

THE EVOLUTION OF PRINTING

by

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I. Introduction.

First evidences of impression printing.

In the remote antique ages man could think and his thoughts did not die with him. We have them yet, embedded in the picturesque ruins of his works of art. Yet the hieroglyphic messages were chiselled into the cold granite with much pains and labor, and it was the beholding of this infinite toil of the stone carver that caused one man to ponder. Instead of the unwieldy boulders built by nature in the ages past, he would substitute clay, moulded by the hand of man and in the moment. But the inscriptions? Here was the problem!

The carver of wood came to the rescue. By means of characters first cut in the wood and then impressed into the soft, unbaked clay, the divine words of the King would remain to time immortal.

Thus in the bricks of Egypt and Assyria we have the first evidences of characters reproduced by pressure, and this is the secret of printing. Also, the all-powerful Romans used stamps for producing inscriptions. The plebian marked his cattle with a punch containing his initials. The merchant put an imprint on his goods. But the time was unripe for the development of printing. The rulers imposed heavy burdens upon their subjects and the secret disclosed remained undeveloped. It was not for kings to advance the art, but rather to retard it.

II. Crude beginnings.

Xylographic or block-printing.

Thus the world moved on until the twelfth century gives us the first real evidence of the direct origin of printing. We now find xylographic or block-printing coming into practice. All manuscripts and books up to this time were entirely the product of the pen alone, and

produced by an infinite amount of toil and labor.

III. The era of book manufacture.

A book trade was springing up and the dealers in these much-desired but costly and precious goods found that the slow method of copying or transcribing by hand was inadequate.

1. Demand made printing a necessity.

Necessity gave rise to block-printing. By this method a page of a book or manuscript, including both text and illustration, was prepared upon a block of wood and an impression taken from this. We find this process practiced to-day in China and Japan, yet differing slightly from the xylographic process used in book-making in Europe. By the Chinese method, a piece of transparent paper containing the writing which it is desired to reproduce is pasted upon a block of wood. The engraver then cuts away those portions not covered by characters, leaving the latter in relief. The block is then inked and an impression taken on paper by rubbing a brush over the surface. In Europe the designer or engraver undoubtedly first sketched the designs and texts in reverse upon the block and then proceeded to carve out the characters.

Notwithstanding the work connected with this method we find the art of book-making and the diffusion of literature greatly increased. At the very outset Printing and Education began advancing across the world's stage hand in hand.

2. Movable type.

The liability to faults and errors in the preparation of the text, which would cause a block to be hewn anew, made the method impracticable, and in the fifteenth century a new and lasting process was born to the world, giving a powerful impetus to civilization--that of movable types.

Movable type were first made of wood, carved out and shaped with much labor, but owing to their bulk and irregularity they were far from satisfactory. It is interesting to note that at this stage two men come upon the scene, each claiming the honor of "first printer:" Coster, of Haarlem (Netherlands), and Gutenberg, of Mainz (Germany).

(a) Coster.

According to tradition, legend and other vague data, Laurent Coster first conceived the idea of movable type while playing with children near the city of Haarlem, in Holland. It is said he cut letters from the bark of beech trees and joined them in a fashion to form words, which he reproduced by taking impressions on paper. Coster is supposed to have printed the book "Speculum" with his first crude movable type.

(b) Gutenberg.

We first hear of Gutenberg at work in Strasburg, Germany, in 1440, trying to perfect the art. Instead of the crude wooden type he wanted type less fragile and more durable. He removed to Mainz, and it was here he managed to produce metal type of tin or lead by means of punches, moulds, etc. Having met with this much success he began the task of producing the Bible--a fitting inaugural for the great invention. Nor did Gutenberg only desire type with which a clear-cut impression could be taken--he wished to better the facilities of press work. Heretofore the impressions were taken by rubbing a brush over the paper, which was placed on the forms after they had been inked by means of a pillow-shaped pad covered with dog skin. This method was indeed unsatisfactory, and Gutenberg finally made the model for the first hand press, an improvement of which we can to this day see in many little villages in the United States. By means of a flat wooden bed, and a platen which was hung on a screw and could be moved in a vertical direction by means of a lever-arm, he devised a press by

which impressions could be taken to a very good advantage. In 1454 we have a record stating that the first printed matter, aside from books, that came from Gutenberg's press was the famous letters of indulgence which Pope Nicholas V was at that time sending throughout Europe.

In typographic circles there is a great controversy concerning the share the two foregoing men had in the invention of printing. According to all obtainable data, it would seem that Coster may have first conceived the idea of connecting separate type in lines and thus building sentences, but Gutenberg certainly deserves the credit for erecting the first printing press and improving the method of taking impressions. Because the rulers and the clergy viewed with alarm the possibility of their subjects receiving enlightenment by means of the press, we find these men working in secrecy and failing to put imprints on their productions, thus leaving in obscurity much that would otherwise be known.

IV. Diffusion of the art.

Assuming Mainz to be the father city of printing, we find the art diffusing with great rapidity. In 1489 every principal city boasted of a printing establishment. As the workmen learned the trade they would leave the scenes of their apprenticeship and set up shops of their own. Thus the art kept spreading.

V. Progress and improvement.

Division into branches.

In Vienna we first hear of Nicholas Jensen, the inventor of the first "Roman" characters, more perfect than any heretofore and the direct parents of the type-face of the same name in use to-day. The semi-cursive style of letter first used by the early Italian printers gave rise to the "Italic" type now in use. Wm. Caxton carried the art across the channel to England, and it is here we first find a division

of the art into branches. Heretofore each printer manufactured his own type and engravings. By an act of law, we now have in England four type founders empowered with the right to manufacture type exclusively in the kingdom. Engraving also began to become a trade apart from printing proper.

Although the art spread rapidly it made little improvement in a mechanical way in the next two hundred years. The press erected in 1450 is the same press in use by Benjamin Franklin in Philadelphia. It was not until the close of the eighteenth century that the hand press was considered too slow for the needs of the times. In 1790 Wm. Nicholson patented in England the first cylinder press, but it was found impractical because he endeavored to fasten movable type to a cylinder. In 1811 and in 1813 other efforts were made which owed their failure mainly to the lack of a proper inking apparatus. In 1814 Mr. König, a German printer, developed the idea of using a movable flat bed for the forms and applying the pressure with a cylinder. Presses of this type do most of the printing for the world to-day. About this time a printer in Philadelphia discovered the process of making rollers by using a composition of gelatine and molasses which solved the inking problem and opened the way for rapid improvement in typography. Richard Hoe, of New York, gave the world the first newspaper perfecting press in 1847.

Nor was the process of type-setting lying idle. Hand composition required too much time, and to meet the demand for rapid composition the nineteenth century produced the first type-setting machine, by which movable type are set in long rows, (only needing to be justified to the width of the column desired) by an operator working the machine by means of a keyboard marked with the different letters and characters. Later the linotype makes its appearance, by which a "slug", containing a complete line in a solid piece, is cast from

movable matrixes brought into position by a mechanism controlled by a keyboard as in the type-setting machine. Each machine machine is supplied with an automatic distributing device, astounding in its mechanical dexterity.

VI. Conclusion.

And now, in tracing the gradual development from the simplest and crudest devices to the complicated labor-saving machinery of the twentieth century, we find ourselves again returning to block-printing. For wood we have substituted the stereotype plate, a solid metal block made by taking a heavy impression from a form upon specially prepared paper, which serves as a mould, and in the case of newspaper printing allows the plate to be cast in a semi-circular form and shaped to fit the cylinder of the perfecting press. The texts are again being illuminated, not by hand, but by the almost incredible color press. The old type-faces used by Gutenberg, Jensen and Caxton have been born anew, in attractive styles, by the modern type founders. The modern mind has endowed the old with a new spirit. Each revolution of the earth marks another day of advancement in printing. The art is in a continual process of evolution.

Finis.