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# Studies in Bibliography

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## SYMMETRY IN WATERMARK SEQUENCES

by  
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As the late Allan Stevenson observed, the study of paper has until recently been historical rather than bibliographical, "and most of the attempts to draw useful inferences out of watermarks (and other aspects of paper) have been uninformed and unscientific."<sup>1</sup> There have, of course, been exceptions to this rule, among the most notable of which was Sir Walter Greg's classic work on the misdated Pavier quartos of Shakespeare.<sup>2</sup> And Stevenson's own inspired contributions to the study of paper, which culminated in his investigation of the *Missale speciale*,<sup>3</sup> have done much to make the bibliographical analysis of paper evidence more sophisticated and reliable.<sup>4</sup> The principal end of both Greg's work on the Shakespeare quartos and Stevenson's on the *Missale* was dating, and for this it was necessary for them to compare the paper in several books. Other scholars have used paper evidence to locate textual disruptions, by examining the patterns produced by folding single sheets of paper in specific formats. In the folio format, for example, a sheet of paper is folded once to produce one leaf with a watermark at its center and one unwatermarked leaf. In quartos, the double folding of the sheet splits the watermark so that roughly one half of the mark appears centered at the gutter on each of two conjugate leaves, while the other two leaves of the sheet are unwatermarked. Robert W. Chapman and others have realized that violations of these patterns indicate cancellation or some other disturbance of the gathering.<sup>5</sup> What has not been appreciated,

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however, is that elaborations on these patterns involving several sheets within gatherings produce complex symmetries in the resultant sequences of watermarks. In the present study I shall propose a method of analyzing watermark sequences which can not only discover the ways in which gatherings were originally formed, but can also identify and locate textual disruptions where this might otherwise be impossible. I shall also try to demonstrate how this mode of analysis, when considered in concert with the literary and bibliographical evidence, can sometimes illumine the history of both a codex and its text. It is worth noting that while earlier analyses of paper evidence have generally been restricted to printed books and have often relied upon several copies of these books, the present approach is suitable to manuscripts, and is valid even when applied to unique codices.

To illustrate this method of analysis, I shall refer to Cotton MS. Vespasian D. viii., the N-town Cycle of mystery plays, a small quarto dating from the second half of the fifteenth century. The

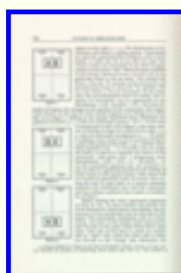
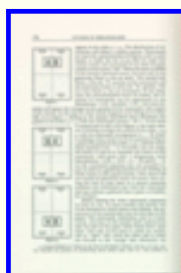
plays in this text are patently composite, and there is good evidence that the cycle was in part compiled as the manuscript was transcribed; <sup>6</sup> it is therefore well suited to demonstrate some of the possible applications of the approach under discussion in this study. The manuscript is in a British Museum binding and the leaves have been cut and separately mounted on guards, save for a few bifolia which are mounted on single guards. Most of the original signatures and quire-marks have been cut away. Later, perhaps Cottonian, quire-marks do appear, but the quiring they indicate is very odd: according to these marks, six quires contain only two leaves each, while other quires contain three, six, eight, twelve, fourteen, fifteen, sixteen, eighteen, nineteen, and twenty leaves. By analyzing the watermark sequences, one can test the accuracy of the quire-marks, and in the process shed light on the compilation of the codex and the plays themselves.

As already noted, each folded sheet in the quarto format produces two watermarked leaves, each with roughly one half of the mark, and two un-watermarked leaves. The order in which these leaves actually appear in old manuscript books varies, probably owing to the different positions of the sheets when they were folded (various methods of folding the sheets may also have been a factor, but this seems less likely, and the results would have been the same in any case). The double folding of sheets in quarto produced four distinct patterns of watermark distribution, as I shall try to show. For the purpose of this demonstration, let us assume a fixed manner of folding: first folding the sheet in half and forward, toward the scribe, along a line parallel to the shorter side; then folding it forward again, along a line parallel to the other side. If a sheet sitting in the position illustrated by Figure 1 is folded in this way, the four leaves (let us call them "panels" in this context) will

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appear in the order 3 1 2 4. The distribution of watermarks will follow a similar pattern. Watermarks are typically representations of objects, such as pots, hands, or bulls, but let us say that by some convenient stroke, the watermark of our sheet of paper consists of the letters "AB." When the sheet is folded in the manner described above, the first leaf in the gathering, Panel 3, has no mark. The second leaf, Panel 1, has the "A" portion of the watermark and the third leaf, Panel 2, bears the "B" portion. The last leaf, Panel 4, has no watermark. If one designates the unwatermarked leaves by dashes, this sequence of watermarks can be represented by the formulation-A B-(actually-<sup>∇</sup> B-, but these formulas will ignore the changes in the position of the watermark with respect to the viewer). In the case of a sheet which happens to be sitting on its other side, as in Figure 2, folding in the manner described above distributes the panels in the order 4 2 1 3, with the watermark pattern-B A-. If the sheet is turned end to end, as in Figure 3, the same manner of folding arranges the panels in the order 1 3 4 2, with the watermark arrangement A -- -- B. Finally, folding a sheet which sits in the position of Figure 4 places the panels in the order 2 4 3 1, and the watermark sequence is B -- A. Naturally, one can assign the letters A and B to represent the halves of any watermark. And given such a designation, these four patterns,-A B-,-B A-, A -- B, and B -- A, are the watermark sequences one can normally expect to find in a gathering formed by the folding of whole sheets in the quarto format. (The sheets will not usually be physically intact, of course, since cutting the bolt in each sheet in a quarto normally produces two half-sheets - one with the watermark and one without -- gathered into a quire, or booklet, for sewing. <sup>7</sup>)



Before looking for these watermark sequences in Vesp. D. viii., we must consider one further test of the method by which sheets were folded: the appearance of the mould-sides and the felt-sides of the paper. The watermark, chain-lines, and, to a lesser extent, wire-lines of the mould made indentations into the side of the paper which faced down upon them. This side of the sheet is called the mould-side or "right" side, while the other side is called the felt-side or the "wrong" side. Obviously, the

method of folding determines the locations in which the mould-sides and felt-sides will appear. For example, in a sheet folded so as to produce the pattern 3 1 2 4 in the panels, if the mould-side is the recto of Panel 3 (the first leaf of the gathering), then the verso of Panel 4 must also be the mould-side; in addition, the mould-side must be the verso of Panel 1 and the recto of Panel 2. This produces the pattern for the mould-side of this folded sheet of recto-verso-recto-verso. The only other possible pattern for the appearance of the mould-sides in a folded whole sheet is verso-recto-verso-recto. If neither of these two patterns obtains, then the text has been disturbed, or the scribe did not quire by folding whole sheets. Half-sheets were used in some books, and in such cases, the

mould-sides must appear in the patterns recto-verso or verso-recto; if they do not, there has been interpolation, or excision, or both. [8](#)



Now let us turn to the watermark and mould-side sequences in Vesp. D. viii., as represented by the following chart:

<i>A</i>	<i>quire:</i>																		
r	v	r	v	v	r	r	v	v	r	v	r	r	v	v	r	r	v	r	v
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A <sub>1</sub>	--	A <sub>1</sub>	--	B <sub>1</sub>	--	B <sub>2</sub>	--	--	A <sub>1</sub>	B <sub>1</sub>	--	--	A <sub>2</sub>	--	A <sub>1</sub>	--	B <sub>1</sub>	--	B <sub>1</sub>

<i>B</i>	<i>quire:</i>																		
r	v	v	r	v	r	v	r	r	v	r	v	v	r	v	?	v	r	r	v
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
--	A <sub>2</sub>	--	--	--	A <sub>1</sub>	A <sub>2</sub>	A <sub>1</sub>	--	B <sub>1</sub>	A <sub>1</sub>	--	B <sub>1</sub>	B <sub>2</sub>	B <sub>1</sub>	--	--	--	B <sub>2</sub>	--

<i>C</i>	<i>quire:</i>						
v	r	v	r	v	r	v	r
41	42	43	44	45	46	47	48
C <sub>1</sub>	--	--	C <sub>2</sub>	D <sub>2</sub>	--	--	D <sub>1</sub>

<i>D</i>	<i>quire:</i>	<i>E</i>	<i>quire:</i>	<i>F</i>	<i>quire:</i>
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v	v	r	v	v	v	v	r	r	r	r	v	v	v	v	r	r	r
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66
--	C <sub>1</sub>	E	F	C <sub>1</sub>	--	--	C <sub>2</sub>	C <sub>2</sub>	--	--	--	--	D <sub>2</sub>	D <sub>2</sub>	--	--	D <sub>1</sub>

<i>G</i> quire:																		
v	v	v	v	r	v	r	r	r	r	v	v	v	v	r	r	r	r	r
67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85
D <sub>2</sub>	D <sub>2</sub>	D <sub>2</sub>	D <sub>2</sub>	--	C <sub>1</sub>	--	--	--	--	--	--	--	--	D <sub>1</sub>	C <sub>2</sub>	C <sub>2</sub>	C <sub>2</sub>	C <sub>2</sub>

<i>H</i> quire:																		
v	v	v	v	v	r	?	v	v	[r]	[v]	v	r	r	r	r	r	r	
86	87	88	89	90	91	92	93	94	[95]	[96]	97	98	99	100	101	102		
D <sub>2</sub>	--	C <sub>1</sub>	--	D <sub>2</sub>	--	--	D <sub>2</sub>	--	[G]	[H]	--	C <sub>2</sub>	--	D <sub>1</sub>	--	C <sub>2</sub>		

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<i>J</i> quire:																		
v	v	v	v	v	r	r	r	r	[v]	v	v	v	v	r	r	r	r	r
103	104	105	106	107	108	109	110	111	[112]	113	114	115	116	117	118	119	120	121
D <sub>2</sub>	--	--	--	D <sub>2</sub>	--	D <sub>1</sub>	D <sub>1</sub>	--	[--]	--	C <sub>1</sub>	C <sub>1</sub>	--	C <sub>2</sub>	--	--	--	C <sub>2</sub>

<i>K</i> quire:		<i>L</i> quire:		<i>M</i> quire:									
v	v	r	r	r	v	v	v	r	v	r	r	r	v
122	123	124	125	126	127	128	129	130	131	132	133	134	135
--	D <sub>2</sub>	C <sub>2</sub>	--	C <sub>2</sub>	--	C <sub>1</sub>	--	D <sub>1</sub>	C <sub>1</sub>	--	D <sub>1</sub>	--	D <sub>2</sub>

<i>N</i> quire:																		<i>O</i> quire:
-----------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-----------------

r	v	r	r	v	v	r	?	r	v	v	r	v	r	v	r
136	137	138	139	140	141	142	[143]	144	145	146	147	148	149	150	151
--	I <sub>1</sub>	J <sub>1</sub>	--	IQ2;	--	--	[ -- ]	J <sub>2</sub>	--	I <sub>1</sub>	J <sub>1</sub>	--	--	--	A <sub>1</sub>

<i>P</i>	<i>quire:</i>	<i>Q</i>	<i>quire:</i>	<i>R</i>	<i>quire:</i>											
v	r	r	r	v	v	v	r	v	r	r	r					
152	153	154	155	156	157	158	159	160	161	162	163					
--	J <sub>2</sub>	J <sub>2</sub>	--	I <sub>2</sub>	--	--	J <sub>1</sub>	I <sub>1</sub>	--	--	J <sub>2</sub>					

<i>S</i>	<i>quire:</i>																
r	r	r	r	v	v	v	v	r	r	r	r	v	v	v	v		
164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179		
--	K <sub>1</sub>	K <sub>1</sub>	--	K <sub>2</sub>	--	--	K <sub>2</sub>	L <sub>2</sub>	--	--	L <sub>2</sub>	--	L <sub>1</sub>	L <sub>1</sub>	--		

<i>T</i>	<i>quire:</i>																
r	r	v	v	[v]	[r]	r	r	v	v								
180	181	182	183	[184]	[185]	186	187	188	189								
K <sub>1</sub>	K <sub>1</sub>	--	--	[ -- ]	[ -- ]	--	--	L <sub>1</sub>	L <sub>1</sub>								

<i>V</i>	<i>quire:</i>																		
v	v	v	v	v	r	r	r	r	r	v	v	v	v	v	r	r	r	r	r
190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209
--	--	--	--	D <sub>2</sub>	--	C <sub>2</sub>	C <sub>2</sub>	C <sub>2</sub>	C <sub>2</sub>	D <sub>2</sub>	D <sub>2</sub>	D <sub>2</sub>	D <sub>2</sub>	--	C <sub>2</sub>	--	--	--	--

<i>W</i>	<i>quire:</i>					"Assumption of Mary"															
v	r	v	r	v	r	r															
210	211	212	213	214	215	216															

D <sub>2</sub>	--	D <sub>2</sub>	C <sub>2</sub>	--	C <sub>2</sub>	M <sub>1</sub>			--	M <sub>2</sub>	M <sub>1</sub>	--	--	N <sub>1</sub>	N <sub>2</sub>	--	N <sub>1</sub>
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The first two quires in the codex consist of a variety of Bunch of Grapes paper. I refer to one half of this watermark, the part with most of the grapes, as A. The complementary portion of the mark, containing a leaf and vegetable elaboration, I call B. As Allan Stevenson has instructed us, watermarks normally occur in slightly distinct pairs, as fraternal twins, so to speak, owing to the use of two moulds in paper production.<sup>9</sup> Such twins do appear in the Bunch of Grapes paper, and I have designated these companion marks AB<sub>1</sub> (comprising A<sub>1</sub> and B<sub>1</sub>) and AB<sub>2</sub> (consisting of A<sub>2</sub> and B<sub>2</sub>).<sup>10</sup>

Of the four possible watermark sequences, one that is immediately apparent in A quire is-A B-in ff. 9-12. These leaves constitute a single sheet, and ff. 10 and 11 are, in fact, a bifolium, and are mounted on a single guard.

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If we imagine ourselves to have removed ff. 9-12 from the gathering, another acceptable pattern emerges in ff. 7, 8, 13, and 14. The same is true of ff. 5, 6, 15, and 16; 3, 4, 17, and 18; and 1, 2, 19, and 20. It would seem that A quire was formed by folding one sheet (ff. 1, 2, 19, and 20), then inserting into it another folded sheet (ff. 3, 4, 17, and 18), and so on. This may be graphically represented as follows:



The gathering may well have been quired in this way, but another possibility must be considered: judging from the watermark sequence alone, it is possible that four sheets of paper were laid in a pile and then all folded together. The bottom sheet would have produced ff. 1, 8, 13, and 20; the sheet above that ff. 2, 7, 14, and 19; the next sheet ff. 3, 6, 15, and 18; and the top sheet ff. 4, 5, 16, and 17. Into these would have been inserted the folded sheet which comprises ff. 9-12 (note that this sheet could not have been folded along with the others: ff. 1, 10, 11, and 20 do not form an acceptable watermark sequence; nor do ff. 2, 9, 12, and 19). Which of these methods of quiring was actually used, the one in which sheets were folded separately and inserted one into the other, or the "multi-folded" method of folding a pile of sheets simultaneously?<sup>11</sup> Here one can turn for help to the appearance of the mould-sides and felt-sides in the gathering; this is indicated in the chart by the letters "r" and "v" above the folio numbers, designating which side of the leaf, the recto or the verso, is the mould-side.<sup>12</sup> The former reconstruction of the formation of A quire, in which five sheets were separately folded, is entirely consistent with the mould-side sequence in the gathering. In ff. 1, 2, 19, and 20, for example, the mould-sides are in the order recto-verso-recto-

verso. The same is true of ff. 3, 4, 17, and 18, while ff. 5, 6, 15, and 16 yield the other normal pattern: verso-recto-verso-recto. The other conjugate leaves also produce these patterns. The multi-folding of four sheets, however, does not fit with the evidence of the mould-side sequence: ff. 3, 6, 15, and 18 produce the sequence recto-recto-verso-verso and ff. 4, 5, 16, and 17 the pattern verso-verso-recto-recto. Thus the gathering was not quired by multi-folding four sheets;

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nor does the mould-side arrangement allow for three multi-folded sheets. It is possible, though, that two sheets were multi-folded (producing ff. 1, 4, 17, and 20 and 2, 3, 18, and 19) and into them were inserted three separately folded sheets. The other alternative, as noted above, is that all five sheets were separately folded. There is, one might add, no evidence, either from the quiring or the matter written in the gathering, that *A* quire was in any way altered after it was originally formed.

As the reader may by now have surmised, the first step in identifying the symmetry in a watermark sequence is to locate the center of the quire. In *B* quire this is an easy task: ff. 30 and 31 surround the center of the symmetry in this gathering, with the watermark sequence projecting to the left and right of these leaves (i.e. toward the beginning and end of the gathering) in what might loosely be called a mirror-image pattern. As in *A* quire, the central four leaves seem to comprise a single folded sheet, and here too the innermost two leaves have been left uncut and mounted as a bifolium. But in this quire we find very strong evidence of multi-folding, for this is almost certainly the explanation of the watermark sequence in ff. 23-28 and 33-38. Clearly, three sheets were laid one atop the other and folded, producing a tripled version of the *A B*- pattern. Folios 21, 22, 39, and 40 could have resulted from the folding of a single sheet; the gathering would in that event have been quired by folding one sheet, inserting into it three multi-folded sheets, and then inserting one folded sheet into the whole. But once again another arrangement is possible: all five sheets may have been multi-folded. The bottom sheet would in that case have produced ff. 21, 30, 31, and 40, the next sheet ff. 22, 29, 32, and 39, and so on. The mould-side pattern is congruous with either of these methods of quiring, and both are therefore possible.

Quires *C*, *D*, *F* -- *M* (with the exception of ff. 95, 96, and 112), *V*, and *W* (except for the interpolated "Assumption of Mary" play on ff. 213-222) consist of paper with the YHS in a Sun watermark. "*C*" designates the upper portion of this mark, "*D*" the lower portion. Twins of the mark are indicated by *C*<sub>1</sub> and *C*<sub>2</sub>, *D*<sub>1</sub> and *D*<sub>2</sub>.<sup>13</sup> The conjugacy of leaves, as indicated by the watermark and mould-side sequences, is corroborated, incidentally, by several tests, including the relative size of the complementary portions of the mark on conjugate leaves and the direction in which the sun's rays point in the watermark design.

*C* quire is rather small, but it appears to be intact, as evidenced by the watermark and mould-side arrangements. I shall discuss the brevity of this quire later in the present study.

Quires *D*, *E*, and *F* must be considered together since they constitute a single quire which has been disturbed by an interpolation. *E* quire, ff. 51-52, appears in the midst of the "Marriage of Mary and Joseph" (Play 10), which

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begins on f. 49<sup>r</sup>, and a variety of evidence makes it certain that *E* quire was interpolated after the "Marriage" had been transcribed: ff. 51-52 are a different paper from that which appears elsewhere in the codex,<sup>14</sup> and the text on these two leaves was written by a different hand than was the rest of the manuscript; moreover, *E* quire manifestly interrupts the action of the play, even dividing a stanza between ff. 50<sup>v</sup> and 53<sup>r</sup>. When *E* quire was inserted, *D* quire was split in two, and the resulting threefold division of the text at this point was treated as three separate quires, and so marked. As we shall see, this pattern of events is probably paradigmatic of the division of other gatherings in the codex into small segments. The watermark and mould-side sequences in *D* and *F* quires confirm the theory that these two gatherings were originally one. *D/F*, it seems clear, consisted of four multi-folded sheets (the mould-side pattern disallows the possibility, suggested by the watermark arrangement, that two multi-folded sheets were inserted into two other multi-folded sheets); one leaf following f. 66 has been excised. Folio 49 must have survived from a larger unit of paper which was also part of this gathering: as the first leaf in the "Marriage" it was very probably not attached separately to the rest of the quire, and indeed there is no physical evidence of such an arrangement (e.g. an unfolded stub or extra sewing holes). Folio 49 was, then, an element in either a whole sheet or a half-sheet, which means that *D/F* quire comprised either eighteen or twenty leaves.<sup>15</sup>

An interesting variation on the results of multi-folding appears in *G* quire. The asymmetrical sequence of watermarks in this gathering may at first seem confusing, but an obvious explanation suggests itself: the sheet which produced ff. 71, 72, 81, and a missing leaf following f. 81 sat head-to-tail with the four other sheets which comprise this quire, and all five sheets were multi-folded (cf. *V* quire, which was similarly formed). Since there are now nineteen leaves in the gathering, traditional collation would suggest that one leaf was missing somewhere. In order to locate the original position of that leaf, one need only complete the watermark symmetry in the gathering by supplying an unwatermarked leaf after f. 81; this creates a perfect mirror-image pattern extending from the center of the quire between ff. 76 and 77. Other explanations are possible (e.g. interpolation of one or three leaves), but there is no literary or bibliographical evidence to support these ideas. By contrast, the contention that a leaf was excised after f. 81 accords with the textual evidence, for the arrangement of the plays makes it possible that a blank leaf once followed f. 81: "The Trial of Joseph and Mary" (Play 14) ends on f. 81<sup>v</sup> and the next play, "The Nativity," begins on f. 82<sup>r</sup>. A blank leaf may well have originally stood between these plays, possibly owing to

the scribe's copying down the "Nativity" before the "Trial" had been fully transcribed. There is clear evidence that the scribe left leaves blank in just this way elsewhere in the codex. <sup>16</sup>

As we have seen, once one has identified the symmetry of a watermark sequence, it is possible to locate the violations of that symmetry, and this can in turn help to discover the number of leaves which may have been lost from a gathering. In *H* quire, this approach may also help to explain one of the cruces of the cycle: the fact that there is no Play 17. In this gathering, *C* and *D* are again YHS in a Sun paper whereas *G* and *H* in ff. 95 and 96 designate the complementary portions of a Hand watermark.<sup>17</sup> Folios 95-96, along with f. 112 in the "Baptism" play, were interpolated after the text had been transcribed: they were written by a different hand from the main scribe's on paper which does not appear elsewhere in the manuscript. These leaves lack the normal rubrication of the

codex, and f. 112, which is the first leaf of the "Baptism," is the only initial leaf of any play which does not have a play number; clearly this leaf replaced the original initial leaf at some point after the rubricator had numbered the plays, and ff. 95-96 were probably interpolated at the same time. The text of these interpolated leaves gives every sign of being faithful copies of lost originals, blending thematically with the material contiguous to it and conforming to the prosodic variety of that material. Moreover, both the "Magi" and the "Baptism" are incomplete without these interpolations.

The most important question about *H* quire is how many leaves have been lost, and from where? There are now, excluding ff. 95-96, fifteen leaves; one would normally expect either one or five leaves to have been lost. If only one leaf had been lost from the quire, it would have necessarily stood in the present location of ff. 95-96, since both the literary evidence and the watermark and mould-side patterns show that these folios replaced some earlier matter. But the watermark sequence does not square with the loss of only one leaf. It therefore seems probable that five leaves have been lost from the gathering, and this hypothesis is confirmed by the mould-side pattern of the fifteen leaves which have survived from the original quire:

v v v v r ? v v v r r r r

Two inferences can be drawn from this pattern. First, multi-folding was employed rather than individual folding of sheets. Second, five leaves have been lost: three or four "mould-side-recto" leaves after the first five folios in

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the gathering, and one or two "mould-side-verso" leaves before the last five folios. The other alternative is that the gathering was quired with half-sheets. This is unlikely, however, because the main scribe seems not to have normally quired in this manner while transcribing the bulk of the codex, as I shall show presently. Furthermore, the mould-side sequence in this quire clearly seems to be the quintupled verso-recto-verso-recto arrangement which characterizes five multi-folded whole sheets.

In order to discover the original location of the five lost leaves, we must look first to the position now occupied by ff. 95-96, since, as noted above, these leaves evidently replaced earlier material. The watermark and mould-side sequences rule out the possibility that five or two leaves once stood there, leaving open the question of whether one, three, or four folios were originally present. Any conjecture beyond this must necessarily be uncertain, but one hypothesis fits so well with the evidence in the quire that it deserves mention, viz. four leaves have been removed after f. 91 and one leaf after f. 94. To begin with, it is most probable that one leaf is missing after f. 94 (as opposed to three or four leaves) because only one leaf's worth of material was copied onto ff. 95-96: these two leaves contain eighty-two lines of text and two one-line stage directions as against eighty-four lines of text on f. 94.<sup>18</sup> The loss of three or four leaves from this position is improbable since it would suggest that a significant amount of material had been removed from the middle of the "Magi," a play which seems complete as we have it with respect both to itself and to the other extant English Magi plays. If, therefore, one leaf is missing after f. 91, where could the other four lost leaves have originally stood? Several answers are possible, most of which involve a complicated pattern of excisions at unrelated points in the quire; but excisions of this kind obtain in no other quire, and are therefore unlikely to have occurred here. A more convincing solution is

suggested by evidence within *H* quire that something has been removed after f. 91. Most significantly, the "Shepherds," which ends on f. 91<sup>r</sup>, is Play 16, and the "Magi," which begins on f. 92<sup>r</sup>, is Play 18, with no play in between. It seems safe to say that something, presumably a whole play, either followed or was intended to follow the "Shepherds." The watermark and mould-side sequences indicate that if one of the lost leaves originally stood after f. 94, as we have posited, then the other four leaves could have followed f. 91; this is perhaps the only arrangement, in fact, which accords with the literary evidence and does not scatter the missing leaves among different plays in locations which show no sign of textual disturbance. The four missing leaves would have provided space enough for a short play: the "Purification of Mary" (Play 19) takes up about that amount of space, for example. Indeed, if the scribe left the four leaves blank and went on to the "Magi" (and he often did leave space blank in this way, as noted above), the "Purification" may have been the very play which was originally intended to be number 17. Not only would it fit thematically between the "Shepherds" and "Magi," but there is also reason to believe that it was an addition to the original cycle, and that the change of

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plans over its place of insertion led to confusion in the numbering of the plays that follow it.<sup>19</sup> In any event, locating the missing leaves after ff. 91 and 94 yields the following hypothetical arrangement for the original quire (C/D indicates "either C or D"):



This hypothesis about *H* quire is very strongly corroborated by a peculiar bit of material evidence: the extreme narrowness of ff. 92 and 93. These are the narrowest leaves in the codex, with f. 92 124-125 mm. wide and f. 93 118-119 mm. wide, as against a width of 136-140 mm. for most leaves. The outer margins of these two leaves have been completely cropped, and some of the text and part of the playnumber 18 (on f. 92<sup>r</sup>) have been cut away; the inner margins are of normal width. Apparently these leaves were loose from the gathering when the manuscript was cut for binding -- and their condition at that time may very well be explained by the above history of the quire. According to this hypothesis, f. 92 and its conjugate leaf would have been the central leaves in the quire, with f. 93 and its conjugate leaf immediately beneath them. These leaves would have been the most likely to move away from the sewing, since there would have been no leaves above them to hold them down. Once they had loosened from the gathering, the conjugate leaves would necessarily have been cut to the same extent as ff. 92 and 93; but since no other extant leaf in the gathering, or indeed the codex, displays this degree of cropping, it seems probable that the conjugate leaves had already been excised at the time of the cutting. Two final observations should be made about *H* quire. First, the gathering as we have reconstructed it is entirely consistent with the inferences drawn above from the surviving mould-side sequence. Second, our hypothetical history of the quire may provide its own explanation for the appearance of the two interpolated leaves: the removal of the four leaves which originally followed f. 91 may have resulted in the

replacement by ff. 95-96 of the leaf which once followed f. 94; for the conjugate of this leaf, which would have followed f. 91, would also have been excised.

In *J* quire f. 112 probably replaced two watermarked conjugate leaves. Folio 111, the two missing leaves, and f. 113 comprised a separately-folded sheet, and ff. 105-110 and 114-119 were multi-folded (ff. 107-108 and 116-117 constitute a sheet which sat head-to-foot with the other two multi-folded sheets). Folios 103-104 and 120-121 appear to contain the first clearcut evidence that the main scribe ever quired with half-sheets, for the mould-side pattern of these four leaves does not fit with any of the ways by which whole

sheets might have been folded to produce this gathering. This arrangement may have resulted from textual disturbance, but I know of no evidence to support such a hypothesis.

At this point it may be apposite to consider the implications of quiring with half-sheets. G. S. Ivy, in his excellent article "The Bibliography of the Manuscript Book," discusses two of the principal ways in which quires were formed: the "bifolium" method, in which a single sheet was folded once to yield two leaves, and the multi-folded method of simultaneously folding two large sheets.<sup>20</sup> As we have seen, in Vesp. D. viii. there is evidence of further methods of forming quires: the double folding of single whole sheets and the multi-folding of three or more whole sheets; the single folding of a half-sheet can be considered a variety of the bifolium method. As Ivy says (p. 39), once the leaves of a *membrane* codex have been cut, it is not usually possible to assert whether the bifolium or the multi-folded method has been used. But in Vesp. D. viii. we see that watermark and mould-side sequences in *paper* manuscripts can indicate that whole sheets were employed, and that many of these were multi-folded. In one sense, the bifolium method was probably always used in this codex, since after the sheets were folded (individually or in piles), they were presumably unfolded and cut along the fold parallel to the shorter side. The resulting two stacks of bifolia were then placed in their original positions. If, however, one understands the bifolium method to mean the formation of quires by piling non-conjugate half-sheets in random arrangement, then it is unlikely that the main scribe used this method in the codex very often. The watermark sequences in quires *B*, *G*, *T*, and *V*, for example, are unlikely to have been arrived at by chance; rather, they almost certainly resulted from the multi-folding of whole sheets.<sup>21</sup> Also implausible is the idea that unrelated half-sheets were randomly gathered to produce mould-side patterns like *v v v v r r r r v v v v r r r [r]* in *D/F* quire, *r r r r v v v v r r r r v v v v* in *S* quire, and *v v v v r r r r r v v v v r r r r* in *V* quire -- all of which are consonant in addition with watermark sequences which result from folding whole sheets. In sum, the main scribe of Vesp. D. viii. appears normally to have folded whole sheets, either individually or in piles. Half-sheets may possibly have been used sometimes, but it seems significant that this question arises with reference only to those quires which have evidently experienced some physical disruption: every gathering the main scribe formed which has escaped such disruption appears to have been quired by folding whole sheets of paper.

Consider, for example, *R* quire. The mould-side sequence in this gathering indicates textual disturbance or quiring by half-sheet, or both. Before one attempts to choose among these options it is helpful to observe that *R*

quire belongs to Passion Play 1, a discrete sequence of Passion plays which has experienced much physical disruption. Passion Play 1 now comprises quires *N-R*, but of these, *O* quire is manifestly an interpolation (as is f. 143).<sup>22</sup> In addition, *Q* quire bears several signs of having been an insertion into Passion Play 1. First there is the evidence of the catchwords: the scribe usually placed a catchword at the ends of quires in Passion Plays 1 and 2. A catchword after *N* quire, for example, contains the first words of *P* quire.<sup>23</sup> But no catchwords appear after *P* and *Q* quires, indicating that the scribe did not consider them to be normal gatherings. Secondly, f. 153<sup>v</sup>, the page facing *Q* quire, and f. 155<sup>v</sup>, the last page of this quire, are short pages: the scribe's text was not sufficient to fill these pages. He apparently stopped writing on f. 153<sup>v</sup> and went on to f. 156<sup>r</sup>; ff. 154-155 were inserted later, and the new text filled most of the space on these leaves, but not all. The third sign that *Q* quire was inserted into the text is that the scribe wrote long elaborate ascenders, an extremely unusual feature in this codex, in the top lines of ff. 153<sup>v</sup> and 154<sup>r</sup>; this was perhaps a reminder to himself of where to include the additional leaves. A final indication that *Q* quire was an interpolation is provided by the literary evidence: Christ's exposition of the symbolism of the foods and accoutrements of the Last Supper on ff. 154-155 repeats much of what he says on f. 153<sup>v</sup>. Indeed, the interpolation of ff. 154-155 may well have resulted from the decision to alter this part of the "Last Supper" (Play 27). Christ's exposition on ff. 153-155 is more than twice as long as the longest analogue in the extant English medieval drama, extending over one hundred lines, and is often considered one of the hallmarks of the N-town Cycle; yet it appears, as we have seen, to have resulted from revision as Passion Play 1 was transcribed.

*P* and *R* quires, then, may have originally been one gathering which was split by the interpolation of *Q* quire, just as *D/F* quire was almost certainly divided by the intrusion of *E* quire. If *P* and *R* were one quire, and if they were formed by folding whole sheets, then the watermark and mould-side patterns indicate that further substantial alteration of the quire must also have taken place. Alternatively, if it was quired with half-sheets, only two leaves following f. 163 (the leaves which would have been conjugate with ff. 152-153) need have been displaced. At the least one can say that these quires have been in some way physically disturbed, and it may therefore be impossible to reconstruct how they were formed. A similar arrangement obtains

in quires *K-M*, and an analogous alteration of the text, probably involving the interpolation of *L* quire, may well account for it.<sup>24</sup>

Looking briefly at the remainder of the codex, one may observe that the two gatherings which constitute Passion Play 2, *S* and *T* quires, appear to comprise four multi-folded sheets and two multi-folded sheets respectively.<sup>25</sup> Folios 184-185, the chain-spaces of which correspond to the Bunch of Grapes or YHS in a Sun paper, were interpolated into *T* quire as part of the compilation of the cycle.<sup>26</sup> *V* quire comprises five multi-folded sheets of YHS in a Sun paper (ff. 194-195 and 204-205 sat head-to-foot with the other sheets in the pile). Finally, *W* quire has lost two leaves, one before and one after the gathering; the latter leaf probably contained the conclusion of "Doomsday" (Play 42). More leaves may, of course, have been lost before and after this quire, but there is no literary or bibliographical evidence that this happened. Folios 213-222, the

"Assumption of Mary" (Play 41), were interpolated into *W* quire: these leaves are a different paper from that found elsewhere in the codex, and the play is written in a different hand.<sup>27</sup> The outer leaves of this play comprise a half-sheet, and since f. 213 is a flyleaf, this scribe may have quired in this instance with a bifolium. But it is also possible that the two leaves which were conjugate with ff. 213 and 222 were also once employed as flyleaves for this play; such an arrangement was quite common in small independent medieval texts, which required multiple flyleaves to protect them until they were bound into larger volumes (Ivy, pp. 53-54).

In sum, bibliographical analysis of the paper in Vesp. D. viii. illumines some of the steps in the compilation of the codex. By examining the overall patterns in the evidence, one may draw reasonably confident inferences about the main scribe's habits of quiring. First of all, it should be said that the present quire-marks appear to be accurate. But one can look back to an earlier stage and reconstruct the physical make-up of the manuscript before the many interpolations and excisions. As we have seen, quires *A*, *B*, possibly *D/F*, *H*, *J*, and *V* each appears originally to have contained twenty leaves. Significantly, all but three of the remaining quires were evidently additions to the original text.<sup>28</sup> It therefore appears that the main scribe's normal practice as he transcribed the bulk of the manuscript was to quire in twenties,

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and the three exceptions are all explicable. To work from last to first, *W* quire, the last gathering in the codex, might well be expected to be small, since the scribe had only a limited amount of material left to copy when he wrote this quire.<sup>29</sup> *K* (or *K/M*) quire was also in a sense a "final" gathering because it precedes the Passion Plays; since these sequences were written down independently of the rest of the codex, there was a limited amount of material available for this quire. The third short gathering is *C* quire, in which is written most of "The Conception of Mary" (Play 8) and all of "The Presentation of Mary in the Temple" (Play 9). Good evidence indicates that these and other Marian plays were added to the cycle as the codex was being transcribed.<sup>30</sup> *D/F* quire had already been at least partially copied down as these plays were added, and so *C* quire too was in a sense a "final" gathering: only a limited amount of material could be transcribed on it. Thus Vesp. D. viii., which has often been considered a perplexing patchwork collection of disparate material, was originally quite orderly: apparently it consisted of several quires of twenty leaves each, with a few gatherings which were necessarily smaller; <sup>31</sup> all of these were made up of Bunch of Grapes or YHS in a Sun paper. The irregularity in the size of gatherings and the bewildering distribution of paper types were created during the processes of the compilation of the cycle.

Before concluding I should like to note that analysis of watermark symmetries is not restricted to the quarto format. In folios, for example, one may expect symmetries to obtain, radiating out from the centers of gatherings in inverted and complementary patterns. For instance, if a quire begins with three marked and two unmarked leaves, it should end with two marked and three unmarked leaves. In practice, the symmetries may be fairly complex; e.g. a gathering which begins with three watermarked leaves, then one unmarked leaf, then four marked, one unmarked, and three marked leaves may be expected to conclude with the inverted complementary pattern of three unmarked leaves, then one marked, four unmarked, one marked, and three unmarked leaves. This pattern actually occurs in Harley MS 2013, one of the five cyclic versions of the Chester mystery plays. Transcribed in the year 1600, this folio codex contains no signatures or quire-marks,

although there is foliation, presumably by the scribe, George Bellin. For the present I wish only to demonstrate that the quiring of this manuscript can be discovered by reference to watermark and mould-side sequences. I shall therefore represent these patterns in an arbitrary number of leaves, say, ff. 1-70: [32](#)

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The first center of symmetry is between ff. 10 and 11, the next between ff. 33 and 34, and the third between ff. 57 and 58. Quire 1 includes ff. 1-20 and quire 2 ff. 22-45 (this is the gathering which was described in the above illustration of watermark-sequence symmetry in the folio format). To which gathering can we assign f. 21? This folio has apparently lost its conjugate leaf, which must have stood either before f. 1 or after f. 45, the last leaf in quire 2. The latter possibility is unlikely, firstly because there is no sign of textual disturbance between ff. 45 and 46 (which are the second and third leaves of the "Nativity" play), and also because the mould-side pattern would be most peculiar if f. 21 and its conjugate leaf belonged to quire 2: f. 21 would be the only "mould-side-verso" leaf in the first half of quire 2, and the only initial leaf in any gathering in the manuscript to have its mould-side on the verso; the mould-side arrangement would also be anomalous with respect to the missing conjugate leaf. [33](#) On the other hand, locating f. 21 in quire 1 fits perfectly with the mould-side pattern and makes good sense on another count as well: the conjugate leaf would have preceded f. 1, and might very well have been a flyleaf; its excision would therefore have been quite natural. Quire 3 comprises ff. 46-69, and on f. 70 begins quire 4. Note that the mould-side patterns in each case agree with these findings, and in themselves indicate the centers and limits of gatherings. The collation of the

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entire codex, taking into account cancelled leaves, appears to be: 1<sup>22</sup> ( -- 1<sub>1</sub>) 2-4<sup>24</sup> 5<sup>24</sup> ( -- 5<sub>14</sub>) 6<sup>22</sup> 7 -- 8<sup>24</sup> 9<sup>20</sup> ( -- 9<sub>1</sub>). [34](#) Interestingly, lines of string appear not only at the centers of several gatherings, but also in between quires, and occasionally elsewhere. The locations of such strings are sometimes thought to be reliable guides to collation, but in this manuscript and others, they clearly are not reliable.

I have proposed in this study a method of analyzing symmetries, and violations thereof, in the watermark and mould-side sequences of paper codices. I have tried to show that this kind of analysis can be an essential tool in detecting and locating interpolations and excisions, and in disclosing the history of literary documents. It seems fair to say in view of the findings of the

present study that examinations of the material evidence in many paper manuscripts should now be reconsidered. [35](#)

*The Problem of the Missale speciale* (1967), p. 26.

W. W. Greg, "On Certain False Dates in Shakespearian Quartos," *Library*, 2nd ser., 9 (1908), 113-131, 381-409.

*The Problem of the Missale speciale*, passim. Although Stevenson's analysis of the paper in the *Missale speciale* seems indisputable, his dating of the text, and the use of watermarks to date early texts in general, have been seriously questioned by Curt F. Bühler; see "Watermarks and the Dates of Fifteenth-Century Books," *SB*, 9 (1957), 217-224, and "Last Words on Watermarks," *PBSA*, 67 (1973), 1-16.

See, for example, his "New Uses of Watermarks as Bibliographical Evidence," *SB*, 1 (1948-49), 149-182; "Watermarks are Twins," *SB*, 4 (1951-52), 57-91; "Chain-Indentations in Paper as Evidence," *SB*, 6 (1954), 181-195; and "Paper as Bibliographical Evidence," *Library*, 5th ser., 17 (1962), 197-212. G. Thomas Tanselle's "The Bibliographical Description of Paper," *SB*, 24 (1971), 27-67, admirably surveys analyses of paper by John Carter and Graham Pollard, Stevenson, and others, and suggests methods of presenting the results of paper analysis in descriptive bibliographies. One fruitful analysis of paper evidence which appeared after Tanselle's survey is found in David V. Erdman's *The Notebook of William Blake* (1973), pp. 2-7.

Chapman wrote in *Cancels* (1930), p. 33, that "if a watermark is certainly absent when it should be present, or present when it should certainly be absent, or is the wrong watermark, then the leaf is a cancel"; Chapman acknowledged that this test is only negatively valid. Clifford Leech explained a disturbance in a seventeenth-century text partially on the grounds that in the quarto format one sheet cannot produce three unwatermarked leaves ("A Cancel in Southerne's *The Disappointment*, 1684," *Library*, 4th ser., 13, [1932-33], 396). See also Ronald B. McKerrow, *An Introduction to Bibliography for Literary Students* (1927), pp. 222-30.

See my article, "The Composition and Development of an Eclectic Manuscript: Cotton Vespasian D. viii.," which will appear in *Leeds Studies in English*.

Graham Pollard, in "Notes on the Size of the Sheet," *Library*, 4th ser., 22 (1941-42), 107, discusses the practice of transcribing sheets before they were cut. This method of "imposing" material as printers were later to do would have been most practical in producing multiple copies of fixed texts. It is unlikely that Vesp. D. viii. was written down in this way since it was a one-off job and was compiled as it was being transcribed. I am greatly indebted to Dr. A. I. Doyle for advice on this and other questions about the study of paper manuscripts.

See Stevenson, "Chain-Indentations in Paper as Evidence," *passim*.

"Watermarks are Twins," *passim*.



10. Watermark AB<sub>1</sub> measures about 61 x 11 [26.5|27] 10 and is similar in design to Briquet 13055 and 13056. Mark AB<sub>2</sub> measures about 68 x 14[25|32]4.5 and its design is in part horizontally inverted with respect to AB<sub>1</sub>. (See Tanselle, "Bibliographical Description of Paper," pp. 46-48, for an explanation of the notation of watermark dimensions.)

The term "multi-folded" is used in this sense by G. S. Ivy in "The Bibliography of the Manuscript Book," *The English Library before 1700*, eds. Francis Wormald and C. E. Wright (1958), p. 38. See n. 20 in the present study.

Despite Allan Stevenson's assurances to the contrary ("Chain-Indentations in Paper," p. 182), it is occasionally very difficult to distinguish the mould-side of a leaf from the felt-side. This is sometimes the result of heavy wear, or of washing and pressing, but in other instances it may be a function of the qualities of the particular kind of paper one is examining. In Vesp. D. viii., for example, paper with the mark IJ is comparatively easy to examine in this regard while paper with the MN watermark is extremely difficult. I indicate the leaves of which I have been unable to identify the mould-side by a question mark above the folio number.

CD<sub>1</sub> measures about 42 x 2[36.5|5], CD<sub>2</sub> about 44.5 x [3.5|37.5|2]. The mark generally resembles Briquet 9477, although it differs in detail from that tracing. CD<sub>1</sub> is distinguished from CD<sub>2</sub> by several details in the design, including a defective ray opposite the "Y" in "YHS."

Folios 51-52 contain watermark EF, a one-armed pot surmounted by a cross which measures about 40 x 5[15]5. This mark does not correspond to tracings in any of the watermark collections, but it contains some similarities to Briquet 12496, 12498, and 12501.

Some confusion was evidently caused by the inclusion of a group of plays at precisely the time that *D/F* quire was being transcribed (see Spector, "Composition and Development of an Eclectic Manuscript"). This resulted in significant physical alteration of the manuscript, and it is possible that a leaf preceding f. 49 was lost as part of this process. If so, *D/F* quire was originally a twenty.

See Spector, "Composition and Development of an Eclectic Manuscript." The two blank leaves which have survived from the original text, ff. 105 and 120, both occur between plays (I discount f. 96 and the flyleaves of Passion Play 2 [f. 164] and the "Assumption of Mary" play [f. 213], since these are all additions to the original manuscript; see notes 17, 27, and 28 in the present study).

Since these leaves have been mounted uncut as a bifolium, the watermark is intact. It measures about 70 x 1[20]7 and is a long, graceful hand surmounted by a pentangle; a "B" or some similar form is on the palm and a bit of lacing appears at the wrist. This mark does not correspond to any of the tracings in the watermark collections.

Half of f. 96<sup>r</sup> and all of f. 96<sup>v</sup> are blank.

See K. S. Block, *The Ludus Coventriae*, EETS ES 120 (1922), p. xxviii. Miss Block suggested that one additional leaf originally followed f. 91 while two leaves followed f. 94, and mistakenly added that "the correspondence of watermarks in this quire supports this." See also my "The Genesis of the N-town Cycle," Yale Univ. Diss., 1973, p. 107.

20. Ivy, p. 38. Dr. Ivy argues that multi-folding involved folding the sheet first on a line parallel to the longer side, then on a line parallel to the shorter side. In Vesp. D. viii., however, the folding in each case seems to have been the other way around, with the first fold parallel to the shorter side, the second parallel to the longer side.

For an arrangement which is more typical of the bifolium method of quiring, see the watermark sequence in Harley MS. 2013, as represented later in the present article.

See Esther L. Swenson, *An Inquiry into the Composition and Structure of the Ludus Coventriae*, Univ. of Minnesota Studies in Language and Literature, no. 1 (1914), p. 55; W. W. Greg, *Bibliographical and Textual Problems in the English Miracle Cycles* (1914), p. 115; and Spector, "The Genesis of the N-Town Cycle," pp. 65-70. All of *O* quire appears to be Bunch of Grapes paper while the rest of Passion Play 1 consists of paper with the mark of a Bull's Head surmounted by an X. This mark, which I designate IJ, bears some resemblance to Briquet 14184 and 14189. IJ1 measures about 74 x 2[32]8; IJ2 measures about 70 x 7[29]6 and differs slightly in design from IJ1.

The cancellation of catchwords on f. 148<sup>v</sup> provides evidence about the stages in which *O* quire was interpolated; see Swenson, p. 55, and Greg, *Bibliographical and Textual Problems*, p. 115.

Note that the mould-side patterns in *K* and *L* quires rules out the possibility that ff. 122-25 comprise a single whole sheet. Interestingly, if *K/M* quire was formed by folding whole sheets, it would originally have been a twenty.

KL is a variety of Two Crossed Keys watermark which resembles Briquet 3887. KL<sub>1</sub> measures about 47 x 14.5[16.5|25.5]4.5, and KL<sub>2</sub>, which differs in minor details from its twin, measures about 51 x 6[24|18]15.

See Spector, "Composition and Development of an Eclectic Manuscript."

These leaves contain a Two-Wheeled Cart watermark which resembles Briquet 3528. MN<sub>1</sub> measures about 69 x 12.5[19|22]8 and is slightly different in design from MN<sub>2</sub>, which measures about 69 x 12[20|20]10. This play may have been the last substantive addition to the cycle; see Spector, "Composition and Development of an Eclectic Manuscript."

Passion Plays 1 and 2 (quires *N* and *P-T*) appear to have been transcribed at a

different time from the rest of the manuscript; see Spector, "Composition and Development of an Eclectic Manuscript." Quires *E*, *K*, *L*, and *O* and the "Assumption of Mary" (ff. 213-222) have already been discussed.

Ivy observes that the scribes' tendency to shorten their quires when little of the text remained to be copied is particularly noticeable (p. 41).

30. See Spector, "Composition and Development of an Eclectic Manuscript."

It is worth noting that an examination of the distances between the sewing holes in each leaf confirms the findings of the present study. These measurements are tricky to compile since the holes in many cases enlarged in an irregular fashion or were otherwise distorted, but they can identify within very general limits the constituents of quires; this is therefore a good form of corroborative evidence, at least.

Mark A is a one-handled pot.  $A_1$  measures 58.5 x [20],  $A_2$  58.5 x [20|1]. Mark B is also a pot with one handle of which twin  $B_1$  measures 48 x 1[17.5]3.5 while twin  $B_2$  measures 46.5 x 1[17.5]3.5 and differs slightly in appearance from  $B_1$ . Mark C is a large and elaborate two-handled pot.  $C_1$  measures 74.5 x [4.5|20.5|4],  $C_2$  74.5 x [6|21|3.5]. When viewed right-side up from the mould-side of the paper,  $C_1$  is to the left of the deckle while  $C_2$  is to the right. Mark D is a pot with one handle, surmounted by a crescent.  $D_1$  measures 73.5 x [4.5|22] as against a measurement of 70.5 x [7.5|21] for  $D_2$ . Of these marks, only D is similar to the watermark tracings: it bears some resemblance to Briquet 12803 and Heawood 3583. The foliation I employ is that of the modern foliater rather than Bellin's.

One very tentative exception is f. 205, the last leaf in the codex, which may be mould-side-recto. This is uncertain, however, because it is unusually difficult to distinguish the mould-sides of the paper in the final gathering. To make matters more difficult, the conjugate leaf of f. 205 is absent (as indicated by the watermark sequence). In any event, the remainder of this quire appears to conform to the normal pattern in the manuscript in which the first half of the gathering is mould-side-recto, the second half mould-side-verso.

For a different collation of this codex, see R. M. Lumiansky and David Mills, eds., *The Chester Mystery Cycle*, EETS SS 3 (1974), I, xix.

I wish to thank Dr. A. I. Doyle, Professor Norman Davis, Richard Proudfoot, N. R. Ker, and Martin Stevens for their advice and encouragement concerning watermark study. I am grateful to the officials of the British Library for allowing me to examine Vesp. D. viii. and Harley 2013, and to the American Council of Learned Societies, which provided generous fellowship support.

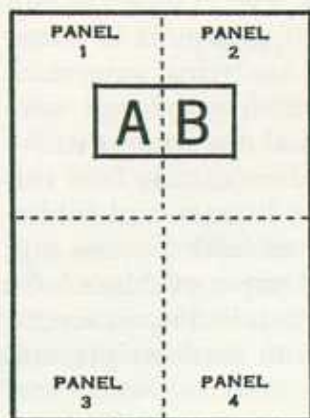


Figure 1

appear in the order 3 1 2 4. The distribution of watermarks will follow a similar pattern. Watermarks are typically representations of objects, such as pots, hands, or bulls, but let us say that by some convenient stroke, the watermark of our sheet of paper consists of the letters "AB." When the sheet is folded in the manner described above, the first leaf in the gathering, Panel 3, has no mark. The second leaf, Panel 1, has the "A" portion of the watermark and the third leaf, Panel 2, bears the "B" portion. The last leaf, Panel 4, has no watermark. If one designates the unwatermarked leaves by dashes, this sequence of watermarks can be represented by the formulation - A B - (actually - V B -, but these formulas will ignore the changes in the position of the watermark with respect to the viewer). In the case of a sheet which happens to be sitting on its other side, as in Figure 2, folding in the manner described above distributes the panels in the order 4 2 1 3, with the watermark pattern - B A -.

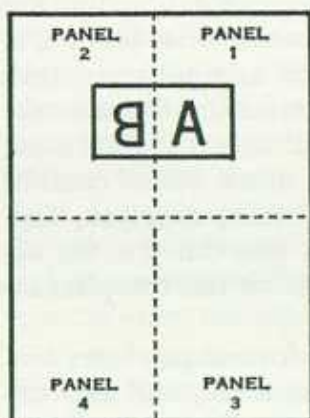


Figure 2

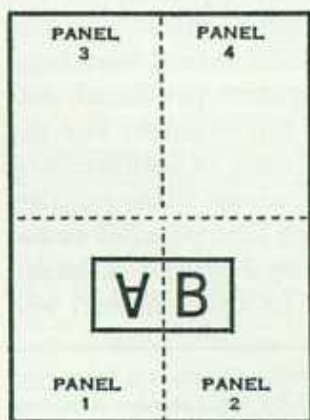


Figure 3

Finally, folding a sheet which sits in the position of Figure 4 places the panels in the order 2 4 3 1, and the watermark sequence is B - - A. Naturally, one can assign the letters A and B to represent the halves of any watermark. And given such a designation, these four patterns, - A B -, - B A -, A - - B, and B - - A, are the watermark sequences one can normally expect to find in a gathering formed by the folding of whole sheets in the quarto format. (The sheets will not usually be physically intact, of course, since cutting the bolt in each sheet in a quarto normally produces two half-sheets—one with the watermark and one without—gathered into a quire, or booklet, for sewing.<sup>7</sup>)

Before looking for these watermark sequences in Vesp. D. viii., we must consider one further test of the method by which sheets were folded: the appearance of the mould-sides and the felt-sides of the paper. The watermark, chain-lines, and, to a lesser extent, wire-lines of the mould made indentations into the side of the paper which faced down upon them. This side of the sheet is called the mould-side or "right" side, while the other side is called the felt-side or the "wrong" side. Obviously, the

7. Graham Pollard, in "Notes on the Size of the Sheet," *Library*, 4th ser., 22 (1941-42), 107, discusses the practice of transcribing sheets before they were cut. This method of



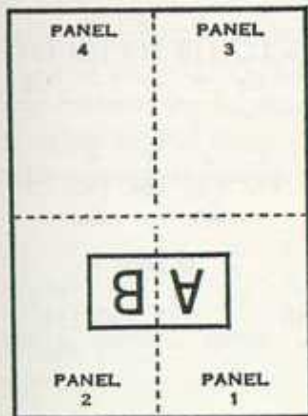


Figure 4

method of folding determines the locations in which the mould-sides and felt-sides will appear. For example, in a sheet folded so as to produce the pattern 3 1 2 4 in the panels, if the mould-side is the recto of Panel 3 (the first leaf of the gathering), then the verso of Panel 4 must also be the mould-side; in addition, the mould-side must be the verso of Panel 1 and the recto of Panel 2. This produces the pattern for the mould-side of this folded sheet of recto-verso-recto-verso. The only other possible pattern for the appearance of the mould-sides in a folded whole sheet is verso-recto-verso-recto. If neither of these two patterns obtains, then the text has been disturbed, or the scribe did not quire by folding

whole sheets. Half-sheets were used in some books, and in such cases, the mould-sides must appear in the patterns recto-verso or verso-recto; if they do not, there has been interpolation, or excision, or both.<sup>8</sup>

Now let us turn to the watermark and mould-side sequences in Vesp. D. viii., as represented by the following chart:

*A quire:*

r v r v v r r v v r v r r v v r r v r v  
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20  
 A<sub>1</sub> - A<sub>1</sub> - B<sub>1</sub> - B<sub>2</sub> - - A<sub>1</sub> B<sub>1</sub> - - A<sub>2</sub> - A<sub>1</sub> - B<sub>1</sub> - B<sub>1</sub>

*B quire:*

r v v r v r v r r v r v v r v ? v r r v  
 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40  
 - A<sub>2</sub> - - - A<sub>1</sub> A<sub>2</sub> A<sub>1</sub> - B<sub>1</sub> A<sub>1</sub> - B<sub>1</sub> B<sub>2</sub> B<sub>1</sub> - - - B<sub>2</sub> -

*C quire:*

v r v r v r v r  
 41 42 43 44 45 46 47 48  
 C<sub>1</sub> - - C<sub>2</sub> D<sub>2</sub> - - D<sub>1</sub>

*D quire:*

v v  
 49 50  
 - C<sub>1</sub>

*E quire:*

r v  
 51 52  
 E F

*F quire:*

v v v r r r r v v v v r r r  
 53 54 55 56 57 58 59 60 61 62 63 64 65 66  
 C<sub>1</sub> - - C<sub>2</sub> C<sub>2</sub> - - - - D<sub>2</sub> D<sub>2</sub> - - D<sub>1</sub>

*G quire:*

v v v v r v r r r r v v v v r r r r r  
 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85  
 D<sub>2</sub> D<sub>2</sub> D<sub>2</sub> D<sub>2</sub> - C<sub>1</sub> - - - - - - - D<sub>1</sub> C<sub>2</sub> C<sub>2</sub> C<sub>2</sub> C<sub>2</sub>

*H quire:*

v v v v v r ? v v [r] [v] v r r r r r  
 86 87 88 89 90 91 92 93 94 [95] [96] 97 98 99 100 101 102  
 D<sub>2</sub> - C<sub>1</sub> - D<sub>2</sub> - - D<sub>2</sub> - [G] [H] - C<sub>2</sub> - D<sub>1</sub> - C<sub>2</sub>

"imposing" material as printers were later to do would have been most practical in producing multiple copies of fixed texts. It is unlikely that Vesp. D. viii. was written down in this way since it was a one-off job and was compiled as it was being transcribed. I am greatly indebted to Dr. A. I. Doyle for advice on this and other questions about the study of paper manuscripts.

8. See Stevenson, "Chain-Indentations in Paper as Evidence," *passim*.



If we imagine ourselves to have removed ff. 9-12 from the gathering, another acceptable pattern emerges in ff. 7, 8, 13, and 14. The same is true of ff. 5, 6, 15, and 16; 3, 4, 17, and 18; and 1, 2, 19, and 20. It would seem that *A* quire was formed by folding one sheet (ff. 1, 2, 19, and 20), then inserting into it another folded sheet (ff. 3, 4, 17, and 18), and so on. This may be graphically represented as follows:

r	v	r	v	v	r	r	v	v	r	v	r	r	v	v	r	r	v	r	v
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
(A	-	(A	-	(B	-	(B	-	(-	A	B	-)	-	A)	-	A)	-	B)	-	B)
SHEET	SHEET	SHEET	SHEET	SHEET		SHEET	▲	SHEET	SHEET	SHEET	SHEET	SHEET	SHEET	SHEET	SHEET	SHEET	SHEET	SHEET	SHEET
1	2	3	4	5		5	CENTER	5	4	3	2	1							

The gathering may well have been quired in this way, but another possibility must be considered: judging from the watermark sequence alone, it is possible that four sheets of paper were laid in a pile and then all folded together. The bottom sheet would have produced ff. 1, 8, 13, and 20; the sheet above that ff. 2, 7, 14, and 19; the next sheet ff. 3, 6, 15, and 18; and the top sheet ff. 4, 5, 16, and 17. Into these would have been inserted the folded sheet which comprises ff. 9-12 (note that this sheet could not have been folded along with the others: ff. 1, 10, 11, and 20 do not form an acceptable watermark sequence; nor do ff. 2, 9, 12, and 19). Which of these methods of quiring was actually used, the one in which sheets were folded separately and inserted one into the other, or the "multi-folded" method of folding a pile of sheets simultaneously?<sup>11</sup> Here one can turn for help to the appearance of the mould-sides and felt-sides in the gathering; this is indicated in the chart by the letters "r" and "v" above the folio numbers, designating which side of the leaf, the recto or the verso, is the mould-side.<sup>12</sup> The former reconstruction of the formation of *A* quire, in which five sheets were separately folded, is entirely consistent with the mould-side sequence in the gathering. In ff. 1, 2, 19, and 20, for example, the mould-sides are in the order recto-verso-recto-verso. The same is true of ff. 3, 4, 17, and 18, while ff. 5, 6, 15, and 16 yield the other normal pattern: verso-recto-verso-recto. The other conjugate leaves also produce these patterns. The multi-folding of four sheets, however, does not fit with the evidence of the mould-side sequence: ff. 3, 6, 15, and 18 produce the sequence recto-recto-verso-verso and ff. 4, 5, 16, and 17 the pattern verso-verso-recto-recto. Thus the gathering was not quired by multi-folding four sheets;

11. The term "multi-folded" is used in this sense by G. S. Ivy in "The Bibliography of the Manuscript Book," *The English Library before 1700*, eds. Francis Wormald and C. E. Wright (1958), p. 38. See n. 20 in the present study.

12. Despite Allan Stevenson's assurances to the contrary ("Chain-Indentations in Paper," p. 182), it is occasionally very difficult to distinguish the mould-side of a leaf from the felt-side. This is sometimes the result of heavy wear, or of washing and pressing, but in other instances it may be a function of the qualities of the particular kind of paper one is examining. In Vesp. D. viii., for example, paper with the mark IJ is comparatively easy to examine in this regard while paper with the MN watermark is extremely difficult. I indicate the leaves of which I have been unable to identify the mould-side by a question mark above the folio number.





plans over its place of insertion led to confusion in the numbering of the plays that follow it.<sup>19</sup> In any event, locating the missing leaves after ff. 91 and 94 yields the following hypothetical arrangement for the original quire (C/D indicates "either C or D"):

v	v	v	v	v	r	*r	*r	*r	*r	v	v	v	*v	v	r	r	r	r	r
86	87	88	89	90	91	*	*	*	*	92	93	94	*	97	98	99	100	101	102
D <sub>2</sub>	-	C <sub>1</sub>	-	D <sub>2</sub>	-	*C/D	-	*C <sub>2</sub>	*- ↑ CENTER	-	D <sub>2</sub>	-	*C/D	-	C <sub>2</sub>	-	D <sub>1</sub>	-	C <sub>2</sub>

This hypothesis about *H* quire is very strongly corroborated by a peculiar bit of material evidence: the extreme narrowness of ff. 92 and 93. These are the narrowest leaves in the codex, with f. 92 124–125 mm. wide and f. 93 118–119 mm. wide, as against a width of 136–140 mm. for most leaves. The outer margins of these two leaves have been completely cropped, and some of the text and part of the playnumber 18 (on f. 92<sup>r</sup>) have been cut away; the inner margins are of normal width. Apparently these leaves were loose from the gathering when the manuscript was cut for binding—and their condition at that time may very well be explained by the above history of the quire. According to this hypothesis, f. 92 and its conjugate leaf would have been the central leaves in the quire, with f. 93 and its conjugate leaf immediately beneath them. These leaves would have been the most likely to move away from the sewing, since there would have been no leaves above them to hold them down. Once they had loosened from the gathering, the conjugate leaves would necessarily have been cut to the same extent as ff. 92 and 93; but since no other extant leaf in the gathering, or indeed the codex, displays this degree of cropping, it seems probable that the conjugate leaves had already been excised at the time of the cutting. Two final observations should be made about *H* quire. First, the gathering as we have reconstructed it is entirely consistent with the inferences drawn above from the surviving mould-side sequence. Second, our hypothetical history of the quire may provide its own explanation for the appearance of the two interpolated leaves: the removal of the four leaves which originally followed f. 91 may have resulted in the replacement by ff. 95–96 of the leaf which once followed f. 94; for the conjugate of this leaf, which would have followed f. 91, would also have been excised.

In *J* quire f. 112 probably replaced two watermarked conjugate leaves. Folio 111, the two missing leaves, and f. 113 comprised a separately-folded sheet, and ff. 105–110 and 114–119 were multi-folded (ff. 107–108 and 116–117 constitute a sheet which sat head-to-foot with the other two multi-folded sheets). Folios 103–104 and 120–121 appear to contain the first clearcut evidence that the main scribe ever quired with half-sheets, for the mould-side pattern of these four leaves does not fit with any of the ways by which whole

19. See K. S. Block, *The Ludus Coventriae*, EETS ES 120 (1922), p. xxviii. Miss Block suggested that one additional leaf originally followed f. 91 while two leaves followed f. 94, and mistakenly added that "the correspondence of watermarks in this quire supports this." See also my "The Genesis of the N-town Cycle," Yale Univ. Diss., 1973, p. 107.



r r r r r r r r r r v v v v ? v v v v v v r r  
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23  
 A<sub>1</sub> A<sub>2</sub> - A<sub>2</sub> - - B<sub>1</sub> B<sub>1</sub> B<sub>1</sub> - - - B<sub>1</sub> B<sub>2</sub> - B<sub>1</sub> B<sub>1</sub> - - - C<sub>1</sub> C<sub>1</sub>

r r r r r r r r r r v v v v v v v v v v v v r  
 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46  
 C<sub>1</sub> - C<sub>1</sub> C<sub>1</sub> C<sub>1</sub> C<sub>2</sub> - C<sub>1</sub> C<sub>1</sub> C<sub>1</sub> - - - C<sub>2</sub> - - - - C<sub>2</sub> - - - D<sub>1</sub>

r r r r r r r r r r v v v v v v v v v v v v r  
 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70  
 D<sub>2</sub> - - D<sub>2</sub> - - D<sub>1</sub> - D<sub>1</sub> D<sub>1</sub> D<sub>1</sub> - - - D<sub>2</sub> - D<sub>2</sub> D<sub>1</sub> - D<sub>1</sub> D<sub>1</sub> - - D<sub>1</sub>

The first center of symmetry is between ff. 10 and 11, the next between ff. 33 and 34, and the third between ff. 57 and 58. Quire 1 includes ff. 1–20 and quire 2 ff. 22–45 (this is the gathering which was described in the above illustration of watermark-sequence symmetry in the folio format). To which gathering can we assign f. 21? This folio has apparently lost its conjugate leaf, which must have stood either before f. 1 or after f. 45, the last leaf in quire 2. The latter possibility is unlikely, firstly because there is no sign of textual disturbance between ff. 45 and 46 (which are the second and third leaves of the “Nativity” play), and also because the mould-side pattern would be most peculiar if f. 21 and its conjugate leaf belonged to quire 2: f. 21 would be the only “mould-side-verso” leaf in the first half of quire 2, and the only initial leaf in any gathering in the manuscript to have its mould-side on the verso; the mould-side arrangement would also be anomalous with respect to the missing conjugate leaf.<sup>33</sup> On the other hand, locating f. 21 in quire 1 fits perfectly with the mould-side pattern and makes good sense on another count as well: the conjugate leaf would have preceded f. 1, and might very well have been a flyleaf; its excision would therefore have been quite natural. Quire 3 comprises ff. 46–69, and on f. 70 begins quire 4. Note that the mould-side patterns in each case agree with these findings, and in themselves indicate the centers and limits of gatherings. The collation of the

also a pot with one handle of which twin B<sub>1</sub> measures 48 x 1[17.5]3.5 while twin B<sub>2</sub> measures 46.5 x 1[17.5]3.5 and differs slightly in appearance from B<sub>1</sub>. Mark C is a large and elaborate two-handled pot. C<sub>1</sub> measures 74.5 x [4.5|20.5|4], C<sub>2</sub> 74.5 x [6|21|3.5]. When viewed right-side up from the mould-side of the paper, C<sub>1</sub> is to the left of the deckle while C<sub>2</sub> is to the right. Mark D is a pot with one handle, surmounted by a crescent. D<sub>1</sub> measures 73.5 x [4.5|22] as against a measurement of 70.5 x [7.5|21] for D<sub>2</sub>. Of these marks, only D is similar to the watermark tracings: it bears some resemblance to Briquet 12803 and Heawood 3583. The foliation I employ is that of the modern foliater rather than Bellin's.

33. One very tentative exception is f. 205, the last leaf in the codex, which may be mould-side-recto. This is uncertain, however, because it is unusually difficult to distinguish the mould-sides of the paper in the final gathering. To make matters more difficult, the conjugate leaf of f. 205 is absent (as indicated by the watermark sequence). In any event, the remainder of this quire appears to conform to the normal pattern in the manuscript in which the first half of the gathering is mould-side-recto, the second half mould-side-verso.

