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9

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STATISTICAL CORRELATION BETWEEN
TYPOGRAPHICAL DATA AND SPELLING-VARIANTS
IN 16th AND 17th CENTURY ENGLISH BOOKS

A CONTRIBUTION TO DIACHRONIC ENGLISH MORPHOGRAPHEMICS

H. E. BREKLE

1. It is the aim of this paper to prove statistically a connection between compositorial habits in setting up a page with lines of even length and the variability of English spelling in printed books of the 16th and 17th centuries.

1.1. For a long time a connection between compositorial practice and spelling habits displayed in Tudor and Elizabethan books had been assumed¹; the latest reference to this phenomenon in a full-scale book on the history of the English language is to be found in A. C. Baugh (²1960) § 156: "Most printers probably took advantage of the variability of English spelling to 'justify' a line, with as little scruple about optional letters as about extra spaces." Jespersen in his *Growth and Structure of the English Language* (³1960) § 215 quotes some examples of 'short' and

¹ E.g. by E. Rudolf, *Die englische Orthographie von Caxton bis Shakespeare*, Diss. Marburg (1904), 31: "Das stumme *e* trägt, neben der Konsonantenverdoppelung, ganz besonders dazu bei, die englische Orthographie im 16. Jahrhundert so unregelmässig erscheinen zu lassen. 1. Es kann, ohne dass feste Regeln bestehen, an beinahe jedes Wort angefügt werden; denn in den Wörtern, welchen ein *e* am Ende historisch zukam, war es verstummt. Die Drucker unserer Periode bedienten sich seiner, ebenso wie der Konsonantenverdoppelung, wo es ihnen passte, um beim Setzen die Zeilen jedesmal richtig zu füllen; das sagt uns W. Salesbury ausdrücklich (H. Sweet, *A History of English Sounds*, Oxford 1888, 209)." Similar statements are found in W. Sopp, *Orthographie und Aussprache der ersten neuenglischen Bibelübersetzung von W. Tyndale*, Diss. Marburg (1889); M. Grünzinger, *Die neuenglische Schriftsprache in den Werken des Sir Thomas More (1478-1535)*, Diss. Würzburg (1909), 21; W. Blades (*The Biography and Typography of William Caxton, England's first printer*, London-Strassburg, ²1882) in spite of his thoroughly conducted typographical investigations and descriptions, does not mention the obvious variability of Caxton's spellings, which, as will be afterwards explained, are partly due to the need of 'justifying' lines to equal length. What he did notice is that Caxton did not accept the practice of spacing out lines to an even length before 1480. Up to this time Caxton followed the time-honoured scribal practice of placing all the spare space at the end of the lines. Thus, 1480 is the point post quem in English printing practice when spacing out of lines to an even length became an engrained habit.

'long' spellings of a word, e.g.: "The early printers used the two forms [viz. *doth* and *doeth*] indiscriminately, or rather preferred *doth* where *doeth* would make the line appear too closely packed, and *doeth* where there was room enough." Another reference for the assumed connection between technical procedures of setting up a page and various spellings of a single word is given by Professor Brunner²: "Im 16. und 17. Jahrhundert verwendete man noch oft in demselben Wort verschiedene Schreibungen, wobei sich die Buchdrucker vielfach davon leiten liessen, ob der Satzspiegel längere oder kürzere Formen verlangte, da man verschieden grosse Spatien noch nicht kannte und Worttrennung nach Möglichkeit vermied." However, Professor Brunner is mistaken in assuming a connection between 'type area' (*Satzspiegel*) and various spellings of a word, the expression he should have used instead is 'length of line' (*Zeilenbreite*). Apart from that it is simply not true that the early English printers did not use spacing materials in various widths; there is overwhelming evidence for this fact on every printed page from 1480 onwards. The same holds true regarding word-division, at least during the 16th century, especially with relatively short lines, e.g. of about 50 mm. The dividing of words at the end of a line, for the most part even without any system, was common practice.

2. In order to prove the assumption laid down in the heading of this paper, it is advisable to premise some explanations about compositorial practice,³ which in this very point had not altered since Caxton.

As everybody knows from his own type-writing the result generally obtained is lines of uneven length. This primarily also happens when a compositor sets up a page of prose, but he has the means of bringing the set up lines to a fixed length by varying the spaces between the words, or, as will be shown afterwards, by varying the spellings of certain words, i.e. by choosing either a 'short' spelling if the respective line would become too long, or, by choosing a 'long' spelling if there is some space left at the end of a line. It is clear from the outset that these varied spellings will occur more often with a text set up in lines having a relatively narrow measure,⁴ because in this case the compositor has only very few spaces between words at his disposal, whereas in the case of a relatively wide measure he has many spaces between words available for spacing out the

² *Die englische Sprache* (Tübingen, 1960), I, 185ff.

³ The author of this paper acquired some experience in this field during his seven years' working as a compositor, proof-reader, and printer.

⁴ E.g. with a text set up in pica and the measure being 50-60 mm i.e. the 'narrowness' of measure thus being a function of the two variables 'type size' and 'measure'.

respective lines to an even length. This habit of taking advantage of the variability of English spelling was common practice between 1480 and the middle of the 17th century.

2.1. As a proof of this assumed interdependence between varied spellings of words and the afore mentioned compositorial devices the following investigation is based upon materials drawn from eleven books printed between 1550 and 1687 (see below 2.2. and 3.1.-3.10.).

2.2. One of these books may serve as an example for the proposed techniques of investigation which will be used in this article.

Bibliographical notes:

Discourses vpon Seneca the Tragedian. By Sir William Cornwalleys, Knight. Imprinted at London for Edmund Mattes, at the hand and plough in Fleetstreet. 1601. (A facsimile reproduction with an introduction by Robert H. Bowers. Gainesville, Florida. *Scholars' Facsimiles and Reprints* 1952.)

Octavo. Collation: π^2 , \mathbb{I}^2 , A-G⁸, H⁸ (H⁸ a genuine blank). Kind of type: Roman, accentuated with italics. Type size: 11-12 (German point system!). Measure of the column: 50 mm. Number of lines per page: mostly 24 + running title (verso): *Discourses vpon* / (recto): *Seneca the Tragedian* + catchwords at the bottom of nearly all pages.

In order to gather the material for the following statistical procedures the investigation was made quire-wise, i.e. each of the eight quires was searched for lines containing spellings of a word which differ in comparison with spellings of the same word in other lines. The result obtained in searching through the quires A-G⁸, H⁸ (each complete quire comprises 8 sheets = 16 pages) for varying spellings was:

2.3.1. *Number of 'long' and 'short' spellings*

Quire	'long' spellings	'short' spellings ⁵
A	37	90
B	36	72
C	33	100
D	49	78
E	45	58
F	32	75
G	55	50
H	16	35
Σ A-H	303	558

From the ratio of the respective numbers of the two columns can be inferred that the compositor, when setting up a line, deliberately chose the

⁵ See the following footnote.

'short' spelling of the word in question and, if there was some spare space left at the end of the line, he 'justified' the line by inserting 'long' spellings and at the same time varying the spaces between the words. Quite naturally, he could only vary the spelling of a word if this belonged to the below-mentioned class of words which can be varied. For this reason the 'short' spellings can be considered as 'normal' spellings. This standpoint does not, however, entail any conclusions about the nature of a supposed correspondence between these word-forms and actual sound sequences represented by them. This is proved by the appearance of 'long' spellings like *-nesse* (*-nes*), *bodie* (*body*), *shall* (*shal*), *goe* (*go*), *it selfe* (*itselfe*) occurring in last lines of a paragraph and as catchwords where no need arises to use them instead of the 'short' variety.

Apart from that there is no correlational connection between these two columns of numbers, because they are wholly conditioned by the choice of words combined together by the author to form the text.

2.3.2. The words appearing in varied spellings are (in order of decreasing frequency):⁶

long spellings	short spellings
<i>bee, beeing, beene</i>	<i>be, being, ben</i>
<i>hee</i>	<i>he</i>
<i>doe, doeth</i>	<i>do, doth</i>
<i>wee</i>	<i>we</i>
<i>-nesse</i> (suffix)	<i>-nes</i>
<i>my</i>	<i>my</i>
.	.
. <i>selfe/selves</i>	. <i>selfe/selves</i>
.	.
<i>them</i>	<i>them</i>
(set in two words)	(set without space in one word)
<i>shee</i>	<i>she</i>
<i>onely</i>	<i>only</i>
<i>mee</i>	<i>me</i>
<i>can not</i>	<i>cannot</i>
<i>goe</i>	<i>go</i> ¹⁰
<i>howe</i>	<i>how</i>

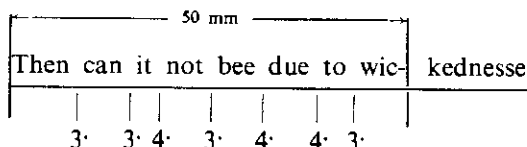
2.4. For our purpose four types of varied spellings must be discerned.

⁶ Excluded are the following pairs of words from which we can conclude nothing definite for our purposes: *all* – *al*, *will* – *wil*, *well* – *wel*, *shall* – *shal*, *bodie* – *body*, *fall* – *fal* and abbreviations taken over from manuscript practice e.g. *-ē* = *en/em* etc.

The examples given below are intended to clarify at the same time the compositorial technique of spacing out lines to an even length.

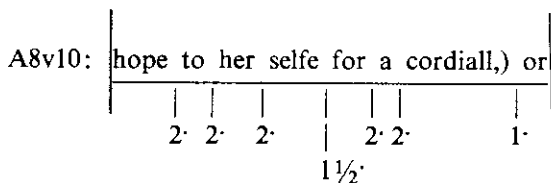
2.4.1. Conclusive 'long spelling' type

Quire B, sheet 4 recto, 10th line from above = B4r10:



The process of setting up this line can be reconstructed as follows: The letters were set up one after another in a composing-stick with a fixed measure, in our case 50 mm and were primarily spaced with 3· after each word. Arriving at the end of the line there was, however, not space enough for the whole word *wickednesse*, not even enough to divide it after *wicked-*; thus the compositor divided it after *wic-* as there existed at that time no hard and fast rules for the division of words. Even so there was some spare space left. Consequently he had to look for means of getting rid of it. Two ways were open to him: Either to put more space between the words or to 'lengthen' the spelling of *be* (which belonged to that class of words susceptible of being altered in spelling). He did both as may be seen from the example above: The normal space between words was approx. three points (2660 points making a meter), thrice he put in 4 points between the words and expanded at the same time *be* to *bee* saving another 4½ points. Now the line was 'justified' to an even length. The above example is conclusive for our case because the compositor did alter the spelling of a word in order to meet with the typographical necessity of spacing out lines to an even length.

2.4.2. Non-conclusive 'long spelling' type



The spelling of the reflexive personal pronoun *her selfe* in the above example is not conclusive in this case, because, according to our assumed connection between typographical data (i.e. the spaces between words in a line) and 'long' and 'short' spelling variants of a word, the compositor should have, in this case, chosen the 'short' spelling (= *herselfe*) and instead put more space between the words. The explanation for his not

having done so is probably that he did not become aware of the fact that he had a word in the line which could be contracted and thus resorted only to the device of diminishing the space between words to a minimum.⁷ However, this phenomenon forms a minor class of all cases of spelling divergencies found in the corpus. It occurs in 47 cases out of 303 (see below 2.6.2).

2.4.3. Conclusive 'short spelling' type

G8v21:	thē, which we say are in calamitie:						
	no						no
	space	2·	2·	2·	2·	2½·	space

The first word *thē* is an abbreviation for *them* (following an old medieval scribal practice). The use of this device for abbreviating the combination of a vowel plus *n* or *m* is quite frequent in our corpus. However, it was not taken as evidence for our purpose. What must be considered as a token of spelling variation is the personal pronoun *we* which is in many other cases matched by *wee* (= 'long spelling'). From the above example it is quite obvious that the compositor did not have enough space available between words in order to choose the 'long spelling' *wee*. Thus for this type too the connection between the typographical device of spacing out a line and the spelling of a single word is established. The motivation is even a twofold one because of the occurrence of *thē* = *them*.

2.4.4. Non-conclusive 'short spelling' type

C1r9:	they take vp armes being Sub-					(iects,...)
	6·	4·	4·	6·	4·	

The spacing of this line is extraordinarily wide. The average space between words is 2 to 3 points. Our compositor could have resorted to the device of choosing a 'long spelling' for *being* (= *beeing*, which often

⁷ A similar case is reported by Charlton Hinman, *The Printing and Proof-reading of the First Folio of Shakespeare* (2 vols.) (Oxford, 1963), I, 187, discussing various clues hinting at the compositorship of certain passages: "What seems indisputable is that spellings that were not habitually used by a given compositor sometimes do appear in material set by him because of a real or fancied need to justify, (occasionally only fancied, one may suppose, since a compositor may sometimes have estimated wrongly that the line he was about to set would be too long unless he used a short spelling at the beginning of it) and that evidence from spelling is far less reliable for purposes of compositor identification in prose passages and in long lines of verse than elsewhere."

appears in other lines), why he did not do so is unknown to us. So in this case the spelling of *being* is not conclusive for our purpose. Worth mentioning is, however, that far less examples belonging to this type occur in our corpus than examples of the non conclusive 'long spelling' type.

2.5. As was pointed out in 2.3.1. the overall ratio of 'long' and 'short' spellings is 303:558. This shows clearly that the compositor of the 'Discourses' preferred 'short spellings' to 'long spellings' (cf. the frequency list under 2.3.2.) and that throughout the whole book. Under 2.3.1. it was assumed that there is no correlational connection between the two sets of numbers (viz. 'long' and 'short' spellings). This assumption can be verified by subjecting these two sets of data to the process of correlation.⁸ The technique made use of can be seen in detail in 2.6.1. and in footnote 10. The correlation coefficient thus obtained has the value of about 0.02, i.e. it is very near to zero, which means in our case that the two sets of data ('long' and 'short' spellings) are practically wholly independent of each other. This result can be equalled by the confirmation of the null hypothesis, i.e. the distribution of our two sets of data must be considered to be due exclusively to chance (= the choice of words out of the total stock of a vocabulary forming a meaningful set of sentences).⁹

2.6. The aim of the previous paragraphs was to introduce the more technical premises of the subject dealt with and to establish criteria for the choice of data significant for our investigation together with methods applied to them.

This part of the paper will present a proof for the assumed statistical connection between compositorial devices (set out in 2., 2.3., 2.3.1., 2.4.1.-2.4.4.) and variable spellings of certain words as listed under 2.3.2. The process of correlation will be accomplished by correlating the two sets of numbers set out in the table below. The correlation is made between 'long spellings' (overall number) and 'long spellings' (conditioned by typographical criteria as set out especially in 2.4.1. and 2.4.2.). The result obtained is also valid for the cases (listed in 2.3.2.) constituting the 'short spelling' type for analogical reasons; apart from that the cases of non-conclusive 'short spellings' are relatively far less numerous than the

⁸ Cf. *Mathematics Dictionary*, eds. G. James, R. C. James (Princeton/Toronto/New York/London, 1959), 88: *Correlation*: ... (2) (statistics) The interdependence between two sets of numbers; a relation between two quantities, such that when one changes the other does (simultaneous increasing or decreasing is called positive correlation and one increasing, the other decreasing, negative correlation); ...

⁹ See on the whole question G. Herdan, *Language as Choice and Chance* (Groningen, 1956), especially chapters 1, 5, and 7.

respective cases of 'long spellings' (cf. the arguments given in 2.3.1. and 2.4.4.). Thus the value of the correlation coefficient arrived at below for the two sets of 'long spellings' (2.4.1. + 2.4.2.) must be valid a fortiori for the interdependence of the two sets of 'short spellings' (2.4.3. + 2.4.4.).

2.6.1. The formula for the correlation coefficient r (as given e.g. in *Mathematics Dictionary* and elsewhere) is:¹⁰

$$r = \frac{\sum_{i=1}^n (x_i - \bar{x}) (y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}}$$

In our case the numerator of the fraction consists of the sum of $(x_i - \bar{x}) (y_i - \bar{y})$ throughout the quires A-H = $\sum_A^H (x_i - \bar{x}) (y_i - \bar{y})$ is the product of two differences: $(x_i - \bar{x})$ = (the absolute number of unconditioned 'long spellings' per quire = x_i) minus ($\bar{x} = 38$ = the arithmetic mean of the numbers listed under x_i). The same holds true for y_i = conditioned 'long spellings' (according to 2.4.1.). The denominator of the fraction consists of the square root of the product of the sum of the respective squares of $(x_i - \bar{x})$ and $(y_i - \bar{y})$, the arithmetic mean of the numbers in the y_i -column being 32.

2.6.2. In the following table our data are arranged so that they can be readily put into the formula of the correlation coefficient.

Quire	x_i	y_i	$(x_i - \bar{x})$	$(y_i - \bar{y})$	$(x_i - \bar{x}) (y_i - \bar{y})$	$(x_i - \bar{x})^2$	$(y_i - \bar{y})^2$
A	37	31	- 1	- 1	+ 1	1	1
B	36	34	- 2	+ 2	- 4	4	4
C	33	29	- 5	- 3	+ 15	25	9
D	49	43	+ 11	+ 11	+ 121	121	121
E	45	39	+ 7	+ 7	+ 49	49	49
F	32	27	- 6	- 5	+ 30	36	25
G	55	39	+ 17	+ 7	+ 119	289	49
H	16	14	- 22	- 18	+ 396	484	324
Σ A-H	303	256			+ 727	1009	572
Arithmetic							
mean $\bar{x} = 38$ $\bar{y} = 32$							

¹⁰ It is defined in *Mathematics Dictionary*, 57: "Correlation coefficient between two sets of data (or numbers). A number between -1 and 1 which indicates the degree of linear relationship between the two sets of numbers. If the two sets of numbers are (x_1, x_2, \dots, x_n) and (y_1, y_2, \dots, y_n) , the coefficient of correlation r measures how near the points $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$ are to lying on a straight line. If $r = 1$, the points lie on a line and the two sets of data are said to be in perfect correlation."

Consequently the correlational coefficient can be established as

$$r = \frac{\sum_A^H (x_1 - \bar{x}) (y_1 - \bar{y})}{\sqrt{\sum_A^H (x_1 - \bar{x})^2 \sum_A^H (y_1 - \bar{y})^2}} =$$

$$\sqrt{\frac{727}{1009 \cdot 572}} \approx \frac{727}{760} \approx 0.956$$

2.6.3. Now $r = 0.956$ must be interpreted as a strong interdependence between the two phenomena of 'long spellings' (unconditioned) and 'long spellings' (conditioned according to 2.4.1.). Our value of r is very close to the theoretically attainable maximum of +1 which means that there exists a relation between our two sets of data, such that when one increases or decreases the other does. Thus a strong internal interdependence of the two phenomena is established, i.e., the hypothesis laid down in 1., 1.1., and 2.4.1. is validated.

3. As convincing as the result of the foregoing section may be, it does not, however, prove anything about the generality of the observed and investigated phenomena. In order to prove the applicability of the methods described above to a whole class of instances, a sample consisting of ten books printed between 1550 and 1687 was chosen. This sample is representative of books printed in this period insofar as the choice of the single instances listed below was wholly fortuitous, i.e. it depends upon how accessible the facsimiles or original printings of that time were. It will be observed that the phenomena described in 2.-2.6.3. appear principally under the same conditions, though with varying frequency throughout the list of books given below.

3.1. *A Treatise of Schemes and Tropes* ... by Rychard Sherry Londoner ..., together with: *That chyl dren oughte to be taught and brought vp gētly* ... by Erasmus of Roterdame (from quire Gi onwards).

Imprynted at London by John Day ... 1550.

(A facsimile reproduction with an introduction by H. W. Hildebrandt. Gainesville, Florida (1961).)

Octavo. Collation: A-Piili (= 232 pp.). Quire: 8 sheets = 16 pp. Kind of type: Gothic 10/10; measure of the column: 50 mm.

Long and short spellings (conditioned according to 2.4.1. and 2.4.3.). The spelling pairs are arranged according to their appearance in the text.

<i>all</i>	—	<i>al</i>	<i>handsomelye</i>	—	<i>hansomely</i>
<i>wyl, wyll</i>	—	<i>wil</i>	<i>oure</i>	—	<i>our</i>
<i>bee</i>	—	<i>be</i>	<i>howe</i>	—	<i>how</i>
<i>-ynge</i>	—	<i>-yng</i>	<i>were</i>	—	<i>wer</i>
<i>manye</i>	—	<i>many</i>	<i>lytle</i>	—	<i>litle</i>
<i>whiche</i>	—	<i>which</i>	<i>shall</i>	—	<i>shal</i>
<i>nowe</i>	—	<i>now</i>	<i>-inge</i>	—	<i>-ing</i>
<i>wyth</i>	—	<i>with</i>	<i>throughe</i>	—	<i>through</i>
<i>-lye</i>	—	<i>-ly, -li</i>	<i>they</i>	—	<i>thei</i>
<i>maye</i>	—	<i>may</i>	<i>well</i>	—	<i>wel</i>
<i>whyche</i>	—	<i>whyche</i>	<i>whereby</i>	—	<i>wherbi</i>
<i>my</i>		<i>my</i>	<i>mooste</i>	—	<i>most</i>
.		.	<i>everye</i>	—	<i>every, everi</i>
.	<i>selfe/</i>	.	<i>speache</i>	—	<i>speche</i>
.	<i>selves</i>	.	<i>selves</i>		
<i>them</i>		<i>them</i>			
(set in 2 words)		(set in one word without space)			
<i>onely</i>	—	<i>only</i>	<i>woordes</i>	—	<i>wordes</i>
<i>anye</i>	—	<i>any</i>			

3.2. *The Arte of Rhetorique* (1553) ... by Thomas Wilson ... (Imprint of Hh iijv): *Richardus Graftonus, typographus Regius excudebat*. (A facsimile reproduction with an introduction by R. H. Bowers, Gainesville, Florida (1962).)

Collation: (A.i.—iijj+a.i.—iijj)–(Z.iiij)+(Aaiij–Hhiiij) (= 260 pp.). Quire: 4 sheets = 8 pp. Kind of type: Gothic: 10/12; measure of the column: 89-90 mm.

Long and short spellings (conditioned according to 2.4.1. + 2.4.3.).

The spelling pairs were gathered only from the first two quires and are arranged according to their appearance in the text.

<i>anye</i>	—	<i>any</i>	<i>my</i>		<i>my</i>	
<i>certayne</i>	—	<i>certain</i>	.		.	
<i>-lye</i>	—	<i>-ly</i>	.	<i>selfe/</i>	—	<i>selfe/</i>
<i>whyche</i>	—	<i>which</i>	.	<i>selves</i>	—	<i>selves</i>
			<i>them</i>		<i>them</i>	
			(set in 2 words)		(set in one word without space)	
<i>whiche</i>	—	<i>which</i>				
<i>-ynge</i>	—	<i>-yng</i>	<i>bee</i>	—	<i>be</i>	
<i>-inge</i>	—	<i>-ing</i>	<i>withoute</i>	—	<i>without</i>	
<i>doe</i>	—	<i>do</i>	<i>mooste</i>	—	<i>most</i>	
<i>wee</i>	—	<i>we</i>	<i>bothe</i>	—	<i>both</i>	

<i>shall</i>	— <i>shal</i>	<i>beinge</i>	— <i>being</i>
<i>manye</i>	— <i>many</i>	<i>they</i>	— <i>thei</i>
<i>wyth</i>	— <i>with</i>	<i>woordes</i>	— <i>wordes</i>
<i>see</i>	— <i>se</i>	<i>else</i>	— <i>els</i>
<i>Lordeshyppes</i>	— <i>Lordeshyps</i> (gen.)		
<i>maye</i>	— <i>may</i>	<i>howe</i>	— <i>how</i>
<i>youre</i>	— <i>your</i>	<i>nowe</i>	— <i>now</i>
<i>thoughe</i>	— <i>though</i>	<i>twoo</i>	— <i>two</i>
<i>-nesse</i>	— <i>-nes</i>	<i>(I) doo</i>	— <i>do</i>
<i>(he)dothe</i>	— <i>doth</i>	<i>(he) dooeth</i>	— <i>doeth/doth</i>
<i>(he)doeth</i>	— <i>doth</i>	<i>(I) doo</i>	— <i>dooe</i>
<i>all</i>	— <i>al</i>	<i>(they) doo</i>	— <i>doen</i>

In this part of the book the hands of two compositors can be clearly discerned. The most apparent difference between them is that the compositor of the first quire avoids long spellings of *be*, *wordes*, *two* and, as an instance of a super-long spelling *dooe*, instead of *doo* or *do*, while the compositor of the second quire deliberately chooses the respective long spellings *bee*, *woordes*, *twoo*, and *dooe*.

3.3. *A very briefe and profitable Treatise declaring howve many counsellis, and vv hat maner of Counselers a Prince that will gouerne well ought to haue.*

Imprinted at London by William Seres. (1570). (By Thomas Blundeville, an English reworking of *El consejo i consejeros del principe* (1559) by Federico Furio Ceriol). (A facsimile reproduction with an introduction by K.-L. Selig, Gainesville, Florida (1963).)

Collation: A4-Q4. Quire: 4 sheets = 8 pp. Kind of type: Roman 16; measure of the column: 67 mm.

Long and short spellings (conditioned according to 2.4.1. + 2.4.3.).

The spelling pairs were gathered from the sheets A²-D¹ (= 23 pp.). A notable spelling device for /w/ occurs in the text: vv (double u) as a 'long' letter for w, though w is as frequent as the 'long' variety. The spelling pairs are arranged according to their appearance in the text.

<i>hee</i>	— <i>he</i>	<i>by cause</i>	— <i>bicause</i>
<i>doe</i>	— <i>do</i>	<i>bodye</i>	— <i>body</i>
<i>my</i>	<i>my</i>	<i>everye</i>	— <i>every</i>
.	.	<i>hovve</i>	— <i>how</i>
.	<i>selfe</i>	<i>vvell</i>	— <i>vvel</i>
.	<i>selves</i>		
<i>them</i>	<i>them</i>		
(set in 2 words)	(set in one word)		

<i>all</i>	— <i>al</i>	<i>-lye</i>	— <i>-ly</i>
<i>tongue</i>	— <i>tong</i>	<i>ordinarie</i>	— <i>ordinary</i>
<i>mee</i>	— <i>me</i>	<i>vvarre</i>	— <i>warre</i>
<i>bee</i>	— <i>be</i>	<i>anye</i>	— <i>any</i>
<i>maye</i>	— <i>may</i>	<i>carrye</i>	— <i>carry</i>
		<i>verye</i>	— <i>very</i>

3.4. *Golden Epistles*, Contayning varietie of discourse both Morall, Philosophicall, and Diuine... By Geffroy Fenton. Imprinted at London by Henry Middelton, for Rafe Newbery, dwelling in Fleetstreet a litle aboue the Conduit. (1575).

Collation: (Text only) A⁸-Y⁸; Aa⁸-Yy⁸; Aa⁸-Dd⁸.

Quire: 8 sheets = 16 pp. Kind of type: Gothic 10/11; measure of the column: 84, 86,5 + 89 mm.¹¹

Long and short spellings (conditioned according to 2.4.1. + 2.4.3.).

The spelling pairs were gathered from the first three quires and are arranged according to their appearance in the text. Many abbreviations of the type *ē* = *en* etc. occur; apart from that the compositor used ligatures as *ee* and *oo* cast together in one letter, thus in case of necessity he could vary his spellings between 'long' letters (*ee*, *oo* set in two letters) and 'short' letters (*ee*, *oo* set in one letter).

<i>hee</i>	— <i>he</i>	<i>canne not</i>	— <i>cannot</i>
<i>fall</i>	— <i>fal</i>	<i>can not</i>	— <i>cannot</i>
<i>-ing</i>	— <i>-inge</i>	<i>doe</i>	— <i>do</i>
<i>shee</i>	— <i>she</i>	<i>verye</i>	— <i>very</i>
<i>beeing</i>	— <i>being</i>	<i>seeing</i>	— <i>seing</i>
<i>mee</i>	— <i>me</i>	<i>-shippe</i>	— <i>-ship</i>
<i>bene</i>	— <i>ben</i> (= mod. <i>been</i>)		
<i>call</i>	— <i>cal</i>	<i>-lye</i>	— <i>-ly</i>
<i>onely</i>	— <i>only</i>	<i>goe</i>	— <i>go</i>
<i>-nesse</i>	— <i>-nes</i>	<i>anye</i>	— <i>any</i>
		<i>carrie/carie</i>	— <i>cary</i>

3.5. *The Traveiler of Jerome Turler* ... Imprinted at London by William How, for Abraham Weale (1575).

(A facsimile reproduction with an introduction by D. E. Baughan, Gainesville, Florida (1951).)

Collation: A⁸-N⁸ (= XVI + 192 pp.).

Quire: 8 sheets = 16 pp. Kind of type: Gothic 11; measure of the column: 57 mm.

¹¹ Cf. F. Bowers, "Bibliographical Evidence from the Printer's Measure", *Studies in Bibliography* (= *Papers of the Bibliographical Society of the University of Virginia*, II) (1949-50), 153-167. P. 154: "In early times this compositor's stick was made in various fixed lengths ... (made of wood, thus) ... the compositor owned his own measure." In our case this would indicate that at least three different compositors were at work when setting up the *Golden Epistles*.

Long and short spellings (conditioned according to 2.4.1. + 2.4.3.).

The spelling pairs were gathered from the sheets B¹-D³ (= 37 pp.). The same abbreviations and ligatures as listed in 3.4.

<i>doe</i>	— <i>do</i>	<i>my</i>		<i>my</i>	
<i>call</i>	— <i>cal</i>	.		.	
<i>onely</i>	— <i>only</i>	.		<i>selfe/</i>	— . <i>selfe/</i>
<i>beeing</i>	— <i>being</i>	.		<i>selves</i>	. <i>selves</i>
<i>beinge</i>	— <i>being</i>	<i>them</i>		<i>them</i>	
<i>bee</i>	— <i>be</i>	(two words)		(one word)	
(The <i>ee</i> may be either a ligature or two single <i>e</i> 's, the same holds true for <i>hee</i> , <i>wee</i> etc.)		<i>shee</i>	—	<i>she</i>	
		<i>all</i>	—	<i>al</i>	
		<i>manie</i>	—	<i>many</i>	
		<i>anye, anie</i>	—	<i>any</i>	
		<i>enie (!)</i>			
<i>hee</i>	— <i>he</i>	<i>wyll</i>	—	<i>wyl</i>	
<i>wee</i>	— <i>we</i>	<i>will</i>	—	<i>wil</i>	
<i>howe</i>	— <i>how</i>	(he) <i>goe</i>	—	(he) <i>go</i>	
<i>-lye</i>	— <i>-ly</i>	<i>too</i>	—	<i>to</i>	
<i>shall</i>	— <i>shal</i>	(marker of the infinitive)			
<i>-nesse</i>	— <i>-nes</i>	<i>bodye</i>	—	<i>body</i>	
<i>maye</i>	— <i>may</i>	(he) <i>dothe</i>	—	(he) <i>doth</i>	
<i>-ynge/-inge</i>	— <i>-ing/-yng</i>	<i>well</i>	—	<i>wel</i>	
		<i>althoughe</i>	—	<i>although</i>	
		<i>wyth</i>	—	<i>with</i>	

3.6. *A new Booke of Good Husbandry* ... Written in Latine by Janus Dubrauius, and translated into English at the special request of George Churchey, fellow of Lions Inne, the 9. Februarie 1599.

Imprinted at London by William White, dwelling in Cow-lane. 1599.

(A facsimile reproduction with an introduction by J. M. French, Gainesville, Florida (1962). The books investigated in 3.7. and 3.8. are associated with the one dealt with here in one volume.).

Collation: A⁴-L² (= 83 pp.). Quire: 4 sheets = 8 pp. Kind of type: the prologues to each chapter are set in 12/13· Roman, the text itself in Gothic 10· (accentuated with Roman and italics); measure of the column: 89 mm.

Long and short spellings (conditioned according to 2.4.1. + 2.4.3.).

The spelling pairs were gathered throughout the 83 pp.

<i>wee</i>	— <i>we</i> (quite often)	<i>fysh</i>	—	<i>fish</i>
<i>hee</i>	— <i>he</i>	<i>wrytheth</i>	—	<i>writeth</i>
<i>doe</i>	— <i>do</i>	<i>agoe</i>	—	<i>ago</i>
<i>goe</i>	— <i>go</i>	<i>hencefoorth</i>	—	<i>henceforth</i>

The scarcity of spelling variants in this text is partly due to the relatively wide measure of the column = 89 mm (cf. above 2.); the other factor conducive to the small number of spelling variants is the date of printing, 1599. It seems that at the beginning of the 17th century the habit of using spelling variants gradually loses ground. This is also true of the books discussed in 3.7., 3.8., 3.9. + 3.10.

3.7. *The Pleasvres of Princes*, ... Containing a Discourse of the generall Art of Fishing

London: Printed by T. S. for John Browne ... 1614.

Collation: A⁴-E⁴ (= 40 pp.) Kind of type: Gothic 10-; measure of the column: 86,5 mm (running titles and marginal notes in Roman type).

Long and short spellings.

The spelling pairs were gathered throughout the 40 pp.

<i>onely</i>	—	<i>only</i>	<i>will</i>	—	<i>wil</i>
<i>hee</i>	—	<i>he</i>	<i>doeth</i>	—	<i>doth</i>
(quite often)			<i>shall</i>	—	<i>shal</i>
<i>it selfe</i>	—	<i>himselfe</i>	<i>wee</i>	—	<i>we</i>
(instances for the complete paradigm do not occur.)					

3.8. *Barker's Delight; or, the Art of Angling* ... The Second Edition much enlarged. By Thomas Barker, an antient practitioner in the said Art. ... London, Printed for Humphrey Moseley, ... 1659.

Collation: A⁸-D⁸ (= 64 pp.). Quire: 8 sheets = 16 pp. Kind of type: Roman 14/16-; measure of the column: 92 mm. (Running titles in italics).

Long and short spellings.

<i>doe</i> (3.P.Pl.)	—	<i>do</i> (2.P.Sing.)
(6-8 instances)		
<i>goe</i> (3.P.Pl.)	—	<i>go</i> (4-6 instances)

In the case of this book the first factor conducive to the scarcity of spelling variants, namely the relative 'width' of the measure of the column seems to be ruled out by the time factor (1659!). The relation between the width of measure and the type size (14-) is such that for technical reasons alone spelling variants could arise (cf. above 2.).

3.9. *The History of the Royal Society of London* ... By Tho. Sprat. London, Printed by T. R. for J. Martyn at the Bell without Temple-Bar, and J. Allestry at the Rose and Crown in Duck-lane, Printers to the Royal Society. MDCLXVII (1667).

Collation (Text): 439 pp. Kind of type: Roman 12- (accentuated with italics); measure of the column: 90-94 mm.

Long and short spelling. (The spelling pairs were gathered through the 439 pages.)

One peculiarity of the 'orthography' of the text should be mentioned: The letter *e* is often omitted, e.g. in cases like: *manag'd* etc., *suff'rings* (*sufferings*) etc., but both spellings do occur. However, these 'missing' *e*'s are not due to any typographical influence.

<i>my</i>			<i>my</i>			
.			.			
.		<i>self</i>	—	.		<i>self</i>
.		<i>selves</i>		.		<i>selves</i>
<i>them</i>			<i>them</i>			
(set in 2 words)			(set in one word)			
<i>onely</i>		—	<i>only</i>			
<i>farre</i>		—	<i>farr</i> (= mod. <i>far</i>)			

It cannot be said that these spelling variants are necessarily conditioned by typographical evidence. The reason for it has been already given in 3.6. and 3.8.

3.10. *The Lives of the most Famous English Poets ...* by William Winstanly ... Printed by H. Clark ... Cornhil, 1687.

(A facsimile reproduction with an introduction by W. R. Parker, Gainesville, Florida (1963).)

Collation: A⁸-P⁷ (= XXVI + 221 pp.). Kind of type: Roman with italic 12/13; measure of the column: 97 mm.

There is practically no compositorial influence upon spelling: the 'orthography' is very consistent, only self-compounds are sometimes printed in two words and sometimes in one. But even in these cases the reasons given in 3.6. and 3.8. preclude a typographical conditioning.

4. This paper is not meant to be even a rough sketch of the development of English spelling practice between 1550 and 1687, nor is it intended to deal with the problem if and to what extent mainly historically conditioned spelling habits – as we have it in the case of the printed material dealt with here – can be considered to represent phonetic and phonemic features and relations of a language system at a give time.¹² Its purpose could rather be to draw the attention of linguists dealing with the histori-

¹² Cf. for recent discussions: Stockwell and Barrett, *Some Old English Graphemic-Phonemic Correspondences* (= *Occasional Paper* No. 4 of *Studies in Linguistics*, 1951), and P. Valentin, "Althochdeutsche Phonemsysteme", *Zeitschrift für Mundartforschung*, 29 (1962), 341-56; John C. McLaughlin, *A Graphemic-Phonemic Study of a Middle English Manuscript* (The Hague, Mouton, 1963), esp. pp. 18-41.

cal phonology of English to possible pit-falls hidden in printed material between 1480 and the middle of the 17th century. The results we attained here are such that phonetic/phonemic inferences drawn from the spelling features displayed by a certain class of words (conditioned according to 2.4.1. and 2.4.3.) are highly susceptible of being doubtful in so far as the observed differences in spelling may not represent a phonetic/phonemic difference of the word-forms under investigation¹³ but must be considered rather as several instances of bound or free allomorphographs¹⁴ (simple units as in: *hee* – *he*, compound units as in: *doeth* – *doth*) conditioned by certain compositorial habits described above in 2ff. Consequently the spelling *pairs* ('long' and 'short' spellings) discussed in 2.3.2. ff and 3. ff. can be regarded as being instances of morphographemes. McLaughlin defines the term 'morphographeme' as "a class of allomorphographs which are semantically similar and which are in non-contrastive distribution" (29). It is obvious that the logical basis of both phonemic and graphemic theory and terminology is very much the same.¹⁵

In the light of graphemic theory the result of the present paper can be interpreted as being a list of typographically conditioned allomorphographs or combinations of allomorphographs, which are in non-contrastive distribution. It is evident that allomorphographs can practically only occur in writing systems where there does not exist something like a fixed 'orthography'. This is shown by the outcome of the present investigation of printed English books between 1550 and 1687.

Tübingen

¹³ Cf. for a similar statement, which, however, does not touch our problem of typographically conditioned spellings in: Horn-Lehnert, *Laut und Leben: Englische Lautgeschichte der neueren Zeit (1400-1950)* (Berlin, 1954), I, 74: "Wir dürfen nicht einzelne Schreibungen aus den Quellen herausheben und für sich allein verwerten. Im einzelnen Fall kann man nicht immer feststellen, ob es sich um eine gelegentliche Verschreibung handelt, oder um die phonetische Wiedergabe einer Sprachform."

¹⁴ For the graphemic terminology used here see John McLaughlin, *op. cit.*, 29 ff. The author of the present paper only recently came across McLaughlin's book, i.e. not before this paper was practically finished.

¹⁵ McLaughlin's own wording is this (20): "The rationale for such a theory is simply stated: The phonology of a language can be described in terms of the distinctive and non-distinctive character of the sounds of which it consists; the graphonomy of a language can be described in terms of the distinctive and non-distinctive character of the graphs of which it consists."