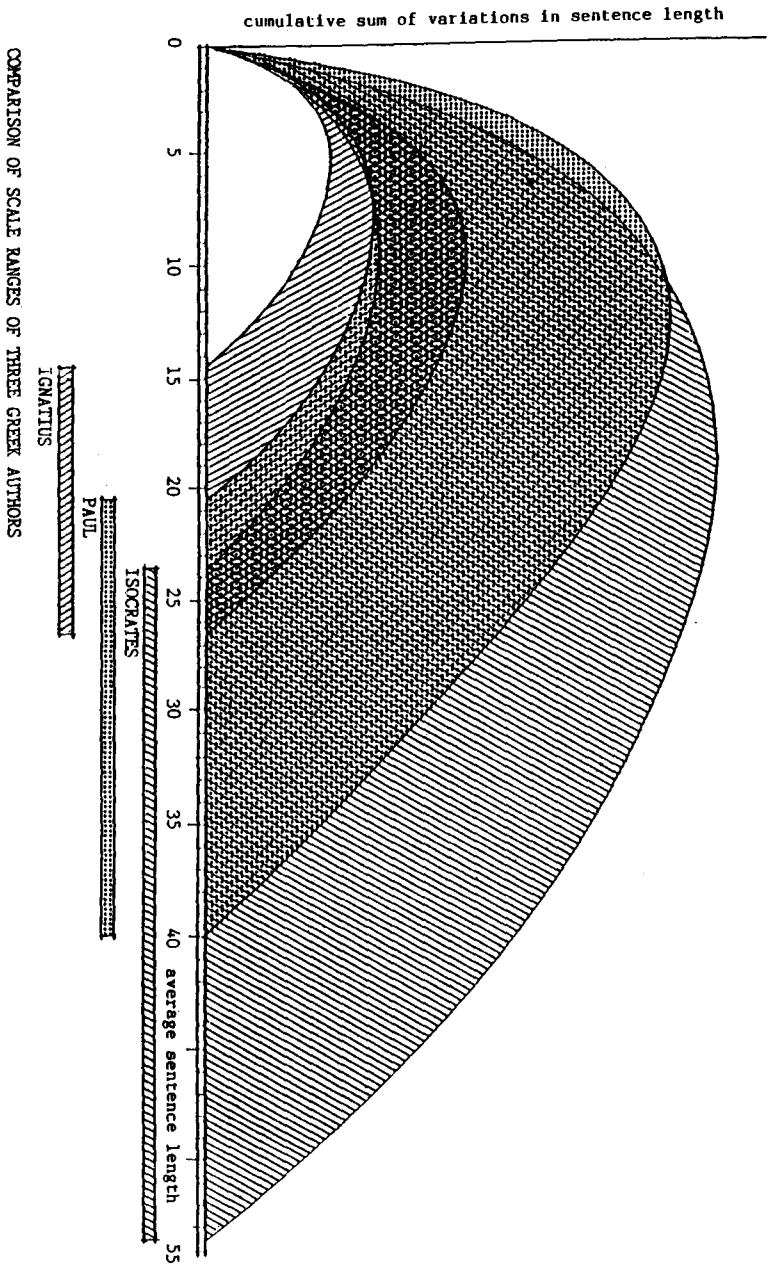
regarding the major stops in the Greek texts and these may be usefully employed for several purposes. The measurement of scale-changes in terms of distance from the beginning of the work eliminates the problem of punctuation.

Techniques

In my thesis, (*SCALE IN LITERATURE - with reference to the New Testament and other texts in English and Greek*. University of Edinburgh. 1994.), graphical techniques were developed to demonstrate scale in literature. Cumulative sum charts of sentence sequences have been used for many years to give a picture of the "shape" of a piece of writing. A picture of a whole corpus can be presented by superimposing the graphs of each work scaled to a common base. In doing this certain common characteristics may become evident.

Tables of sentences of different lengths have been used to demonstrate sentence distribution, but with such discrete material it is difficult to use tables to compare different works. This problem is overcome by sorting the sentences in order of length and preparing a cumulative sum graph of the series. This produces smooth distribution curves for each work which can be compared with other curves. If the ranges of such curves for several authors are superimposed on a standard base then areas of overlap and areas of discrimination are clearly seen. Taking it a step further, these distribution ranges may be superimposed on a base representing average sentence length. This reveals further areas of discrimination and overlap. The comparison between the sentence distribution ranges of Ignatius, Paul and Isocrates is shown on page 25. The range of the Pauline corpus is seen to be modest compared to that of Isocrates.

It is sometimes found that when the distribution graphs of two pieces by the same author are scaled to a common base the curves match exactly, even though there is considerable difference in the average sentence length. This means that the distribution of one is in proportion to the distribution of the other, but they are written at

COMPARISON OF SCALE RANGES OF THREE GREEK AUTHORS

cumulative sum of variations in sentence length

average sentence length

IGNATIUS

PAUL

ISOCRATES

different scale levels. One distribution is a "scaled-up" version of the other with sentences proportionally longer. Where such a coincidence occurs, then the average sentence lengths give a precise measure of the scale difference. This observation probably constitutes the first proof of the existence of scale in literature.

Sentence sequence graphs

It is important to relate these graphs to the content of the text. James Stewart in his sermons had the habit of outlining a human situation, using fairly short sentences. Then he would consider that situation in the light of the holiness of God in passages with great numinous content. These "numinous" passages have very long, monumental sentences which appear as great slashes in the graphs.

In other authors, changes of genre, say, from description to conversation, result in changes of scale from section to section. These are clearly seen in the graphs where the trace rises in the large scale sections and falls in the small scale sections.

In my own essays, I noticed the repetition of certain forms, and on referring to the content, found that each example of the form represented material which had been thought through and written out in one operation. For example, a graph of a thesis on the Church in the Highlands showed a double motif. The first represented material concerning the pre-Reformation Church and the other the post-Reformation Church. The thesis really consisted of two separate essays. These characteristic graphical motifs I called PRIME PATTERNS; they reflect material thought through and written out in one operation. Such patterns occur in the works of other authors. Three of the seven letters of Ignatius sustain consistent patterns over the whole length of the work, even though they differ in scale and average sentence length. This proved to be the key to the Pauline epistles where prime patterns are found in all thirteen epistles. These prime patterns are not, however, immediately evident as they are disguised by differences in scale, length, and complexity in the scaling pattern.
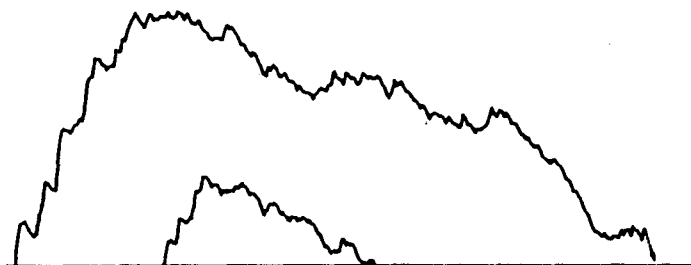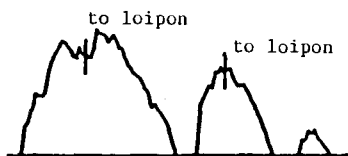
ROMANS 1-15 AND GALATIANS

loipon ouv

EPHESIANS   COL.   1 THESS.

to loipon

to loipon

PHIL.   2 THESS. PHILEM.

PAULINE EPISTLES

COMPARISON OF SENTENCE SEQUENCE GRAPHS

"Skewed symmetry" in the Pauline epistles

Two sets of Pauline sentence sequence patterns are shown on page 27. Galatians looks like a scale model of Romans. The graphs of Eph., Phil., Col., 1 and 2 Thess. and Philem. are similar in general shape to each other, but differ from those of Ro./Gal. How can these differences be reconciled?

The Eph. to Philem. group all show a V-notch at the top, and this suggests that each graph consists of two sections, one large scale and the other small scale. A cumulative sum graph of a simple work consisting of a few long sentences followed by a few short sentences takes the form of a triangle. If two such works of different scales are combined, the resulting graph will be M-shaped with a V-notch at the top. Considering this to be the possible construction of the Paulines, it was thought that a marker might be found in the area of the notch to indicate a change of scale - a change of subject or something like that. In Phil. the term τὸ λοιπόν (finally) lies in the notch, clearly marking a change in subject. In 1 Thess. λοιπὸν οὖν (finally) is found in the notch. In 2 Thess. τὸ λοιπόν is found in the notch. In Eph. there is the dramatic climax to the theological section - "One Lord, one Faith, one Baptism" - followed immediately by the change to the ethical - "Each has received a special gift". In Col. there is the theological climax - "Your real life is in Christ and you will share his glory" - followed immediately by the change to the ethical - "You must put to death your earthly desires".

Clearly the basic pattern of the Paulines consists of a large scale section (the A section) followed by a small scale section (the B section). The junction of these I called the "hinge point". The batch of longer sentences immediately following the hinge I called the "thrust" into the B section. There is a remarkable symmetry to be observed. If the number of sentences on each side of the thrust is counted, the results using UBS3 are as follows:

1 Thess. -	26 before/26 after
2 Thess. -	13 before/13 after
Phil.	31before/28 after
Col.	20 before/21 after
Phil. (Souter)	28 before/30 after

It is a symmetry of sentences, but there is a scale difference. The sentences in the A section are long sentences; in the B section they are shorter. It is a "skewed symmetry". Can this feature link the Ro./Gal. group and the Eph./Philem. group?
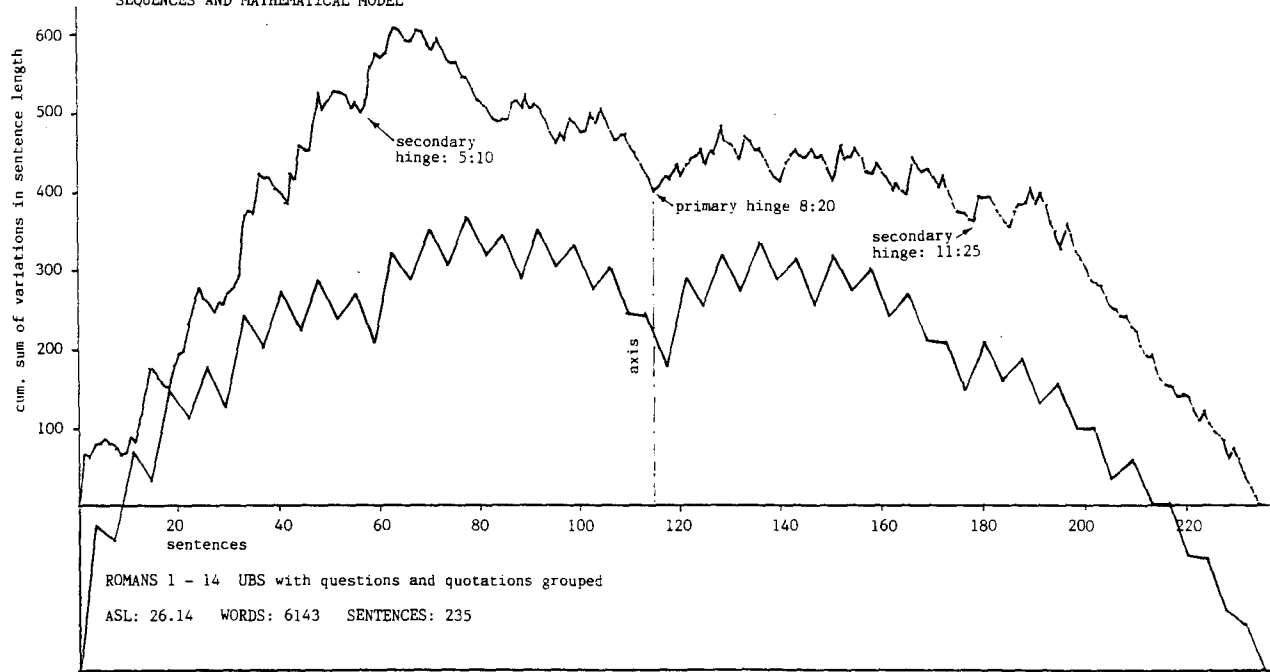
A mathematical model for the Paulines

The structure of the Paulines can be mimicked mathematically. In the Ephesians group there are two main contrasts. The first is the cycle of long and short sentences which gives the initial stepped formation in the graph. The second is the main contrast between the scale of the A section and the scale of the B section. After some experiments, two numbers were selected to represent the sentence cycle - 12/4. For the ratio between the two sections, 1.5:1 was chosen. The choice of numbers and ratio, however, is not critical. It affects the rendering of fine detail, and in the case of Romans (page 30) the numbers 12/3 and a ratio of 1.33:1 were used to enhance the detail, mimicking the opening cyclic series more closely.

A cumulative sum graph of 12/4 gives a simple triangle (Level 1). Increasing each by the ratio 1.5:1 gives 18/6 and these are added to the 12/4. A cumulative sum graph of the series 18/6-12/4 gives the simple notched figure (Level 2). Increasing all these terms by a further 1.5:1 and adding the result to the series gives 27/9-18/6-18/6-12/4. This provides Level 3 which gives a very fair representation of the features of the graph of Eph. (page 31). Note that the features of the B section correspond to Level 2, and the features of the B2 section correspond to Level 1 of the Model.

Up to this point one can imagine the mental process of writing with a rhythm of long and short sentences, and one may imagine that rhythm gradually reducing in scope as the letter goes on - that is, the scale of the rhythm growing smaller. It is difficult to imagine a more complex system. However, when the model, based on the two characteristics observed in Eph. is developed to Level 6, it is found that that level provides a schematic for Romans 1-14 (page 30). It is not an accurate fit, but it is the features rather than the fit which is important. The graph of Romans has the central hinge, the symmetry of sentences, the many steps at the beginning. The model solves the problem of the stepped beginning. The steps are not just
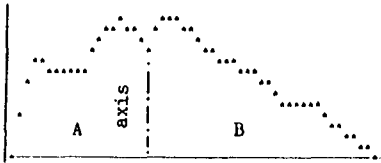
COMPARISON OF GRAPHS OF SENTENCE

SEQUENCES AND MATHEMATICAL MODEL

secondary
hinge: 5:10

primary hinge 8:20

secondary
hinge: 11:25

axis

cum. sum of variations in sentence length

600

500

400

300

200

100

20   40   60   80   100   120   140   160   180   200   220

sentences

ROMANS 1 - 14 UBS with questions and quotations grouped
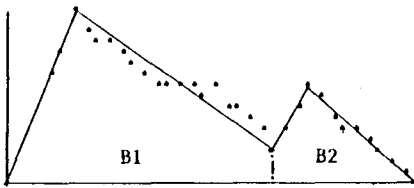
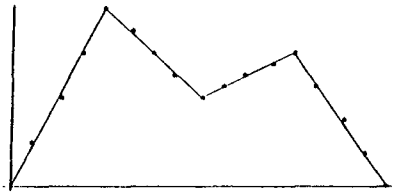ASL: 26.14   WORDS: 6143   SENTENCES: 235

MODEL: LEVEL 6

EPHESIANS 1:1 – 6:4
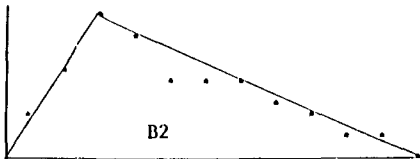
UBS TEXT ADJUSTED

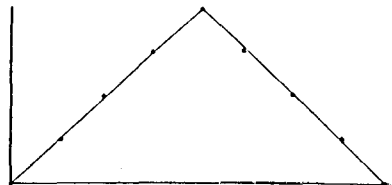MODEL: LEVEL THREE

ADDITIONAL POINTS INTERPOLATED

EPHESIANS 4:11 – 6:4

(SECTION B)

MODEL: LEVEL TWO

ADDITIONAL POINTS INTERPOLATED

EPHESIANS 5:18 – 6:4

(SECTION B2)

MODEL: LEVEL ONE

ADDITIONAL POINTS INTERPOLATED

an opening feature; they are an essential part of the rhythmic structure which runs right through the fourteen chapters. The number of steps in different letters varies because of differences in the complexity of the scaling system which has been mimicked by the mathematical model.

Prime patterns in each of the Pauline epistles

Romans 1-14 forms the prime pattern and represents the material prepared and dictated, possibly in one operation. Strings of questions have to be grouped in accordance with the scale of the context. (This is also necessary to a lesser extent in the Corinthian letters and Gal.) Chapter 15 is an added piece with a greater average sentence length than the closing part of Chapter 14. Chapter 16 contains greetings with an appropriately low average sentence length.
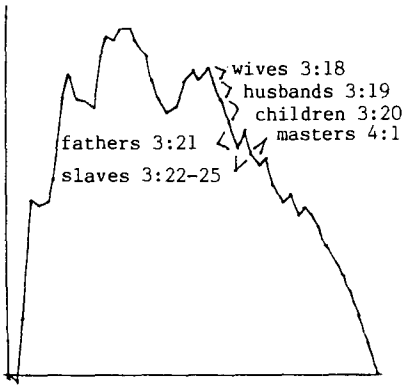
1 Cor. 1-6 form a prime pattern. The rest of 1 Cor. consists of small topics with a pattern to each. The prime pattern has the characteristic skewed symmetry, hinge point etc.

2 Cor. 1-9 show small topics with a pattern to each. A fragment has been inserted at 6:14-7:1. The prime pattern is 2 Cor. 10:1-12:19a. One or two sentences are missing from the beginning; otherwise this pattern forms a complete epistle. Chapter 13 is an afterthought.

Gal.1:1-5:15 is a prime pattern, the remainder being afterthoughts. The hinge in the graph falls precisely at the change from Law to Faith.

Ephesians 1:1-5:33 provides the prime pattern. This ends with the grand vision of Christ and the Church. To this, sundry afterthoughts are added in which Paul gives further advice to various classes of people, ending with the passage on the armour of God. (Note comparison with Col. below.)

Phil. consists entirely of a prime pattern with the most sophisticated layered scaling system. The first τὸ λοιπόν marker lies in the notch of the graph. The second τὸ λοιπόν lies in another notch in the centre of section B. Section B on its own replicates the features of the whole epistle. The two occurrences of "finally" are

wives 3:18
husbands 3:19
children 3:20
fathers 3:21   masters 4:1
slaves 3:22-25

COLOSSIANS

wives 5:22-24

husbands 5:25-33
(Christ and the Church)

children 6:1-3
fathers 6:4   slaves
masters
tou loipou
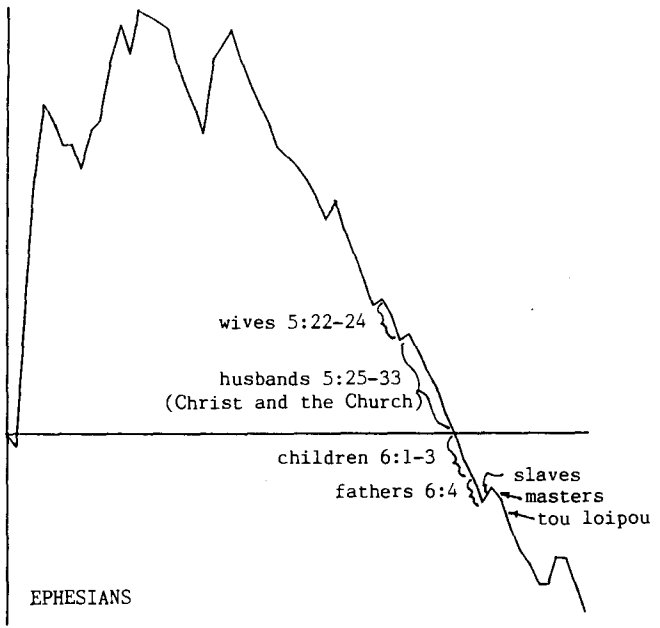
EPHESIANS

by no means random, but are tied in a very precise scaling relationship.

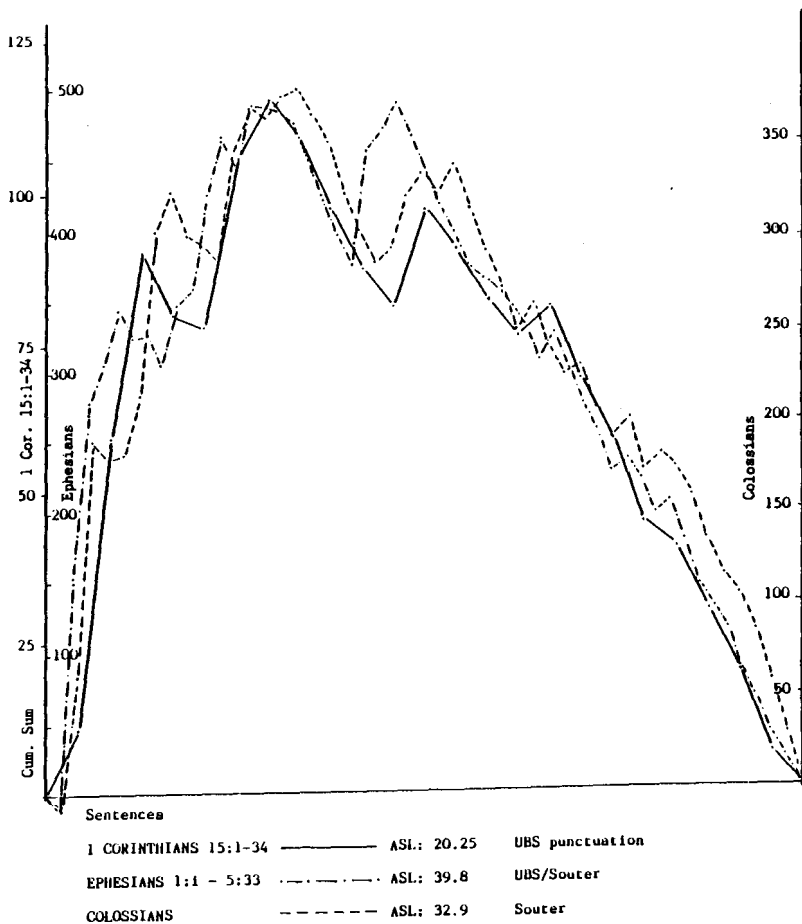Col. consists entirely of a prime pattern. The advice to various classes of people all falls well within the pattern, which is not the case in Eph. This is shown on page 33. This suggests that Eph. is the prior epistle, ending with the vision of Christ and the Church. The afterthought added advice to further groups, requiring a further mention of fathers. In Col., however, the material has been recast; the vision of Christ and the Church has been dropped, and all the advice grouped together within the body of the prime material. The similarities between Eph. and Col. can be seen when sentence sequence graphs of the prime patterns are superimposed on a common base. On page 35 they are compared also with a tiny prime pattern from 1 Cor. 15:1-34 which is the passage on resurrection. This last passage appears to represent a topic which has been well thought through and stored in the memory, and has been reproduced in individual prime pattern form amongst other topics. These three are very different in scale, size and average sentence length, but display the common Pauline features.

1 Thess. appears to be a development of the simplest form, consisting of two contrasting sections with different average sentence lengths. There is insufficient contrast to allow the more sophisticated scaling forms to develop. Λοιπὸν οὖν marks the change of scale.

2 Thess. is dominated by the huge second sentence which is a rogue. Nevertheless, the skewed symmetry is present and the τὸ λοιπόν marker lies in the expected position.

1 Timothy and Titus both show signs of disturbance. In each case this is traced to the passages concerning the qualities required in bishops, and in the latter epistle to some additional verses regarding Cretans. The prime pattern in 1 Tim. is from 1:1 to 5:7 with 3:1-16 omitted and is followed by afterthoughts. In Titus, the bishops passage (1:7-9) and the Cretans passage (1:12-16) should be omitted. In each case typical scaling patterns are thus restored.

2 Timothy is also disturbed. The passage from 1:15-2:7 concerning Phygelus, Hermogenes and Onesiphorus, and the following verses giving advice to Timothy, sit better with greetings at the end of the letter. Placing that material after 4:5 restores the

Sentences

1 CORINTHIANS 15:1-34 ———— ASL: 20.25	UBS punctuation
EPHESIANS 1:1 - 5:33 ·—·—·—· ASL: 39.8	UBS/Souter
COLOSSIANS — — — — — ASL: 32.9	Souter

symmetry and gives a close likeness to the adjusted version of 1 Timothy.

Philemon provides a tiny Level 1 pattern with the change of scale falling precisely on the critical verse at v.17.

Classification of the Pauline epistles

A new way of classifying the Pauline material is suggested, and this is shown on page 37. The small topics in the Corinthian correspondence are separated from the remainder of the material. The rest of the material consists largely of prime patterns with occasional afterthoughts. 2 Cor. 6:14-7:1 is an isolated fragment. The bishops and Cretan passages appear to be insertions, possibly marginal notes which through time have been incorporated in the text.

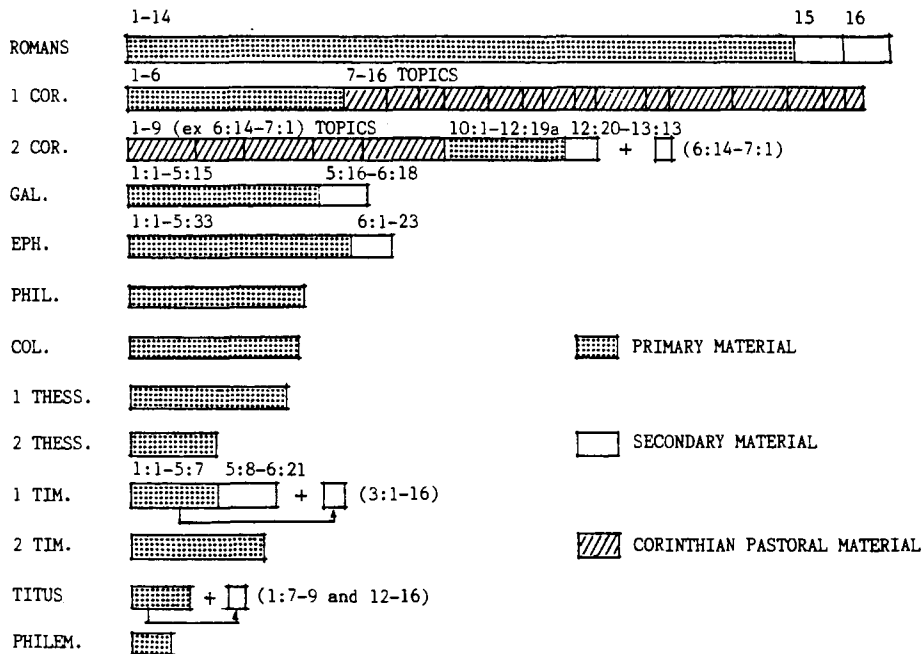Prime patterns account for 67% of the entire text, or 88% if the small Corinthian topics are not included.

The striking rhythmic nature of these prime patterns may be appreciated by comparing a montage of all the prime patterns (page 38) with a montage of the sequence graphs of the twelve forensic speeches of Isaeus (page 39). Note the disposition of the graphs relative to the base line. Isaeus may begin a speech with shorter than average sentences (graph falls below the base line) or with longer than average sentences (graph rises above the base line). The prime patterns of all thirteen Pauline epistles are consistent in form, though showing varying degrees of complexity. They all show the same skewed symmetry, and the hinge points are seen to lie along the central axis.

Origin of the prime pattern

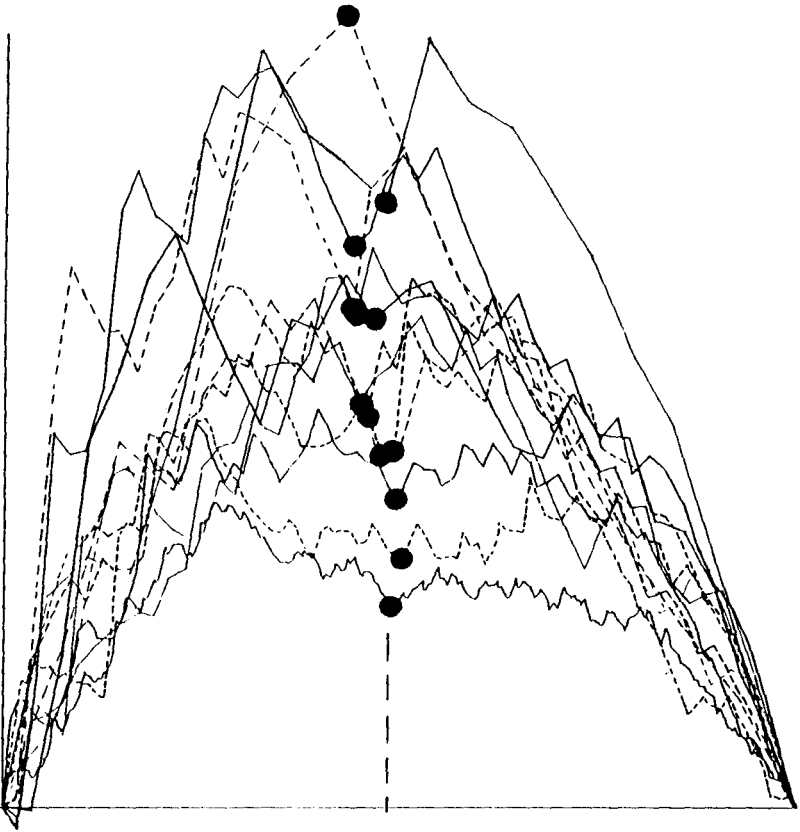Several possibilities have been explored: the influence of modern editors in punctuating the ancient texts; of the researcher in his interpretation of the punctuation; the possible use of conventional epistolary forms; the part the secretary must have played in the writing of the epistles; the theory that a school of Paulinists were responsible for the writing of disputed epistles; and lastly, the

CLASSIFICATION OF THE PAULINE TEXTS

```
                    1-14                                                    15    16
ROMANS              [::::::::::::::::::::::::::::::::::::::::::::::::::::::::::][    ][    ]
                    1-6                      7-16 TOPICS
1 COR.              [::::::::::::::::::][///////////////////////////////////////////]
                    1-9 (ex 6:14-7:1) TOPICS      10:1-12:19a 12:20-13:13
2 COR.              [///////////////////////////////][:::::::::::::][  ] +  [ ] (6:14-7:1)
                    1:1-5:15             5:16-6:18
GAL.                [::::::::::::::::::::::::::::][    ]
                    1:1-5:33             6:1-23
EPH.                [::::::::::::::::::::::::::][    ]

PHIL.               [::::::::::::::::::::::::::]

COL.                [::::::::::::::::::::::::::]            [::::::] PRIMARY MATERIAL

1 THESS.            [::::::::::::::::::::::]

2 THESS.            [::::::::::::]                          [    ] SECONDARY MATERIAL
                    1:1-5:7    5:8-6:21
1 TIM.              [:::::::::][    ]  +  [ ] (3:1-16)

2 TIM.              [::::::::::::::::::::]                  [////] CORINTHIAN PASTORAL MATERIAL

TITUS               [::::::] + [ ] (1:7-9 and 12-16)

PHILEM.             [::::]
```

SENTENCE SEQUENCE GRAPHS

COMPARISON OF PAULINE PRIME PATTERNS

Prime patterns account for 67% of the Pauline epistles
or 88% if the small Corinthian topics are not included.

● PRIMARY HINGE POINTS
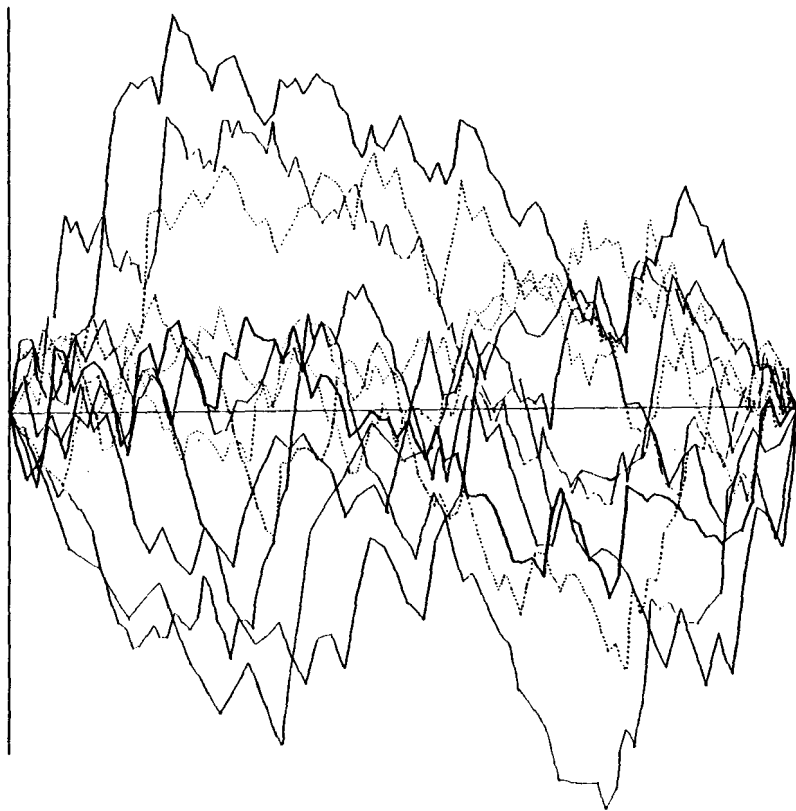
TWELVE SPEECHES OF ISAEUS

COMPARISON OF CUMULATIVE SUM CHARTS OF SENTENCE SEQUENCES

possibility that the epistles come from the hand or from the mind of a single author.

There is no indication that prime patterns of the Pauline type are to be found in any of the catholic epistles, in the letters of Ignatius or the speeches of Isaeus, or in the writings of Isocrates. If the patterns were due to punctuation they might be expected to appear in non-epistolary writings, but no such patterns with the Pauline characteristics have as yet been found.

Nor can they be attributed to the manipulation of the punctuation by the researcher. The texts used were UBS3 and Souter which agree to a considerable extent regarding the principal stops. Where one interpretation has been favoured, it has the backing of reputable scholarship. At first sight there appears to be no escape from the problem of grouping strings of questions, but a check was made by grouping these mechanically according to the scale of the immediate context and this produced graphs which corresponded in their essential features to those prepared by grouping strings according to content and syntax. The mathematical model in no way creates patterns; it simply mimics the features found in the Eph./Philem. group. The fact that the graphs of the Ro./Gal. group correspond to other levels of the model shows that the difference between the groups is one of degrees of complexity and not of kind.

A study of epistolary forms and literary devices such as analogy, chiasmus, parallelisms, lists, letter types etc. and oratorical devices such as paranesis, diatribe and oration showed that none of these elements occurred with sufficient regularity and extent to account for the prime patterns.

It must be asked whether the Pauline epistles themselves provide a common epistolary form which might be detected and used by later pseudonymous writers. The structure of the A and B sections, which gives rise to skewed symmetry around the central axis and hinge point, is on occasion related to the combination of theological sections and ethical sections. But this is not always the case; some epistles do not have that division, yet retain the form. The astonishingly regular positioning of the LOIPON markers is not a feature that a secretary or a later imitator would detect.

The consistency of the rhythms in the epistles results in changes of scale occurring at specific points and within certain limits. In the case of the simple Level 1 epistles, 1 Thess. and Philem., a pseudonymous writer would have to reduce the scale and the average sentence length abruptly to a lower level at precisely 59%-60% of the way through the text. In the Level 3-4 group, the primary hinges in Eph., Col. and 1 Tim. lie within the 59%-62% range. In the Level 5-6 group, the hinges in Ro. 1-14, 1 Cor. 1-6, 2 Cor. 10-12:19a, Gal. 1:1-5:15, Phil., and 2 Tim. all lie within the 55%-60% range. On the fringe lie 2 Thess. and Titus both with primary hinges at 67%.

Those epistles which clearly show secondary hinges provide another demanding parameter. The secondary hinges in Ro. 1-14, Gal., Phil. and 2 Tim. all lie between 81%-85% from the beginning of the text.

The percentages indicating the position of scale changes are independent of punctuation and do not depend on interpretations of the text by modern editors. The hinge points are related to identifiable but different changes of genre in different epistles. It is inconceivable that a pseudonymous writer could meet these criteria, and indeed these features have not as yet been found in any works outwith the Paulines. No explanation has been found to account for these consistent patterns other than that they reflect an extraordinary sense of rhythm which is found only in the Pauline epistles. Whatever difficulties it presents to New Testament scholarship, the pattern of scale changes points to the very strong possibility that the prime patterns in the thirteen Pauline epistles reflect the rhythmic sense of one extraordinary writer.

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