

up with wooden furniture, and long wedges were fitted round the edges. Short wedges, or quoins, were then put in between the long wedges and the inside of the chase, loosely at first so that the string with which the pages were tied up could be unwound and removed, and so that any pieces of type that were sticking up above the rest could be knocked down with a wooden planer. Finally the quoins were driven home with a mallet and 'shooting stick' to lock the forme up tightly.

Sixteenth-century chases might be made of wood, as some of Plantin's were.³ Chases with thumb-screws in two of the sides for locking up the forme without the use of quoins were used in France and Germany until the seventeenth century and in Italy until the eighteenth century, but there is no evidence of their use in Holland or England (except by Baskerville, whose methods were peculiar to him).⁴

If the job had been done properly—if all the lines of type were correctly justified and the pieces of furniture were not binding against each other—the forme was now virtually a solid slab of wood and metal and, although it did not have a bottom like a tray, it could be moved about or lifted without the type falling out. The compositor therefore pushed it to one side (or stood it on its edge on the floor, leaning against his frame) and proceeded to impose the second forme of the sheet in the same way.

FORMAT

In bibliographical usage the format of a book of the hand-press period means the arrangement of its formes and the subsequent folding of the printed sheets as indicated by the number and conjugacy of the leaves and the orientation of the paper in the gatherings, and is expressed in the terms folio, quarto, octavo, etc. A book made up of sheets printed from pairs of four-page formes folded twice to make four-leaf, eight-page, gatherings with horizontal chain lines is called a quarto; and it is still called a quarto, not a folio, if the eight-page sheets were cut in half before folding to make gatherings of pairs of leaves with four pages each. If the size of the paper can be established by measuring the leaves or identifying the watermark it is added to the format statement, thus indicating the size and shape of the book in the terminology of the trade: foolscap quarto, demy octavo, etc.

We shall see later that books of the machine-press period were commonly printed from multiple impositions on large sheets of paper which were then cut up for folding into ordinary gatherings. For such books a

format statement such as 'crown octavo' does not necessarily indicate either the imposition scheme or the size of the large sheets; what it does indicate—properly used—is that the size of the sub-units of the sheets used for the gatherings was crown, and that the sub-units were folded octavo-fashion into gatherings of eight leaves.

Paper sizes have already been considered; now we must examine the impositions and foldings that printers used. The usual terminology is folio (abbreviated 2°) for sheets folded once across the longer side, giving two leaves or four pages to the sheet; quarto (4°), when a second fold is made across the first, making four leaves, eight pages; octavo (8°), with a third fold across the second, making eight leaves, sixteen pages; duodecimo (12°), folded twice across the longer dimension and three times across the shorter, making twelve leaves, twenty-four pages; long twelves (long 12°), when the sheet is folded once across the shorter side and five times across the longer, again making twelve leaves, twenty-four pages; and sixteenmo (etc.) for the more complex foldings (16° (etc.) up to 128°). Large books of plates were sometimes made up of broadsheets, not folded at all (1°), while a handbill might be in the form of a half-sheet or quarter-sheet ($\frac{1}{2}$ °, $\frac{1}{4}$ °).

The compositor laid out his type pages on the stone in the mirror image of the order in which they were to appear on the printed sheet. To take the simple case of a sheet of folio, which is folded once across its longer dimension, pages 1 and 4 appear on the outside of the folded sheet and pages 2 and 3 on the inside. If the sheet is laid out flat with pages 1 and 4 upwards, page 1 is on the right and page 4 on the left. The forme from which

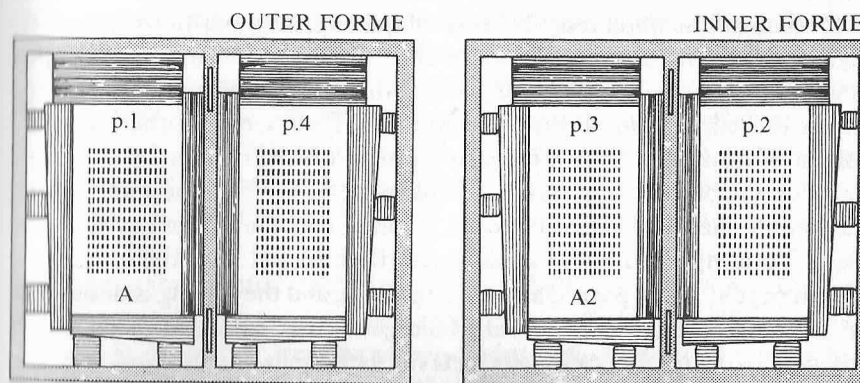


FIG. 44. The two formes for a sheet of folio, showing the disposition of the pages (cf. fig. 46). The furniture is so arranged that the head-, side-, foot-, and gutter-sticks will not bind on each other when the quoins are driven up tight. The cross of the chase has slots in it to protect the points of the press when the tympan is folded down.

³ Information from Professor J. Gerritsen.

⁴ Zonca, V., *Nova teatro di machine et edificiū*, Padoua 1607, p. 64; Hornschuch, H., *Ἐρθεοτυπογραφία*, Lipsiae 1608, A8^b; Fertel, M. D., *La science pratique de l'imprimerie*, Saint-Omer 1723, p. 181; *The Library*, x, 1955, pp. 41-2; *Signature*, xii, 1951, p. 51; Gaskell, P., *John Baskerville, a bibliography*, Cambridge 1959, p. xix.

this outer side of the sheet was printed therefore had type-page 1 on the left and type-page 4 on the right; and it was called the outer forme. The forme from which the inner side of the same sheet was printed, containing pages 2 and 3, was called the inner forme. Similarly for other formats; the formes were laid out as mirror images of the printed sheets, and the outer forme always contained page 1, the inner forme page 2.

It will also be obvious that a sheet of paper folded in folio had the chain lines in the paper running up and down the leaves (vertically), not across (horizontally); and that the watermark was in the middle of one of the leaves (it could be in either leaf) with the countermark, if any, in the middle of the other. Each format, in fact, had its own characteristics of chain-line direction, watermark position, etc.

The following diagrams (figs. 46-63), which represent printed sheets, not formes, are intended both to explain how the various impositions and foldings worked, and to make them easier to identify in early books. By no means all the possible formats are included—Savage's manual of 1841 illustrated more than 150 impositions⁵—but all the really common ones are here. By using the diagrams in conjunction with the notes which follow it will usually be easy enough to see how a particular hand-printed book was made; in difficult cases it will be found helpful to make a model of the sheet with a piece of 'quarto' paper. But it is well to remember that throughout the period nearly all books were printed in one of the four normal formats, folio, quarto, octavo, or duodecimo, or in half-sheet versions of quarto, octavo, or duodecimo; and that other formats were used only for special cases, such as very small books, or books with pages of unusual shape.

Preliminary mention must be made of quiring, of impositions for gathering by half sheets, and of anomalous chain-lines and watermarks in paper. It was normal in the early days of printing to impose for gatherings of several sheets tucked, or quired, inside each other. Thus a folio gathering might consist of three folio sheets, the outermost of which contained pages 1 and 12 (printed from the outer forme) and pages 2 and 11 (from the inner forme); the middle sheet had pages 3 and 10, 4 and 9; and the innermost sheet had pages 5 and 8, 6 and 7. All three sheets were signed with the same letter (A1 on page 1, A2 on page 3, and A3 on page 5), and the folding is designated '2^o in 6s'. In the fifteenth century folio gatherings consisted of up to five sheets; quarto (and occasionally octavo) gatherings might consist of two sheets. Patterns of quiring changed in later periods. Folios were generally gathered in 6s during the sixteenth and seventeenth centuries, but most eighteenth-century folios were gathered by single sheets (i.e. in 2s) despite

⁵ Savage, W., *A dictionary of the art of printing*, London 1841, pp. 335-400.

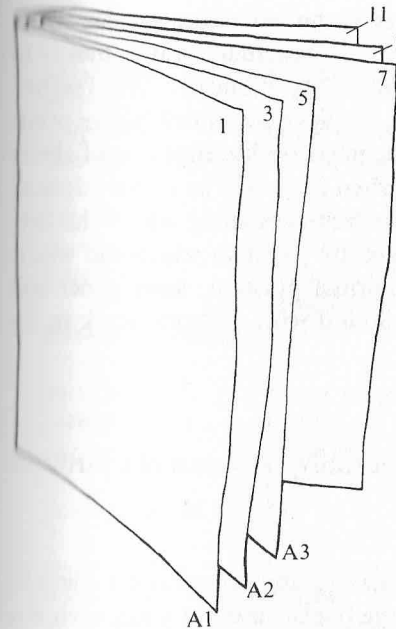


FIG. 45. A gathering, or section, of three sheets of folio, quired (2^o in 6s).

the extra sewing that this entailed. Quarto in 8s remained common in English printing until the seventeenth century, and was continued in Bible printing until 1800. Octavo gatherings were rarely quired after the fifteenth century.

Impositions for gathering by half sheets in formats other than folio were used occasionally from early times, but did not become really common until the eighteenth century; they too required extra sewing. Two methods were used which produced closely similar results. In one, called half-sheet imposition,⁶ all the pages for a half sheet were imposed in one forme (see figs. 49, 53, 59); this forme was first printed on one side of the whole sheet, then the heap of paper was turned (end over end in quarto and octavo, side over side in duodecimo) and printed from the same forme on the other side. Each printed sheet was then slit in half to yield two copies of the same half sheet. In the other method, the pages for two successive half sheets were imposed in two formes (see figs. 48, 52, 58) and printed in the normal way; again the printed sheets were cut in half, but this time each one yielded copies of the two successive half sheets which were different from each other, but which were sometimes indistinguishable from similar half sheets printed by half-sheet imposition. It is seldom possible to tell which method has been used in printing particular half sheets in quarto or octavo.

⁶ Or 'work and turn'. See Povey, K., 'On the diagnosis of half-sheet imposition', *The Library*, xi, 1956, pp. 268-72.

Turned chain-lines—that is, chain-lines in the paper that appear to run the wrong way for a particular format—are occasionally found, mostly in late-seventeenth-century and in eighteenth-century books. They resulted from the use either of double-sized sheets of paper cut in half before printing (when one of the long sides has a cut, not a deckle edge), or of sheets made in side-by-side two-sheet moulds (when there will be deckle edges all round); both varieties are likely to have tranchefiles along one of the long edges only.⁷ Confusion may also be caused by paper in which the watermark is located elsewhere than in the normal position; such paper was rarely made, but may now and again be found with the watermark in the middle, or next to an edge, of the sheet.

THE IDENTIFICATION OF FORMAT

The following procedure may be used to identify the format of a particular book.

1. Make notes of:

- a. The dimensions of the uncut leaf (making allowance for cut edges by adding 1.0-2.0 cm. each way for large books, or 0.5-1.0 cm. each way for small books).
 - b. The direction of the chain-lines.
 - c. The position of the watermark.
 - d. The number of leaves per gathering.
2. Refer to Key I to see if the book appears to be in one of the normal formats (2°, 4°, 8°, or 12°) or in long 12°; if it does, check the relevant diagram and note; finally, using Key III, multiply the dimensions of the leaf by the factors appropriate to the format to obtain the size of the uncut whole sheet, and find its name in the tables of paper sizes, pp. 73-5.
 3. If the book does not appear to be in one of the normal formats or in long 12° (remembering that it may have been heavily cut down, and that chain-lines and watermarks are not quite always reliable guides), and if it is not more than 15 cm. tall, refer to Key II, and check the possibilities with Key III.
 4. If there is still no clear answer, either because the format appears to be abnormal or because there are several alternatives, consult one of the early printers' manuals (pp. 87, 393) and make reversed paper models of possible imposition schemes, paying attention as far as possible to deckle, cut and conjoint edges, tranchefiles, and point-holes.

⁷ See pp. 63-5.

KEY I: *Large and Medium Formats*

1. <i>uncut height</i>	30 cm. or more	}	2° (see fig. 46 and note A)
<i>chain-lines</i>	vertical		
<i>watermark</i>	in the middle of the leaf		
<i>leaves per gathering</i>	2, 4, 6, 8, or 10		
2. <i>uncut height</i>	19 cm. or more	}	4° (see figs. 47-9 and note B)
<i>chain-lines</i>	horizontal		
<i>watermark</i>	in the middle of the spine fold		
<i>leaves per gathering</i>	4 or 2		
3. <i>uncut height</i>	15 cm. or more	}	8° (see figs. 50-3 and note C)
<i>chain-lines</i>	vertical		
<i>watermark</i>	at the head of the spine fold		
<i>leaves per gathering</i>	8 or 4		
4. <i>uncut height</i>	15 cm. or more	}	long 12° (see fig. 54 and note D)
<i>chain-lines</i>	vertical		
<i>watermark</i>	at the head of the leaf		
<i>leaves per gathering</i>	12		
5. <i>uncut height</i>	12.5 cm. or more	}	12° (see figs. 55-9 and note E)
<i>chain-lines</i>	horizontal		
<i>watermark</i>	at the fore-edge of the leaf		
<i>leaves per gathering</i>	12, 6, or 8 and 4		

KEY II: *Small Formats*

(see figs. 60-3 and note F)

NOTE: Books in formats from 16° down to 128° were usually printed on the smaller sizes of paper, especially pot and foolscap, so that their cut heights are seldom much more than the minimum uncut heights given in this key. See also the table of typical leaf sizes in Key III.

6. <i>chain-lines</i>	vertical	
<i>leaves per gathering</i>	8 or 16	
<i>minimum uncut height</i>	10.0 cm.	long 24°
	7.5 cm.	32°
	5.0 cm.	96°
	3.75 cm.	128°

KEY II: *Small Formats (cont.)*

7. <i>chain-lines</i>	horizontal		
<i>leaves per gathering</i>	8 or 16		
<i>minimum uncut height</i>	9.5 cm.	16°; 24° (the 16 way)	
	6.3 cm.	48°	
	4.75 cm.	64°	
8. <i>chain-lines</i>	vertical		
<i>leaves per gathering</i>	6 or 12		
<i>minimum uncut height</i>	10.0 cm.	18°; long 24°	
	5.0 cm.	72°	
9. <i>chain-lines</i>	horizontal		
<i>leaves per gathering</i>	6 or 12		
<i>minimum uncut height</i>	9.5 cm.	24° (the 16 way).	
	6.3 cm.	36°; 48°	

KEY III: *Sheet Sizes*

format	to find sheet size, multiply		dimensions of uncut leaves from three repre- sentative sizes of paper in cm. (height × width)		
	height of leaf by	width of leaf by	pot	demy	royal
1°	1	1	39.0 × 31.0	51.0 × 38.0	60.0 × 46.0
2°	1	2	31.0 × 19.5	38.0 × 25.5	46.0 × 30.0
4°	2	2	19.5 × 15.5	25.5 × 19.0	30.0 × 23.0
8°	2	4	15.5 × 9.75	19.0 × 12.75	23.0 × 15.0
long 12°	2	6	15.5 × 6.5	19.0 × 8.5	23.0 × 10.0
12°	3	4	13.0 × 7.75	17.0 × 9.5	20.0 × 11.5
16°	4	4	9.75 × 7.75	12.75 × 9.5	15.0 × 11.5
18°	3	6	10.3 × 6.5	12.6 × 8.5	15.3 × 10.0
long 24°	3	8	10.3 × 4.9	12.6 × 6.4	15.3 × 7.5
24° the 16 way	4	6	9.75 × 5.2	12.75 × 6.3	15.0 × 7.7
32°	4	8	7.75 × 4.9	9.5 × 6.4	11.5 × 7.5
36°	6	6	6.5 × 5.2	8.5 × 6.3	10.0 × 7.7
48°	6	8	6.5 × 3.9	8.5 × 4.75	10.0 × 5.75
64°	8	8	4.9 × 3.9	6.4 × 4.75	7.5 × 5.75
72°	6	12	5.2 × 3.25	6.3 × 4.25	7.7 × 5.0
96°	6	16	5.2 × 2.4	6.3 × 3.2	7.7 × 3.75
128°	8	16	3.9 × 2.4	4.75 × 3.2	5.75 × 3.75

Notes on the format diagrams

The diagrams are based primarily on impositions shown in the following four manuals: Wolffger, G., *Neu-auffgesetztes Format-Büchlein*, Graz 1673; Moxon, J., *Mechanick exercises*, London 1683; Fertel, M. D., *La science pratique de l'imprimerie*, Saint-Omer 1723; and Smith, J., *The printer's grammar*, London 1755.

The wavy sheet margins indicate deckle edges, and the grids of vertical lines represent the chain-lines and the tranchesfiles (though not all paper had tranchesfiles). Watermarks are shown in particular halves of the sheets, but they could as easily be in the opposite halves. (It will be remembered that not all paper was watermarked; and that countermarks, which are also shown, were rare before the mid seventeenth century.)

The layouts of the pages are shown in the orientation they had as a printed sheet lying on the open tympan of the press as seen by the pressman (these details are explained in the section on presswork).⁸ The figure at the top of each page is the page number; and the signature letter and leaf number is given at the foot of every page in order to make the features of each leaf readily apparent (although in fact no more than the first few recto pages of each sheet were so signed). Point-hole positions are shown at o o (with alternative positions at x x in figs. 51, 56).

The cuts whereby sections of the printed sheet were removed before folding are indicated by plain lines with pairs of shears drawn at the ends. Folds are shown by dashed lines. Spine folds (marked S) connected conjugate pairs of leaves; but the other folds, although they made some of the edges conjoint when the sheet was first folded, were normally opened later by the binder's plough, or with a paper knife.

⁸ In France and Germany quarto sheets were oriented the other way round; see p. 127.