The History of Printing - A Potted Version (by Pam Killalea)

Printing from woodblocks and brass castings in China and Korea had pre-dated events in Europe by many years but this piece will concentrate on early developments in Europe.

While there is still some conjecture as to who actually made the breakthrough and developed moveable type and the printing press, most now accept that it was Johannes Gutenberg. Born Johannes Gensfleish (meaning gooseflesh) he adopted his mother's maiden name.

In Europe in the 15th century, there was an increasing demand for large-scale production of literature. Gutenberg's invention was largely prompted by the fact that the multiplication of texts had become a recognised and lucrative trade. A Mainz goldsmith, he began experimenting with printing about 1440. At that time others were also engaged in discovering some method of producing an 'artificial script' as it was called. Avignon, Bruges and Bologna are mentioned as places where such experiments were taking place.

By 1450, Gutenberg had perfected his invention far enough to exploit it commercially. He needed capital and borrowed from a Mainz lawyer (bad move!) who became his partner but then foreclosed on the inventor and took possession of his presses and types. Gutenberg saved very little from the wreck of his fortune and after 1460 seems to have abandoned printing, possibly because of blindness. He suffered further loss in the sack of Mainz in 1462 but received a kind of pension in 1465. He died in 1468. A relation later dedicated an epitaph which says:

> "to the immortal memory of Johannes Gensfleish, the inventor of printing, who has deserved well of every nation and language".

Indeed. To return to 1450 when Gutenberg perfected the hand-casting of type…….. his first mould for casting type may have been primitive, but since the 16th century, designs have changed little in principle up to the present day – though mechanical casters have made them obsolete.

Type metal is an alloy of varying composition. The basic metal is lead with different admixtures of tin and antimony as well as other metals such as copper at times. Metal alloys were already in use in the 15th century. Gutenberg's second invention, without which printing, as we understand it would have been impossible, was the preparation of an ink which would adhere to the metal types. Early inks consisted of lampblack or soot mixed with animal glue or vegetable oils. The printer made his own ink which he cooked according to a 'secret' formula. Boiled linseed oil was an ingredient at one time.

In the days before inking rollers, printers used what were called mushrooms. These were made of soft leather stuffed with horsehair and had a wooden handle. The

mushroom was used in a rolling motion to apply the ink to the type. To keep them soft between use, they were kept in a bucket of urine, that essential by-product of the middle ages and beyond!

There were other variations of presses made but Gutenberg's remained in use without any radical improvement for more than three centuries. It was slow and cumbersome (at least to our modern eyes) required a great amount of muscular force but sufficed for its day and the then limited section of the public that could read its product. However, as these very products continuously enlarged the number of literate people, the old press became incapable of coping with the demand it created. It was thus the principal agent in superseding itself.

A great deal is known about Caxton introducing the printing press into England in 1476 so we won't linger there. Sufficient to say he was not only the first English printer-publisher but also the first English retailer of printed books. After Caxton's death, his business went to his assistant with the wonderful name of Wynken de Worde, a native of Alsace, who was a prodigious publisher. About two-fifths of his output was intended for the use of grammar-school boys and so Wynken de Worde may justly be called the first publisher who actually made the schoolbook department the financial basis of his business.

During the era 1550-1800 the personal union of type-founder, printer, editor, publisher and bookseller became a thing of the past. Occasionally it happened but, on the whole, the occupational difference had come to stay. Virtually no technical progress took place in the composing and printing rooms; the organization of the trade became stabilised – literally and figuratively. Three hundred and fifty years elapsed after Gutenberg's invention before any basic change was made in the technique of printing. There was no difference between the humble press on which Gutenberg printed the 42-line Bible and the presses for which John Vanbrugh designed the spacious Clarendon Building in 1713.

Now, within a generation, the printing trade underwent a wholesale alteration. Various improvements had been suggested or attempted but inertia or downright hostility to any change prevented their adoption. It was to one Joseph Moxon, a Yorkshireman, to whom posterity owes the most comprehensive book on the practise of typecutting, type-founding and type-setting before the power press and composing machines were invented. From 1667-1679 he published thirty-eight papers for the professional instruction of skilled artisans in the metal and woodworking trades. Twenty-four of these tracts were subsequently republished by him in book form – this has remained a mine of information about every aspect of the technical processes of printing as they were practised from Gutenberg to Konig.

The first revolutionary invention was the mechanical manufacture of paper. A machine to supersede the costly and slow production of hand-made paper was invented in 1798 by Nicholas Robert who took his patent to England and here the first efficient machines were set up in 1803 at Frogmere, Hertfordshire. The output of paper became ten times as high – from 60-100lbs made daily by hand in the old papermills, it now produced up to 1,000lbs per day.

Scotsman, William Gel, like Gutenberg a goldsmith, in 1700 took up an idea which Dutch printers had been trying out unsuccessfully; namely, how to preserve the pages of type for future reprints, thereby avoiding the resetting of the text. He took a cast of the original in plaster of paris and from this mould produced a fresh metal plate as often as required. The jealousy of the Scots printers who feared for their livelihood, wrecked the invention. It was revived sixty years later and steadily improved on until the somewhat clumsy plaster and metal matrices were replaced by papier mache which, at the same time, reduced time, labour, weight and bulk.

Of even greater importance, in the early 1800's, was Stanhope's improvement of the printing press itself – by replacing the wooden press with an iron structure and by increasing the bed of, and adapting the lever principle to, the older machines invented by the Dutchman Blaeu in 1620. Stanhope had actually been anticipated nearly three centuries earlier by Leonardo da Vinci who had fully worked out on paper the principles and main features of Stanhope's press of 1804. Its increased multiplying capacity was itself multiplied by Frederick Konig's machine which saved the double composition of the inner forme and also allowed for more copies to be pulled per man-hour.

However, it is not these detailed achievements which make Konig's invention an epoch-making event, but his principle of replacing man-power by steam-power. This was indeed, as John Walter said in The Times of 29 November, 1814, "the greatest improvement connected with printing since the discovery of the art itself, relieving the human frame of its most laborious efforts in printing". The first try-out of the steam press was a sheet of the Annual Register run off in 1811. Its real importance became clear when it was adopted by The Times in 1814. The work done by a hand-press amounted to 300 sheets in one hour. Konig's machine raised it to 1100. Then followed the 4-cylinder press in 1828 which allowed 4,000 sheets per hour. The rotary press in 1848 printed 8,000 sheets. In 1939 The Times could be printed at the rate of 40,000 copies an hour of a 32-page paper. Konig's invention at once lowered printing costs by twenty-five percent and so made cheaper and larger editions possible.

The inventions which made possible and increased the mass production of printed texts were accompanied by those which facilitated and reduced the cost of printed illustrations. The first illustrated book to be printed on a steam-press was done in 1832. It was, however, popular journalism which hastened the spread of illustrations as a regular adjunct to printed information. The Penny Magazine from 1832 and the Illustrated London News (1842) were the pioneers of educational and entertaining illustration respectively – leading to the tabloids of today which, as we know, are a mixed blessing indeed!

As a final comment, the linotype machine is arguably the most influential and mechanically outstanding invention of all time. Indeed, Edison called it 'the eighth wonder of the world'. It was designed by Ottmar Merganthaler and meant that lines of type could be set by the machine and not single letters picked out by human hand which then had to be put back into their proper receptacles. When the first line was

set in 1886 one man watching cried out, “you’ve done it, Ottmar, a line o’ type”. And that’s how this amazing machine acquired its name.

My husband served his apprenticeship on the improved version of that linotype. Now, of course, they are obsolete, having been made redundant by that ubiquitous creature, the computer.