

PLATO'S SEVENTH LETTER

It has recently been argued¹ on the basis of certain linguistic features that the *Seventh Letter*, attributed to Plato, cannot in fact have been written by him. The purpose of this article is to show that, on a correct interpretation, there is no significant difference in respect of these features between the *Seventh Letter* and works generally accepted as Platonic.

With their first criterion of authenticity, sentence length distribution, the work with which LMW compared the *Seventh Letter* was the *Apology*, described as being "Plato's only other continuous prose work of comparable size". In taking the *Apology* as their standard they failed to observe the principles laid down by themselves (p. 311) of comparing only works of the same type and homogeneous with regard to the use of the linguistic feature in question. To employ common terminology and call the one work a "Socratic apology", the other a "Platonic apology", is to gloss over a basic difference between the two : whereas the *Seventh Letter* is largely a straightforward narrative, the *Apology* is cast in the form of a speech to a jury. Furthermore, the *Apology* is not homogeneous, containing as it

does a dialogue between Socrates and one of his prosecutors, Meletus. It is true that in the *Seventh Letter* there are some snippets of conversation between Plato, Theodotes and Dionysius (348 c - 349 e), but only a dozen sentences are involved, and these cannot be regarded as having any influence on the general character of the work. This is not so with the *Apology* : here the dialogue section (24 c - 27 e) constitutes a seventh of the whole work, calculated on the basis of the number of words, and over a quarter when calculated on that of the number of sentences.² Both forensic rhetoric and dialogue are characterized as literary forms by more animated expression than narrative, and greater animation brings with it a tendency towards shorter sentences – most obvious in the case of rhetoric in the exhortations, invocations, exclamations, rhetorical questions and so forth, in the case of dialogue in the rapid alternation of speakers.

It is clear from LMW's Table 2 that the main difference in sentence length distribution between the *Seventh Letter* and the *Apology* lies in the considerably higher frequency in the latter of sentences of ten words or less. A rough idea of the extent to which this is due to the difference in literary form can be gained by separating the statistics for the dialogue section from those for the rest of the work (Table 1, columns 1 - 3); the percentage of sentences with ten words or less out of the total number of sentences in each section is respectively 56% and 30%. If one also separated out those short sentences which characterize the rhetorical as opposed to the narrative style (in the *Apology* many of these are in fact common to the dialogue form e.g. *είεν, τί οὖν; πολλοῦ γε δεῖ*), then the discrepancy would be greater still.

To which work then ought the *Seventh Letter* to be compared ? The *Apology* was chosen by LMW as the “only other continuous prose work of comparable size”, their intention being to exclude those composed as dialogues. However, the nature of a work is not to be judged superficially : just as the *Apology* purports to be a speech, but contains much that is formally dialogue, conversely there are works – such as the *Timaeus*, *Critias* and parts of the *Laws* – which purport to be dialogues, but which in reality are continuous narratives. In this investigation the *Laws* was used as the standard of comparison.

How they defined a sentence is not stated by LMW, but it is evident from their statistics that they regarded it as being terminated by a full-stop, colon or question mark. Using the O.C.T. of Burnet, I adopted the same practice, except that instances like Πῶς δὲ οὐκ; ἔφη. (348 e.9) were counted as one sentence, not as two. Since a mechanical computer cannot observe such distinctions, this may be the explanation of why my total number of sentences for the *Seventh Letter* is slightly less than that of LMW. In the interests of objectivity all dashes in the text were ignored, even though they sometimes clearly mark the end of a sentence. Burnet uses these indiscriminately – and inconsistently – in place of comma, colon or full stop; fortunately they are not frequent enough to affect the validity of the statistics.

The parts of the *Laws* with which the *Seventh Letter* was compared were those with the least dialogue : book V, which is a monologue by the Athenian Stranger apart from the final sentence, VI 753 a.7 - 768 e.3, and XII 941 a - 960 c.1. The latter two are also monologues apart from three

reply formulae (754 a.3, 8, 758 e.8) in VI and one question (951 c.5) in XII, and were made so by excluding these interruptions from the calculations.

The resulting statistics (Table 1, columns 4 - 7) were subjected to χ^2 tests, in accordance with which the Null Hypothesis (i.e. of identical authorship) would have to be rejected, if the χ^2 value proved so large as to be unlikely to have occurred by chance fluctuations – assuming that no difference could be found inherent in the character of the works themselves. It was decided in advance to regard as significant a χ^2 value for which the probability (p), i.e. that the difference between the works compared in respect of sentence length distribution was due simply to chance, was 5% or less. The results showed that p was in no case less than 20%.

The second linguistic feature used by LMW to test the authenticity of the *Seventh Letter* was the frequency of occurrence of $\kappa\alpha\iota'$, ignoring for the purposes of the investigation its different functions. They showed (Table 3A) that the proportion of $\kappa\alpha\iota'$ to the total number of words remained fairly constant at 5% - 6% for a number of Platonic works of varying type and chronological period.³ From this the conclusion was drawn that “the distribution of $\kappa\alpha\iota'$ in sentences is a characteristic remarkably impervious to differences of literary form” (p. 314), and the significant difference in this respect between the *Apology* and the *Seventh Letter* was accordingly treated as proof of the unauthenticity of the latter. This, however, was not a valid conclusion, since the basis of calculation was changed from the total number of words in a work in Table 3A to the total number of sentences in Table 3B. While it may be true that the proportion of $\kappa\alpha\iota'$

TABLE I

No. of words in sentence	Apology excluding dialogue section	Apology dialogue section	Apology total	Laws V	Laws VI .753a.7 - 768e.3	Laws XII 941a.1 - 960c.1	Seventh Letter
1- 5	35	32	67	5	1	5	15
6- 10	78	28	106	34	16	21	44
11- 15	73	19	92	44	31	27	50
16- 20	48	11	59	52	33	23	44
21- 25	44	8	52	32	23	19	36
26- 30	36	3	39	25	22	28	34
31- 35	17	3	20	17	13	20	26
36- 40	13	1	14	19	14	15	20
41- 45	10		10	13	11	9	13
46- 50	7		7	4	4	7	9
51- 55	4		4	6	7	7	8
56- 60	3	1	4	1	4	6	4
61- 65	3	1	4	1	3	7	4
66- 70	1		1				2
71- 75	3		3	5	2	2	3
76- 80				2		2	3
81- 85				1			2
86- 90				2		1	4
91- 95				2	1	1	3
96-100				2		1	
101-105	1		1			1	
106-110				1			1
111-115				1	1		
116-120	1		1				1
121-125					1		
166-170						1	
Total no. of sentences	377	107	484	269	187	203	326

χ^2 (11 degrees of freedom) for Seventh Letter - Laws V = 9.41
 - Laws VI = 13.42
 - Laws XII = 7.27

For $p = 0.20$ $\chi^2 = 14.631$ For $p = 0.05$ $\chi^2 = 19.675$

calculated on the former basis remains constant regardless of a work's literary form, it is certainly not true of the proportion calculated on the basis of the number of sentences. *A priori* one would expect fewer *καί*'s per sentence in dialogue, where shorter sentences and frequent alternations of speaker provide less opportunity for co-ordination than in continuous prose. This turns out to be so in practice, as can be seen by again comparing the dialogue section of the *Apology* with the remainder of the work : excluding the two bracketed *καί*'s and the twelve in crasis, the 465 instances are divided in the proportion 54 : 490, the 484 sentences in the proportion 107 : 377. This means that there are less than half the number of *καί*'s per sentence in the dialogue section compared with the continuous prose part.

In view of this, LMW's evidence for the unauthenticity of the *Seventh Letter* based on *καί* had to be rejected and a fresh comparison made with works containing as little dialogue as possible – *Laws* V and XI 931 e.8 – XII 960 c.1. (excluding the interlocutor's sentences at the end of V and at XII 951 c.5.⁴) The figures obtained (Table II) showed that, regarding the frequency distribution of *καί* in sentences, there was no significant difference between the *Seventh Letter* and the two samples from the *Laws* with which it was compared : χ^2 tests produced values for which the probability of the difference being due to chance exceeded 10% in the one instance, 80% in the other. Moreover, this result was essentially unaffected by the alteration to the data consequent on the exclusion of the colon as a sentence marker in the second set of calculations.

TABLE II

No. of <i>καί</i> 's in sentence	No. of sentences (including colon)			No. of sentences (excluding colon)		
	Laws V	Laws XI-XII	Seventh Letter	Laws V	Laws XI-XII	Seventh Letter
0	93	117	111	34	52	40
1	72	87	97	41	42	52
2	44	36	54	21	32	37
3	21	19	25	14	22	22
4	18	7	23	19	6	19
5	9	6	6	11	10	12
6	2	2	4	7	3	7
7	4	4	1	5	4	1
8			1	2	1	5
9	2		3	3		2
10	1			2	1	2
11		1	1			1
12	1	2		2	2	
13		1				1
14					2	
17	1			1		
Total no. of sentences	268	282	326	162	177	201
Total no. of <i>καί</i> 's	437	362	479	437	362	479

χ^2 (6 degrees of freedom) for Seventh Epistle – Laws V = 2.27 } including colon
 – Laws XI-XII = 10.52 }
 – Laws V = 4.04 } excluding colon
 – Laws XI-XII = 9.57 }

For $p = 0.1$ $\chi^2 = 10.645$ For $p = 0.05$ $\chi^2 = 12.592$

As their third criterion of the *Seventh Letter's* authenticity LMW investigated the frequency of $\delta\acute{\epsilon}$ in its function as a sentence connective, a test which they affirmed was "independent of sentence length, and so not affected by the difference between dialogue and continuous prose" (p. 315). There is an error here; for although the frequency of this $\delta\acute{\epsilon}$ may be independent of sentence length, it is not permissible to conclude therefrom that there will be no difference in its occurrence between continuous prose and dialogue : other factors may operate. The evidence in fact was already present in LMW's own statistics, only they chose to interpret it in a different manner. The works in their Tables 4 and 5 which have a frequency of $\delta\acute{\epsilon}$ as sentence connective two or three times higher than the rest, namely the *Timaeus*, *Critias*, *Laws V - VI* and the *Seventh Letter*, are precisely those which contain little or no dialogue. It is remarkable that they failed to observe that the heterogeneous character of the first 200 sentences of the *Timaeus* and the first 50 to the *Critias* with regard to the use of this $\delta\acute{\epsilon}$ is due solely to the difference in literary form which they explicitly deny (p. 318). These are the sections which contain the introductory dialogue prior to the monologues by Timaeus and Critias respectively.

To substantiate this interpretation, an investigation of $\delta\acute{\epsilon}$ as sentence connective was made in two works which belong to different chronological periods and which are partly dialogue, partly continuous prose. The first part of *Laws XII* (i.e. 941 a - 960 c.1) is a monologue except for one remark by the interlocutor (951 c.5); the second part (960 c.2 - end) is a dialogue, a change of speaker occurring 104 times. The first part of *Republic X* (i.e. 595 a - 614 b.2) is a dialogue, with 313 changes of speaker; the second part (614 b.2 - end) is a continuous narrative (The Myth

TABLE III

		δέ as sentence connective			δέ as connective within sentence		
		Total no. of δέ	Total no. of sentences	Proportion of δέ per sentence	Total no. of δέ	Total no. of sentences	Proportion of δέ per sentence
Laws XII	A.	102	203	0.502	139	203	0.685
	B.	28	181	0.155	39	181	0.215
Republic X	A.	54	455	0.119	45	455	0.099
	B.	50	100	0.500	47	100	0.470
Laws XII	B. (after deductions)	28	148	0.189	39	148	0.264
Rep. X	A.	44	290	0.153	43	290	0.148

of Er).⁵ Two sets of calculations were made for *Laws XII B* and *Rep. X A*; first with the dialogue complete, secondly with 33 reply formulae subtracted from *Laws XII B* and all 165 sentences belonging to the interlocutor from *Rep. X A* : the former involved the loss of no $\delta\acute{\epsilon}$, the latter of ten. The purpose of the second calculation was to see whether the presence in dialogue of a large number of reply formulae or short sentences, in which $\delta\acute{\epsilon}$ in its function as sentence connective had little or no opportunity to occur, was the cause of its lower frequency per sentence. The results (Table III) show that, while it did have some effect on the frequency, it was not the sole or even the main cause. The fact that the frequency per sentence of $\delta\acute{\epsilon}$ as sentence connective is considerably higher in continuous prose than in dialogue is no more than one should expect, remembering that $\delta\acute{\epsilon}$ is the most colourless of all sentence connectives; its occurrence, therefore, will tend to be inversely proportionate to the vivaciousness and animation of the literary *genre* or of the style. This, combined with the lack of continuity caused by the alternation of speakers, is the true explanation of its relatively low frequency in dialogue.

Although this test proved beyond doubt that the higher frequency of $\delta\acute{\epsilon}$ as sentence connective in the *Seventh Letter* compared with works of Plato in dialogue form could not be regarded as evidence of its unauthenticity, it also raised the question ironically enough whether the frequency was as high as it ought to be for a genuine work of non-dialogue form : half of all the sentences in *Laws XII A* and *Rep. X B* had $\delta\acute{\epsilon}$ as their connective, little more than a third of those in the *Seventh Letter*. The investigation was therefore extended to other works containing little or no dialogue. *Laws V*, VI 753 a.7 - 768 e.3, VIII 842 b.1 - IX 856 e.3, IX 864 c.10 - end,

TABLE IV

		$\delta\acute{e}$ as sentence connective				$\delta\acute{e}$ as connective within sentence				
		Frequency	No. of sentences	Proportion of sentences with $\delta\acute{e}$	Standard error of proportion	Frequency	No. of sentences	Proportion of sentences with $\delta\acute{e}$	Standard error of proportion	
A	Laws VIII-IX	91	151	0.603	0.040	Laws XII A	139	203	0.685	0.033
	IX	116	211	0.550	0.034	Timaeus	424	700	0.606	0.018
	VI	102	187	0.545	0.036	Laws VI	105	187	0.561	0.036
	XI	159	301	0.528	0.029	V	148	268	0.552	0.030
	XII A	102	203	0.502	0.035	XI	159	301	0.528	0.028
	Rep. X B	50	100	0.500	0.050	IX	108	211	0.512	0.034
	Timaeus	267	700	0.381	0.018	Rep. X B	47	100	0.470	0.050
	Seventh Letter	123	326	0.377	0.027	Seventh Letter	154	326	0.472	0.027
	Laws V	96	268	0.358	0.029	Laws VIII-IX	69	151	0.457	0.041
	B	Timaeus A	38	100	0.380	0.049	Timaeus A	60	100	0.600
B		33	100	0.330	0.047	B	47	100	0.470	0.050
C		34	100	0.340	0.047	C	60	100	0.600	0.049
D		43	100	0.430	0.050	D	53	100	0.530	0.050
E		45	100	0.450	0.050	E	70	100	0.700	0.046
F		37	100	0.370	0.048	F	66	100	0.660	0.047
G		37	100	0.370	0.048	G	68	100	0.680	0.047
C	Seventh Letter A	104	270	0.385	0.029	Seventh Letter A	129	270	0.478	0.030
	B	19	56	0.339	0.063	B	25	56	0.446	0.066

For Group A χ^2 (8 degrees of freedom) = 70.73
 For Group B χ^2 (6 degrees of freedom) = 4.99
 For p = 0.001 (8 degrees of freedom) χ^2 = 26.125
 For p = 0.5 (6 degrees of freedom) χ^2 = 5.348

For Group A χ^2 (8 degrees of freedom) = 19.30
 For Group B χ^2 (6 degrees of freedom) = 6.86
 For p = 0.02 (8 degrees of freedom) χ^2 = 18.168
 For p = 0.20 (6 degrees of freedom) χ^2 = 8.558

XI⁶ and *Timaeus* 29 d.7 - 91 a.4 calculated both as a whole and in seven consecutive blocks of 100 sentences each.⁷ The *Seventh Letter* was divided into two parts (A. 323 d - 341 b.3 and 345 d.1 - end, B. 341 b.3 - 345 d.1) in accordance with LMW's belief that the "digression" was heterogeneous. In addition to its function as a sentence connective, the frequency of $\delta\acute{\epsilon}$ as a connective within the sentence was also investigated.

The results (Table IV) yielded a χ^2 value for both functions of $\delta\acute{\epsilon}$ in the seven sections of the *Timaeus* which showed that the fluctuations in frequency between the sections were attributable to chance. This, however, was not true of the fluctuations between the various works. With regard to $\delta\acute{\epsilon}$ as sentence connective the works fell into two distinct groups - those in which half of all the sentences were connected by $\delta\acute{\epsilon}$ (*Rep.* X B, *Laws* VI, IX, XI, XII A and VIII - IX as a rather extreme member) and those in which little more than a third of the sentences were so connected (*Timaeus*, *Laws* V and *Seventh Letter*).

Seeking an explanation for this difference in behaviour, it is clear that there can be no question of chronological influence, when such widely separated works as the *Republic* and *Laws* occur in the same group, and it would be rash to do as Winspear does (p. 321) and condemn the *Timaeus* and *Laws* V as unauthentic along with the *Seventh Letter*, when the authenticity of the first at least is supported by Aristotle (e.g. *De Gen. et Corrupt.* A 325 b.24, B 332 a.29). Furthermore one may note that it is impossible to discern the same two groups, or even similar affinities, in the case of $\delta\acute{\epsilon}$ within the sentence. The correct explanation is to be found in the connection already observed between the frequency of $\delta\acute{\epsilon}$ and the

character of the work : it is hardly a co-incident that the works in which its occurrence as a sentence connective is highest are those consisting largely of a series of regulations. The formula "If such and such an offence is committed, such and such a penalty will apply" is particularly common,⁸ and the frequency of *ἐάν* (including its variants *ἄν* and *ἤν*) in the different books of the *Laws* is instructive :

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
19	11	12	6	17	52	16	40	121	18	139	84

A significantly higher frequency occurs in exactly those books in which the occurrence of *δέ* as sentence connective is most common, and it seems reasonable to regard the repeated use of both words as a feature of the unvaried manner of exposition imposed by the subject-matter in these books. This would explain why *Laws* V shows an affinity in respect of *δέ* as sentence connective with the *Timaeus* and *Seventh Letter* instead of with the other continuous narrative parts of the *Laws*, because it deals for the most part with general principles of ethics and government, not with individual regulations.

Little need be said about the frequency of *δέ* as connective within the sentence beyond the fact that it is similarly dictated by literary form, manner of presentation and subject-matter, being particularly affected by enumerations.⁹

As for the *Seventh Letter*, the appropriate conclusion is that, as with

sentence length distribution and *καί*, so too with regard to *δέ* its behaviour is in harmony with that of the works to which it is most closely related in form. Moreover there is no evidence in the statistics to suggest that the “digression” was not written by the same author as the rest of the work.¹⁰

LMW's fourth criterion was clausula rhythm. They pointed out (p. 312) that, if the investigation of this reported by Professor D. R. Cox and myself¹¹ was extended to the *Seventh Letter*, it located this between the *Critias* and *Politicus* in the chronological sequence of Plato's later works — a position which “most scholars would feel obliged to resist.” There is a snag however : the investigation was based on the data of W. Kaluscha,¹² who did not indicate which edition he used, how he defined a clausula, or what principles he followed on some uncertain points of scansion. This means that it is not possible to produce comparable data for any work outside those investigated by Kaluscha himself. Despite the fact, therefore, that LMW fail to give the data on which they base their contention that the *Seventh Letter* would occupy an impossible chronological position for a genuine work, that data however obtained must be considered unacceptable.

Because Kaluscha's data could not, for the reason given, be checked as completely accurate, I carried out another investigation of clausula rhythm to determine the chronological order of Plato's later works,¹³ and this can be extended to the *Seventh Letter*, since its basis is known.¹⁴

The investigation set out from the statement of Aristotle¹⁵ and other ancient authorities that the *Laws* was written later than the *Republic*,

combined with the observation of W. Kaluscha and L. Billig¹⁶ that, in the interval between the two, Plato's style regarding clausula rhythm underwent a drastic change. The frequency of each of the 32 possible types of clausula was calculated as a percentage of the total number of clausula in the *Laws* (represented by sample, books I - III) and in the *Republic* (also represented by sample, books VIII - X).¹⁷ After the difference between the two works in the frequency of each clausula had been obtained by dividing the figure for the *Laws* by that for the *Republic*,¹⁸ it was expressed as negative or positive by substituting the corresponding logarithm.¹⁹ When these logarithms were multiplied by the corresponding frequency figures in columns 1 and 2, since the higher absolute frequencies within the *Republic* tended to coincide with negative logarithms (i.e. higher relative frequencies), those within the *Laws* with positive logarithms, the resulting products when summed created a substantial negative balance (mean score) for the *Republic* and a similar positive balance for the *Laws*.

The same calculations were carried out for the *Timaeus*, *Critias*, *Sophist*, *Politicus*, and *Philebus* — a group of works established by earlier stylometric inquiries as written during the latter part of Plato's life : the percentage frequency figures for the various clausulae in each work were multiplied by their corresponding logarithmic change factors (Table V column 4) and the products summed. Assuming that these works were written after the *Republic* but before the *Laws*, their mean scores would lie between those of the two works serving as standards of comparison,²⁰ and their degree of affinity in respect of clausula rhythm to one or the other would be indicated by the size of the score, whether negative or positive. The results are given in Table VI.

TABLE V

	1	2	3	4	5	6	7	8	9	10
Clausula	Laws I-III %	Rep. VIII-X %	Laws Z Rep. %	Log ₁₀ of column 3	Seventh Letter	Seventh Letter %	Column 6 x column 4	Seventh Letter	Seventh Letter %	Column 9 x column 4
UUUUU	1.980	0.823	2.406	0.878	3	1.020	0.896	3	1.154	1.013
UUUUU	3.218	1.646	1.955	0.670	12	4.082	2.735	11	4.231	2.835
UUUUU	2.559	1.097	2.333	0.847	2	0.680	0.576	1	0.385	0.326
UUUUU	2.351	1.509	1.558	0.443	9	3.061	1.356	8	3.077	1.363
UUUUU	3.837	2.058	1.864	0.623	13	4.422	2.755	13	5.000	3.115
UUUUU	4.084	0.686	5.953	1.784	9	3.061	5.461	7	2.692	4.803
UUUUU	2.351	1.371	1.715	0.539	2	0.680	0.367	2	0.769	0.414
UUUUU	1.238	2.195	0.564	-0.573	4	1.361	-0.780	4	1.539	-0.882
UUUUU	0.248	3.567	0.070	-2.659	3	1.020	-2.712	3	1.154	-3.068
UUUUU	8.292	3.292	2.519	0.924	31	10.544	9.743	25	9.615	8.884
UUUUU	3.094	1.509	2.050	0.718	7	2.381	1.710	5	1.923	1.381
UUUUU	0.619	2.332	0.265	-1.328	6	2.041	-2.710	6	2.308	-3.065
UUUUU	1.361	3.567	0.382	-0.962	0	----	----	1	0.385	-0.370
UUUUU	1.980	2.195	0.902	-0.103	4	1.361	-0.140	4	1.539	-0.159
UUUUU	2.559	4.252	0.602	-0.507	11	3.741	-1.897	10	3.846	-1.950
UUUUU	6.312	2.469	2.557	0.939	18	6.122	5.749	18	6.923	6.501
UUUUU	4.332	2.469	1.755	0.562	13	4.422	2.485	11	4.231	2.378
UUUUU	1.980	4.527	0.437	-0.828	5	1.701	-1.408	3	1.154	-0.956
UUUUU	0.723	3.704	0.195	-1.635	5	1.701	-2.781	5	1.923	-3.144
UUUUU	4.084	2.195	1.861	0.621	8	2.722	1.690	9	3.462	2.150
UUUUU	1.485	5.350	0.278	-1.280	5	1.701	-2.177	4	1.539	-1.970
UUUUU	0.990	4.390	0.226	-1.487	2	0.680	-1.011	2	0.769	-1.144
UUUUU	3.465	2.469	1.403	0.339	11	3.741	1.268	10	3.846	1.304
UUUUU	1.114	6.173	0.180	-1.715	1	0.340	-0.583	1	0.385	-0.660
UUUUU	6.683	5.213	1.282	0.248	20	6.803	1.687	20	7.692	1.908
UUUUU	1.609	3.292	0.489	-0.715	9	3.061	-2.189	6	2.308	-1.650
UUUUU	5.198	3.429	1.516	0.416	14	4.762	1.981	7	2.692	1.120
UUUUU	3.589	6.310	0.569	-0.564	12	4.002	-2.708	11	4.231	-2.386
UUUUU	3.942	5.213	0.641	-0.445	9	3.061	-1.362	9	3.462	-1.541
UUUUU	7.428	4.664	1.593	0.466	23	7.823	3.646	21	8.077	3.764
UUUUU	2.104	1.646	1.278	0.245	7	2.381	0.583	6	2.308	0.565
UUUUU	5.693	4.390	1.297	0.260	16	5.442	1.415	14	5.385	1.400
	808	729			294		23.645	260		22.279

In order to establish whether the differences between the mean scores were statistically significant, the standard error of each mean score was first calculated according to the formula

$$\sqrt{\frac{1}{n-1} \left(\frac{S(f \times \log^2)}{100} - \frac{S(f \times \log)^2}{100^2} \right)}$$

and the standard error for the difference between the scores of any two works according to the formula

$$\sqrt{(\text{Standard error of work x})^2 + (\text{Standard error of work y})^2}$$

If there were no *real* difference in the clausula frequency distribution between the two works, the difference between their mean scores would exceed twice the standard error of the difference only with 5% probability and two and a half times only with 1% probability. Hence any difference that exceeded two and a half times the standard error or difference could reasonably be taken as indicative of a real discrepancy between the two works in the use of clausulae, while one between two and two and a half times would be significant, but not conclusive evidence.

The mean scores for Plato's later works and the *Republic* (Table VI section A) suggested a triple grouping – a) *Rep.* VIII - X, b) *Crit.*, *Tim.*, *Soph.*, c) *Pol.*, *Phil.*, *Laws* I - III, and this was confirmed by reference to the difference between the mean scores in conjunction with the standard error of difference.²² The ratio of these²³ in comparisons of works

T A B L E VI

A	Rep. VIII-X	Crit.	Tim.	Soph.	Pol.	Phil.	Laws I-III
Mean score	- 38.5	- 8.3	- 3.6	4.1	23.6	29.3	31.5
Standard error	3.8	6.2	3.4	3.3	2.9	2.8	2.7
B	Rep. VIII	Rep. IX	Rep. X	Laws I	Laws II	Laws III	Seventh Letter
Mean score	- 48.2	- 39.3	- 29.4	24.7	33.7	36.7	23.6
Standard error	7.0	6.8	6.0	4.6	4.7	4.8	4.6
C	Rep.- Crit.	Crit.-Soph.	Tim.-Soph.	Soph.-Pol.	Pol.-Phil.	Pol.-Laws	Laws-Seventh Letter
Difference between mean scores	30.2	12.4	7.7	19.5	5.7	7.9	7.9
Standard error of difference	7.27	7.02	4.74	4.39	4.03	3.96	5.33

belonging to the same group nowhere reached 2,²⁴ so that nothing could be deduced about the relative order of the works within the groups, whereas in comparisons of works belonging to different groups it was in every case 4 or higher. Such a ratio, with a probability of occurring by chance of less than 0.01%, was very highly significant; it was therefore concluded that the three groups of works were stylistically disparate regarding clausula rhythm, and, remembering the temporal distinction between the *Republic* and *Laws*, chronologically sequential.

The *Seventh Letter* was written after Dion's death in 354 B.C. not more than seven years before the death of Plato himself, and it is unlikely that at this time Plato had not yet started work on the final group of dialogues, *Politicus*, *Philebus*, *Laws*, since these constitute a quarter of his total literary output. In extending the investigation of clausula rhythm to the *Seventh Letter*, therefore, it was to be expected that, if genuine, it would show an affinity to the works of this group rather than to those of any earlier one.

Two sets of data were obtained : in the first (Table V column 5) a sentence was defined in the same way as for the previous investigation;²⁵ in the second (column 8) because of its inconsistent use in Burnet's text, the dash was ignored as a sentence - marker, in order to check the extent to which this affected the statistics. The calculation of the mean score for the *Seventh Letter* with each set of data (columns 6 - 7 and 9 - 10 respectively) resulted in a figure very close to that for the *Politicus*. As a work containing fewer clausulae, however, and so with a greater element of chance in their distribution, the standard error was larger (Table VI section

B), so that comparison with the other works of the final group produced a Standard Normal value substantially below 2.²⁶ The conclusion was accordingly drawn that, in respect of clausula rhythm, the style of the *Seventh Letter* was consistent with that of the works of Plato with which it was, if authentic, in all probability contemporaneous.

Although earlier stylistic investigations had favoured the authenticity of the *Seventh Letter*, their validity was questioned by LMW on the grounds that they had had as their subject conscious mannerisms. Arguing that these were mainly distinctive features such as would have attracted the attention of an imitator, they examined the "unconscious habits of style" mentioned above : contrary to their own findings, it has been shown that these support the views that the *Seventh Letter's* genuineness cannot be doubted on the basis of its language and style.

On the other hand there are those who will have nothing at all to do with stylometry in these matters. In a recent work,²⁷ for example, the author remarks : "But neither terminological nor stylistic identity is sufficient evidence of genuineness. There is always a chance that someone imitated Plato's art of writing even to perfection. So the decision must in the end rest on the interpretation of the content of the letter." An analysis of the content suffices to prove to him that the author could not have been Plato, primarily because there are supposedly irreconcilable inconsistencies between the ideas and doctrines expressed in the *Seventh Letter* and those to be found in the genuine works.

However apart from the fact that the interpretation of content as a

criterion of authenticity is inferior to stylometry in that it is less objective, it too suffers from the inability to produce absolute proof, so that for both the question of authenticity is ultimately a question of probability. This being so, the problem can be stated quite simply : if the interpretations of the *Seventh Letter's* content which condemn it as spurious are correct, we are obliged to believe in the existence of a forger who, in the comparatively simple matter of ensuring that what he said was compatible with Platonic doctrine, betrayed himself by his gross incompetence, while in the more difficult task of copying that author's style he proved himself capable of imitating not merely the more obvious idiosyncrasies of Plato, but his unconscious habits as well, with such scrupulous and uncanny accuracy that he is indistinguishable from Plato himself.²⁸

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NOTES

1. M. Levison, A. Q. Morton, A. D. Winspear, "The Seventh Letter of Plato", del. *Mind* LXXVII No. 307, 1968, pp. 309-325; henceforth referred to as LMW.
2. There is another, shorter dialogue between Socrates and Critias (20a-b), but I ignore this for the purpose of the argument.
3. Their figure for the *Apology* (358) in Table 3A is a mistake : calculated from Table 3B it turns out to be 467, which is correct for the O.C.T. except that it includes two instances bracketed by Burnet and excludes twelve instances of *καί* in crasis, the computer presumably not being programmed to recognise these. The correct total for the *Seventh Letter* is 479, excluding three in crasis.
4. Crases of *καί* were not included, since it might be objected that they are, at least formally, different words : in any case they are not sufficiently frequent to have any noteworthy effect on the statistics. A sentence was defined as for sentence length distribution above, except that, as a check on the possible influence of different punctuation, a second calculation was carried out with the colon excluded as a sentence marker.
5. These subdivisions are henceforth referred to as Laws XII A and B and as *Rep.* A and B respectively.

6. These were rendered completely devoid of dialogue by excluding the interlocutor's sentences, mainly short reply formulae, as follows :
V 747e.10, VI 754a.3,8, 758e.8, VIII - IX 848b.3,6, 853b.3, IX 867c.3, 869e.9, 876a.4,7, XI 918c.8, 922c.6,10, d.3,9, e.4, 926a.4,8, 931b.1,4, d.4, e.7.
7. A. 29d.7 - 40d.5, B. 40d.6 - 49b.5, C. 49b.6 - 56d.1, D. 56d.1 - 63d.4, E. 63d.4 - 72e.6, F. 72e.6 - 82b.5, G. 82b.5 - 91a.4.
8. Of the 301 sentences in *Laws XI*, for example, 50 begin with *ἐὰν* (*ἀν*, *ἦν*) *δέ*
9. E.g. *Rep. X* 616e.3 - 617a.4, where 13 such instances of *δέ* occur in two sentences.
10. The discrepancy in the use of *καί* in this section revealed by LMW's cusum plot cannot be regarded as meaningful in the absence of further evidence in the same direction : it is usually possible to isolate an area in any set of statistics which is inconsistent with the general trend.
11. "On a Discriminatory Problem connected with the Works of Plato" - *Journal of the Royal Statistical Society*, vol. 21, Series B, 1959, p. 195 ff.
12. "Zur Chronologie der Platonischen Dialogue - *Wiener Studien* 26, 1904, pp. 190-204.

13. *The Dating of Plato's Works by the Stylistic Method*, Ph. D. Thesis, London, 1958, p. 341 ff. : henceforth referred to simply as "Thesis".
14. The edition used was Burnet's. No clausula of any sentence with less than fifteen syllables was counted, nor any clausula containing a long vowel in hiatus at the end of a word or a short vowel before a combination of mute and liquid consonants. A sentence was defined as for the investigation of sentence length distribution above, except that the dash was included as a sentence marker. The last five syllables of a sentence were regarded as the clausula.
15. *Politics* II.6, 1264B, 24 ff.
16. "Clausulae and Platonic Chronology" - *Journal of Philology* 35, 1920, pp. 225-256.
17. Table V columns 1 and 2.
18. Column 3.
19. Column 4.
20. The possibility of treating the three books of the *Laws* and of the *Republic* respectively as single works for the purpose of comparison depended on their being homogeneous with regard to clausula rhythm : this was established in the same manner as for Kaluscha's data (Thesis, p. 339 ff.)

21. n = total no. of clausulae in work, f = frequency of clausula as percentage of total no., S = sum. The figures resulting are given in Table VI.
22. The more critical combinations of these are included in Section C of Table VI.
23. The quantity
$$\frac{\text{Mean score of } x - \text{Mean score of } y}{\sqrt{(\text{S.e. of mean score } x)^2 + (\text{S.e. of mean score } y)^2}}$$
 may, for large amounts of data, be compared with the Standard Normal Tables.
24. For *Politicus – Laws*, however, it was virtually 2, which was moderately significant.
25. See note 14.
26. The difference between the mean scores and the standard error of the difference are shown for the comparison with the *Laws*, the work at the other extreme of the final group in terms of mean scores, in Table VI section C.
27. L. Edelstein, *Plato's Seventh Letter*, 1966, p.2.
28. I should like here to record my indebtedness to Dr. R. Morton of the Mathematics Department in the University of Manchester, without whose guidance in statistical procedures this article could not have been written.