strained to go along with them and to take the said corpse, picture, and books, which, being carried into Campo di Fiori, were there instantly burned. And because the said Archbishop towards the end of his life made show as if he had been penitent for the heresies which he had held *de novo* after his former abjuration, and asking pardon for them, he had the favour done him to be made a partaker of the most holy sacraments. But, notwithstanding, because he had relapsed, he was therefore given over to the secular power, which was all that occurred in this action.

INSCRIPTIO.

MARCUS ANTONIUS DE DOMINIS,
LATE ARCHBISHOP OF SPALATRO,

Most impiously bent his style against the Church of God, which had extraordinarily well deserved of him; having wounded her and stabbed her through, he so left her without cure, and wretchedly betook himself to the English altars, that thence the swine might the more securely gruntle against the Pope and Catholics. Returning home again, but no convert, his apostatic spirit he forsook not. He died (and the voice of a penitent man would he had not uttered) impenitent.' "—(pp. 252—256.)

Monstrous triumph over the betrayed, the "perplexed in the extreme," the erring, and the dead!

To all an example, to no one a pattern. The Archbishop of Spalatro is stated to have been the first who explained the colours of the rainbow; the evanescent type of his religious persuasions, rising in storm, spanning the heavens in brightness, and dissolving in mists and the tears of nature!

This volume, exhibiting all these important conditions, is indeed eminently deserving of the earnest consideration of the Christian world.

THE ORIGIN AND PROGRESS OF PRINTING[a].

As many cities have contended for the honour of being the birthplace of Homer, so also has the invention of printing been claimed by some twenty places, and by as many different persons. Investigation of the pretensions of the several claimants has resulted in the conclusion that typography was invented or discovered at about the same period both in Holland and in Germany.

The art of printing was developed gradually. Other graphic arts were arrived at a tolerable state of perfection, when, by a process which may be likened to crystallization in chemistry, they combined, and taking a new form, became that wondrous combination now known as typography. Most of the useful arts have followed the same course: the perfection of the steam-engine, of the electric telegraph, of photography, the greatest marvels of our age, has been the result of the aggregation of isolated elements, which at the proper moment became concrete.

Few important discoveries can, properly speaking, be regarded as accidental. "Nothing in this great world which concerns the well-being of man takes place by accident, but is brought forward by Divine will, precisely at the moment most suitable to our condition." That is, just when society is ripe to receive it, and prepared to turn it to the best account. The steam-engine had to wait the discovery of latent heat before it could

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[a] "The Origin and Progress of Printing. A Lecture delivered at Twickenham, April 8th, and repeated, by desire, at Richmond, April 21st, 1857." (Privately printed by the Philobiblon Society.)

be perfected: photography, as we at present know it, was not possible before the discovery of iodine. "And so it is with printing. Although its invention is placed in the middle of the fifteenth century, and almost the very year fixed, this can only be regarded as a mature stage of it." From the earliest times mankind had employed various means of communicating its thoughts to the eye. Hence arose symbols, hieroglyphics, and writing. The North American Indians of the present day practise a kind of picture-writing, identical, in principle, with the hieroglyphics of the ancient Egyptians. The Chinese have never advanced beyond the use of symbolic characters. The employment of an alphabet may be regarded as a test of civilization of a people, and it has, moreover, the effect of rendering that civilization permanent.

"The invention of the alphabet, which in a small number of elementary characters is capable of 620 sextillions of combinations, and of exhibiting to the sight the countless conceptions of the mind which have no corporeal forms, is so wonderful, that great men of all ages have shrunk from accounting for it, otherwise than as a boon of Divine origin. Although apparently developed by human ingenuity, the finger of a higher guidance is seen in it, and this feeling is strengthened by the singular circumstance that so many alphabets bear a strong similarity to each other, however widely separated the countries in which they arose."—(p. 9.)

The existence of an alphabet presupposes writing, which, at first, was a kind of engraving; the same Greek word, *graphein*, signifies 'to draw' as well as 'to write;' writing being at first a kind of incising, as when waxed tablets were written upon with the style; next we have inscriptions cut in stone, metal, wood, ivory, &c. The early use of seal-rings may have suggested the taking of impressions in relief from the incised inscriptions on some plastic material, such as clay or wax. The ruins of Egypt and Nineveh shew that more than thirty centuries ago, printing of a peculiar character was practised, in which soft clay, in the form of bricks, was impressed with hieroglyphic or denotic characters, in which the inscriptions have been preserved to the present day; this could not have happened had these records been on brass, parchment, or paper.

But writing, as we now understand it, that is, executed upon some material which in the progress of time has been superseded by *paper*, was the chief means of communicating and transmitting thought. Nature furnished the materials ready to hand: the pigment was a fragment of charcoal, or a piece of coloured earth, the paper was the leaves of various trees, or the bark, or the pith; hence the word *codex*, 'a trunk of a tree,' and *folium*, 'a leaf,' and *tabula*, from the use of their planks or tables of wood employed for writing upon. Stencil-plates were also in use, to teach the young the art of writing with the style, as well as by the Emperor Justinian to enable him to sign his name. But the most important of all the writing materials employed in past times were papyrus and parchment, upon which most of the valuable manuscripts of the ancients were written. The date of the invention of paper from rags cannot be fixed; it has been traced to the twelfth century, but the oldest specimen extant, which bears a water mark, is preserved in the archives of the city of Augsburg, in Bavaria. It bears the date of 1320. Like papyrus and parchment, paper from rags is an Oriental product, most probably due to the Arabians.

"Before the end of the fourteenth century paper-mills had been established in many parts of Europe, first in Spain, and then successively in Italy, Germany, Holland, and France. They seem to have come late into England, for Caxton printed all his books on paper imported from the Low Countries; and it was not till Wynken de Worde succeeded him in 1495, that paper was manufactured in England . . . Now we are

the largest paper manufacturers in the world, and have perhaps 500 mills at work."—(p. 23.)

We have not much faith in figures, if we had, we might question the accuracy of the latter part of the above quotation. It has been stated that France, with 35,000,000 of inhabitants, produces annually 70,000 tons of paper, being at the rate of four pounds per head; Great Britain, with 28,000,000 of people, produces 66,000 tons, which gives about four and a-half pounds per head; but the production of the United States is said to be equal to both France and England together, its consumption being equal to thirteen pounds and a-half per head to a population of 20,000,000. This extraordinary difference can only be attributed to the immense consumption of paper for educational purposes and the great diffusion of newspapers, together with an abundant supply of raw material.

The quantity of rags required for the manufacture of this immense mass of paper is so great, that of late years it has been a question of the deepest interest to find a cheap substitute. Many fibrous materials have been tried, but the only one that has met the desired purpose is wheat straw. Large quantities of paper manufactured from this material are now consumed. In Prussia there are more than twenty mills where paper is made from straw.

When paper was first introduced, although rough and to our eyes unsightly, it was always well sized, hence its great hardness and durability: it was not till the sixteenth century that unsized paper was used. Most of the printing paper used in the United States of America is unsized: so also is much of that in Germany, and some other Continental states. The invention of vellum paper is attributed to Montgolfier, the inventor of the balloon.

Until the year 1815 paper was made "by hand;" but so long ago as 1798 machinery was proposed for the purpose of making it, by a workman of Essonne, named Robert, although his suggestion was not acted upon until seventeen years afterwards, by Didot, at the cost of the Foudriniers, who devoted some ten years to experiments before attaining success. Attempts have been made, and successfully, to re-manufacture paper that has been written or printed upon, as well as paper-cuttings and other waste material.

A few words must be bestowed upon pens, for without them we should have had no book, and printing would not have been called for:—

"Pens are of great antiquity, and are frequently alluded to in the Bible. Pens of iron, which may mean styles, are mentioned by Job and Jeremiah. Reed-pens are known to have been in common use by the ancients, and some were discovered at Pompeii. Pens of gold and silver are alluded to by the classical writers, and there is evidence of the use of quills in the seventh century. Of whatever material the pen was made, it was called a *calamus*, whence our familiar saying *currente calamo*, 'with a flowing pen.' The use of styles must have been very prevalent in ancient days, as Suetonius tells us that the Emperor Caligula incited the people to massacre a Roman senator with their styles; and previous to that, Cæsar had wounded Cassius with his style."—(p. 26.)

The "grey goose quill" superseded the calamus only in the eighth century, although Isidore, a bishop of Spain, who died in 636, makes mention of the quill. Metallic pens were proposed nearly a century before they came into common use by a French mechanic named Arnoux, in 1750. In 1801, M. Berthollet exhibited pens composed of an alloy of silver. Various materials for pens, intended to supersede the quill, have been brought forward of late, such as alloys of gold, silver, copper, steel, and galvanised iron. Horn, tortoiseshell, gutta-percha, and hardened india-rubber have

also put in their claims, but the best substitute, both for the goose quill and the steel pen, is the modern gold pen, nibbed with rhodium or other hard metal. In the United States the gold pen manufacture has taken an enormous extension, it having almost entirely superseded all other kinds of pen.

"The next, and not the least, important ingredient in writing and printing is ink. Staining and colouring matters were well known to the ancients at a very early period, witness the lustrous pigments on Etruscan vases more than 2000 years ago: and inks are often mentioned in the Bible. Gold, silver, red, blue, and green inks were thoroughly understood in the middle ages, and perhaps earlier; and the black writing-ink of the seventh down to the tenth century, as seen in our manuscripts, was in such perfection, that it has retained its lustre better than some of later ages. Printing ink, by the time it began to be currently used for book-printing in the fifteenth century, had attained a perfection which has never been surpassed, and indeed scarcely equalled." —(p. 27.)

Red ink was generally employed for printing initials and the titles of books and chapters, hence the term *rubrics*, from *rubrica*, 'red.' At Orleans there is a charter of Philip the First, of the date of 1090, written in green ink. The emperors signed with purple ink obtained from the *murex;* gold and silver inks were chiefly employed on coloured parchment or purple vellum. The celebrated Codex of Upsal is written with silver ink upon violet parchment, the initials and some passages being in gold.

But black ink was in general use for manuscripts and charters. The basis of all the black inks was carbon in various forms, as lamp-black. Modern writing ink owes its origin to the discovery in 1736 of gallic acid, by the chemist Scheele.

The ink of the ancients, and that used in the middle ages, had a consistency much thicker than that at present in use; very highly gummed when applied to papyrus, parchment, or paper, it formed letters in relief, as if they were embossed, which has given rise to an erroneous conjecture that these writings were produced by a sort of typographic process.

Crayons or pencils have been extensively employed as substitutes for pen and ink. The best known form of the crayon is the so-called black-lead pencil, the colouring material of which is graphite, or carburet of iron.

Paper and ink having reached their highest point of excellence, we next consider the progress that had in the meanwhile been made in engraving and type or letter-cutting. It will be seen that the material elements of printing were by degrees converging to a culminating point.

Evidence of engraving, both in relief and in intaglio, are of very ancient date. Coins, cameos, and seals of a date many centuries anterior to the Christian era, testify, by their exquisite workmanship, the high state of cultivation at which the arts had then arrived. The art of casting and chasing in bronze was extensively practised in the twelfth century, and specimens are to be seen with letters so cut in relief as, if separated, might form moveable type. The goldsmiths were among the greatest artists of the early ages, and competent to execute dies or moulds of any degree of excellence. They engraved very beautiful cameos, the ornaments and vessels so extensively required for the service of the Church,—crosses, cups, ciboria, candelabra, and a multitude of objects connected with religious worship and domestic use. In these works the pencil was very extensively employed, and, with the chisel, aided in the production of that class of works known as *opus interrasile* and *opus punctile*. Another very extensive application of the graver's art consisted in the production of monumental brasses, great numbers of which are still to be met with in northern Germany, Finland,

Sweden, and England. These are, for the most part, productions of the thirteenth and fourteenth centuries.

Inscriptions on bells form another feature in the graver's art: one in the Cathedral of Sienna bears the date of 1159, but they belong mostly to the thirteenth century. Four different processes were employed in producing these inscriptions: in some they are simply incised, in others the characters are in very low relief, shewing that the letters were formed in the mould. The inscription is often reversed, and in the figures represented the priest is giving the benediction with his left hand; swords are suspended on the right side, &c. The third process in use in the fourteenth century appears to consist in impressing the mould with punches, or letters cut in relief in wood, the words being formed by single letters applied one after the other. The fourth method practised in the fifteenth century, and still in use, consists in forming letters in wax by means of a stencil-plate. The separate letters thus obtained are fastened on the mould in words, and form the inscription in *intaglio*, and are produced in *relievo* on the bell when cast.

For the execution of these works there must have been a large class of artists occupied as letter-painters. Masons and other artists required the manuscript alphabets to guide them in the formation of letters; these were executed by an inferior class of artists to those employed upon missals and other valuable works, as they required to be sold at a low price. These letter-painters were also colourists, and often designed and coloured playing-cards. As their business increased, they must have felt the want of accelerating processes to enable them to meet the demand for their productions.

Playing-cards are doubtless of Chinese origin, and in the early part of the twelfth century were in use among the Arabs, and throughout the East generally, and were probably brought to Europe by the crusaders. They were coloured, and often very beautifully executed, even with the same care and finish as the miniatures that adorn manuscripts. At first very costly, as their use extended they became cheaper, and in the fourteenth and fifteenth centuries they were articles of merchandise, sold at a low price, indicating that mechanical means of producing them were employed: they were then printed from engravings on wood and copper.

The card-painters soon became wood-engravers, and mould-cutters in metal. The names of many who flourished in the fifteenth century are preserved. At Frankfort-on-the-Main, one Heune Kruse of Mayence, is named printer in 1440. In 1442 the fraternity of Saint Luke at Antwerp consisted of painters, sculptors in wood, glass-workers, colourists, and printers. In 1454 the fraternity of St. John at Bruges included scribes, schoolmasters, printers from wooden blocks, binders, and image-makers.

It may be confidently asserted that mould-cutters and engravers on wood, as well as printers of cards and of letters, were well established in 1440, and probably for twenty years preceding that date.

Mariolatry created an immense demand for pictures representing the Annunciation, the infant Christ and His mother, the Crucifixion, &c. This demand on the part of the poorer classes was met by the image and letter painters before alluded to. These pictures were frequently collected and bound in a volume, with a text engraved on a separate block, and when printed, placed opposite the picture it described. These productions must be regarded as the first epoch of printing:—

"From single prints, with letter-press inscriptions, the next stage, that of a series of prints accompanied by letter-press, was obvious. Block-printing ushered in the great epoch; and the first dawn of it in Europe seems to have been single prints of

saints and scriptural subjects, with a line or two of description engraved on the same wooden plate (block ?). These are for the most part lost; but there is one in possession of Lord Spencer, large and exceedingly fine, of St. Christopher, with two lines of inscription, dated 1423, believed to have been printed with the ordinary printing-press."—(p. 36.)

Although generally regarded as authentic, and taken as a proof of the existence of the art of printing at that early date, still it is open to many objections which hinder us from accepting it as irrefragable testimony in establishing the date of the invention of printing. In the first place, the date 1423 has no connection with the period at which the engraving was executed, but rather to an extraordinary event which occurred in the course of that year; secondly, the inscription does not, as usual, designate the attributes of the saint, but on the contrary, alludes to that event. In fact, the dates found upon these ancient woodcuts have generally another signification than that of marking the date of their fabrication; sometimes they are in connection with the person represented, as is the case with an engraving of a Saint Nicholas of Tolentino, with the date 1466, which is the year of his canonization; at other times they designate a festival, a miracle, or the year in which the original drawing was made, which was copied on the block by the engraver. But what tells most against the supposed antiquity of this engraving of St. Christopher is, that it is not printed in the manner of the period, that is, by rubbing, and in pale ink: it is printed at the press with black ink. A duplicate of this plate exists in the *Cabinet des Estampes* at Paris; and it is remarkable that two specimens of this plate, supposed to be the most ancient extant, should exist, while of all others known, only single specimens are extant. The block-books form a special division in the literature and arts of the middle ages, and possess great interest for the history and development of the art of wood-engraving and printing. Among the first in importance are the *Biblia Pauperum*, supposed to have been printed at Haarlem by Laurence Koster, between 1420 and 1430, and this brings us to the debateable ground of where, and by whom, typography was invented.

From what has been stated it will be seen that the way was fully prepared for this important invention; engraving, letter-cutting, and printing, were practised with considerable skill; nothing was wanting but moveable types and the press, and an inventive genius who could combine the separate elements, and pass from wood-block-printing to typographic-printing. Like many other inventions, it appears to have been discovered simultaneously by two different individuals; and the honour of this discovery is divided between Koster of Haarlem, and Gutenberg at Mayence:—

"The pretensions of Haarlem and Koster have for more than a century been a matter of fierce controversy; and there have been upwards of 150 volumes written for or against, without any approach to a satisfactory conclusion. This one thing is certain, that whether or not we owe the first idea of moveable type to Laurence Koster or to Haarlem, we do not owe to the period any very marked use of it; that was reserved for a later day."—(p. 44.)

In consequence of the expulsion of many patrician families from Mayence, John (Heune) Gensfleisch took refuge in 1420 at Strasburg. He assumed his mother's name, which was Gutenberg. During his sojourn in that city he occupied himself with many useful arts, among others, that of the lapidary, with silvering mirrors, and especially with printing.

Documents relating to a trial between himself and his associates still exist, which prove that his principal occupation, although not avowed, was

printing; and that he was seeking the means of printing with moveable types and with a *press*, in place of the mode then employed, of *rubbing*. There is mention made of *lead*, bought by his associate, Andrew Dritzehn, of a *press* made by Conrad Sahsbach, a cabinet-maker, and of various other *objects for printing with*, bought of Hans Dunne, a goldsmith, in 1436.

It appears that Gutenberg, as we must now call him, was not very successful at Strasburg, for in 1444 he returned to Mayence, provided with all his implements, and there continued his experiments.

Some years afterwards, in 1450, he associated himself with a capitalist, John Faust, with a view of setting up a printing-office. Soon afterwards he took another partner, Peter Schœffer, a skilful penman, who contributed greatly to the improvement of the type, with such success that in 1455 they were enabled to bring out the Bible entire.

But in this year the partnership was broken up in consequence of a law-suit. The result was very disastrous for Gutenberg, who, deprived of everything, had to begin the world anew. He shared the fate of most inventors, dying in 1468, poor, and without having derived any advantage from the noble invention with which he endowed the human family. Faust, on the other hand, remained proprietor of the concern, with all its appliances, and more intimately allied himself with Schœffer, who married the daughter of his son Conrad; they vigorously prosecuted their art, and in 1457 brought out the celebrated Psalter, regarded as the most remarkable product of typography. The printing-press of Faust and Schœffer continued at work even during the pillage of Mayence by the troops of Duke Adolphe of Nassau in 1462. But soon after this sad event Faust died of the plague at Paris, whither he had gone to dispose of some of his stock of printed books.

The sack of Mayence in 1462 had the effect of dispersing the workmen who had been taught their craft in the office of Faust and Schœffer, and of spreading this new art over other countries. Nevertheless it must not be omitted to mention, that printing establishments existed before this period at Mayence and elsewhere, the first productions of which are of a date prior to 1462.

Lawrence Janszoon (son of John) Koster, Churchwarden of Haarlem, is also claimed as the inventor of typography. He was born about 1370 and died in 1439. It is not unlikely that he had the same idea as Gutenberg, and that he carried it out, although no publication exists signed by either one or the other.

According to the sagacious researches of M. Auguste Bernard, it appears on good evidence that typography was realized, although but imperfectly, before 1440, by Koster, who, having practised the profession of woodcut printer, had the notion of replacing his solid blocks by moveable wooden letters, and then of metal type cast in sand moulds. He also thought of substituting the press, which was already in use in many other professions, for rubbing, and also made an oleaginous ink, which was better adapted to his new process of printing. The ink previously in use was composed of lamp-black and size. He printed the *Speculum Humanæ Salvationis* in 1430, at first with wood-blocks and then in moveable type; and other small works, such as *Donatuses*, an elementary school-book of Latin syntax. Upon the death of Koster in 1439, one of his workmen taking advantage of the confusion caused by this event, absconded, taking with him type, &c., and after short sojourns at Amsterdam and Cologne, is said to have got to Mayence, and introduced printing there; but there is no

reliable evidence to support this statement. Besides the printing of several block-books there are fourteen or fifteen remarkable typographical works, the printing of which is attributed to Koster and his successors. They were published probably between the years 1430 and 1460. It has been established beyond dispute, that no printing was carried on in Holland from 1460 to 1473, but that in this latter year printers from Mayence arrived in that country.

Once the printing-press got into motion, its activity was remarkable:—

"Before the commencement of the sixteenth century, that is, within forty or fifty years of the invention of printing with moveable type, upwards of twenty thousand volumes had issued from at least a thousand different presses. All the principal Latin classics, many of the Greek, and upwards of two hundred and fifty editions of the Bible, or parts of the Bible, had appeared."—(p. 66.)

Almost every city of importance possessed its printing-press, and even several. Some of the printing-offices were of considerable extent; that of Anthony Koberger, at Nuremberg, in 1473, kept twenty-four presses at work daily, and is said to have employed several hundreds of workmen. Koberger carried on a large trade in printed books, and had his agents in all the principal continental cities. Printing took also a nomadic turn. Ambulatory printing-presses, wandering from town to village, astonished the people with the feats of the new art, which in the twinkling of an eye could cover a sheet of white paper with thousands of characters, which it would have cost a scribe weeks to write. This magic art, for such it appeared, carried joy or terror in its train. By some it was received with delight, others it made tremble with fear. Still these missionaries of the divine art travelled on fearlessly, and carried the evidences of the new revolution to the eyes of the sceptic in every part of the world. Some of the type first used in printing was discovered in a printing-office at Mayence in 1840. If the notes found among this type be genuine, it would appear that it had belonged to Faust.

According to the authority of M. Tallandier, an edition of a book by the first printers consisted of 275 copies. After 1472 the number was increased to 300.

We cannot stop in this place to trace the steps of the printing-press in its path over the world, but merely indicate a few of the most interesting data. It reached Iceland in 1531, and in 1584 the first Bible in the Icelandic tongue was printed, ornamented with woodcuts executed by the bishop, Jeus Aresen, himself. In 1581 the first Bible in the old Russian character was printed, the type being imitated from those of Slavonic manuscripts. The first printing-press in Russia was established at Moscow in 1553. It did not reach St. Petersburgh until 1711. Printing was begun in Armenia in 1794, in Constantinople in 1726, and in Greece, not until it had achieved its independence, in 1822. The monks of Mount Libanus have been printers since 1610. Printing in Batavia dates from 1707, in Ceylon from 1737, but in the Philippine islands it has existed since 1570.

In America, Mexico began to print in 1549, and Lima in 1586. In the North American colonies, Massachusetts acquired a printing-press in 1639, Pennsylvania in 1686, and New York in 1693. The French carried printing to Egypt in 1799. It reached the Cape of Good Hope in 1806; the Sandwich Islands in 1821.

The introduction of printing into England must now engage our attention:—

"Caxton, by common consent, is the introducer of the art of printing into England. He was born in or about 1412, in the weald of Kent, and received what was then thought a liberal education. His father must have been in respectable circumstances, as there was at that time a law in full force prohibiting any youth from being apprenticed to a trade whose parent was not possessed of a certain rental in land. In his eighteenth year Caxton was apprenticed to Robert Large, an eminent London mercer, who in 1430 was sheriff, and in 1439 Lord Mayor, of London. At his death he bequeathed Caxton a legacy of twenty marks—a large sum in those days, and an honorable testimony to his fidelity and integrity. Soon after this the Mercers' Company appointed him their agent in the Low Countries, in which employment he spent twenty-three years. . . . . During the greater part of this long period he was residing or travelling in the midst of the countries where the new art of printing was the great subject of interest, and would naturally take some measures to acquaint himself with it. . . . . He returned to this country about 1474, bringing with him presses and types, and established himself in one of the chapels of Westminster Abbey, called the Eleemosynary, Almondry, or Arm'ry, supposed to be on the site of Henry the Seventh's Chapel. . . . . The first book he printed is supposed to be *The Game and Play of Chesse*, dated 1474. But some have raised doubts whether this was printed in England, as there is no actual evidence of it. . . . A second edition, with woodcuts, was printed two or three years later, and this is generally admitted to have been printed in England."—(p. 74.)

Caxton published upwards of fifty notable books. He had the honour of printing the poems of Chaucer, of Gower, and of Lydgate, and his own Chronicle of England. He died in 1496, at the age of 82.

Caxton was succeeded by Wynken de Worde, whom he had brought over with him from the Continent, and who superintended his office up to the time of his death. Wynken continued to carry on the business with great spirit for the next forty years; he remodelled his old type, and produced new kinds, becoming his own founder, and greatly promoted the manufacture of paper in this country: no less than four hundred and eight different works were printed by him:—

"He deserves more praise, perhaps, than he has ever received, for the important part he played in establishing and advancing the art in this country. But no one of our early printers deserves more grateful remembrance than Richard Grafton, who, in 1537, was the first publisher of the Bible in English."

A very hazardous experiment in those days, when heretics were burned in Smithfield. He was imprisoned after the death of his patron, and after all his services to religion and literature, died in poverty in 1572. In a short time printing spread all over England.

Printing, as a manufacture, has made immense progress in this country during the present century; the accelerating agents have been steam-power, improved presses, stereotyping and electrotyping. Stereotyping is supposed to have been invented in or about 1725, by William Ged, a goldsmith of Edinburgh, but the opposition of the workmen prevented him carrying out his invention; it was, however, revived by Lord Stanhope in 1803. It is to this nobleman that we are indebted for many improvements in the printing-press; this was originally like the wine-press, and made entirely of wood; gradually iron was introduced, and superseded wood altogether. The first steam-press was constructed in 1811, by Mr. König, an intelligent German, and the "Times," on the 29th of November, 1814, was the first newspaper printed by steam-power. The hand-press was capable of furnishing 250 impressions per hour, the first steam-press gave forth 1,800 in the same space of time; this number was increased to 4,000 in 1828; since then, the achievements of the steam-press are something marvellous. The present "Times" machine prints 13,500 impressions per hour, and by means of stereotype plates, as many as 25,000 copies

are produced, and it is expected that this number will be greatly increased by machines invented by an American engineer, Mr. Hoe, of New York.

Type-composing machines have been invented, and that invented by Mr. Hattersley is working successfully. Although type is composed of very hard metal, it deteriorates under the wear and tear required in the printing of large editions, as in Bibles, Prayer-books, dictionaries, &c.; it has been proposed to cover the type with a copper-facing by means of the electrotype process, but the result has not been altogether satisfactory.

Printing in colours is a branch of the typographic art which has been carried to perfection of late years. At first it was effected with wooden blocks, but its greatest triumphs emanate from the lithographic press. We have now *fac-similes* of water-colour drawings and oil-paintings, which at first sight can hardly be distinguished from the originals.

Our space does not permit of our following the author of this erudite volume through all the auxiliary subjects he has touched upon. There is much that is interesting to be said upon certain *reproductive* arts in connection with typography, arts which have for their object the reproduction of the printed page by other means than by typography. They are very ingenious, and depend for the most part upon chemical agencies. We can but mention the anastatic process, chemitypy, and photography. Each of these can render great service when the production of a limited number of examples is required, or when a page is wanted to make good a loss. There is yet a machine we wait for patiently, that which will supersede the use of the pen: the printing electric telegraph seems a step in the right direction to this object.

The pleasure and instruction we have derived from this *brochure* of Mr. Bohn's is marred only by the reflection that it is "privately printed." The information it contains is not to be readily met with in a popular form. If amplified, as it might be, beyond the limits imposed on it by the form of a lecture, it would form a valuable addition to our "Standard Libraries." The perusal of this lecture has also raised in our minds a vague idea that the book, as understood by the pioneers of typography, is passing away. We have no more folios, few quartos, nothing but trim octavos and duodecimos; and these, we fear, may in their turn yield to the journal and newspaper.

ANTIQUITIES OF THE GARRUENOS.

Coast-recreation now attracts many summer visitors to Yarmouth and Lowestoff. These places are situated in districts which have undergone such changes that their early history opens an interesting field for inquiry. The Yare, the river at the efflux of which into the sea the first of these towns stands, is the modern form of *Garruenos*, the name given by the Greek mariner of Alexandria to the *Garu-an*, the Rough Water of the Britons. Many streams were so designated by the first Keltic inhabitants of Europe, and still retain the designation, variously modified. The turbulent character of the Garonne in France, the *Garouna* and *Garumna* of antiquity, was witnessed and described by Mela Pomponius, about the middle of the first century, (*De Situ Orbis*, l. iii. c. 2). Chalmers (*Caledonia*, vol. ii. p. 968) says that the Yarrow, having its course "over a