

The present research suggests us that “scientific study” of paper is quite important and useful not only for study of history of paper, but also study of economy, social lives of citizen, and cultural lives of citizens.

Concluding Remarks

The study of paper used for old Chinese, European, and Japanese books by the direct scientific analysis methods gave the answer to the question “did culture of publishing books prepare the transformation of premodern society to modern society?”, Yes!

Due to the long history of making large amount of paper in China, high quality paper production began during the end of premodern era in Japan and big effort to obtain paper for books even by purchasing Chinese paper in the 16th to 18th centuries in Europe caused the flood of book publishing, simultaneously. It is proved that paper and printing technique gave peoples wider opportunity of learning and enjoying their own culture, and prepared the modern era.

While in the present time quite curious trend in culture, “paperless lives and having no book” is popular among younger generation. Will book publishing has its meaning in future?

Accelerated development of new technologies of recording by computer, almost unaccountable number of new devices, recording tapes, floppy disks, and memory sticks and cards during the last half century would drive away paper out of use. By the everyday-changing working power of devices and basic computer systems, and greedy capitals pushing people to buy new equipments, we cannot read the data recorded in devices only ten years old at all by newly appeared computer systems. In addition memory devices consisting of new materials, metals, and organic plastics have no guarantee to live one hundred years.

Significance of the scientific study of history of paper, printing, and publishing culture is not only to give new findings in the history of technology, but to prove the real meaning of the facts that “paper and printing” continue to keep and introduce the overall records of human being of the past 1000 years to us, living in the present time.

By temptation in a twinkling “convenience”, to try to throw away “paper and printing” which had been proved its reliability of keeping its life and records written on paper by the past 1000 years history should be absolutely avoided. Our study would be an advice for the danger of the above temptation.

We dream coming new age of “revolt of books” printed beautifully on beautifully prepared paper for every person.

Why the Invention of Letterpress Printing Has Brought about the Media Revolution?

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Historically speaking, paper and printing are inseparably tied, and both co-exist in the media of all kinds, such as books, posters, flyers or newspapers. Among others, letterpress printing, which emerged in Europe in the 15th century, is widely known to have transformed man’s intellectual environment. In fact, it had such a huge impact on everything from how to distribute information to shaping people’s mindset that some even call it the biggest media revolution in human history. Well, why was letterpress printing accepted worldwide? Starting with one of the most rudimentary questions, such as “what is letterpress?” and based on what we have noted concerning how it has been introduced throughout the world and the building of a wooden printing press, I would now like to devise an answer. Leveraging the author’s own experience, I will take up the challenge of answering the simple yet profound question with you.

■ Gutenberg: Four innovations

Many of the books I have seen to date have been based on letterpress printing, which is a printing technique using cuboid blocks, each of which represents a letter or type. While materials used for the types vary widely, from metals to wood and even clay, the first-choice metal used globally since the late modern era is lead. A German named Johannes Gutenberg invented moveable type during the Renaissance in the 15th century.

Gutenberg's letterpress printing can be viewed based on the use of the following four new technologies: 1) type pieces made of lead alloys, 2) molds, 3) oil-based ink and 4) wooden printing presses. Undeniably, the stand-out feature in each case is their ingenuity to move people emotionally.

Gutenberg's printing technology was invented in Mainz, a German city on the River Rhine. It began spreading through the country into other cities, along the River Rhine and had reached the rest of Europe less than half a century later. It literally took all European cities by storm at a stroke, from Stockholm in the north to Sicily in the south; Lisbon in the west to Istanbul in the east.

Furthermore, in the Age of Exploration, letterpress printing machines were also taken aboard large ships, since the Europeans who sailed around the world needed them to publish books in their respective languages. Thanks to the fact that they were finally brought to Nagasaki by the Tensho embassy in 1590, about 150 years after Gutenberg's invention, letterpress printing came to the Far East and Japan.

■ The world's oldest wooden printing press

Let us now take a closer look at letterpress printing. What was a printing jobsite during the Renaissance period like? Unfortunately, the types or printing presses actually used by Gutenberg no longer exist. To get more visual insight into the reality of printing in the early days, illustrations from the period may be handy. The printing presses at the time were wooden and came with screw-type vertical platens. These illustrations reveal that people at the time worked in pairs; printing one to two sheets of around B4-size plates per minute. The scenes of letterpress printing are believed to have remained much the same as those in the Gutenberg era until steam-powered printing presses were invented in the mid-19th century.

The Plantin Moretus Museum in Antwerp, Belgium, houses the world's oldest printing press, commonly known as the Plantin Press, which was built in the country 150 years after Gutenberg's invention. Needless to say, it is crucially important as a living remnant of the era. The museum also reproduced a press identical to the original in 2000. Based on my experience engaging in creating replicas, I would like to discuss the functionality of printing presses and creative ingenuity exercised on the printing site during the Renaissance period.

■ Palimpsest — Lost memory is restored

Meanwhile, why did it have to be letterpress printing? In answering, we have to touch on how people communicated before letterpress printing. In Europe, before the Gutenberg period, handwritten manuscripts were the mainstay of communications. Monks or scribes used brushes or iron gall ink to create beautifully drawn letters and illustrations. While accurate copying is a printed book, transcribing by hand can be referred to as "copying" based on assumed inaccuracy in a sense. Even with the same title, no two copies are identical and unlike letterpress printing, it qualifies as a medium that inevitably reflects the producer's locality or individuality and the spirit of the times.

Before paper was introduced via the Arabic world in the 13th century in Europe, parchment was used for making manuscripts by tanning sheepskin or calfskin. It was valuable in the Greek-speaking world in particular

and reused time and time again by erasing the letters written on it. Such parchment is called palimpsest and was first researched in Europe about two centuries ago, when it came into the spotlight, since letters which (must have) been erased emerged between the lines of parchment. The group of letters includes tales seen by humans for the first time ever. Meanwhile, acid was applied directly to the parchment to elicit the letters, but corroding it significantly. This research method entailed difficulties and ran the risk of ruining invaluable materials.

Against this background and in cooperation with the Vatican Library, we have been working on a whole new research project on palimpsest since 2005. With the aim of developing hardware that minimizes the burden on manuscripts and user-friendly and functional software, we have progressed with research based on the latest digital technology. I will now summarize the development process and the results achieved as of the present moment.

■ Conclusion

The answer to the question: “Why the invention of letterpress printing has brought about the media revolution?” can be summarized in four points, based on what I have mentioned above. Among others, I would like to focus on why the printing industry was able to establish a position, namely, how it became able to mass-produce printed matter of consistent quality, on the day.