印刷专业英语

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印刷专业英语

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Unit 1

A Brief Look at Why and How the Industry Developed

Why the Graphic Communications [1] Industry Developed

People have always needed to communicate with other people. By learning to write and communicate graphically, our ancestors overcame a major limitation in spoken communication—the need for direct contact between people.

However, there were important problems to overcome before our ancestors could make maximum use of the graphic communication process. For example, materials for writing and printing had to be invented and developed. Then ways had to be found to reproduce many copies of a message. Because of their need to communicate efficiently, our ancestors learned how to solve each problem. As they did, the graphic communications industry grew.

How Printing Developed

Our ancestors developed a variety of techniques for reproducing many copies of a graphic message. Printing is the term that describes these techniques.

In its earliest form, printing was done from hand-carved wooden blocks. The complete message was cut in reverse into the block. Then the block was inked and pressed against the material to be printed. This is called relief printing.

A major limitation of wood block printing is that each new message requires carving a new block of wood, and carving is a slow and tedious process. This limitation was overcome with the invention of movable type.

Movable type consists of individual letters of the alphabet that can be assembled to produce a printed message, disassembled and then assembled again to form a new message.

Movable type characters made from hardened clay were used in China as early as 1041 A.D. By the middle of the thirteenth century, Koreans were casting type in bronze.

In 1439 Johann Gutenberg became the first European to print from movable type. It is not known whether he invented the process on his own or if he was aware of the developments that had occurred in the Orient. Not only did Gutenberg print from movable type, but, even more important, he developed a practical means of casting type. The famous *Gutenberg Bible* is one of the earliest books printed from movable type in the West.[2]

Early printing was done on hand-operated wooden presses, Figure 1-1. The printing of

250 sheets of paper in Gutenberg's time was considered a full day's work. By the middle of the seventeenth century, 2000 sheets a day could be printed. Today high-speed presses can print more than ten thousands of sheets in a single hour.

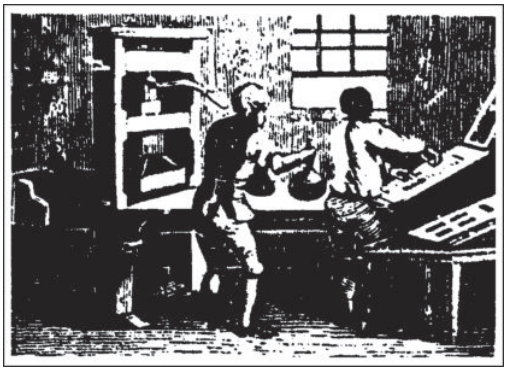

Figure 1-1. An early printing shop.

The first printing press in America was set up in the Massachusetts Bay Colony in 1639. Steven Daye, the first American printer, operated this press. His first book, the *Whole Booke of Psalmes* was printed in 1640. Typesetting, printing, and binding of the 1700 copies of this 300'page book took almost a full year to complete.

The most famous American printer was Benjamin Franklin.[3] Franklin established his own printing business in Philadelphia in 1728. His most notable publications included the *Pennsylvania Gazeete*, a leading colonial newspaper, and *poor Richard's Almanack*, issued in 1732.

Developments in the last 100 years have revolutionized the printing industry. Printing has changed from an art to a science, from a craft to a technology. But the development of printing is not over yet. New materials, machines, and methods are constantly being invented in order to satisfy man's need to communicate.

How Paper Developed

Ts'ai Lun, a Chinese court official, is credited with the invention of paper. He did this nearly 1900 years ago in the year 105 A.D.

Before the invention of paper, people wrote on a variety of materials. For example, animal skins called parchment and vellum were used by the ancient Greeks. And papyrus, a writing surface made by pounding a woven mat of papyrus reed into a thin, hard sheet was used by the ancient Egyptians. The word paper, in fact, is derived from the word papyrus.[4]

In the tenth century A.D. techniques for making paper by hand were introduced to the Western world. North African Moors discovered papermaking while trading with the East. In conquering Spain, the Moors brought papermaking to the West.[5] The first paper mill in America was established in 1690 by William Rittenhouse. It was located near Philadelphia. By the beginning of the nineteenth century, hundreds of paper mills had sprung up throughout the country. However, it was not until the middle of the nineteenth century, when papermaking machines were put into general use, that the urgent demand for inexpensive paper could be met. Today, an average of well over 400 pounds of paper per man, woman, and child is used each year in the industrial developed countries.

How Ink Developed

Printing ink was also invented in China. Wei Dan is credited with developing an ink for block printing about 400 A.D. He made ink from plant substances mixed with colored earth and soot.

By the time of Gutenberg, inks were being made by mixing varnish with lampblack. The varnish was made by boiling linseed oil. These inks were used, with little modification, until the end of the eighteenth century.

During the nineteenth century, advances were made in the use of driers to speed the drying of ink. Various new pigments for producing colored inks were also developed.

It was in the twentieth century, however, that major developments in ink making came about.[6] Rapid technological advances in printing during the past fifty years brought about changes in the composition and manufacture of printing ink. Today, thousands of chemists are constantly working to improve old inks and develop new ones.

Key Technical Terms

printing 印刷
graphic communications industry 印刷工业
Johann Gutenberg 约翰•谷登堡
high-speed press 高速印刷机
Steven Daye 斯蒂文•达伊
binding 装订
papermaking 造纸
Wei Dan 韦诞
relief printing 凸版印刷
movable type 活字
type 活字
wooden press 木制印刷机
typesetting 排字
Benjamin Franklin 本杰明•富兰克林
paper mill 造纸厂

Notes

1. Graphic communications, graphic arts与printing，中文都译作“印刷”，这不仅说明了某种情况下英文术语的多变性，同时也反映了印刷科技发展的不同历史阶段。

2. In 1439 Johann Gutenberg became the first European to print from movable type. … The famous *Gutenberg Bible* is one of the earliest books printed from movable type in the West.

1439年，约翰·谷登堡成为第一个用活字印刷的欧洲人。人们尚不清楚是他自己独立发明了这一工艺，还是他了解到了有关这一工艺在东方世界的发展情况。他不仅用活字来印刷，然而更重要的是他发展了铸造活字的实用方法。著名的谷登堡圣经就是西方世界最早用活字印刷的书籍之一。

3. Benjamin Franklin——本杰明·富兰克林 (1706—1790)，18世纪美国伟大的科学家和发明家，著名的政治家、外交家、哲学家、文学家、航海家和印刷出版商，以及美国独立战争的伟大领袖。1728年在费城建立了自己的印刷企业。

4. Before the invention of paper, people wrote on a variety of materials. … The word paper, in fact, is derived from the word papyrus.

纸张发明之前，人们就在各种材料上书写了。例如，古希腊人使用过动物皮子，如羔皮（parchment）和犊皮（vellum）。古埃及人使用过纸莎草制作的书写材料，它是由纸莎草编织物捣成的一块又薄又硬的纸页。实际上，纸这个词就是由纸莎草引申而来。

5. In the tenth century A.D. techniques for making paper by hand were introduced to the Western world. North African Moors discovered papermaking while trading with the East. In conquering Spain, the Moors brought papermaking to the West.

公元10世纪，手工造纸工艺引入到了西方。北非的摩尔人在与东方的贸易中发现了这种造纸术，他们征服西班牙时也把造纸工艺带到了西方。

6. It was in the twentieth century, however, that major developments in ink making came about. ——强调句型。译为：不过，正是在20世纪，油墨制造才大大前进了。

Supplementary Reading

Move Beyond Ink on Paper

Everything changes when we recognize that we are in the communications business, not the ink-on-paper business. Lithography is a mature industry, communications isn't. All communications are mutually reinforcing, not mutually exclusive—we communicate this way and that way, not this way or that way. The opportunity is vast.

How Can You Be Successful

Our defining opportunity is to help our clients be successful. As we pointed out in the *NAPL State of the Industry Report, Eighth Edition,* we have more ways than ever to do so by:

Helping clients communicate more effectively with their clients.

Defining ourselves in terms of our contributions to the client's success rather than our production processes.

Creating communications/marketing programs—of which print is a critical part, but not the objective—rather than print individual jobs/transactions.

Please look at the following recovery preparedness checklist:

Preparing for a recovery means first being aware of some fundamental industry facts:

1. Even when recovery is at full strength and the recession is far behind us, we aren't going back to the way we were.

2. Sustainable success will require new skills—new skills for a new industry.

3. Market share is being redistributed, but not according to company size, equipment

configuration, or ownership structure.

4. We have to insulate ourselves from the growing commoditization of print.

5. We are in the communications business, not the ink-on-paper business.

6. Our defining opportunity is to make our clients more successful and to ensure they recognize our contributions to their success.

7. Despite record consolidation, our industry is getting more competitive.

8. The stakes are getting higher.

9. We have to make the case for ourselves and our industry.

10. Don't be fooled by averages.

11. Because our industry is getting more competitive and complex, we have to make time for big picture questions such as, What are we doing better today than we did two years ago? What will we be doing better in two years than we are today? How are we becoming more valuable to clients?

We Aren't Going Back

The economy will give our industry a big boost, but we aren't going back to normal because structural change redefines what's normal by redefining our clients, markets, services, competition, value proposition, and everything else that matters.

We've always had to wrestle with change, but for many years change was largely limited to better ways to do the same things: faster presses with shorter make-readies, the Mac and desktop prepress, in-line finishing, etc.

Change was significant and it contributed to the success of those who kept up and the failure of those who didn't, but it was not transformational: We were fundamentally the same industry coming out of recession as going in. Bottom line: What made us successful before a downturn would make us successful after. Not anymore.

In the late 1990s our industry began to change structurally. Structural change is a profound, transformational change that is independent of the business cycle. Examples of structural change include:

- The Internet and digitization, which have created electronic alternatives to print that sometimes complement print and sometimes displace it.
- Digital technologies that allow clients to shorten press runs dramatically by targeting their markets more precisely, reduce inventory and obsolescence by printing on demand, and bring printing capabilities in-house.
- Clients relocating to other parts of the country or the world—and taking their printing with them.
- Clients merging and centralizing/consolidating their print purchases.

Exercise

Q&A

1. Explain why the graphic communications industry developed.

2. Name three important problems that our ancestors had to overcome in order to make maximum use of the graphic communication process.

3. Trace the development and spread of the graphic arts in the world.

4. Define movable type.

5. Describe the contribution of Johann Gutenberg to the development of printing.

6. Trace the development and spread of papermaking throughout the world.

7. Trace the development of inks and ink-making technology.

Complete the Sentences by Filling in the Blanks

1. People have always needed to ____ with other people. By learning to _____ and _____, our ancestors overcame a major limitation in _____ communication — the need for _____ between people.

2. However, there were _____ to overcome before our ancestors could make _____ the graphic communication process. For example, _____ for _____ and _____ had to be invented and developed. Then _____ had to be found to reproduce _____ of a message. Because of their need to _____, our ancestors _____ how to solve each problem.

Put the following into Chinese

In the late 1990s our industry began to change structurally. Structural change is a profound, transformational change that is independent of the business cycle. Examples of structural change include:

- The Internet and digitization, which have created electronic alternatives to print that sometimes complement print and sometimes displace it.
- Digital technologies that allow clients to shorten press runs dramatically by targeting their markets more precisely, reduce inventory and obsolescence by printing on demand, and bring printing capabilities in-house.
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Unit 2

Basic Printing Methods

Transferring an image from one material to another is called printing. This process plays an essential role in visual communications.

Printed matter is produced by eight basic processes.

1. Relief or letterpress printing.
2. Gravure or intaglio printing.
3. Planographic or lithographic printing.
4. Screen-process printing.
5. Photographic printing.
6. Heat transfer printing.
7. Xerographic printing.
8. Ink jet printing.

Each process will be described in more detail later. They all can produce printed matter in single color and in full color. The first three methods account for most printed matter produced each year.

Relief or Letterpress Printing

When ink is applied to a raised surface and paper is pressed against the inked surface, the ink is transferred to the paper, Figure 1-2. Relief and letterpress are terms that describe printing methods that use this principle. The rubber stamp is a device that prints by the relief or letterpress method. It transfers ink from a raised surface to paper. Typewriter elements, also print in this way.

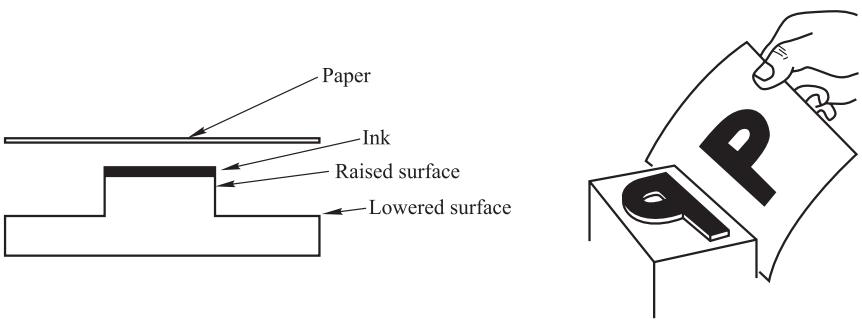

Figure 1-2. Relief or letterpress printing. The lowered surface does not print because it doesn't come in contact with the ink or the paper.

Foundry type[1], Monotype[2], Linotype[3], and Ludlow[4] are used by the letterpress printer to transfer letters and numbers to paper, Figure 1-3. The plates of wood cut, wood engraving[5], linoleum block, and photoengraving can also be used in letterpress printing. Their raised surfaces can print photographs and illustrations as well as letters and numbers.

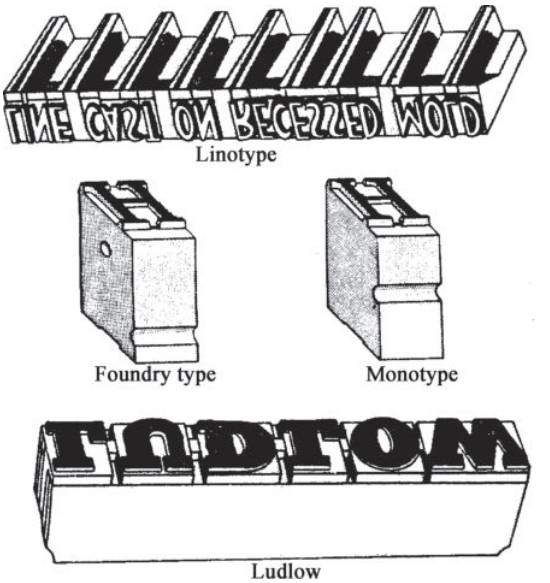

Figure 1-3. Linotype, Foundry type, Monotype, and Ludlow slugs.

Relief or letterpress printing is the oldest printing method. Before 1980s, a wide variety of letterpress plates were used on several types of presses to print a rich and varied assortment of products including newspapers, books, and magazines.

IMAGE REVERSAL. As you can see, the principle of printing from a raised surface is not difficult to understand. There is one problem to consider, however. Look at Figure 1-2 again. Note that the shape of the raised surface that printed the letter P on the paper is "wrong reading" or backwards. The raised surface was purposely prepared this way so that it would print a "right reading" image on the paper.

Gravure or Intaglio Printing

Relief printing transfers ink from a raised surface to paper. The gravure process is just the opposite. In gravure printing, ink is transferred from a lowered surface to paper. The image area of a gravure plate is cut below or into the surface of the plate, Figure 1-4.

Intaglio is another name for gravure. Figure 1-4 also illustrates the gravure or intaglio process. The entire surface of the plate is inked and then wiped clean. This leaves ink in the lowered areas of the plate. Paper is then pressed against the plate and ink transfers to it.

Paper is flexible. It can bend and stretch to get into the lowered areas of a gravure plate. Figure 1-5 shows how ink is transferred to the paper.

Karl Kleitsch is generally credited with inventing the gravure process in 1879. In 1894, he

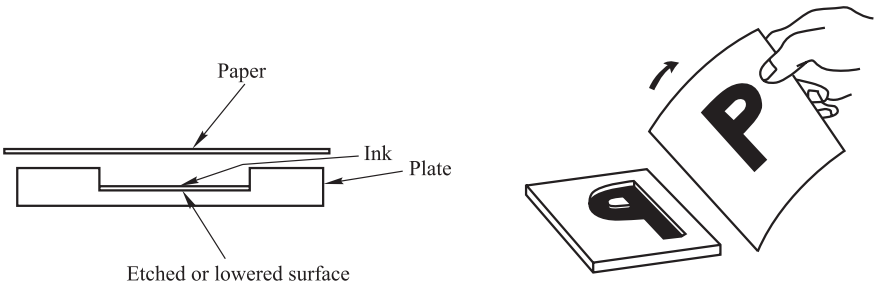

Figure 1-4. Gravure or intnglio printing. Ink is transferred from the lowered surface of the plate to the paper. The top surface of the plate does not print because the ink has been removed.

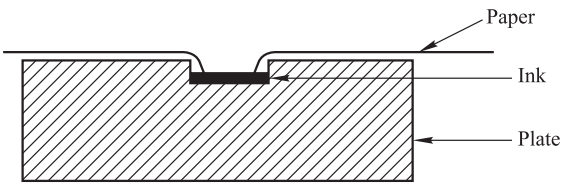

Figure 1-5. Paper is flexible. It can bend and stretch to get into the lowered areas of a gravure plate. Ink then transfers to the paper.

developed a press that could print from etched copper cylinders instead of flat plates. Within twenty years gravure cylinders were being used to print a variety of products including a portion of *New York Times.*

Today both flat and cylindrical gravure plate are used on a variety of presses to print Sunday newspaper supplements, magazines, major mail order catalogs, stamps, and even paper money. Much of our printed fabric is also produced by gravure.

IMAGE REVERSAL. Like the raised image on a relief plate, the lowered image on a gravure plate must also be prepared in reverse. Look at Figure 1-4. Note the shape of the lowered surface that printed the letter P. It is "wrong reading" or backwards. The lowered surface was purposely prepared this way so that it would print a "right reading" image on the paper.

Planographic or Lithographic Printing

To print from a flat surface is also possible. *Planographic* and *lithographic* are both terms that describe methods of printing from a flat surface.

Planographic printing is based on the principle that grease and water do not mix. The process works this way. First, a greasy image is placed on a flat plate. The image may be drawn directly on the plate with a grease pencil. It may also be placed on the plate photographically instead.

Next, water is applied to the plate. The water will cover the non-image area of the plate. Water will be repelled from the image area because WATER AND GREASE DO NOT MIX!

The entire plate is then coated with ink. Ink is a greasy substance and adheres to the

greasy image. Ink is repelled from the wet areas of the plate because WATER AND GREASE DO NOT MIX!

Paper is then pressed against the surface of the plate and the inked image is transferred to the paper. The process of printing from a flat surface is shown in Figure 1-6.

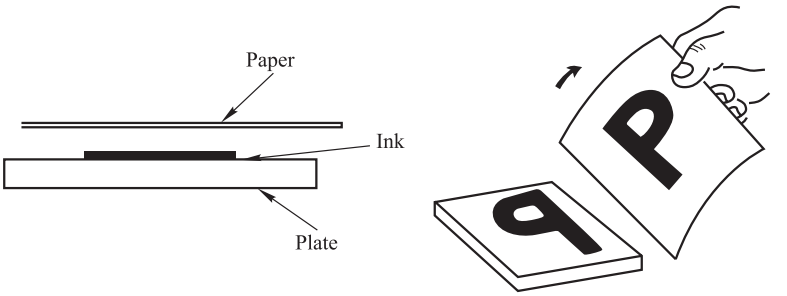

Figure 1-6. Lithographic printing is done from a flat surface.

Planographic or lithographic printing prints from a plane or flat surface, one neither raised nor depressed. The printing image is formed chemically by making some areas of the plate grease receptive and water repellent, while others remain water receptive and grease repellent.

OFFSET PRINTING. Lithographic printing is often called offset printing. Unlike plates for letterpress and gravure (which have their printing surfaces shaped to form the desired image), the printing image on a lithographic plate simply rests upon the plate's surface. The image can rapidly wear away when paper rubs against it during the printing process. This is especially true when the plates are used on high-speed printing presses. To minimize wear the image on the plate is first offset (transferred) to a rubber blanket, Figure 1-7(A). Note that the right-reading image is reversed on the blanket. Figure 1-7(B) shows how the paper receives the image from the blanket. The paper does not make contact with the printing plate. The entire offset lithographic process is diagrammed in Figure 1-7(C).

Alois Senefelder of Germany discovered the lithographic printing method in 1796. He printed directly on paper from a grease image applied to a heavy piece of limestone. Stone lithography is slow and tedious.[6]

Today a wide variety of lithographic plates is used on high-speed offset presses and duplicators[7] to print more products than any other printing method.

Screen Process Printing

Another printing method is to print by forcing ink through openings or holes in a stencil, Figure 1-8. One common type of stencil printing is screen-process printing. This method is also called stencil printing, screen printing and silk screen printing.

STENCILS. The stencil controls what is to be printed. Basically a stencil is nothing more than a thin sheet of paper, film, or other nonporous material with lettering or a design cut

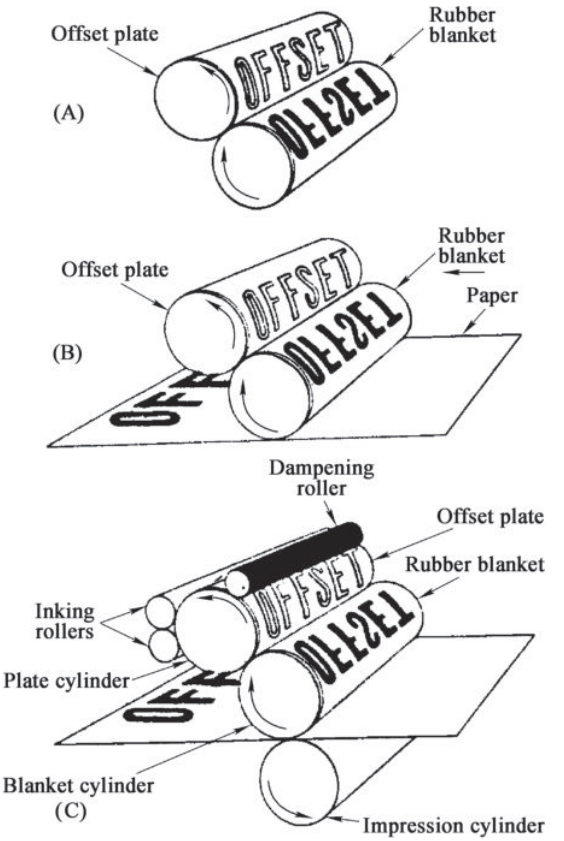

Figure 1-7. Offset printing.
(A) The image is first transferred to a rubber blanket.
(B) The Paper then receives the image from the blanket.
(C) Major parts of an offset-lithographic press.

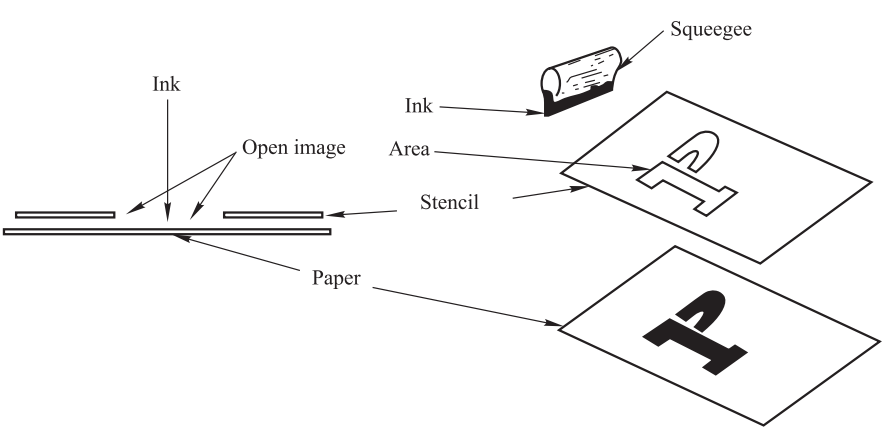

Figure 1-8. Screen-process printing. A squeegee is used to force ink through holes in a stencil onto the paper.