

Printers' Measures

Type and layout measurements.

The establishment of printing in the Middle Ages was at a time when measurements were not standardised in the way we are used to. Measures such as the yard & the pound weight for selling common products were to some extent controlled to prevent disputes & frauds, but even these were not very exact. Most practical measurements were done by comparisons on the spot: a wheelwright would measure the spokes he made against each other (& perhaps a standard piece he kept), not by making them to some numerical measure.

Printing, however, did require careful standardisation of the items used: type & printing surfaces had to be of the same height-to-paper (at least within one firm), & letters used in a line needed to be all of equal body size (effectively distance from one line to the next if unspaced) to fit together properly, & these measures needed to be very precise compared to most at the time: they were also quite small dimensions, fractions of an inch, so no popular measures of suitable sort were in use. What printers did, was much like any other crafts at the time: they used one item as a starting point, & matched the others to it: type was produced by printers (later by foundries) in a range of sizes, each size being given a common name, but not necessarily being identical from different sources, nor matching in some numerical way with any others. One founders' Nonpareil was not the same as another's. A few sizes were related: "two-line English" would be twice "English", providing they came from the same supplier.

Two other units were also used, the en & the em: these were unusual as units, in that they changed according to the circumstances—rather an unusual idea for units, but very practical. The em was a square of whatever size of type was being used, or a length of one side of that square. It was so called, because in most typefaces, the letter m was on a square body. The en was half an en, again so called because a n was usually half the width of an m. Ems were used to measure the lengths of lines of text, & heights of columns, & ens were used in calculating the length of text passages: the en was an average character size, an average word was 6 ens. In the twentieth century, if not before, commercial rates for setting type were calculated on "enrage", at so much per thousand ens.

The height-to-paper did standardise at least to become (on the whole) one height in Europe, & another in Britain, the Empire, & America. This was presumably because it was not too difficult to adjust this height in production, & then at least letters from different sources could be mixed, albeit not on the same line.

By the Nineteenth century, printing was beginning to increase in

scale, & the case for standardising sizes became obvious: the problem was the reluctance to re-tool foundries, & the marketing loss to a firm that changed of matching printers' existing type. In France, the scientific surge that followed the revolution & Napoleon's promotion of science, technology & standardisation, led not just to the metric system, but to Didot's suggestion of a system of printer's measures, the Point System. He suggested a unit of measure, the Cicero, of about 4mm, subdivided into twelve units called points. This was gradually adopted in Europe, but nothing happened in the Anglo-American sphere until there was a great fire in Chicago in 1886, which destroyed several major American foundries: their re-establishment proved a suitable time to introduce a standardisation, & from then the point system was adopted gradually in Britain & America: the arrival of the Monotype & Linotype casting systems also helped, for to use them best, other hand-set type needed to match their output. Of course, the point system adopted wasn't identical to the European one, but the concept was the same, & the unit was called the point. The equivalent of the Cicero was the Pica em, i.e. the 12 point em.

The new system took as its unit the point of 0.01383 inches (0.3513mm), & the measurements were as follows:

(Anglo-American) Point: roughly 1/72 inch, or 1/3 mm. Pica: roughly 1/6 inch, or 4mm. Type height: 0.918 inch
The Didot point was slightly larger at 0.0148 inches (4.513mm), & the continental type-height higher at 0.928 inches (23.567mm).

Old type size names, and their approximate point sizes were:

Diamond	4pt	Long Primer	10pt
Pearl	4 1/2pt	Small Pica	11pt
Agate	5pt	Pica	12pt
Nonpareil	6pt	English	14pt
Minion	7pt	Columbian	16pt
Brevier	8pt	Great Primer	18pt
Bourgeois	9pt	Canon	48pt

Wood letter (which of course was almost always much larger sizes than lead type, usually 72pt or over) carried on the old system in being measured in "lines", now assumed to be 12pt each.

One last odd measure was used by typefounders when supplying special characters: they came in length of the "half-iron", about 24ems.

Paper sizes

Paper sizes also started in a very pragmatic way. The hand making of paper used a wooden frame in which the sheet was formed, & each papermaking place used its own size or sizes. Paper was identified by its watermark, & as was usual in a mainly non-literate society, these trademarks were symbols: a jester's cap, a crown, etc. Eventually spe-

cific sizes were identified with specific watermarks, & a "Crown" sheet was a fairly standard size. There was an accepted way of describing multiple & sub-divided sizes: "Double" & "Quad" meant twice or four-times the standard sheet, while "Folio", "Quarto", & "Octavo" meant half, quarter, & one-eighth sizes—the most commonly used as of course sheets are usually folded or cut in half, then half again, to produce the necessary sizes.

Some Old Paper Sizes

Old paper sizes were pre-metric, so are described here in inches.

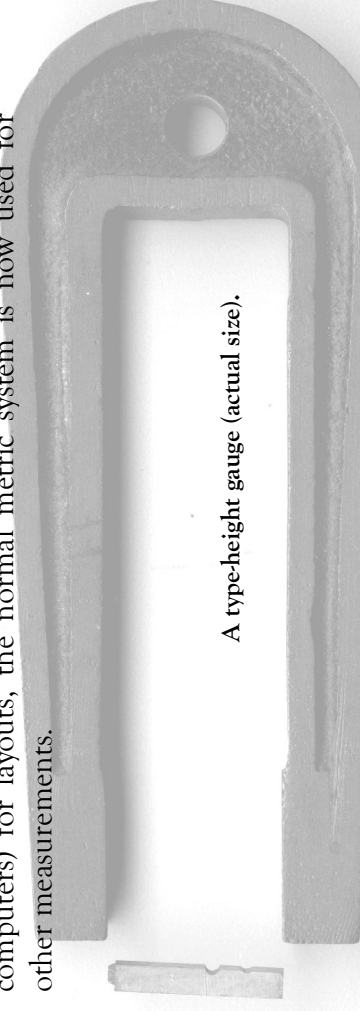
Crown SHEET	20x15	FOLIO	15x10	QUARTO	10x7 1/2
Foolscap	16 1/2x13 1/4	Royal	13 1/4x8 1/4		8 1/4x6 1/2
	25x20		20x12 1/2		12 1/2x10
Medium	23x18	Imperial	18x11 1/2		11 1/2 x 9
	30x22		22 1/2x17 1/2	Small Demy	20x15 1/2
Large Post	21x16 1/2		Small Post		18 1/2x14 1/2

(Trimmed Foolscap folio (8x13) & Post Quarto (8x10) were the common paper sizes for typing & duplicating, & were known colloquially as "foolscap" & "quarto", rather confusingly if you didn't know the full meaning of the terms.)

Some sizes, at least latterly, were used most often for particular purposes. For example, Royal was mostly used for cards, & Double Crown was a standard size for posters, with posters boards described in terms of "sheets" of Double Crown.

In the 1920s the German industrial standards organisation suggested a new set of standard sheet sizes to minimise waste, by making the proportions of the sheet such that when it was cut in half, the shape of the resulting sheet was the same. (Mathematically, this means the sheet has to be in the proportion of 1.41 to 1.) At the same time, it used a sheet of one square metre area as the starting point, thus fixing the size A0 at 1092 by 840 mm. Successive sizes produced by halving were A1, A2 etc, giving the familiar A4 of 298 by 210mm, & doubling gave 2A, etc. This system suited the widespread use of photographic enlargement & reduction, & simplified many of the commercial calculations of paper weights used in pricing bulk purchase of paper by printers.

Although the point & (pica) em system is still used by printers (& on computers) for layouts, the normal metric system is now used for other measurements.



A type-height gauge (actual size).