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### The Literary Detective Computer Analysis of Stylistic Differences Between "The Dark Tower" and C.S. Lewis' Deep Space Trilogy

#### Abstract

Uses a computer program, The Literary Detective, to analyze text from "The Dark Tower" and all three books of the Space Trilogy. Concludes "The Dark Tower" represents a different style from the other books.

#### Additional Keywords

Lewis, C.S. "The Dark Tower"—Authorship; Lewis, C.S. "The Dark Tower"—Computer analysis; Lewis, C.S. "The Dark Tower"—Style; Lewis, C.S. Space Trilogy—Authorship; Lewis, C.S. Space Trilogy—Computer analysis; Lewis, C.S. Space Trilogy—Style

# The Literary Detective Computer Analysis

## of Stylistic Differences Between "The Dark Tower" and C.S. Lewis' Deep Space Trilogy

Carla Faust Jones

### Introduction

As a teenager in the late 1960s, I was introduced to the writing of C.S. Lewis through his deep space trilogy and, like so many others, developed a lifelong passion for his work. I clutched at everything published by him and about him and thrilled to discover that another of my heroes, J.R.R. Tolkien, was his friend. Soon works by Charles Williams, Dorothy Sayers, and other Inklings appeared on my bookshelf, and I glimpsed a unique world of Christian genius and comradeship unduplicated to this day. It was Lewis, however, with whom I felt strangely intimate and whose death I lamented most as I turned the final page of the last of his published writing.

Then in 1977, almost fourteen years after his death, a new collection of Lewis' shorter fiction appeared. Called *The Dark Tower & Other Stories*,<sup>1</sup> the book contained two yet unpublished fragments that had been dramatically rescued in early 1964 from a bonfire on which Lewis' brother had been tossing manuscripts.<sup>2</sup> How exciting! With joy I rushed to get my copy and recapture the thrill of first reading.

Upon completing "The Dark Tower," reportedly an intended sequel to *Out of the Silent Planet* and one of the salvaged texts,<sup>3</sup> I was crushed. The feeling was not the same. I was repulsed by the story, struck by the lack of wit, charm, and sharp insight so characteristic of Lewis. Perhaps I was losing interest, I thought, or becoming less sensitive as I grew older. But then again, maybe the story wasn't up to Lewis' usual standards. Walter Hooper, the editor of the book, suggested such a possibility in the preface:

...I anticipate unfavourable comparisons with the trilogy. Notwithstanding the high expectations established by Lewis' pen, I nevertheless do not believe that an artifact such as "The Dark Tower" should be expected to approach the invention and completed perfection of his superb interplanetary trilogy.<sup>4</sup>

Unfavorable comparisons did appear, and since my initial reading of the story I have learned that other Lewis admirers have reacted with similar discomfort to the style, tone, and characterizations of "The Dark Tower."<sup>5</sup> The April 1978 issue of *The Bulletin of the New York C.S. Lewis Society* reported some readers' surprise at the character of the Stingingman, "they had not expected Lewis' imagination to produce such a perverted figure."<sup>6</sup>

In that issue's featured review, Richard Hodgins describes the story as imperfect and identifies numerous weaknesses relative to Lewis' normal style and thought. He justifies these disparities, however, as the false starts of a nonprofessional fantasist who went as far as he could with a number of clever but ill-conceived ideas. Hodgins concludes that Lewis ultimately and rightly abandoned the manuscript because he "wrote without planning and the plot became impossible."<sup>7</sup> These impressions reinforced my own reaction to the story and caused me to speculate about the possibility that the fragment was not written by Lewis.

### The Literary Detective

In 1986, I became aware of a computer program called the Literary Detective that could be used to tackle the mystery of "The Dark Tower." Designed by Professor Jim Tankard at the College of Communication, University of Texas at Austin, the Literary Detective analyzes the similarity between two texts based on the frequency of individual letters and letter pairs.

According to Tankard, the frequency with which a writer uses certain letters and letter pairs is a reliable indication of the writer's individual style—a sort of "stylistic fingerprint," which can be used to determine the likelihood that a particular writer authored a questionable text.<sup>8</sup> He used his program to analyze 12 disputed Federalist papers and determine if they were closer to the style of James Madison or Alexander Hamilton, both of whom claimed authorship.

The computer analysis indicated that nine of the anonymous Federalist papers were more likely authored by Madison, while the remaining three were closer to Hamilton's style. A previous study had used the frequency of "minor function words" such as "a" and "by" to differentiate style in the Federalist papers and assigned all 12 papers to Madison.<sup>9</sup> The majority of these results, therefore, are consistent with Tankard's findings.

The Literary Detective analyzes text samples in two phases using four separate computer programs. The first phase invokes two programs to compare single-letter frequencies. First, the TEXT GOBBLER 1 program reads a sample text from a typed data file and produces a printout with the number of times each of the 26 letters of the alphabet occurs in the text file. The reported frequencies are normal-

Figure 1. Sample Output from TEXT GOBBLER 1 Run on a Text Sample from "The Dark Tower"

FILENAME	DARK TOWER	
NUMBER OF CHARACTERS	16336	
NUMBER OF SPACES	3253	
LETTER	ACTUAL	NORMALIZED
A	993	80
B	200	16
C	354	29
D	416	34
E	1574	127
F	279	23
G	219	18
H	721	58
I	891	72
J	11	1
K	76	6
L	450	36
M	367	30
N	817	66
O	977	79
P	249	20
Q	9	1
R	668	54
S	730	59
T	1230	99
U	434	35
V	110	9
W	261	21
X	36	3
Y	290	23
Z	11	1

ized to a sample of 1,000 characters, not including spaces and punctuation, to compensate for potential differences in the sizes of the text files being compared. Figure 1 shows an example of TEXT GOBBLER 1 output from a sample of "The Dark Tower" text.

The FREQUENCY ANALYZER 1 program compares the normalized single-letter frequency results from TEXT GOBBLER 1 for any two text samples and computes a difference index score. The difference index score is the sum of the absolute values of the differences in frequency of each letter of the alphabet between the two text samples being compared. The lower the index number, the more two samples of text are alike. For example, if Text A compared to Text B yields a difference index of 60 and Text A compared to Text C yields a difference index of 50, then Text A and Text C are more similar in style than Text A and Text B.

The second phase of the Literary Detective program performs the same type of analysis for the frequency of letter pairs. TEXT GOBBLER 2 reads a text file and prints a two-dimensional array. The array displays each letter of the alphabet vertically as the first letter in the pair and

another alphabet horizontally across the top as the second letter in the pair. By selecting a letter on one axis and matching it with a letter in the other axis, the reader can see the number of times that letter combination occurs in the text file analyzed. The letter-pair frequency results are normalized to a sample of 10,000 characters, not including spaces and punctuation, to account for potential differences in the lengths of the text samples compared. Figure 2 shows an example of the output for TEXT GOBBLER 2 run on the same sample text that produced the results in Figure 1.

FREQUENCY ANALYZER 2 then compares the results of TEXT GOBBLER 2 for any two text files and computes a difference index. The difference index is the sum of the absolute values of the differences between each of the letter-pair frequencies of the two files being compared. Again, the lower the difference index, the more similar the text samples. Analyzing differences between authors' styles based on letter pairs is a more sensitive means of discrimination than using single letter frequencies. Since there are 676 possible letter pairs, 676 comparisons can be made between authors as opposed to only 26 comparisons for single letter frequencies, resulting in a more robust analysis.

To test my suspicions concerning the difference in style between "The Dark Tower" and Lewis' deep space trilogy, I applied Tankard's Literary Detective program to text samples from each of these works. If the writing style reflected in "The Dark Tower" is different from that of the other stories, the difference indices for comparisons of "The Dark Tower" text sample with each of the trilogy text samples would be higher than the difference indices derived from comparisons of one trilogy text sample with another trilogy text sample. If on the other hand, the difference indices for comparisons of "The Dark Tower" with the other Lewis texts were lower than those comparing the trilogy texts with one another or were similar, then indeed "The Dark Tower" reflects Lewis' style and another reason for the incongruity must be sought.

## Results of the

### Literary Detective Analysis

For optimum comparability of the stories, I prepared text files of approximately equal length from chapter 1 of each, beginning with the first page of the narrative. "The Dark Tower" file contains 16,336 characters (excluding spaces and punctuation) from page 17 to the bottom of page 26 of the Harcourt Brace Jovanovich 1977 first edition.<sup>9</sup> The 1965 Macmillan Paperbacks Editions were used to obtain text files for the Lewis trilogy.<sup>10</sup> *The Out of the Silent Planet* file contains 17,629 characters from page 9 to the bottom of page 16; the *Perelandra* file was taken from page 9 to the middle of page 15 and contains 20,861 characters; and the file for *That Hideous Strength* contains 17,908 characters from page 13 to the middle of page 21.

Frequency data produced by TEXT GOBBLER 1 and 2 for

Figure 2. Sample Output from TEXT GOBBLER 2 Run on a Text Sample from "The Dark Tower"

FILNAME	DARK TOWER
NUMBER OF CHARACTERS	16336
NUMBER OF SPACES	3253
FIRST LETTER	SECOND LETTER
A	B C D E F G H I J K L M N O P Q R S T U V W X Y Z
0	21 40 32 0 6 14 0 55 0 6 70 19 154 1 15 0 57 61 134 8 31 8 0 18 1
B	8 0 0 0 52 0 0 0 6 3 0 22 0 0 27 0 0 2 5 0 23 2 0 0 9 0
C	39 0 7 0 45 0 0 46 11 0 8 11 0 0 51 15 0 5 1 27 13 0 0 0 0 0
D	6 0 0 5 26 0 2 0 29 0 0 2 2 5 22 0 0 6 9 0 3 1 0 12 0
E	57 0 35 70 50 11 2 0 6 0 2 41 35 105 7 11 2 132 82 31 21 17 5 25 11 0
F	11 0 0 0 15 11 0 0 36 0 0 2 0 0 24 0 0 11 0 7 14 0 0 0 0 0
G	11 0 0 0 16 0 3 22 9 0 0 4 2 5 21 0 0 10 2 0 2 0 0 0 0 0
H	146 0 0 0 261 1 0 0 59 0 0 1 0 0 24 0 0 9 1 16 6 0 0 0 8 0
I	6 6 55 42 48 26 14 0 0 0 8 19 40 196 23 1 0 21 74 79 0 14 0 2 0 6
J	0 0 0 0 4 0 0 0 1 0 0 0 0 0 1 0 0 0 0 0 3 0 0 0 0 0
K	3 0 0 0 20 0 0 0 7 0 0 1 0 6 0 0 0 5 0 0 0 0 0 0 0 0
L	19 2 0 20 56 2 0 0 44 0 0 61 1 0 16 1 0 2 5 8 6 3 1 0 40 0
M	53 9 0 0 110 0 0 0 27 0 0 0 2 0 27 11 0 0 3 0 9 0 0 0 10 0
N	11 1 32 84 39 0 78 0 16 0 4 9 1 6 55 9 1 0 36 63 5 4 0 0 15 9
O	2 6 6 15 8 78 6 1 13 0 15 14 56 91 23 18 0 95 27 33 146 8 33 2 0
P	31 0 0 0 40 0 0 20 11 0 0 19 0 0 19 13 0 19 2 8 10 0 0 0 2 0
Q	0 7 0 0 0 0 0
R	40 1 7 11 159 23 6 2 31 0 6 3 5 7 34 2 0 8 20 27 6 0 1 0 21 0
S	48 0 19 0 71 2 0 15 32 0 2 2 6 3 42 4 1 0 14 73 20 0 2 0 1 0
T	25 0 2 0 56 0 0 331 74 0 0 10 0 0 78 0 0 24 12 10 23 0 4 0 7 1
U	2 10 9 5 5 0 12 0 6 0 0 26 11 22 0 10 0 65 39 49 0 0 0 0 0 0
V	1 0 0 0 77 0 0 0 10 0 0 0 0 0 2 0 0 0 0 0 0 0 0 0 0 0
W	33 0 0 0 49 0 0 48 20 0 0 1 0 10 21 0 0 1 1 1 0 0 0 0 0 0
X	3 0 3 0 2 1 0 0 1 0 0 0 0 0 0 13 0 0 0 4 0 0 0 0 0 0
Y	0 0 0 0 9 0 0 0 3 0 0 1 0 1 74 2 0 0 10 2 0 0 2 0 0 0
Z	0 0 1 0 6 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

single letters and letter pairs were run for each sample text. Because these data were used by FREQUENCY ANALYZER 1 and 2 to produce difference indices and are insignificant alone, frequencies are not tabulated separately here. Only the difference indices derived by comparing the single and double-letter frequencies are reported.

Six comparisons were run using FREQUENCY ANALYZER 1 and 2. The first three comparisons were between text samples from *Out of the Silent Planet*, *Perelandra*, and *That Hideous Strength*. Since these texts represent verified samples of Lewis' writing style, the difference indices reported in Table 1 will be used as the baseline for single and double-letter frequencies. Among the trilogy texts, the single-letter frequency results show that the lowest score and therefore the greatest similarity exists between the *Silent Planet* and *Hideous Strength* samples. The results for the *Silent Planet*/*Perelandra* comparison and the

*Perelandra*/*Hideous Strength* comparison differ only slightly, with the latter being more similar. The letter-pair results indicate the greatest similarity between the *Silent Planet* and *Perelandra* text samples and the least similarity between *Silent Planet* and *Hideous Strength*, a reversal of the single-letter results. The *Perelandra*/*Hideous Strength* score falls smack in between.

Table 2 contains the results of comparing each of the trilogy text samples with the text sample from "The Dark Tower." The difference indices from both FREQUENCY ANALYZER 1 and 2 indicate that the *Perelandra* and "Dark Tower" samples are most similar, while the *Silent Planet* and "Dark Tower" samples are least similar. Although comparing difference indices within Table 1 and within Table 2 is relatively unrevealing for this analysis, Table 2 does provide one interesting comparison.

Table 1. Comparison of Verified C.S. Lewis Texts Using Frequency Analyzer 1 and Frequency Analyzer 2.

Comparison No. *	Texts Compared	D.I.** From Frequency Analyzer 1	D.I. From Frequency Analyzer 2
A1	Silent Planet & Perelandra	76	1778
A2	Silent Planet & Hideous Strength	60	1890
A3	Perelandra & Hideous Strength	74	1834

\*See Table 3

\*\*D.I. = Difference Index

Table 2. Comparison of Verified C.S. Lewis Texts With Dark Tower Text Using Frequency Analyzer 1 and Frequency Analyzer 2.

Comparison No. *	Texts Compared	D.I.** From Frequency Analyzer 1	D.I. From Frequency Analyzer 2
B1	Silent Planet & Dark Tower	113	2427
B2	Perelandra & Dark Tower	83	2137
B3	Hideous Strength & Dark Tower	91	2327

\*See Table 3

\*\*D.I. = Difference Index

It is likely that an author's style changes over time and that the style used in early writing exhibits stylistic differences over that of later works. Intuitively, then, stories written about the same time should be most similar. In the preface to *The Dark Tower & Other Stories*, Hooper suggests that Lewis wrote "The Dark Tower" fragment shortly after he completed *Out of the Silent Planet* in 1938.<sup>5</sup> Since *Perelandra* was written in 1943 and *That Hideous Strength* in 1945,<sup>11</sup> Frequency Analyzer results should show *Out of the Silent Planet* and "The Dark Tower" to be most similar. In fact, the data in Table 2 reveal just the opposite. The scores derived from comparing letter and letter-pair frequencies in *Out of the Silent Planet* with those of "The Dark Tower" are significantly higher than scores derived from compar-

ing "The Dark Tower" with the later texts.

There are several possible explanations for these results. "The Dark Tower" may have been written later or earlier than Hooper suggested. Lewis may have deliberately altered his style. The computer program used to analyze the texts may not accurately measure stylistic differences, or "The Dark Tower" may not have been written by Lewis. Since Tankard has verified results from the Literary Detective against another study, the fallibility of the computer analysis seems less plausible.

The most useful comparisons for detecting differences in style among these works examine Table 1 results against Table 2 results. If the indices reported in Table 2 are significantly higher than those in Table 1, then it follows that "The Dark Tower" indeed represents a different literary style than that of the trilogy texts. Table 3, therefore, compares the data from Table 1 with the data from Table 2.

The FREQUENCY ANALYZER 1 and FREQUENCY ANALYZER 2 scores for all the possible pairs of comparisons reported in Tables 1 and 2 were subtracted from one another and are reported in columns 2 and 3, respectively, as simple differences. The higher the number, the more significant the difference in the scores. For example, subtracting the A1 and A2 scores (*Silent Planet*/*Perelandra* difference index and *Silent Planet*/*Hideous Strength* difference index) yields a Frequency Analyzer 2 difference of 112, while comparing A1 and B1 (*Silent Planet*/*Perelandra* difference index subtracted from *Silent Planet*/*Dark Tower* difference index) yields a difference of 649. Therefore, the stylistic difference between the undisputed Lewis texts (A1 and A2) is significantly less than the difference between and "The Dark Tower" text (B1) and an undisputed Lewis text (A1). Visual inspection of all the data in column 2 of Table 3, which shows differences in Frequency Analyzer 1 results, indicates that 5 of the 9 comparisons of "The Dark Tower" with trilogy texts are significantly higher than comparisons among the trilogy texts, indicating that "The Dark Tower" does differ from the others in terms of single-letter frequencies. In one instance (A3 & B3), the score is only slightly higher.

The most dramatic results appear in column 3, which contains the letter-pair difference scores for the more discriminating FREQUENCY ANALYZER 2. In every comparison involving "The Dark Tower" and a trilogy text, the difference is significantly higher than the three comparisons among the trilogy texts themselves.

### Conclusions

The data presented in Table 3 support the contention that, with respect to the frequency of single letters and particularly letter pairs, "The Dark Tower" fragment represents a different style than the books comprising Lewis's deep space trilogy. This inference has been confirmed by the author of the Literary Detective program, who also examined the data.<sup>12</sup>

Table 3. Comparison of Difference Indexes Derived from Tables 1 and 2.

Text Comparisons*	Differences in Frequency Analyzer 1 Results	Differences in Frequency Analyzer 2 Results
Trilogy Texts:		
A1 & A2	-16	-112
A1 & A3	-2	-56
A2 & A3	-14	-56
Trilogy Texts with Dark Tower:		
A1 & B1	-37	-649
A1 & B2	-7	-359
A1 & B3	-15	-549
A2 & B1	-53	-537
A2 & B2	-23	-247
A2 & B3	-31	-437
A3 & B1	-39	-593
A3 & B2	-9	-303
A3 & B3	-17	-493

\*Key to Text Comparisons from Tables 1 and 2

A1 Silent Planet & Perelandra  
 A2 Silent Planet & Hideo's Strength  
 A3 Perelandra & Hideo's Strength

B1 Silent Planet & Dark Tower  
 B2 Perelandra & Dark Tower  
 B3 Hideo's Strength & Dark Tower

This study is not a definitive and comprehensive analysis of "The Dark Tower" relative to Lewis's usual literary style, but rather an attempt to use empirical methods to find a possible explanation for its diminished appeal. The credibility of the results reported here depends on the extent to which the traits measured by the Literary Detective are legitimate indicators of a writer's style, a discussion outside the scope of this study. If they are, however, the evidence raises some intriguing questions concerning the controversial fragment. Did Lewis experiment with a new style and, finding it unsatisfying, subsequently abandon the attempt? Or, could it be that "The Dark Tower" was written by someone else? These conjectures may not be amenable to resolution, but I hope

they generate some interest among experts in literary criticism and Lewis scholars whose methods exceed my own capabilities at literary analysis.

## Endnotes

- 1 C.S. Lewis, *The Dark Tower & Other Stories*. Ed. W. Hooper. 1st Edition (New York: Harcourt Brace Jovanovich, 1977).
- 2 *ibid.*, pp. 7-8.
- 3 *ibid.*, p. 8.
- 4 *ibid.*, p. 9.
- 5 Personal communication (March 1986), Dr. Corbin S. Carnell, University of Florida, Department of English; personal communication (May 2, 1986), Kathryn Lindskoog, author of *C.S. Lewis: Mere Christian* and *The Lion of Judah in Neer-Neer Land*, among other works on Lewis. Ms. Lindskoog also indicated to me in personal correspondence (March 27, 1987) that George Sayer, Lewis's pupil and friend, has also expressed uncharacteristic dislike for "The Dark Tower."
- 6 Postscript, *CSL: The Bulletin of the New York C.S. Lewis Society* (Vol. 9, No. 6, April 1978), p. 9.
- 7 Richard Hodgson, Notes on Lewis's "The Dark Tower," *ibid.*, p. 1.
- 8 Jim Tankard, "The Literary Detective," *Byte*, February 1986: 231-238.
- 9 Frederick Mosteller and David L. Wallace. *Inference and Disputed Authorship: The Federalist* (Reading, MA: Addison-Wesley, 1964), cited in Tankard, *ibid.*, pp. 2331-232.
- 10 C.S. Lewis, *Out of the Silent Planet* (1965; New York: The Macmillan Company, 1971); C.S. Lewis, *Perelandra* (New York: The Macmillan Company, 1971); C.S. Lewis, *That Hideous Strength* (1972; New York: The Macmillan Company, 1971).
- 11 Walter Hooper, "A Bibliography of the Writings of C.S. Lewis," pp. 120-121, in Ed. Jocelyn Gibb, *Light on C.S. Lewis* (New York: Harcourt Brace Jovanovich, 1976).
- 12 Personal communication, Jim Tankard (July 9, 1986).

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