UNIVERSITY OF CALCUTTA

Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies (General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE
KOLKATA-700073
The 4th June, 2018

Spaul 4/6/18
(Dr. Santanu Paul)
Deputy Registrar

CBCS SYLLABUS

IN

HISTORY (HONOURS)

CALCUTTA UNIVERSITY

2018

University of Calcutta

HIS – A

The Three - year B.A. Honours in History will comprise 6 Semesters. The curriculum will consist of 14 Core Courses (CC), 4 Discipline Specific Elective (DSE) courses, 2 Ability Enhancement Compulsory Courses (AECC), 2 Skill Enhancement Courses (SEC) Each course will be of 100 Marks. Attendance: 10 marks per Paper, Internal Assessment: 10 marks per paper.

➢ Core Courses CC

[Fourteen courses. Each course: 6 credits (5 theoretical segments TH+ 1 for tutorial related segment TU). Total: 84 credits.

- Each course carries 80 marks. Teaching time: 6x14 = 84 hrs Minimum 60 classes
- 65 marks for theoretical segment.
- Question Pattern for subjective/descriptive segment of 65 marks: 3 questions out of 6 (within 500 words) (10 x3 = 30) + 4 questions out of 8 within 250 words; 5x4 =20) + 15 objective type questions carrying 1 mark each (15 x 1 = 15).
- 15 marks for tutorial - related segments as suggested below (any one from each mode):
- Any one of the following modes: upto 1000 words for one Term Paper/upto 500 words for each of the two Term Papers/ equivalent Book Review/ --based on syllabus -related and/or current topics .[The modes and themes and/or topics are be decided by the concerned faculty of respective colleges.]
- Core courses: 2 each in Semesters 1 and 2; three each in Semesters 3 and 4; 2 each in Semesters 5 and 6.

- IMPORTANT NOTES:

  The Readings provided below include many of those of the UGC Model CBCS Syllabus in History. For further details of Course Objectives and additional references it is advised that the UGC model CBCS syllabus concerning relevant courses and topics should be given due importance and primarily consulted.
- Cited advanced texts in Bengali are not necessarily substitutes, but supplementary to the English books.

- The format is subject to the common structural CBCS format of the University.

➢ Discipline- specific Elective Courses DSE

Each course: 6 credits 5 for theoretical segment + 1 for tutorial-related segment. **(TH -5 TU-1)**

DSE-A for Semester -5/6, DSE-B for Semester 5/6

- Each course carries 80 marks. Minimum 60 classes.
- 65 marks for theoretical segment.
- Question Pattern for subjective/descriptive segment of 65 marks: 3 questions out of 6 (within 500 words; (10 x3 = 30) + 4 questions out of 8 (within 250 words; 5x4=20) and 15 objective type questions carrying 1 mark each (15 x 1 = 15).
- 15 marks for tutorial-related segments as suggested below (any one from each mode): Any one of the following modes: upto 1000 words for one Term Paper/upto 500 words for each of the two Term Papers/ equivalent Book Review/ based on syllabus related and/or current topics [The modes and themes and/or topics of a. and b. to be decided by the concerned faculty of respective colleges.]

- **HIS-A: Skill Enhancement/Skill-based Courses SEC** Each Course: 2 credits . (**Only theoretical**.)

  SEC –A in Semester 3, SEC –B in Semester 4.
  - Each course carries 80 marks. Teaching time: 2 hrs per week or 2x14 =28 hrs
  - 80 marks for theoretical segment.
  - Question Pattern for subjective/descriptive segment of 80 marks: 4 questions out of 8 (within 500 words; (10 x4 = 40) + 5 questions out of 10(within 250 words; 5x5=25) and 15 objective type questions carrying 1 mark each (15 x 1 = 15).
- **HIS-A: Ability Enhancement Compulsory Courses (** AECC) Each Course 2 credits

  AECC -1 : Communicative English/ MIL

  AECC-2 **:** Environmental Studies

  AECC -1 in Semester 1, AECC -2 in Semester 2

IMPORTANT NOTES:

SCOTTISH CHURCH COLLEGE

CU ROLL NUMBER : 18222-11-0083

REGISTRATION NUMBER : 223-1213-0146-18

DEPARTMENT OF HISTORY

SEMESTER : IV

PAPER : CC8

TITLE : 17TH CENTURY EUROPEAN CRISIS:MAJOR ISSUES

CONTENT

INTRODUCTION

There were various controversies regarding the "general crisis" thesis between historians. Some simply denied the existence of any such crisis. For instance, Hobsbawm saw the problems of 17th-century Europe as being social and economic in origin, an emphasis that Trevor-Roper would not concede. Instead, he theorised that the 'General Crisis' was a crisis of state and society, precipitated by the expansion of bureaucratic offices in the Sixteenth century.

The period of crisis that happened in Europe in the seventeenth century was one of the toughest in history. After the process of expansion and growth experienced during the fifteenth and sixteenth centuries, Europe found itself in a deep crisis that lasted nearly a century. A crisis that was characterize by various features, foremost the demographic, because after the late Middle Ages the population had increased steadily; until it stops abruptly in the sixteenth century even to recede in many places. Other reasons that were attributed for causing this crisis including hunger, wars, revolts, politics, plagues and climate changes. Eric Hobsbawn argues that on the big picture, it was economic and social forces that created this mid 17^{th} century crisis. On the other hand, Trevor Roper emphasized that the main causes for this crisis were the religious and political conflict. Although both arguments can be valid and were present in this disaster, I believed that the root causes of the crisis were religious and political differences, which ultimately led Europe to have economic and social conflicts as well.

SOME MAJOR REASONS

Many historians have argued the 17th century was an era of crisis. Today there are historians who promote the crisis model, arguing it provides an invaluable insight into the warfare, politics, economics, and even art of the seventeenth century. The Thirty Years' War (1618–1648) focused attention on the massive horrors that wars could bring to entire populations. The 1640s in particular saw more state breakdowns around the world than any previous or subsequent period. The Polish–Lithuanian Commonwealth , the largest state in Europe, temporarily disappeared . In addition, there were secessions and upheavals in several parts of the Spanish Empire. In Britain there were rebellions in every part of the Stuart monarchy (Kingdom of England, Kingdom of Scotland, Kingdom of Ireland, and British America). Political insurgency and a spate of popular revolts seldom shook the foundations of most states in Europe and Asia. More wars took place around the world in the mid-17th century than in almost any other period of recorded history. The crises spread far beyond Europe—for example Ming China, the most populous state in the world, collapsed.

China's Ming dynasty and Japan's Tokugawa shogunate had radically different economic, social, and political systems. However, they experienced a series of crises during the mid-17th century that were at once interrelated and strikingly similar to those occurring in other parts of the world at the same time. Frederic Wakeman argues that the crisis which destroyed the Ming dynasty was partly a result of the climatic change as well as China's already significant involvement in the developing world economy. Bureaucratic dishonesty worsened the problem. Moreover, the Qing dynasty's success in dealing with the crisis made it more difficult for it to consider alternative responses when confronted with severe challenges from the West in the 19th century

One important example of this crisis is the thirty years war. It was a war that took place in central Europe (especially in Germany) between 1618 and 1648, in which the majority of the great European powers intervened. This war would mark the future if the European continent in the centuries to follow. The origin of this war goes back to the Peace of Augsburg, which basically stated that the religion of the ruler of the land will be the religion of the people. This resolved the conflicts between the Catholics and the Protestants for a while, but due to the diverse religions practiced in the German states, it did not solve the underlying religious issues definitively. Just by analyzing the phrases above, we automatically get the sense that it was religious conflicts the root cause of this war. This is confirmed by the event that sparked the war, the revolt in Bohemia. In this revolt, member of the predominantly protestant bohemian legislature threw two catholic government officials pot the window, as a sign of protest against the religious policies of the newly elected king, the catholic Ferdinand II . However, the Catholics defeated the protestants,

and this leads us to another example of religion causing the 30 years war; the intervention of the Danish and then the Swedish. This happened because of the fear of these kingdoms that their sovereignty as protestant lands was threatened by the Catholic success in the war, and also because the declarations of the king Frederick V, where he said that all Europe should be back to Catholic. Nevertheless, at this point the Catholics are still winning the war, and this catches the awareness of Cardinal Richelieu, who was the chief minister of King Louis XII of France. From this point on, this religious war becomes political, because even though he was catholic, France decides to join the war and help the Protestants. The reason for this was simple, balance of power; the French felt that Habsburgs have gained too much power and they did not want just one great power to control Europe.

This war is a great example of how religious and political reasons shaped this European crisis, and how these events led to the economic and social problems that a war brings, in order to fund the war with money and men. After all, this war was ended with the Treaty of Westphalia; which ironically ended up being like the treaty of the peace Augsburg that stated that the religion of the prince is the religion of the people. The political effects of this war were very traumatic as well, first it weakened the power of the empire, and the individual territories of the Germany gained more autonomy even than before the war.

Another problem that rose during this crisis was the war of the three kingdoms. This is another great example to argue that Trevor Roper was correct in explaining the main cause of the crisis. This war happened after England, Ireland and Scotland became united under the power of only one ruler. This was possible because, since Queen Elizabeth of England had no direct heir to her throne, the next in line was James Stuart, the king of Scotland . So what types of problems this created? First, James was a firm believer of the “divine right monarchy”, which basically means that he was placed there by god and does not have to report to anyone else. This belief did not bring many problems to other nations; however, the fact that England had a parliament created a lot of political tensions in this era. Expanding upon this, the wealth that the members of the parliament had acquired from the agricultural innovation, the expansion of their land and sheep count, increased this problems even more, because they now wanted to match their political power with their economic power. The fact of this happening brings us back to our thesis, and shows a religious problem becoming political, which ultimately becomes social. I argue this because the parliament starts to have power from the times of King Henry, when he needed their approval to separate from the Catholic Church (religion). Years after, this backfires to King James, because it gave more authority to the wealthy parliament, and clash with his ideals of divine right and absolutism (Politics). Subsequently, creating a lot tension and confusion among the people of the three kingdoms, whose laws and taxes kept changing as the power of the monarchy and the parliament would fluctuate (Social).

To further support our point, we can cite the historian Paul Hazard, who coined the term “crisis of the European consciousness” to define an ideological crisis that could be found in

the intellectual ambient of Europe after the wars of religion. This is a valid argument since it is logical to believe that religious conflicts could rupture the emotional stability of a society that is very much influenced by god and religion. The raise and growth of new religions that differed in many matters with ancient Catholicism brought into the map many thinkers that challenged even more the traditional beliefs. Intellectuals such as Descartes, Spinoza, Leibniz, Locke and Newton share a common time, it can even be dated astronomically with the famous Halley's comet of 1680 which allowed Pierre Bayle drafting its Charter, and use this to make fun (in a way) at the Religious superstitions and affirm that knowledge must be constantly proven and updated. However, this eventually created some social problems, since most of the universities and teaching centers were controlled and had the patronage of the church, being either catholic, like the Jesuits, or protestants. This is another example of how religious conflicts (Trevor's argument) happened first and the led to social problems (Hobsbawn argument)

Possibly the best example of the religious and political causes of this crisis was the glorious revolution. Going back to the origin of the problem, old King James II was a Catholic that had already irritated the parliament by relaxing the restrictions on the Catholics and allowing them to hold positions in public offices. Nevertheless, James was old and next line for the throne was his daughter Mary, a protestant that was married to William of Orange; so the parliament does not really take any action. However, things turn ugly after James II has a son that would mean the continuity of Catholic rule in England, which the parliament would not allow. This caused the glorious revolution, and causes James to escape to France with his son, and William of Orange is invited to be king of England.

It is interesting to see how the biggest political problem that King James II had was the fact that he was catholic; once again religion. In addition, the fact that the parliament is the one that invites William to be king summarizes the amount of power that he would have, which as we can see, was very limited. He was given many restrictions, such as the obligation to be an Anglican, he was not allowed to have a standing army, he was not allowed to veto a parliament act and there was no arbitrary arrest. Based on this, comes a liberal social movement that will support the ideas of the parliament in a way, and moves England even further away from absolutism. A leader of this movement is John Locke. We can see in his "Two treatises to the government" his idea of the natural right to live, which basically states that we all have a right to liberty and the possession of property. Moreover, if the government does not protect the natural right to live of the people, they can revel and a demand a ruler who does not violate their rights.

Trevor and Hobsbawn use the Fronde in France as another example of the general crisis. It begun because of general discontent of the people . His beginnings were based on the economic crisis and increasing the tax burden generated to address the cost of participation of France in the Thirty Years War. Its most direct cause, however, can be found in the means used by the monarchy to raise taxes. With the arrival of the regent the people expected the

monarchy to cut rates, but not so: Cardinal Mazarin thought that France could support the war and did not let up the pressure. In addition, the Parliament of Paris tried to limit the power of King Louis XIV and also the nobility felt threatened by the king and wanted more of a voice in the government. All of the causes of the Fronde have political implications to it. Even If it is argued that the raise of the taxes was a social problem, it was a political decision to raise the taxes for war and specially to actually enter the war, with the ideals of balance of power.

CONCLUSION

In conclusion, the general crisis was characterized by a series of wars, revolts, decline of population and political and social changes that in many cases could have been avoided if the right precautions would have been taken. However, the fact Europe was undergoing a time political absolutism (at least that is what the rulers intended) and the close relation between church and government, made it impossible to avoid the conflicts. The numerous wars that happened (all for political and religious reasons) aided by plagues and diseases, caused the first decline in the population after the middle ages, therefore creating social and economic problems in the region. This is the reason why I believe that Trevor Roper was right by saying that the root cause of the crisis was political and religious (decisions to go to war, monarchs selected for their religion, etc); which then led to economic and social problem(increase of taxation, price revolution, and decline in population), aggravating even more the situation.

BIBLIOGRAPHY

The following links have been used in the completion of this assignment

- https://publishing.cdlib.org
- https://en.mwikipedia.org

PRINTING REVOLUTION

CC8 TUTORIAL

DEPARTMENT – HISTORY

SEMESTER – IV

C.U. ROLL NO. – 192223-21-0039

C.U. REGISTRATION NO. – 223-1111-0160-19

CONTENTS

INTRODUCTION

The development of human civilization has always been inseparable from the effective communication of thoughts and ideas. Saying has it that two minds are greater than one. If information is extremely controlled and manipulated by a few people on the top, dawn of the true enlightenment and civilization will hardly come. On the contrary, when control of information is no longer a privilege of the few, and common people have access to the otherwise limited information, democracy will be formed in its prototype. Looking back at the entire history of human society, communicative tools and technologies have always been the catalyst for revolutionary changes. Among these numerous achievements, printing technology is one of the most primitive communicative progress that people have ever made to advance the effective distribution of thoughts and information, which further drives the development of human civilization.

The printing press was invented in the Holy Roman Empire by the German Johannes Gutenberg around 1440, based on existing screw presses. Gutenberg, a goldsmith by profession, developed a complete printing system that perfected the printing process through all of its stages by adapting existing technologies to printing purposes, as well as making groundbreaking inventions of his own. His newly devised hand mould made possible for the first time the precise and rapid creation of metal movable type in large quantities, a key element in the profitability of the whole printing enterprise.

The printing press spread within several decades to over 200 cities in a dozen European countries. By 1500, printing presses in operation throughout Western Europe had already produced more than 20 million volumes. In the 16th century, with presses spreading further afield, their output rose tenfold to an estimated 150 to 200 million copies. The operation of a press became so synonymous with the enterprise of printing that it lent its name to an entire new branch of media, the press.

Fig.1

An illustration of a Flemish printer's shop, Impressio Librorum. Made in Antwerp, 1580-1605 CE. (British Museum, London). / British Museum, Creative Commons

PRINTING BEFORE THE GUTENBERG PRESS

Fig.2
Chinese Movable Type Printing

Before Johannes Gutenberg invented the printing press in the 15th century, the Chinese were printing on paper with carved woodblocks and the Koreans were printing with moveable metal type a century before Gutenberg. Printing on paper using woodblocks started in China around the 8th century. Woodblock printing which is known as xylography today was the first method used on paper. In this method, letters that are to be printed are carved onto a wooden board. Ink is then applied to these letters and then pressed onto the paper or textile material.

The Chinese also were the first to invent movable type printing using porcelain blocks during the Northern Song Dynasty around the year 1041 AD. Metal movable type printing appeared during the late 12th century in which bronze movable types were used to print banknotes and official documents. The Koreans were known to use metal movable type printing during the 13th century in which the board is assembled using different letter types and this changes as per the page being printed. The movable metal type printing technique eventually spread to Europe and improvements were made to the design which leads to the introduction of the mechanical press.

THE INVENTION OF THE PRINTING PRESS

Fig.3
A Replica of the Gutenberg Press

The most fundamental progress of printing technique in the West was made around 1450, when Johannes Gutenberg introduced the first mechanical movable printing system – printing press – into Europe. The innovative mechanical movable type, oil-based ink and adjustable molds, and most importantly, Gutenberg's genius of combining these elements into a practical printing system for printers realized the so-called mass production of printed books for the first time. Compared with the backward manual copy, the printing press saved enormous time and labor whereas produced more efficient dissemination of information. Knowledge was no longer restricted to the privileged few; it became a shared treasure of the entire human beings thanks to printing press which delivered ideas and thoughts to a number of populations. This communicative invention was no doubt revolutionary. It largely facilitated the transmission of Roman humanity thoughts, and directly motivated the far-reaching movement of Renaissance where emerged thousands of glamorous works across fields of painting, sculpture and literature which remain their overriding artistic values until today. At the same time, the distribution of the Gutenberg Bible disenchanted the absolute authority of religious organizations, informing common people of their own greatness and autonomy, which advanced the religious Reformation and exerted great influence on the progress of history.

THE SPREAD OF INFORMATION

Fig.4

A detail of a mid-16th century CE painting by Hans Holbein the Younger showing a desk with a lute, globe and books. From 'The Ambassadors', c. 1533 CE. (National Gallery, London)

Soon, a new boost to the quantity of printed material came with the rise of the humanist movement and its interest in reviving literature from ancient Greece and Rome. Two printers, in particular, profited from this new demand: the Frenchman Nicholas Jensen (1420-1480 CE) and the Italian Aldus Manutius (c. 1452-1515 CE). Jensen innovated with new typefaces in his printing shop in Venice, including the easy-to-read roman type (*littera antiqua*/*lettera antica*) and a Greek font which imitated manuscript texts. Jensen printed over 70 books in the 1470s CE, including Pliny's *Natural History* in 1472 CE. Some of these books had illustrations and decorations added by hand to recapture the quality of older, entirely handmade books.

Meanwhile Manutius, also operating in Venice, specialised in smaller pocket editions of classical texts and contemporary humanist authors. By 1515 CE, all major classical writers were available in print, most in multiple editions and many as collections of complete works. In addition, printed classical texts with identical multiple copies in the hands of scholars across Europe could now be easily checked for accuracy against source manuscripts. Handmade books had often perpetuated errors, omissions, and additions made by individual copyists over centuries, but now, gradually, definitive editions of classical works could be realised which were as close as possible to the ancient original. In short, printed works became both the cause and fruit of an international collective scholarship, a phenomenon which would reap rewards in many other areas from astronomy to zoology.

There was, too, a drive to print more books thanks to the Reformists who began to question the Catholic Church's interpretation of the Bible and its stranglehold on how Christians should think and worship. The Bible was one of the priorities to have translated into vernacular languages, for example German (1466 CE), Italian (1471 CE), Dutch (1477 CE), Catalan (1478 CE), and Czech (1488 CE). Reformists and humanists wrote commentaries on primary sources and argued with each other in print, thereby establishing an invisible web of knowledge and scholarship across Europe. Even the letters written between these scholars were published. As religious and academic issues raged, so the debating scholars fuelled the production of yet more printed works in a perpetuating cycle of the printed word. Ordinary folks, too, were roused by arguments presented in printed materials so that groups of like-minded individuals were able to quickly spread their ideas and organise mass movements across multiple cities such as during the German Peasants' War of 1525 CE.

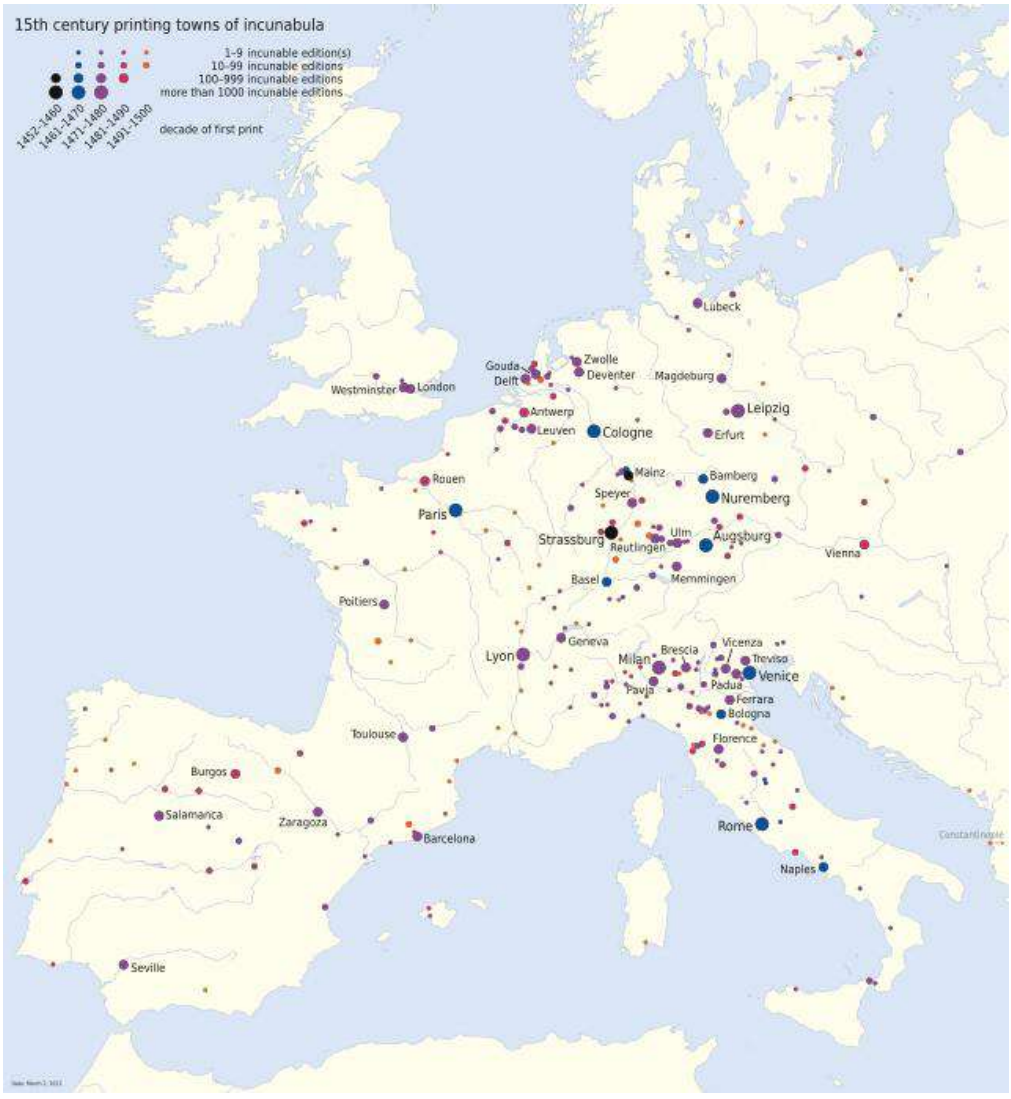


Fig.5

Spread of printing in the 15th century from Mainz, Germany. *Printing places showing the spread of incunabula printing in the 15th century. Two hundred seventy-one locations are known; the largest of them are designated by name. The term "incunabula" referred to printed materials and came to denote the printed books themselves in the late 17th century.*

A BOOMING INDUSTRY

As a consequence of all this demand, those printers who had survived the difficult early years were now booming. Cities across Europe began to boast their own printing firms. Places like Venice, Paris, Rome, Florence, Milan, Basel, Frankfurt, and Valencia all had well-established trade connections (important to import paper and export the final product) and so they became excellent places to produce printed material. Some of these publishers are still around today, notably the Italian company Giunti. Each year, major cities were producing 2-3,000 books every year. In the first decade of the 1500s CE, it is estimated 2 million books were printed in Europe, up to 20 million by 1550 CE, and around 150 million by 1600 CE. There were over half a million works by the Reformist Martin Luther (1483-1546 CE) printed between 1516 and 1521 CE alone. Into the 16th century CE, even small towns now had their own printing press.

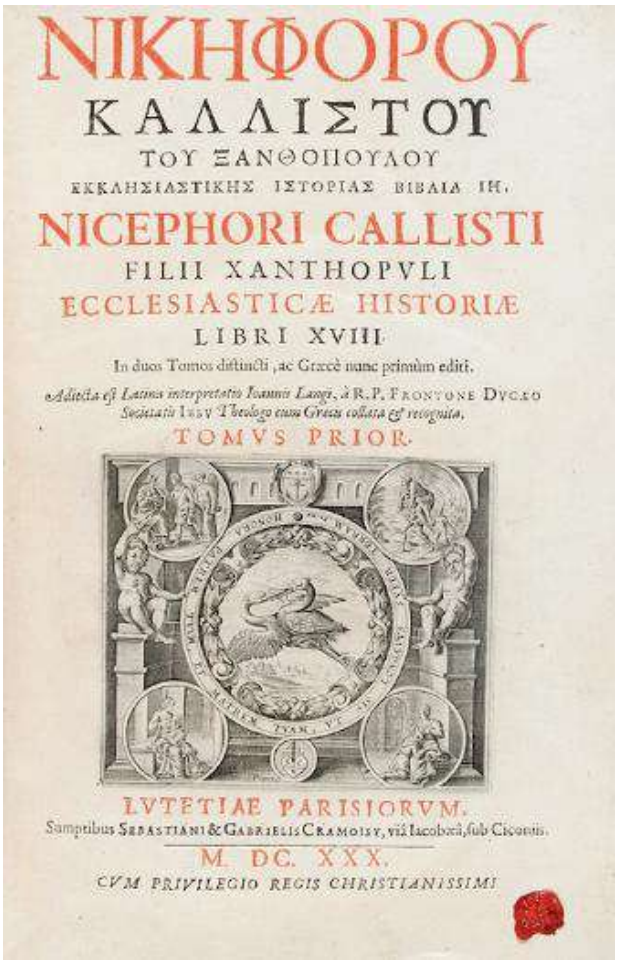

ΝΙΚΗΦΟΡΟΥ
ΚΑΛΛΙΣΤΟΥ
ΤΟΥ ΞΑΝΘΟΠΟΥΛΟΥ
ΕΚΚΛΗΣΙΑΣΤΙΚΗΣ ΙΣΤΟΡΙΑΣ ΒΙΒΛΙΑ ΙΗ.
NICEPHORI CALLISTI
FILII XANTHOPVLI
ECCLESIASTICÆ HISTORIÆ
LIBRI XVIII
In duos Tomos distincti, ac Græcè nunc primùm editi.
Adiecta est Latina interpretatio Ioannis Langi, à R.P. Frontone Ducæo Societatis IESV Theologo cum Græco collata & recognita.
TOMVS PRIOR.
LVTETIAE PARISIORVM.
Sumptibus Sebastiani & Gabrielis Cramoisy, viâ Iacobeâ, sub Ciconiis.
M. DC. XXX.
CVM PRIVILEGIO REGIS CHRISTIANISSIMI

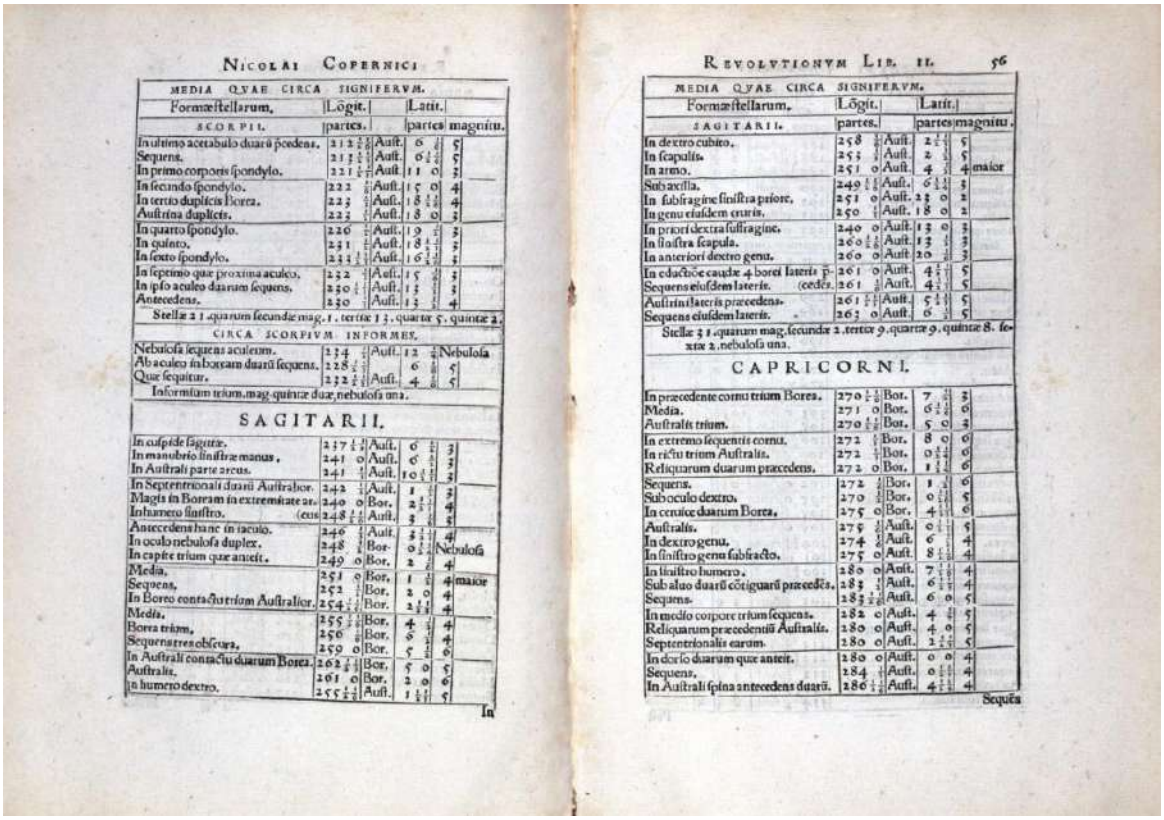
Fig.6

The title page of the 1555 CE edition of Handbook of the Christian Soldier (Enchiridion Militis Christiani) by the Netherlandish Renaissance scholar Desiderius Erasmus (c. 1469-1536 CE). (Skokloster Castle, Sweden)

Besides established authors, many publishers helped new authors (men and women) print their works at a loss in the hope that a lucrative reprint run would finally bring in a profit. The typical print run for a first edition was around 1,000 copies although this depended on the quality of the book as editions ranged from rough paper pocket-sizes to large vellum (calfskin) folio editions for the connoisseur. The smaller size of most printed books compared to handmade volumes meant that habits of reading and storing books changed. Now a desk was no longer required to support large books and one could read anywhere. Similarly, books were no longer kept horizontally in chests but stacked vertically on shelves. There were even odd inventions like the book wheel on which several books could be kept open and easily consulted simultaneously by turning the wheel, especially useful for research scholars. As readers accumulated their books and built up impressive private collections, so many bequeathed these to their city when they died. In this way, within 50 years of the printing press' invention, public libraries were formed across Europe.

Printed works became so common, they helped enormously to establish the reputations, fame and wealth of certain writers. The Dutch scholar Desiderius Erasmus (c. 1469-1536 CE) is perhaps the best example, one of the first authors to make a living solely through writing books. There were, though, some threats to authors and printers. One of the biggest problems was copyright infringement because it was next to impossible to control what went on beyond a particular city. Many books were copied and reprinted without permission, and the quality of these rip-offs was not always very good.

PRINTING POWERS THE SCIENTIFIC REVOLUTION



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SCORPII.				
In ultimo acetabulo duarũ pedes.	212 2/3	Aust.	6 1/2	5
Sequens.	213 1/3	Aust.	6 1/2	5
In primo corporis spondylo.	221 1/2	Aust.	11 0	3
In secundo spondylo.	222 1/3	Aust.	15 0	4
In tertio duplicis Borea.	223 1/3	Aust.	18 1/2	4
Austrina duplicis.	223 1/3	Aust.	18 0	3
In quarto spondylo.	226 1/3	Aust.	19 1/2	3
In quinto.	231 1/3	Aust.	18 1/2	3
In sexto spondylo.	234 1/2	Aust.	16 1/2	3
In septimo quæ proxima aculeo.	232 1/3	Aust.	15 1/2	3
In ipso aculeo duarum sequens.	230 1/3	Aust.	13 1/2	3
Antecedens.	230 1/3	Aust.	13 1/2	4

Stellæ 21. quarum secundæ mag. 1. tertiæ 13. quartæ 5. quintæ 2.

CIRCA SCORPIVM INFORMES.

Nebulosa sequens aculeum.	234 1/3	Aust.	12 1/2	Nebulosa
Ab aculeo in borearn duarũ sequens.	228 2/3		6 1/2	5
Quæ sequitur.	232 2/3	Aust.	4 1/2	5

Informium trium, mag. quintæ duæ, nebulosa una.

SAGITARII.

In cuspide sagittæ.	237 1/2	Aust.	6 1/2	3
In manubrio sinistræ manus.	241 0	Aust.	6 1/2	3
In Australi parte arcus.	241 1/2	Aust.	10 1/2	3
In Septentrionali duarũ Australior.	242 1/3	Aust.	1 1/2	3
Magis in Boream in extremitate ar.	240 0	Bor.	2 1/2	4
In humero sinistro. (cus	248 1/2	Aust.	3 1/2	4
Antecedens hanc in aculo.	246 1/3	Aust.	3 1/2	4
In oculo nebulosa duplex.	248 1/3	Bor.	0 1/2	Nebulosa
In capite trium quæ antecit.	249 0	Bor.	2 1/2	4
Media.	251 0	Bor.	1 1/2	4 maior
Sequens.	252 1/3	Bor.	2 0	4
In Boreo contactu trium Australior.	254 1/2	Bor.	2 1/2	4
Media.	255 1/2	Bor.	4 1/2	4
Borea trium.	256 2/3	Bor.	0 1/2	4
Sequens tres obscura.	259 0	Bor.	5 1/2	6
In Australi contactu duarum Borea.	262 1/2	Bor.	5 0	5
Australis.	261 0	Bor.	2 0	6
In humero dextro.	255 1/2	Aust.	1 1/2	5

In

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MEDIA QVAE CIRCA SIGNIFERVM.

Formæ stellarum,	Lõgit. partes.		Latit. partes	magnitu.
SAGITARII.				
In dextro cubito.	258 2/3	Aust.	2 1/2	5
In scapulis.	255 1/3	Aust.	2 1/2	5
In armo.	251 0	Aust.	4 1/2	4 maior
Sub axilla.	249 1/2	Aust.	6 1/2	5
In subfragine sinistra priore.	251 0	Aust.	23 0	2
In genu eiusdem cruris.	250 1/3	Aust.	18 0	2
In priori dextra suffragine.	240 0	Aust.	13 0	3
In sinistra scapula.	260 1/2	Aust.	13 1/2	3
In anteriori dextro genu.	260 0	Aust.	20 1/2	3
In eductõe caudæ 4 borei lateris p-	261 0	Aust.	4 1/2	5
Sequens eiusdem lateris. (cedes.	261 1/2	Aust.	4 1/2	5
Austrini lateris præcedens.	261 1/2	Aust.	5 1/2	5
Sequens eiusdem lateris.	263 0	Aust.	6 1/2	5

Stellæ 21. quarum mag. secundæ 2. tertiæ 9. quartæ 9. quintæ 8. sextæ 2. nebulosa una.

CAPRICORNI.

In præcedente cornu trium Borea.	270 1/2	Bor.	7 1/2	3
Media.	271 0	Bor.	6 1/2	0
Australis trium.	270 1/2	Bor.	5 0	3
In extremo sequentis cornu.	272 1/3	Bor.	8 0	6
In ricfu trium Australis.	272 1/3	Bor.	0 1/2	6
Reliquarum duarum præcedens.	272 0	Bor.	1 1/2	6
Sequens.	272 1/3	Bor.	1 1/2	6
Sub oculo dextro.	270 1/3	Bor.	0 1/2	5
In cervice duarum Borea.	275 0	Bor.	4 1/2	6
Australis.	275 1/3	Aust.	0 1/2	5
In dextro genu.	274 1/3	Aust.	6 1/2	4
In sinistro genu fabricato.	275 0	Aust.	8 1/2	4
In sinistro humero.	280 0	Aust.	7 1/2	4
Sub aluo duarũ cõtiguarũ præcedẽs.	283 1/3	Aust.	6 1/2	4
Sequens.	283 2/3	Aust.	6 0	5
In medio corpore trium sequens.	282 0	Aust.	4 1/2	5
Reliquarum præcedentiũ Australis.	280 0	Aust.	4 0	5
Septentrionalis earum.	280 0	Aust.	2 1/2	5
In dorso duarum quæ antecit.	280 0	Aust.	0 0	4
Sequens.	284 1/3	Aust.	0 1/2	4
In Australi spina antecedens duarũ.	286 1/2	Aust.	4 1/2	4

Sequẽs

Fig.7

Tables from Polish astronomer Nicolaus Copernicus' pioneering text "De revolutionibus orbium caelestium" (On the revolution of heavenly spheres), 1543, which represents his complete work.

The English philosopher Francis Bacon, who's credited with developing the scientific method, wrote in 1620 that the three inventions that forever changed the world were gunpowder, the nautical compass and the printing press.

For millennia, science was a largely solitary pursuit. Great mathematicians and natural philosophers were separated by geography, language and the sloth-like pace of hand-written publishing. Not only were handwritten copies of scientific data expensive and hard to come by, they were also prone to human error.

With the newfound ability to publish and share scientific findings and experimental data with a wide audience, science took great leaps forward in the 16th and 17th centuries. When developing his sun-centric model of the galaxy in the early 1500s, for example, Polish astronomer Nicolaus Copernicus relied not only on his own heavenly observations, but on printed astronomical tables of planetary movements.

When historian Elizabeth Eisenstein wrote her 1980 book about the impact of the printing press, she said that its biggest gift to science wasn't necessarily the speed at which ideas could spread with printed books, but the accuracy with which the original data were copied. With printed formulas and mathematical tables in hand, scientists could trust the fidelity of existing data and devote more energy to breaking new ground.

FRINGE VOICES GET A PLATFORM

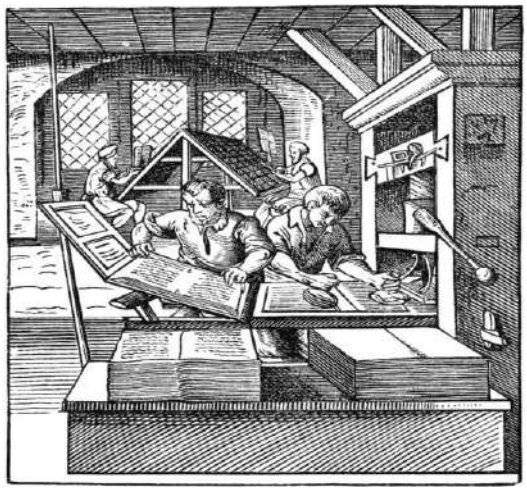


Fig.8

A printing press being used to make books during the 16th century.

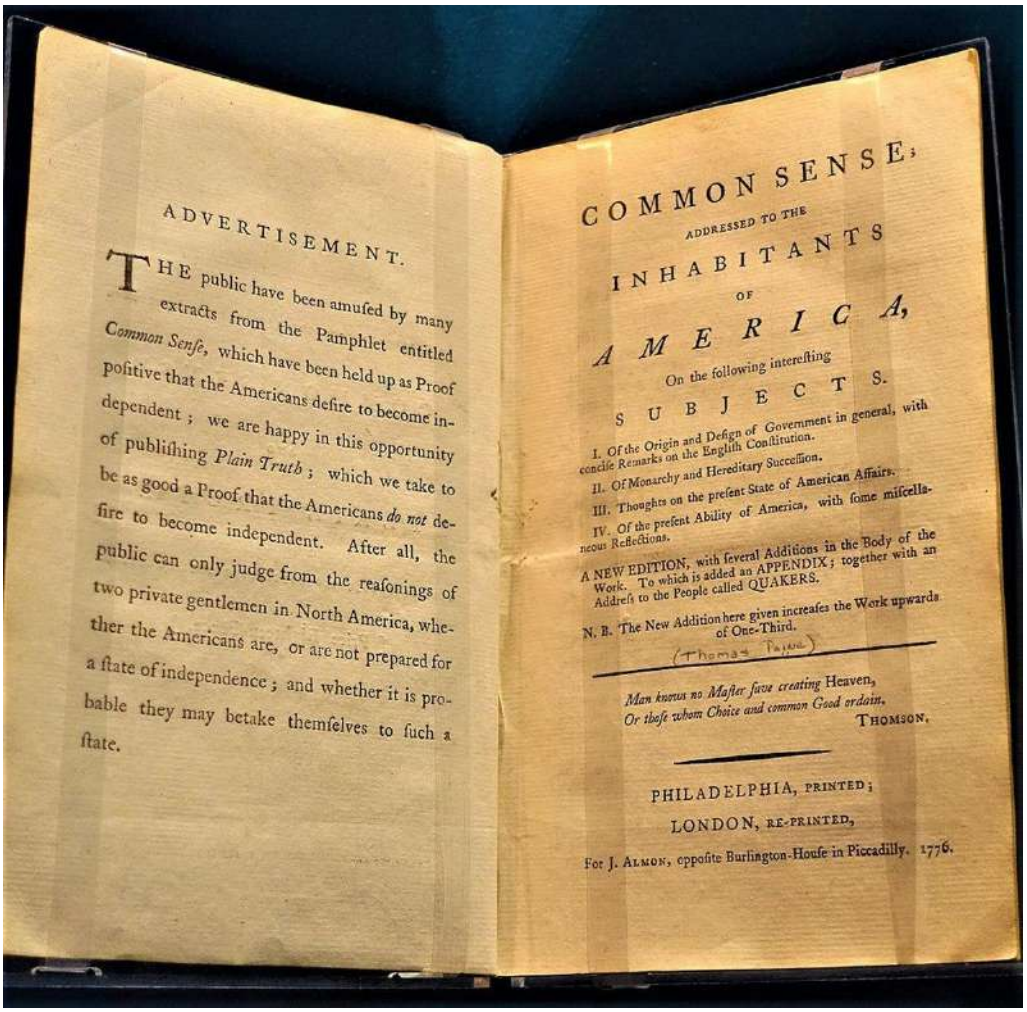
"Whenever a new information technology comes along, and this includes the printing press, among the very first groups to be 'loud' in it are the people who were silenced in the earlier system, which means radical voices," says Palmer.

"In the print revolution, that meant radical heresies, radical Christian splinter groups, radical egalitarian groups, critics of the government," says Palmer. "The Protestant Reformation is only one of many symptoms of print enabling these voices to be heard."

As critical and alternative opinions entered the public discourse, those in power tried to censor it. Before the printing press, censorship was easy. All it required was killing the "heretic" and burning his or her handful of notebooks.

But after the printing press, Palmer says it became nearly impossible to destroy all copies of a dangerous idea. And the more dangerous a book was claimed to be, the more the people wanted to read it. Every time the Church published a list of banned books, the booksellers knew exactly what they should print next.

FROM PUBLIC OPINION TO POPULAR REVOLUTION



ADVERTISEMENT.

THE public have been amuſed by many extracts from the Pamphlet entitled *Common Senſe*, which have been held up as Proof poſitive that the Americans deſire to become independent; we are happy in this opportunity of publiſhing *Plain Truth*; which we take to be as good a Proof that the Americans *do not* deſire to become independent. After all, the public can only judge from the reaſonings of two private gentlemen in North America, whether the Americans are, or are not prepared for a ſtate of independence; and whether it is probable they may betake themſelves to ſuch a ſtate.

COMMON SENSE;

ADDRESSED TO THE

INHABITANTS

OF

AMERICA,

On the following intereſting

SUBJECTS.

I. Of the Origin and Deſign of Government in general, with concile Remarks on the Engliſh Conſtitution.

II. Of Monarchy and Hereditary Succeſſion.

III. Thoughts on the preſent State of American Affairs.

IV. Of the preſent Ability of America, with ſome miſcellaneous Reflections.

A NEW EDITION, with ſeveral Additions in the Body of the Work. To which is added an APPENDIX; together with an Addreſs to the People called QUAKERS.

N. B. The New Addition here given increaſes the Work upwards of One-Third.

(Thomas Paine)

Man knows no Maſter ſave creating Heaven,
Or thoſe whom Choice and common Good ordain.
THOMSON.

PHILADELPHIA, PRINTED;
LONDON, RE-PRINTED,
For J. ALMON, oppoſite Burlington-Houſe in Piccadilly. 1776.

Fig.9

"Common Sense" by Thomas Paine at the Museum of the American Revolution.

During the Enlightenment era, philosophers like John Locke, Voltaire and Jean-Jacques Rousseau were widely read among an increasingly literate populace. Their elevation of critical reasoning above custom and tradition encouraged people to question religious authority and prize personal liberty.

Increasing democratization of knowledge in the Enlightenment era led to the development of public opinion and its power to topple the ruling elite. Writing in pre-Revolution France, Louis-Sebástien Mercier declared:

“A great and momentous revolution in our ideas has taken place within the last thirty years. Public opinion has now become a preponderant power in Europe, one that cannot be resisted… one may hope that enlightened ideas will bring about the greatest good on Earth and that tyrants of all kinds will tremble before the universal cry that echoes everywhere, awakening Europe from its slumbers.”

“[Printing] is the most beautiful gift from heaven,” continues Mercier. “It soon will change the countenance of the universe… Printing was only born a short while ago, and already everything is heading toward perfection… Tremble, therefore, tyrants of the world! Tremble before the virtuous writer!”

Even the illiterate couldn’t resist the attraction of revolutionary Enlightenment authors, Palmer says. When Thomas Paine published “Common Sense” in 1776, the literacy rate in the American colonies was around 15 percent, yet there were more copies printed and sold of the revolutionary tract than the entire population of the colonies.

MACHINES 'STEAL JOBS' FROM WORKERS

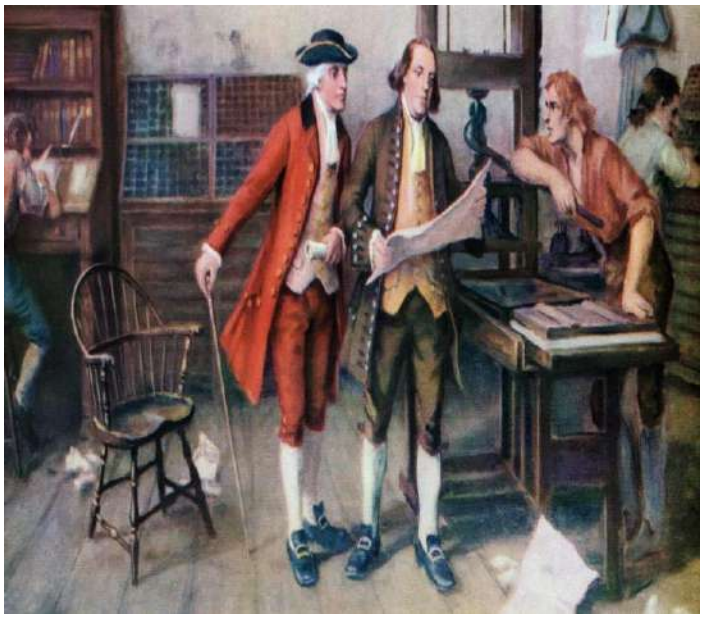


Fig.10

Benjamin Franklin and associates at Franklin's printing press in 1732.

The Industrial Revolution didn't get into full swing in Europe until the mid-18th century, but you can make the argument that the printing press introduced the world to the idea of machines "stealing jobs" from workers.

Before Gutenberg's paradigm-shifting invention, scribes were in high demand. Bookmakers would employ dozens of trained artisans to painstakingly hand-copy and illuminate manuscripts. But by the late 15th century, the printing press had rendered their unique skillset all but obsolete.

On the flip side, the huge demand for printed material spawned the creation of an entirely new industry of printers, brick-and-mortar booksellers and enterprising street peddlers. Among those who got his start as a printer's apprentice was future Founding Father, Benjamin Franklin.

CONCLUSION

Over all, the printing press is a revolutionizing invention. First, the printing press was invented during a crucial time period. In this time period, there was a lot of chaos and distress, because of the black death. The printing press had a huge a effect on spreading ideas, thoughts , news, education, and being informed. By printing books and newspapers, we have learned how to communicate and spread ideas throughout the world. The printing press is one of basis invention for the creations and inspiration of many other newer inventions which also revolutionized the world. Although the printing press was a magnificent invention, some people had different views. People believed maintenance would be too difficult, that writing in Chinese would be impossible due to the intricate Chinese writing system, and that the churches and religious groups wouldn't be able to censor what was being printed. Without the printing press, we don't know how we could have possibly spread our thought and evolve over time mentally, socially, economically, politically, and religiously without the printing press.

Johannes Gutenberg's printing press was and still is a very indispensable part of history and our lives wouldn't be like it is today if it wasn't for Gutenberg's printing press. Even more, it allowed for greater accessibility and spread of all kinds of knowledge throughout a wider population never before seen, bringing about several new social dynamics that would lead to several social revolutions. Even though Gutenberg suffered, he helped heal many wounds in the world.

Fig.11

Printing in Progress

Printing these days is so common that we hardly even think about it. But we fail to realize it has been the foundation of the information revolution. The invention of the mechanical movable type printing press allowed us to share knowledge and information faster and in large numbers than ever before. As the old saying goes, knowledge is power and the printing press paved the way for this information to reach people across the world with ease.

BIBLIOGRAPHY

BOOKS

- Briggs, Asa and Burke, Peter (2002). *A Social History of the Media: From Gutenberg to the Internet*, Polity, Cambridge.
- Julia C. Crick; Alexandra Walsham (2004). *The uses of script and print, 1300–1700*. Cambridge University Press.

WEBSITES

- www.worldhistory.org
- www.courses.lumenlearning.com
- www.history.com
- www.britannica.com

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Topic-17th century European crisis: major issues

সূচিপত্র

সপ্তদশ শতকে ইউরোপের মূল সমস্যা গুলি আলোচনা কর

ভূমিকা– সমগ্র সপ্তদশ শতক জুড়ে শুধুই ইউরোপের সর্বত্র বিদ্রোহ অভ্যুত্থান ঘটে। সপ্তদশ শতকের প্রথমার্ধে পার্লামেন্টের বিরোধী ছিল, স্পেন ও ফ্রান্সের বিরোধ, সুইডেন ও পোল্যান্ডের বিরোধ রাশিয়ার ও ডেনমার্কের ক্ষতি করেছিল অস্ট্রিয়াত ওবোহেমিয়ান বিরোধ থেকে ৩০ বছর ব্যাপী যুদ্ধের সূচনা হয়েছিল। এই শতাব্দীর ইউরোপের বহু দেশে কৃষক বিদ্রোহ হয়েছিল এবং নতুন নতুন শহরের অভ্যুত্থান ঘটে ছিল। এই সামগ্রিক সংকটের দুটি দিক হলো রাজনৈতিক এবং অর্থসামাজিক জলবায়ু পরিবর্তন, জনসংখ্যা বৃদ্ধি, মহামারী এবং অভাব যুদ্ধ-বিদ্রহ এই সংকটের সৃষ্টি হয়েছিল।

১.সপ্তদশ শতকের ইউরোপ

জনসংখ্যা বৃদ্ধি ও হ্রাস– রাজারা সেনাবাহিনীর উপর করাতে বাধ্য হয় এবং জনগণ এতে বিদ্রোহ করতে বাধ্য হয়।

২.সপ্তদশ শতকের মহামারী

এই শতকের সংকট ১৬২০ খ্রিস্টাব্দে শুরু হয়েছিল এবং সত্তরের দশক পর্যন্ত ইউরোপের বিভিন্ন দেশে এই সংকট চলেছিল। অনেকের মতে অষ্টাদশ শতকের প্রথম দিকে ছিল এই শতকের সংকট ইউরোপের দক্ষিণ প্রান্তে দেশগুলিকে বেশি ক্ষতিগ্রস্ত করেছিল।

৩. সপ্তদশ শতকের ইউরোপে প্লেগ মহামারী

পুঁজিবাদ– এই শতকের সংকট এর চারটি বৈশিষ্ট্য লক্ষ্য করা যায় সাধারণ অর্থনৈতিক সংকট, রাজনৈতিক সংকট, পুঁজিবাদের সংকট, ও মানুষের সামগ্রিক জীবনের সংকট, ইউরোপের সর্বত্র এই সংকট ছিল। অভিজাতদের হাতে শুধু অর্থ ছিল কিন্তু তারা অর্থ উৎপাদনের জন্য লগ্নি না করে বিশাল ব্যসনে মত্ত ছিলেন। সামন্ত সমাজের উৎপাদন ব্যবস্থা গতিশীল হতে পারেনি। বুর্জোয়া শ্রেণি উৎপাদন বাড়াতে পারেনি ইউরোপের সর্বোচ্চ পুঁজিবাদের বাধা সৃষ্টি হয়েছিল।

৪. ইউরোপের পুঁজিবাদী ব্যবস্থা

রাজনৈতিক ও অর্থ সামাজিক সংকট– স্পেন ও মধ্য ইউরোপ আন্তর্জাতিক মর্যাদা হারিয়েছিল। ভূমধ্যসাগর বাল্টিকসাগর আর অর্থনৈতিক ঘাটি ছিলনা। নতুন অর্থনৈতিক কর্মকাণ্ডে ঘাঁটি হয় আটলান্টিকের উপকূলবর্তী ঘাটি সমূহ। এই সময় আয়তন প্রসারণ, আমলাতন্ত্র বেড়েছিল, ব্যয় বেড়ে ছিল। গ্রাম ও শহরের দরবারী জেন্টির মধ্যে বিরোধ বেধেছিল। ফলে সমাজ ও রাষ্ট্র পরস্পরের সঙ্গে যুদ্ধে লিপ্ত হয়।

৫. সপ্তদশ শতকে ইউরোপে যুদ্ধ বিদ্রোহ

সপ্তদশ শতকের সামাজিক অস্থিরতা ও অর্থনৈতিক সংকটে সবচেয়ে বড় কারণ হল আধুনিক স্বৈরাচারী রাষ্ট্র ছিল আসলে যুদ্ধ রাষ্ট্র। পর্তুগাল, সুইডেন, ডেনমার্ক, আয়ারল্যান্ড, মেক্সিকো। মধ্য ইউরোপ ও ফ্রান্স ধরণটি ছিল এক রকমের ৩০বছরের যুদ্ধ মধ্যইউরোপের অর্থনৈতিক ক্ষয়ক্ষতির জন্য দায়ী ছিল। ইংল্যান্ড, ফ্রান্স, স্পেন অভ্যন্তরীণ দ্বন্দ্ব অর্থনৈতিক সংকট

স্পেনের রাজারা প্রচুর ঋণ করেছিল কিন্তু সেইসব মূলধন উৎপাদনশীল কাজে নিয়োগ করা সম্ভব হয়নি। ইংল্যান্ড, সুইডেন অভিযাতরা সরকারের উচ্চপদ, জমি, সুযোগ-সুবিধা নিয়ে দ্বন্দ্বে লিপ্ত ছিল। রাজার নতুন নতুন কর স্থাপন করলে কৃষকরা বিদ্রোহী হয়ে ওঠে।

৬.সপ্তদশ শতকের স্পেনের বিদ্রোহ

উপসংহার- সপ্তদশ শতকের সংকট বৌদ্ধিক এবং মানসিকও ছিল। ধর্মরাজতান্ত্রিক শোষণের বিরুদ্ধে জনগণ বিরোধিতা করেছিল।

৭.সপ্তদশ শতকে শহরে অগ্নিকাণ্ড

ইংল্যান্ডের পিউরিটানরা অ্যালিকান চার্চের বিরুদ্ধে প্রতিবাদ জানিয়েছিল। ফ্রান্স ও জার্মানিতে ধর্ম দ্বন্দ্ব রাজনৈতিক অশান্তির ধর্ম সংকটের সৃষ্টি করে। এইভাবে সপ্তদশ শতকের ইউরোপের সর্বত্র যে সংকট দেখা যায় তা শুধু রাজনৈতিক বা অর্থনৈতিক নয় সামাজিক ও ধর্মীয় ইত্যাদি কারণেও সংকট দেখা দেয়। এর সঙ্গে যুদ্ধ, মহামারী, দূর্ভিক্ষ মা সংকটে

শক্তিশালী করে তুলেছিল।

গ্রন্থ তালিকা– মুখোপাধ্যায় সুবোধ কুমার

"আধুনিক ইউরোপের আদিপর্বের রূপান্তর"

কে পি বাগচী অ্যান্ড কোম্পানী

কলকাতা

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চক্রবর্তী ভাস্কর ,চক্রবর্তী সুভাষ রঞ্জন, চট্টোপাধ্যায় কিংশুক

"ইউরোপের যুগান্তর"

নবভারতী প্রকাশনী

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Proto-Industrialization in Early Modern Europe

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Index

Proto-Industrialization

For about a decade a new word has been rattling around in the corridors of economic history. Responsibility for the innovation seems to rest with Franklin Mendels, who publicized it in an article in the *Journal of Economic History* in 1972. The word was “Proto-Industrialization” and its intellectual appeal was such that it was popping up in sundry books and articles. Proto-industries arose in almost every part of Europe in the two or three centuries before industrialization and research on them encompasses almost every aspect of early modern European life.

Proto-Industrialization is the name given to the expansion of domestic industries producing goods for non-local markets which took place in many parts of Europe between the 16th and the 19th centuries. Often, although not always, such industries arouse in the countryside where they were practiced alongside agriculture; usually, they expanded without adopting advanced technology or centralizing workers into factories. This widespread industrial growth in early modern Europe has long been a subject of specialized study. The concept of proto industrialization became an influential one in economic history in the 1970s and 1980s. Peter Kriedte, Hans Medric, and Jurgen Schlumbohm's “*Industrialization Before Industrialization”* provided an extensive historical and theoretical treatment of the phenomenon in 1977, "It has been long known that industrial commodity production in the countryside for large inter-regional and international markets was of considerable importance during the formative period of capitalism." In other words, quickening demand beyond the immediate vicinity of production, and even overseas, what's the fundamental stimulus for expanded production.

Production was organized in cottage workshops, and the primary unit of production was the household. Merchants distributed raw materials like wool or flax (for making linen) to peasants. Men and women would spin the raw material into yarn, and merchants would then put the yarn out to weavers working looms in their cottages to produce cloth. Merchants would then distribute the cloth to other cottage workers for bleaching and dyeing and collect it a final time for sale to a wholesaler in a near or distant city. The peasant workers were paid piece rates. This type of rural manufacturing, sometimes called "the putting-out system," existed at least from the sixteenth century, notably in the Netherlands, as merchants sought cheaper labor than what was available in towns, where cloth workers were well organized to defend their economic interests.

Peter Kriedte explained the regional pattern of emergence of proto-industrialization in terms of the different forms of power possessed by lords in different parts of Europe: “The power-constellations and their impact on the spatial expansion of industrial commodity production were different in east-central and eastern Europe. Peasants were more directly and more firmly dominated by their lords, and there was little room for the development of rural industries.... But whether a region developed rural industries or not was determined not so much

by the extent of feudal charges as by the form in which peasants paid them. And the form of payment was determined not only by the social relationship in the narrow sense between the feudal lord and his dependent peasants but also by the overall relations of production." This argument is similar to that offered by Robert Brenner in his explanation of different courses that agricultural development took in different parts of Europe.

The first regions of relatively dense rural industry had developed in England, the southern Low Countries, and southern Germany in the late Middle Ages. The decisive thrust which brought about the phase of proto-industrialization came at the end of the sixteenth and in the seventeenth centuries. Generally speaking, a region that has made the transition to commercial agriculture is barren soil for rural manufacturing, for the simple reason that commercial farmers earn a sufficient income through farming. When proto-industrialization gained a foothold in a region of commercial agriculture special circumstances are usually responsible. First of all, commercial agriculture, generally, could only develop in a highly urbanized region. The concentrated demand of a large town or a whole network of towns was necessary in order to induce the self-sufficient peasant family holding to enter on the path of specialization.

Hans Medick emphasizes the micro-side of the equation -- the economics of the peasant household in the late Middle Ages. "The central feature of the 'rationality' underlying the family economy is the fact that its productive activity was not governed primarily by the objective of maximizing profit and achieving a monetary surplus. The maximization of the gross produce rather than the net profit is the goal of family labour." In the sense described by Chayanov -- use of family labor to the point approaching a marginal product of zero (The Theory of Peasant Economy). Under these circumstances, it is economically rational to expend some family labor on sideline manufacturing if there is some income associated with this activity -- no matter how low the wage.

Proto-industrialization is described as transitional because its economic possibility was created by the political situation of feudal cities -- specialized manufacture in cities under a regulated guild system, self-production in the countryside. And, it is sometimes claimed, proto-industrialization prepared the ground for a full modern system of capitalist industry. But it is also possible that proto-industrialization was an alternative to capitalist development -- a cousin rather than a grandparent.

The proto-industrialization was a situation that was highly profitable for the merchant. As the peasants lived off their lands, the production cost for the merchant was minimal. Also as the peasants lived scattered all over Europe he was incapable of neither selling directly in the market nor organizing protests for better pay and conditions. As for the peasants the situation further freed them from feudal control and provided them with additional sources of income. However, scholars agree that the process suffered from inherent contradictions which eventually paved the way for the industrial processes of the 19th century. Mendels argues that a region experiencing proto-industrialization will soon begin to encounter diminishing returns as dispersed industries

create difficulties in collection of output and the control of quality. This eventually would lead the merchants to concentrate labour in workshops. He would extend his control over the means of production and group workers in ‘manufactories’ where he could combine under one roof several stages of production. Wage work became much more common than it had been in the old textile towns, and the separation of capital and labour was becoming more marked.

Proto-industrialization had important economic ramifications. It strengthened marketing networks and contributed to the accumulation of profit to entrepreneurial merchants who in turn sought further outlets for reinvestment. Moreover, because workers were paid cash for their products, they became increasingly integrated into a cash and wage-based manufacturing economy. Each of these factors further prepared Europe to make the leap into industrialization.

Contributing to the expansion of proto-industrialization in the eighteenth century were population growth and an increased and better supply of food as more rural workers became available, and expanding commercial farming provided markets with food for them. Proto-industry employed far more people than the traditional cottage industry had, and in some areas peasants gave up farming entirely and became dependent upon "wages" paid by urban merchants. In some rural regions, a majority of the population worked for urban merchants.

As proto-industrialization advanced, more peasants were driven into poverty, and landless peasants were more inclined to work for low wages than urban artisans. Merchants, driven by increasing competition in the market and the capitalistic motive to maximize profit by minimizing costs, exploited this source of cheap, unorganized labor. Some Marxist historians refer to this process as Proletarianization, referring to the transformation of once independent farmer manufacturers into a class of property-less, impoverished wageworkers totally reliant upon the merchant-capitalist—and the vagaries of demand in distant markets—for their livelihood. Such developments had deep social, even demographic consequences.

A Theory of Economic Development

Proto-industrialization describes a historical process, but it also refers to a theory of economic development first advanced by Franklin Mendels in a seminal article in 1972. This theory, subsequently championed by such historians as Peter Kriedte, Hans Medick, and Jürgen Schlumbohm, argues that proto-industrialization had a direct and causal relation to the emergence of factory production, assumed to be the key characteristic of the industrial revolution. This complex shift from crafts to industrial production stretched from the 12th to the industrial revolution. The rate of change varied enormously from industry to industry, from region to region and from period to period. In England, for e.g., as the laws of the family economy functioned as the engine of proto-industrial growth, they also stood in the way of growth in the overall system. The only way out of the crisis was mechanisation along with centralisation leading to industrial revolution as the scattered proto-industrial structure lacked control and supervision.

Mendels argues that proto-industrialisation enabled the accumulation of capital for these workshops as well as introduction of machines. Proto-Industrialisation would also lead to accumulation of technical knowledge as a result of the merchant's experience with inter-regional and international trade. In this way it provided a training ground in which the early industrialists were recruited. Moreover, it focuses almost exclusively upon the woolen, linen, and cotton industries. Empirical studies confirm, as the theory attests, that the first factories were in the countryside and often concentrated the decentralized cottage production in a single building. It is also true that in some areas proto-industrial merchants acquired substantial resources which they later invested in the building of new machines and factories. One can plausibly draw the conclusion, as the proponents of the theory of proto-industrialization have, that cottage manufacturing in both its small traditional form and as proto-industrialization was eventually replaced by factory production. And, of course, it is well known that the cotton industry was the leader in factory-based industrial development.

The theory of proto-industrialization has as many critics as champions, however, among the earliest being Maxine Berg, Pat Hudson, and Michael Sonenscher. Recent research has demonstrated that industrialization was a slow and protracted process, certainly not complete by 1800, that it did not occur exclusively or even primarily in the countryside, and that it had multiple causes. Moreover, historians are much more inclined today to see the connections between proto-industry and factory production as more geographically limited than the theory originally asserted. Furthermore, studies of the economic functions of cities have shown that, contrary to the assumptions of the theory, cities and towns were not just centers of trade and finance, but were in fact also important manufacturing centers where productive artisans engaged in myriad industrial activities (increasingly supplementing their manual labor with mechanized

sources of power as the nineteenth century unfolded), few of which were organized in proto-industrial fashion and even fewer of which evolved into factories.

Perhaps the weakest feature of the theory of proto-industrialization is its overemphasis on the factory in the emergence of industrialism. Research in the last ten years, points out that, it was only in the second half of the nineteenth century that factory production in textiles truly came to dominate, largely as a result of the widespread installation of power looms. In 1841 in England, for example, scarcely more than half (53 percent) of all cotton workers were employed in factories.

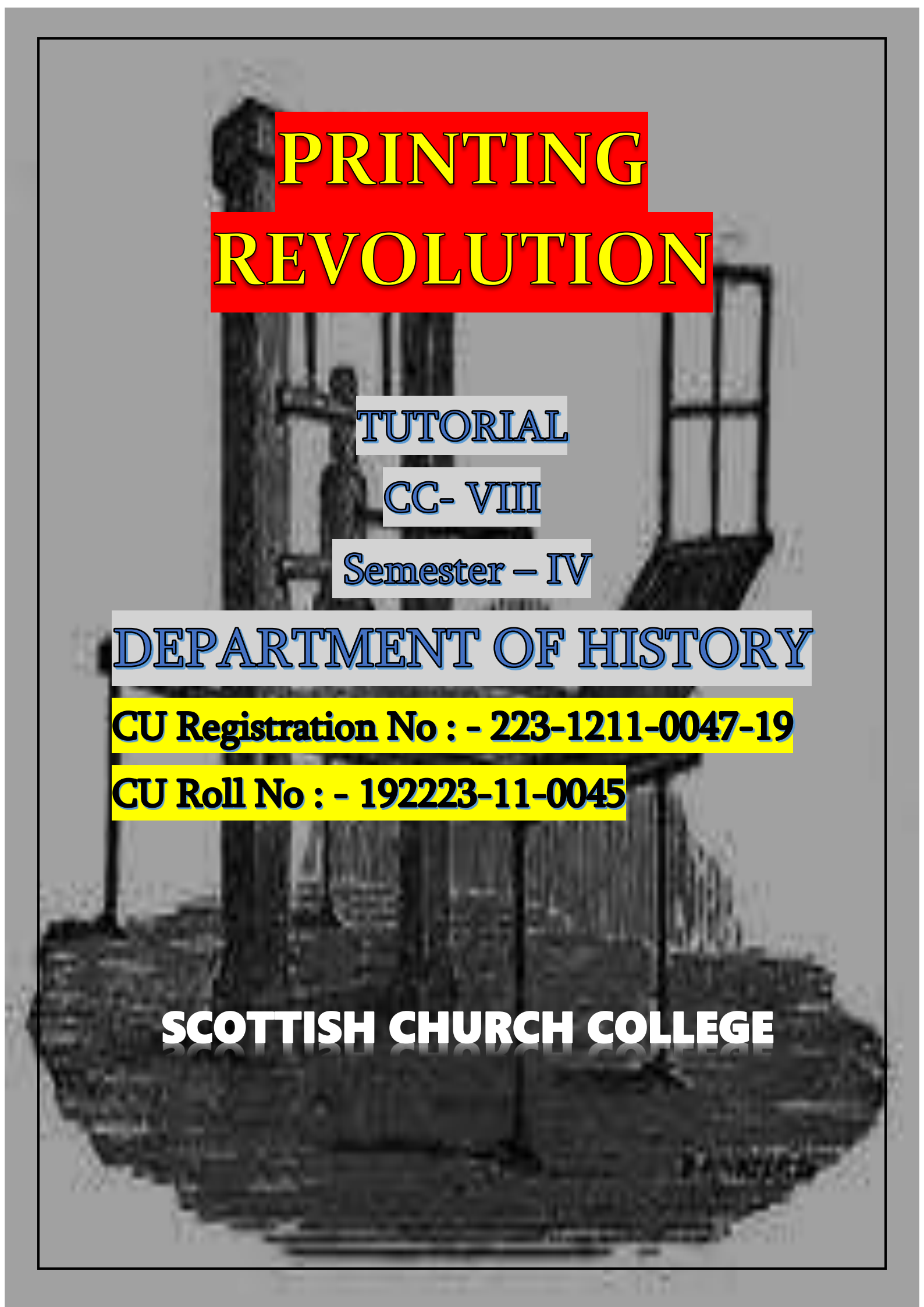
Recent empirical studies have prompted historians to conclude that there were many roads to industrialization, proto-industry and factory production in the countryside being but one, textiles being an important but certainly not the only industry. In fact, much industrialization occurred outside of the factory, notably in metal smelting and mining. A theory like protoindustrialization, therefore, is not so much wrong as limited in its applicability. Indeed, there were many areas of Europe where proto-industries thrived yet did not evolve into factories, nor did these areas sink into "deindustrialized" backwaters, the only two trajectories entertained by the theory of proto-industrialization. Even as some textile manufacturing moved into factories, out-work or cottage work expanded as manufacturers sent work home to be done by workers' families. This was particularly the case in the garment industry, where women did fine needlework and cloth finishing in their homes. Moreover, many other industries besides textiles were proto-industrialized (notably in metal ware production), and continued to thrive throughout much of the nineteenth century, even as factory-based industrialization took hold. Indeed, as late as 1851 in England, only 5 percent of the overall industrial workforce worked in factories. Artisanal workshops in the countryside continued to exist and even expand, often as ancillary businesses supplementing the work being done in factories. Skilled machinists and tool and die makers, necessary for the functioning of the machines in the factories, are an illustrative case in point.

Conclusion

Proto-industrialization is a significant historical phenomenon, we might say, because it represented a large and marked change in the organization and volume of production of goods from the medieval period to the early modern period. Towns and cities were already economically active locations, representing both concentrated demand and concentrated production. But the rural population was almost entirely involved in farming and sideline production for home use. The emergence of a significant level of production in rural hinterlands was a shift, and so it is worth asking why this change occurred in the circumstances in which it did. The change dynamics Kriedte, Medick, and Schlumbohm describe include population change; urban economic regulations; incentives for feudal rights-holders to transition to cash obligations; and the existence of inter-regional trade and markets that extend beyond the local village.

References

1) Coleman, D. C. "Proto-Industrialization: A Concept Too Many." *The Economic History Review*, New Series, 36, no. 3 (1983): 435-48. Accessed July 2, 2021. Doi: 10.2307/2594975.
2) Ogilvie, Sheilagh C. “Proto-Industrialization in Europe.” *Continuity and Change 8*, no. 2 (1993): 159–79. Doi: 10.1017/S0268416000002058. Accessed July 2, 2021.
3) Little, D. “Proto-industrialization.” *Understanding Society*. (2010). https://understandingsociety.blogspot.com. Accessed July 5, 2021.
4) "Proto-Industry." Europe, 1450 to 1789: Encyclopedia of the Early Modern World. . Encyclopedia.com. https://www.encyclopedia.com/history/encyclopedias-almanacs-transcripts-and-maps/proto-industry. Accessed July 16, 2021.
5) Kriedte, Peter, Hans Medick, and Jürgen Schlumbohm. *Industrialization before Industrialization: Rural Industry in the Genesis of Capitalism*. Translated by Beate Schempp. Cambridge, U.K., and New York, 1981.



PRINTING REVOLUTION

TUTORIAL

CC- VIII

Semester – IV

DEPARTMENT OF HISTORY

CU Registration No : - 223-1211-0047-19

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SCOTTISH CHURCH COLLEGE

CONTENTS

Acknowledgement

During the course of this assignment, I had to take assistance from various sources and various persons to whom I convey my heartfelt gratitude. Firstly, I would like to extend my sincere thanks to our professors of Department of History, for providing me this opportunity to carry out this assignment. This initiative has helped me learn new elements of historical research more vividly. Secondly I am also thankful to my parents and friends for helping to complete this assignment within the limited time frame.

INTRODUCTION

The arrival of mechanical movable type printing introduced the era of mass communication which permanently altered the structure of society. A printing press is any form of technology that applies pressure between an inked surface and a print medium (like paper or cloth). In this sense, it is a means of transferring ink from an inked surface and the medium. It was an enormous improvement on previous methodologies, like transcribing by hand using a 'pen' and ink or brushing and rubbing repeatedly to achieve ink transfer.

Fig – 1: - Printing Press

Source- https://bit.ly/3BKrH7a

Fig – 2: - Xylography

Source- https://bit.ly/3kSS6cW

Marshall McLuhan rightly notes that the shift from predominantly oral culture to print culture also affected the nature of human consciousness in that print represented an abstraction of thought which gave precedence to linearity, continuity and homogeneity. This mode of thinking is very much evident not only in rationalist philosophy, realistic fiction, but also in the rise of scientific materialism in the

following centuries. The relatively unrestricted circulation of information and revolutionary ideas transcended borders. It ushered in the era of modern Europe by making both ancient and medieval texts available to a broader audience which produced a fertile ground for new ideas and new theories.

ORIGIN

The concept of paper and ink first came in China. Two Chinese inventions, block printing and paper are linked with the beginning of typographic printing in Western Europe. In 8th century CE, China during the Tang dynasty introduced wooden block printing or xylography. The Arabs traders being the trading explorers used to trade all over Asia, Europe and went to China and witnessed it. Thus, carried forwarded the technology to Europe.

Fig – 3: - Origin of the Printing Press

Source - https://bit.ly/3kYvN5G

If something has an active role in the transition of Europe from medieval age to modern period then this is undoubtedly Printing Revolution. Eugene F. Rice and Anthony Grafton in "The Foundation of Early Modern Europe 1460-1559" argued that though the invention of the Printing press was successfully completed by Mainz printers in the 1450's, it had important earlier beginnings.

MANUFACTURERS OF THE PRINTING PRESS

In 1450, in Germany's Mainz, Johannes Gutenberg, his colleague: Johannes Fust and also the son in law of Fust: Peter Schoffer established a printing press.

This change with the onset of printing revolution is the transition of Europe. Gutenberg introduce the moveable metal printing method replacing the wooden block method.

Fig – 4: - Johannes Gutenberg

Source - https://bit.ly/3i7LWnz

Fig – 5: - Johannes Fust

Source - https://bit.ly/3BKt1Hd

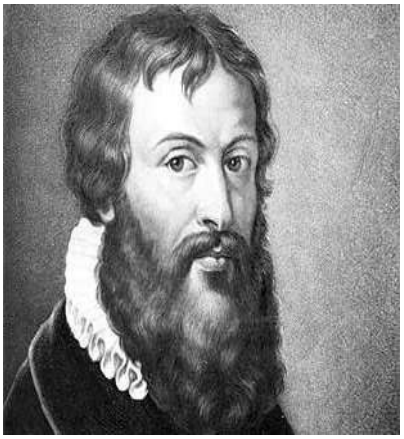


Fig – 6: - Peter Schoffer

Source - https://bit.ly/3x6LiL5

EVOLUTION OF PRINTING PRESS

Previously there were manuscripts which was hand written and were very expensive. Also took a lot of time to be completed. It was not available to everyone and the common people did not have an access of it. It was confined to only the church authorities, papacy and royal library. So, knowledge was limited. With the onset of renaissance there was also the emergence of merchant class. But this period witnessed the text written which were confined only to religion but except religion the other copies were overruled and no other books except the religious book were available. So, there was a demand but no supply. Historians considered printing as an only a new and particular kind of writing. Schoffer coined it as 'the art of writing without pen'. The printing of books has been regarded as watershed in history.

Erasmus called printing the greatest of all discoveries. Lucien Febvre and Henri Jean Martin in "The Coming of the Book mention that at the initial period printers were planning trade outlets in university towns; Fust and Schoffer were supplying books for sale in Frankfurt, Lubeck, Angers and were about to open a bookshop in Paris. From 1460-70 printing expanded markedly and the trade improved its organization in Germany. By 1480 printing presses were in operation in more than 110 towns throughout Western Europe. From that it may be said of Europe that the printed books were in universal use. No fewer than 236 towns had

seen printing presses installed by 1500. Rice and Grafton point out that by 1500 printers concentrated in places like Mainz, Strasbourg, Nuremberg, Augsburg, Basle, Venice, Rome, Paris or Lyons where venture capital could be found, patrons sought and contracts negotiated. The immediate effect of printing was to further increase the circulation of those works which had already enjoyed success in manuscripts. Euan Cameron states that the printing press evolved as a practical solution to a practical problem.

PRINTING PRESS IN RENAISSANCE

In 14th century there was an emergence of renaissance in Europe. The concept of individualism, secular ideologies, scientific discoveries were carried out but the urge to publish was not possible without the printing press. During this time there are many universities set up in France, Germany and England. But as there were previously no paper, studying was very problematic. So, printing press solve this problem.

THE REVOLUTIONARY ROLE OF THE PRINTING REVOLUTION

The printing press played a vital role in the spread of the new learning. The introduction of printing provided a practical way to produce books. The printing presses became

important vehicles of cultural exchange and communication. Elizabeth L. Eisenstein in "The Printing Revolution in Modern Europe" argues that the advent of printing entailed a 'communication revolution'.

Printing Revolution broke the notion of limited books and numerous books were published. So, the monopoly of the church and royal authority was lost. Now, the printing press published books at cheaper rates and the books were also very quickly published. Common people read the Bible in vernacular which resulted in the loss of prestige and influence of the papacy, church and clergy. Will Durant states the printing ended the clerical monopoly of learning and the priestly control of education. Earlier any writing which was against the Christian authority, they were damaged and it was not possible to rewrite them by gathering more parchment. Religious authorities became aware and common people could challenge the church authority.

Fig – 7: - Revolutionary Role of the Printing Press

Source - https://bit.ly/3x0qvJe

If a bible was to be published in the parchment 300 sheeps and 140 cuffs were slaughtered and their skin was used. Instead the paper was cheap and only 1/6th of the cost of parchment was the cost of the paper. Thus, animal slaughter was stopped.

Manuscripts were decorated and written consuming a huge amount of time but with the printing press the time consumed in the publishing process was reduced. No manuscript could be preserved for long without undergoing corruption by copyists and even this sort of 'preservation' rested precariously on the shifting demands of local elites.

After the advent of printing, preservation could be archived by using abundant supplies of paper.
Rice and Grafton argue that the influence of printing on scholarship was most striking in the years before the Reformation as notion of individualism and practicality emerged. Unlike manuscripts, printed books were comparatively faultless, free from errors. Whereas any mistake in a parchment was not possible to be corrected but now with the printing revolution the mistakes could be corrected.

Printing not only made scholarship fuller and more accurate, it also made it less difficult to acquire. Because of the greater standardization of print, learning to read was easier. It lessened the burden on the mind of man; many things could be obtained from books. Thus, printing freed the memory.

SIGNIFICANCE OF PRINTING

Printing gave scholars all over Europe identical texts to work on. Scholars in diverse countries could work with one another by references to specific pages of specific editions. It encouraged the development of an extensive 'scientific' literature written in the vernacular and intended for a mass market. Like when scientific revolution and the geographical discoveries happened, due to availability of books it reached to all common people. It turned intellectual work as a whole into a cooperative enterprise instead of a solitary human activity. Eugene F. Rice compared the printing revolution with the discovery of a computer as i just like a computer it spreads the knowledge. In Europe literacy rate was increased.

Earlier Medieval latin was used in all the writings and by the advent of printing revolution, this monopoly of the latin was broken. As the common people could easily assess it, the regional languages were introduced.

Alison Brown in her "The Renaissance' argues that printing was important because it helped to diffuse Renaissance ideas by making books available to all.

Febvre and Martin criticize the notion that the Reformation was the child of the printing press. But they argue that books played a critical role in the development of Protestantism in the 16th century.

From 1517 to 1520, 30 books were written by Martin Luther (Father of Reformation) and 300000 copies were sold. Due to the emergence of the 'merchant class' the industry

developed which dealt with books and earned profit out of it. Febvre and Martin state that the reading public wanted to start their own private libraries grew in the 16th century and the number of books in these private libraries rose steadily. It may be stated that with the advent of printing publishing became a new profession in society and the day of preachers were gone. Copyists protested that printing would destroy their means of livelihood. Aristocrats opposed it as a mechanical vulgarization, and feared that it would lessen the value of their manuscript libraries, statesmen and clergy distrusted it as a possible vehicle of subversive ideas. But despite this opposition printing made it triumph nevertheless.

CONCLUSION

Printing virtually marked the end of medieval cultural life and ushered in the 'Modern Era in Europe.'

Printing revolution made possible the scientific Revolution, Renaissance. In the book" New Cambridge Modern History", it is said that steam engine was mobilised by the industrial revolution. So, likely Printing revolution mobilised Europe towards rationality, modernism and practicality.

Fig- 8: - Printing Revolution shaped the future

Source - https://bit.ly/2Vbly38

BIBLIOGRAPHY

1. Du Plessis, Robert S. Transitions to Capitalism in Early Modern Europe: Economies in the Era of Early Globalization, C. 1450 - C. 1820. United Kingdom: Cambridge University Press, 2019.

2. Eisenstein, Elizabeth L. The Printing Revolution in Early Modern Europe. United Kingdom: Cambridge University Press, 2012.

3. Grafton, Anthony., Rice, Eugene F.. The Foundations of Early Modern Europe, 1460-1559. United Kingdom: W.W. Norton, 1994.

4. Phukan, Meenaxi. Rise of the Modern West. India: Macmillan Publishers India Limited, 2000.

5. Sinha, Arvind. Europe in Transition: From Feudalism to Industrialization. India: Manohar Publishers & Distributors, 2010.

6. https://courses.lumenlearning.com/suny-hccc-worldhistory/chapter/the-printing-revolution/

   Cited on- 14/7/21

7. https://www.worldhistory.org/article/1632/the-printing-revolution-in-renaissance-europe/

   Cited on- 15/7/21

8. https://www.google.com/amp/s/www.history.com/.amp/news/printing-press-renaissance

Cited on- 16/7/21

9. https://www.google.com/amp/s/amp.interestingengineering.com/the-invention-and-history-of-the-printing-press

Cited on- 14/7/21

10. https://study.com/academy/lesson/how-the-printing-press-changed-the-world.html

Cited on- 13/7/21

11. https://www.psprint.com/resources/printing-press/

Cited on- 12/7/21

PICTURE REFERENCES

1. Printing Press
Source- https://bit.ly/3BKrH7a
Cited On – 19/07/21

2. Xylography
Source- https://bit.ly/3BKrH7a
Cited On – 19/07/21

3. Origin of the Printing Press
   Source - https://bit.ly/3kYvN5G
   Cited On – 21/07/21

4. Johannes Gutenberg
   Source - https://bit.ly/3i7LWnz
   Cited On – 22/07/21

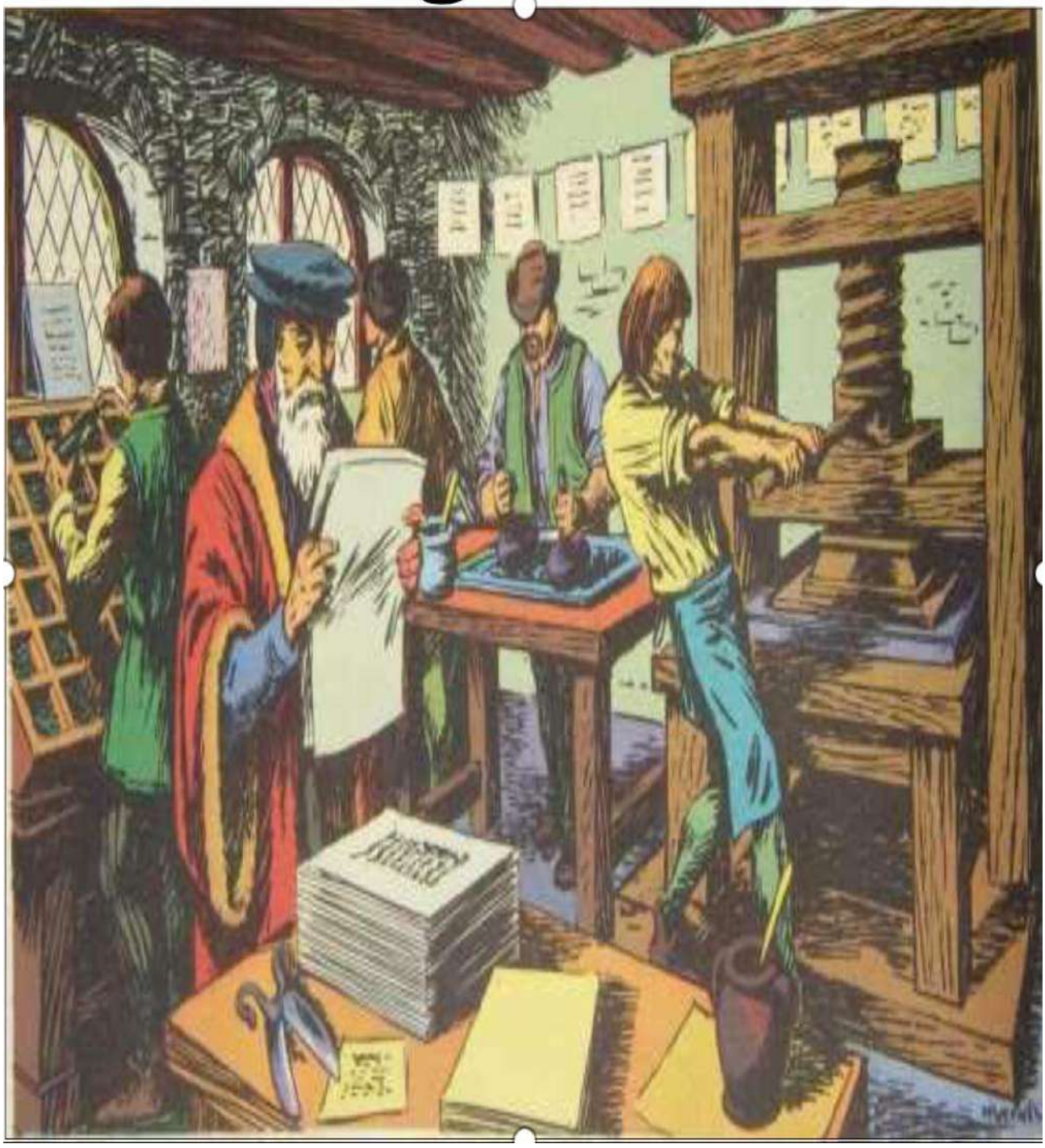
5. Johannes Fust
   Source - https://bit.ly/3BKt1Hd
   Cited On – 23/07/21

6. Peter Schoffer
   Source - https://bit.ly/3x6LiL5
   Cited On – 22/07/21

7. Revolutionary Role of the Printing Press
   Source - https://bit.ly/3x0qvJe
   Cited On – 23/07/21

8. Printing Revolution shaped the future
   Source - https://bit.ly/2Vbly38
   Cited On – 22/07/21

Printing Revolution



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Semester- **IV**

Paper name- **CC8**

- **Introduction**
- **The impact of the printing press in Europe**
- **Johannes Gutenberg**
- **Printed Matter**
- **The Spread of Information**
- **A Booming Industry**
- **Conclusion**
- **Bibliography**

Introduction- **The arrival in Europe of the printing press with moveable metal type in the 1450s CE was an event which had enormous and long-lasting consequences. The German printer Johannes Gutenberg (c. 1398-1468 CE) is widely credited with the innovation and he famously printed an edition of the Bible in 1456 CE. Beginning with religious works and textbooks, soon presses were churning out all manner of texts from Reformation pamphlets to romantic novels. The number of books greatly increased, their cost diminished and so more people read than ever before. Ideas were transmitted across Europe as scholars published their own works, commentaries on ancient texts, and criticism of each other. Authorities like the Catholic Church took exception to some books and censored or even burned them, but the public's attitude to books and reading was by then already changed forever.**

The impact of the printing press in Europe:-

- **A huge increase in the volume of books produced compared to handmade works.**
- **An increase in the access to books in terms of physical availability and lower cost.**
- **More authors were published, including unknown writers.**
- **A successful author could now earn a living solely through writing.**
- **An increase in the use and standardisation of the vernacular as opposed to Latin in books.**
- **An increase in literacy rates.**
- **The rapid spread of ideas concerning religion, history, science, poetry, art, and daily life.**
- **An increase in the accuracy of ancient canonical texts.**
- **Movements could now be easily organised by leaders who had no physical contact with their followers.**
- **The creation of public libraries.**
- **The censorship of books by concerned authorities.**

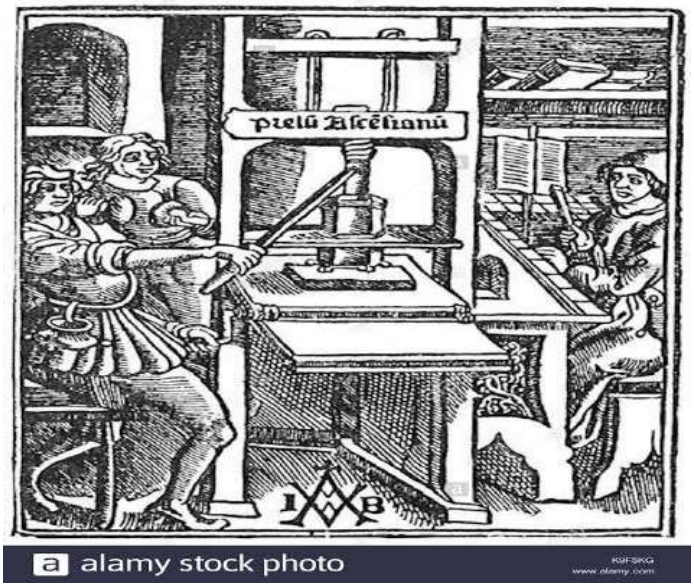
Johannes Gutenberg:- **Gutenberg began his printing experiments sometime in the 1440s CE, and he was able to establish his printing firm in Mainz in 1450 CE. Gutenberg's printer used Gothic script letters. Each letter was made on a metal block by engraving it into the base of a copper mould and then filling the mould with molten metal. Individual blocks were arranged in a frame to create a text and then covered in a viscous ink. Next, a sheet of paper, at that time made from old linen and rags, was mechanically pressed onto the metal blocks. Gutenberg's success in putting all these elements together is indicated by his printed edition of the Latin Bible in 1456 CE.**

Gutenberg and invention of the printing press

Image source-
https://images.app.goo.gl/jRPkUfEhsJmUZGez5

Printed Matter:- There was already a well-established demand for books from the clergy and the many new universities and grammar schools which had sprung up across Europe in the late medieval period. Indeed, traditional book-makers had struggled to keep up with demand in the first half of the 15th century CE, with quality often being compromised. This demand for religious material, in particular, was one of the main driving forces behind the invention of the printing press. Scholars had access to manuscripts in private and monastic libraries, but even they struggled to find copies of many texts, and they often had to travel far and wide to get access to them. Consequently, religious works and textbooks for study would dominate the printing presses throughout the 15th century CE. It is important to remember, though, that handmade books continued to be produced long after the printing press had arrived and, as with many new technologies, there were people still convinced that the flimsy printed

book would never really catch on. The availability of things to read for people in general massively increased thanks to printing. Previously, the opportunity to read anything at all was rather limited. Ordinary folks often had little more than church notice boards to read. The printing press offered all sorts of new and exciting possibilities such as informative pamphlets, travel guides, collections of poems, romantic novels, histories of art and architecture, cooking and medicinal recipes, maps, posters, cartoons, and sheet music. Printed books were themselves a catalyst for literacy as works were produced that could be used to teach people how to read and write. At the end of the medieval period still only 1 in 10 people at most were able to read extended texts. With the arrival of the printing press, this figure would never be as low again.



Printing Press

Image source-

https://images.app.goo.gl/Uyyk9ZtY3EAVacbu8

The Spread of Information:- Soon, a new boost to the quantity of printed material came with the rise of the humanist movement and its interest in reviving literature from ancient Greece and Rome. Two printers, in particular, profited from this new demand: the Frenchman Nicholas Jensen (1420-1480 CE) and the Italian Aldus Manutius (c. 1452-1515 CE). Jensen innovated with new typefaces in his printing shop in

Venice, including the easy-to-read roman type (littera antiqua/lettera antica) and a Greek font which imitated manuscript texts. Jensen printed over 70 books in the 1470s CE, including Pliny's Natural History in 1472 CE. Some of these books had illustrations and decorations added by hand to recapture the quality of older, entirely handmade books.

Meanwhile Manutius, also operating in Venice, specialised in smaller pocket editions of classical texts and contemporary humanist authors. By 1515 CE, all major classical writers were available in print, most in multiple editions and many as collections of complete works. In addition, printed classical texts with identical multiple copies in the hands of scholars across Europe could now be easily checked for accuracy against source manuscripts. Handmade books had often perpetuated errors, omissions, and additions made by individual copyists over centuries, but now, gradually, definitive editions of classical works could be realised which were as close as possible to the ancient original. In short, printed works became both the cause and fruit of an international collective

scholarship, a phenomenon which would reap rewards in many other areas from astronomy to zoology.

There was, too, a drive to print more books thanks to the Reformists who began to question the Catholic Church's interpretation of the Bible and its stranglehold on how Christians should think and worship. The Bible was one of the priorities to have translated into vernacular languages, for example German (1466 CE), Italian (1471 CE), Dutch (1477 CE), Catalan (1478 CE), and Czech (1488 CE). Reformists and humanists wrote commentaries on primary sources and argued with each other in print, thereby establishing an invisible web of knowledge and scholarship across Europe. Even the letters written between these scholars were published. As religious and academic issues raged, so the debating scholars fuelled the production of yet more printed works in a perpetuating cycle of the printed word. Ordinary folks, too, were roused by arguments presented in printed materials so that groups of like-minded individuals were able to quickly spread their ideas and organise mass movements across multiple cities such as during the German Peasants' War of 1525 CE.

There were, too, plenty of works for non-scholars. As more people began to read, so more collections of poems, novellas, and romances were printed, establishing Europe-wide trends in literature. These secular works were often written in the vernacular and not the Latin scholars then preferred. Finally, many books included a number of woodcut engravings to illustrate the text. Collections of fine prints of famous paintings, sculptures, and frescoes became very popular and helped to spread ideas in art across countries so that a painter like Albrecht Dürer (1471-1528 CE) in Germany could see what Raphael (1483-1520 CE) was up to in Italy.

A Booming Industry- As a consequence of all this demand, those printers who had survived the difficult early years were now booming. Cities across Europe began to boast their own printing firms. Places like Venice, Paris, Rome, Florence, Milan, Basel, Frankfurt, and Valencia all had well-established trade connections (important to import paper and export the final product) and so they became excellent places to produce printed material. Some of these publishers

are still around today, notably the Italian company Giunti. Each year, major cities were producing 2-3,000 books every year. In the first decade of the 1500s CE, it is estimated 2 million books were printed in Europe, up to 20 million by 1550 CE, and around 150 million by 1600 CE. There were over half a million works by the Reformist Martin Luther (1483-1546 CE) printed between 1516 and 1521 CE alone. Into the 16th century CE, even small towns now had their own printing press.

Besides established authors, many publishers helped new authors print their works at a loss in the hope that a lucrative reprint run would finally bring in a profit. The typical print run for a first edition was around 1,000 copies although this depended on the quality of the book as editions ranged from rough paper pocket-sizes to large vellum (calfskin) folio editions for the connoisseur.

As readers accumulated their books and built up impressive private collections, so many bequeathed these to their city when they died. In this way, within

50 years of the printing press invention, public libraries were formed across Europe.

An early-modern bookwheel, used to display several open books at once. (Jagiellonian University Museum Krakow, Poland)

Image source-

https://images.app.goo.gl/TEGhn8SavvgBAkCQ6

Conclusion

The printing press enabled a large number of socioeconomic, religious, scientific, and cultural changes to take place in the medieval world, whose effects are felt to date. Even though the Renaissance began much before the printing press was invented, the press provided a significant impetus to the Renaissance, notably also hastening the propagation of new ideas. The printing press democratized access to the written word, and in order to appeal to the masses, printing was started in vernacular languages instead of Latin, thus standardizing them, and giving birth to the languages used today.

BIBLIOGRAPHY

Blockmans, Wim & Hoppenbrouwers, Peter. Introduction to Medieval Europe 300–1500. Routledge, 2017.

Campbell, Gordon. The Oxford Illustrated History of the Renaissance. Oxford University Press, 2019.

Eugene F. Rice Jr. & Anthony Grafton. The Foundations of Early Modern Europe, 1460-1559. W. W. Norton & Company, 1994.

Holmes, George. The Oxford History Of Medieval Europe. Oxford University Press, U.S.A., 2001.

Gutenberg and invention of the printing press illustration:-
https://images.app.goo.gl/jRPkUfEhsJmUZGez5

Printing Press illustration:-
https://images.app.goo.gl/Uyyk9ZtY3EAVacbu8

An early-modern bookwheel, used to display several open books at once. (Jagiellonian University Museum Krakow, Poland) illustration:-
https://images.app.goo.gl/TEGhn8SavvgBAkCQ6

University of Calcutta

17th Century Crisis in Europe: Major Causes

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Index

The objective of the paper

As historians and scholars, fail to reach a general consensus on the causes for the crisis in Europe in the seventeenth century, we cannot pinpoint any particular crisis and its associated development, deprivation and devastation, and extract a timeline for the other events that took place throughout the century. The best way to approach the understanding of the crisis, despite the absence of a mainstream timeline in which the events unfolded, is to sort them under the nature of the conflicts and work our way through the causes and their effects. As we explore the effects, we can establish that the events despite being considered isolated from each other, the devastation they unfolded was rather universal and affected every European life. In the expanse of this paper, we shall discuss the **major** causes of the crisis in Europe in the seventeenth century, with the devastation it unfolded on the European states.

Introduction

There is no general consensus among the body of historians and scholars on the crisis in Europe in the seventeenth century. This stark difference from the various bodies of historians and scholars reflect on the belonging and inclinations from various schools of historical thoughts, profoundly based on ideology on political and economical issues. It is generally of no help considering each development isolated from the other as that benefits the nations and their associated misdoings. The crisis in Europe in the seventeenth century was not a local development. Rather it plunged Europe into a deep-seated crisis that haunted the people till the end of the eighteenth century. The pathway of recovery was not short, rather comprised of a lot of obstacles in the way. There existed no uniformity in the political system in Europe in the seventeenth century. Various parts of Europe was ruled by various kinds of governing entities, governed by a variety of ideology. The only mutual cause, they all shared, was to enhance their wealth. Some succeeded in doing so, others did not. However, the ones who

succeeded in their endeavour used it precariously or failed to invest in good places. This is exceptionally true for Italy and to some extent Spain, Netherlands, and Germany. The accumulation of capital they made operating in the Feudal system, catering to the markets across the world and exploiting the resources from their colonies, did not make them aware at the extent. Therefore, they were reluctant and resisted the development of the capitalist mode of production. The unfortunate part is that these economies did not have the voices and opinions of the people, on whose lives and blood the national economy and its associated capital accumulation was done. However, it was these people, who eventually were the ones to suffer and paid with their lives due to the unwise, egocentric decisions of their precarious leaders. The crisis is portrayed predominantly as economic, with the feudal mode of production resisting the capitalist one. However, that's only a part of the crisis, which undermines the more distasteful causes of the religious, sectarian and class divide, and the violence it maneuvered.

Climate change -

Geoffrey Parker[1] believes that during the seventeenth century, there was a global crisis, in which climate had a part to play. He states that a general deterioration of the global climate, during the seventeenth century, is a major issue in the crisis of Europe.

Evidence gathered by historians, meteorologists, and solar physicists, hint at a climate of greater extremes of weather, and in particular cooler and wetter summers in the temperate zone, during the seventeenth century, with a particular severe period during 1620-40.

According to Parker, there was an absence of sun spots between 1646-1715 or a corona during the solar eclipses. All these reflect at a cooler and wetter summers, across the globe, and colder and harsh winters. The climate was rendered unsuitable for human habitation in many places, throughout Europe. This often led to widespread migration to warmer lands, for access to food and water, and for pastures for domesticated animals. American astronomer John Eddy opines from his work, that the overall reduction in the solar energy and cooling of the earth had led to such change in climate[2].

Climate change haunts our generation, irrespective of how careless is our perception of it. With the polar ice-caps melting at a rate faster than ever, the Amazon rainforest now consuming more carbon dioxide than it produces, the global sea level is set to rise by over 2 cm, each year, the future is dystopian. As scholars, scientists and historians have argued that this is not the first time that climate change has such adverse implications, even they agree that it is the first time that the credit for these adverse consequences lies with humankind.

In history, there is a period of unequivocal change in temperatures that affected humankind, especially in Europe, to a great extent. There followed death, devastation and widespread

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[1] PARKER, GEOFFREY. *Global Crisis: War, Climate Change and Catastrophe in the Seventeenth Century*. NEW HAVEN; LONDON: Yale University Press, 2013.

[2] Eddy, J. A. (June 1976). "The Maunder Minimum" (PDF). Science. 192 (4245): 1189–1202.

deprivation during the period. This period is known as The Little Ice Age[3]. The Little Ice Age is the glue that holds the myriad events of the crisis of the seventeenth century in Europe together and produces a coherent scope of global crisis. However, the extent of the crisis and its impact is often argued to be limited mostly to Europe, and scholars opine that the devastation did not take place throughout the globe.

A small change in the climate results in devastation to great extent. During the seventeenth century, in Europe, unlike today, the majority of the population, between **80** to **90** per cent of the population were directly dependent on agriculture. The economies were agriculture driven. In such an economic chain, agriculture was the prime derivative. The progress and development of agriculture determined the economy of the other sectors, such as textile, production and so on. During the middle of the seventeenth century, there were twelve volcanic eruptions between 1638-1644 which are believed to have made the planet cooler, according to the latest more-accepted hypothesis[4].

According to Parker, a fall of two degrees celcius during the growing season (usually for majority of food crops, the summer season) precisely the scale of global cooling in the 1640s, reduces rice harvest yields between thirty to forty percent. In the temperate zone, under which most of Europe falls and above, each fall in a half-degree temperature in summer, decreases the number of days in which the crops would ripen by 10 per cent. it also doubles the risk of single harvest failure and increases the risk of a double failure by six times. Going by the stats, a thirty per cent reduction in grain harvest often doubled the price of bread, whereas a fifty per cent reduction, increases it by five times.

This widespread inflation took place in the background of a lot of death, and devastation due to wars, famines, droughts. The population which was recovered due to the events unfolded during the thirteenth and fourteenth centuries, was lost during the sixteenth and seventeenth

[3] Matthes, F. E. (1939), Report of Committee on Glaciers, April 1939, *Eos Trans. AGU*, 20(4), 518– 523, doi:10.1029/TR020i004p00518.

[4] Robock, Alan (May 2000). "Volcanic eruptions and climate". Reviews of Geophysics. 38 (2): 191–219

centuries. There was no scope of recovery until the 1740s. The synergy of this adverse change in climate, combined with the destruction of crops, regular famines and droughts, wars resulted in a reduction of the population across Europe by one-third.

Economic Crisis & the final resistance against the capitalist mode of production -

The adverse change in the climate and the presence of revolts and conflicts had plagued entire Europe in deprivation. The extent of the crisis cannot be easily defined as it was multi-layered. Soe nations could recover, others failed. From the set of the nations which could recover, they took over the leadership of Europe in the seventeenth century. The wars across Europe had resulted in vast expanses and the deprivation of the imperial or federal treasuries. To support the wars, in such times when agriculture is not just affected but also into crisis, the trade remains hindered. The burden of taxation has always been on the middle to lower classes, while the elites in all societies have a way of saving themselves the trouble. The same took place during this period. The meaningless prolonged period of war increased the burden of taxation on the common people, with the atmosphere of the conflict already having disturbed the entire scenario of trade and commerce. The abrupt change in climate towards cooler and wetter summers and colder and drier winters had blasphemous effects on agriculture. During this time, as we've earlier noted, over 80 per cent of Europe's population was directly or indirectly dependent on agriculture.

The unprecedented inflation in food prices also did not help. Inflation was a direct result of the devastating effect of climate change and population decline and retardation. Due to climate change, the entire ecosystem of agriculture was affected, which was attributed to the widespread migration of people. Climate change also resulted in death and starvation, in great numbers, with the war ongoing, and thereby the demand for products was reduced. The production of goods was affected overall.

As Europe plunged into crisis, only Netherlands and England emerged the least affected. This was due to the fact that England had evolved itself into the first industrial capitalist society,

while the Netherlands despite remaining feudal made technological advancements in agriculture, from the capital it had accumulated from its trade with the East and was also involved in a lesser number of conflicts. For France, the progress towards the establishment of capitalism was hindered, however, it was unscathed with scratches. As Cipolla[5] has opined the seventeenth century was a black century for Spain, Italy and Germany, and at least a grey one for France, but for Holland, it was the golden age, and for England if not golden at least silver. This was also due to development brought about as a result of the decay of the Mediterranean world, with the rise of the areas around the North Sea which also led to the establishment of economic centers around the North Sea in nations like England, Netherlands, and France.

For Eric Hobsbawn[6] the crisis was one of the production. In the limited elite markets of the feudal society, wealth was concentrated in the hands of a few aristocrats who used their accumulated capital for conspicuous consumption rather than productive investment. This led to a wide proportion of capital gained, to fall prey to misinvestent. With the colonial system of economy established, the feudal system drove the European nations into wide scale accumulation of wealth, which did not find itself in responsible hands. As a result, with the collapse of such extractive and exploitative economy in nations like Spain, Italy, Portugal, Iberian states, the entire economy came to a standstill. They did not responsible handle when they were flush with capital, and thus the crisis came daunting upon them. This has led Meenaxi Phukan to comment “Wealth had grown too fast and was put to unproductive uses,

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[5] Fenoaltea, Stefano. “The Fontana Economic History of Europe. Vol. 1: The Middle Ages. Edited by Carlo M. Cipolla. New York: Barnes and Noble Books, 1976. Pp. 389.” *The Journal of Economic History* 38, no. 2 (1978): 524–24. doi:10.1017/S0022050700105376.

[6] E. J. Hobsbawm, The General Crisis of the European Economy in the 17th Century, *Past & Present*, Volume 5, Issue 1, November 1954, Pages 33–53, https://doi.org/10.1093/past/5.1.33

particlarly by a wasteful aristocracy"[7]. This is exceptionally true for Italy, Spain and the nations who accumulated capital operating under the old Feudal setup, and lent off large sums of money to other nations. This in turn aided the debtor, and when crisis crept in, the money was doomed. From abundance of capital, to deprivation did fare well. The misinvestent and loss of money, plunged the nations. With this being the predominant nature of crisis, the nations failed to emerge for the basic recovery, even long after the 1740s.

The development of serf-economy, which was an extension of the Feudal mode of extraction, in the Eastern European nations, which strengthened the localized feudal setup. This led to the deprivation of peasants, and forced them to turn to a more humble way of life. This fragmented the wealth, lands and estates into the hands of a minuscule magnets, than the entire class of nobility. The increased exploitation came with prosperous initial result with large extraction of corn as surplus. However, soon it ravaged the Eastern European nations into crisis due to exploitation as unlike Western European nation, the wage of the peasants did not increase and therefore their bargaining power did not enhance. The Ukranian revolution, Polish uprisings, are some examples.

For a capitalist mode of surplus extraction to develop, the factors of production, which are, land and labour, have to be established as 'commodities'. These factors can be purchased and organized with the investment of capital, to any form. Unlike today, during the seventeenth century, if the prices of commodities were high, the production did not rise and therefore, more people could not be made interested to invest into the said commodity. Land, during the seventeenth century, was not freely for sale. Mostly managed and owned by village communities, land was used by the general public. The growing devastation as a culmination of numerous factors, rising inflation, made the people aware and cautious than to part with

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[7] Phukan, Meenaxi. 2012. *Rise of Moden West: Social and Economic History of Early Modern Europe*. N.p.: Trinity Press Pvt Ltd.

their land, irrespective of its size. The land produces supplemented the peasants during better times and fed them during the harsh times. The French aristocracy, along with their Western and Southern European counterparts failed to consolidate their farms and lands. Therefore, with the exception of England, capitalism did not succeed. This also explains why the Polish landowners failed to take advantage of the rising prices, despite being prepared with surplus produce. This inefficiency is the resolution for the reason why these nations fell into crisis.

Prior to the Industrial Revolution, the need for materials from the colonies outranks the requirement of the colonies of goods from their colonizers. The trade between the two was balanced by the trade bullion exports to the colonial powers, and at times supplemented with slaves, furs, amber and other manufactures. For example, in 1665, the Royal African company's profits in gold were outnumbered by twice the figures in the slave trade. The European conquest of the primary trade routes did not bring about a dramatic change in the method of operation of trade and commerce. It, however, helped reduction of costs in logistics, middlemen, and provided the colonial power for its merchants and officers to do as they please in the colonized land. It further, most importantly, aided in the bullion collection. This did not last for long, as Hobsbawn puts it, that the colonial endeavour of the European was of the nature of a single bonus, rather regular dividends. The haste the Europeans made, as they wanted to find out the source of golden eggs, that they cut open the chicken, soon ruined their enterprise. The profits soon failed to compensate for the expenditure in military affairs, and therefore they resorted to full-time recipients of war ravaging economic endeavour in their colonies like the English East India Company, and also imposed heavy taxation in the colonies to supplement their income. States like Spain, Portugal, Dutch, France eventually failed. This is where the exploitative enterprise endeavour of the English was tested, and they flared well till the English Banking scandal in the mid-nineteenth

century. England is a nation whose entire economy was based on the drain of wealth from its colonies, by the time the Industries were set up. However, despite all these measures, the incompetent coherent attitude of the colonial powers proved ineffective and the losses they endured plunged their own nations into deep crisis.

By the seventeenth century, as Italy became decentralized, Germany was more divided and it was rather a set of German-speaking states and not as an entity, France and Poland failed to meet with the pace, with the final resistance from the feudal aristocracy, failed to take advantage of the high prices; Switzerland, Sweden, England reorganised their industrial and rural framework and prepared themselves for the next phase of economic development under the realm of capitalism. The Dutch failed to withhold the progress they had made and soon shrank within the next couple of decades. Russia, Poland and their neighbouring nations erupted in complete ruins after this phase with the rigidity of their feudal landowners. The Spanish and Portuguese empires shrank rapidly and changed their basic character.[89]

The bureaucratic expansion of the sixteenth and seventeenth centuries was the product of the needs of all the states to recruit, pay, equip and transport large number of fighting men over vast distances. The conflicts of the seventeenth century were primarily caused by the rising scale and duration of the war, for which the state forced and pushed the burden on the poor peasants and the common people, to aide in the ear finance despite the extreme deprivation as a result of the war and many other factors, that the people faced at the time. This is one of the most fundamental causes for the seventeenth century crisis in Europe, with respect to economy.

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[8] De Vries, Jan. "The Economic Crisis of the Seventeenth Century after Fifty Years." *The Journal of Interdisciplinary History* 40, no. 2 (2009): 151-94. Accessed July 25, 2021. http://www.jstor.org/stable/40263652.

[9] Stone, Lawrence. “The Conquest of the Material World. By John U. Nef. Chicago and London: University of Chicago Press, 1964. Pp. Xii, 408.” *The Journal of Economic History* 25, no. 3 (1965): 452–53. doi:10.1017/S0022050700057600.

Political dimension - endless revolts, uprisings, and wars & the devastation-

The seventeenth-century Europe was ravaged by conflicts, with every aspect of human life affected. Europe during the seventeenth century is a period of the crisis based on a variety of factors. Europe during the seventeenth century had gone through various changes as a result of the political developments during the fifteenth and sixteenth centuries. The seventeenth century was a time for Europe to recover from the damage, devastation and deprivation, and progress with the political reforms in the European society. Europe had just gone through major changes. The situation was one of dearth. People could not afford instability, deprivation and loss. However, the leaders of the various European nations failed to respect the wishes of their population and instead let their own ego drive their nations into chaos.

The crisis of the seventeenth century was a long duration of crisis, although the timing varied in different nations. Its effect on the countries is said to be the same, however, the recovery of the nations is a derivative of their preparedness, flexibility, participation in religious wars, form of exploitation of common people committed and the nature of the colonial enterprise, if undertaken.

Spain and Central Europe, losing much of their international orientation is a reflection of the crisis. The significance of both the Baltic and the Mediterranean trade receded with the Atlantic seaboard became increasingly the centre of European trade. This was mainly due to the establishment of America, a European colony. With the European colonial expedition to America, besides Asia and Africa, the avenues of mineral and resource-rich Northern and Souther American was available to the European colonial powers. For the duration of the seventeenth century, it is always imperative that the Baltic and the Mediterranean seaboard lost business, but did not go out of business. The flourishing trade in the routes of the North

Sea was at its inception. Colonial enterprise being, in the words of Eric Hobsbawm, ‘a single bonus’ is attributed to the haste in exploitation, rather than endeavouring ‘regular dividends’.

H.R. Trevor-Roper has seen the crisis of the seventeenth century as a watershed between one age and another, the Renaissance and the Enlightenment, a crisis caused by a basic defect in the preexisting social structure which made it incapable of withstanding the strains on it.[10] He interpreted the crisis beyond the realm of being constitutional or economic, but established it to be a crisis between the society and the state, that is, the expansion, and wastefulness of a parasitic state apparatus and in the size and cost of the court. However, the expansion of court and the imperial (or federal) bureaucracy was important in the times of wars and rebellions. The more successful societies of Holland, England, France, Sweden, Switzerland, Portugal (to a little extent), adjusted to the crisis by expansion their economic resources by the application of mercentalist ideas. In case for Spain, the bureaucratic setup did necessarily not evolve into a burden. It was rather the struggle between the periphery and the centre. In England, the crisis was a result of the direct conflict between the Puritan minded Opposition, and a parasitic bureaucracy created by the Renaissance state. It was apparently, the conflict between the monarchy’s attempt to strengthen the economic independence and the taxpayer’s defence for his customary rights because as life (labour) is a factor of production and in a capitalist mode of production, life has to resort to being a commodity which can be bought and organized. For Eastern European nations, the political dimension is the conflict between the feudal aristocracy who based the mode of production and surplus extraction of exploitative feudalism, to support the export surplus for commercial gain. In the case of Southern and Central European nations, the nature of the crisis owes to the sectarian divide between the various leaders, and their states, and the attempt for some to conquer land and

[10] Trevor-Roper, H. R. "The General Crisis of the 17th Century." *Past & Present*, no. 16 (1959): 31-64. http://www.jstor.org/stable/650152.

estates, to meet their short-term fiscal deficits. As highlighted by Monsieur[11] in France, the office bearers often rose in rebellion against the State. In Catalonia and Portugal, the revolt were against the government's policy to pay for Spanish foreign policy.

John Eliot and Stone[12][13] regarded the modern state as primarily a war machine, created and driven forwards for the need of military preparedness and aggression. According to Vicens Vives, the 16th century Renaissance state was a product of international warfare and internal disorder, its most striking manifestation being the standing army, often comprising of foreign mercenaries.

The economic decline is accredited due to the phenomenon of Absolutism, example, the Thirty Years' War which cause widespread deprivation, loss of life and great economic deprivation across Europe, especially in the German speaking states under their rulers. As mentioned earlier, the crisis in the seventeenth century further discouraged any change at unity among German speaking states and there existed no unified Germany during the seventeenth century.

The seventeenth century in most states in Europe was a peasant society. In backward economies, like that in Spain, Portugal, German speaking states, Italy, Baltic, Poland, Russia, and so on, institutional inflexibility was the most important obstacle in the growth of agriculture and industry. It was the interplay between changing political structures and changing market pressures that created divergent paths for the agrarian economy of various European nations.

The bureaucratic expansion of the sixteenth and seventeenth centuries was the product of the needs of all the states to recruit, pay, equip and transport large numbers of fighting men over

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[11] Mousnier, Roland, J. H. Elliott, Lawrence Stone, H. R. Trevor-Roper, E. H. Kossmann, E. J. Hobsbawm, and J. H. Hexter. "Discussion of H. R. Trevor-Roper: "The General Crisis of the Seventeenth Century."" Past & Present, no. 18 (1960): 8-42. http://www.jstor.org/stable/649885.

[12] Payne, Stanley G. "Jaime Vicens Vives and the Writing of Spanish History." The Journal of Modern History 34, no. 2 (1962): 119-34. http://www.jstor.org/stable/1875175.

[13] Lane, Frederic C. "Meanings of Capitalism." *The Journal of Economic History* 29, no. 1 (1969): 5-12. http://www.jstor.org/stable/2115496.

vast distances. Since the offices could be sold, the increase of officials over organizational requirements was a product of the needs of war finance. This being so, the conflicts of the seventeenth century were primarily caused by the rising scale and duration of the war, which forced all governments to attempt to invade old fiscal and constitutional immunities, in order to appropriate an even larger proportion of the natural resources which were shrinking because of the general economic recession. In many nations, both advanced and backward economies, such as Scotland, Catalonia, and Portugal, the provinces at the periphery rebelled against the centralized process, fearing the imposition of crushing tax burdens, interference in local liberties, diminished sovereignty, disregard for their provincial interest and economic development. While in nations England, France and Sweden, competing oligarchies among the elite - nobles, gentry and merchants - fought among themselves for access to or for the control of offices, grants and favors at the disposal of the authoritarian Absolutist state.

The cause of the crisis is also attributed to the social conflicts, which was borne out of people's expression of dissatisfaction and disgruntled towards their ruling elite, whose decisions were as far aloof from the general welfare as it could be. The problem did not evolve, with the leaders not representing the wishes of their own population, irrespective of the political system the ruling establishment followed.

The rise of the Absolutist State in Europe did not follow a uniform pattern. By the 16th century it was well established in Spain, France and some German states. England‟s experience with a Parliament was different and unique. Monarchies were also well established in Denmark and Sweden.

The establishment of Absolutism in several European states is generally taken as a direct sign of economic weakness. However, it is often put to disregard that the Absolutist behaviour of the state and the rulers, led to the economic crisis (weakness) to occur.

With the symptoms of economic crisis apparent, and a society ridden with internal conflicts, throughout Europe, the obvious trend was the growth of state power and increased fiscal demand. The problem of the crisis, is, therefore, the problem of Absolutism.

In his *Peasant Uprisings*, **Mousnier** saw the connection between the t**axation pressures and the revolts**. According to him, the increased fiscal demand kit all social groups, and so is of decisive importance in the revolt of the peasants in 17th century France. Mousnier defended the government foreign policy as being a political necessity—the wars were national and France had long frontiers to defend. The French masses wanted Absolutism according to Mousnie. The Soviet historian **Porshnev**[14] believed that the wars were responsible for the subjection of the exploited class. Though Mousnier and Porshnev have contradictory viewpoints, they both believed that the government is an institution that acts rationally in the interest of either a nation or of a social class.

[14] Porshnev, B. F., Dmitri Bayanov, and Igor Bourtsev. "The Troglodytidae and the Hominidae in the Taxonomy and Evolution of Higher Primates." *Current Anthropology* 15, no. 4 (1974): 449-56. http://www.jstor.org/stable/2740797

Conclusion

Religion is plays a very important role in society, whether it should or not, is widely debatable. Religion is something which is assigned to us at the time of our birth, and we spend the rest of our lives defending it, aimlessly without even questioning if it's worthy of such defence. The Europe in the seventeenth century was recovering from a change. The change was in the pattern of political setup after Reformation, due to religious conflicts which further led to sectarian divide. This sectarian divide led the entire Europe to ruins in the seventeenth century. The wars ravaged the already deprived Europe, to a point of no return. As we've discussed the major causes, there are a variety of causes impacting each European state in its own ways. Our understanding is no more limited on this topic, as it was for more than a century, until Europe recovered. The recovery helped and shaped Europe into the kind of state it is today. Irrespective of our understanding and opinion, we can never estimate the suffering of the people. Neither should we. The continent does not suddenly land into a crisis which takes away a third of its population, strips three-fourth of its population of the basic amenities and end the hope for nine-tenth of the population. The crisis, despite the causes, is a culmination of a long-term mistakes and wrongdoings. It is unfortunate that the ones responsible for such devastation lived surrounded with luxuries, unscathed in their privilege bubbles while they send for or remained mere spectators of the wreckage. Religion was at the centre of the entire political dimension, however, it soon turned political because unlike the Japanese, the Absolutists consider a war to be an opportunity of conquest and to meet their greed. The rulers knew that no one would win a war of such scale and the end was compromise. However, they still fought with the intention to conquer more lands. The expense of human lives was inevitable.

Bibliography

Books & Research Papers -

Phukan, Meenaxi. 2012. *Rise of Moden West: Social and Economic History of Early Modern Europe*. N.p.: Trinity Press Pvt Ltd.

Fenoaltea, Stefano. "*The Fontana Economic History of Europe. Vol. 1: The Middle Ages*. Edited by Carlo M. Cipolla. New York: Barnes and Noble Books, 1976. Pp. 389." The Journal of Economic History 38, no. 2 (1978): 524–24. doi:10.1017/S0022050700105376.

PARKER, GEOFFREY. *Global Crisis: War, Climate Change and Catastrophe in the Seventeenth Century*. NEW HAVEN; LONDON: Yale University Press, 2013.

Mousnier, Ronald. 1971. *Peasant Uprisings in Seventeenth-century France, Russia and China*. N.p.: Allen & Unwin.

Journals & Articles-

E. J. Hobsbawm, *The General Crisis of the European Economy in the 17th Century*, Past & Present, Volume 5, Issue 1, November 1954, Pages 33–53, https://doi.org/10.1093/past/5.1.33

Trevor-Roper, H. R. "*The General Crisis of the 17th Century*." Past & Present, no. 16 (1959): 31-64. http://www.jstor.org/stable/650152.

Payne, Stanley G. "*Jaime Vicens Vives and the Writing of Spanish History*." The Journal of Modern History 34, no. 2 (1962): 119-34. http://www.jstor.org/stable/1875175.

Lane, Frederic C. "Meanings of Capitalism." The Journal of Economic History 29, no. 1 (1969): 5-12. http://www.jstor.org/stable/2115496

Eddy, J. A. (June 1976). "The Maunder Minimum" (PDF). Science. 192 (4245): 1189–1202.

Mousnier, Roland, J. H. Elliott, Lawrence Stone, H. R. Trevor-Roper, E. H. Kossmann, E. J. Hobsbawm, and J. H. Hexter. "*Discussion of H. R. Trevor-Roper: "The General Crisis of the Seventeenth Century.*"" Past & Present, no. 18 (1960): 8-42. http://www.jstor.org/stable/649885

De Vries, Jan. "*The Economic Crisis of the Seventeenth Century after Fifty Years*." The Journal of Interdisciplinary History 40, no. 2 (2009): 151-94. Accessed July 25, 2021. http://www.jstor.org/stable/40263652.

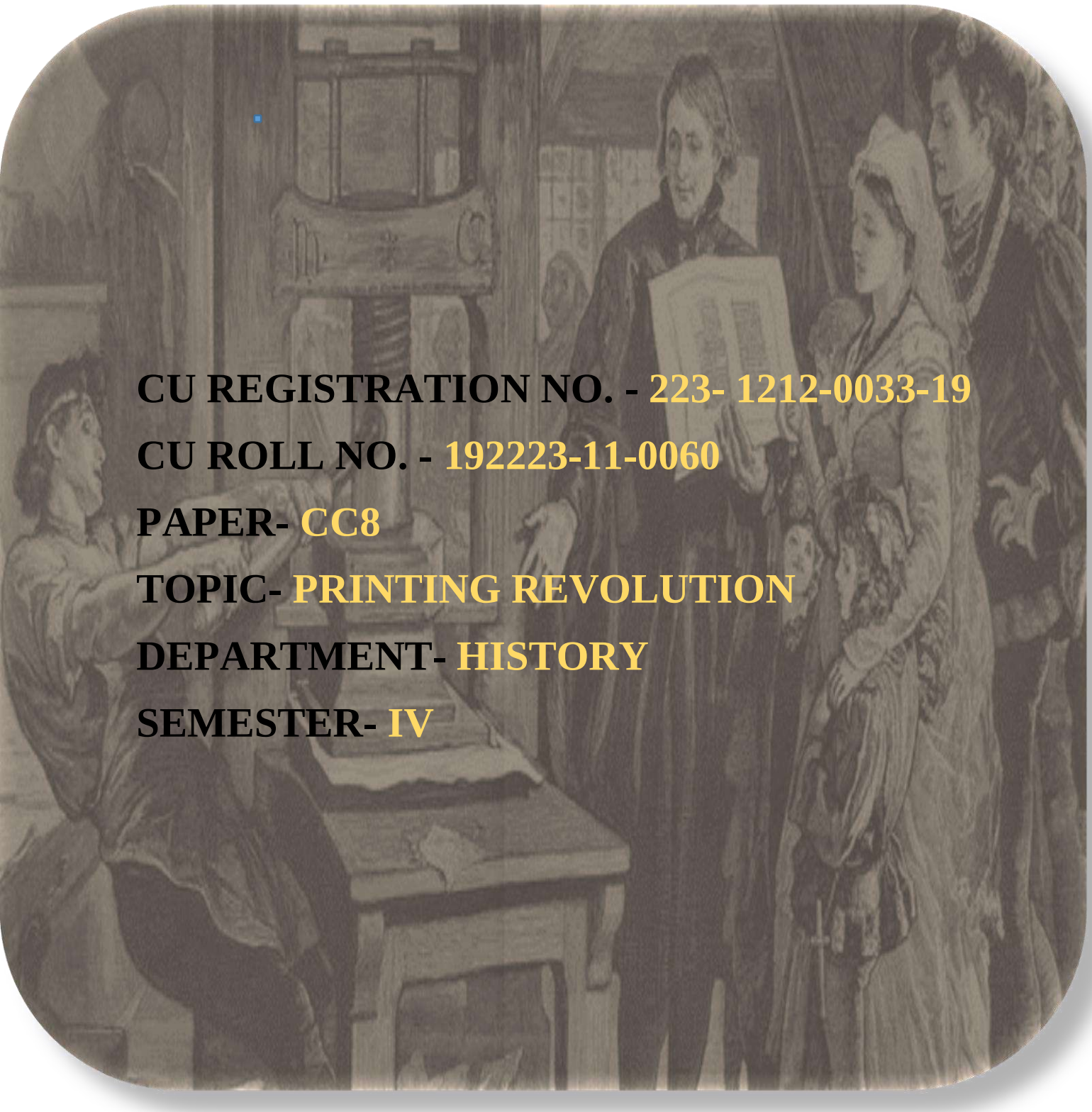
Stone, Lawrence. "*The Conquest of the Material World*. By John U. Nef. Chicago and London: University of Chicago Press, 1964. Pp. Xii, 408." The Journal of Economic History 25, no. 3 (1965): 452–53. doi:10.1017/S0022050700057600.

Porshnev, B. F., Dmitri Bayanov, and Igor Bourtsev. "*The Troglodytidae and the Hominidae in the Taxonomy and Evolution of Higher Primates*." *Current Anthropology* 15, no. 4 (1974): 449-56.
http://www.jstor.org/stable/2740797

Reports -

Matthes, François E. 1939. Report of Committee on Glaciers, April 1939. N.p.: American Geophysical Union. https://doi.org/10.1029/TR020i004p00518

Robock, Alan. 2000. Volcanic Eruptions and Climate. N.p.: Reviews of Geophysics. https://doi.org/10.1029/1998RG000054



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PAPER- CC8

TOPIC- PRINTING REVOLUTION

DEPARTMENT- HISTORY

SEMESTER- IV

CONTENTS

INTRODUCTION

Today's digital media has transformed the lives of people living in the west. Digitized images, text and sound mean that we have new ways of accessing what we want to learn about or enjoy and the range of things we can know about has expanded. The testament to the long reach of another technology that had a similarly transformative effect in the early modern period: print. The printing press was one of three inventions – alongside gunpowder and the compass- that seemed to revolutionize society. The politician, intellectual and essayist Francis Bacon claimed that these three have changed the whole face and state of things throughout the world. Further the printing revolutionized in Germany, around 1440, goldsmith Johannes Gutenberg invented the printing press, which started the printing revolution. Modelled on the design of existing screw presses, a single renaissance printing press could produce up to 3600 pages per work day, compared to forty by hand printing and a few by hand copying. Printing reduced the cost of books. The time and labor required to produce each book came down and multiple copies could be produced with greater ease. Knowledge is power, as the saying goes and the invention of mechanical movable type printing press helped disseminate knowledge wider and faster than ever before.

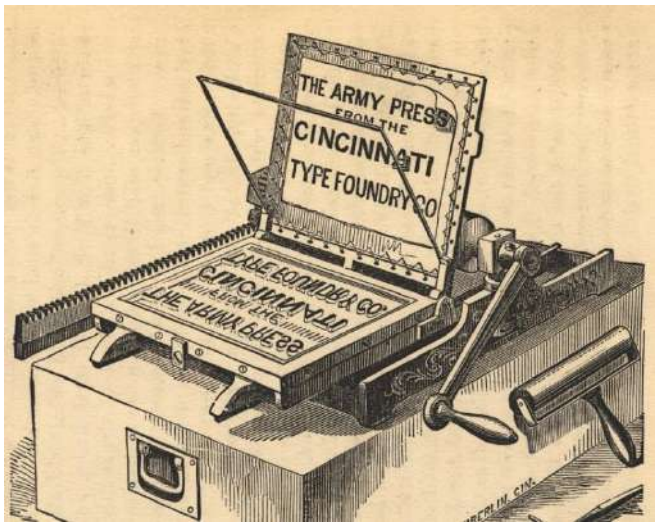
CHINA AND PRINTING REVOLUTION

No one knows when the first printing press was invented or who invented it, but the oldest known printed text originated in China during the first millennium A.D. Printing in China helped so much and brought China to a big part of History. The developed of printing allowed Chinese officials to make important documents. Woodblock printing created the world's first print culture. So it affected the Chinese in a good way as a form of communicating and an art form. The movable-type printing press was invented 400 years earlier than Europe, but failed to take off due to high number of characters. The more, limited number of characters needed for European languages was an important factor.

EVOLUTION OF MODERN PRINTING TECHNOLOGY

FIRST STAGE: WOODBLOCK PRINTING

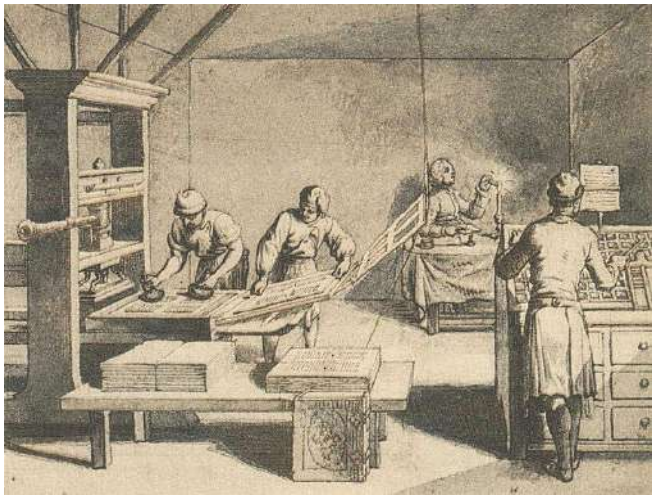
The Diamond Sutra, a Buddhist book from Dunhuang, China from around 868 A.D during the Tang Dynasty, is said to be the oldest know printed book. The Diamond Sutra was created with a method known as block printing, which utilize panels of hand carved wood blocks in reverse.



Some other texts have survived from Dunhuang as well, including a printed calendar from around 877 A.D. mathematic charts, vocabulary guide, etiquette instruction, funeral and wedding guides, children's educational material, dictionaries and almanacs. Woodblock printing was also used in Japan and Korea at that time and block printing was also developed at some point during that period, typically for Buddhist and Taoist texts.

SECOND STAGE: MOVABLE-TYPE PRINTING

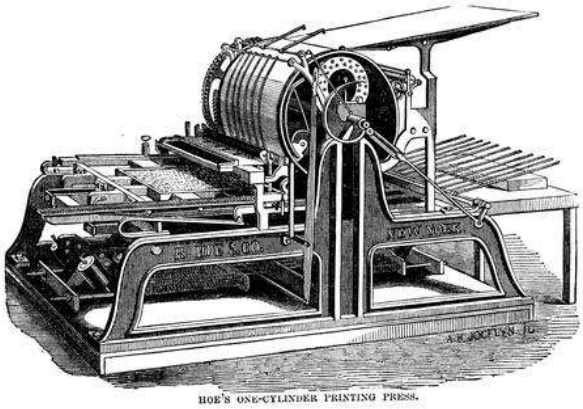
Moveable type which replaced panels of printing blocks with moveable individual letters that could be reused, was developed by Bi Sheng, from Yingshan, Hubei, China, who lived roughly from 970 to 1051 A.D.



In 15th century and the introduction of movable type in Europe by Johannes Gutenberg. He was the first to use oil-based inks and he invented the first printing press, which was inspired by the grape press. On 23rd February 1455, after about a year's experimentation, the first Gutenberg Bible was published with a print run of 180 copies.

THIRD STAGE: THE ROTARY PRESS

We're in the United States and Richard March Hoe has just invented the first rotary press, perfected in 1846 and patented in 1847. Initially, this system was hand-fed with single sheets until, in 1863, William Bullock introduced a press that was fed by a paper roll: the images to be printed were curved around cylinders.



HOE'S ONE-CYLINDER PRINTING PRESS.

There was no longer a flat surface that exerted pressure to print: instead, the paper passed through a cylinder which exerted a far greater force. Mechanization of the process and the introduction of continuous paper rolls, rotary printing presses could print up to 8000 sheets an hour. Which makes it the first press suitable for large print runs.

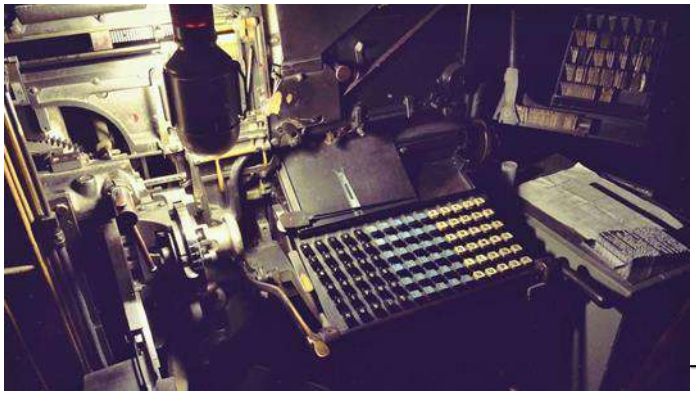
FOURTH STAGE: OFFSET PRINTING

In 1875, Robert Barclay invented the offset press for printing on metal. It generated very sharp, clean images. High-quality printing on any type of paper, even if it has a surface that isn't perfectly smooth. Offset presses are bulky and require lots of maintenance. Which is why this printing system is only cost-effective for large print runs.

FIFTH STAGE: THE LINOTYPE MACHINE

In 1885, German inventor Ottmar Mergenthaler developed the linotype, a typesetting machine. In 1886, the linotype machine was used for the first time to print the ''New York Tribune'', a daily

newspaper founded in 1841 in New York. In Italy, it was first used in 1897 to print the ‘’Tribuna’’, one of the Rome’s leading dailies.



Thomas Edison called the linotype machine ‘’the eighth wonder of the world’’, which underlines the importance of this machine in the history of printing.

SIXTH STAGE: THE LASER PRINTER

In 1971, the Xerox Corporation developed laser technology. In a laser printer, the content to be printed is generated by electronic processes and printed directly onto the sheet of paper. With this system, it’s possible to print around 20,000 lines a minutes. Record breaking. But more importantly, from this point on, anyone could print whatever they wanted, whenever they wanted in their office or home.

HE LAST STAGE: 3D PRINTING

We have reached the present day. We end our journey through time in the era of the 3D printer. This printing technology was actually developed some years ago, in 1983 to be exact, when Chuck Hull used UV rays to harden varnishes. It has taken years for 3d printing to become widely used. The cost of this technology was initially

extremely high. Now 3D printing is used in many fields- from architecture to archeology, from art to healthcare- with more being added all the time.

THE INITIAL VENTURE

BIBLE- The Gutenberg Bible was printed in Mainz in 1455 by Johann Gutenberg and his associates, Johann Fust and Peter Schaeffer. Only 48 copies are known to have survived, of which 12 are printed on vellum and 36 on paper. The Gutenberg Bible or the 42 line bible (B42) was the earliest major book printed using mass produced movable metal type in Europe. The B42 contains the Latin version of Hebrew Old Testament and the Greek New Testament. The Bible seems to have sold out immediately.

BOOK BUSINESS DEVELOPMENT- The printing of affordable books brought in great profit and soon inspired printers to continue pocket book practice with secular books. This influx in the amount to printed material eventually led to a great growth in literacy.

LITERACY RATE- Printing books became more readily available because they were easier to produce and cheaper to make. More people were able to read because they could get books to read. The printing press was also a factor in the establishment of a community of science. In just over 200 years after Gutenberg's improvements to the printing press the literacy rate climbed to about 47%, and in another 200 years the literacy rate reached 62%.

CONTRIBUTION OF PRINTING REVOLUTION

The printing press made it possible to educate people faster than ever before. New ideas and knowledge could be shared with more people than ever the best teacher could hope to reach in their lifetime. Quality color printing is a key asset in a wide range of classroom scenarios. Its immediate effect was that it spread information quickly and accurately. This helped create a wider literate reading public. However, its importance lay not just in how it spread information and opinions, but also in what sorts of information and opinions it was spreading.

CRITICS VIEW ON REVOLUTION

The above benefits was also censored by the church. These was a cause of concern among church leadership, as scientific findings being circulated threatened some of the popular religious views. This conflict between religious and the printing press came into a climax with a Martin Luther in1517.

Inks used in industrial printing effect the environment in various ways. The chemicals required to break down the ingredients for paper production emit fumes.

CONCLUSION

It is certain that distribution and accessibility of texts increased Europe-wise from 15th century onwards. Historians and literary scholars have pointed to revolutions not just reading habits but also in religion, science, politics and wider cultural brief-system that seems attributable to the press. On the other hand, there are many who see the press as really instrumental in fostering a religion of the word, such as Protestantism. On the other hand there are scholars who stress that print did not provoke a radial break with past and that its impact was often dependent on other technologies, especially transport. Moreover the correlation between text and behavior is uncertain.

BIBLIOGRAPHY

BOOK- (i) Knights Mark, McShane Angela, THE EUROPEAN WORLD 1500-1800 (THRID EDITION), Published in 2017

(ii) Mukherjee Rila, Europe in transition- from feudalism to industrialization, 1st edition, published on 30 January 2010

(iii) Phukan Meenaxi, Rise of the modern west, 1st edition

WEBSITES- www.history.com/topics/inventions/printing-press

www.pixartprinting.co.uk/blog/brief-history-printing

www.wikipedia.org

Pictures- www.bing.com/images/search?q=printing+press&form

Semester 4
CC-8 Tutorial

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Marxist View of the Nature of the English Civil War (1640-42)

ACKNOWLEDGEMENT:

I, Jacob Thanggoumung Guite of Scottish Church College, Department of History, have successfully completed my Core Course 8 Tutorial on "Marxist View of the Nature of the English Civil War (1640-42)" under the guidance of my Professors. I would like to thank them for their valuable guidance. I’d also like to thank my friends without whom my assignment would have been incomplete.

Contents:

Introduction

The English Civil War (1642–1651) was a series of civil wars and political machinations between Parliamentarians and Royalists, mainly over the manner of England's governance and issues of religious freedom. It was part of the wider Wars of the Three Kingdoms.

In the twentieth century, however, Marxist historians introduced the use of the term "English Revolution" to describe the period of the English Civil Wars and Commonwealth period (1640–1660), in which Parliament challenged King Charles I's authority, engaged in civil conflict against his forces, and executed him in 1649.

According to the Marxist interpretation of the English Revolution, the events in Britain from 1640 to 1660 were a bourgeois revolution in which the final section of English feudalism (the state) was destroyed by a bourgeois class (and its supporters) and replaced with a state (and society) that reflected the wider establishment of agrarian (and later industrial) capitalism. According to this view, the English Revolution was essential in Britain's shift from feudalism to capitalism, and from a feudal state to a capitalist one.

According to Marxist historian Christopher Hill:

The Civil War was a class war, in which the despotism of Charles I was defended by the reactionary forces of the established Church and conservative landlords, and on the other side stood the trading and industrial classes in town and countryside ... the yeomen and progressive gentry, and ... wider masses of the population whenever they were able by free discussion to understand what the struggle was really about.

Later advances of the Marxist viewpoint moved away from the notion of the bourgeois revolution and said that the English Revolution foreshadowed the French Revolution and subsequent revolutions in terms of popular administrative and economic benefits. The revolution, together with the development of parliamentary authority, shattered many of the traditional power ties in both rural and urban English society. The period's guild democracy movement was most successful among London's transport workers, most notably the Thames Watermen, who democratized their business in 1641–43. With the start of the Civil War in 1642, rural people began seizing timber and other resources on royal estates. and the church hierarchy. Some communities improved their conditions of tenure on such estates

The Gentry

The gentry origin, simply the mass of the feudal landowning class in England, where only the upper crust of this class had distinctive ‘noble’ titles. Both Marx and Engels suggested that the development of commodity production in agriculture in sixteenth-century England and the two-way social mobility between the gentry and the bourgeoisie made the gentry natural allies of the bourgeoisie in the revolution.

The ‘rise of the gentry’ becomes a gaping trap for Marxists into which perhaps only Perry Anderson of New Left Review has jumped with both feet. For Anderson, the English Civil War was a “bourgeois revolution” only by proxy’, because it was made by a section of the ruling class. But if a bourgeois revolution can be made by proxy from above, can a proletarian revolution? If a section of the ruling class could break the last bonds of feudalism on behalf of the bourgeoisie, could not a section of the bourgeoisie set up socialism on behalf of the working class?

The biggest problem about the gentry as a class, however, is that when the Civil War came in 1642, they played as a class an overwhelmingly counter-revolutionary role. Keen as they may have been to oppose the king in 1640, when it came to seizing the armed power of the state in 1642, the majority of the gentry either supported the Crown or attempted to prevent the outbreak of war. The ‘pure country gentlemen’, those not regularly involved in national politics through Parliament or the JPs’ bench, were the first to desert the opposition, but in some counties, there was an almost complete turn-around of the MPs from the opposition in 1640 to royalism in 1642. Forty per cent of the House of Commons itself opposed Parliament in the Civil War, despite the fact that MPs were the most involved, the most committed of the gentry.

There were, of course, exceptions to the royalism of the gentry. Without the Parliamentarian gentry (and peers, who were a substantial minority of the House of Lords) the struggle would never have got off the ground. These gentries fall into two, probably overlapping, categories. First, there was a group of two or three great ‘connections’ excluded from power by Charles I, who saw themselves as an alternative leadership of the nation which had to be forced on the king (all other methods have failed) by a show of arms. These included the aristocratic generals who in 1644 were accused of not wanting an outright victory.

The second group that backed Parliament came from the lower gentry (including Oliver Cromwell himself), and they were frequently committed to the Independent, parochial-congregationalist strain of Puritanism, as well as a very strong opposition to aristocratic control. They were to play a crucial role in the revolution, but their prominence has blinded many historians to the gentry's overall conservatism.

A comprehensive re-examination of the gentry's role by Marxists may utterly disarm the "New History" and redirect our emphasis where it belongs: on the bourgeoisie and the oppressed classes.

The Bourgeoisie

The English bourgeoisie had not prepared or initiated the crisis of 1640 to the extent that the gentry had. They enjoyed little direct political influence, Parliament, and the counties being dominated by the gentry.

Despite certain issues which could unite most of the bourgeoisie, such as customs duties, the main concern of most sectors of the merchant and manufacturing classes was a corporate privilege. The largest and most powerful bourgeois institution, the Corporation of the City of London, regarded its own privileges as paramount and was prepared to negotiate its own compromises with the monarchy. The privileges of competing interest groups disunited the bourgeoisie, for they were often readier to see other sections as the main enemy rather than the system as a whole.

In the pre-revolutionary decade of the 1630s, the bourgeoisie showed distinct signs of being bought off by Charles I's plausibly mercantilist policies: it should not be forgotten that absolutism was a system which offered the bourgeoisie a deal, and to many it may have seemed an acceptable one. The availability of social promotion through wealth – the passage of merchant families into the gentry – probably had a depoliticising effect, the permeation of the existing system by individuals diverting attention from the class issues.

When the Civil War came in 1642, there was royalist bourgeois just as there was Parliamentarian gentry. Virtually the whole of the existing leadership of the City of London had to be ousted to bring the City on to Parliament's side; the Newcastle coal cartel, the Corporation of Chester (still a major port), and some of the Bristol merchants supported the King; even the merchant clothiers of Leeds (who were big entrepreneurs compared with the master artisans of neighboring Bradford) were initially royalists.

All this has led not only the New Historians, but even some Marxists, to dismiss the pre-industrial bourgeoisie as a revolutionary class, redefining them as part of the 'ruling elite in late feudal society.

The Revolt of the Exploited Classes

In 1642, the spearhead of the revolution was not the gentry or the bourgeoisie, but those strata in late feudal society who were oppressed or threatened with exploitation by both. Brian Manning has detailed how a major public revolt altered the political situation between 1640 and 1642, dividing the gentry and bourgeoisie between those who believed they could take over and manage the uprising and those who regarded the king's backing as the least of two evils.

Peasant revolts, rent refusal, ransacking of big country homes, and shouts of 'Bread' combined with those of 'Justice' all occurred during the English and French Revolutions. These scenes of popular violence have traditionally been regarded as stage-managed by Parliamentary leaders, but Manning's account shows that the leaders of the 'popular party' had lifted the lid on a cauldron of class struggle that they had not brewed and could hardly keep from engulfing them entirely.

Who were these people who forced the bourgeoisie and the gentry minority into revolution, and what were their struggles? The masses who revolted in 1640–42, and the radical political movements to which this revolt gave birth, have been variously described by Marxists as ‘the petty bourgeoisie, ‘the middling sort of people, ‘independent small producers’ and ‘plebeian elements.’ ‘Petty bourgeoisie’ is misleading, for it suggests a mere junior division of the bourgeoisie with essentially the same interests. ‘The middling sort’ was used at the time, and has been used ever since, to blur the distinction between the bourgeoisie and their allies from the lower classes. ‘Plebeian’ has the same effect, and it seems pointless to borrow a term from Ancient Rome which meant simply non-aristocratic.

Many of the individuals who took part in the 1640–42 uprising, the New Model Army during the war, and following radical organizations were actually independent small manufacturers. In feudal society, the small producer enjoyed ownership or possession of the means of production, and wage labour was typically a temporary or supplementary source of livelihood – for the near-landless peasant family, the journeyman on his way to becoming an independent master craftsman, and even domestic servants, who saved their wages for marriage and a household of their own. Wage labour has become the norm under capitalism, and the independent small producer exists primarily to compete with large-scale capitalist industry. The separation of the labourer from the means of production was a critical issue in the development of the capitalist mode of production in seventeenth-century England, which was transitioning from feudalism to capitalism. This proletarianisation of the labour force, as Marx recognised, preceded large-scale capital accumulation: it was the core of ‘so-called primary accumulation' or ‘the first revolutionising era of feudal production.

Criticism

The notion that the events of 1640 to 1660 constitute an "English Revolution" has been criticized by historians such as Austin Woolrych, who has pointed out in his book ‘Britain in Revolution, 1625–1660.’ that painstaking research in the county after county, in local record offices and family archives, has revealed that the changes in the ownership of the real estate, and hence in the composition of the governing class, were nothing like as great as used to be thought.
Woolrych argues that the notion that the period constitutes an "English Revolution" not only ignores the lack of significant social change contained within the period but also ignores the long-term trends of the early modern period which extend beyond this narrow time-frame.

Conclusion

The reintroduction of Marxist theory into the history of the revolution should be a must. This is a historical subject where theory has possibly vanished more thoroughly than in any other. The Stalinist period was followed by a period of conformity to bourgeois academic ‘standards,' during which theory was evidently seen as too controversial to mention. This has since been surpassed by the argument over the ‘poverty of theory,' in which some Marxist historians argue that the lack of a theoretical standpoint is a positive value. A thorough and open discussion in expressly Marxist terms is the yardstick against which both old and new ideas must be judged.

Ironically, the absence of theoretical discussion has not brought Marxist history in this field any closer to the masses. Hill’s The English Revolution, 1640, and The Century of Revolution (1961) are still the most widely read Marxist accounts among ordinary socialists.

The English Civil War was a fight for dominance. This includes the ability to make or give laws, tax estates, appoint magistrates, declare war and form alliances, and mint coins. The administration of the Protestant religion in England, on the other hand, was not a routine matter. It stressed the people's spiritual well-being. The established church's discipline was a right or a sign of sovereignty. It was the lynchpin of opposition to royal policy in the early 1640s, more than just formal sovereignty. Authority over souls was more essential than power over people, property, and estates. The problem of sovereignty, as well as the issue of religious freedom

Bibliography

1. L. Stone, The Revival of Narrative, Past, and Present (1979).

2. D. Pennington and K.Thomas (eds.), Puritans and Revolutionaries. Essays in Seventeenth-Century Historiography Presented to Christopher Hill (1978).

3. C. Russell, (ed.) The Origins of the English Civil War (1973),.

4. M. MacEwen, The day the Party had to stop, Socialist Register, 1976.

5. R.H. Tawney, The Rise of the gentry, 1540-1640, Economic History Review, XI

6. P. Anderson, Origins of the present crisis, New Left Review 23 (1964).

7. D. Underdown, Pride's Purge (1971); D. Brunton & H.H. Pennington, Members of the Long Parliament (1953).

8. H. Kearney, The Eleven Years' Tyranny of Charles I (Historical Association, 1962).
9. Christopher Hill. "The English Revolution 1640"(1940).

PRINTING REVOLUTION

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INDEX

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I would like to convey my heartfelt regards to our professors who have made our life easier by teaching us and helping us understand history better. This project has made me learn a lot about Akbar as an Empire builder and its entire story. I would like to thank our Professor Debadyuti Banerjee and Sreya ma’am for giving us this wonderful opportunity to learn.

INTRODUCTION

The printing press was invented in the Holy Roman Empire by the German Johannes Gutenberg around 1440, based on existing screw presses. Gutenberg, a goldsmith by profession, developed a complete printing system that perfected the printing process through all of its stages by adapting existing technologies to printing purposes, as well as making ground-breaking inventions of his own. His newly devised hand mould made possible for the first time the precise and rapid creation of metal movable type in large quantities, a key element in the profitability of the whole printing enterprise.

The printing press spread within several decades to over 200 cities in a dozen European countries. By 1500, printing presses in operation throughout Western Europe had already produced more than 20 million volumes. In the 16th century, with presses spreading further afield, their output rose tenfold to an estimated 150 to 200 million copies. The operation of a press became so synonymous with the enterprise of printing that it lent its name to an entire new branch of media, the press.

JOHANNES GUTENBERG

The invention of the movable metal type printer in Europe is usually credited to the German printer Johannes Gutenberg. However, there are other claims, notably the Dutch printer **Laurens Janszoon Coster** (c. 1370-1440 CE) and two other early German printers, **Johann Fust** (c. 1400-1465 CE) and his son-in-law **Peter Schöffer** (c. 1425-1502 CE). There is, too, evidence that movable metal type printers had already been invented in Korea in 1234 CE in the Goryeo Kingdom (918-1392 CE). Chinese Buddhist scholars also printed religious works using moveable type presses; the earliest ones used woodblocks during the Song Dynasty (960-1279 CE). Whether the idea of moveable type presses spread via merchants and travellers from Asia to Europe or if the invention by Gutenberg was spontaneous is still a point of debate amongst scholars. In any case, like most technologies in history, the invention likely sprang from a cumulation of elements, ideas, and necessity involving multiple individuals across time and space.

Gutenberg began his printing experiments sometime in the 1440s CE, and he was able to establish his printing firm in Mainz in 1450 CE. Gutenberg's printer used Gothic script letters. Each letter was made on a metal block by engraving it into the base of a copper mould and then filling the mould with molten metal. Individual blocks were arranged in a frame to create a text and then covered in a viscous ink. Next, a sheet of paper, at that time made from old linen and rags, was mechanically pressed onto the metal blocks. Gutenberg's success in putting all these elements together is indicated by his printed edition of the Latin Bible in 1456 CE.

The new type of presses soon appeared elsewhere, notably with two Germans, **Arnold Pannartz** (d. 1476 CE) and **Conrad Sweynheym** (aka Schweinheim, d. 1477 CE). This pair established their printing press in 1465 CE in the Benedictine monastery of Subiaco. It was the first such press in Italy. Pannartz and Sweynheym moved their operation to Rome in 1467 CE and then Venice in 1469 CE, which already had a long experience of printing such things as playing cards. There were still some problems such as the lack of quality compared to handmade books and the drab presentation in respect to beautifully colour-illustrated manuscripts. Also, there were sometimes errors seen in the early printed editions and these mistakes were often then repeated in later editions. However, the revolution into how and what people read had well and truly begun.

Invention of the press

When Andreas Dritzehn died at Christmas 1438, his heirs, trying to circumvent the terms of the contract, began a lawsuit against Gutenberg in which they demanded to be made partners. They lost the suit, but the trial revealed that Gutenberg was working on a new invention. Witnesses testified that a carpenter named Conrad Saspach had advanced sums to Andreas Dritzehn for the building of a wooden press, and Hans Dünne, a goldsmith, declared that he had sold to Gutenberg, as early as 1436, 100 guilders' worth of printing materials. Gutenberg, apparently well along the way to completing his invention, was anxious to keep secret the nature of the enterprise

After March 12, 1444, Gutenberg's activities are undocumented for a number of years, but it is doubtful that he returned immediately to

Mainz, for the quarrel between patricians and guilds had been renewed in that city. In October 1448, however, Gutenberg was back in Mainz to borrow more money, which he received from a relative. By 1450 his printing experiments had apparently reached a considerable degree of refinement, for he was able to persuade Johann Fust, a wealthy financier, to lend him 800 guilders—a very substantial capital investment, for which the tools and equipment for printing were to act as securities. Two years later Fust made an investment of an additional 800 guilders for a partnership in the enterprise. Fust and Gutenberg eventually became estranged, Fust, apparently, wanting a safe and quick return on his investment, while Gutenberg aimed at perfection rather than promptness.

Fust won a suit against him, the record of which is preserved, in part, in what is called the Helmaspergersches, Notariatsinstrument (the Helmasperger notarial instrument), dated November 6, 1455, now in the library of the University of Göttingen. Gutenberg was ordered to pay Fust the total sum of the two loans and compound interest (probably totaling 2,020 guilders). Traditional historiography suggested that this settlement ruined Gutenberg, but more recent scholarship suggests that it favoured him, allowing him to operate a printing shop through the 1450s and maybe into the 1460s.

THE SPREAD OF INFORMATION

Soon, a new boost to the quantity of printed material came with the rise of the humanist movement and its interest in reviving literature from ancient Greece and Rome. Two printers, in particular, profited from this new demand: the Frenchman Nicholas Jensen (1420-1480 CE) and the Italian Aldus Manutius (c. 1452-1515 CE). Jensen innovated with new typefaces in his printing shop in Venice, including the easy-to-read roman type (*littera antiqua*/*lettera antica*) and a Greek font which imitated manuscript texts. Jensen printed over 70 books in the 1470s CE, including Pliny's *Natural History* in 1472 CE. Some of these books had illustrations and decorations added by hand to recapture the quality of older, entirely handmade books.

Meanwhile Manutius, also operating in Venice, specialised in smaller pocket editions of classical texts and contemporary humanist authors. By 1515 CE, all major classical writers were available in print, most in multiple editions and many as collections of complete works. In addition, printed classical texts with identical multiple copies in the hands of scholars across Europe could now be easily checked for accuracy against source manuscripts. Handmade books had often perpetuated errors, omissions, and additions made by individual copyists over centuries, but now, gradually, definitive editions of classical works could be realised which were as close as possible to the ancient original. In short, printed works became both the cause and fruit of an international collective scholarship, a phenomenon which would reap rewards in many other areas from astronomy to zoology.

There was, too, a drive to print more books thanks to the Reformists who began to question the Catholic Church's interpretation of the Bible and its stranglehold on how Christians should think and worship. The Bible was one of the priorities to have translated into vernacular languages, for example German (1466 CE), Italian (1471 CE), Dutch (1477 CE), Catalan (1478 CE), and Czech (1488 CE). Reformists and humanists wrote commentaries on primary sources and argued with each other in print, thereby establishing an invisible web of knowledge and scholarship across Europe. Even the letters written between these scholars were published. As religious and academic issues raged, so the debating scholars fuelled the production of yet more printed works in a perpetuating cycle of the printed word. Ordinary folks, too, were roused by arguments presented in printed materials so that groups of like-minded individuals were able to quickly spread their ideas and organise mass movements across multiple cities such as during the German Peasants' War of 1525 CE.

There were, too, plenty of works for non-scholars. As more people began to read, so more collections of poems, novellas, and romances were printed, establishing Europe-wide trends in literature. These secular works were often written in the vernacular and not the Latin scholars then preferred. Finally, many books included a number of woodcut engravings to illustrate the text. Collections of fine prints of famous paintings, sculptures, and frescoes became very popular and helped to spread ideas in art across countries so that a painter like Albrecht Dürer (1471-1528 CE) in Germany could see what Raphael (1483-1520 CE) was up to in Italy.

CHANGES INTRODUCED BY PRINTING REVOLUTION

1. A Global News Network Was Launched

Gutenberg didn't live to see the immense impact of his invention. His greatest accomplishment was the first print run of the Bible in Latin, which took three years to print around 200 copies, a miraculously speedy achievement in the day of hand-copied manuscripts. Since literacy rates were still very low in the 1490s, locals would gather at the pub to hear a paid reader recite the latest news, which was everything from bawdy scandals to war reports.

2.The Renaissance Kicked Into High Gear

The Italian Renaissance began nearly a century before Gutenberg invented his printing press when 14th-century political leaders in Italian city-states like Rome and Florence set

out to revive the Ancient Roman educational system that had produced giants like Caesar, Cicero and Seneca.

One of the chief projects of the early Renaissance was to find long-lost works by figures like Plato and Aristotle and republish them. Wealthy patrons funded expensive expeditions across the Alps in search of isolated monasteries. Italian emissaries spent years in the Ottoman Empire learning enough Ancient Greek and Arabic to translate and copy rare texts into Latin.

The operation to retrieve classic texts was in action long before the printing press, but publishing the texts had been arduously slow and prohibitively expensive for anyone other than the richest of the rich. Palmer says that one hand-copied book in the 14th century cost as much as a house and libraries cost a small fortune. The largest European library in 1300 was the university library of Paris, which had 300 total manuscripts.

By the 1490s, when Venice was the book-printing capital of Europe, a printed copy of a great work by Cicero only cost a month's salary for a school teacher. The printing press didn't launch the Renaissance, but it vastly accelerated the rediscovery and sharing of knowledge.

3. Martin Luther Becomes the First Best-Selling Author

There's a famous quote attributed to German religious reformer Martin Luther that sums up the role of the printing press in the Protestant Reformation: "Printing is the ultimate gift of God and the greatest one."

Luther wasn't the first theologian to question the Church, but he was the first to widely publish his message. Other "heretics" saw their movements quickly quashed by Church authorities and the few copies of their writings easily destroyed. But the timing of Luther's crusade against the selling of indulgences coincided with an explosion of printing presses across Europe.

As the legend goes, Luther nailed his "95 Theses" to the church door in Wittenberg on October 31, 1517. Palmer says that broadsheet copies of Luther's document were being printed in London as quickly as 17 days later.

Thanks to the printing press and the timely power of his message, Luther became the world's first best-selling author. Luther's translation of the New Testament into German sold 5,000 copies in just two weeks. From 1518 to 1525, Luther's writings accounted for a third of all books sold in Germany and his German Bible went through more than 430 editions.

4. Printing Powers the Scientific Revolution

The English philosopher Francis Bacon, who's credited with developing the scientific method, wrote in 1620 that the three inventions that forever changed the world were gunpowder, the nautical compass and the printing press.

When historian Elizabeth Eisenstein wrote her 1980 book about the impact of the printing press, she said that its biggest gift to science wasn't necessarily the speed at which ideas could spread with printed books, but the accuracy with which the

original data were copied. With printed formulas and mathematical tables in hand, scientists could trust the fidelity of existing data and devote more energy to breaking new ground.

5. Fringe Voices Get a Platform

“Whenever a new information technology comes along, and this includes the printing press, among the very first groups to be ‘loud’ in it are the people who were silenced in the earlier system, which means radical voices,” says Palmer.

It takes effort to adopt a new information technology, whether it’s the ham radio, an internet bulletin board, or Instagram. The people most willing to take risks and make the effort to be early adopters are those who had no voice before that technology existed.

“In the print revolution, that meant radical heresies, radical Christian splinter groups, radical egalitarian groups, critics of the government,” says Palmer. “The Protestant Reformation is only one of many symptoms of print enabling these voices to be heard.”

As critical and alternative opinions entered the public discourse, those in power tried to censor it. Before the printing press, censorship was easy. All it required was killing the “heretic” and burning his or her handful of notebooks.

6.From Public Opinion to Popular Revolution

During the Enlightenment era, philosophers like John Locke, Voltaire and Jean-Jacques Rousseau were widely read among an increasingly literate populace. Their elevation of critical reasoning above custom and tradition encouraged people to question religious authority and prize personal liberty.

“Printing is the most beautiful gift from heaven,” continues Mercier. “It soon will change the countenance of the universe… Printing was only born a short while ago, and already everything is heading toward perfection… Tremble, therefore, tyrants of the world! Tremble before the virtuous writer!”

Even the illiterate couldn’t resist the attraction of revolutionary Enlightenment authors, Palmer says. When Thomas Paine published “Common Sense” in 1776, the literacy rate in the American colonies was around 15 percent, yet there were more copies printed and sold of the revolutionary tract than the entire population of the colonies.

7. Machines ‘Steal Jobs’ From Workers

The Industrial Revolution didn’t get into full swing in Europe until the mid-18th century, but you can make the argument that the printing press introduced the world to the idea of machines “stealing jobs” from workers.

Before Gutenberg’s paradigm-shifting invention, scribes were in high demand. Bookmakers would employ dozens of trained artisans to painstakingly hand-copy and illuminate manuscripts. But by the late 15th century, the printing press had rendered their unique skillset all but obsolete.

On the flip side, the huge demand for printed material spawned the creation of an entirely new industry of printers, brick-and-mortar booksellers and enterprising street peddlers. Among those who got his start as a printer's apprentice was future Founding Father, Benjamin Franklin.

BIBLOGRAPHY

Campbell, Gordon. *The Oxford Illustrated History of the Renaissance.* Oxford University Press, 2019.

Holmes, George. *The Oxford History Of Medieval Europe.* Oxford University Press, U.S.A., 2001.

Wyatt, Michael. *The Cambridge Companion to the Italian* Renaissance*.* Cambridge University Press, 2014.

www.courses.lumenlearning.com

www.worldhistory.org

www.crf-usa.org

Scientific Revolution. How Scientific was it?

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Introduction of the Scientific Revolution

During the 1500s and 1600s, a handful of brilliant individuals laid the foundations for science as we know it today. Some historians consider the development of modern science the most important event in the intellectual history of humankind.
The series of events that led to the birth of modern science is called the Scientific Revolution. It occurred between about 1540 and 1700. Why would the birth of science be called a “revolution”? The answer is that science was a radical new idea. It was a completely different way of looking at the world.
Science is a particular way of gaining knowledge about the world. In fact, the word science comes from a Latin word meaning “knowledge” or “understanding.” Science starts with observation. Scientists observe, or look at, the world. By observing the world they can identify facts about it. A famous scientist once said, “Science is built up with facts, as a house is with stones. But a collection of facts is no more a science than a pile of stones is a house.”

So scientists do more than identify facts. They use logic to explain the facts they have observed. The explanations scientists develop based on these facts are called theories. Theories are not accepted on faith. They must be tested to see if they are true. Scientists design experiments to test their theories. If the experiments keep showing that the theory makes sense, the theory is kept. If the experiments do not support the theory, scientists try a new theory. In this way, scientists learn more about the world.
As you can see, scientific knowledge is based on observations, facts, and logical ideas, or theories, about them. Before the Scientific Revolution, this method of gaining knowledge was uncommon.

Greek Thinkers

Many Greek thinkers expressed ideas that, today, we would call scientific. The great philosopher Aristotle, for example, wrote about astronomy, geography, and many other fields. But his greatest contribution to science was the idea that people should observe the world carefully and draw logical conclusions about what they see. The use of observation and logic, as you have just read, is important in gaining scientific knowledge.

Another Greek thinker was Ptolemy, an ancient astronomer. He studied the skies, recorded his observations, and offered theories to explain what he saw. Ptolemy was also a geographer who made the best maps of his time. His maps were based on observations of the real world. Aristotle, Ptolemy, and other Greek thinkers were rationalists, people who looked at the world in a rational, or reasonable and logical, way. During the Renaissance, Europeans studied the works of Greek rationalists. As a result, they began to view the world in a rational way. They began to think like scientists.

Developments in Europe

The Scientific Revolution was not just the result of European scholars studying ancient Greek writings. Developments in Europe also helped bring about the Scientific Revolution. One development that helped lead to the Scientific Revolution was the growth of humanism during the Renaissance. Humanist artists and writers spent much of their time studying the natural world. This interest in the natural world carried forward into the Scientific Revolution.

Another development was a growing interest in alchemy (AL-kuh-mee). Alchemy was a forerunner of chemistry. Alchemists experimented with various natural substances. They were best known for trying to change other metals into gold. Although they failed at that, alchemists succeeded in using experiments to learn more about how nature worked.

All of these developments—the interest in ancient Greek writings, the growth of humanism, the experiments of alchemists—came together in the early 1500s to bring about the Scientific Revolution.

ASTRONOMY

In 1543 an astronomer published a book that contradicted what a Greek authority had written. Many historians think the publication of this book marks the beginning of the Scientific Revolution.

Nicolaus Copernicus

The book thought to have marked the beginning of the Scientific Revolution was written by a Polish astronomer, Nicolaus Copernicus (kuh-PUHR-ni-kuhs). His 1543 book was called On the Revolution of the Celestial Spheres. Copernicus was familiar with Ptolemy's theories and writings. Ptolemy had written that the earth was the center of the universe and that the sun and other planets orbited, or circled around, the earth. For 1,400 years, people accepted this belief as fact.

As Copernicus studied the movements of the planets, however, what Ptolemy stated made less and less sense to him. If the planets were indeed orbiting the earth, they would have to be moving in very complex patterns. So Copernicus tried a different explanation for what he observed in the sky. Copernicus asked, What if the planets actually orbited the sun? Suddenly, complex patterns weren't necessary to make sense of what Copernicus observed. Instead, simple circular orbits would account for the planets' movements.

GALILEO GALILEI

Galileo was one of the most important scientists of the Scientific Revolution. He was the first person to study the sky with a telescope. With his telescope, Galileo discovered craters and mountains on the moon. He also discovered that moons orbit Jupiter.

Galileo was interested in more than astronomy, however. He also was interested in such things as how falling objects behave. Today, we use the term mechanics for the study of objects and motion.

SIR ISAAC NEWTON

The high point of the Scientific Revolution was marked by the publication of a remarkable book. This book, published in 1687, was Principia Mathematica. Its author was the English scientist Sir Isaac Newton. Newton was one of the greatest and most influential scientists who ever lived. Newton studied and simplified the work of earlier scientists. In doing so, he:

- reviewed everything scientists had been learning,
- coupled it with his own observations and ideas, and
- identified four theories that described how the physical world worked.

Some of his theories have been proven so many times that they are no longer called theories, but laws.

SCIENCE, GOVERNMENT, AND SOCIETY

Some of the most important effects of the Scientific Revolution had nothing to do with science at all. When philosophers began applying scientific thought to other areas of human life, they came up with some startling new ideas.

The Power of Reason

By the end of the Scientific Revolution, one thing had become clear to many European thinkers: human reason, or logical thought, was a powerful tool. After all, scientists using reason had made many discoveries about the universe in a relatively short time. Since reason had proven itself as a way to learn some of nature's great secrets, might reason also be used to solve the problems facing people? Philosophers decided to use reason when they considered society's problems like poverty and war, or what type of government is best. This use of reason to consider the problems of society led philosophers to look at the world in a new way. They thought they could use reason to determine how to improve society.

Democratic Ideas

One way in which scientists thought they could improve society was by changing its government. Scientists' use of reason and logic during the Scientific Revolution helped pave the way for the beginnings of democratic thought in Europe. As scientists like Sir Isaac Newton studied the world, they discovered laws that governed nature. In time, some scientists began to think that there must be laws that governed human behavior as well.

SCIENCE AND RELIGION

The Roman Catholic Church was a powerful force in Europe during the time of the Scientific Revolution. The birth and growth of science led to conflicts between scientists and the Church.

Reason for Conflict

There were two related parts to the conflict between science and the Church. The first was that the new science was putting forth ideas that contradicted Church teachings. For example, Copernicus's idea that the earth orbited the sun contradicted the Church teaching that the earth was at the center of the universe.

A second part of the conflict was related to the first. When people contradicted the Church's teachings, they weakened the Church. Church officials were afraid that questioning even one Church teaching might lead to more and more questions about the Church. People might even start to doubt key elements of the faith. Church officials feared this would undermine the Church's influence.

The Trial of Galileo

The conflict between science and the Church was illustrated by a trial. Galileo published a book that supported the view that the planets orbit the sun. For this, he was put on trial by the Inquisition, a Church court that investigated people who questioned Church authority. Catholic officials insisted that Galileo publicly reject his findings and accept Catholic teachings that the earth was the center of the universe and did not move. Under threat of torture, Galileo agreed. Still, legend has it that as Galileo left his trial, he muttered, "And yet it does move." Although he is remembered for opposing this Church teaching, Galileo was a devout Catholic. He believed that experimentation was a search for an understanding of God's creation.

Preserving Ancient Knowledge

European scholars could study ancient Greek writings because of the work of others. Muslim scholars translated Greek writings into Arabic. They studied them for centuries and added their own new ideas. Later, the Arabic versions were translated into Latin, which was read in Europe. This work preserved ancient knowledge and spread interest in science to Europe.

Other religious scholars also played a role in preserving Greek ideas. The Jewish scholar Maimonides studied and wrote about Aristotle, trying to unite his work with Jewish ideas. The Christian scholar Thomas Aquinas tried to unite the work of Aristotle with Christian ideas. Other Christian scholars studied Greek ideas in Europe's universities.

Conclusion

Despite the conflicts, science developed rapidly after the Scientific Revolution. Scientists made—and continue to make—countless discoveries. Scientific knowledge has changed human life dramatically and touches your life every day. Therefore, the Scientific Revolution ranks as one of the most influential events in history.

Many of the scientists you have been reading about held views similar to Galileo's. For the scientists of the Scientific Revolution, science and traditional religious beliefs could exist at the same time. Nicolaus Copernicus served as a Church official. Sir Isaac Newton saw a close connection between science and religion. For example, Newton believed that all forces in nature were actions directed by God.

Bibliography

Playlist : https://youtu.be/enji5ffwiis
https://youtu.be/XBX4mOuxl2s
https://youtu.be/M7A-cJGlDgA

Readings :
To Explain the World: The Discovery of Modern Science
College LMS

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বিষয়

আমি বিজ্ঞানমনস্ক হতে

তারিখ

(৩ - ২)

আধুনিক শিল্পায়ন :- শিল্প বিপ্লবের ইতিহাসটি আন্তর্জাতিক কারণে আধুনিক শিল্পায়ন-ই ক্রিয়াটি গুরুত্ব লাভ করেছে। আধুনিক শিল্পায়ন বলতে আধুনিক শিল্পায়নের পূর্ববর্তী অবস্থাকে বোঝায় না, তাছাড়া অতিরিক্ত কিছু বোঝানো হয়ে থাকে। বস্তুত সত্য আধুনিক শিল্পায়ন যেসব সমস্যা তৈরি হয়েছিল, তা সমস্ত আন্তর্জাতিক অর্থনীতির অবিচ্ছেদ্য অংশে পরিণত হয়েছিল। অনেকে আধুনিক শিল্পায়নকে শিল্পায়নের স্বাভাবিক সমস্যা বলেও গণ্য করে থাকেন। ঐতিহাসিকেরা আধুনিক শিল্পায়নের শ্রেণীবিভাগের বিকাশের ক্ষেত্রে কতকগুলি অর্থনৈতিক দিককে গুরুত্ব দিয়ে থাকেন।

আধুনিক শিল্পায়ন সমাজের গুহাভ্যন্তরিক উৎপাদন সংস্কৃতি থেকে উন্নত সমাজের গুহাভ্যন্তরিক সমাজের স্থায়ী বাজারের চাহিদা অনুযায়ী উৎপাদন করা হত। প্রযুক্তিগত বিপ্লবের ফলে অল্প খরচে অনেক মাল তৈরি হতে লাগল, সেই দিক থেকে আধুনিক শিল্পায়নের সম্ভাবনা বৃদ্ধি পেল, তাই কারখানে অসংখ্য বড় বড় বাজারের জন্য শিল্পায়ন শুরু করা হয়েছিল, আর এই সমাজের বড় বড় বণিকেরা প্রাথমিক উৎপাদনকে পুঁজি করে কারখানা সংগঠন করত। উৎপাদিত সামগ্রীকে এই বড় বণিকেরা বাজারজাত করতেন, এই ভাবে অনেক সমাজের বণিকেরা পুঁজির আকর শিল্প পুঁজির চাহিদা বৃদ্ধি হয়েছিল, কারিগরী ও এই অগ্রগতির বিশেষজ্ঞদের গুরুত্ব দিতে থাকেন।

এই সময়ে অর্থনৈতিক দিক দিয়েও আত্মনির্ভরশীল ছিল, কেননা এই সময়ের উৎপাদনী ব্যবস্থায় অনেকের হাত বিনামূল্যে ব্যবহৃত হত। কারিগর উৎপাদকেরা শুধুমাত্র নিজের স্ত্রীকে নিয়ে ব্যবসা পরিচালনা করত। অবশ্যই তারা কিছু সহায়ক কর্মী নিয়োগ করত, তবে তাদের সংখ্যা খুব বেশি হত না। তারা সাধারণত বাজারের বিভিন্ন অংশের জন্য উৎপাদন করত। কিন্তু উৎপাদকের সাথে সাথে উৎপাদনের প্রযুক্তিগুলিও উন্নত হচ্ছিল। ক্রমবর্ধমান উৎপাদন ব্যবস্থার সঙ্গে সঙ্গে এই সময়ে শ্রমিকদের মধ্যে বিশেষীকরণ দেখা দেয়। ক্রমবর্ধমান উৎপাদন ব্যবস্থার সঙ্গে সঙ্গে এই সময়ে শ্রমিকদের মধ্যে বিশেষীকরণ দেখা দেয়। ক্রমবর্ধমান উৎপাদন ব্যবস্থার সঙ্গে সঙ্গে এই সময়ে শ্রমিকদের মধ্যে বিশেষীকরণ দেখা দেয়।

অষ্টাদশ শতাব্দীর শেষের দিকে শিল্পবিপ্লবের সূচনা হয়। এই সময়ে উৎপাদন ব্যবস্থায় ব্যাপক পরিবর্তন আসে। ক্ষুদ্র উৎপাদন ব্যবস্থার স্থান নেয় বৃহৎ উৎপাদন ব্যবস্থা। এই সময়ে উৎপাদন ব্যবস্থায় ব্যাপক পরিবর্তন আসে। ক্ষুদ্র উৎপাদন ব্যবস্থার স্থান নেয় বৃহৎ উৎপাদন ব্যবস্থা। এই সময়ে উৎপাদন ব্যবস্থায় ব্যাপক পরিবর্তন আসে। ক্ষুদ্র উৎপাদন ব্যবস্থার স্থান নেয় বৃহৎ উৎপাদন ব্যবস্থা।

দিলে কোন কারণে সংসারটি ধ্বংস হলে তাই বাবা উইলের মাধ্যমে তাদের স্ত্রীকে সুরক্ষা দিতেন, যাতে তাঁরা উইলের সুরক্ষা লাভ করতে পারেন।

আইনের অনুশাসনের ক্ষেত্রে বলা হয়ে থাকে যে, আদালত কোনো আইনের ব্যাখ্যা অনুশাসনের বিপক্ষে যুক্তি উপস্থাপন করলে সেটি গ্রহণ করতেন না, তেমনি এই আইনের লাভালাভ হত, তেমনি সমাজে অসাম্য দূর করে সাম্য প্রতিষ্ঠার বিষয়ে লাভ সাধিত হত, সাথে সাথে উইলের ব্যাখ্যার অনুশাসন বিঘ্নিত হত, তাহলে আইনের ব্যাখ্যা করতে গেলে এই উইলের ক্ষেত্রে উইলকারী অসহায়দের কাঁচামাল করতে দিতো, সাথে সাথে উইলের ব্যাখ্যার উইলের ব্যাপকতা সম্পর্কিত কোনো সংজ্ঞা দেওয়া যায়, এই সমস্ত বিষয়ে বলা যেতে পারে যে আদালত সংসারটি স্ত্রীদের অস্তিত্বের জন্য কোনো ধারণা করলেও স্ত্রী-দের ব্যাপকতা বিষয়ে সঠিক হতে পারেন, তাহলেও তাদের উইলের বিষয়ে ইতিহাসে আদালত সংসারটি সুরক্ষা দেবার জন্য এগিয়ে আসে।

Printing Revolution

Department of History – 4th Semester

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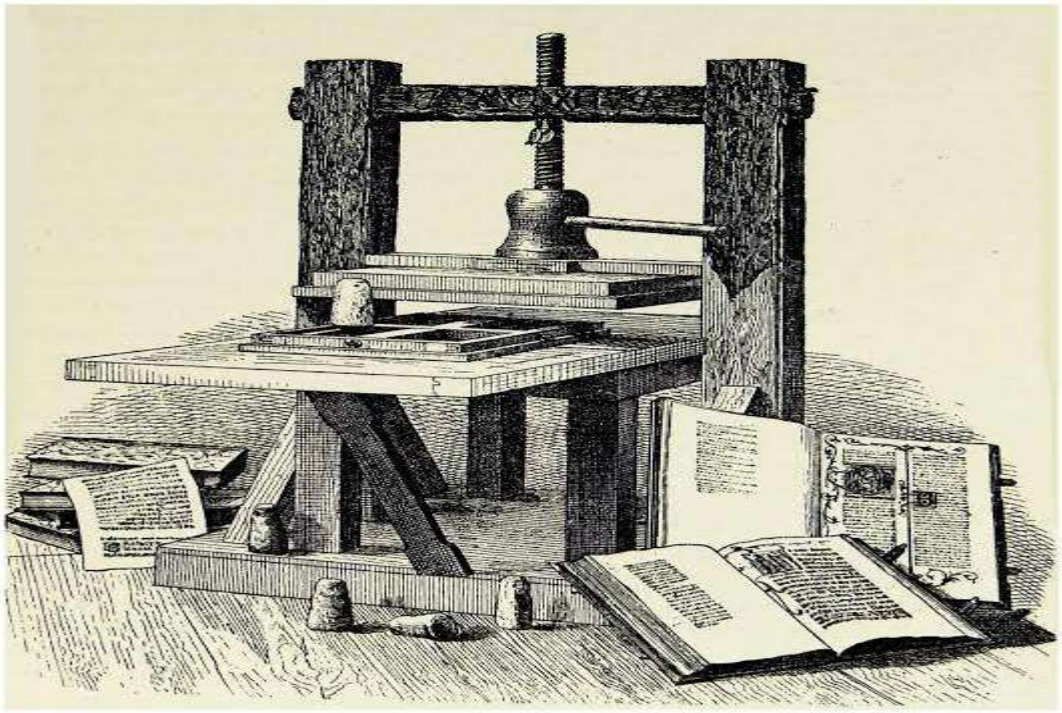
Content

Introduction

The early modern period in European history coincides almost with the age of the hand press. Before c.1450, literature circulated in manuscript. Printing with movable metal type was perfected in Mainz about 1450. By the early 1450s, Johann Gutenberg and his assistants Johann Fust and Peter Schoffer had devised and perfected a mechanical technique to replicate a manuscript book by other means. The Printing press was a major event in the commercial and academic world and it began to spread in different parts of Europe, particularly in the Italian city states. With the advent of printing press, book production multiplied by the end of the 15th century. Indeed, the coming ofthe printing book not only brought about a fundamental change in the sphere of rational thinking but it also helped to bring about a revolutionary change in the social structure and culture of the Contemporary Europe.



One of the first printing press (image 1)

Printing Prior to 15th Century

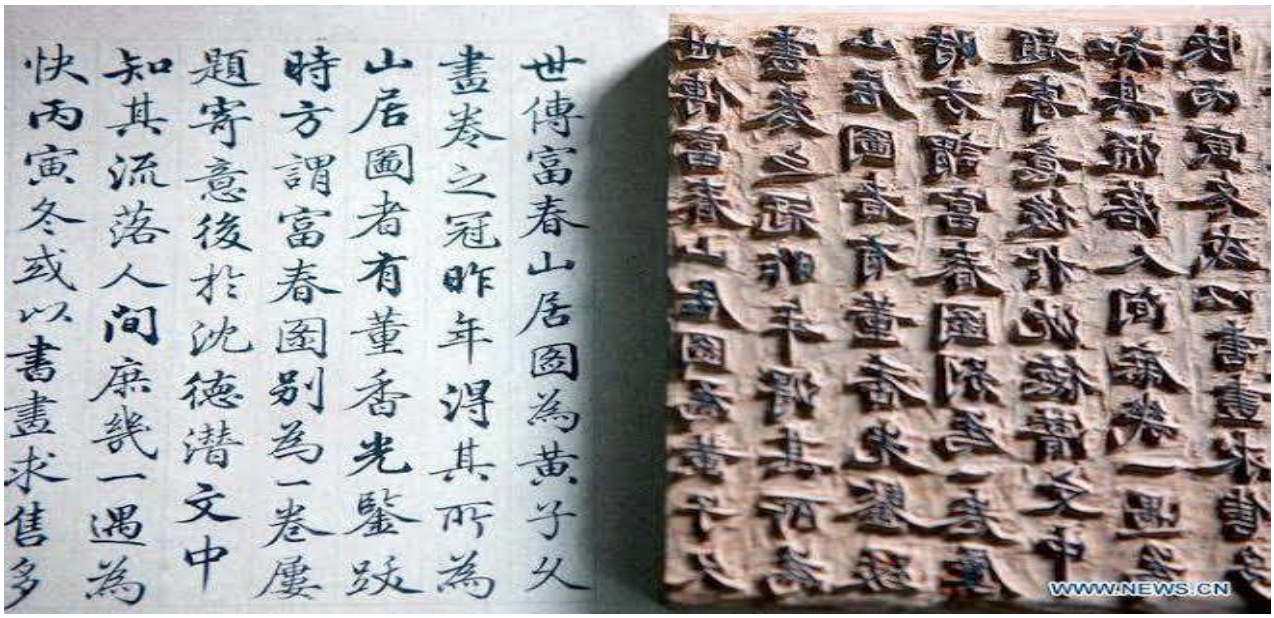
Eugene F. Rice and Anthony Grafton in “The Foundation of Early Modern Europe 1460-1559 argue that though the invention of the Printing press was successfully completed by Mainz printers in the 1450’s, it had important earlier beginnings. Two Chinese inventions, block printing and paper are linked with the beginning of typographic printing in Western Europe.

Moveable type, which replaced panels of printing blocks with moveable individual letters that could be reused, was developed by Bi Sheng, from Yingshan, Hubei, China, who lived roughly from 970 to 1051 A.D.

The first moveable type was carved into clay and baked into hard blocks that were then arranged onto an iron frame that was pressed against an iron plate.The earliest mention of Bi Sheng’s printing press is in the book Dream Pool Essays, written in 1086 by scientist Shen Kuo, who noted that his nephews came into possession of Bi Sheng’s typefaces after his death.

Woodtype made a comeback in 1297 when Ching-te magistrate Wang Chen printed a treatise on agriculture and farming practices called Nung Shu.Wang Chen devised a process to make the wood more durable and precise. He then created a revolving table for typesetters to organize with more efficiency, which led to greater speed in printing. Nung Shu is considered the world’s first mass-produced book

Though the process of Xylography or block printing is difficult, time-consuming and wasteful in execution and ill adapted to the alphabetic writing of the West, its indirect importance was great as it certainly diffused the idea of Printing and of the printed book. Manuscripts were copied on parchment or vellum. But a large book like Bible would require 170 calf skins.



Ancient Chinese technique of printing (image 2)

Johannes Gutenberg and Gutenberg Press

Integral to Gutenberg's design was replacing wood with metal and printing blocks with each letter, creating the European version of moveable type.In order to make the type available in large quantities and to different stages of printing, Gutenberg applied the concept of replica casting, which saw letters created in reverse in brass and then replicas made from these molds by pouring molten lead.

Researchers have speculated that Gutenberg actually used a sand-casting system that uses carved sand to create the metal molds. The letters were fashioned to fit together uniformly to create level lines of letters and consistent columns on flat media. Gutenberg's process would not have worked as seamlessly as it did if he had not made his own ink, devised to affix to metal rather than wood. Gutenberg was also able to perfect a method for flattening printing paper for use by using a winepress, traditionally used to press grapes for wine and olives for oil, retrofitted into his printing press design.

Gutenberg Press (image 3)

The oldest surviving books printed with moveable metal type were issued in Mainz. The 42 line Latin Bible, associated with Gutenberg, was finished in 1455. Rice and Grafton state that the Mainz printers had established the technology of printing on firm foundations and his successors followed his process even after 300 years.

Johann Fust and Peter Schoffer

On 14th August, 1457, Fust and Schoffer issued the Pslams printed on Vellum. It is one of the most beautiful and the oldest signed and dated book printed in Europe that has survived. The type, printed in red and black, fits handsomely on the page. Each psalm is adorned with the beauty of large initial letters, the lacy design of these letters, ornamented with flowers and animals, is masterly. Euan Cameron in his edited book 'Early Modern Europe' points out that the key to the 'Printing Revolution' was the combination of accuracy and flexibility.

The Mainz Psalter (image 4)

The first printed books have curios feature as their pages so closely resemble those of manuscript books. It seems that the earliest printers had no conception of the unique of their invention. They considered printing only a new and particular kind of writing. Schoffer coined it as 'the art of writing artificially without pen'.

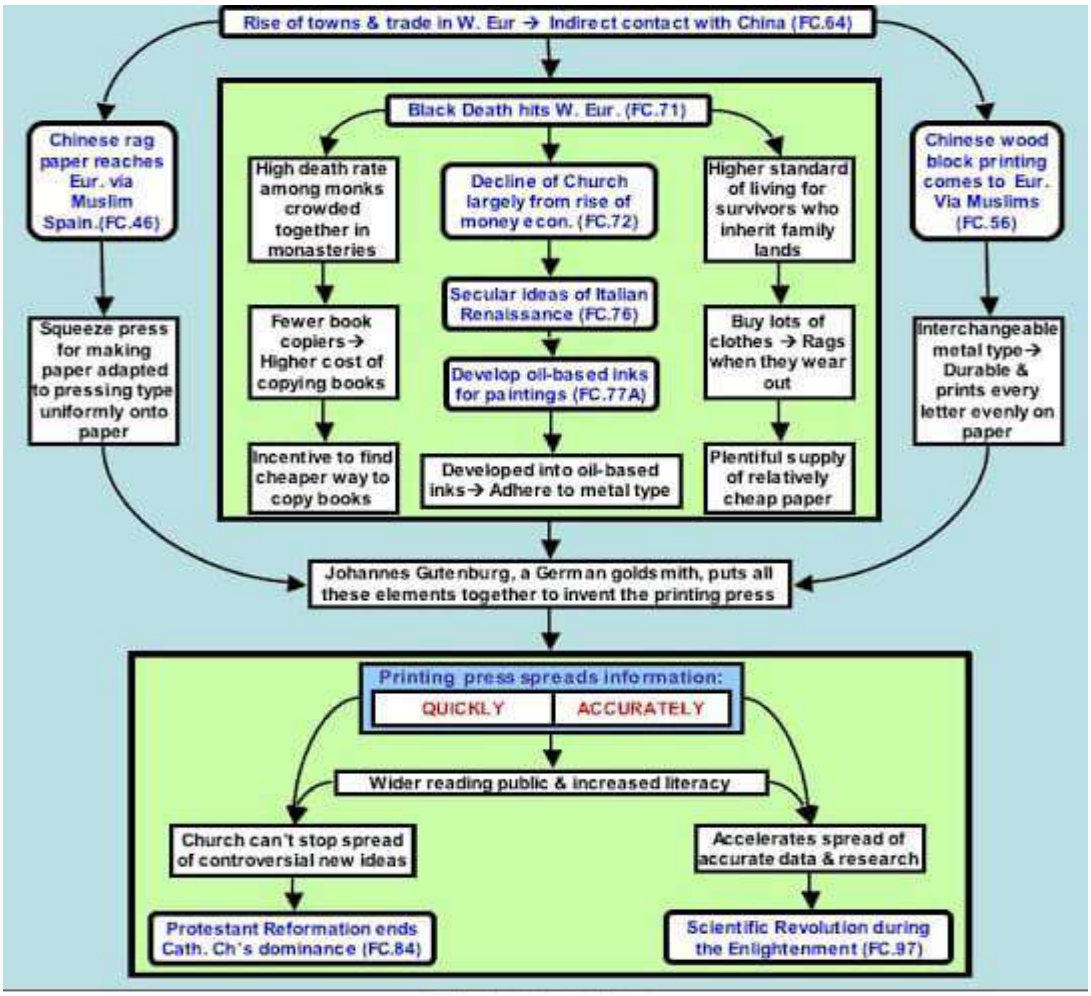
Printing Revolution

Lucien Febvre and Henri Jean Martin in “The Coming of the Book mention that at the initial period printers were planning trade outlets in university towns; Fust and Schoffer were supplying books for sale in Frankfurt, Lubeck, Angers and were about to open a bookshop in Paris. From 1460-70 printing expanded markedly and the trade improved its organization in Germany. By 1480 printing presses were in operation in more than 110 towns throughout Western Europe. From that it may be said of Europe that the printed books was in universal use. No fewer than 236 towns had seen printing presses installed by 1500. Rice and Grafton point out that by 1500 Printers concentrated in places like Mainz, Strasbourg, Nuremberg, Augsburg, Basle, Venice, Rome,Paris or Lyons where venture capital could be found, patrons sought and contracts negotiated.

The printers worked for profit. The immediate effect of printing was to further increase the circulation of those works which had already enjoyed success in manuscript. Euan Cameron mentions that religious works are estimated to account for three quarters of all books published before 1520: 16 editions of the Latin Vulgate Bible appeared at Paris alone between 1475 and 1517, while translations into the various vernaculars numbered at least 60 editions across Europe before 1520. Febvre and Martin argue that one of the first effects of the printing press was to multiply the number of works of popular piety generally available; the press thus testified to the depth of religious feeling among people in the late 15th century.

Euan Cameron states that the printing press evolved as a practical solution to a practical problem. In the 15th century, the number of universities, schools, colleges and the demand for books among the merchants, substantial artisans, lawyers, doctors, teachers who lived

and worked in towns seems to have been the key factor in the astonishingly rapid spread of printing between 1460 and 1500.

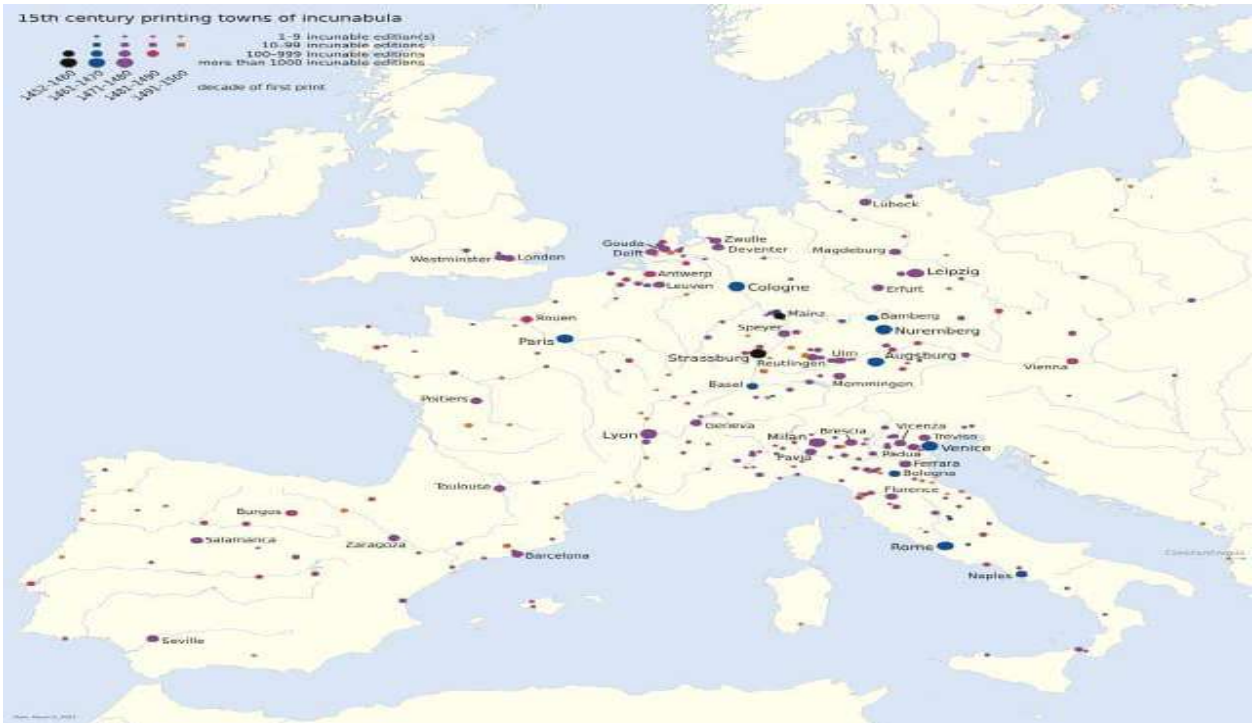


Printing Revolution (image 5)

Underlying the expansion of printing was that expansion of urban population and secular literacy which had begun in the high Middle Ages. As townsmen grew in number, education, wealth their cultural needs increased and they eagerly bought entertaining and useful books of all-sorts. By 1500, the presses had issued about 6 million books in approximately 40000 edition

Spread of Renaissance work and ideals through Printing Press

The Renaissance was a period of rebirth in Europe, and it was a period of inventions as well. One of the most important inventions that changed Europe and the entire world was the printing press created by Johannes Gutenberg in the 1440's.



Printing towns being created to spread the thoughts and ideals of Renaissance (image 6)

Gradually the taste of the Renaissance began to interact with the world of the publisher printer. In 1465 two German printers Konrad Swenheym and Arnold Pannartz issued Cicero's orator in Renaissance Roman type, and Augustine's city of God in the same type in 1467. By that time, humanist letter forms were being used in Strasbourg and Paris. A Frenchman Nicolas Jenson produced editions of Eusebius, Cicero and Virgil between 1470 and 1475 at Venice. By 1501, the Venetian printer Aldus Manutius and his type carved Francesco Griffo achieved the technically difficult feat of converting the Cancellaresca,

the Italic, into a printing type. Aldus succeeded inturing the publishing of Renaissance classical literature into a successful commercial proposition. By the early 16th century printers issued huge numbers of classical and Renaissance texts.

Impact of Printing Revolution

The printing of books has been regarded as watershed in history. Erasmus called printing the greatest of all discoveries. The printing press played a vital role in the spread of the new learning. The introduction of printing provided a practical way to produce books. The printing presses became important vehicles of cultural exchange and communication. Elizabeth L.Eisenstein in "The Printing Revolution in Modern Europe" argues that the advent of printing entailed a 'communication revolution'.

Rice and Grafton argue that the influence of printing on scholarship was most striking in the years before the Reformation. Unlike manuscripts, printed books were comparatively faultless, free from errors. Printing not only made scholarship fuller and more accurate, it also made it less difficult to acquire. Because of the greater standardization of print, learning to read was easier. It lessened the burden on the mind of man; many things could be obtained from books. Thus, printing freed the memory. Printing gave scholars all over Europe identical texts to work on. Scholars in diverse countries could work with one another by references to specific pages of specific editions.

Conclusion

Printing has played a critical role in the evolution of society across centuries, and with that in mind, much of the modern world has been shaped under its influence. The invention of printing greatly facilitated the spread of ideas, allowing for widespread publication of books,

pamphlets, newspapers, etc. Compared to the Middle Ages, when books had to be painstakingly copied by hand, printing allowed books (as well as various other forms of literature) to be produced far more quickly and in far greater numbers.

This proved critical in shaping so many of the critical intellectual currents of the early modern era, where printing was used as a tool to reach a larger audience. Throughout the Scientific Revolution, the Protestant Reformation, and the Enlightenment, printing was used as a tool for the proliferation of ideas and discourse. These all represented critical turning points in history, which have all held a lasting legacy in shaping society and culture centuries after the fact.

Johannes Guttenberg, the man who started the advent of Printing Revolution (image 7)

Bibliography

Technologies of Writing by Jaishree K. Odin ,University of Hawaii at Manoa – https://www.hawaii.edu/aln/printing.htm

Printing Press by Historia - https://www.google.com/amp/s/www.history.com/.amp/topics/inventions/printing-press

The Printing Revolution - https://courses.lumenlearning.com/suny-hccc-worldhistory/chapter/the-printing-revolution/

Images - https://images.app.goo.gl/GWzCzRpfgCdggqz57

17TH Century European Crisis: Major Issues

SEM IV

CALCUTTA UNIVERSITY ROLL NUMBER:

192223-11-0049

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CONTENT

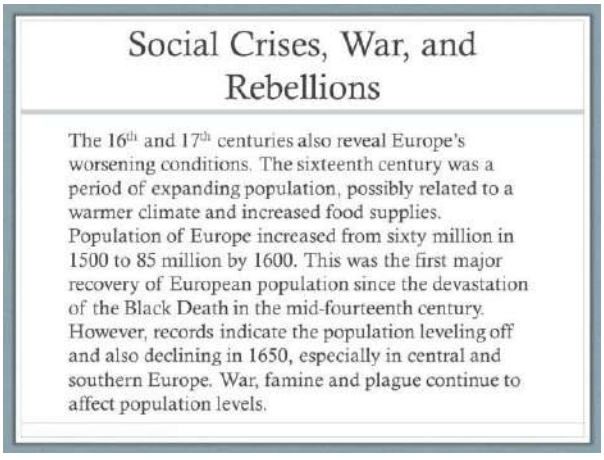
INTRODUCTION

The political, economic, and social upheavals of the mid-seventeenth century are called a 'General Crisis', and debated under that rubric, in most countries. The exception is Germany. For historians of Germany, the Thirty Years' War is the central concept for organizing the seventeenth century. Conversely, historians of the general crisis have largely ignored Germany. This is unsatisfactory on both sides. For the crisis historians it is unacceptable not only because any theory of general crisis must be able to account for Germany, but also because the Thirty Years' War was the most spectacular disorder of the crisis period. German historians, on the other hand, cannot be satisfied with a purely German account of the Thirty Years' War that suppresses the wider political and economic context of what was, after all, a 'European civil war'. This topic will reconcile these viewpoints by putting Germany squarely at the centre of a theory of the crisis that takes existing crisis theories as its starting-point, but also shows how the Thirty Years' War, largely caused by the peculiar institutional structure of the Holy Roman Empire, in turn wrought significant institutional change, not just in Germany, but throughout Europe.

NOTES ON 17TH CENTURY

- Historians often refer to the seventeenth century as an "age of citrus" because Europe was challenged by population looses, economic decline, and social and political urgent.

- Peasants occupied the lower tires of a society organized in hierarchical level
- In much of Europe, the monarch occupied the summit, celebrate as a semi divine being chosen by God to embody the state.
- A political system common to early modern Europe in which monarchs claimed exclusive power to make and enforce laws, without checks by other institutions; this system was limited in practice by the need to maintain legitimacy and compromise with elites.
- Harsh economic conditions in the seventeenth century were greatly exacerbated by the decades-long conflict known as the Thirty Years' War (1618-1648). The war began with a conflict in Bohemia (part of the present-day Czach Republic) between the Catholic League and the Protestant Union but soon spread through the Holy Roman Empire, drawing in combatants from across Europe. The tide the catholic turned due to the intervention of Sweden, under its king Gustavus Adolphus (r. 1594-1632), and then France. The 1648 Peace of Westphalia that ended the Thirty Years' War marked a turning point in European history.



- Behind the conflict we find the same thing everywhere, the State's demand for higher revenues… In every case it was the governments that acted in a revolutionary manner: the tax demands disrupted the social balance. They did not create a revolutionary situation: they were in themselves revolution

Historical Debates on 17th Century Crisis

The period of crisis that happened in Europe in the seventeenth century was one of the toughest in history. After the process of expansion and growth experienced during the fifteenth and sixteenth centuries, Europe found itself in a deep crisis that lasted nearly a century. A crisis that was characterize by various features, foremost the demographic, because after the late Middle Ages the population had increased steadily; until it stops abruptly in the sixteenth century even to recede in many places. Other reasons that were attributed for causing this crisis included hunger, wars, revolts, politics, plagues and climate changes. Eric Hobsbawn argues that on the big picture, it was economic and social forces that created this mid 17th century crisis. On the other hand, Trevor Roper emphasized that the main causes for this crisis were the religious and political conflict. Although both arguments can be valid and were present in this disaster, I believe that the root causes of this crisis were religious and political differences, which ultimately led Europe to have economic and social conflicts as well.

One important example of this crisis is the thirty years war. It was a war that took place in central Europe (especially in Germany) between 1618 and 1648, in which the majority of the great European powers intervened. This war would mark the future if the European continent in the centuries to follow. The origin of this war goes back to the Peace of Augsburg, which basically stated that the religion of the ruler of the land will be the religion of the people. This resolved the conflicts between the Catholics and the Protestants for a while, but due to the diverse religions practiced in the German states, it did not solve the underlying religious issues definitively. Just by analyzing the phrases above, we automatically get the sense that it was religious conflicts the root cause of this war. This is confirmed by the event that sparked the war, the revolt in Bohemia. In this revolt, member of the predominantly protestant

bohemian legislature threw two catholic government officials pot the window, as a sign of protest against the religious policies of the newly elected king, the catholic Ferdinand II . However, the Catholics defeated the protestants, and this leads us to another example of religion causing the 30 years war; the intervention of the Danish and then the Swedish. This happened because of the fear of these kingdoms that their sovereignty as protestant lands was threatened by the Catholic success in the war, and also because the declarations of the king Frederick V, where he said that all Europe should be back to Catholic. Nevertheless, at this point the Catholics are still winning the war, and this catches the awareness of Cardinal Richelieu, who was the chief minister of King Louis XII of France. From this point on, this religious war becomes political, because even though he was catholic, France decides to join the war and help the Protestants. The reason for this was simple, balance of power; the French felt that Habsburgs have gained too much power and they did not want just one great power to control Europe.

This war is a great example of how religious and political reasons shaped this European crisis, and how these events led to the economic and social problems that a war brings, in order to fund the war with money and men. After all, this war was ended with the Treaty of Westphalia; which ironically ended up being like the treaty of the peace Augsburg that stated that the religion of the prince is the religion of the people. The political effects of this war were very traumatic as well, first it weakened the power of the empire, and the individual territories of the Germany gained more autonomy even than before the war.

Another problem that rose during this crisis was the war of the three kingdoms. This is another great example to argue that Trevor Roper was correct in explaining the main cause of the crisis. This

war happened after England, Ireland and Scotland became united under the power of only one ruler. This was possible because, since Queen Elizabeth of England had no direct heir to her throne, the next in line was James Stuart, the king of Scotland . So what types of problems this created? First, James was a firm believer of the “divine right monarchy”, which basically means that he was placed there by god and does not have to report to anyone else. This belief did not bring many problems to other nations; however, the fact that England had a parliament created a lot of political tensions in this era. Expanding upon this, the wealth that the members of the parliament had acquired from the agricultural innovation, the expansion of their land and sheep count, increased this problems even more, because they now wanted to match their political power with their economic power. The fact of this happening brings us back to our thesis, and shows a religious problem becoming political, which ultimately becomes social. I argue this because the parliament starts to have power from the times of King Henry, when he needed their approval to separate from the Catholic Church (religion). Years after, this backfires to King James, because it gave more authority to the wealthy parliament, and clash with his ideals of divine right and absolutism (Politics). Subsequently, creating a lot tension and confusion among the people of the three kingdoms, whose laws and taxes kept changing as the power of the monarchy and the parliament would fluctuate (Social).

To further support our point, we can cite the historian Paul Hazard, who coined the term “crisis of the European consciousness” to

define an ideological crisis that could be found in the intellectual ambient of Europe after the wars of religion. This is a valid argument since it is logical to believe that religious conflicts could rupture the emotional stability of a society that is very much influenced by god and religion. The raise and growth of new religions that differed in many matters with ancient Catholicism brought into the map many thinkers that challenged even more the traditional beliefs. Intellectuals such as Descartes, Spinoza, Leibniz, Locke and Newton share a common time, it can even be dated astronomically with the famous Halley's comet of 1680 which allowed Pierre Bayle drafting its Charter, and use this to make fun (in a way) at the Religious superstitions and affirm that knowledge must be constantly proven and updated. However, this eventually created some social problems, since most of the universities and teaching centers were controlled and had the patronage of the church, being either catholic, like the Jesuits, or protestants. This is another example of how religious conflicts (Trevor's argument) happened first and the led to social problems (Hobsbawn argument)

Possibly the best example of the religious and political causes of this crisis was the glorious revolution. Going back to the origin of the problem, old King James II was a Catholic that had already irritated the parliament by relaxing the restrictions on the Catholics and allowing them to hold positions in public offices. Nevertheless, James was old and next line for the throne was his daughter Mary, a protestant that was married to William of Orange; so the parliament does not really take any action. However, things turn ugly after James II has a son that would mean the continuity of Catholic rule in England, which the parliament would not allow. This caused the glorious revolution, and causes James to escape to France with his son, and William of Orange is invited to be king of England.

It is interesting to see how the biggest political problem that King James II had was the fact that he was catholic; once again religion. In addition, the fact that the parliament is the one that invites William to be king summarizes the amount of power that he would have, which as we can see, was very limited. He was given many restrictions, such as the obligation to be an Anglican, he was not allowed to have a standing army, he was not allowed to veto a parliament act and there was no arbitrary arrest. Based on this, comes a liberal social movement that will support the ideas of the parliament in a way, and moves England even further away from absolutism. A leader of this movement is John Locke. We can see in his “Two treatises to the government” his idea of the natural right to live, which basically states that we all have a right to liberty and the possession of property. Moreover, if the government does not protect the natural right to live of the people, they can revel and a demand a ruler who does not violate their rights.

CRISIS OF THE SEVENTEENTH CENTURY. Echoing contemporary diarists and chroniclers, recent historians have depicted the seventeenth century as particularly troubled. Two essays that appeared in the British journal Past and Present during the 1950s have proved particularly influential. Though based on different premises and propounding distinct interpretations, both portrayed a systemic Europe-wide "general crisis" rooted in common economic distress and political unrest but producing a variety of outcomes.

Eric J. Hobsbawm's essay (printed in two parts in 1954, as "The General Crisis of the European Economy in the Seventeenth Century" and "The Crisis of the Seventeenth Century, II") addressed the then heated debate on the transition to capitalism. Whereas many participants held that the feudal economy had collapsed at the time of the Black Death, Hobsbawm argued that much of the old socioeconomic order had been perpetuated during the booming "long sixteenth century." By the end of that period, however, the feudal elements fatally obstructed growth. The ensuing broad and deep "retrogression" created opportunities for structural change, a possibility realized most completely in England, where political revolution removed obstacles to profound economic transformation.

CONCLUSION

In conclusion, the general crisis was characterized by a series of wars, revolts, decline of population and political and social changes that in many cases could have been avoided if the right precautions would have been taken. However, the fact Europe was undergoing a time political absolutism (at least that is what the rulers intended) and the close relation between church and government, made it impossible to avoid the conflicts. The numerous wars that happened (all for political and religious reasons) aided by plagues and diseases, caused the first decline in the population after the middle ages, therefore creating social and economic problems in the region. This is the reason why I believe that Trevor Roper was right by saying that the root cause of the crisis was political and religious (decisions to go to war, monarchs selected for their religion, etc); which then led to economic and social problem(increase of taxation, price revolution, and decline in population), aggravating even more the situation.

BIBLIOGRAPHY

https://en.m.wikipedia.org/wiki/The_General_Crisis

https://www.encyclopedia.com/history/encyclopedias-almanacs-transcripts-and-maps/crisis-seventeenth-century

https://www.britannica.com/place/Italy/The-17th-century-crisis

https://sites.google.com/site/historyforlarra2/home/unit-9-the-17th-century-europe-and-spain

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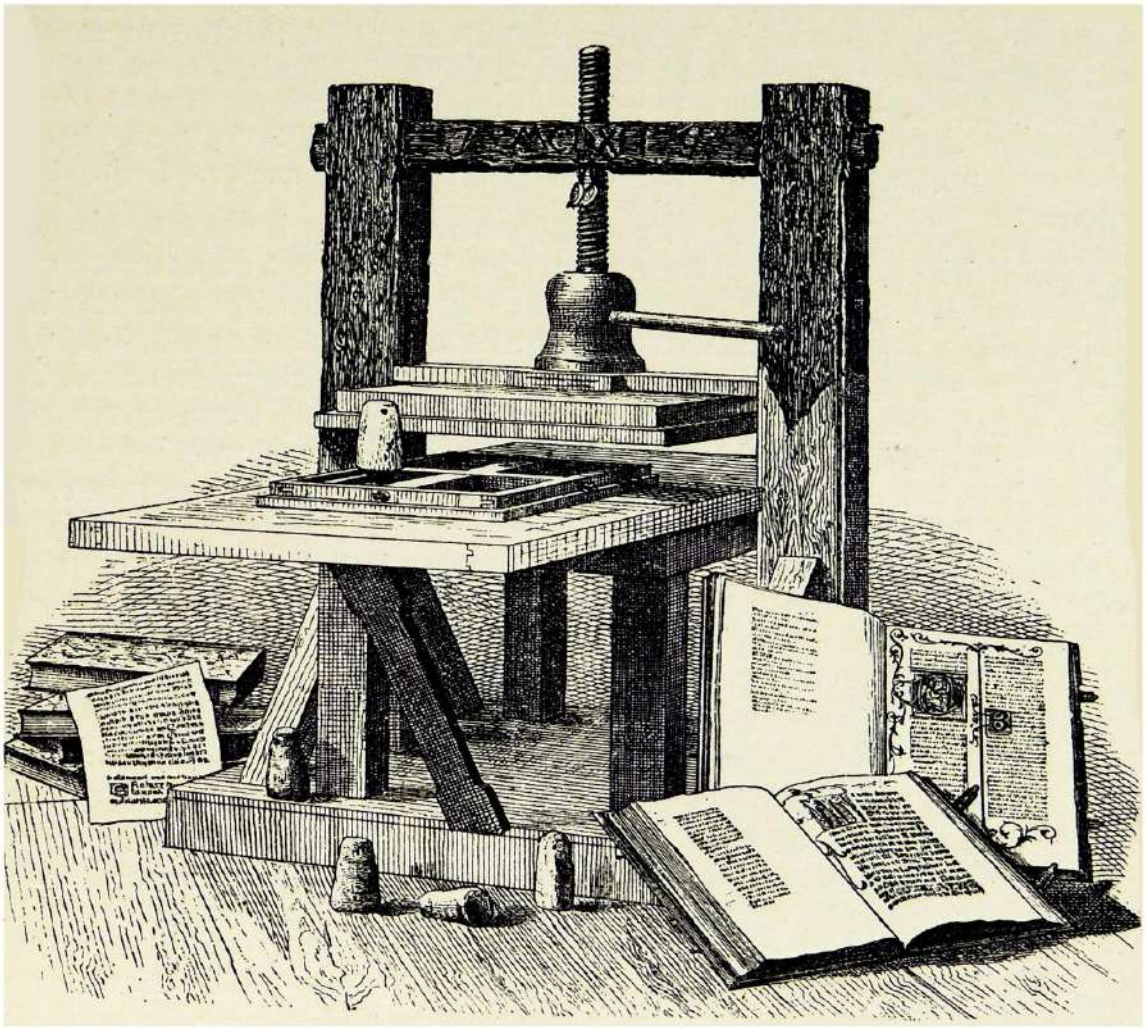
CONTENTS **PAGE NO.**

PRINTING REVOLUTION

Printing Revolution is one of the important features of early modern Europe. In the mid-fifteenth century all Europe came to have printing press. Before c.1450, literature circulated in manuscript. Printing with movable metal type was perfected in Mainz about 1450. By the early 1450s, Johann Gutenberg and his assistants Johann Fust and Peter Schoffer had devised and perfected a mechanical technique to replicate a manuscript book by other means. The Printing press was a major event in the commercial and academic world and it began to spread in different parts of Europe, particularly in the Italian city states. With the advent of printing press, book production multiplied by the end of the 15th century. Indeed, the coming of the printing book not only brought about a fundamental change in the sphere of rational thinking but it also helped to bring about a revolutionary change in the social structure and culture of the contemporary Europe.



JOHANNES GUTENBERG'S FIRST PRINTING PRESS

Eugene F. Rice and Anthony Grafton in “The Foundation of Early Modern Europe 1460-1559” argue that though the invention of the Printing press was successfully completed by Mainz printers in the 1450's, it had important earlier beginnings. Two Chinese inventions, block printing and paper are linked with the beginning of typographic printing in Western Europe. Though the process of Xylography or block printing is difficult, time-consuming and wasteful in execution and ill adapted to the alphabetic writing of the West, its indirect importance was great as it certainly diffused the idea of Printing and of the printed book. Manuscripts were copied on parchment or vellum. But a large book like Bible would require 170 calf skins. Thus, paper became economically indispensable as by the early 15th century paper was sold for approximately $1/6^{th}$ the price of parchment. Europeans learnt paper manufacturing from the Arabs who introduced it in Spain in the 12th century.

Within a short period this technology spread to Italy, France, Germany and Switzerland. Modern paper was made in Europe which completed the process of printing revolution. Not only machine and paper completed the printing revolution, other ingredients included the printing ink, oil and other materials. Paper technology was partially employed in printing process. New types were all made of metal. Metal technology was in an advanced stage in Europe which helped make metal types possible. Paper, machine, and ink jointly made the printing revolution possible and extremely successful. The oldest surviving books printed with moveable metal type were issued in Mainz. The 42 line Latin Bible, associated with Gutenberg, was finished in 1455. Rice and Grafton state that the Mainz printers had established the technology of printing on firm foundations and his successors followed his process even after 300 years. On 14th August, 1457, Fust and Schoffer issued the Pslams printed on Vellum. It is one of the most beautiful and the oldest signed and dated book printed in Europe that has survived. The type, printed in red and black, fits handsomely on the page. Each psalm is adorned with the beauty of large initial letters, the lacy design of these letters, ornamented with flowers and animals, is masterly. Euan Cameron in his edited book “Early Modern Europe” points out that the key to the 'Printing Revolution' was the combination of accuracy and flexibility. The first printed books have curios feature as their pages so closely resemble those of manuscript books. It seems that the earliest printers had no conception of the unique potentialities of their invention. They considered printing only a new and particular kind of writing. Schoffer coined it as 'the art of writing artificially without pen'.

One relevant information about printing revolution was that demand for books increased; this was a new social phenomenon in Europe. In earlier days only clergymen needed books which were supplied by copyists. From fifteenth century onwards the hand-written books could not meet the ever-rising demands. Books were still not as cheap as today in terms of price compared to income, but they were only around one-eighth of the price of a handmade book. With printing matter being varied and affordable, people who could not previously do so now had a real motive to read and so literacy rates increased. From this time onward books were written on various subjects, religions ceased to be the only theme. This was the great contribution of the Renaissance which broadened the outlook of the people in general. The gentry and the bourgeoisie tended to favor the spread of education. The growth of industry,

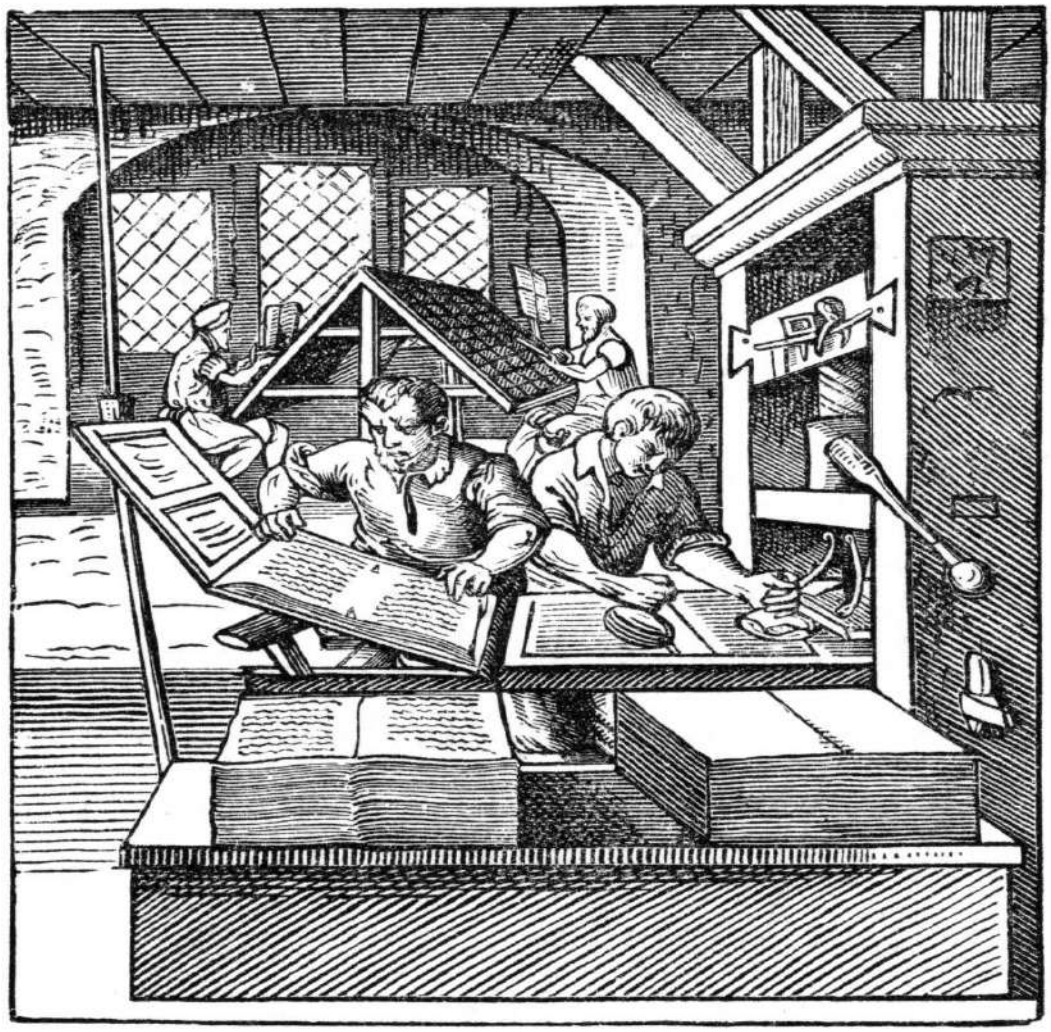
trade and finance necessitated the knowledge of mathematics. In general education was rapidly spreading all over Europe. It is said that necessity is the mother of invention. New Cambridge Modern History tells us that education was spreading rapidly under the impact of the Renaissance but the standard was going down. People wanted education not only for professional use but also for the pleasure of learning. Not only the biur and religious books were printed, books were written in vernacular languages. This was a period of expanding lay education new schools came into being. Between 1300 and 1500 the number of universities increased in central Europe from twenty to seventy, colleges also increased proportionately. France had 63 colleges, England 21, Italy 16 and Germany also had 16 colleges. By 1500 A.D. the number of educated people in Europe definitely increased but one black spot in this otherwise bright picture was that the peasants remained illiterate. Social groups like merchants, artisans, lawyers, government officials, doctors and teachers expanded rapidly. This increased the demand for books, and there was diversity in their contents. Books on history, grammar, encyclopedia, dictionary, mathematics and other subjects came out. The people wanted books on diverse subjects. The printing press also offered all sorts of new and exciting possibilities such as informative pamphlets, travel guides, collections of poems, romantic novels, histories of art and architecture, cooking and medicinal recipes, maps, posters, cartoons, and sheet music. It is not true that all people welcomed the advent of printing revolution, but those who opposed were few in number. They could not stop the process of transformation as the Luddites failed to stop the industrial revolution. Their products were superior in quality and less costly. By the end of the fifteenth century Germany alone produced more than forty thousand books.

The printing of books has been regarded as watershed in history. Erasmus called printing the greatest of all discoveries. The printing press played a vital role in the spread of the new learning. The introduction of printing provided a practical way to produce books. The printing presses became important vehicles of cultural exchange and communication. Elizabeth L. Eisenstein in "The Printing Revolution in Modern Europe" argues that the advent of printing entailed a 'communication revolution'.

Rice and Grafton argue that the influence of printing on scholarship was most striking in the years before the Reformation. Unlike manuscripts, printed books were comparatively faultless, free from errors. Printing not only made scholarship fuller and more accurate, it also made it less difficult to acquire. Because of the greater standardization of print, learning to read was easier. It lessened the burden on the mind of man; many things could be obtained from books. Thus, printing freed the memory.

The printing press encouraged the development of an extensive scientific literature written in the vernacular and intended for a mass market. In Italy Petrarch, Dante and Bottichelli wrote in the mother tongue. The same thing happened with Chaucer in England who popularised the vernacular. Printing turned intellectual work as a whole into a cooperative enterprise instead of a solitary human activity. Through printing scientific research became a public dialogue. The people of Europe came to know of the discovery of America and Asia through the printing press. People came to know the inventions of Copernicus, Galileo, Brahe, William Harvey and others through the press. In Germany Martin Luther preached his new

teachings in German language to make it intelligible to the common people. Between 1500 and 1530, Luther produced literally hundreds of pamphlets in German - a total of 20% of all pamphlets produced at the time. It cannot be denied that the printing revolution made the impact of Reformation very powerful. According to Mark U. Edwards (Harvard Divinity School), the printing press provided a means to "shape and channel mass movement [in ideas]". Simply put without the printing press it is unclear whether the Reformation would ever have occurred. By using the printing press in this manner the Catholic church lost it hegemonic control of written materials and, more importantly, made it near impossible for them to halt the spread of 'heretical ideas'. This is important for many reasons but ultimately it can be seen as an enormous shift in political thinking that would forge the later technological and societal development of the nations of Europe. It was, to borrow a phrase, "a really big deal".



A PRINTING PRESS BEING USED TO MAKE BOOKS DURING THE 16TH CENTURY

CONCLUSION

The impact of the printing press is, almost, impossible to really quantify. On the surface it allowed for the much more rapid spread of accurate information but, more elusively, it had an enormous impact on the nations and population in Europe at large. Thanks, in no small part to the press, literacy began to rise as well as the types of information people could be exposed to. Around this time Europe was recovering from the devastating impact of the Black Death. This had decimated the population and had led to the decline in the rise of the church, the rise of the money economy, and subsequent birth of the Renaissance. On the back of this, the printing press was 'in the right place at the right time' to help in the secularisation of Western culture. Of course, many early texts were of a religious nature but more and more were beginning to be more secular in nature. Science was able to flourish at this time with early scientists suddenly being offered an incredible tool to collaborate with each other around the continent. It also ripped absolute control of the contents of religious texts from the hands of the church. No longer would it be possible to centrally control and censor what was written on topics of the Christian, and other, faiths. By the 1600's the Scientific Revolution of the Enlightenment was in full force, which would radically alter how Europeans viewed the world and universe forever. A process of thinking that would ultimately culminate in the Industrial Revolution - Thank you, Gutenberg *et al*!

REFERENCES

- Jr., Eugene F. Rice and Anthony Grafton. *The Foundations of Early Modern Europe, 1460-1559*. 2nd ed. New York: W.W. Norton & Company, 1994.
- Eisenstein, Elizabeth L. *The Printing Revolution in Early Modern Europe.* 2nd ed. N.p.: Cambridge University Press, 2012.
- Mukhopadhyay, S. K. *An Introduction to Early Modern Europe 1400-1789: A Political Social Economic and Cultural History.* Kolkata: Mitram, 2007.
- Cartwright, Mark. "The Printing Revolution in Renaissance Europe." *World History Encyclopedia.* Nov. 2nd. https://www.worldhistory.org/article/1632/the-printing-revolution-in-renaissance-europe/.
- McFadden, Christopher. "The Invention and History of the Printing Press." *Interesting Engineering.* Sep. 12th. https://interestingengineering.com/the-invention-and-history-of-the-printing-press.
- Roos, Dave. "7 Ways the Printing Press Changed the World." *History.* Sep. 3rd. https://www.history.com/news/printing-press-renaissance (Picture 1 and 2).

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DEPARTMENT – HISTORY

TOPIC – 17th CENTURY CRISIS IN EUROPE : MAJOR ISSUES

CONTENT

INTRODUCTION

The period of crisis that happened in Europe in the seventeenth century was one of the toughest in history. After the process of expansion and growth experienced during the fifteenth and sixteenth centuries, Europe found itself in a deep crisis that lasted nearly a century. A crisis that was characterize by various features, foremost the demographic, because after the late Middle Ages the population had increased steadily; until it stops abruptly in the sixteenth century even to recede in many places. Other reasons that were attributed for causing this crisis included hunger, wars, revolts, politics, plagues and climate changes. Eric Hobsbawn argues that on the big picture, it was economic and social forces that created this mid 17th century crisis. On the other hand, Trevor Roper emphasized that the main causes for this crisis were the religious and political conflict. Although both arguments can be valid and were present in this disaster, the root causes of this crisis were religious and political differences, which ultimately led Europe to have economic and social conflicts as well.

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THE THIRTY YEARS' WAR DEVASTATED MUCH OF EUROPE 1618–1648 AND WAS ONE OF THE MANY POLITICAL UPHEAVALS DURING THE GENERAL CRISIS.

17th CENTURY CRISIS IN EUROPE

As a historiographic concept, the place of the general crisis was cemented by Hugh Trevor-Roper in a 1959 article entitled "The General Crisis of the Seventeenth Century" published in the same journal. Hobsbawm discussed an economic crisis in Europe; Trevor-Roper saw a wider crisis, "a crisis in the relations between society and the State". Trevor-Roper argued that the middle years of the 17th century in Western Europe saw a widespread breakdown in politics, economics and society caused by a complex series of demographic, religious, economic and political problems. In the "general crisis", various events such as the English Civil War, the Fronde in France, the climax of the Thirty Years' War in the Holy Roman Empire and revolts against the Spanish Crown in Portugal, Naples and Catalonia were all manifestations of the same problem. The most important cause of the "general crisis", in Trevor-Roper's opinion, was the conflict between "Court" and "Country"; that is between the increasingly powerful centralising, bureaucratic, sovereign princely states represented by the court, and the traditional, regional, land-based aristocracy and gentry representing the country. He saw the intellectual and religious changes introduced by the Renaissance and the Protestant Reformation as important secondary causes of the "general crisis". There were various controversies regarding the "general crisis" thesis between historians. Some simply denied the existence of any such crisis. For instance, Hobsbawm saw the problems of 17th-century Europe as being social and economic in origin, an emphasis that Trevor-Roper would not concede. Instead, he theorised that the 'General Crisis' was a crisis of state and society, precipitated by the expansion of bureaucratic offices in the Sixteenth century.

https://upload.wikimedia.org/wikipedia/commons/1/12/Battle_of_Naseby.jpg

THE ENGLISH CIVIL WAR

MAJOR ISSUES OF THE CRISIS

Demographic change - the climate change and its impact on agriculture across Europe and echoed in the population statistics. The general figures show that the 16th century saw a rise to a peak European population of hundred million in 1600, followed by stagnation and then decline to a low of around 80 million some 50 years later. Some areas saw a far more disastrous decline than others, Spain, for example, losing around one third of its population from 1600 to 1650.

Climatic change - there is a good deal of evidence that one of the main roots of economic problems which affected Europe in the early 1600s was some kind of climatic change. Deposits of carbon rose enormously during the 17th century, a phenomenon closely associated with the cooling climate, and probably related to the reduction in the occurrence of sunspots which was recorded at that time. The 'Little Ice Age' is generally reckoned to have seen a fall in temperature across Europe of 10 degree Celsius, the effect of which restricts the growing season of plants by three or four weeks and produces maximum altitude for cultivation by about 500 feet.

https://www.sapiens.org/wp-content/uploads/2016/02/01_1575_Valckenborch_Winterlandschaft_bei_Antwerpen_mit_Schneefall_anagoria_Wikimedia-Commons-1076x803.jpg

THE 'LITTLE ICE AGE'

Combined effect of demography and climate - Agriculture, influenced to a large degree by difficulties of both democracy and climate, suffered in many areas of Europe. As the agricultural labour force decline and the weather

generally worsened, yield ratios begin to stagnant or decline with what sending harvest notably in eastern Europe which had been the major food producing region of the continent. In spite of lower production do food prices actually fell, reaching that peak from the inflation of the sixteenth century during the first decades of the 17th and remaining low for the remainder of the the century. This points to a decline in demand which was faster than the fall in production.

<u>Economic crisis</u> - England and Netherlands overcame the crisis and took over the economic leadership of Europe. England crossed the obstacles and became the first industrial capitalist society. In France industrial capitalism was delayed by a century and even father in Poland Spain and Italy. Carlo Maria Cipolla has commented on this that 17th century was a black century for Spain, Italy and Germany and at least a grey one for France but for Holland it was the golden age, and for England if not golden at least silver. This not so colourful explanation is denied by many scholars. Neil's Steensgraad believed that there was a fall in the rate of growth of European economy. While Jan De Vries believed that most classes suffered a drastic reduction of purchasing power. According to many scholars there was a shift in population from Southern Europe towards the channel region. Population decline has been attributed to several factors such as thirty years war epidemics like bubonic plague, small pox, typhus and influenza. This along with the absence of knowledge of medicine was the other factors. Cipolla believed that a decline in both faith resulted partly from a change in model attitude a system of conscious family planning and by way of late marriages.

<u>Political crisis</u> - the English Marxist historian of Christopher Hill believed that there was an economic and political crisis all over Western and Central Europe in the 17th century. The crisis of the seventeenth century was of long duration, although the timing varied in different countries. Reactions to this crisis took very different forms in different countries and influenced by differing national circumstances, which intern must be analysed in relation to social and political structures and to religious institutions and believes. It affected countries and equally and while some never recovered others suffer temporary setbacks.

The most successful societies of Holland, England and France, adjusted to the situation by increasing their economic resources, partially by the application of merchantilist ideas. In England the crisis was the result of a conflict between puritan minded opposition and a parasitical bureaucracy created by the Renaissance state.

Thirty Years' War - The Thirty Years' War was a 17th-century religious conflict fought primarily in central Europe. It remains one of the longest and most brutal wars in human history, with more than 8 million casualties resulting from military battles as well as from the famine and disease caused by the conflict. The war lasted from 1618 to 1648, starting as a battle among the Catholic and Protestant states that formed the Holy Roman Empire. However, as the Thirty Years' War evolved, it became less about religion and more about which group would ultimately govern Europe. In the end, the conflict changed the geopolitical face of Europe and the role of religion and nation-states in society.

European history, a series of wars fought by various nations for various reasons, including religious, dynastic, territorial, and commercial rivalries. Its destructive campaigns and battles occurred over most of Europe, and, when it ended with the Treaty of Westphalia in 1648, the map of Europe had been irrevocably changed. Although the struggles that created it erupted some years earlier, the war is conventionally held to have begun in 1618, when the future Holy Roman emperor Ferdinand II, in his role as king of Bohemia, attempted to impose Roman Catholic absolutism on his domains, and the Protestant nobles of both Bohemia and Austria rose up in rebellion. Ferdinand won after a five-year struggle. In 1625 King Christian IV of Denmark saw an opportunity to gain valuable territory in Germany to balance his earlier loss of Baltic provinces to Sweden. Christian's defeat and the Peace of Lübeck in 1629 finished Denmark as a European power, but Sweden's Gustav II Adolf, having ended a four-year war with Poland, invaded Germany and won many German princes to his anti-Roman Catholic, anti-imperial cause. Meanwhile the conflict widened, fueled by political ambitions of the various powers. Poland, having been drawn in as a Baltic power coveted by Sweden, pushed its own ambitions by attacking Russia and establishing a dictatorship in Moscow under Władysław, Poland's future king. The Russo-Polish Peace of Polyanov in 1634 ended Poland's claim to the tsarist throne but freed Poland to resume hostilities against its Baltic archenemy, Sweden, which was now deeply embroiled in Germany. Here, in the heartland of Europe, three denominations vied for dominance: Roman Catholicism, Lutheranism, and Calvinism. This resulted in a Gordian tangle of alliances as princes and prelates called in foreign powers to aid them. Overall, the struggle was between the Holy Roman Empire, which was Roman Catholic and Habsburg, and a network of Protestant towns and principalities that relied on the chief anti-Catholic powers of Sweden and the United Netherlands, which had at last thrown off the yoke of Spain after a

struggle lasting 80 years. A parallel struggle involved the rivalry of France with the Habsburgs of the empire and with the Habsburgs of Spain, who had been attempting to construct a cordon of anti-French alliances. The principal battlefield for all these intermittent conflicts was the towns and principalities of Germany, which suffered severely. During the Thirty Years' War, many of the contending armies were mercenaries, many of whom could not collect their pay. This threw them on the countryside for their supplies, and thus began the "wolf-strategy" that typified this war. The armies of both sides plundered as they marched, leaving cities, towns, villages, and farms ravaged. When the contending powers finally met in the German province of Westphalia to end the bloodshed, the balance of power in Europe had been radically changed. Spain had lost not only the Netherlands but its dominant position in western Europe. France was now the chief Western power. Sweden had control of the Baltic. The United Netherlands was recognized as an independent republic. The member states of the Holy Roman Empire were granted full sovereignty. The ancient notion of a Roman Catholic empire of Europe, headed spiritually by a pope and temporally by an emperor, was permanently abandoned, and the essential structure of modern Europe as a community of sovereign states was established.

https://www.historytoday.com/sites/default/files/treaty_westphalia.jpg

ON 24 OCTOBER 1648, THE TREATY OF WESTPHALIA WAS SIGNED, MARKING THE END OF THE THIRTY YEARS' WAR.

IMPACT OF THE CRISIS

The 17th century crisis brought about significant changes in Europe but its impact was far from uniform. On the one hand it created conditions for a new phase of expansion by removing tension between the productive sectors and restoring balance between population and food supplies and on the other hand it fastened feudal grip over a sizeable population of Europe. While considering the impact in demographic terms, the crisis resulted in high mortality in several parts of the continent. The impact was greater in the urban centres. The demographic losses caused extensive location of trade and industry. Military operations, economic disruptions and population loses caused a serious strain on government resources. It placed heavy strain on already border and economy of Europe by increasing the burden of taxation on the lower classes. Except for England the crisis led to the extension of power of the rules over their subjects to extract the maximum from all possible sources.

One of the most important developments in the post-crisis period was the shift away from the continent countries towards the sea powers of the north-west. The gap between the eastern and western regions was futher widened during the 17th century. Another important consequence of the 17th century crisis was the displacement of industry to the countryside and the spread of proto-industrialisation in some parts of Western and Central Europe. This marked the first phase of industrialisation.

The long and continuous war had created a serious shortage of labour, which was needed to work on demesne lands. The demographic losses had made labour very costly. In such situations the the lord's instead of hiring fresh labour to work in their private lands opted to to utilise the existing serf by placing additional responsibilities on them. Thus, where as in western Europe the extension of demesne was carried out through impetus towards capitalism, in eastern Europe, because of chronic shortage of manpower, it led to the strengthening of consolidation of serfdom. Hence the gap between eastern and western Europe was greatly widened after the 17th century.

CONCLUSION

The general crisis was characterized by a series of wars, revolts, decline of population and political and social changes that in many cases could have been avoided if the right precautions would have been taken. However, the fact Europe was undergoing a time political absolutism (at least that is what the rulers intended) and the close relation between church and government, made it impossible to avoid the conflicts. The numerous wars that happened (all for political and religious reasons) aided by plagues and diseases, caused the first decline in the population after the middle ages, therefore creating social and economic problems in the region. The root cause of the crisis was political and religious (decisions to go to war, monarchs selected for their religion, etc); which then led to economic and social problem (increase of taxation, price revolution, and decline in population), aggravating even more the situation.

BIBLIOGRAPHY

URL ID REFERRED:

- https://upload.wikimedia.org/wikipedia/commons/thumb/4/4e/Bautzen-nach1620-Merian.jpg/1024px-Bautzen-nach1620-Merian.jpg
- https://upload.wikimedia.org/wikipedia/commons/1/12/Battle_of_Naseby.jpg
- https://www.sapiens.org/wp-content/uploads/2016/02/01_1575_Valckenborch_Winterlandschaft_bei_Antwerpen_mit_Schneefall_anagoria_Wikimedia-Commons-1076x803.jpg

- https://www.historytoday.com/sites/default/files/treaty_westphalia.jpg

- https://www.britannica.com/event/Thirty-Years-War

- https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwit9Km46YDyAhWFILcAHaU4BpYQFjALegQIORAD&url=https%3A%2F%2Fwww.deshbandhucollege.ac.in%2Fpdf%2Fresources%2F1586228243_Hs(H)-IV-HM-17th_Century_Crisis.docx&usg=AOvVaw27tQLMfwAjgj5Cgr-h2Ehk

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PAPER - CC8

TOPIC-PRINTING REVOLUTION

SEMESTER IV

SCOTTISH CHURCH COLLEGE

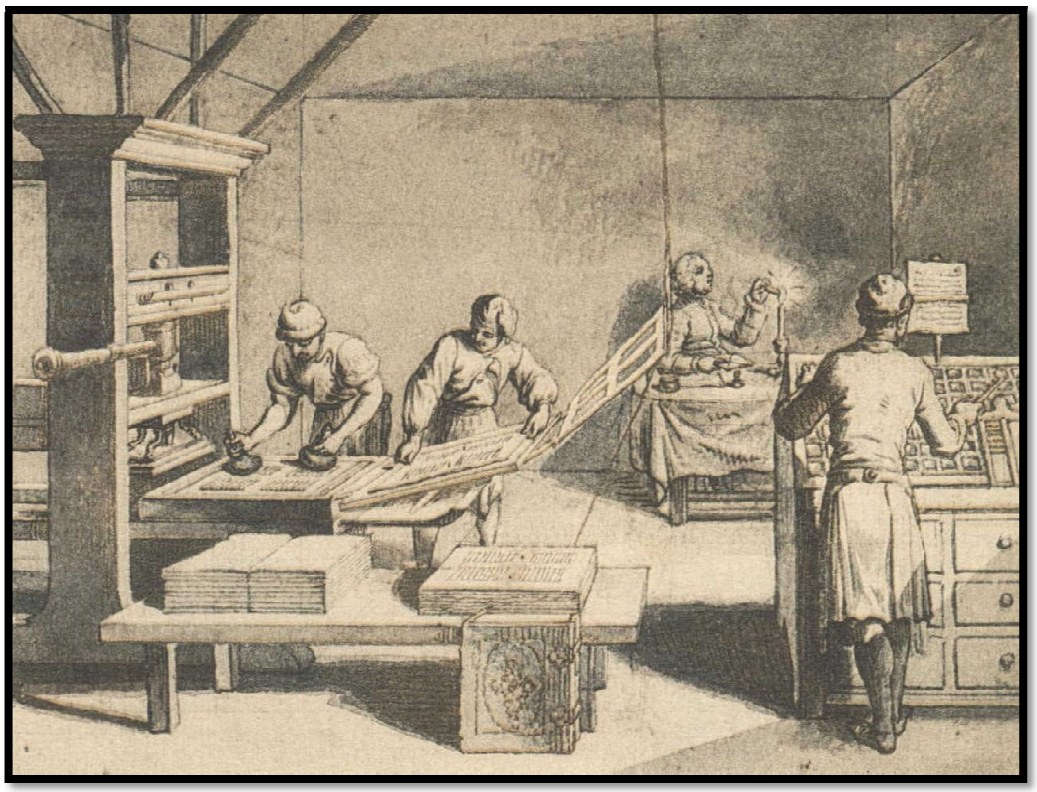
PRINTING REVOLUTION

INDEX

INTRODUCTION

More than the rise of national states and royal absolutism in the realm of politics, and hardly less significant than the expansion of Europe and the development of capitalism in the economic sphere, was the intellectual quickening which occurred in the 15th and 16th centuries and which has had a profound impact on modern society and civilization. This quickening was most evident in the invention of printing and the resulting diffusion of knowledge.

Printing in early modern Europe was a complicated process involving the moveable type with which the impression was made and paper on which it was made. Inspired by developments in China, the European moveable type was perfected in Mainz in about 1450.



Moveable Type

Picture -1

The evolution of the practice of casting individual letters in separate little pieces of metal all of the same height and then arranging them in any desired sequence of printing provided the flexibility and dynamism that turned the process of printing into a socio-cultural revolution.

The emergence of modern paper fit for printing and the ink further facilitated the process of mechanical duplication. These processes were developed by **Johann Gutenberg, Johann Fust and Peter Schoffer**. The earliest known products of the new art were papal “Letters of Indulgence” and a version of the Bible--- ***Biblica Latina*** --- both printed by Gutenberg in 1454.

Gutenberg's Printing Press

Johannes Gutenberg

Picture -2

The invention of the movable metal type printer in Europe is usually credited to the German printer Johannes Gutenberg. However, there are other claims, notably the **Dutch printer Laurens Janszoon Coster (c. 1370-1440 CE) and two other early German printers, Johann Fust (c. 1400-1465 CE) and his son-in-law Peter Schöffer (c. 1425-1502 CE).** There is, too, evidence that movable metal type printers had already been invented in **Korea in 1234** CE in the **Goryeo Kingdom (918-1392 CE).**

Chinese Buddhist scholars also printed religious works using moveable type presses; the earliest ones used woodblocks during the Song Dynasty (960-1279 CE).

Whether the idea of moveable type presses spread via merchants and travellers from Asia to Europe or if the invention by Gutenberg was spontaneous is still a point of debate amongst scholars.

In any case, like most technologies in history, the invention likely sprang from a cumulation of elements, ideas, and necessity involving multiple individuals across time and space.

Gutenberg began his printing experiments sometime in the 1440s CE, and he was able to establish his printing firm in **Mainz in 1450 CE**.

Gutenberg's printer used **Gothic script letters. Each letter was made on a metal block by engraving it into the base of a copper mould and then filling the mould with molten metal. Individual blocks were arranged in a frame to create a text and then covered in a viscous ink. Next, a sheet of paper, at that time made from old linen and rags, was mechanically pressed onto the metal blocks.**

Gutenberg's success in putting all these elements together is indicated by his printed edition of the **Latin Bible in 1456 CE.**

Gutenberg Bible

Picture -3

Rising demand for Books

There was already a well-established demand for books from the clergy and the many new universities and grammar schools which had sprung up across Europe in the late medieval period. Indeed, traditional book-makers had struggled to keep up with demand in the first half of the 15th century CE, with quality often being compromised. This **demand for religious material**, in particular, was one of the main driving forces behind the invention of the printing press.

Scholars had access to manuscripts in private and monastic libraries, but even they **struggled to find copies of many texts, and they often had to travel far and wide to get access to them**. Consequently, religious works and textbooks for study would dominate the printing presses throughout the 15th century CE. It is important to remember, though, that handmade books continued to be produced long after the printing press had arrived and, as with many new technologies, there were people still convinced that the flimsy printed book would never really catch on.

The availability of things to read for people in general massively increased thanks to printing. Previously, the opportunity to read anything at all was rather limited.

The printing press offered all sorts of new and exciting possibilities such as **informative pamphlets, travel guides, collections of poems, romantic novels, histories of art and architecture, cooking and medicinal recipes, maps, posters, cartoons, and sheet music.**

Books were still not as cheap as today in terms of price compared to income, but they were only around one-eighth of the price of a handmade book. With printing matter being varied and affordable, people who could not previously do so now had a real motive to read and so literacy rates increased.

Further, printed books were themselves a catalyst for literacy as works were produced that could be used to teach people how to read and write.

16 CE Desk with Lute Globes and Books.

Picture -4

The Spread of Information

Soon, a new boost to the quantity of printed material came with the rise of the humanist movement and its interest in reviving literature from ancient Greece and Rome. Two printers, in particular, profited from this new demand: **the Frenchman Nicholas Jensen (1420-1480 CE) and the Italian Aldus Manutius (c. 1452-1515 CE).**

Jensen innovated with new typefaces in his printing shop in Venice, including the easy-to-read roman type (*littera antiqua/lettera antica*) and a Greek font which imitated manuscript texts.

Jensen printed over 70 books in the 1470s CE, including **Pliny's *Natural History* in 1472 CE.** Some of these books had illustrations and decorations added by hand to recapture the quality of older, entirely handmade books.

By 1515 CE, all major classical writers were available in print, most in multiple editions and many as collections of complete works. In addition, printed classical texts with identical multiple copies in the hands of scholars across Europe could now be easily checked for accuracy against source manuscripts. **Handmade books had often perpetuated errors, omissions, and additions made by individual copyists over centuries, but now, gradually, definitive editions of classical works could be realised which were as close as possible to the ancient original.**

There was, too, a drive to print more books thanks to the Reformists who began to question the Catholic Church's interpretation of the Bible and its stranglehold on how Christians should think and worship.

The Bible was one of the priorities to have translated into vernacular languages, for example German (1466 CE), Italian (1471 CE), Dutch (1477 CE), Catalan (1478 CE), and Czech (1488 CE).

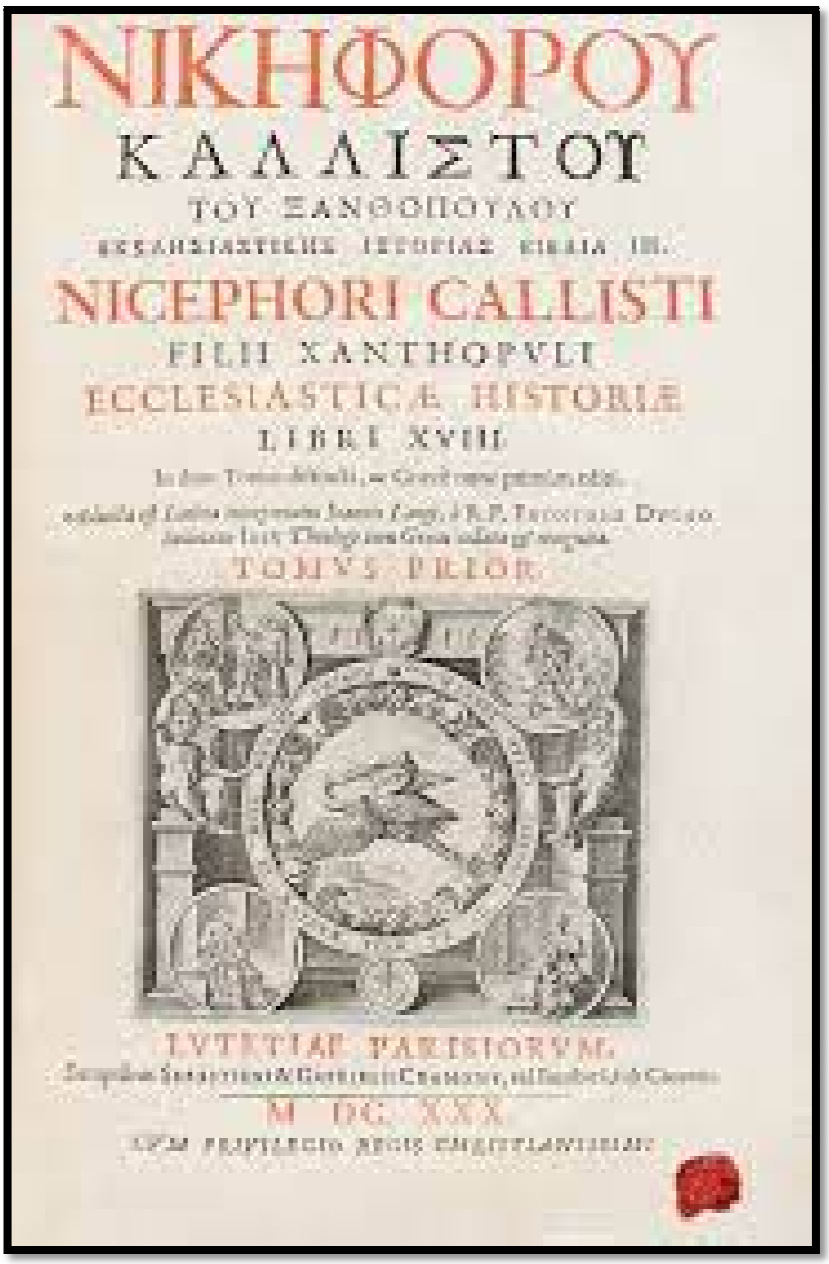
Reformists and humanists wrote commentaries on primary sources and argued with each other in print, thereby establishing an invisible web of knowledge and scholarship across Europe

Ordinary folks, too, were roused by arguments presented in printed materials so that **groups of like-minded individuals were able to quickly spread their ideas and organise mass movements across multiple cities such as during the German Peasants' War of 1525 CE.**

A Booming Industry

As a consequence of all this demand, those printers who had survived the difficult early years were now booming. Cities across Europe began to boast their own printing firms. **Places like Venice, Paris, Rome, Florence, Milan, Basel, Frankfurt, and Valencia all had well-established trade connections (important to import paper and export the final product) and so they became excellent places to produce printed material.**

Some of these publishers are still around today, notably the Italian company Giunti. **Each year, major cities were producing 2-3,000 books every year. In the first decade of the 1500s CE**, it is **estimated 2 million books were printed** in Europe. Into the 16th century CE, even small towns now had their own printing press.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NICEPHORI CALLISTI
FILII XANTHOPVLI
ECCLESIASTICÆ HISTORIÆ
LIBRI XVIII
TOMVS PRIOR
LVTETIAE PARISIORVM.
M DC XXX

Title Page of the Handbook of the Christian Soldier by Erasmus

Picture -5

Printed works became so common, they helped enormously to establish the reputations, fame and wealth of certain writers. **The Dutch scholar Desiderius Erasmus (c. 1469-1536 CE) is perhaps the best example, one of the first authors to make a living solely through writing books.** There were, though, some threats to authors and printers.

One of the biggest problems was **copyright infringement because it was next to impossible to control what went on beyond a particular city.** Many books were copied and reprinted without permission, and the quality of these rip-offs was not always very good.

Impact of Printing Revolution

The invention of the printing press made Western culture lose their medieval characteristics and become more modern. **Book-making had been a long, tedious process before the printing press, but with the invention of the press, the process of making books was significantly shortened**.

With this quick process, books also became cheaper, thus allowing more types of people to be able to afford books. **Specifically, middle class people could purchase books, and they only wanted more.** Books in languages other than Latin and a different variety of books (romance, poetry, and almanacs) started being published. Making music became cheaper too as music could now be printed. **The book trade and its related industries, like paper-making, thrived due to this boom in printing, leading to a stronger economy.**

Additionally, it became harder for the **church to censor material as there were too many printing presses for them to control.**

It was the printing press that sparked the interest in writing and reading that people had and still have today. As more people began to read, there was more of a need for new material. **Reading and writing have become tools for education, work, and entertainment that people have been using for centuries.**

However, **the lower and working classes were largely unaffected by this innovation**. Although mostly wealthy males could read and afford to read, it was definitely the start of something new...

Conclusion

All of these developments were not welcomed by all people. The Catholic Church was particularly concerned that some printed books might lead people to doubt their local clergy or even turn away from the Church. Some new works were more overtly dangerous such as those written by Reformists**. For this reason, in the mid-16th century CE, lists were compiled of forbidden books.**

The first such list, the 1538 CE Italian Index of Prohibited Books, was issued by the Senate of Milan. The Papacy and other cities and states across Europe soon followed the practice where certain books could not be printed, read, or owned, and anyone caught doing so was, at least in theory, punished.

Authorities banned certain works or even anything written by a particular author. **The *De Revolutionibus Orbium Coelestium* (*On the Revolutions of the Heavenly Spheres*, 1543 CE) by the Polish astronomer Nicolaus Copernicus (1473-1543 CE) was added to the forbidden list for putting the Sun at the centre of the solar system instead of the Earth.**

Finally, **the printed word sometimes posed a challenge to oral traditions such as the professionals who recited songs, lyrical poetry, and folk tales**.

On the other hand, many authors and **scholars transcribed these traditions into the printed form and so preserved** them for future generations .

Bibliography

L.M.S PPT Notes

Printing Revolution. (accessed July 6,2021).

Web Sources

1.World History Encyclopedia

https://www.worldhistory.org/article/1632/the-printing-revolution-in-renaissance-europe/.(accessed July 6,2021).

2.Askinglot.com

https://askinglot.com/what-impact-did-the-printing-press-have-long-term.(accessed July 8,2021).

Pictures

Picture 1

https://www.google.com/url?sa=i&url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FMovable_type&psig=AOvVaw1bvNUqRRunjaeMMKmjUnYC&ust=1627372466836000&source=images&cd=vfe&ved=0CAgQjRxqFwoTCPDt14ChgPICFQAAAAAdAAAAABAL. (accessed July 4,2021).

Picture 2

https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.biography.com%2Finventor%2Fjohannes-gutenberg&psig=AOvVaw1bvNUqRRunjaeMMKmjUnYC&ust=1627372466836000&source=images&cd=vfe&ved=0CAgQjRxqFwoTCPDt14ChgPICFQAAAAAdAAAAABAP.

Picture 3

https://upload.wikimedia.org/wikipedia/commons/b/b6/Gutenberg_Bible%2C_Lenox_Copy%2C_New_York_Public_Library%2C_2009._Pic_01.jpg . (accessed July 4,2021).

Picture 4

https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.worldhistory.org%2Fimage%2F12457%2F16th-century-ce-desk-with-lute-globe-and-books%2F&psig=AOvVaw13aWUC-K_dLSn5HpSX1oJh&ust=1627372815201000&source=images&cd=vfe&ved=0CAgQjRxqFwoTCOiVk6eigPICFQAAAAAdAAAAABAD. (accessed July 6,2021).

Picture 5

https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.worldhistory.org%2Fimage%2F13058%2Ftitle-page-of-the-handbook-of-the-christian-soldie%2F&psig=AOvVaw3fQwNNzfUrxQWsqQgCFtFt&ust=1627372917364000&source=images&cd=vfe&ved=0CAgQjRxqFwoTCMCBltiigPICFQAAAAAdAAAAABAD. (accessed July 6,2021)

DEPARTMENT OF HISTORY

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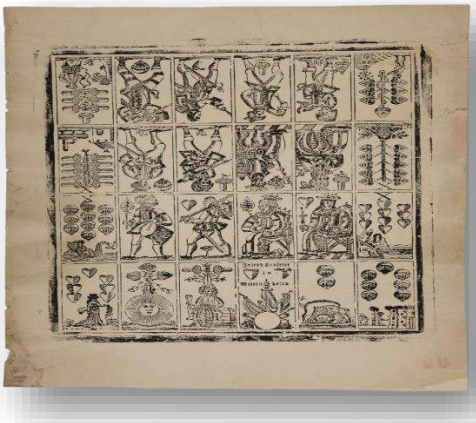
CONTENTS

INTRODUCTION:

During the half century before 1500, Europeans read the first books printed in the West. Printing with movable metal type was perfected in Mainz in about 1450. Three names recur in the sources, those of Johann Gutenberg, Johann fust and Peter Schoffer, Fust's son-in-law. These sources are scanty, often unclear, and sometimes of doubtful authenticity. So it is impossible to determine accurately the contribution of a particular individual to the development of typography and its commercial exploitation. Our relative ignorance about the origins of printing does have advantages, however. It discourages the misguided effort to attribute complex technological innovation to a single man, and forces us to realize that an invention is in any case not the creation of an individual, as is a poem or a painting, but a social product. Like the development of the steam engine or the telegraph, the "invention" of a mechanical process for duplicating texts was multiple and cumulative. It was successfully completed by Mainz printers in the 1450's, but it had important earlier beginnings. Two Chinese inventions, block printing and paper are linked with the beginnings of typographic printing in Western Europe. Xylography, or block printing, originated in China in the early eighth century. The printer drew in reverse on a block of wood the text or the picture he wished to reproduce, carved the wood so that the graphic pattern stood out in relief, inked the block and transferred the design to paper. The process is simple in conception, difficult, time-consuming and wasteful in execution. And ill adapted to the alphabetic writing of West. Its transmission to the west – probably during the century from 1250 to 135, when European contact with China was unusually close – had little direct importance for the development of typography.



XYLOGRAPHY

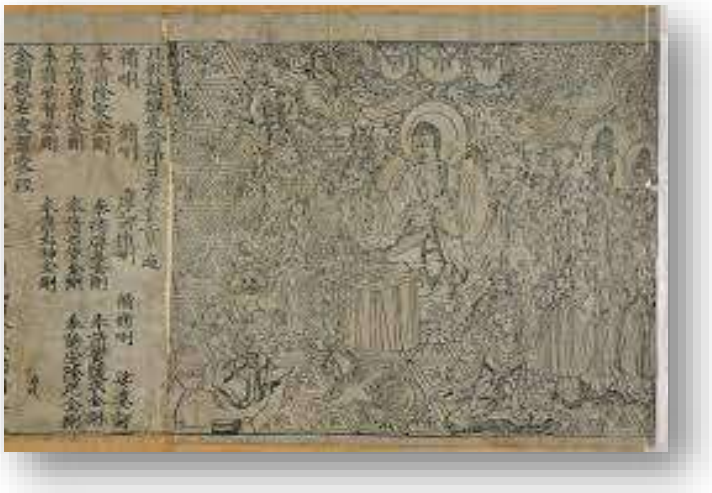
EARLY METHODS OF PRINTING:

Paper was indispensable, but for economic rather than technical reasons. Manuscript books were usually copied on parchment or on vellum3, and these materials were used also by typographic printers when the aim was magnificence rather than utility. But since a single large book like the Bible required as many as 170 calf skins or 300 sheep skins, the absence of paper soon would have nullified the promise of mechanical duplication: the cheap, rapid production of books in large numbers. Paper manufacture was introduced in Spain during the twelfth century by the Arabs, who had themselves received the technique from China.

Chinese monks were setting ink to paper using a method known as block printing, in which wooden blocks are coated with ink and pressed to sheets of paper. One of the earliest surviving books printed in this fashion — an ancient Buddhist text known as "The Diamond Sutra" — was created in 868 during the Tang (T'ang) Dynasty (618-909) in China. The book, which was sealed inside a cave near the city of Dunhuang, China, for nearly a thousand years before its discovery in 1900, is now housed in the British Library in London. The carved wooden blocks used for this early method of printing were also used in Japan and Korea as early as the eighth century. Private printers in these places used both wood and metal blocks to produce Buddhist and Taoist treatises and histories in the centuries before movable type was invented.An important advancement to woodblock printing came in the early eleventh century, when a Chinese peasant named Bi Sheng (Pi Sheng) developed the world's first movable type. Though Sheng himself was a commoner and didn't leave much of a historical trail, his ingenious method of printing, which involved the production of hundreds of individual characters, was well-documented by his contemporary, a scholar and scientist named Shen Kuo. In his 11th-century work, "Dream Pool Essays," Kuo explains that Sheng's movable characters were made out of baked clay. The ink he used was a mix of pine resin, wax and paper ashes, and as Kuo tells it, Sheng's method could be used to print thousands of copies of a document fairly quickly.While earthenware movable type was used by several other Chinese printers throughout the 12th and 13th centuries, Sheng's movable type didn't go mainstream in China or elsewhere until many centuries later. In the 14th century, Wang Chen, a Chinese government official of the Yuan Dynasty, independently created his own set of movable characters out of wood. His motivation for developing this new method of printing was the publication of a voluminous series of books on agriculture, titled "Nung Shu.""Nung Shu" was eventually printed in 1313 using tried-and-true

woodblock methods, not movable type. But Chen's printing method did catch on, albeit slowly, and was used for reproducing documents in the centuries that followed.

Paper manufacturing spread slowly during the next two centuries to much of Europe: Italy, France, Germany and Switzerland. In Europe the chief raw material used was old rags. Papermakers shredded the rags in a stamping mill driven by waterpower, mixed the macerated flax and hemp fibres with water, and dipped their mold, a large flat wire sieve with a wooden frame, into the liquid pulp. When the pulp was evenly distributed over the wire mesh and the water had run out through the holes, they put the sheets on alternate layers of felt, squeezed them in a press, and then dried and sized them. Hans Sachs, the cobbler-poet and hero of Wagner's Meistersinger von Nurnberg, described the process of paper making in a poem which accompanies the earliest picture of papermaking.



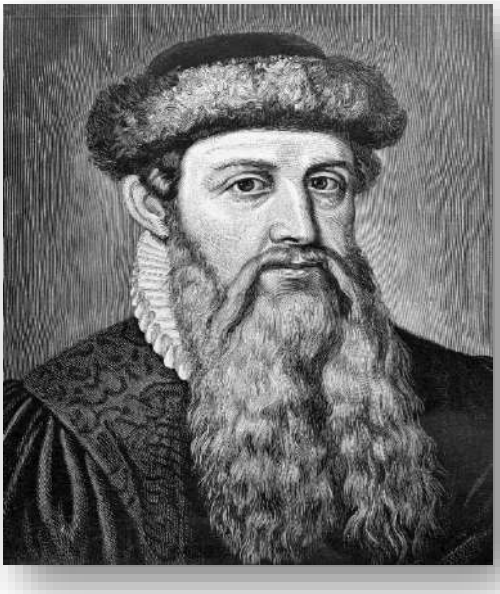
DIAMOND SUTRA

PRINTING DURING GUTENBERG:

By the time of Gutenberg's youth, paper was plentiful and sold approximately one sixth the price of parchment. Western typography drew upon European methods also, and these were of more immediate technical relevance. Printing, as it was practiced in Mainz by Gutenberg, Fust and Schoffer required a suitable ink, a press for transferring the ink to paper, and a metal type. To adhere to

metal smoothly and evenly, ink must have an oil base. By the early fifteenth century, Flemish artists had began to paint in oils, a suitable printer's ink, consisting of a pigment ground in a linseed-oil varnish, was simply an adaptation of oil paint. The immediate ancestor of the wooden press was also at hand: the press used in paper mills for squeezing water from the damp sheets, a device easily adaptable to printing. Most crucial was the invention of type – the mirror image of each of the letters of the alphabet made in metal by precision casting from matrices. The skills which contributed to the development of typecasting were understandably those connected with the more delicate forms of metallurgy: those of the metal engraver and the designer of coins and medals, of the goldsmith adept at casting small objects, of craftsmen who made punches for stamping letters on bells, pewter vessels and book bindings. We must imagine that in many places in Europe during the first half of the fifteenth century ingenious artisans experimented with type, inks and presses, that many parallel efforts were made to replace the scribe by a mechanical device, that the actual invention of printing – the dramatic fusion of familiar techniques into a new and workable process – also occurred independently in several places, that, finally, this new process was perfected and first organized as an industry by Gutenberg, Fust and Schoffer.

The best among them astonish still by their technical perfection, further evidence that the Mainz printing firms had inherited considerable expertise from earlier experiment and discovery. The great Latin Bible popularly associated with Gutenberg and more cautiously named the forty-two-line Bible by bibliographers was finished in 1455. The craftmanship of its type and the art of typesetting and printing are impeccable. Clearly, the Mainz printers had established the technology of printing on firm foundations, and indeed for over three hundred years Gutenberg's successors cut punches, fitted matrices, cast type, composed and printed substantially as he had done. On August 14, 1457, Fust and Schoffer issued the Psalms. The volume was printed on vellum. The type, printed in red and black, is noble and fits handsomely on the page. Each psalm, as the printers boasted in a note at the end, is "adorned with the beauty of large initial letters"; the lacy design of these letters, ornamented with flowers and small animals and printed in red and blue, is masterly. Fust and Schoffer's Psalms is the oldest signed and dated book printed in Europe that has survived. In its sober magnificence it is also one of the most beautiful.



JOHANNES GUTENBERG

WIDESPREAD DEMAND FOR PRINTING BOOKS:

These first printed books have a further, and curious, characteristic: their pages so closely resemble those of manuscript books as to be virtually indistinguishable to the unpractised eye. Printing first became a significant business enterprise in a provincial ecclesiastical capital with a population of about three thousand and meagre intellectual distinction. The ecclesiastical authorities dominated job printing, for example, a common order was for indulgence forms. The cheaper books, to judge from the earliest publisher's list, reflected traditional tastes, biblical digests, works by St. Thomas Aquinas, saint's lives, brief guides to living well and dying well, and for secular diversion, romances of chivalry predominated. Yet eve in Mainz, what was to be the key factor in the astonishingly rapid spread of printing between 1460 and 1500 was clearly evident: the unsatisfied demand for books among the merchants, substantial artists, lawyers, government officials, doctors and teachers who lived and worked in towns. The European peasantry was largely illiterate and would remain so for centuries. The needs of the clergy and of those adaptable nobles who were beginning to recognize the importance of a literary education for careers of service to their prince and country had been reasonably well met in the past by workshops where sometimes scores of copyists multiplied books by hand. Indeed, printed books met with a lively resistance for several decades, especially in Italy, from wealthy and cultivated

collectors. But among what we must call, loosely but inevitably, the middle classes of the towns, among men who needed to read, write and calculate in order to manage their businesses and conduct civic affairs, who in the fifteenth century were swelling the arts faculties of the universities, there was a large and ready market for printed books. Underlying the expansion of printing was that expansion of urban population and secular literacy which had begun in the high Middle Ages.as townsmen grew in number, education, wealth, power and self-consciousness, their intellectual and cultural needs increased. With the unremitting enthusiasm of the bourgeoisie for edification and self improvement, they eagerly brought entertaining and useful books of all sorts: religious and secular, in Latin and in the vernacular, grammars, dictionaries and encyclopedias, elementary texts in mathematics, astrology, medicine and law, local and universal histories, manuals of popular devotion and Latin classics of proven appeal – Virgil's Aeneid, Cicero's De officiis, Terence, Pliny and Seneca.

City-based entreprenuers catered to the reading needs of the urban population well before the invention of printing. Stationers, as they were called, provided custom-made books on demand. Using large amounts of capital, they hired scribes and illuminators and equipped them with texts and materials, and some of them produced large inventories of popular books on speculation, to be sold at retail, as well as individual items ordered in advance. The most ambitious of these men worked on a very large scale indeed. Diebold Lauber, a Nuremberg scribe, used handwritten lists to advertise the collection of almost one hundred different texts that one could find at his shop. And Vespasiano da Bisticci, the Florence cartolaio who lived on into the age of printing, which he despised, mobilized forty-five scribes to complete some two hundred books in twenty-months for Cosimo de' Medici, and worked in a similarly extensive scale for other rulers and collectors, some from as far off as England. They spread the fashions for the news, clear script of the humanists, for decorated title pages, and for bindings stamped with classical motifs and portrait busts, which survived into the age of printing book. Their shops, as well as the libraries they furnished, became lively centers of discussion for intellectuals and their patrons – centers not separated from the larger society, like the monasteries and universities of the Middle ages ,but fully integrated into its commercial life. The existing methods of finance and distribution, and the demands of the urban market, released the inherent dynamism of typography. The result was a steadily expanding stream of books. Printing spread from Mainz to Strasbourg, Cologne, Augsburg, Nuremberg, Leipzig and Vienna. German printers or their

pupils introduced the “divine” art to Italy in 1467, Switzerland and Bohemia in 1468, France and the Netherlands in 1470. Spain, England, hungary and Poland between 1474 and 1476, Denmark and Sweden in 1482-1483.

VESPASIANO DA BISTICCI

IMPACT:

Eugene F. Rice and Anthony Grafton in “The Foundations of Modern Europe 1460-1559” argue that though the invention of printing press was successfully completed by Mainz printers in the 1450’s, it had important earlier beginnings. The oldest surviving books printed with movable metal type were issued in Mainz. Euan Cameron in his edited book “Early Modern Europe” points out that the key to the ‘print revolution’ was the combination of accuracy and flexibility. Lucien Febvre and Henri Jean Martin in “The Coming of the Book” mention that at the initial period printers were planning trade outlets in university towns. From 1460-70 printing expanded markedly and the trade improved its organisation in Germany. By 1480 printing press were in operation in more than 110 towns throughout Western Europe. Rice and Grafton point out that by 1500, printers concentrated in places like Mainz, Strasbourg, Nuremberg. The immediate effect of printing was to further increase the

circulation of those works which had already enjoyed success in manuscript: Euan Cameron mentions that religious works are estimated to account for three-quarters of all books published before 1520. Febvre and Martin argue that one of the first effects of the printing press was to multiply the number of works of popular piety.

Euan Cameron states that the printing press evolved as a practical solution to a practical problem. In the 15th century, the number of universities, schools, colleges increases and the demand for books seem to have been the key factor in the astonishingly rapid spread of printing between 1460 and 1500. Underlying the expansion of printing was that expansion of urban population and secular literacy which had begun in high Middle Ages. By 1500, the presses had issued about 6 million books in approximately 40000 editions. Febvre and Martin state that the reading public wanted to start their own private libraries in the 16th century and the number of books in these private libraries rose steadily. In the course of time, church declined in relative importance as purchasers of books, lawyers, members of an ascending social group, became steadily more important. The printing of books has been regarded as a watershed in history. Erasmus called printing the greatest of all discoveries. The printing press played a vital role in the spread of the new learning. The introduction of printing provided a practical way to produce books. The printing presses became important vehicles of cultural exchange and communication. Elizabeth L. Eisenstein in “The Printing Revolution in Early Modern Europe” argues that the advent of printing entailed a ‘communication revolution’. Rice and Grafton argue that the influence of printing on scholarship was most striking in the years before the Reformation. Unlike manuscripts, printed books were comparatively faultless, free from errors. Printing not only made scholarship fuller and more accurate, it also made it less difficult to acquire.

ERASMUS

Printing gave scholars all over Europe identical texts to work on. Scholars in diverse countries could work with one another by references to specific pages of specific editions. Elizabeth L. Eisenstein argues that editorial decisions made by early printers with regard to layout and presentation probably helped to reorganize the thinking of readers. McLuhar suggests that the scanning lines of print affected thought process. Eisenstein also states that the thoughts of readers are guided by the way contents of books are arranged and presented. No manuscript could be preserved for long without undergoing corruption by copyists. After the advent of printing, preservation could be achieved by using abundant supplies of paper. Febvre and Martin state that printing played a vital role in the diffusion of a knowledge of classical literature at the beginning of the 16th century and later in the propagation of Reformation doctrines. Meillet and Ferdinand brunot also argue that printing exercised a profound influence on the development of the national languages.

The printing press encouraged the development of an extensive 'scientific' literature written in the vernacular and intended for a mass market. Printing turned intellectual work as a whole into a cooperative enterprise instead of a solitary human activity. Through printing scientific research became a public dialogue. Alison Brown in her "The Renaissance" argues that printing was important because it helped to diffuse Renaissance ideas by making books much

cheaper and more easily available. The visual arts reached wider public. Eisenstein states that printing not only diffused Renaissance culture throughout the Europe but also made another revival unnecessary since, once printed, the classics were never lost again. Febvre and Martin argue that books played a critical role in the development of Protestantism in the 16th century. Printing also helped the spread of Bible. Common people read the Bible in vernacular which resulted in the loss of prestige and influence of the papacy, church and clergy. Will Durant states that printing ended the clerical monopoly of learning and the priestly control of education. S. Ozment argues that printing served the designs of kings as readily as those religious reformers. Thomas Cromwell, the chief advisor of king Henry VIII of England, defended the king's position through the printed material. It may be stated that with the advent of printing publishing became a new profession in the society and the days of preachers were gone. Copyists protested that printing would destroy their means of livelihood, aristocrats opposed it as a mechanical vulgarization, and feared that it would lessen the value of their manuscript libraries, statesmen and clergy distrusted it as a possible vehicle of subversive ideas. But despite these oppositions printing made its triumph nevertheless. Printing virtually marked the end of medieval cultural life and ushered in the "modern" era in Europe.

CONCLUSION:

Equally striking, particularly after 1500, was the way printing accelerated the diffusion of images and ideas. The visual arts reached a new and wider public. Engravings, the normal means of reproducing works of art before the invention of photography, carried iconographic and decorative motifs from one region to another, from one artist to another, just as the influence of a man of letters like Erasmus of Rotterdam rapidly touched every intellectual circle in Europe through the printed word, so engravings of works by Michelangelo, for example, made the arrangement and postures of the nudes on the ceiling of the Sistine Chapel the common property of his most distant contemporaries. But, it was the spread of Lutheranism that first made frighteningly and triumphantly clear the revolutionary significance of printing for the communication of ideas. The Reformation spread with the same astonishing rapidity as printing itself, it could not have done so without it. Indeed, the role of printing in the early sixteenth century already suggests its double role in the future through its promise of enlightenment and popular education, potentially revolutionary and hostile to the status quo, but when controlled by the state, the most effective agent of manipulation until the invention of radio and television.

This is why the systematic censorship of books, little practiced in the Middle Ages, appeared very soon after the invention of printing, and spread with it. By making reading more democratic, printing spawned the modern censor. Both secular and ecclesiastical authorities censored books, for the prohibition and burning of books were designed to maintain political as well as religious orthodoxy. Alexander VI, pope between 1492 and 1503, clearly expressed the attitude of the church in a bull of 1501. He said “The art of printing is very useful insofar as it furthers the circulation of useful and tested books, but it can be harmful if it is permitted to widen the influence of pernicious works. It will therefore be necessary to maintain full control over the printers so that they may be prevented from bringing into print writings which are antagonistic to the Catholic faith or which are likely to cause trouble to believers.” The struggle between author, printer and publisher on the one hand and ecclesiastical and government censors, on the other, had become one aspect of the battle for intellectual liberty and freedom of conscience in an age of fundamental ideological conflict.

BIBLIOGRAPHY:

● Rice, Eugene F., and Anthony Grafton. The Foundations of Early Modern Europe

1460-1559. W.W. Norton & Co., 1994.

● Rundle, David. The Hutchinson Encyclopedia of the Renaissance. Hodder

Arnold, 2000.

● Wyatt, Michael. The Cambridge Companion to the Italian Renaissance.

Cambridge University Press, 2014

University of Calcutta

Marxist View of the Nature of the English Civil War

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(CC8)

INDEX

Introduction

"The history of all hitherto existing society is the history of class struggles." So wrote Marx and Engels in The Communist Manifesto. But instead of explaining the struggle between the classes - between the exploiters and the exploited - traditional history books simply present us with the lives (and deaths) of kings and queens; of generals and bishops; of 'Great Men' and individual 'geniuses'.Yet there is another history to be told: a history of the working class, the labour movement, and the revolutionary struggles that have transformed society.

Christopher Hill, a Marxist Historian, says that "the historiography of the English civil war is in itself a fascinating study for a Marxist." For two centuries nothing was written on the events of 1640-60 that could improve on the comments of contemporary observers. Such an observer was James Harrington, who noted that in the century and a half before 1640 the people (that is, the bourgeoisie and lesser gentry) had been increasing in wealth at the expense of crown, church and peerage; and he held that the civil war was a mere readjustment of the political "super-structure".

From the early fifteenth century, great changes had been afoot in much of England. The country was starting to undergo the transformation from a feudal to a capitalist economy. Merchants, financiers and industrialists were the up-and-coming class, gaining rapidly in economic power. They wanted a system of government that would provide maximum encouragement to what is now called 'the enterprise culture'. In addition they craved the political power they felt they were entitled to given their increasingly prominent economic position. This class, the 'bourgeoisie', found their interests frequently opposed by those who traditionally held power – the King, the Church and the so-called nobility, the latter in reality being men who were often nothing more than criminals with posh titles.

This along with religious, economic, and social tensions led to the English Civil War, or the English Revolution, or as Marx calls as one of the "bourgeoisie revolution".
In this paper, we will try to trace our steps back to 17th century England, and interpret the English Civil War according to Marx, learn about the proletariat struggles that are often overlooked in this "bourgeoisie revolution", gain an understanding of the consequences of this war from the eye of a Marxist, and absorb the criticisms of the Marxist view of the nature of the English Civil War.

Interpretation of the English Civil War as a "bourgeoisie" revolution

Marxist historians and Marx himself viewed the English Revolution of 1640-51 (or the English Civil war), like all other revolutions primarily as a class struggle. This can be best illustrated by his writings in the "The Communist Manifesto" : "*The history of all hitherto existing society is the history of class struggles. Freeman and slave, patrician and plebeian, lord and serf, gildmaster and journeyman, in a word, oppressor and oppressed, stood in constant opposition to one another, carried on an uninterrupted, now hidden, now open fight, a fight that each time ended, either in a revolutionary reconstitution of society at large, or in the common ruin of the contending classes. . . . From the serfs of the Middle Ages sprang the chartered burghers of the earliest towns. From these burgesses the first elements of the bourgeoisie were developed.*"

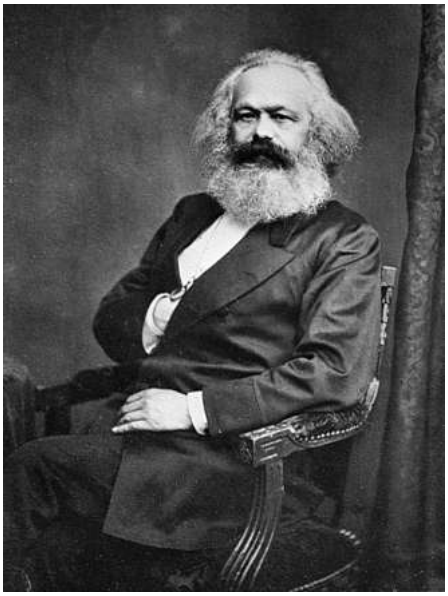


Figure 1: Karl Marx, Photograph by John Mayall, 1875

He further states, "*The feudal system of industry, in which industrial production was monopolised by closed gilds, now no longer sufficed for the growing wants of the new markets. The manufacturing system took its place. The gildmasters were pushed aside by the manufacturing middle class: division of labour between the different corporate gilds vanished in the face of division of labour in each single workshop. . . . Each step in the development of the bourgeoisie was accompanied by a corresponding political advance of that class. . . . The means of production and exchange,*

on whose foundation the bourgeoisie built itself up, were generated in feudal society. At a certain stage in the development of these means of production and of exchange; the conditions under which feudal society produced and exchanged, the feudal organisation of agriculture and manufacturing industry, in one word, the feudal relations of property became no longer compatible with the already developed productive forces; they became so many fetters. They had to be burst asunder; they were burst asunder. Into their place stepped free competition, accompanied by a social and political constitution adapted to it, and by the economic and political sway of the bourgeois class"

This is the Marxist concept of bourgeois revolution is : the revolution in which the feudal state is overthrown by the middle class that has grown up inside it, and a new state created as the instrument of bourgeois rule.

Contrary to popular belief, it was The Netherlands Revolt in the second half of the sixteenth century and not the English Civil War which was the first successful bourgeois revolution on a national scale; It was followed by the English Revolution of 1640, the French Revolution of 1789, the abortive German Revolution of 1848- and later the Russian Revolutions of 1905 and of February 1917.

Figure 2: The English Civil War (Source: Marxist.org)

In 1844, Engels claimed that the English Revolution of the seventeenth century was the predecessor of the French Revolution of 1789. He comments, *"In the Long Parliament we can easily distinguish the three estates, which in France appeared as the Constituent and Legislative*

Assemblies and as the National Convention; the transition from constitutional monarchy to democracy, military despotism, restoration and "juste-milieu" revolution is in England clearly demonstrated."
He further goes on to say that Oliver Cromwell[1] is Robespierre and Napoleon in a single person. He also draws parallels between the Presbyterians, Independents and Levellers with the Gironde, the Mountain, and the Hébertists and Babeuvis.

Hence according to Engels and Marx, in the English just as in the French Revolution the property question took the following form: it was a matter of the realization of free competition and the abolition of all feudal property relations, as manorialism, gilds, monopolies, etc., which had been transformed into fetters on industry in its evolution from the sixteenth to the eighteenth century.

This analysis of the English Civil War by Marx and Engels was done during 1848-50. What is remarkable is the fact that a few months before his death in 1895, in a passage that Engels wrote established the continuity of his and Marx's ideas.

"All revolutions up to the present day have resulted in the displacement of one definite class rule by another: all ruling classes up to now have been only minorities in relation to the ruled mass of the people. A ruling minority was thus overthrown; another minority seized the helm of the state and remodelled the state apparatus in accordance with its own interests. This was on every occasion the minority group enabled and called to rule by the degree of economic development, and just for that reason, and only for that reason, it happened that the ruled majority either participated in the revolution on the side of the former or else passively acquiesced it. ... Even when the majority took part it did so- whether wittingly or not- only in the service of a minority; but because of this, or simply because of the passive unresisting attitude of the majority, this minority acquired the appearance of being representative of the whole people."
He concludes *"All revolutions of modern times, beginning with the great English Revolution of the seventeenth century, showed these features."*

[1] an English general and statesman who, first as a subordinate and later as Commander-in-Chief, led armies of the Parliament of England against King Charles I during the English Civil War, subsequently ruling the British Isles as Lord Protector from 1653 until his death in 1658. He acted simultaneously as head of state and head of government of the new republican commonwealth.

Causes of the English Civil War according to Marxists

- **Economic**

Feudal society in England was dealt a mortal blow at the Battle of Bosworth in 1485 where the 'nobles' fought themselves virtually to a standstill. The new King, Henry VII, was on the throne because of the results of force and violence and was firm to secure his own position by ensuring that the barons failed to regain their previous power. They had to be swept away or at least dropped at heel if modernization was to take place.

By the 1630s the population of England and Wales was about 5 million of whom the bulk were still engaged in agriculture. Many were yeoman farmers cultivating their own or rented smallholdings. They were strongly independent-minded and ready to defend their interests. A peasantry declining in numbers worked for frugal rewards on small rented plots. there were a bigger number of landless labourers who eked out a similarly frugal existence by working for wages on the land supplemented by earnings from work in their own homes, spinning or weaving in the cloth trade, for instance. Most industrial production at this point bore little resemblance to modern industry, being administered in a rural setting by cottagers as a family unit in their own homes.

Figure 3: A Farmer begs for mercy in front of a burning farm, 17th century print (Source: Alamy)

Significantly, however, production was for the market instead of for the producer's own consumption. The increasing development of large-scale enterprises in such industries as mining, iron and metal-working, seafaring, transport and distribution was creating a new class in society, i.e. people

who sold their labour power in return for wages: intrinsically they were the forerunners of the modern working class or proletariat. The common folk, both rural and in growing numbers urban, had no political rights whatever.

England had a big woollen industry, centred especially in East Anglia, the Cotswolds and also the West Riding of Yorkshire. The thriving nature of this industry had caused many landowners to convert their land from use for labour-intensive arable farming to sheep pasture. This meant that enormous numbers of peasants and their families lost their livelihoods and substantial numbers of them drifted to the towns, especially London, where they took whatever low-paid work was available, themselves also becoming a part of the proletariat. Others became robbers, beggars and vagabonds. Tudor England saw an explosion of crime.

"The labourers are first driven from the land," Marx wrote in Capital, "and then come the sheep. Land grabbing on a great scale, such as was perpetrated in England, is the first step in creating à field for the establishment of agriculture on a great scale. Hence this subversion of agriculture puts on, at first, more the appearance of a political revolution."

The inhabitants of the many towns that were growing rapidly could not cultivate their own crops or rear many animals and so to cater for urban demand, some landowners seized the opportunity to overhaul their agricultural practices along capitalist lines, producing for the urban market. This process involved enclosures which consolidated land in far fewer hands, allowed modernization to take place and led to an increase in productivity. It also forced many others who had worked on the land to migrate in search of work. Some of the larger landowners became capitalists producing for the market, not for subsistence, and these processes were carried out with the ruthlessness and disregard for social effects that typify capitalist business methods. These landowners or gentry and the emerging bourgeoisie, both growing in wealth and playing such an important part in the developing economy, found their interests at odds with those surviving vestiges of the past, the feudal nobility, the Church and the Crown.

Marx states, *"In the history of primitive accumulation, all revolutions are epoch making that act as levers for the capitalist class in process of formation, but, above all, those moments when great masses of men are suddenly and forcibly torn from their means of subsistence, and hurled as free and "independent" proletarians on the labour market. The expropriation of the agricultural producer, of the peasant, from the soil is*

the basis of the whole process. The history of this expropriation, in different countries, assumes different aspects. ... In England alone . . . has it the classic form."

The enclosure movement was important for the new class in two ways, as Marx showed. On the one hand it led to accumulation of capital in the hands of a small number: at the opposite pole it created the "free" laborer to be employed by these new capitalists. It was because of this real coincidence of economic interests that "in 1648 the bourgeoisie was allied with the new nobility against the monarchy, against the feudal nobility, and against the established church.

Figure 4: Enclosure in England (Source: WTH?istory, University of Georgia)

Engels elaborates it further and says that this revolution in the economic conditions of society was not followed by any immediate corresponding change in its political structure. Hence, the state order remained feudal, while society became more and more bourgeois. International trade requires free owners of commodities who are unrestricted in their movements and have equal rights as traders to exchange their commodities on the basis of laws that are equal for them all, at least in each separate place. The transition from handicraft to manufacture "presupposes the existence of a number of free workers - free on the one hand from the fetters of the gild and on the other from the means whereby they could themselves utilize their labour power", i.e. workers who can contract with their employers for the hire of their labour power, and as parties to the contract have equal rights with his.

But where economic relations required freedom and equality of rights, the political system opposed them at every step with gild restrictions and special privileges. Local privileges, differential duties, exceptional laws of all kinds in trade affected not only foreigners or people living in the colonies, but often enough also whole categories of the nationals of each country. The privileges of the gilds everywhere and ever anew formed barriers to the path of development of manufacture.

England had a Parliament. This consisted firstly of the House of Lords, mostly hereditary landowners, some with a lineage dating back to the eleventh century and including many who hankered for a return to their past status in a feudal society. The Lords mostly resented the emergence of the bourgeoisie. The House of Commons was growing in stature and consisted largely of members of the country gentry and of the rising urban bourgeoisie, many of them strongly influenced by Puritanism. In constitutional terms, Parliament had no specific powers. The Commons had little to do with the day-to-day government of the country, nor were the King and his advisers responsible to Parliament. Charles stated quite clearly that he was responsible to God alone for his acts. James and especially Charles viewed Parliament as a collecting box, to be summoned when they needed extra money.

Figure 5: James I and Charles I (from left to right), (Source : Wikipedia)

Neither James I nor Charles I thought that the Commons should interfere in their right to raise their own income from taxes, to spend their money on whatever they chose or to rule in any way they wished. James, however, handled this conviction more circumspectly than his successor. The first half of the sixteenth century was a time of inflation. James and Charles were both permanently broke and demanded more revenue from taxes. Those who refused to pay or protested against the fiscal exactions of

Charles were brought before the Court of Star Chamber. This in effect was the King's private kangaroo court and he used it to bypass the normal courts where proceedings took place under the common law. Members of the House of Commons were reluctant to vote increased taxes without the quid pro quo of increased political power. The proposal to reorganize taxation raised the question of the confidence of the tax-paying classes in the government, raised the whole question of state power. "No taxation without consent of parliament" became the cry of the bourgeoisie in town and country.

Figure 6: Parliament in 1643, Frontispiece

Thus as the threat from the bourgeoisie and the new gentry increased the crown drew closer to the more reactionary and feudal forces in the country, which hitherto it had played off against the bourgeoisie and gentry. At the same time it also drew closer to the forces of international reaction which it had hitherto opposed. We can see this in James I's foreign policy of appeasing Spain, in Laud's "recatholicizing" policy in religious affairs, and in Charles I's revival of feudal techniques of government.

The Stuarts wanted to create a state apparatus to support their despotic rule. This, among other things, would require a standing army which could only be paid for by a significant increase in taxation. They could not do this without attacking private property and profit-making. The King's powers and the backward-looking institutions which supported him had become obstacles to the

development of the productive forces along capitalist lines. Such a situation was unacceptable to the bourgeoisie.

- **Religious and Political Causes**

Marx has been quoted saying *"Religious suffering is, at one and the same time, the expression of real suffering and a protest against real suffering. Religion is the sigh of the oppressed creature, the heart of a heartless world, and the soul of soulless conditions. It is the opium of the people."* This quote finds its way into 17th century England, where even though the struggle between the bourgeoisie and the monarchy was purely political; the majority of the commoners however, were made to believe that this struggle was also religious.

Figure 7: The Puritan (1887), a statue in Springfield, Massachusetts, by Augustus Saint-Gaudens (Source: Wikipedia)

By the early seventeenth century, elements within the bourgeoisie were developing their own brand of Christianity, conveniently if not very precisely defined as 'Puritanism'.[2] The Catholic Church was viewed as a sinister international conspiracy bent on regaining the power it had enjoyed before the Reformation. Every Puritan thought he or she was one of God's chosen people, a member of an elite. As the chosen, they could use any methods to confound their enemies; such enemies were, in their eyes, the enemies of God.

[2] a word may be said about Marx* and Engels* views on Puritanism as the ideology of the bourgeois revolution in England. They early came to realize that men only groped their way slowly towards a scientific theory of politics, at every stage relying on the experience of previous generations and in particular of previous revolutionary up heavals. Thus when the middle-class revolt against feudal society first began, its mode of thought was largely colored by the very ideology against which it was struggling

Puritanism was a self-serving religion. The pursuit of worldly wealth was elevated to a virtue and it could be achieved through hard work, sobriety, thrift, moral conduct and the rejection of shallow, pleasure-seeking pursuits. Success in piling up material riches was taken as evidence of God's approval. It is worth remembering that the Church before the Reformation had, in words at least, condemned usury and excess profiteering and advocated what would now be called 'ethical trading'. Many Puritans were rich bankers and traders. No wonder many of them had a fanatical loathing of Catholicism and all its trappings.

As the political theorist and Marxist author, Alan Woods, explains, in the early 17th century, Catholics were loathed, taxed, and even killed in England. So much had the hatred for Catholics grown, that in 1603, James I changed his religious views from Catholic to Protestant so that he could occupy the throne of England. The amount of influence religion had over the people of Europe can be demonstrated by the "5th of November - Gunpowder, treason, and Plot" incident. While popular culture and Alan Moore might have you believe that Guy Fawkes or Giddo Fawkes wanted to blow up the British Parliament in 1605 because of an unjust government (which is to be fair partially true), his actual motivation was purely religious and inspired by Catholic fanaticism. When the European people heard that James I was going to be the new king of England, the Catholics rejoiced - expecting the unjust behaviour towards them to end. However, James I imposed heavier taxes and made lives of Catholics more miserable - to the point that if you were found to possess a Bible, you could be arrested.These reasons made the background of the Gunpowder plot whose aim was to kill King James I. The Gun power plot of Guy Fawkes, when exposed, brought more fear and horror of the Catholics in England.

Figure 8: Guy Fawkes and the Gunpowder plot (Credits: The St. Peter's Foundation)

Deep suspicions were now held that both James and his son Charles ultimately wanted the country to return to its earlier place within the Church of Rome. Those who had bought monastic assets so cheaply during the reign of Henry VIII feared that if the Catholic Church was restored to power, they would have to surrender those lands. Charles I, in league with Archbishop Laud, allowed Catholic practices to creep back into England and attempted to ally England with feudal Catholic states such as Spain and Austria. However it was the heavy-handed attempt of Charles to impose a new prayer book in Scotland, based on the English one, which was seen as the thin end of the wedge. It provoked a violent response from the Scottish Covenanters and drew Charles into an ill-judged attempt to enforce the prayer book on the Scots by force of arms. This was a precursor of the Civil War.

It should be noted, that while Marx views the English Civil War "primarily" as a class struggle, he does not refute the fact that Religion was indeed used as a catalyst in this struggle.
Engels, while drawing a parallel between the French Revolution and The English Civil War beautifully sums up, "the religious and the irreligious revolutions, in so far as they remained political, both in the end produced a single result. The English revolution ended in compromise and the creation of the two national parties."

The Proletariat Class in the English Civil War

In his "Wage, Labour and Capital", Marx says *"From the moment when, like a butterfly from the chrysalis, the bourgeoisie arose out of the burghers of the feudal period, when this "estate" of the Middle Ages developed into a class of modern society, it was always and inevitably accompanied by its shadow, the proletariat. And in the same way the bourgeois demand for equality was accompanied by the proletarian demand for equality. From the moment when the bourgeois demand for the abolition of class privileges was put forward, alongside of it appeared the proletarian demand for the abolition of the classes themselves- at first in religious form, basing itself on primitive Christianity. . The demand for equality in the mouth of the proletariat ... is ... as was the case at the very start, for example in the Peasants War (in Germany)- the spontaneous reaction against crying social inequalities, against the contrast of rich and poor, the feudal lords and their serfs, surfeit and starvation."* [3]

[3] Marx and Engels were careful not to exaggerate the part played by a proletariat in seventeenth century England. "In both revolutions [the English and the French] the bourgeoisie was the class which

- **The Levellers**

As one class increasingly sought to replace another at the top, 17th century England was gripped by new revolutionary ideas. This took a mainly religious form, which was the only ideological forum open to society at that time. The Christianity of the new merchants and embryonic capitalists reflected their own aspirations, as against the dead hand of the old feudal order. They were Puritans, in the main being Presbyterians. Their agenda was to clear the way for a new type of society: one based on property, trade, commodities and the money system. Alongside the Presbyterians were many smaller groups, known as Independents. They drew their support from the "middling" and lower layers of society, those who sold their labour for money. By 1646, the new bourgeois had succeeded in their bid for power following the defeat of the absolutist monarchy in the English Civil War - a revolution in reality. But it was not a clear-cut victory. Rather, to quote Engels, it was a "compromise between the rising middle class and the ex-feudal landowners." On the one hand, a section of the old order were ready to cooperate with the rising men of power. On the other hand, the bourgeois "Grandees" around Cromwell were still weak and divided.

Figure 9: The Leveller Revolution: Radical Political Organization in England, 1640-1650, Verso Books

Cromwell needed the forces of the New Model Army to gain victory over the troops of the King. The oil that lubricated this revolutionary army was the political ideas of the Independents - or Levellers as they were dubbed, as they called for a "level" or classless society. Within the New Model Army, the Levellers began to organise around their programme, known as

found itself effectively at the head of the movement. The proletarians and those fractions of the burgher class that did not belong to the bourgeoisie either still had no interests separate from those of the bourgeoisie or still did not form independent evolved classes or sub-classes.

the "Good Old Cause". The ranks elected delegates, called Agitators, to represent them and in 1647, the Levellers published "The Case of the Army truly stated", taking full advantage of the latest developments in printing to spread their demands. Having to rest on both the Grandees within parliament and the forces of the New Model Army without, Cromwell knew he had a dilemma to resolve. This was attempted at the Putney Debates, a full meeting of all the various sides and interested parties which took place in October 1647 at Putney Church near London. It was a debate over nothing less than the future direction of England itself and was deemed important enough for Cromwell himself to chair some of the sessions. The Levellers within the ranks of the army delegates gave as good as they got but in the end no clear decision was reached. The army was fobbed off with promises of a commission to further investigate the questions raised. A meeting of the New Model Army at Ware in November railed against this delay and demanded "Justice!, Soldiers' Rights!, Freedom!" However any potential revolt was soon suppressed - the King had just escaped imprisonment and unity was needed to defeat the new Royalist uprising. With the defeat and subsequent execution of Charles 1 in 1649, Cromwell - now Lord Protector of England - was able to set to work defeating the Levellers and destroying their base. The most militant regiments of the New Model Army were sent to Ireland. Opposition in the ranks was crushed in London, Banbury and Salisbury. The last of the Leveller forces were defeated at Burford in May of that year.

Largely purged from official histories of this period, even today, the Levellers are usually described as an irrelevance. It is true that had they won power and tried to implement their programme (which still preserved property rights it should be noted) they would not have been able to stop the establishment of a capitalist Britain. That would have required a force, a class that did not yet exist to any great degree - the proletariat, the working class. Nevertheless the ideas of the Levellers would influence those radical forces which came afterwards during the struggles of the following centuries. However, there was another group in 1649 which would have a more direct influence on revolutionary socialism - the True Levellers or, as they came to be known, the Diggers.

- **The Diggers or the "True" Levellers**

Following the defeat and execution of Charles I, the subsequent suppression of the Levellers by Oliver Cromwell seemed to bring an end to that flowering of English radicalism, although it would never entirely disappear, even after the Restoration of 1659. Yet, in 1649, another radical movement moved into action with ideas that anticipated those raised by Marx and Engels two hundred years later. Although they would consider themselves as True Levellers, history knows them as the Diggers. They were the first to formulate truly communistic ideas, based on the works of Gerard Winstanley.[4] From 1648, his published writings - initially in pamphlet form - began to circulate widely amongst radical elements, attracting followers and the basis of a group. Indeed there is an argument that some of the writings later attributed to Winstanley may have been written by others, mainly Levellers, inspired by what they had already read and heard.

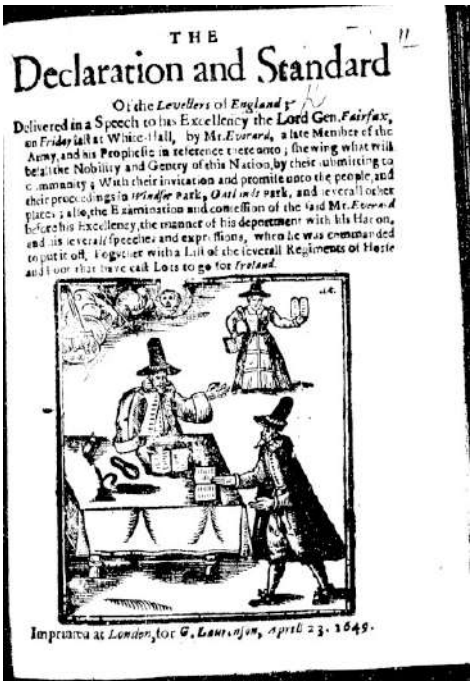

THE
Declaration and Standard
Of the *Levellers* of *England*:
Delivered in a Speech to his Excellency the Lord Gen. *Fairfax*, on *Friday* last at White-Hall, by Mr. *Everard*, a late Member of the Army, and his Prophetic in reference thereunto; shewing what will befall the Nobility and Gentry of this Nation, by their submitting to Community; With their invitation and promise unto the people, and their proceedings in *Windsor* Park, *Oatlands* Park, and several other places; also the Examination and confession of the said Mr. *Everard* before his Excellency, the manner of his deportment with his Hat on, and his several speeches and expressions, when he was commanded to put it off. Together with a List of the several Regiments of Horse and Foot that have cast Lots to go for *Ireland*.
Imprinted at *London*, for G. Lawrence, April 23. 1649.

Figure 10: Woodcut from a Diggers document by William Everard

Like the Levellers, and others before, Winstanley argued that all men were equal but he also argued that this equality extended to property rights as well. Whereas the leaders of the English Revolution spoke grandly of "freedom", Winstanley pointed out that political freedom alone was of

[4] former cloth merchant, who like many others at this time took full advantage of the rise of the printing press to spread his message. He was a Baptist at first but developed humanist theories that would later form the basis of clearly recognizable socialist thought.

little use to the people if they still went hungry. The programme of the Diggers, although couched in religious terms, went beyond that of most of the Levellers, who in the main defended established property relations, by calling for the following:

- All land to be communally owned and its produce shared amongst all.
- Abolition of money.
- Election of all officials
- Annual parliaments, elected by universal male suffrage.
- Free education for all, male and female.
- Abolition of all feudal titles.

However, it was not enough to just argue for this. On 1 April 1649, Winstanley and his group occupied wasteland at St George's Hill in Surrey and started to cultivate it, operating as a commune. The local landowners (and clergy) were hostile and began to attack the Digger community with regular and often physical force. After eleven hard months the commune was broken and finally forced out. The Diggers had attracted national interest and landowners were now on their guard against further such encroachments. The establishment of another commune was attempted by Winstanley in 1650 at Cobham (where he had lived for a few years prior to the events of 1649) but this too was suppressed and its members driven out. Winstanley left Cobham for London and his writings dried up after the publication in 1651 of what is now his most famous work, 'The Law of Freedom'. Like a number of other Diggers he later became involved in the Quakers, dying in September 1676. Winstanley's writings and the communes at St. George's Hill and Cobham clearly inspired a number of other Digger groups to take action: at Barnet and Enfield near London; and Iver and Wellingborough further out into Middlesex, with clear evidence of other groups existing even towards the north of England. None would last. Winstanley and the True Levellers would be whitewashed out of English history until the late 19th century. Even now their influence and importance is underestimated. Winstanley came to understand that the forces needed to make the necessary changes simply did not exist. He even petitioned Cromwell to take on that role, dedicating 'The Law of Freedom' to the Lord Protector. Yet Winstanley was looking at society through seventeenth century eyes. The required forces to achieve the aims of the Diggers would not be formed until the rise of the industrial proletariat and with it the militant organisations of class struggle and socialism. It is these mighty forces that will make, in Winstanley's words, the earth "a Common Treasury" and fulfill the vision of those men, women and children who dug up the muddy ground at St.George's Hill, 370 years ago.

Consequences

Due to these radical and reactionary thoughts of the Levellers and Diggers, a fear of "popular democracy" settled among the bourgeoisie (who had acquired all they wanted from the revolution), nobility, clergy, as well as the monarchy. The restoration of monarchy in 1660, even if it was a bourgeoisie monarchy instead of an absolute monarchy was inspired by this fear.

However, the English Civil War was not futile, as many schools of thought claimed. Upon this excess of revolutionary activity [1640-60] there necessarily followed the inevitable reaction, which is turn went beyond the point when it might have maintained itself. After a series of oscillations, the new centre of gravity was at last attained and became a new starting point. The grand period of English history, known to respectability under the name of "the Great Rebellion," and the struggles succeeding it, were brought to a close by the comparatively puny event entitled by liberal historians 'the Glorious Revolution' of 1688.

The new starting point was a compromise between the rising middle class and the ex-feudal landowners. The latter,though called, as now, the aristocracy, had been long since on the way which led them to become what Louis Philippe in France became at a much later period, "the first bourgeois of the kingdom."

Christopher Hill, comments "The compromise settlement of 1660 and 1688, succeeding the 'Bonapartist semi-dictatorship' of Oliver Cromwell, was made possible in England by the previous history of capitalism and land-ownership there. 'Ex-feudal' and bourgeois landowners could come together in face of a threat from democracy, and they have remained united against it ever since."

Conclusion

Although, Marxist interpretations have been criticized by the Tory school of thought for over simplification of the religious struggle, and over vilification of the feudal lords, it should be noted that Tories themselves are accused of whitewashing the crimes of monarchy and nobility, in the name of saving the peasantry from the exploitation by the "bad capitalists", who were at the time a very small class.

The aim of this school of thought becomes clear in their criticism of Marx - a person whose entire theory is based on how to benefit the working class.

Thus, in investigating the English Revolution, Marx was investigating a crucial period in the history of humanity, a period whose practice and theory had contributed to their own ideas. Thanks to the development of productive forces made possible by the victory of the bourgeoisie in the seventeenth century, Marx believed that the hopes and dreams of the left-wing democrats, inexorably defeated in the seventeenth century, were at last realizable.

That is why he declares in the Communist Manifesto:
The weapons with which the bourgeoisie felled feudalism to the ground are now turned against the bourgeoisie itself. But not only has the bourgeoisie forged the weapons that bring death to itself; it has also called into existence the men who are to wield those weapons- the modern working class- the proletarians.

Bibliography

- **Journal Articles**

Hill, Christopher. 1948. “The English Civil War Interpreted by Marx and Engels.” Science &
Society 12, no. 1 (Winter): 130-156. http://www.jstor.org/stable/40399879.

Carlin, Norah. "THE COLLECTED ESSAYS OF CHRISTOPHER HILL." International
Review of Social History 33, no. 3 (1988): 329-38. http://www.jstor.org/stable/44582054

Phelps, Christopher, and Robin Vandome, eds. Marxism and America: New Appraisals. Manchester: Manchester University Press, 2021. http://www.jstor.org/stable/j.ctv1q26zw1

- **Websites**

Brandon, David. 2020. “The English Civil War and the Levellers.” Socialist Appeal. https://www.socialist.net/the-english-civil-war-and-the-levellers.htm.

Carlin, Noah. 1980. “Marxism and the English Civil War.” Encyclopaedia of Trotskyism On-Line. https://www.marxists.org/history/etol/writers/carlin/1980/xx/civilwar.html.

“Causes of the English Civil War.” n.d. The Cromwell Association. http://www.olivercromwell.org/wordpress/?page_id=1808

Ohlmeyer, J. H.. "English Civil Wars." Encyclopedia Britannica, June 30, 2021. https://www.britannica.com/event/English-Civil-Wars

- **Books/Book Sections**

Appeal, Socialist. 2020. The World Turned Upside Down: Britain's Forgotten Revolutionary
History. N.p.: Socialist Appeal.

Phukan, Meenaxi. 2012. Rise of Moden West: Social and Economic History of Early Modern Europe. N.p.: Trinity Press Pvt Ltd.

Marx, Karl. 1847. Wage Labour and Capital. N.p.: Neue Rheinische Zeitung.

Marx, Karl. 1848. The Communist Manifesto. Bishopsgate, London: Workers' Educational Association (Kommunistischer Arbeiterbildungsverein).

Marx, Karl. 1867. Capital. Volume I: The Process of Production of Capital. N.p.: Marx-Engels-Gesamtausgabe.

Marx, Karl. 1885. Capital, Volume II: The Process of Circulation of Capital. Compiled by Freidrich Engels. N.p.: Marx-Engels-Gesamtausgabe.

Marx, Karl. 1894. Capital, Volume III: The Process of Capitalist Production as a Whole. Compiled by Freidrich Engels. N.p.: Marx-Engels-Gesamtausgabe.

- **Images**

Figure 1: Karl Marx, Photograph by John Mayall, 1875, Public Domain, https://commons.wikimedia.org/wiki/File:Karl_Marx_001.jpg

Figure 2: The English Civil War, 17th Century Print , Public Domain https://www.marxists.org/archive/hill-christopher/english-revolution/

Figure 3: A farmer begs for mercy in front of a burning farm. 17th century print. For illustrating Icelandic article on The Thirty Years War, Alamy Stock Photo https://www.alamy.com/a-farmer-begs-for-mercy-in-front-of-a-burning-farm-17th-century-print-for-illustrating-icelandic-article-on-the-thirty-years-war-image215688655.html

Figure 4: Enclosure in England: The Commodification of a blade of grass - WTH(istory)? Attribution: https://ctlsites.uga.edu/whatthehistory/wp-content/uploads/sites/314/2016/09/sheep.png

Figure 5: James I and Charles I adorn two of the the Royal Mail's new stamps featuring the Stuarts. Photograph: Royal Mail/PA Photograph: Royal Mail/PA Attribution: http://www.execreview.com/2010/06/we-cut-off-the-head-of-charles-i-so-why-are-we-putting-it-back-on-a-stamp/

Figure 6: Parliament in 1643, Frontispiece from An exact collection of all remonstrances ... and other remarkable passages betweene the Kings most Excellent Majesty and his high court of Parliament ... which were formerly published either by the Kings Majesties command or by order from one or both Houses of Parliament, London, Printed for Edward Husbands, T. Warren, R. Best, 1643 https://www.historyofparliamentonline.org/gallery/parliaments/husbands-exact-collection

Figure 7: The Puritan (1887), a statue in Springfield, Massachusetts, by Augustus Saint-Gaudens , Public Domain https://commons.wikimedia.org/wiki/File:The_Puritan_by_Augustus_Saint-Gaudens_-_Springfield,_Massachusetts_-_DSC02513.JPG

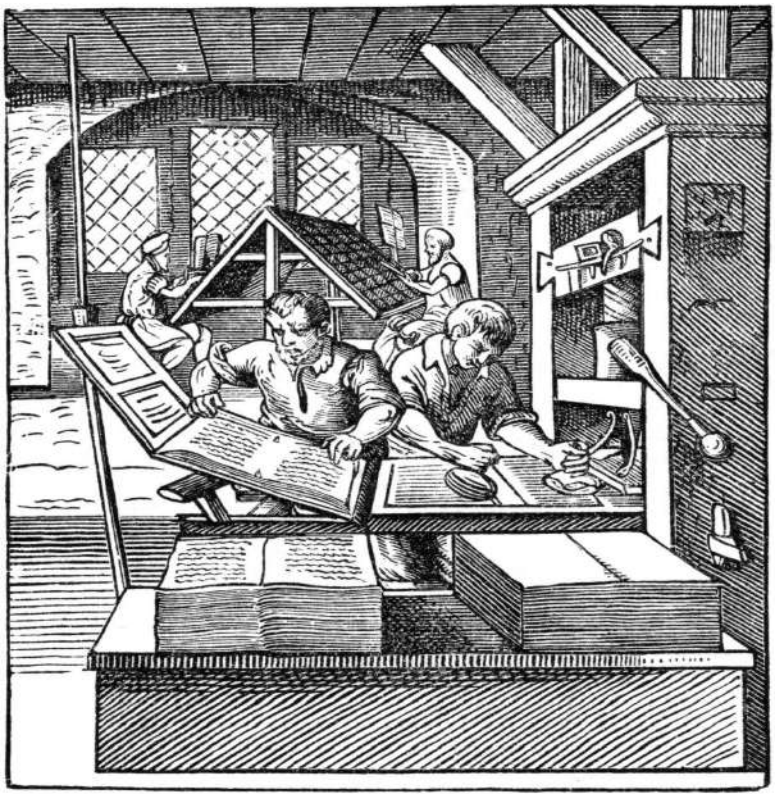
Figure 8: Guy Fawkes, St. Peter's Foundation ,Historic Royal Places https://www.hrp.org.uk/tower-of-london/history-and-stories/guy-fawkes-and-the-gunpowder-plot/#gs.6w25sp

Figure 9: The Leveller Revolution: Radical Political Organization in England, 1640-1650, Verso Books (By John Rees)
Accessed via:
https://portside.org/2019-06-13/remembering-english-revolution

Figure 10: Woodcut from a Diggers document by William Everard, Public Domain https://commons.wikimedia.org/wiki/File:Levellers_declaration_and_standard.gif

C C 8

INTERNAL ASSIGNMENT



SEMESTER - IV

DEPARTMENT - HISTORY

TOPIC - Printing Revolution

College Roll Number : 19A-265

Registration Number : 223-1212-0180-19

CU Roll Number : 192223-11-0062

CONTEXT

INTRODUCTION

The printing press is a device that allows for the mass production of uniform printed matter, mainly text in the form of books, pamphlets, and newspapers. Created in China, the printing press revolutionized society there before being further developed in Europe in the 15th Century by Johannes Gutenberg and his invention of the Gutenberg press. The arrival in Europe of the printing press with moveable metal type in the 1450s CE was an event that had enormous and long-lasting consequences. Johannes Gutenberg is widely credited with innovation. Some people would claim that the invention of Gutenberg's printing press was just as important and impactful as the harnessing of fire, metallurgy, and the internet. Beginning with religious works and textbooks, soon presses were churning out all manner of texts from Reformation pamphlets to romantic novels. The number of books greatly increased, their cost diminished and so more people read than ever before. Ideas were transmitted across Europe as scholars published their works, commentaries on ancient texts, and criticism of each other. The advent of the printing press was a triumph for many aspects of the developing western world. The influence of the printing press ranges from the education and literacy rates of European civilians slowly increasing, scientists being able to share discoveries, and the almighty Catholic Church not being able to censor what everyone was viewing. Protestant thinkers used Gutenberg's printing press to expand their proposition of reformation in the Catholic Church through pamphlets beyond their minuscule villages, to all of Europe. There was a sense of liberation of the ideas that created a substantial imprint on the philosophy of religion to this day and was one of the most powerful tools of the modern era.

Before Printing Revolution

During the Middle Ages in Europe, most people lived in small, isolated villages. If people traveled at all, they typically ventured only a few miles from where they were born. For most people, the only source of both religious and worldly information was the village Catholic priest. The news passed often in the form of rumors. Written documents were rare and often doubted by the common people as forgeries. The important matter was oral testimony based on oaths taken in the name of God, to tell the truth. Almost no one could read or write the language they spoke. Those few who were literate usually went on to master Latin, the universal language of scholarship, the law, and the Roman Catholic Church. Books, all hand-copied, were rare, expensive, and almost always in Latin. They were so valuable that universities chained them to reading tables. Most people passed their lifetime without ever gazing at a book or written work of any sort. Memory and memorization ruled daily life and learning. Poets, actors, and storytellers relied on rhyming lines to remember vast amounts of material. Craftsmen memorized the secrets of their trades to pass on orally to apprentices. Merchants kept their accounts in their heads. Even scholars literate in Latin used memory devices to remember what they had learned. Scribes, often monks living in monasteries, each labored for up to a year to copy a single book, usually in Latin. The scribes copied books on processed calfskin called vellum and later on paper. Specialists painted large capital letters and the margins of many books with colorful designs and even miniature scenes. These books were beautiful works of art. But they took a long time to make and were very costly.

Fig.1

Johannes Gutenberg

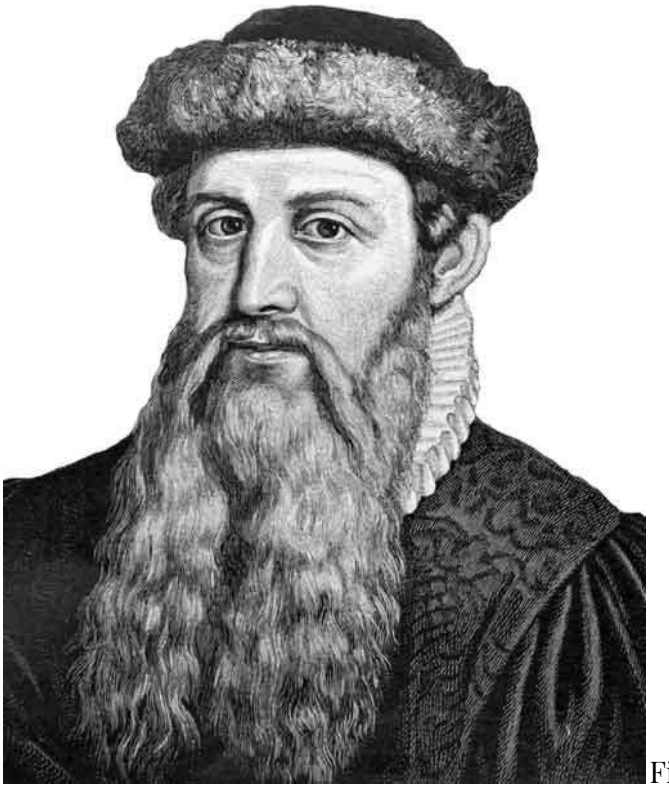


Fig.2

Johann Gutenberg was born around 1400 into one of the leading families of Mainz, Germany. Mainz was a busy commercial port on the Rhine River. Nothing is known about his education, but he probably attended a university because he knew Latin well. Gutenberg began his printing experiments sometime in the 1440s CE, and he was able to establish his printing firm in Mainz in 1450 CE. However, there are other claims, notably the Dutch printer Laurens Janszoon Coster and two other early German printers, Johann Fust and his son-in-law Peter Schöffer. Gutenberg's printer used Gothic script letters. Each letter was made on a metal block by engraving it into the base of a copper mold and then filling the mold with molten metal. Individual blocks were arranged in a frame to create a text and then covered in viscous ink. Next, a sheet of paper, at that time made from old linen and rags, was mechanically pressed onto the metal blocks.

At the time of 1452, Gutenberg entered a business partnership with Fust to continue providing funds for his printing experiments. In 1436, he partnered with Andreas Dritzehn and Andreas Heilmann however, it was not until in 1439 a lawsuit against Gutenberg that an official record exists. Winning the lawsuit, Johann Fust took possession of the print shop and finished printing the Bibles, which he sold. Fust and Schoffer continued operating Gutenberg's print shop. Gutenberg's success in putting all these elements together is indicated by his printed edition of the Latin Bible in 1456 CE. The

Bible had three volumes of text in Latin and had 42 lines of characters per page with color illustrations.
In the last days of Gutenberg's press, Fust shut the entire production down and closed Gutenberg's shop, disallowing him entry and access to his equipment. Gutenberg was never acclaimed for his astounding invention during his lifetime. He died a poor and forgotten man in Mainz in 1468.

PRINTING REVOLUTION


Fig.3

In Renaissance Europe, the arrival of mechanical movable type printing introduced the era of mass communication, which permanently altered the structure of society. The relatively unrestricted circulation of information and revolutionary ideas captured the masses in the Reformation and threatened the power of political and religious authorities. The sharp increase in literacy broke the monopoly of the literate elite on education and learning and bolstered the emerging middle class.

As early as 1480 there were printers active in 110 different places in Germany, Italy, France, Spain, the Netherlands, Belgium, Switzerland, England, Bohemia, and Poland. From that time on, it is assumed that the printed book was in universal use in Europe. Printing presses were soon producing great numbers of books translated into Latin from Greek, Hebrew, Arabic, and other classic languages. These books dealt with many subjects such as literature, the law, philosophy, architecture, and geography. By 1500, the printing presses in operation throughout Western Europe had already produced more than 20 million copies. In the following century, their output rose tenfold to an estimated 150 to 200 million copies. They produced books with title pages, tables of contents, numbered pages, indexes, and engravings of pictures, maps, and diagrams. They also began to use standard punctuation marks and broke down text into paragraphs.

The vast printing capacities meant that individual authors could now become true bestsellers. The increasing supply of books and other printed materials in vernacular languages spurred more people to learn how to read. Printers began to publish newspapers to meet the demand of readers for more information about national and world affairs. In the period from 1518 to 1524, the publication of books in Germany alone skyrocketed sevenfold. Between 1518 and 1520, Luther's tracts were distributed in 300,000 printed copies. Two hundred seventy-one locations are known and the largest of them are designated by name. The term "incunabula" referred to printed materials and came to denote the printed books themselves in the late 17th century.

The printing revolution also helped develop modern science in Europe. For example, in 1543, Copernicus, took advantage of printed works on astronomy and tables of data on planet movements to print his book, arguing that the earth revolved around the sun. Later, Tycho Brahe installed a printing press and paper mill near his observatory to print books on his discoveries.

Along with the many gains in European learning and culture, there were some losses as well. Scribes tried to continue their craft, sometimes even copying printed books, but most surrendered to the printing press by the late 1400s. This showed many occupations were replaced with machines.

Another loss was a decline in the use of Latin, the universal language of religion and scholarship in the Middle Ages. With greater demand for books in the vernacular, more and more books were printed in vernacular languages. Memorization also began to fade as a way to remember large quantities of information.

CONSEQUENCES

The impact of the printing press in Europe included:

- A huge increase in the volume of books produced compared to handmade works. The printing press allowed for mass production of these detailed drawings, which would have taken years to print one copy by another printing process that was outdated or by a scribe.
- An increase in the access to books in terms of physical availability and lower cost.
- A successful author could now earn a living solely through writing. More authors were published, including unknown writers. Because of the printing press, authorship became more meaningful and profitable. It was suddenly important who had said or written what, and what the precise formulation and time of composition were. This allowed the exact citing of references, producing the rule, "one author, one work, one piece of information."
- The printing process ensured that the same information fell on the same pages. Thus the process of reading changed, gradually moving over several centuries from oral readings to silent, private reading.
- An increase in the use and standardization of the vernacular as opposed to Latin in books. The spread of knowledge in less elite communities such as the general population. The printing press distributed literature from bright minds that were most commonly found in Latin, that was translated into more native languages so everyone could understand and absorb the knowledge which overall made the literacy rates of European civilians grow. The wider availability of printed materials led to a drastic rise in the adult literacy rate throughout Europe. That enlargement was beneficial for everyone, not just the country of Europe.
- The rapid spread of ideas concerning religion, history, science, poetry, art, and daily life. In the 1500s, science was considered a high academic subject, made for highly educated people instead of commoners and the academically challenged. Even though the movable type printing press increased the amount of inexpensive scientific books for the population, most didn't buy the books because the topics were irrelevant or too complex for their understanding. Thus, the main consumers of early scientific material were still mostly scientific scholars.

- The printing press was a factor in the establishment of a community of scientists who could easily communicate their discoveries through widely disseminated scholarly journals, helping to bring on the scientific revolution. The printing press did play a huge role in the Scientific Revolution within the scientific community, which later led to the spread of scientific knowledge to the rest of the general population.
- An increase in the accuracy of ancient canonical texts. The printing press encouraged reprinting and distribution of ancient texts by previous scientists for current scientists to access and consult freely.
- Movements could now be easily organized by leaders who had no physical contact with their followers.
- The creation of public libraries.
- The censorship of books by concerned authorities.

In conclusion, Johannes Gutenberg's printing press was and still is a very indispensable part of history and our lives wouldn't be like it is today if it wasn't for Gutenberg's printing press. Even more, it allowed for greater accessibility and the spread of all kinds of knowledge throughout a wider population never before seen, bringing about several new social dynamics that would lead to several social revolutions. Even though Gutenberg suffered, he helped heal many wounds in the world.

BIBLIOGRAPHY

BOOKS :

Rice, JR.Eugene. F & Anthony Grafton, The foundation of early modern Europe 1460 -1559. Second edition, (New York: London), W.W. Norton and Company, 1970.

WEBSITES :

Constitutional Rights Foundation, https://www.crf-usa.org/bill-of-rights-in-action/bria-24-3-b-gutenberg-and-the-printing-revolution-in-europe

World History Encyclopedia, https://www.worldhistory.org/article/1632/the-printing-revolution-in-renaissance-europe/

HISTORY, https://www.history.com/news/printing-press-renaissance

Britannica, https://www.britannica.com/technology/printing-press

PICTURES :

Fig.1 : http://quicktaxconsulting.net/parshan/BeforePress.html

Fig.2 : https://science4fun.info/wp-content/uploads/2020/02/Johannes-Gutenberg.jpg

Fig.3 : https://sites.google.com/site/historyofprinting/gutenberg-and-the-movable-type-press

COLLEGE NAME : SCOTTISH CHURCH COLLEGE

DEPARTMENT : HISTORY

SEM : IV

PAPER : CC8

CU REGISTRATION NUMBER : 223-1111-0012-19A

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PROJECT TOPIC : 17th CENTURY EUROPEAN CRISIS : MAJOR ISSUES.

17TH CENTURY EUOPEAN CRISIS : MAJOR CRISIS.

INTRODUCTION

The period of crisis that happened in Europe in the seventeenth century was one of the toughest in history. After the process of expansion and growth experienced during the fifteenth and sixteenth centuries, Europe found itself in a deep crisis that lasted nearly a century. A crisis that was characterize by various features, foremost the demographic, because after the late Middle Ages the population had increased steadily; until it stops abruptly in the sixteenth century even to recede in many places. Other reasons that were attributed for causing this crisis included hunger, wars, revolts, politics, plagues and climate changes. Eric Hobsbawn argues that on the big picture, it was economic and social forces that created this mid 17th century crisis. On the other hand, Trevor Roper emphasized that the main causes for this crisis were the religious and political conflict. Although both arguments can be valid and were present in this disaster, I believe that the root causes of this crisis were religious and political differences, which ultimately led Europe to have economic and social conflicts as well.

One important example of this crisis is the thirty years war. It was a war that took place in central Europe (especially in Germany) between 1618 and 1648, in which the majority of the great European powers intervened. This war would mark the future if the European continent in the centuries to follow. The origin of this war goes back to the Peace of Augsburg, which basically stated that the religion of the ruler of the land will be the religion of the people. This resolved the conflicts between the Catholics and the Protestants for a while, but due to the diverse religions practiced in the German states, it did not solve the underlying religious issues definitively. Just by analyzing the phrases above, we automatically get the sense that it was religious conflicts the root cause of this war. This is confirmed by the event that sparked the war, the revolt in Bohemia. In this revolt, member of the predominantly protestant bohemian legislature threw two catholic government officials pot the window, as a sign of protest against the religious policies of the newly elected king, the catholic Ferdinand II. However, the Catholics defeated the protestants, and this leads us to another example of religion causing the 30 years war; the intervention of the Danish and then the Swedish. This happened because of the fear of these kingdoms that their sovereignty as protestant lands was threatened by the Catholic success in the war, and also because the declarations of the king Frederick V, where he said that all

Europe should be back to Catholic. Nevertheless, at this point the Catholics are still winning the war, and this catches the awareness of Cardinal Richelieu, who was the chief minister of King Louis XII of France. From this point on, this religious war becomes political, because even though he was catholic, France decides to join the war and help the Protestants. The reason for this was simple, balance of power; the French felt that Habsburgs have gained too much power and they did not want just one great power to control Europe.

Another problem that rose during this crisis was the war of the three kingdoms. This is another great example to argue that Trevor Roper was correct in explaining the main cause of the crisis. This war happened after England, Ireland and Scotland became united under the power of only one ruler. This was possible because, since Queen Elizabeth of England had no direct heir to her throne, the next in line was James Stuart, the king of Scotland. So what types of problems this created? First, James was a firm believer of the "divine right monarchy", which basically means that he was placed there by god and does not have to report to anyone else. This belief did not bring many problems to other nations; however, the fact that England had a parliament created a lot of political tensions in this era. Expanding upon this, the wealth that the members of the parliament had acquired from the agricultural innovation, the expansion of their land and sheep count, increased this problems even more, because they now wanted to match their political power with their economic power. The fact of this happening brings us back to our thesis, and shows a religious problem becoming political, which ultimately becomes social. I argue this because the parliament starts to have power from the times of King Henry, when he needed their approval to separate from the Catholic Church (religion). Years after, this backfires to King James, because it gave more authority to the wealthy parliament, and clash with his ideals of divine right and absolutism. Subsequently, creating a lot tension and confusion among the people of the three kingdoms, whose laws and taxes kept changing as the power of the monarchy and the parliament would fluctuate.

This is another example of how religious conflicts happened first and the led to social problems

Possibly the best example of the religious and political causes of this crisis was the glorious revolution. Going back to the origin of the problem, old King James II was a Catholic that had already irritated the parliament by relaxing the restrictions on the Catholics and allowing them to hold positions in public offices. Nevertheless, James was old and next line for the throne was his daughter Mary, a protestant that was married to William of Orange; so the parliament does not really take any action. However, things turn ugly after James II has a son that would mean the continuity of Catholic rule in England, which the parliament would not allow. This caused the glorious revolution, and causes James to escape to France with his son, and William of Orange is invited to be king of England

The General Crisis is a term used by some historians to describe the period of widespread global conflict and instability that occurred from the early 17th century to the early 18th century in Europe and in more recent historiography in the world at large.

The term was coined by Eric Hobsbawm in his pair of 1954 articles, "The Crisis of the Seventeenth Century"

Definition

As a historiographic concept, the place of the general crisis was cemented by Hugh Trevor-Roper in a 1959 article entitled "The General Crisis of the Seventeenth Century" published in the same journal. Hobsbawm discussed an economic crisis in Europe; Trevor-Roper saw a wider crisis, "a crisis in the relations between society and the State". Trevor-Roper argued that the middle years of the 17th century in Western Europe saw a widespread breakdown in politics, economics and society caused by a complex series of demographic, religious, economic and political problems. In the "general crisis", various events such as the English Civil War, the Fronde in France, the climax of the Thirty Years' War in the Holy Roman Empire and revolts against the spanish
Crown in Portugal, Naples and Catalonia were all manifestations of the same problem. The most important cause of the "general crisis", in Trevor-Roper's opinion, was the conflict between "Court" and "Country"; that is between the increasingly powerful centralising, bureaucratic, sovereign princely states represented by the court, and the traditional, regional, land-based aristocracy and gentry representing the country. He saw the intellectual and religious changes introduced by the Renaissance and the Protestant Reformation as important secondary causes of the "general crisis".

There were various controversies regarding the "general crisis" thesis between historians. Some simply denied the existence of any such crisis. For instance, Hobsbawm saw the problems of 17th-century Europe as being social and economic in origin, an emphasis that Trevor-Roper would not concede. Instead, he theorised that the 'General Crisis' was a crisis of state and society, precipitated by the expansion of bureaucratic offices in the Sixteenth century.

Subsequent historians interested in the General Crisis include Geoffrey Parker, who has authored multiple books on the subject.

Global patterns

Many historians have argued the 17th century was an era of crisis. Today there are historians who promote the crisis model, arguing it provides an invaluable insight into the warfare, politics, economics, and even art of the seventeenth century. The Thirty Years' War (1618–1648) focused attention on the massive horrors that wars could bring to entire populations. The 1640s in particular saw more state breakdowns around the world than any previous or subsequent period. The Polish–Lithuanian Commonwealth, the largest state in Europe, temporarily disappeared. In addition,

there were secessions and upheavals in several parts of the Spanish Empire. In Britain there were rebellions in every part of the Stuart monarchy (Kingdom of England, Kingdom of Scotland, Kingdom of Ireland, and British America). Political insurgency and a spate of popular revolts seldom shook the foundations of most states in Europe and Asia. More wars took place around the world in the mid-17th century than in almost any other period of recorded history. The crises spread far beyond Europe—for example Ming China, the most populous state in the world, collapsed.

China's Ming dynasty and Japan's Tokugawa shogunate had radically different economic, social, and political systems. However, they experienced a series of crises during the mid-17th century that were at once interrelated and strikingly similar to those occurring in other parts of the world at the same time. Frederic Wakeman argues that the crisis which destroyed the Ming dynasty was partly a result of the climatic change as well as China's already significant involvement in the developing world economy. Bureaucratic dishonesty worsened the problem. Moreover, the Qing dynasty's success in dealing with the crisis made it more difficult for it to consider alternative responses when confronted with severe challenges from the West in the 19th century.

Climate change

The General Crisis overlaps fairly neatly with the Little Ice Age whose peak some authorities locate in the 17th century. Of particular interest is the overlap with the Maunder Minimum, El Niño events and an abnormal spate of volcanic activity. Climatologists such as David Rind and Jonathan Overpeck have hypothesised that these three events are interlinked. Across the Northern Hemisphere, the mid-17th century experienced almost unprecedented death rates. Geoffrey Parker has suggested that environmental factors may have been in part to blame, especially the global cooling trend of this period. David D. Zhang et al provide a detailed analysis here.

Demographic decline

During this period there was a significant decline in populations particularly in Europe and China. The cause for this demographic decline is complicated and significantly unproven; but, war, climate change and migration are the main factors that contributed to this population crisis. War ravaged Europe for almost the entirety of the century with no major state avoiding war in the 1640s. Some states saw very few years of peace; for example Poland only saw 27 years of peace, the Dutch Republic 14, France 11, and Spain only 3. An example of the impact of war on demography in Europe is Germany, whose population was reduced by approximately 15% to 30% in the Thirty Years' War. Another factor for the demographic decline in Europe was the spate of climatic events that dramatically affected the food supply and caused major crop failure in the marginal farmland of Europe. During this period there was a drop of 1–2 °C, which coincides with the Maunder Minimum and frequent, large spates of volcanism which acted to drop temperatures enough to cause crop failures in Europe. Crop failures were met with a

wave of urban migration that perpetuated unsustainable urban populations and caused in some areas a Malthusian crisis. Although in some areas the early stages of the subsistence crises were not necessarily Malthusian in nature, the result usually followed this model of agricultural deficit in relation to population.

Conflicts and wars

- The Thirty years war within the Holy Roman Empire, (1618–1648)
- The Fronde in France, which led to the exile of the regent King Louis XIV (1648–1653)
- The Wars Of The Three Kingdoms, including the English Civil War, with multiple revolts against King Charles I of England and Scotland and a period of republicanism (1640–1660)
- Revolts against Spanish rule, including the renewal of hostilities in the Eighty Years War, the Portuguese Restoration War, the Reaoers War, and the Nepolitan War.
- The *Kipper and Wipper*, an economic crisis in the Holy ROMAN Empire (1619–1623
- The collapse of the Ming Dynasty and its Replacement by the Qingb Dynasty (1618–1683)
- The Mughal – Maratha War in India (1680–1707)

BIBLIOGRAPHY

- *Aston, Trevor, ed. (1965), Crisis in Europe 1560–1660: Essays from Past and Present*.
- Hill, Christopher. (1961), *The Century of the Revolution*. W.W. Norton & Company

WEBSITE : https://www.ukessays.com/essays/history/the-general-crisis-in-the-17th-century-history-essay.php#:~:text=Other%20reasons%20that%20were%20attributed,this%20mid%2017th%20century%20crisis.

Printing Revolution

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DEPARTMENT HISTORY HONOURS

PAPER CC8

SEMESTER SEMESTER 4

Introduction

The printing press is one of the most important inventions of all time. Its development would destroy the hegemonic control of information in Europe and change the course of history forever.

The quick, cheap and easy distribution of information would ultimately lead to the Protestant Reformation (more on this later), the Renaissance, the Scientific Enlightenment, and Industrial Revolution. A printing press is any form of technology that applies pressure between an inked surface and a print medium (like paper or cloth). In this sense, it is a means of transferring ink from an inked surface and the medium. It was an enormous improvement on previous methodologies, like transcribing by hand using a 'pen' and ink or brushing and rubbing repeatedly to achieve ink transfer. They have historically been used primarily for texts, but not exclusively, and its invention revolutionized bookmaking and distribution around the world. As the prices of book production fell, less wealthy members of society could suddenly gain access to this exclusive and rare luxury item.When someone mentions the printing press most will instinctively think of Johannes Guttenberg and his revolution 15th Century (1440 AD) technology. Whilst his invention was revolutionary in its own right it wasn't in fact, the first printing press to be developed. Not by a long shot. In fact, the history of the printing press stretches back to the 3rd Century (the technique of woodblock printing but on textiles) with its adaptation for printing text in wide use during the Tang Dynasty of China (6th-10th Century AD).

Introduction

Despite this fact, Guttenberg rightfully deserves his place in history for producing a machine that allowed for the mass-production of books for the first time in history.

Before his invention books were transcribed by hand or 'printed' using wooden blocks. Both were a painstakingly slow and laborious process that effectively meant access to the printed word was limited to those who could afford their high price tags.

Did the Chinese invent the printing press?

More than 600 years before Guttenberg's press, Chinese monks were printing ink on paper using block printing. It was a very simple process and used carved wooden blocks to press ink onto sheets of paper. Forgotten for centuries an example text from the time, The Diamond Sutra (that was created in around 868 AD), was discovered inside a cave near Dunhuang, China in 1907 by explorer Sir Marc Aurel Stein.

Its discovery, in a single step, completely rewrote what we thought we knew about the development of the printing press.This text is now housed at the British Library in London and is described them as "the earliest complete survival of a dated printed book". The same process appears to have been prevalent in Japan and Korea at the same time too. These early printed books were made using either wooden or metal blocks and were primarily focussed on Buddhist and Taoist treaties.The process was heavily improved in the 11th Century when a Chinese peasant, Bi (Pi) Sheng, developed a form of early movable type. Although little else is known about Si (Pi), his ingenious method of producing hundreds of individual characters was a huge stepping-stone on the path to the modern printing press.

The ability for Buddhist and Taoist texts to be printed quickly and in large volumes was very important for the Chinese (and surrounding nations). This, in no small part, helped spread Buddhism around the region.

And we might not know about this man if it wasn't for a contemporary scholar and scientist named Shen Kuo. He documented Sheng's movable type in his work "Dream Pool Essays" and explained that the moveable print was formed from backed clay.

Kuo also tells his readers about the type of ink used (pine resin, wax and paper ash) and he also explains how it was a fairly efficient, and quick, method of copying documents.

Despite this advancement, it would take a few centuries for it to be widely adopted across China. Other forms were developed in the 14th Century by Wang Zhen (A Chinese government official) during the Yuan Dynasty.

Zhen's system greatly improved on Sheng's system using rotary tables to help typesetters sort and process carved wooden blocks for printing very efficiently.

Pic 1. Ancient Chinese Printing Press

JOHANNES GUTENBURG

Despite the progress of printing press development in China, it didn't catch on as quickly as it did in Europe. This is thought to be a consequence of the complexities of Asian writing systems when compared to the more concise, alphabetical script used in Western languages.
It should be noted that relatively primitive forms of the printing press did exist in Europe in the late 14th and early 15th Centuries. These were ostensibly the same as Chinese woodblock printing, known as xylography, and were used in much the same way as those techniques used for The Diamond Sutra.
But one German Goldsmith and Craftsman in Strasbourg was about to change the world. Initially experimenting with existing xylographic methods he hit upon an idea to make the process much more efficient (and profitable).
What makes Gutenberg's press stand out from its predecessors was his integration of mechanization for transferring ink from movable type to paper. He adapted the screw mechanism from wine presses, papermakers' presses and linen presses to develop a system perfectly suited from printing.

Pic 2. Gutenburg in his printing press

Pic 3. Printing Machine

His device enabled the establishment of an early form of assembly-line production of printed text allowing for the mass-production of books at a much cheaper cost than contemporary methods.

As for his intentions behind developing the printing press, no one knows for sure but making money is a likely incentive. His first production books were the now famous Gutenberg Bible. Over 200 are thought to have been printed but only 22 survive to the modern day.

Few records exist from this time about Gutenberg but his invention is first recorded in a lawsuit testimony from a former financial backer, Johan Fust, over repayment. This testimony describes his type, inventory of metals and types of molds and the case would ultimately be lost by Gutenberg and his press was seized by Furst as collateral.

WHAT WAS THE FIRST BOOK PRINTED ON THE PRINTING PRESS?

The first books to ever be printed on Gutenberg's press was his, now famed, Gutenberg Bible. These became incredibly popular and a total of 200 copies were produced in short order.
In fact, they were so popular that many were sold long before they had actually been printed.
The contents of his bible were based on the versions currently circulating around the Rhine area of Germany between the 14th and 15th centuries. His version would become the de facto standard version for bibles thereafter and would form the template for all future biblical texts.

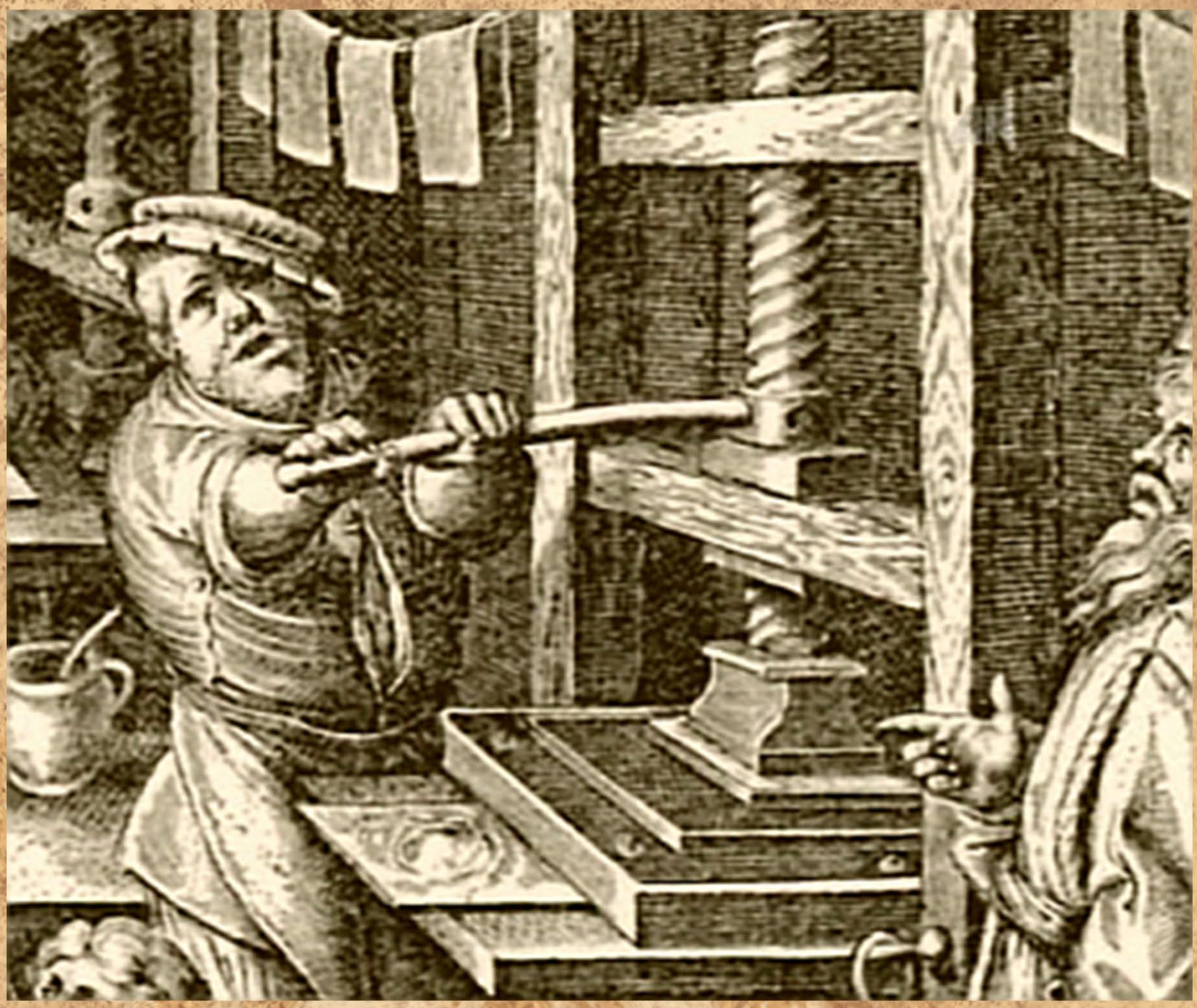
Pic 4. The Gutenberg Bible

WHY WAS THE PRINTING PRESS IMPORTANT TO THE REFORMATION?

As we have seen the printing press had an enormous impact on the distribution of information around Europe after its invention by Gutenberg in 1448. The technology, and printed texts, quickly spread around Europe at this time.

It is no coincidence that was also a time of enormous change in cultural and religious change across the continent. These would ultimately change the course of Europe's history and culminate in the Protestant Reformation.

Never before had intellectual and religious leaders had a means of spreading their teachings beyond a limited congregation at any one time. Martin Luther, the founder of the Protestant movement, would quickly take advantage of this. The printing press "meant more access to information, more dissent, more informed discussion and more widespread criticism of authorities," observes the British Library.



Pic 5. Printing of the Lutheran Bibles

According to Mark U. Edwards (Harvard Divinity School), the printing press provided a means to "shape and channel mass movement [in ideas]". Simply put without the printing press it is unclear whether the Reformation would ever have occurred.

Between 1500 and 1530, Martin Luther produced literally hundreds of pamphlets in German - a total of 20% of all pamphlets produced at the time.

By using the printing press in this manner the Catholic church lost it hegemonic control of written materials and, more importantly, made it near impossible for them to halt the spread of 'heretical ideas'.

This is important for many reasons but ultimately it can be seen as an enormous shift in political thinking that would forge the later technological and societal development of the nations of Europe. It was, to borrow a phrase, "a really big deal".

HOW DID THE PRINTING PRESS CHANGE EUROPE AND THE WORLD?

The printing press would ultimately lead to some major reforms across the continent. The rapid production and easy spread of standardized texts would provide thinkers (religious, scientific or otherwise) a means of mass-producing texts and spreading them with relative ease.

With its creation books could be mass-produced on a scale that hand-written texts simply could not compete with in terms of volume and price.

Printing presses would dramatically reduce the cost of book production and, with easier access to texts, consequently dramatically increase the literacy rates of Europe's citizens.

It also laid the foundations for facilitated research and scientific publishing, which birthed the Renaissance movement. The importance of this cannot be underestimated for the history and development of Europe and the world at large.

The printing press demolished centralized control and censorship of published materials and allowed new ideas to literally 'spread like wildfire' in a manner never seen before.

It also led to new professions and trades being developed from printers becoming artisans to proofreading and, arguably graphic design, to name but a few becoming wholly new occupations. Occupations that still exist to the modern day.

The modern world would be a very different place without Gutenberg and his printing press.

Conclusion

The impact of the printing press is, almost, impossible to really quantify. On the surface it allowed for the much more rapid spread of accurate information but, more elusively, it had an enormous impact on the nations and population in Europe at large.Thanks, in no small part to the press, literacy began to rise as well as the types of information people could be exposed to.Around this time Europe was recovering from the devastating impact of the Black Death. This had decimated the population and had led to the decline in the rise of the church, the rise of the money economy, and subsequent birth of the Renaissance.On the back of this, the printing press was 'in the right place at the right time' to help in the secularisation of Western culture. Of course, many early texts were of a religious nature but more and more were beginning to be more secular in nature.Science was able to flourish at this time with early scientists suddenly being offered an incredible tool to collaborate with each other around the continent. It also ripped absolute control of the contents of religious texts from the hands of the church. No longer would it be possible to centrally control and censor what was written on topics of the Christian, and other, faiths. By the 1600's the Scientific Revolution of the Enlightenment was in full force, which would radically alter how Europeans viewed the world and universe forever. A process of thinking that would ultimately culminate in the Industrial Revolution

Bibliography

Books

Rice,Eugene and Anthony, Grafton, *The foundations of Early Modern Europe 1460-1559.* W &W Norton and Company. 1970.

Phukan,Meenaxi, *Rise of the Modern West:Social and Economic History of early modern Euprope.* Laxmi Publications,2013

Websites

https://courses.lumenlearning.com/suny-hccc-worldhistory/

https://en.wikipedia.org/wiki/Printing_press

https://www.crf-usa.org/bill-of-rights-in-action/bria-24-3-b-gutenberg-and-the-printing-revolution-in-europe

Pictures

Pic 1. https://www.google.comsearch?q=chinese+printing+press&rlz=1C1CHBD_enIN959IN959&sxsrf=

Pic 2. https://www.britannica.com/biography/Johannes-Gutenberg

Pictures

Pic 3. https://www.chiefoutsiders.com/blog/bid/99905/Big-Data-More-Transformational-Than-the-Gutenberg-Printing-Press

Pic 4 https://www.facsimilefinder.com/facsimiles/gutenberg-bible-facsimile

Pic 5 https://thefounding.net/translation-printing-bible-common-languages/

CC 8 : Rise of the Modern West – II

Printing Revolution

C.U. Registration No. – 223-1111-0024-19

C.U. Roll No.- 192223-21-0025

Semester IV

Department of History

Scottish Church College

Index

Introduction

The most significant human invention was language because it enabled people to share ideas and undertake cooperative action to solve the problems of life. The sphere of oral communication however is limited. Writing extended the transmission of knowledge through space and time, but hand-printed books were expensive and their circulation was limited. Few people knew how to read and write, nor was there any point in learning since books were generally not available to the average person. In Medieval Europe, anyone who wanted to spend their life in study and scholarship had to join the Church and thus implicitly submit their mind to the Church's dogma and theology. The printing press made it possible for scholars and innovators to widely disseminate their ideas and get paid for writing them down. More than any other single factor, it was the printing press that promoted the growth of the sciences. The widespread dissemination of individual results allowed the development of a pragmatic criterion for determining truth: repeatability. Anecdotal data were supplanted by the systematic collection, comparison, and explanation of empirical data. It thus became feasible to supplant the deductive Greek method of demonstration by a science based on observation and induction. The invention of the printing press was not an inspired breakthrough so much as the inevitable culmination of historical technology.

Press, Ink, Paper and Type

In the cultural history of mankind there is no event even approaching in importance the invention of printing with movable types. Printing had far-reaching effects in every field of human enterprise and experience. The mechanical printing press made it possible to circulate large quantities of books. The effects of this invention were far-reaching and incalculable.

The founding and growth of the European universities in the twelfth and thirteenth centuries increased the demand for books. At the beginning of the fifteenth century copy shops began to mass produce books and documents by employing small armies of scribes. Materials were cheap and common, but the cost of labor was high. A scribe was a skilled laborer, and the Plague had decimated the European

population as a result at the beginning of 15th century wages in early modern Europe were thirty to forty percent higher than they had been fifty years previous. The demand for books and other materials could not be met due the shortage and incompetence of scribes and copiers. This meant that if someone could perfect a mechanical means of printing it might be possible to make a small fortune.

Printing in early modern Europe was a complicated process. There were three technological prerequisites for the invention of the printing press: a printing press or the Movable type, ink that would stick to cast metal type, and an inexpensive material to print on.

The greatest difficulty in devising a printing press was the manufacture of movable type to precise tolerances. The immediate motivation for the development of movable type was to improve upon the process of *block* ***printing*** that had been used in Europe as early as the twelfth century. A block print was made by engraving an image or text on a piece of wood, smearing it with ink, and then pressing the illustration on a sheet of paper. However block printing was inherently limited. The carving of individual wood blocks was a time-consuming process. Wood was also not the best material for type. It expanded and contracted with changes in humidity. The absorption of ink was uneven, and wood was not as strong or durable as metal. What was needed was a sturdy movable type made of metal. Movable type could be used repeatedly for printing successive pages.

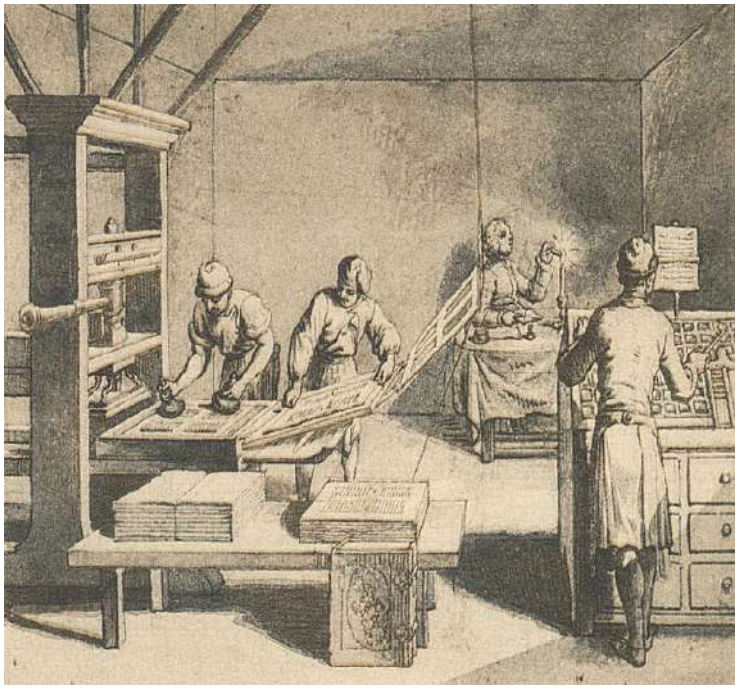


Figure 1 Wooden block Printing

Ink that could stick to metal was derived from oil-based paints. By the end of the thirteenth century, painters had discovered a durable paint could be made by mixing pigments with thickened linseed oil.

The third requirement of was satisfied by the invention of paper. In the Middle East and Europe papyrus and parchment had been used for hundreds of years, but both were expensive and in limited supply. The invention of paper can be traced back to China and Samarkhand from where it spread westwards. Paper slowly replaced parchment in Europe by the middle of fourteenth century.

These processes were developed by **Johann Gutenberg, Johann Fust and Peter Schoffer.** The technology of the printing press spread rapidly throughout Europe. By the end of the fifteenth century, there were 252 printing shops in Europe.

Role of Gutenberg in printing revolution

Some scholars have attributed the invention of printing to Lourens Janszoon Coster who lived in the city of Haarlem in the Netherlands." But the modern consensus is that the person who deserves credit for the invention of the printing press is the German gold- smith, Johannes Gutenberg (c. **1400/1406** —1568). Gutenberg was the first person to perfect the metallurgical techniques that enabled the mass production of movable type cast in molds.

We know little of the details of Gutenberg's life, but what we do know seems to indicate he was a better inventor than businessman. From the record of a lawsuit which took place in the city of Strasbourg in **1439,** it appears that Gutenberg had been involved with three men who had lent him money to develop some secret processes. One of these processes appears to have been printing. It is thus apparent that Gutenberg was conducting experiments and seeking to perfect a printing press in the late 1430s.

There is no record of Gutenberg's activities during the 1440s, but in 1450 Gutenberg found a new financial backer, Johann Fust, in the city of Mainz. Fust loaned Gutenberg a substantial amount of money at an interest rate of five percent.

Two years later Gutenberg borrowed more money from Fust for the purchase of paper and ink. This time Fust required two conditions of Gutenberg. Fust was to be made a partner in Gutenberg's business and Gutenberg was to take on as an assistant one Peter Schoeffer, a man who later became Fust's son-in-law.

In 1455 Fust sued Gutenberg for the entire sum of money he had loaned him. Fust also sought possession of Gutenberg's tools and inventory of materials. The lawsuit was decided in Fust's favor and Gutenberg was disenfranchised from his own business.

Whatever the case, Gutenberg's disenfranchisement was essentially contemporaneous with the perfection of his invention. In 1455 the Gutenberg Bible appeared. It was the first book in Europe mechanically printed with movable type.

The Gutenberg Bible strongly resembled a hand-printed book in its font and presentation. The **Latin** text was set in a Gothic type that was thoroughly medieval, the pages were unnumbered, and the book lacked a title page. For his first major product, Gutenberg needed a book that he knew would be well-received. Thus he chose the most conservative subject and approach possible.

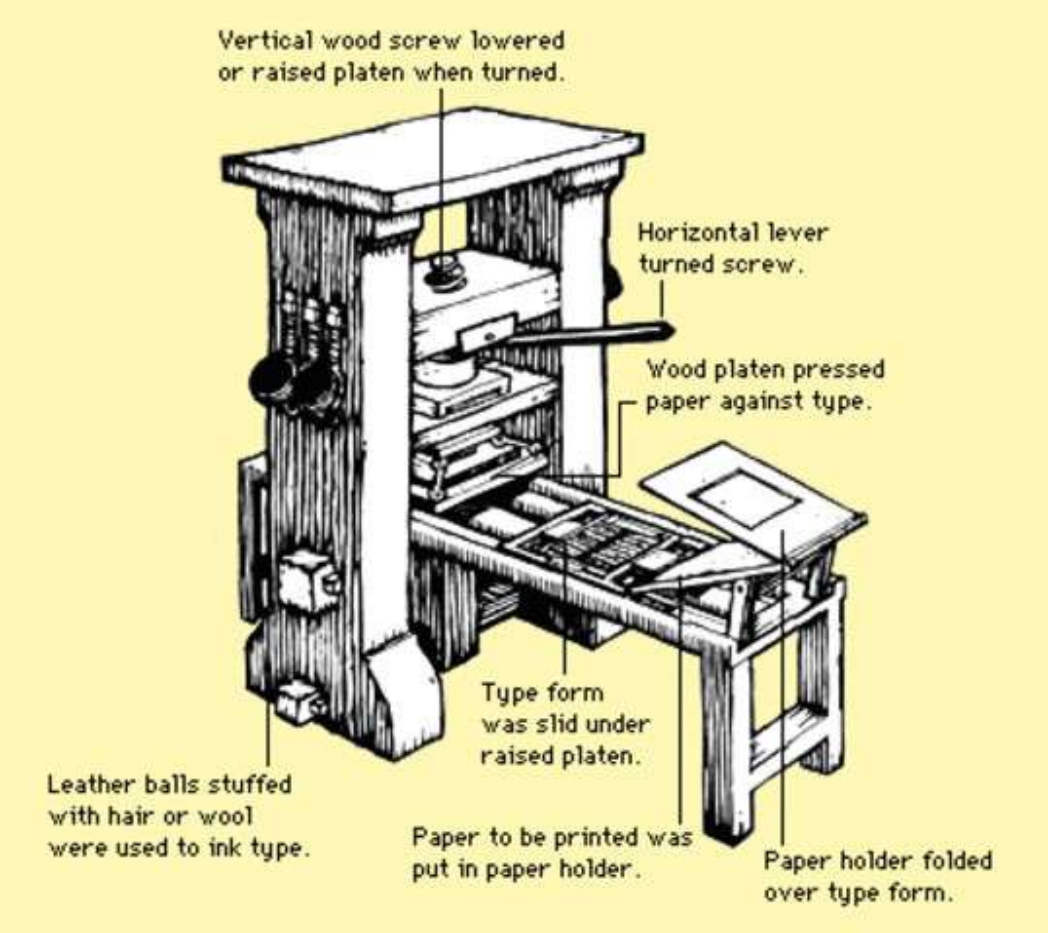


Figure 2 Gutenberg's Printing Machine type and arrangement

Impact of the Printing revolution

The authority and prestige ascribed to ancient texts such as the Bible and the works of Aristotle derived in part from their scarcity. When books became common, authority suffered. Scholars and thinkers benefited tremendously from the printing press.

In Medieval Europe, anyone who wanted to spend their life in study and scholarship had to join the Church and thus implicitly submit their mind to the Church's dogma and theology. The supply of books materially increased. Earlier, a skilled copyist may have produced two books in a year. Now in a single year of the 16th century, some 24,000 copies of a popular book were being printed by one printing press. It may be noted in this context that the copyists and illuminists of the middle ages did suffer unemployment as printing gathered momentum.

The availability of books fostered literacy amongst the population at large who demanded books written in the vernacular, not the Latin of the scholars. Thus the use of Latin began to decline. The fundamental contribution of printing to learning was that it halted this progressive corruption and made possible the restoration of the great classical texts approaching their original integrity. Printing gave all over Europe identical texts to work. Printing also accelerated diffusion of images as the visual arts reached a new and a wider public.

Printing turned intellectual work into a cooperative instead of a solitary human activity. Printing enlarged the amount of intellectual efforts applied to individual problems. This was most effectively seen in case of the development of the Scientific Revolution.

The astonishing speed at which Europe witnessed the spread of Reformation would not have been possible without the printing press. The most remarkable contribution was the availability of the Bible in vernacular that allowed the learned European to re-evaluate his spiritual existence.

The Catholic Church was caught napping by the advent of the printing press. At first, they welcomed the development as an efficient means of duplicating their own materials. But in a very few years they began to

catch onto the fact that books could also be written and published by heretics and critics. Printing also brought about censorship. Both secular and ecclesiastical authorities censored books and prohibition and burning of books were designated to maintain political as well religious orthodoxy.

Conclusion

Paper, type, ink and rollers are the materials that go into the printing press, one of the most revolutionary inventions in the history of the world. From the time of the Gutenberg bible in the fifteenth century to the mass-produced books of the twenty-first century, the printing press has permitted ideas and knowledge to spread, transforming every aspect of everyday life. At the same time, printing has helped to shape alterations in social relations made possible by industrial development and economic transformations. By means of books, pamphlets, and the press, information of all kinds has reached all levels of society in most countries.

Print remains an extraordinarily powerful medium influencing thought, belief and culture and has given little ground to the power of other modern media. In view of the contemporary competition over some of its traditional functions, it has been suggested by some observers that printing is destined to disappear. On the other hand, this point of view has been condemned as unrealistic by those who argue that information in printed form offers particular advantages different from those of other audio or visual media. Printed texts and documents, though they require a longer time to be produced, are permanently available and so permit reflection. Print is directly accessible. Far from being fated to disappear,

printing seems more likely to experience an evolution marked by its increasingly close association with these various other means by which information is placed at the disposal of humankind.

Bibliography

Books

- Deming, David. Science and Technology in World History– Vol. 3 The Black Death, the Renaissance, the Reformation and the Scientific Revolution. North Carolina, 28640, United States of America: McFarland Company. Inc
- Eisenstein, E.L. The printing press as an agent of change: communications and cultural transformations in early modern Europe.*1979,* Cambridge, United Kingdom: Cambridge University Press.

Websites

- Conclusion - The Invention of the Printing Press (weebly.com) (accessed July 1, 2021).
- Printing - The Development and Consequences: Conclusion (historyofprint.blogspot.com) (accessed July 1, 2021).
- The Printing Revolution | Western Civilization (lumenlearning.com) (accessed July 1, 2021).

Pictures

- Figure 1 Source: Chodowiecki Basedow Tafel 21 c Z - Woodblock printing - Wikipedia
- Figure 2 Source: Product Evolution Activity: Innovation of the Printer- Nishita Sojan (timetoast.com)

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PRINTING REVOLUTION

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SEM - IV
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CU Roll No. – 192223-21-0026

CONTENTS

INTRODUCTION

Johannes Gutenberg, the personality credited with the invention of printing press. An invention so impactful that it changed the course of education, religion, politics as well as the day-to-day life of human beings. Before diving into the printing revolution he brought upon the world, let us first get to know him a little bit. Gutenberg was born in the German city of Mainz and grew up to work as a merchant and later shifted to the profession of blacksmiths and goldsmiths. In his early adult life he moved with his family to Strasbourg. He made a lot of failed investments thus found himself in abject debt. To please the people he was indebted to he promised them shares in the printing press he was working on. Legends say that the idea of a printing press occurred to him in overnight but it obvious that's an embellished story.

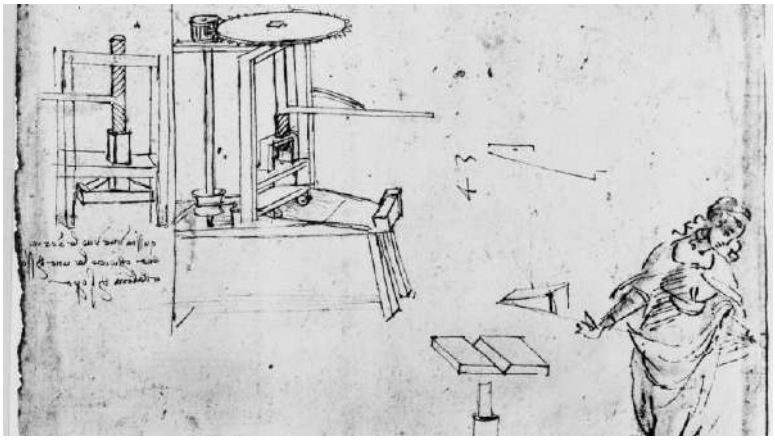
BODY

In the mid-15th century, many European nations witnessed the far-reaching impact of the printing revolution. Three prominent personalities like Johann Guttenberg, Johann Fust and Peter Schoffer were closely associated with the printing technology but according to scholars it was Johann Guttenberg who for the first time set up a printing press in place called Mainz in Germany and that is why in the history of Europe, Johann Guttenberg is popularly known as the inventor of printing press in Europe. Historians like Rice and Grafton have rightly stated that like the development of the steam engine or the telegraph, the invention of a mechanical process for duplicating texts was multiple and cumulative. However, it was successfully completed by Mainz printers in 1450s. At the very beginning, the model of Chinese printing process was followed but the Chinese printing machine could not be imitated in Europe due to the fundamental difference in the Chinese style of writing with that of European. The split letters in Europe stood in the way of following Chinese printing technology.

Despite fundamental problems in following the Chinese model of printing technology it is difficult to ignore the fact that it was China who provided inspiration to European countries for initiating the printing technology. Professor Rice and Grafton, have further shown that what was new in European printing technology was the introduction of moving types. Whereas, in Chinese technology block printing was the basic aspect. However, there were certain essential ingredients for printing i.e., paper, ink, oil and other materials and the new types were all made of metal. It is important to note here that by that time, metal technology was in an advanced stage in Europe. Thus, the paper, ink and machine jointly made the printing revolution successful. In 1455-56, the new printing technology produced printed Bible and this was the first printed book with date. According to the historian of New Cambridge Modern History, the first printed book was not only very beautiful in shape, but also in terms of design. It was well decorated. The most important aspects of the first printed book were that the first letter in the book was well decorated and the margins in the pages of the book also bore the craftsmanship of artisans. As a whole, the printing revolution brought about a change in the art of writing without pen and above all the printing revolution made books available to thousands of people and it made it possible for spreading knowledge. Under the impact of the printing revolution, the demand for books increased and this was indeed a new social phenomenon in Europe. At the very beginning i.e., prior to the printing revolution the books were primarily handwritten and so it was not possible to meet the growing demands of books. Moreover, handwritten books were also very costly. But in due course of time along with the growth and development of industries and trading activities the official documents where now printed and particularly, the financial matters necessited some related commercial knowledge which were also coming in printed forms. The historian of the New Cambridge modern history also reminds the fact that education was spreading rapidly under the impact of the printing revolution.

Professor Rice and Grafton in their book the foundations of early modern Europe (1460 to 1559) have rightly stated that printing turned intellectual work as a whole into a cooperative instead of a solitary human activity. As the steam powered machines of the industrial revolution would multiply the productivity of human physical labor, so printing enlarged the amount of intellectual effort applied to individual problems. They have further stated that scientific research-and all scholarship-became, through this new tool of the intellect a public dialogue, a published exchange of novel results controlled by cooperative critical examination and the repetition of experiments. In this context, the invention of printing can be compared only with the invention of writing on the one hand, and of the computer on the other. As a whole. Printing not only made scholarship fuller and more accurate; it

also made it less difficult to acquire. Because of the greater standardization of print, learning to read was easier. Professor Rice and Grafton have further noted that the printing accelerated the diffusion of images and ideas. The visual arts reached a new and wider public. Before the invention of photography there was iconographic and decorative motifs from one region to another, from one artist to another. Just as the influence of learned men like Erasmus rapidly touched every intellectual circle in Europe through the printed word. The reformation also spread rapidly as printing itself; it could not have done so without it. Professor Rice and Grafton concludes that the role of printing was enormous in terms of spreading enlightenment and popular education. This revolution had its impact on protestant movement as the press provided it with a powerful weapon to fight Catholicism. In fact, printing virtually marked the end of the medieval cultural life and the beginning of modern Europe. It had the largest contribution in the modernization of Europe. Therefore, the printing revolution was one of the main events that helped Europe out of its dark age by furthering the development of human beings.



Sketch of a printing press found in a notebook of Leonardo Da Vinci.

When somebody invents a technology, which becomes such a massive feat we expect the inventor to get filthy rich overnight. But that was not the case for Guttenberg, unfortunately, he died penniless. What do you do after printing a lot texts if there's no one to read them? Firstly, the Bible of 200 pages was published which took about three years but according to an estimate in that region only three people knew how to read Latin so how were they supposed to sell the remaining 197. Same goes with newspapers, there was no one to read them. To solve this demand dearth, captains before leaving with their ships from the dock were sold a number of books which they were allowed to resell to anybody. The 4-page newspapers containing anything from petty quarrels to reports of war were also given to them. Thus, once this chain started the demand for printed media and books were on the rise. An overseas chain or circulation of printed material emerged gradually. Let's take a look into the renaissance and the printing revolution. Renaissance started a century before the invention of printing press yet it had a major impact on it. The Italian Renaissance was all about the restoration of classical texts as well as their translation and interpretation. The classical authors that were mainly targeted were Homer, Aristotle, Plato, Socrates, etc. Many scholars trained themselves in Ancient Greek and Arabic for years so that they could translate those texts to Latin. But printing was extremely costly. The cost a hand printed book was same as the cost of building a house and the construction of a library would cost a wealthy person their entire life savings. The invention of printing press changed that. Now printing a book would cost as much as the one-month salary of a teacher. Thus knowledge stopped being a privilege of the wealthiest elites rather now projects were taken so that many libraries could be established in different cities as well as in the homes of reasonably wealthy merchants.

CONCLUSION

Thus, Johannes Gutenberg born into being a merchant and then goes on to do blacksmithing and goldsmithing and later on to pay of his huge debts invents the printing press that eventually led to a very revolution. It had such a huge impact on the collective society that the course of education, religion, social life as well as the daily lives of people changed. The knowledge of the classical texts were no longer confined just to the royalty and wealthy elites, building libraries did not cost a fortune anymore, an network of demand of books started, the first culture of circulation of news started, revolutionaries who revolted against the Catholic Church could now circulate their views with greater efficiency, the participation of the common people in state politics drastically increased and so much more all due to the invention of the printing press. It is as if the cavemen discovered fire or the modern man invented computer. An invention so significant that it changed the structure and course of human evolution forever.

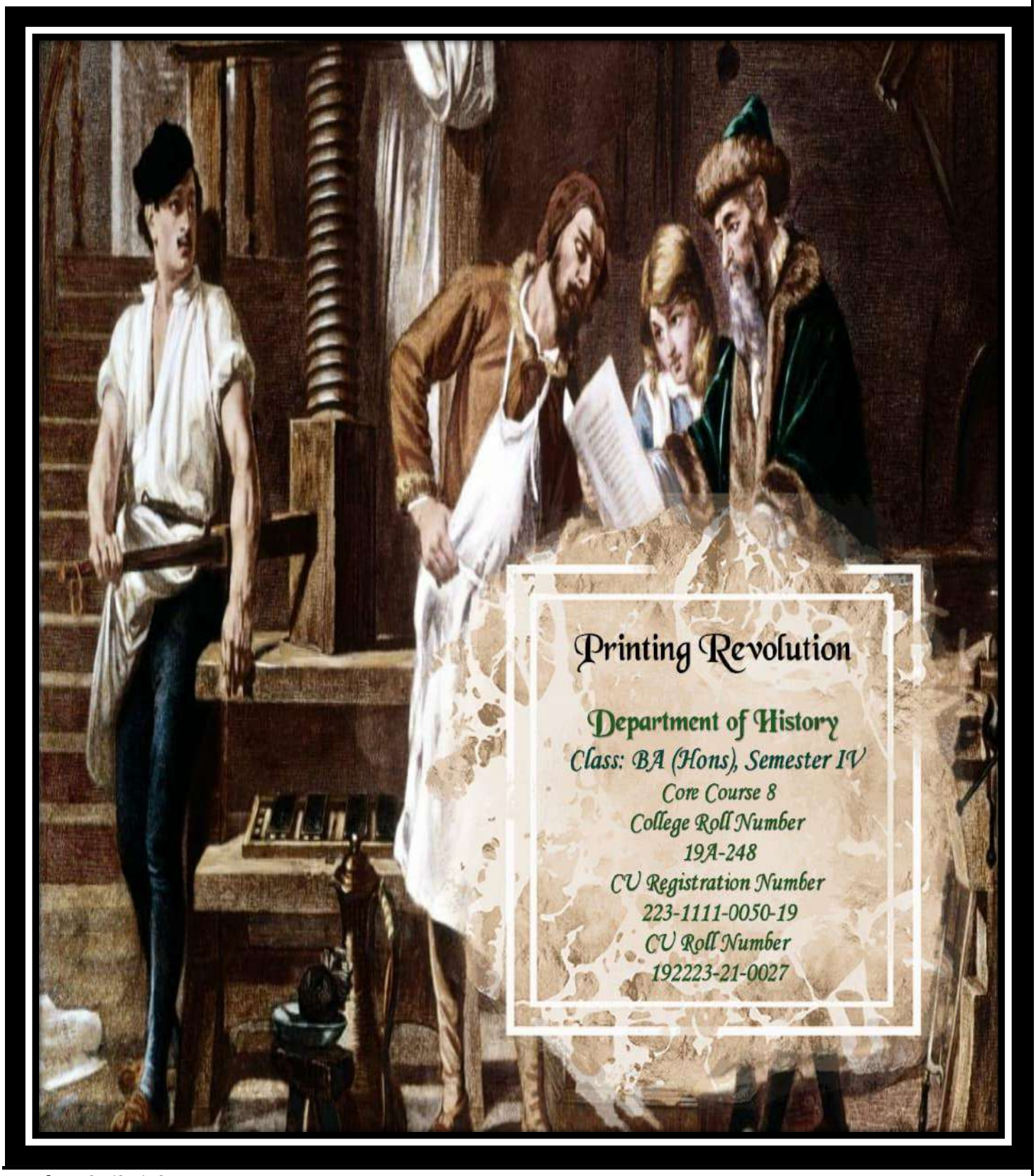
BIBLIOGRAPHY

BOOKS: -

- **Man, John (2002), *The Gutenberg Revolution: The Story of a Genius and an Invention that Changed the World*, London: Headline Review, ISBN 978-0-7472-4504-9**
- **Einstein, Elizabeth L. (1980), *The Printing Press as an Agent of Change,* England: Cambridge University Press, ISBN 0521299551**

WEBSITES: -

- **Dave Roos, *"7 Ways the Printing Press Changed the World"* , History Stories, https://www.history.com/news/printing-press-renaissance#:~:text=ClassicStock%2FGetty%20Images-,In%20the%2015th%20century%2C%20an%20innovation%20enabled%20people%20to%20share,and%20faster%20than%20ever%20before. (Accessed July 25th, 2021)**



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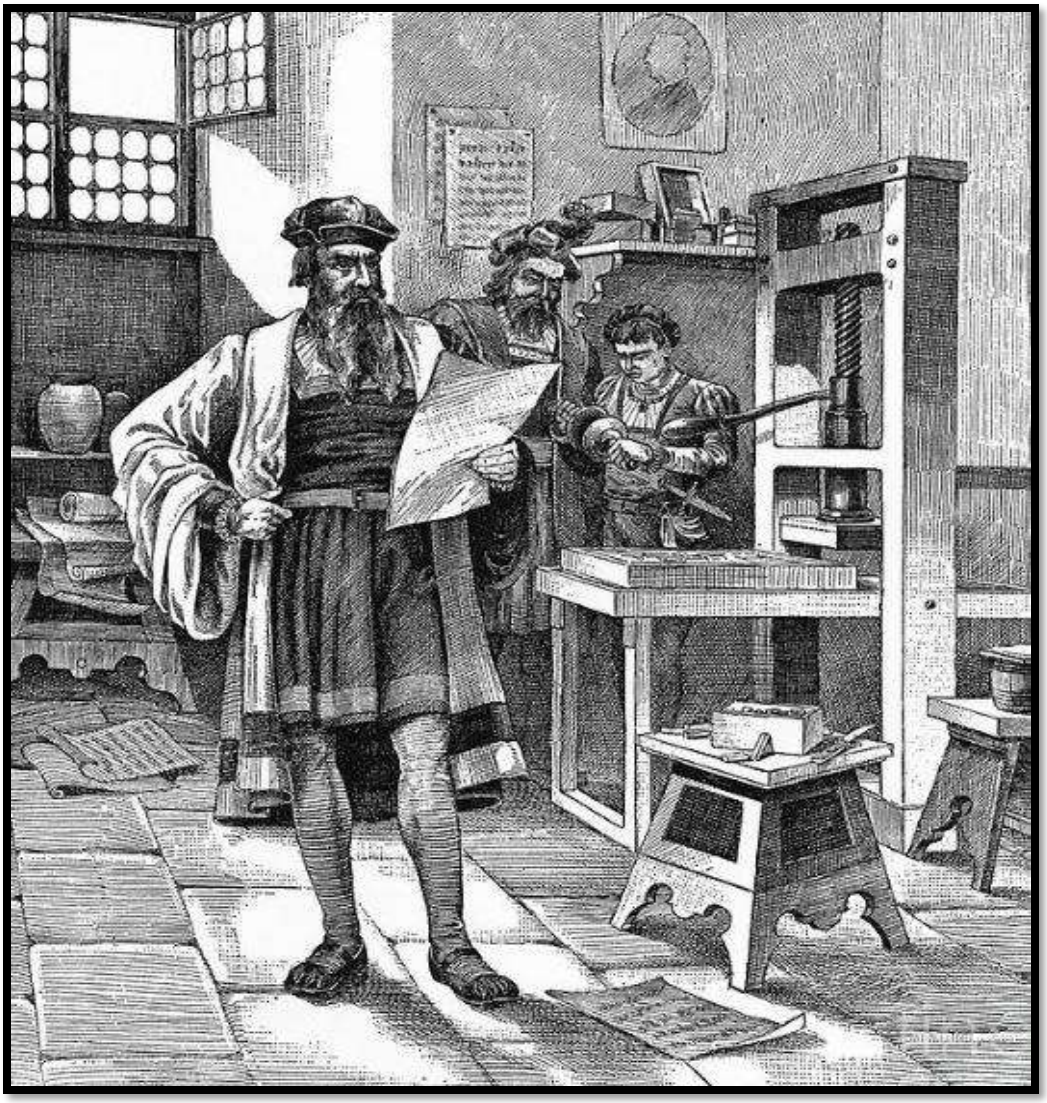

Printing Revolution

- ***Department of History***
- ***Class: B.A.Hons,Semester-IV***
- ***College Roll Number: 19A-248***
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- ***Calcutta University Roll Number:192223-21-0027***

Table of Contents

Introduction

"What gunpowder did for war, the printing press has done for the mind."
— Wendell Phillips

Writing history means to understand the forces which create the history. A historical epoch has began due to printing revolution- an 'armed revolution with three weapons-paper,ink and moveable type'. Not only the fire and the discovery of iron, not only the devlopement of states and wars, but also the spread of information creates culture and civilization.

The printing revolution is, in all aspects, the origin of other revolution which marched the history of culture, the history of religion and the history of policy in Europe. The discovery of printing represents a technical discovery which lead at a revolution of information (which all the consequences of a revolution of information) who changed Europe. The debates about ideas, the access to education, the cultural and scientifical homogeneity in Europe is due to printing. This meditation about printing revolution is also a meditation about the consequences of information. Since the discovery of printing, information has been an essential factor of cultural, scientifical and even political development of Europe.Writing history means to understand the forces which create history. A historical epoch has began due to printing revolution. Not only the fire and discovery of iron, not only the devlopement of states and wars, but also the spread of information creates culture and civilization.

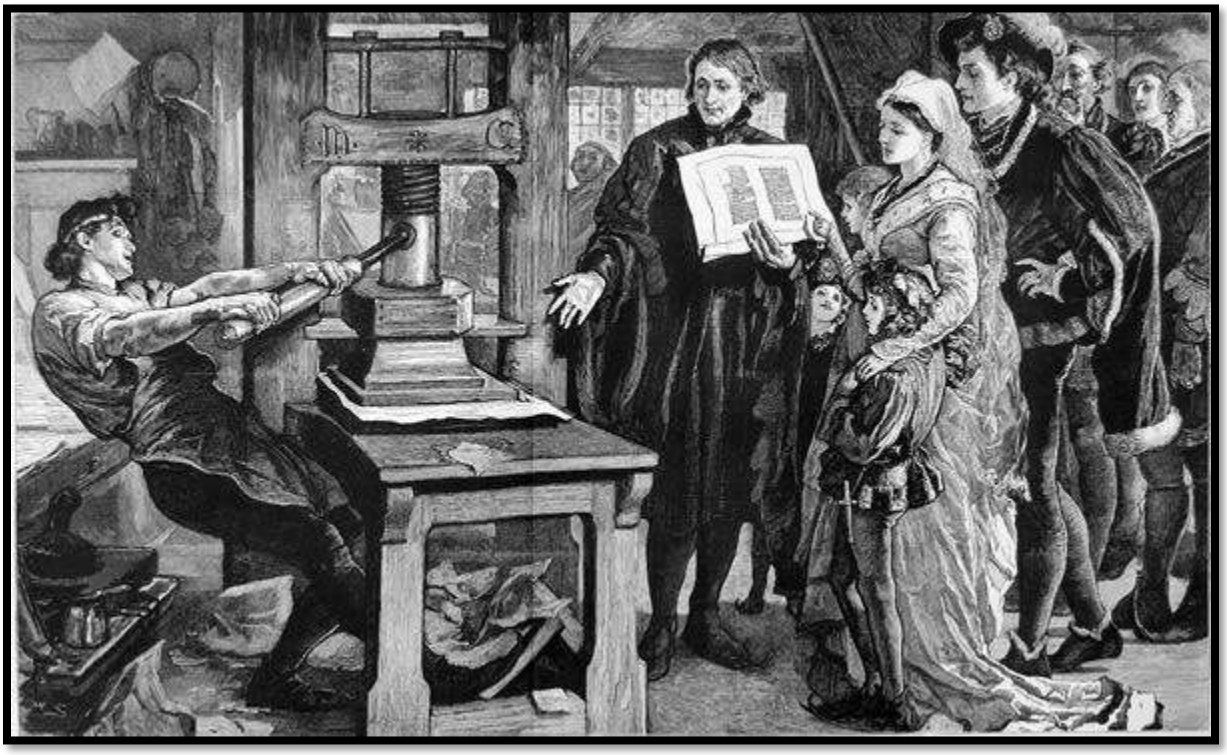

Figure 1: A Sketch of Printing Press of 15th Century Europe
(Source: http://epicworldhistory.blogspot.com/2012/05/europe-and-printing-press.html)

Evolution of Moveable Types & Printing Press :

Moveable type is the system of printing and typography that uses movable components to reproduce the elements of a document (usually individual letters or punctuation). A printing press is a mechanical device for applying pressure to an inked surface resting upon a print medium (such as paper or cloth), thereby transferring the ink. It marked a dramatic improvement on earlier printing methods in which the cloth, paper or other medium was brushed or rubbed repeatedly to achieve the transfer of ink, and accelerated the process. Typically used for texts, the invention and global spread of the printing press was one of the most influential events in the second millennium.

Figure 2: A Xylograph Design

(Source: https://dribbble.com/tags/xylography)

- **Xylography of 8th Century :** Xylography, the art of printing from wood carving, the existence and importance of which in China was never suspected by Marco Polo, appeared in Europe no earlier than the last quarter of the 14th century, spontaneously and presumably as a result of the use of paper. It had been observed that paper was better suited than rough-surfaced parchment for making the impressions from wood reliefs that manuscript copyists used to reproduce the outline of ornamental initial capital letters.

Figure 3: Chinese Xylography of 8th Century

(Source: https://www.yundle.com/terms-definitions/x/xylography)

Figure 4: A Woodcut Design using techniques of Xylography

(Source: http://the-word-blog.com/2010/04/15/xylography/)

- **Chinese moveable type of 11th Century and Wooden Block:** The process was extended to the making of religious pictures. These at first appeared alone and later were accompanied by a brief text. As engravers became more skillful, the text finally became more important than the illustration, and in the first half of the 15th century small, genuine books of several pages, religious works or compendiums of Latin grammar by Aelius Donatus and called *donats*, were published by a method identical to that of the Chinese. Given the Western alphabet, it would seem reasonable that the next step taken might have been to carve blocks of writing that, instead of texts, would simply contain a large number of letters of the alphabet; such blocks could then be cut up into type, usable and reusable.

Figure 5: Chinese Movable Type of 11th Century

(Source: https://www.ancientpages.com/2014/12/30/chinese-invention-worlds-first-known-movable-type-printing/)

Figure 6: Wooden Block

(*Source: https://medium.com/@RossAlTejada/movable-type-the-very-first-printer-and-a-brief-look-at-its-history-4228bde57e9a)***

- **Metallographic Printing:** Metallographic impression is more likely to turn out to be the direct ancestor of typography, although the record is far from clear.
  Several medieval craft guilds, notably the metal founders, the die-cutters, and goldsmiths and silversmiths, were familiar with the technique of using dies. Masters of this technique apparently realized that it could be applied to a process that would enable texts to be set in relief more quickly than by carving wood blocks, probably in three steps: (1) a set of dies, each bearing a letter of the alphabet, was engraved in brass or bronze; (2) using these dies, the text was struck letter by letter to form a mold on the surface of a matrix of clay or of a soft metal such as lead; (3) lead was then poured over the surface to form a small plate that, once hardened, would bear the text in relief.

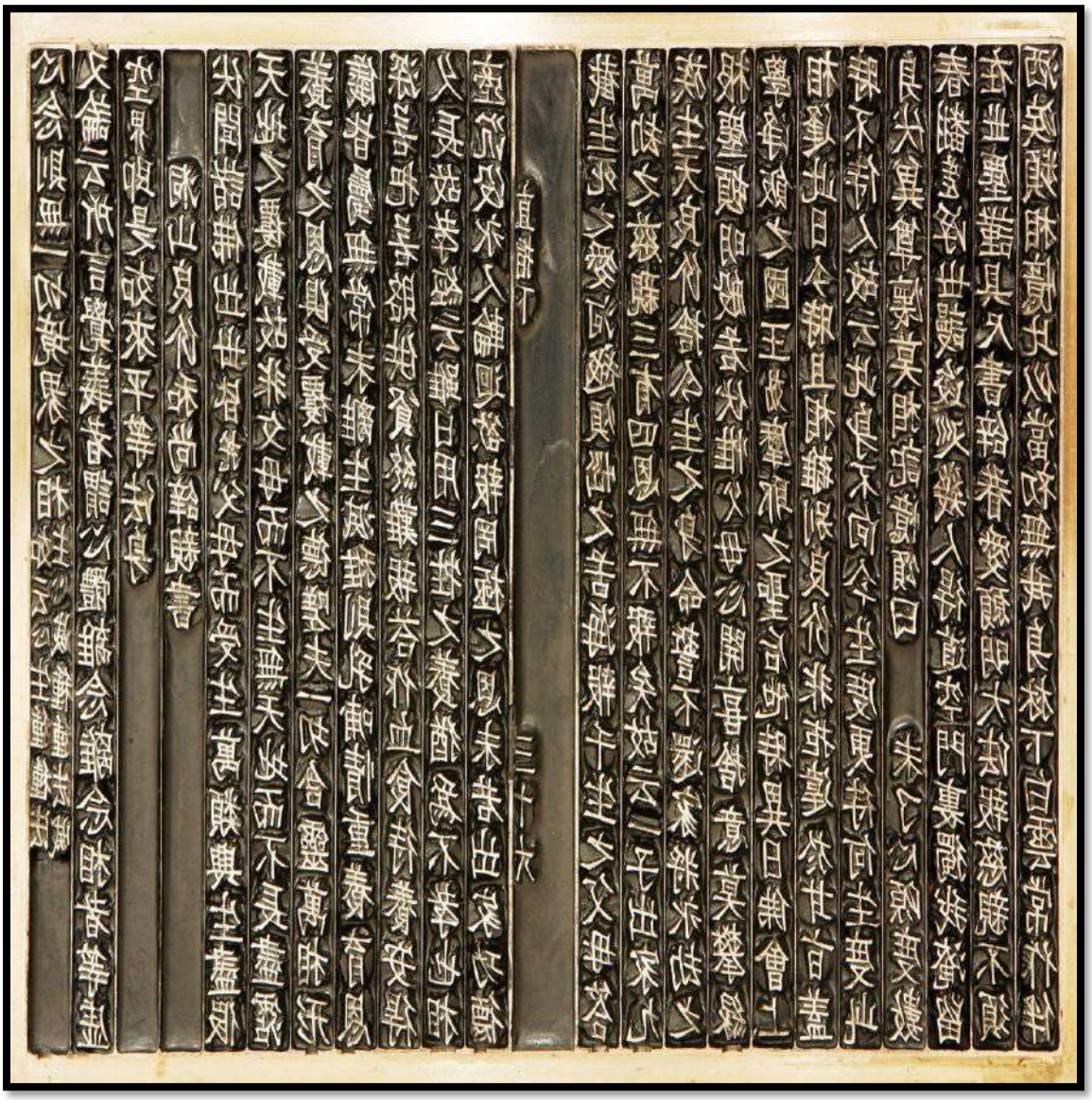

Figure 7: Movable Type used in China

(Source: https://tricycle.org/magazine/buddhist-history-moveable-type/)

The theoretical advantages of this process were that only one engraving per letter, that of the die, was required to make the letter as often as desired, and any two examples of the same letter would be identical, since they came from a single die; sinking the matrix and casting the lead were rapid operations; the lead had better durability than wood; and by casting several plates from the same matrix the number of copies printed could be rapidly increased.

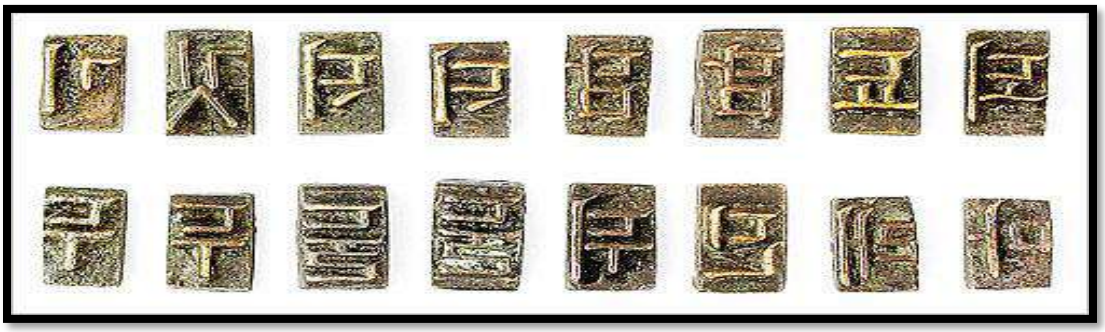

Figure 8: Blocks used in Movable Type

(Source: https://lithub.com/so-gutenberg-didnt-actually-invent-the-printing-press/)

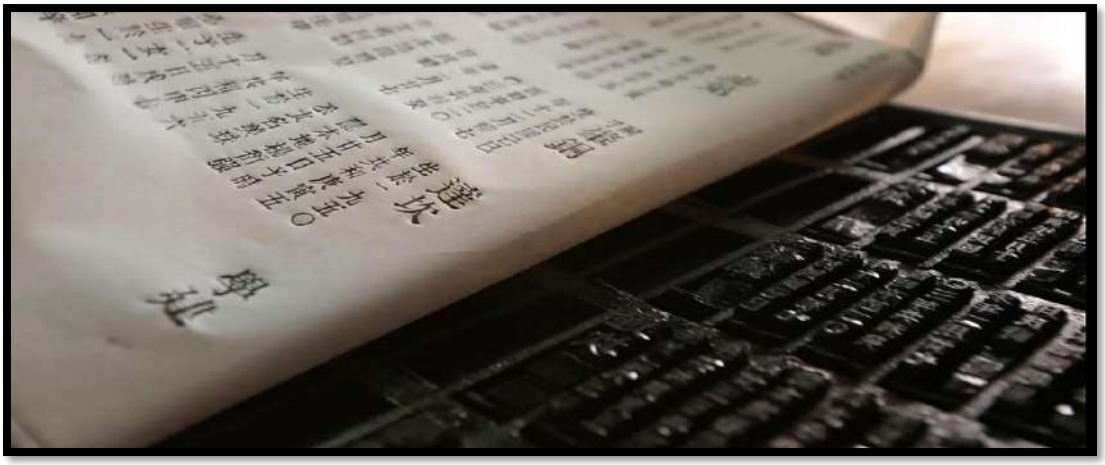

Figure 9: Movable Type

(*Source: https://www.green-coursehub.com/research-blog/-movable-type-from-asian)*

Metallographic printing appears to have been practiced in Holland around 1430 and next in the Rhineland. Gutenberg used it in Strassburg (now Strasbourg, France) between 1434 and 1439.

But the experiments were not followed up because of problems created by the cast plates. It was difficult to strike each letter die with the same force and to keep a regular alignment, and, worse, each strike tended to deform the adjacent letter. It may well be that the major value of metallographic printing was that it associated the idea of the die, the matrix, and cast lead.

- **The invention of typography—Johannes Gutenberg :** The invention of the movable metal type printer in Europe is usually credited to the German printer Johannes Gutenberg. However, there are other claims, notably the Dutch printer Laurens Janszoon Coster (c. 1370-1440 CE) and two other early German printers, Johann Fust (c. 1400-1465 CE) and his son-in-law Peter Schöffer (c. 1425-1502 CE). There is, too, evidence that movable metal type printers had already been invented in Korea in 1234 CE in the Goryeo Kingdom (918-1392 CE). Chinese Buddhist scholars also printed religious works using moveable type presses; the earliest ones used woodblocks during the Song Dynasty (960-1279 CE). Whether the idea of moveable type presses spread via merchants and travellers from Asia to Europe or if the invention by Gutenberg was spontaneous is still a point of debate amongst scholars. In any case, like most technologies in history, the invention likely sprang from a cumulation of elements, ideas, and necessity involving multiple individuals across time and space.

Figure 10: A sketch of the inner-world of a Printing Press
(Source: https://www.historyonthenet.com/printing-press-appeared-middle-east-400-years-europe)

Gutenberg began his printing experiments sometime in the 1440s CE, and he was able to establish his printing firm in Mainz in 1450 CE. Gutenberg's printer used Gothic script letters. Each letter was made on a metal block by engraving it into the base of a copper mould and then filling the mould with molten metal. Individual blocks were arranged in a frame to create a text and then covered in a viscous ink. Next, a sheet of paper, at that time made from old linen and rags, was mechanically pressed onto the metal blocks. Gutenberg's success in putting all these elements together is indicated by his printed edition of the Latin Bible in 1456 CE.

The new type of presses soon appeared elsewhere, notably with two Germans, Arnold Pannartz (d. 1476 CE) and Conrad Sweynheym (aka Schweinheim, d. 1477 CE). This pair established their printing press in 1465 CE in the Benedictine monastery of Subiaco. It was the first such press in Italy. Pannartz and Sweynheym moved their operation to Rome in 1467 CE and then Venice in 1469 CE, which already had a long experience of printing such things as playing cards. There were still some problems such as the lack of quality compared to handmade books and the drab presentation in respect to beautifully colour-illustrated manuscripts. Also, there were sometimes errors seen in the early printed editions and these mistakes were often then repeated in later editions. However, the revolution into how and what people read had well and truly begun.

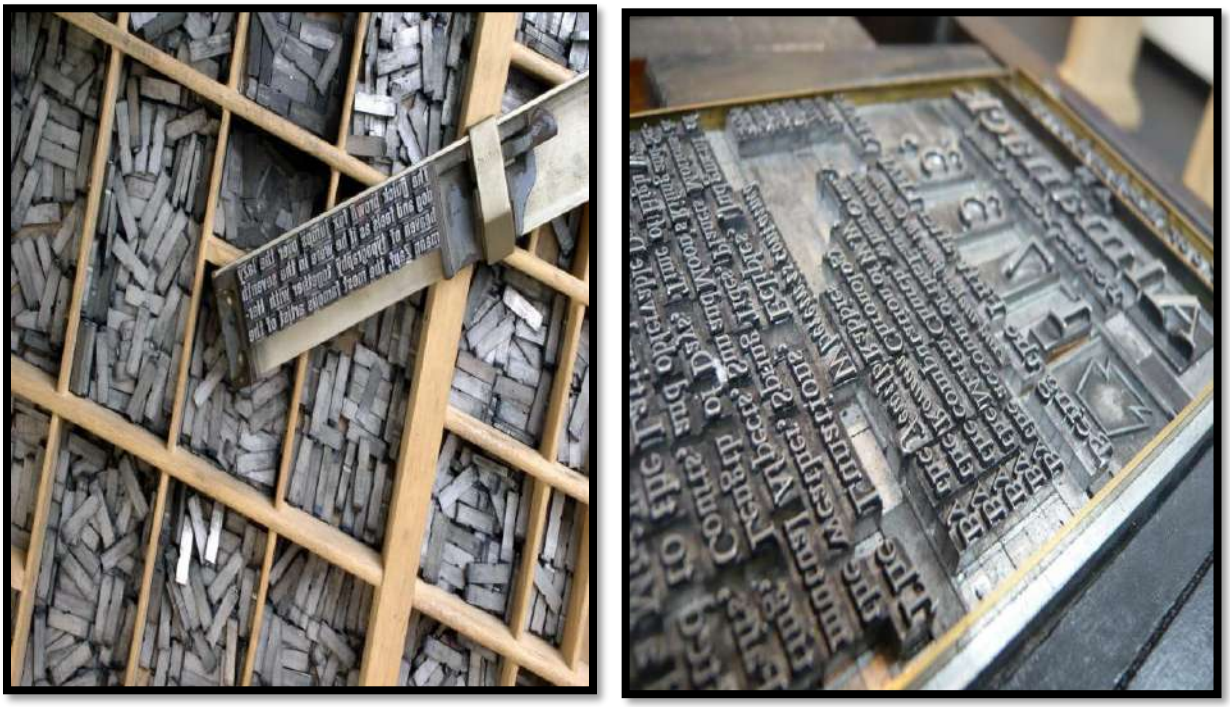

Figure 11 & 12 : Moveable Types used in Europe

(Source: https://www.sciencephoto.com/media/993656/view/printing-workshop-16th-century-1870-)

Evolution of Paper &Ink:

The oldest known archaeological fragments of the immediate precursor to modern paper date to the 2nd century BCE in China. The pulp papermaking process is ascribed to Cai Lun, a 2nd-century CE Han court eunuch. It has been said that knowledge of papermaking was passed to the Islamic world after the Battle of Talas in 751 CE when two Chinese papermakers were captured as prisoners. Although the veracity of this story is uncertain, paper started to be made in Samarkand soon after. Before the industrialisation of paper production the most common fibre source was recycled fibres from used textiles, called rags. The rags were from hemp, linen and cotton. In the 13th century, the knowledge and uses of paper spread from the Middle East to medieval Europe, where the first water-powered paper mills were built.

Figure 13: Papers made from Papyrus

Figure 14: Papyrus

(Source: https://www.metmuseum.org/toah/hd/papy/hd_papy.htm)

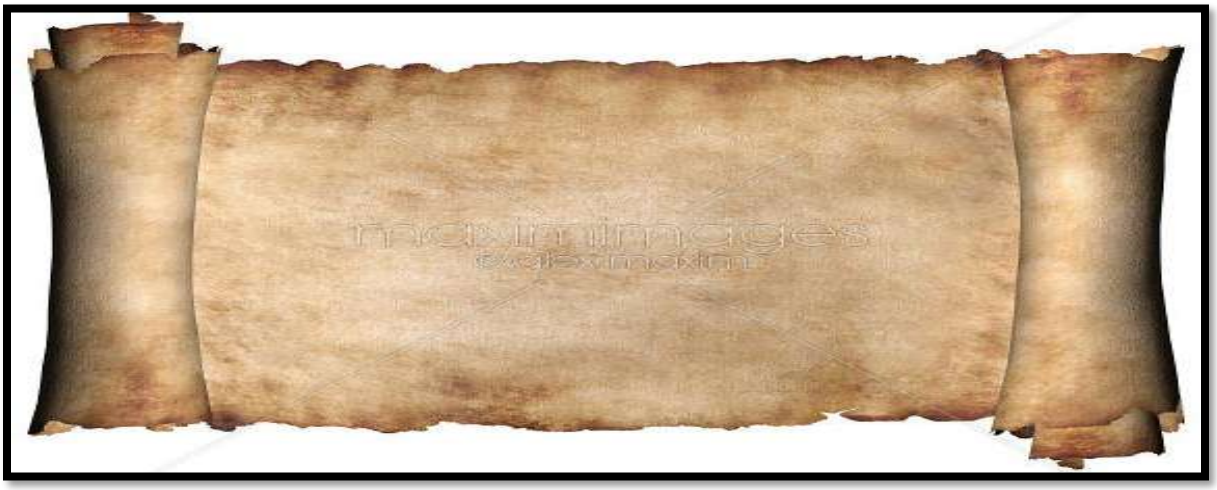

Figure 15: Parchment: dressed skins of animals like sheep

(*Source: https://www.istockphoto.com/photo/old-parchment-paper-texture-gm462206061-32027728)*


Figure 16 & 17: 8th century Chinese paper made from Mulberry bark
(Source: https://www.paperrecycles.org/about/the-history-of-paper)


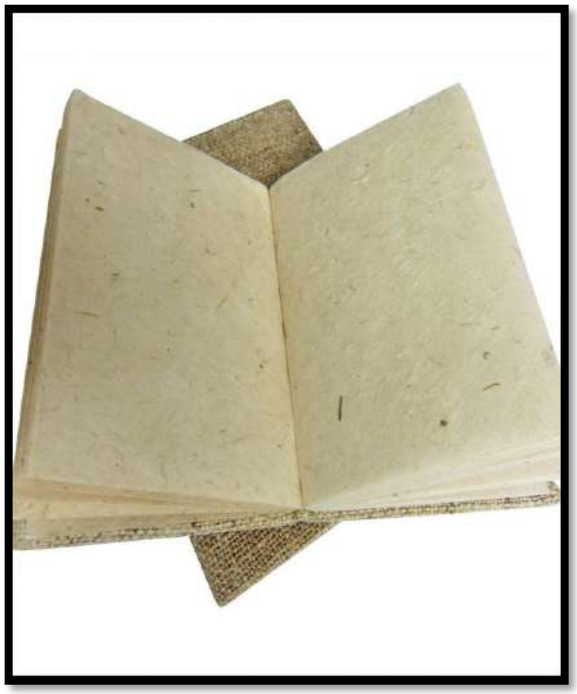

Figure 18 & 19: Hemp Fibre & Paper from Hemp Fibre
(Source: https://www.intelligentliving.co/hemp-toilet-paper-could-save-the-world)

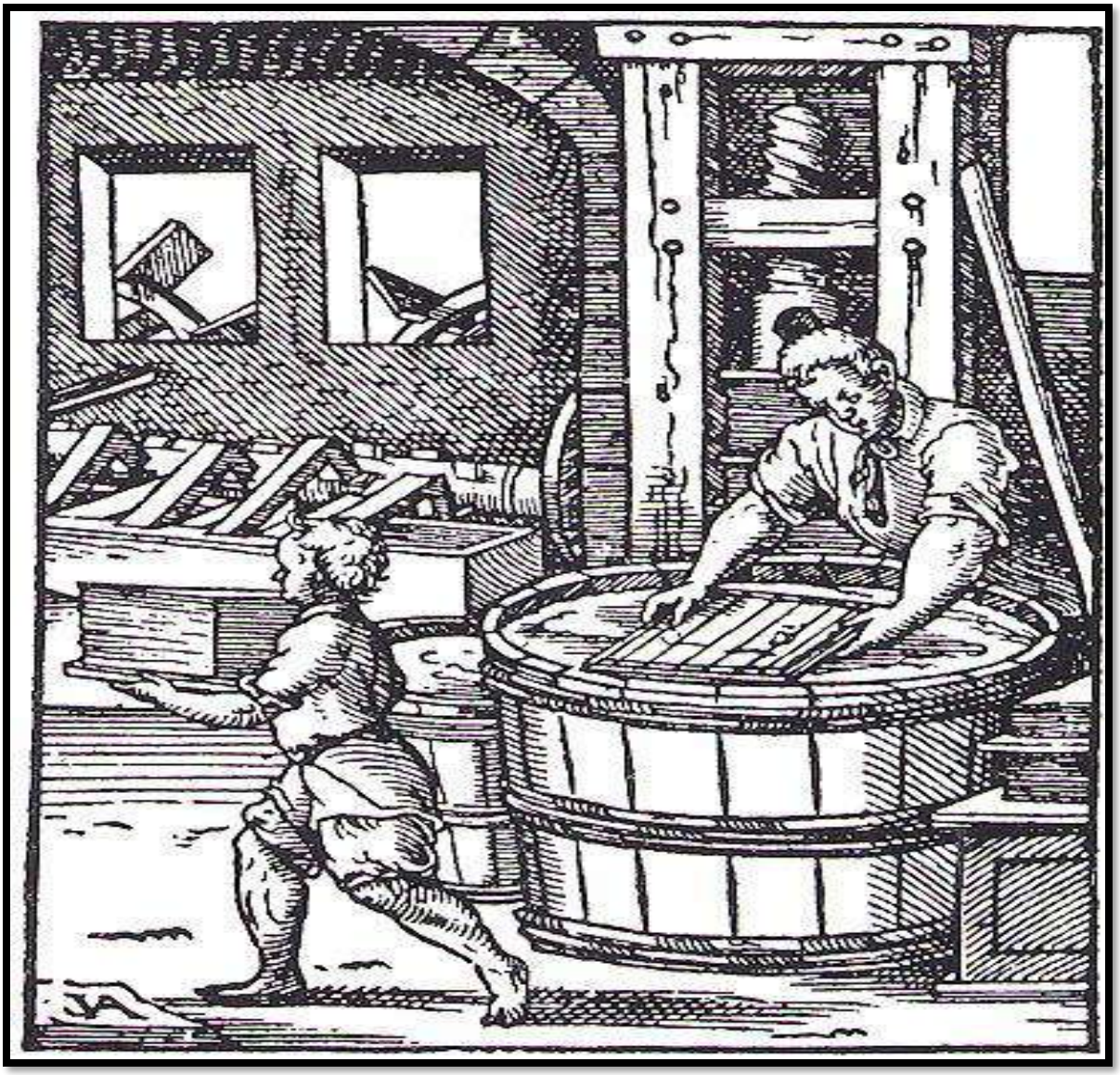

Figure 20: Europe : Cotton, hemp and flax by 13th century was being used
(Source: https://www.history.com/news/printing-press-renaissance)

Scribes in medieval Europe (about AD 800 to 1500) wrote principally on parchment or vellum. One 12th century ink recipe called for hawthorn branches to be cut in the spring and left to dry. Then the bark was pounded from the branches and soaked in water for eight days. The water was boiled until it thickened and turned black. Wine was added during boiling. The ink was poured into special bags and hung in the sun. Once dried, the mixture was mixed with wine and iron salt over a fire to make the final ink. Oil mixed with colour became the new ink . The process for removing printing inks from recycled paper was invented by German jurist Justus Claproth in 1774. Nowadays this method is called deinking. It was not until the introduction of wood pulp in 1843 that paper production was not dependent on recycled materials from ragpickers.

Printed Matter:

There was already a well-established demand for books from the clergy and the many new universities and grammar schools which had sprung up across Europe in the late medieval period. Indeed, traditional book-makers had struggled to keep up with demand in the first half of the 15th century CE, with quality often being compromised. This demand for religious material, in particular, was one of the main driving forces behind the invention of the printing press. Scholars had access to manuscripts in private and monastic libraries, but even they struggled to find copies of many texts, and they often had to travel far and wide to get access to them. Consequently, religious works and textbooks for study would dominate the printing presses throughout the 15th century CE. It is important to remember, though, that handmade books continued to be produced long after the printing press had arrived and, as with many new technologies, there were people still convinced that the flimsy printed book would never really catch on.

Figure 21: The first printed books looked exactly like the manuscripts and were called the Incunabula

(*Source: https://www.lib.cam.ac.uk/collections/departments/rare-books/rare-books-collections/incunabula* ***)***

The availability of things to read for people in general massively increased thanks to printing. Previously, the opportunity to read anything at all was rather limited. Ordinary folks often had little more than church notice boards to read. The printing press offered all sorts of new and exciting possibilities such as informative pamphlets, travel guides, collections of poems, romantic novels, histories of art and architecture, cooking and medicinal recipes, maps, posters, cartoons, and sheet music. Books were still not as cheap as today in terms of price compared to income, but they were only around one-eighth of the price of a handmade book. With printing matter being varied and affordable, people who could not previously do so now had a real motive to read and so literacy rates increased. Further, printed books were themselves a catalyst for literacy as works were produced that could be used to teach people how to read and write. At the end of the medieval period still only 1 in 10 people at most were able to read extended texts. With the arrival of the printing press, this figure would never be as low again.

Figure 22: Illuminated Bible

(Source: https://rosenbach.org/collection/maps-codex-manuscripts-incunabula-book-arts/)

The Spread of Information:

Soon, a new boost to the quantity of printed material came with the rise of the humanist movement and its interest in reviving literature from ancient Greece and Rome. Two printers, in particular, profited from this new demand: the Frenchman Nicholas Jensen (1420-1480 CE) and the Italian Aldus Manutius (c. 1452-1515 CE). Jensen innovated with new typefaces in his printing shop in Venice, including the easy-to-read roman type (*littera antiqua*/*lettera antica*) and a Greek font which imitated manuscript texts. Jensen printed over 70 books in the 1470s CE, including Pliny's *Natural History* in 1472 CE. Some of these books had illustrations and decorations added by hand to recapture the quality of older, entirely handmade books.

Meanwhile Manutius, also operating in Venice, specialised in smaller pocket editions of classical texts and contemporary humanist authors. By 1515 CE, all major classical writers were available in print, most in multiple editions and many as collections of complete works. In addition, printed classical texts with identical multiple copies in the hands of scholars across Europe could now be easily checked for accuracy against source manuscripts. Handmade books had often perpetuated errors, omissions, and additions made by individual copyists over centuries, but now, gradually, definitive editions of classical works could be realised which were as close as possible to the ancient original. In short, printed works became both the cause and fruit of an international collective scholarship, a phenomenon which would reap rewards in many other areas from astronomy to zoology.

There was, too, a drive to print more books thanks to the Reformists who began to question the Catholic Church's interpretation of the Bible and its stranglehold on how Christians should think and worship. The Bible was one of the priorities to have translated into vernacular languages, for example German (1466 CE), Italian (1471 CE), Dutch (1477 CE), Catalan (1478 CE), and Czech (1488 CE). Reformists and humanists wrote commentaries on primary sources and argued with each other in print, thereby establishing an invisible web of knowledge and scholarship across Europe. Even the letters written between these scholars were published. As religious and academic issues raged, so the debating scholars fuelled the production of yet more printed works in a perpetuating cycle of the printed word. Ordinary folks, too, were roused by arguments presented in printed materials so that groups of like-minded individuals were able to quickly spread their ideas and organise mass movements across multiple cities such as during the German Peasants' War of 1525 CE.

There were, too, plenty of works for non-scholars. As more people began to read, so more collections of poems, novellas, and romances were printed, establishing Europe-wide trends in literature. These secular works were often written in the vernacular and not the Latin scholars then preferred. Finally, many books included a number of woodcut engravings to illustrate the text. Collections of fine prints of famous paintings, sculptures, and frescoes became very popular and helped to spread ideas in art across countries so that a painter like Albrecht Dürer (1471-1528 CE) in Germany could see what Raphael (1483-1520 CE) was up to in Italy.

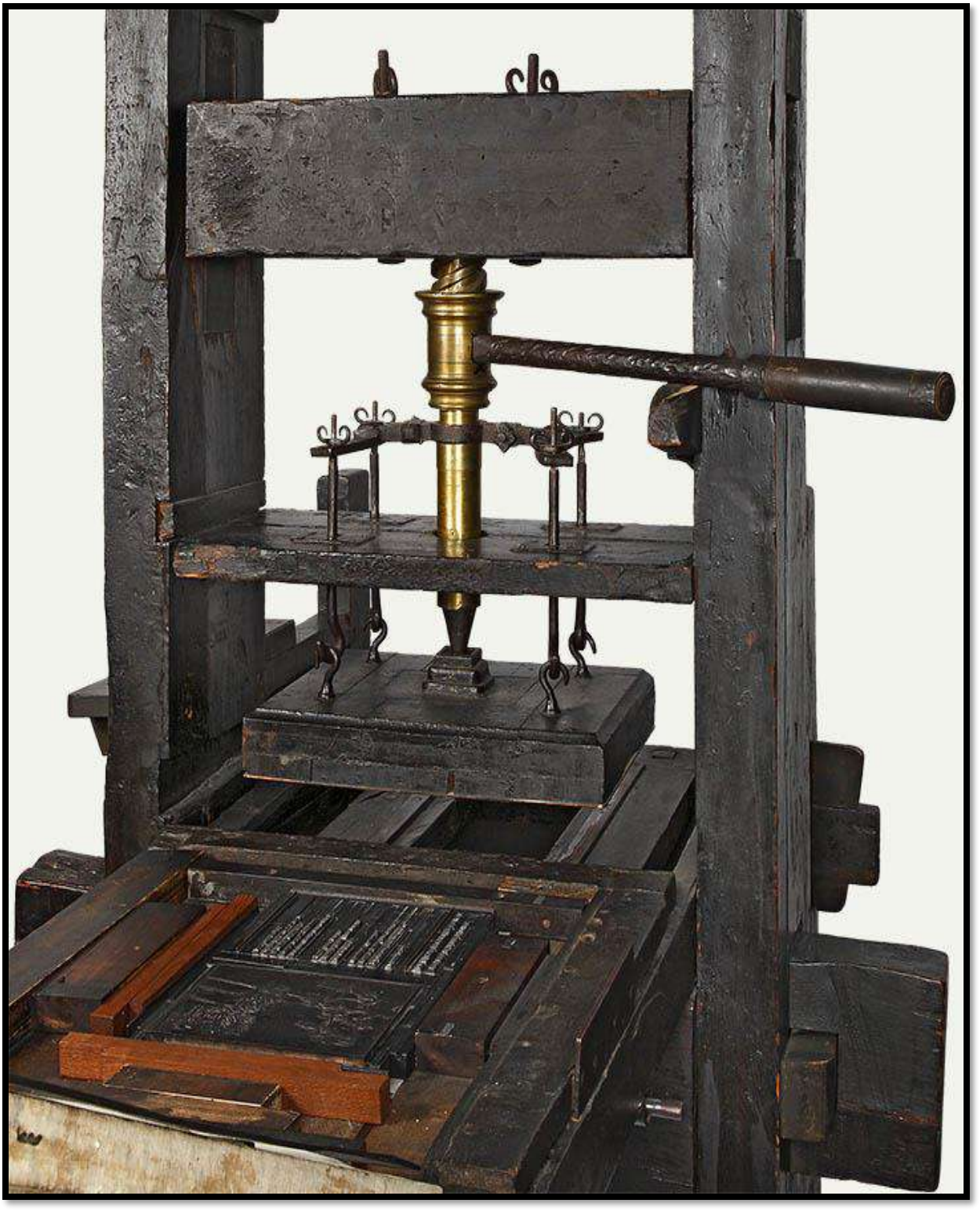

Figure 23 : Gutenberg's Printing Press
(Source: https://www.printrunner.com/blog/printing-press-changed-world/)

Printing Revolution & the birth of a booming industry:

As a consequence of all this demand, those printers who had survived the difficult early years were now booming. Cities across Europe began to boast their own printing firms. Places like Venice, Paris, Rome, Florence, Milan, Basel, Frankfurt, and Valencia all had well-established trade connections (important to import paper and export the final product) and so they became excellent places to produce printed material. Some of these publishers are still around today, notably the Italian company Giunti.

Each year, major cities were producing 2-3,000 books every year. In the first decade of the 1500s CE, it is estimated 2 million books were printed in Europe, up to 20 million by 1550 CE, and around 150 million by 1600 CE. There were over half a million works by the Reformist Martin Luther (1483-1546 CE) printed between 1516 and 1521 CE alone. Into the 16th century CE, even small towns now had their own printing press.

Besides established authors, many publishers helped new authors (men and women) print their works at a loss in the hope that a lucrative reprint run would finally bring in a profit. The typical print run for a first edition was around 1,000 copies although this depended on the quality of the book as editions ranged from rough paper pocket-sizes to large vellum (calfskin) folio editions for the connoisseur.

The smaller size of most printed books compared to handmade volumes meant that habits of reading and storing books changed. Now a desk was no longer required to support large books and one could read anywhere. Similarly, books were no longer kept horizontally in chests but stacked vertically on shelves. There were even odd inventions like the book wheel on which several books could be kept open and easily consulted simultaneously by turning the wheel, especially useful for research scholars. As readers accumulated their books and built up impressive private collections, so many bequeathed these to their city when they died. In this way, within 50 years of the printing press' invention, public libraries were formed across Europe.

Printed works became so common, they helped enormously to establish the reputations, fame and wealth of certain writers. The Dutch scholar Desiderius Erasmus (c. 1469-1536 CE) is perhaps the best example, one of the first authors to make a living solely through writing books. There were, though, some threats to authors and printers. One of the biggest problems was copyright infringement because it was next to impossible to control what went on beyond a particular city. Many books were copied and reprinted without permission, and the quality of these rip-offs was not always very good.

Censorship & 'Wrong' Books:

All of these developments were not welcomed by all people. The Catholic Church was particularly concerned that some printed books might lead people to doubt their local clergy or even turn away from the Church. Some of these works had been first released in manuscript form a century or more earlier but they were now enjoying a new wave of popularity thanks to printed versions. Some new works were more overtly dangerous such as those written by Reformists.

For this reason, in the mid-16th century CE, lists were compiled of forbidden books. The first such list, the 1538 CE Italian Index of Prohibited Books, was issued by the Senate of Milan.

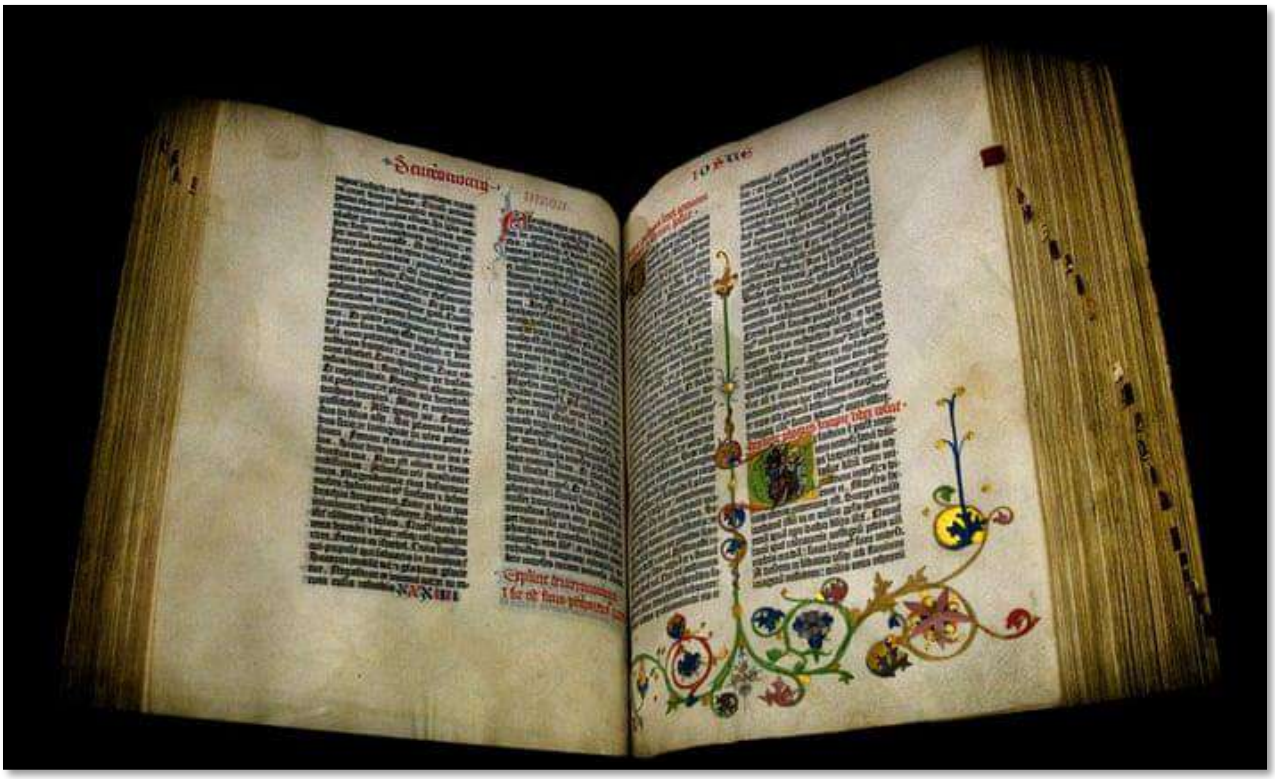

Figure 24: Gutenberg's Bible or Biblica Latina published in 1454-55---180 copies were printed and sold out

(Source: http://historyguide.org/intellect/press.html)

The Papacy and other cities and states across Europe soon followed the practice where certain books could not be printed, read, or owned, and anyone caught doing so was, at least in theory, punished. Further measures included checking texts before they were published and the more careful issuing of licenses to printers.

Institutionalised censorship, then, became a lasting reality of publishing from the mid-16th century CE as rulers and authorities finally began to wake up to the influence of printed matter. Authorities banned certain works or even anything written by a particular author. The *De Revolutionibus Orbium Coelestium* (*On the Revolutions of the Heavenly Spheres*, 1543 CE) by the Polish astronomer Nicolaus Copernicus (1473-1543 CE) was added to the forbidden list for putting the Sun at the centre of the solar system instead of the Earth. The *Decameron* (c. 1353 CE) by the Italian author Giovanni Boccaccio (1313-1375 CE) was added to the list because of its vulgarity. The works of Niccolò Machiavelli were added for his political cynicism.

The worst works singled out for censorship were burned in public displays, the most infamous being the bonfire of the 'vanities' orchestrated by Girolamo Savonarola, a Florentine Dominican

friar, in 1497 CE. On the other hand, some works were eventually allowed to be published (or republished) if they were appropriately edited or had offending parts removed. Most printers did not fight this development but simply printed more of what the authorities approved of. There was certainly, though, an underground market for banned books.

Many intellectuals, too, were equally dismayed at the availability of certain texts to a wide and indiscriminate audience. The *Divine Comedy* (c. 1319 CE) by the Italian poet Dante Alighieri (1265-1321 CE) was thought by some to contain certain moral, philosophical, and scientific ideas too dangerous for non-scholars to contemplate. Similarly, some scholars lamented the challenge the vernacular language was posing to Latin, what they considered the proper form of the written word. The tide had turned already, though, and local vernaculars became more standardised thanks to editors trying to make their material more comprehensible to the greatest number of readers. An improved use of punctuation was another consequence of the printed word.

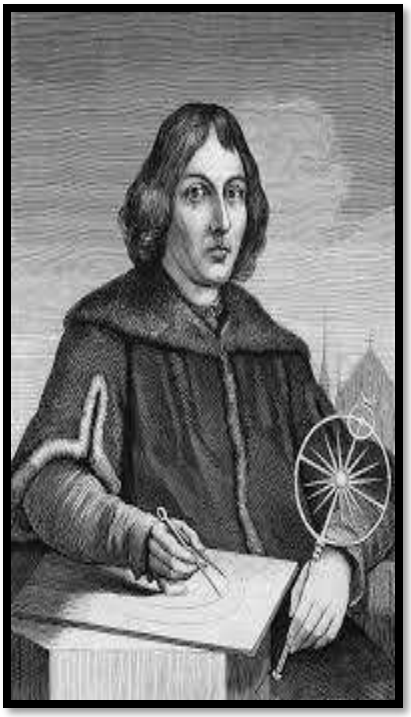

Figure 25: Niccolus Copernicus ***Figure 26: Giovanni Boccaccio*** ***Figure 27: Dante Alighieri***

(Source: https://www.history.com/topics/inventions)

Another delicate area was instruction books. Printers produced trade manuals on anything from architecture to pottery and here again, some people, especially guilds, were not so happy that detailed information on skilled crafts - the original 'trade secrets' - could be revealed to anyone with the money to buy a book. Finally, the printed word sometimes posed a challenge to oral traditions such as the professionals who recited songs, lyrical poetry, and folk tales. On the other hand, many authors and scholars transcribed these traditions into the printed form and so preserved them for future generations up to the present day and beyond.

Impact on European Society & Culture:

The printing revolution opens, probabily, the modern era in Europe. The timing between Renaissance and the printing emergence are opening the discussions about humanism and Renaissance as an Europeean phenomena, the true border in history, between the Middle Ages and the Modern Era, a time in which the history of the continent developed in a quick and triumphal rhythm.

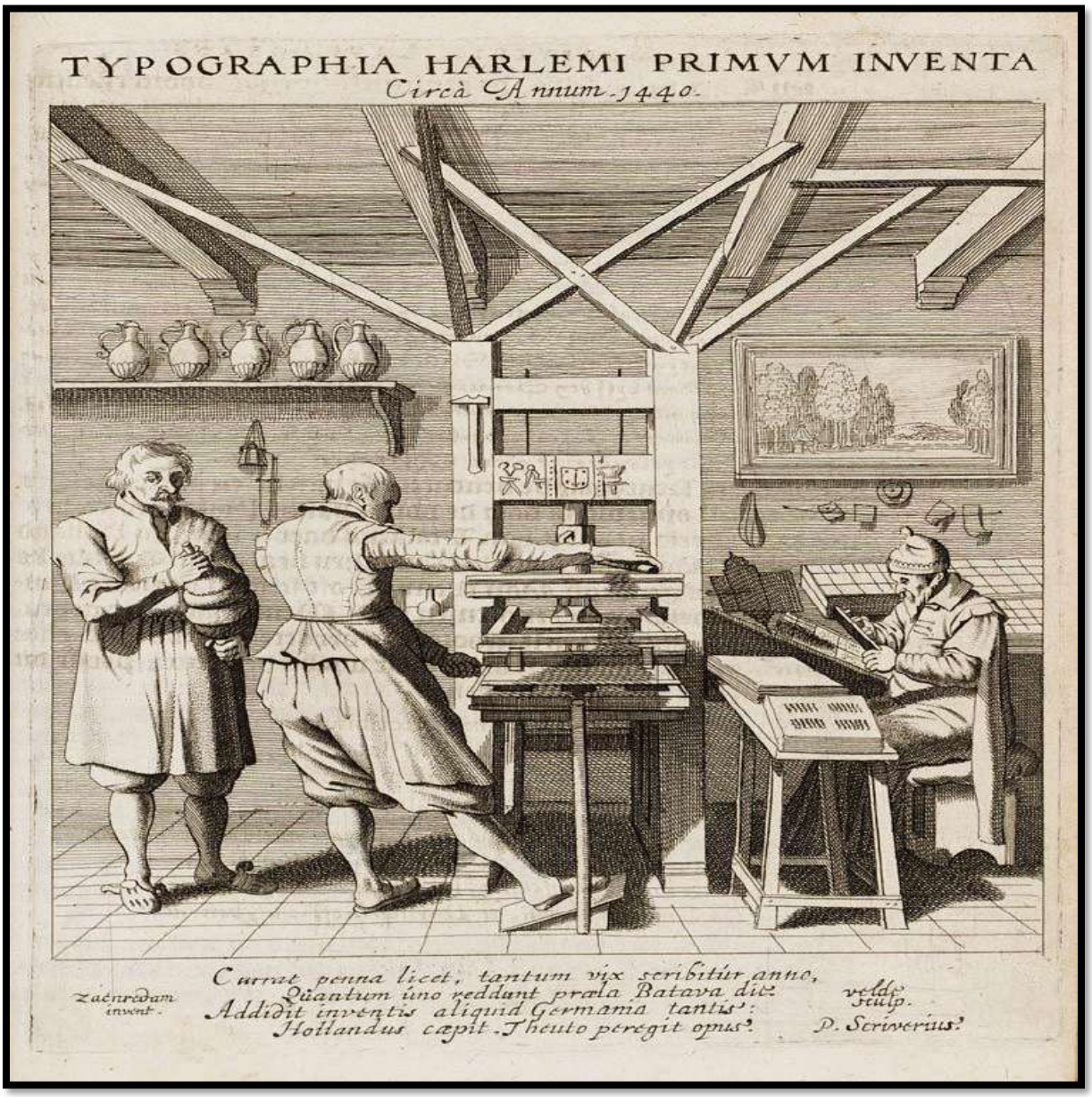

Figure 28: A Sketch of the Printing Press

(Source: https://www.printrunner.com/blog/printing-press-changed-world/)

The supply of books materially increased. Earlier, a skilled copyist may have produced two books in a year. Now in a single year of the 16th century, some 24,000 copies of a popular book were being printed by one printing press. It may be noted in this context that the copyists and illuminists of the middle ages did suffer unemployment as printing gathered momentum.

The most significant impact perhaps was the impact on scholarship. Manuscripts were completely dependent on the skill, learning and care of the scribes. Thus, making it many times inaccurate and unreliable. As successive generations of scribes copies the mistakes of their predecessors and added their own; the accuracy of the texts were further compromised. The fundamental contribution of printing to learning was that it halted this progressive corruption and made possible the restoration of the great classical texts approaching their original integrity. Printing gave all over Europe identical texts to work on.

Printing turned intellectual work into a cooperative instead of a solitary human activity. Printing enlarged the amount of intellectual efforts applied to individual problems. This was most effectively seen in case of the development of the Scientific Revolution. For e.g., as Copernicus's book came to be published, it brought together some of the best minds in Europe into a cooperative, controversial study of the problem and a solution was found much rapidly than it would have been otherwise. Scientific research and all scholarship became through this new tool of intellect, a public dialogue.

Printing also made knowledge much more accessible and less difficult to acquire. Printing diffused knowledge, broadened education, and increased the demand for books. Moreover, because of the greater standardisation of print, learning to read was easier. Along with scholarship, printing also accelerated diffusion of images as the visual arts reached a new and a wider public specially from the 16th century. For e.g., the engraving works of Michelangelo made the paintings of Sistine Chapel the most common property of his most distant contemporaries.

However, it was the spread of Lutheranism that first made clear the revolutionary significance of printing for the communication of ideas. The astonishing speed at which Europe witnessed the spread of Reformation would not have been possible without the printing press. The most remarkable contribution was the availability of the Bible in vernacular that allowed the learned European to re-evaluate his spiritual existence.

Printing also made it possible and profitable to cater to the tastes and whims of the common people. Cheap pamphlets and ephemeral publications including many controversial tracts began to appear in large quantities stimulating a general desire for literacy and at the same time considerable intellectual unrest.

Printing also brought about censorship. Both secular and ecclesiastical authorities censored books and prohibition and burning of books were designated to maintain political as well religious orthodoxy. And on the other hand it gave a new weapon in the hands of those who wished to make their own path. Thus, as it has been said printing made the soil from which sprang modern history, science, popular literature, the emergence of the nation state and so much of everything by which modernity is defined.

Conclusion

Printing revolution ushered in the era of modern Europe by making both ancient and medieval texts available to a broader audience which produced a fertile ground for new ideas and new theories. Marshall McLuhan rightly notes that the shift from predominantly oral culture to print culture also affected the nature of human consciousness in that print represented an abstraction of thought which gave precedence to linearity, sequentiality and homogeneity. This mode of thinking is very much evident not only in rationalist philosophy, realistic fiction, but also in the rise of scientific materialism in the following centuries. Printing also led to the standardization of various European languages as works began to be published in these languages. Eventually this standardization of vernacular languages contributed toward promoting literatures which were used to create national mythologies. Whereas maps were in circulation since ancient times, cartography as a science is the child of print revolution. And cartography was not only important in demarcating national boundaries, but also mapping the territories that were colonized in the new world.

In order to understand the deep changes that were the result of printing revolution, we need to focus our attention at the transition from the scribal to the print culture which brought the book culture from inside the monasteries to outside into the universities. This outwards movement got lay people involved in reading and writing activities. During the Middle Ages, the book production in the manuscript form was confined to monasteries and other ecclesiastical centers which had thus direct control of the resulting book culture. The scribal culture of the Middle Ages depended on the meticulous copying of manuscripts by scribes who spent hours at their task in scriptoria. Such a labor intensive task could not lead to large scale duplication and hence, access to manuscripts was confined to chiefly the clerics who became custodians of the book culture. In the feudal social structure, therefore, the scholarly activities were confined to monasteries and reading was usually the occupation of clerics.

The modes of communication transform modes of production as well as modes of consumption. In the preprint era, when only a small percentage of the population had access to written sources of information or knowledge, both public and private affairs were primarily conducted through oral communication. The primacy of physical presence in communication promoted community formations that were very much dependent on geographical togetherness and within that constraint further determined by communities based on parochial and family bonds. Printing revolution changed all that--for the first time, it was possible for political, economic, and culture producers to reach people who were dispersed geographically. As a result new types of communities were formed that were based on personal or professional interests, or political affiliations.

Bibliography

❖ Books:

1) Phukan,Meenaxi.(2016).Rise of the Modern West: Social and Economic History of Early Modern Europe. New Delhi: Trinity Press
2) Eugene F. Rice Jr. & Anthony Grafton(1994). *The Foundations of Early Modern Europe, 1460-1559:* W. W. Norton & Company
3) Eisenstein, E. L. (1993). *The printing revolution in early modern Europe*. Cambridge: Cambridge University Press.
4) Rees, F. (2006). *Johannes Gutenberg: inventor of the printing press.* Minneapolis, Minn: Compass Point Books.
5) Orenstein, P. (2016). *Printing Revolution: How it helped to give birth of a New Europe*. New York, NY: HarperCollins.
6) Briggs, Asa, Burke, Peter, (2005), Mass-media. O istorie socială. De la Gutenberg la Internet, Iaşi, Ed. Polirom.
7) Burckhardt, Jacob, (1969), Cultura Renaşterii în Italia, Iaşi, Ed. pentru literatură.
8) Coman, Mihai, (2004), Introducere în sistemul mass-media, Iaşi, Ed. Polirom
9) Steinberg, S. H., & Trevitt, J. (1996). *Five hundred years of printing*. London: British Library.
10) McLuhan, M. (1962). *The Gutenberg galaxy: The making of typographic man*.

❖ Articles & Journals:

1) Sorensen, R. (2016). *Printing Revolution in Early-Modern Europe*. London, UK; New York, NY, USA: Anthem Press. Retrieved June 23, 2021, from http://www.jstor.org/stable/j.ctt1dfntn4
2) Cartwright, M. (2020, November 02). The Printing Revolution in Renaissance Europe. *World History Encyclopedia*. Retrieved June 24,2021,from https://www.worldhistory.org/article/1632/the-printing-revolution-in-renaissance-europe/
3) Gwynn, A. (1962).Censorship in the Age of Printing Revolution*: An Irish Quarterly Review*, *51*(203), 349-365. Retrieved January 31, 2021, from http://www.jstor.org/stable/30087760
4) Brady, Jr., T. (1999). New Studies on the Printing Revolution of Europe. *The Journal of Modern History*, *71*(2), 431-444. doi:10.1086/235252
5) Hendrix, S. (1985). The Impact of Printing Revolution on the European Society and Culture-A Study. *The Sixteenth Century Journal*, *16*(1), 3-14. doi:10.2307/2540930
6) Varickayil, R. (1980). Printing Press-How the technology changed the continent of Europe. *Social Scientist*, *8*(11), 14-31. doi:10.2307/3516750

❖ Websites:

1) https://www.hawaii.edu/aln/printing.htm accessed on 24/06/2021 at 4:32 pm
2) https://www.goodreads.com/quotes/tag/printing-press accessed on 24/06/2021 at 3:40 am
3) https://www.printrunner.com/blog/printing-press-changed-world/ accessed on 24/06/2021 at 4:45 am
4) https://www.bbrgraphics.com/news/the-benefits-of-the-printing-press/ accessed on 24/06/2021 at 7:50 am
5) https://courses.lumenlearning.com/suny-hccc-worldhistory/chapter/the-printing-revolution/ accessed at 24/06/2021 at 8:05 pm
6) https://www.history.com/news/printing-press-renaissance accessed on 25/06/2021 at 9:06 pm
7) https://www.worldhistory.org/article/1632/the-printing-revolution-in-renaissance-europe/ accessed on 25/06/2021 at 10:57 pm
8) https://www.crf-usa.org/bill-of-rights-in-action/bria-24-3-b-gutenberg-and-the-printing-revolution-in-europe accessed on 25/06/2021 at 11:42 pm
9) https://www.open.edu/openlearn/history-the-arts/history/history-science-technology-and-medicine/history-technology/printing-revolution accessed on 25/06/2021 at 11:56 pm
10) https://interestingengineering.com/the-invention-and-history-of-the-printing-press accessed on 26/06/2021 at 2:56 am
11) https://www.oxfordreference.com/view/10.1093/acref/9780198606536.001.0001/acref-9780198606536-e-0006?rskey=5nr5Ax&result=4 accessed on 26/06/2021 at 3:12 am
12) https://www.cambridge.org/core/books/printing-revolution-in-early-modern-europe/introduction/91677B8F647DC8EEBFEE1DC3D08570BD accessed on 26/06/2021 at 3:45 am
13) https://owlcation.com/humanities/Johannes-Gutenberg-and-the-Printing-Press-Revolution accessed on 26/06/2021 at 3:57 am
14) https://www.middlebury.edu/cmrs-courses/courses/printing-revolution accessed on 26/06/2021 at 4:05 am
15) https://lithub.com/so-gutenberg-did-actually-invent-the-printing-press/ accessed on 26/06/2021 at 4:36 am
16) http://vidyamandira.ac.in/pdfs/e_learning/gm_history/Printing%20Revolution.pdf accessed on 26/06/2021 at 4:56 am
17) https://sites.bu.edu/cmcs/2017/12/22/revolutions-of-the-printing-press/ accessed on 26/06/2021 at 5:12 am
18) https://www.intergraf.eu/about-print/history-of-print accessed on 26/01/2021 at 5:17 am
19) https://www.pbs.org/wgbh/nova/video/the-printing-press-revolutionized-the-spread-of-information/ accessed on 26/06/2021 at 5:54 am
20) https://www.printingrevolution.eu/ accessed on 26/06/2021 at 8:35 am

❖ Web Resources of Pictures:

1) **Figure 1:** *http://epicworldhistory.blogspot.com/2012/05/europe-and-printing-press.html* cited on 01/07/2021
2) **Figure 2:** *https://dribbble.com/tags/xylography* cited on 01/07/2021
3) **Figure 3:** *https://www.yundle.com/terms-definitions/x/xylography* cited on 01/07/2021
4) **Figure 4:** *http://the-word-blog.com/2010/04/15/xylography/* cited on 01/07/2021
5) **Figure 5:** *https://www.ancientpages.com/2014/12/30/chinese-invention-worlds-first-known-movable-type-printing* cited on 01/07/2021
6) **Figure 6:** *https://medium.com/@RossAlTejada/movable-type-the-very-first-printer-and-a-brief-look-at-its-history-4228bde57e9a* cited on 01/07/2021
7) **Figure 7:** *https://tricycle.org/magazine/buddhist-history-moveable-type/* cited on 01/07/2021
8) **Figure 8:** *https://lithub.com/so-gutenberg-didnt-actually-invent-the-printing-press/* cited on 01/07/2021
9) **Figure 9:** *https://www.green-coursehub.com/research-blog/-movable-type-from-asian* cited on 01/07/2021
10) **Figure 10:** *https://www.historyonthenet.com/printing-press-appeared-middle-east-400-years-europe* cited on 01/07/2021
11) **Figure 11:** *https://www.sciencephoto.com/media/993656/view/printing-workshop-16th-century-1870-* cited on 01/07/2021
12) **Figure 12:** *https://www.sciencephoto.com/media/993656/view/printing-workshop-16th-century-1870-* cited on 02/07/2021
13) **Figure 13:** *https://www.metmuseum.org/toah/hd/papy/hd_papy.htm* cited on 02/07/2021
14) **Figure 14:** *https://www.metmuseum.org/toah/hd/papy/hd_papy.htm* cited on 02/07/2021
15) **Figure 15:** *https://www.istockphoto.com/photo/old-parchment-paper-texture-gm462206061-32027728* cited on 02/07/2021
16) **Figure 16:** *https://www.paperrecycles.org/about/the-history-of-paper* cited on 02/07/2021
17) **Figure 17:** *https://www.paperrecycles.org/about/the-history-of-paper* cited on 02/07/2021
18) **Figure 18:** *https://www.intelligentliving.co/hemp-toilet-paper-could-save-the-world* cited on 02/07/2021
19) **Figure 19:** *https://www.intelligentliving.co/hemp-toilet-paper-could-save-the-world* cited on 02/07/2021
20) **Figure 20:** *https://www.history.com/news/printing-press-renaissance* cited on 02/07/2021
21) **Figure 21:** *https://www.lib.cam.ac.uk/collections/departments/rare-books/rare-books-collections/incunabula* cited on 02/07/2021

22) **Figure 22:** *https://rosenbach.org/collection/maps-codex-manuscripts-incunabula-book-arts/* cited on 02/07/2021
23) **Figure 23:** *https://www.printrunner.com/blog/printing-press-changed-world/* cited on 02/07/2021
24) **Figure 24:** *http://historyguide.org/intellect/press.html* cited on 02/07/2021
25) **Figure 25:** *https://www.history.com/topics/inventions* cited on 02/07/2021
26) **Figure 26:** *https://www.history.com/topics/inventions* cited on 02/07/2021
27) **Figure 27:** *https://www.history.com/topics/inventions* cited on 02/07/2021
28) **Figure 28:** *https://www.printrunner.com/blog/printing-press-changed-world/* cited on 02/07/2021

Printing Revolution

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Introduction

The arrival in Europe of the printing press with moveable metal type in the 1450s CE was an event which had enormous and long-lasting consequences. The German printer Johannes Gutenberg (c. 1398-1468 CE) is widely credited with the innovation and he famously printed an edition of the Bible in 1456 CE. Beginning with religious works and textbooks, soon presses were churning out all manner of texts from Reformation pamphlets to romantic novels. The number of books greatly increased, their cost diminished and so more people read than ever before. Ideas were transmitted across Europe as scholars published their own works, commentaries on ancient texts, and criticism of each other. Authorities like the Catholic Church took exception to some books and censored or even burned them, but the public's attitude to books and reading was by then already changed forever.

The invention of the movable metal type printer in Europe is usually credited to the German printer Johannes Gutenberg. However, there are other claims, notably the Dutch printer Laurens Janszoon Coster (c. 1370-1440 CE) and two other early German printers, Johann Fust (c. 1400-1465 CE) and his son-in-law Peter Schöffer (c. 1425-1502 CE). There is, too, evidence that movable metal type printers had already been invented in Korea in 1234 CE in the Goryeo Kingdom (918-1392 CE). Chinese Buddhist scholars also printed religious works using moveable type presses; the earliest ones used woodblocks during the Song Dynasty (960-1279 CE). Whether the idea of moveable type presses spread via merchants and travellers from Asia to Europe or if the invention by Gutenberg was spontaneous is still a point of debate amongst scholars. In any case, like most technologies in history, the invention likely sprang from a cumulation of elements, ideas, and necessity involving multiple individuals across time and space. Gutenberg began his printing experiments sometime in the 1440s CE, and he was able to establish his printing firm in Mainz in 1450 CE. Gutenberg's printer used Gothic script letters. Each letter was made on a metal block by engraving it into the base of a copper mould and then filling the mould with molten metal. Individual blocks were arranged in a frame to create a text and then covered in a viscous ink. Next, a sheet of paper, at that time made from old linen and rags, was mechanically pressed onto the metal blocks. Gutenberg's success in putting all these elements together is indicated by his printed edition of the Latin Bible in 1456 CE.

The new type of presses soon appeared elsewhere, notably with two Germans, Arnold Pannartz (d. 1476 CE) and Conrad Sweynheym (aka Schweinheim, d. 1477 CE). This pair established their printing press in 1465 CE in the Benedictine monastery of Subiaco. It was the first such press in Italy. Pannartz and Sweynheym moved their operation to Romein 1467 CE and then Venice in 1469 CE, which already had a long experience of printing such things as playing cards. There were still some problems such as the lack of quality compared to handmade books and the drab presentation in respect to beautifully colour-illustrated manuscripts. Also, there were sometimes errors seen in the early printed editions and these mistakes were often then repeated in later editions. However, the revolution into how and what people read had well and truly begun.

Printed Matter

There was already a well-established demand for books from the clergy and the many new universities and grammar schools which had sprung up across Europe in the late medieval period. Indeed, traditional book-makers had struggled to keep up with demand in the first half of the 15th century CE, with quality often being compromised. This demand for religious material, in particular, was one of the main driving forces behind the invention of the printing press. Scholars had access to manuscripts in private and monastic libraries, but even they struggled to find copies of many texts, and they often had to travel far and wide to get access to them. Consequently, religious works and textbooks for study would dominate the printing presses throughout the 15th century CE. It is important to remember, though, that handmade books continued to be produced long after the printing press had arrived and, as with many new technologies, there were people still convinced that the flimsy printed book would never really catch on. The availability of things to read for people in general massively increased

thanks to printing. Previously, the opportunity to read anything at all was rather limited. Ordinary folks often had little more than church notice boards to read. The printing press offered all sorts of new and exciting possibilities such as informative pamphlets, travel guides, collections of poems, romantic novels, histories of art and architecture, cooking and medicinal recipes, maps, posters, cartoons, and sheet music. Books were still not as cheap as today in terms of price compared to income, but they were only around one-eighth of the price of a handmade book. With printing matter being varied and affordable, people who could not previously do so now had a real motive to read and so literacy rates increased. Further, printed books were themselves a catalyst for literacy as works were produced that could be used to teach people how to read and write. At the end of the medieval period still only 1 in 10 people at most were able to read extended texts. With the arrival of the printing press, this figure would never be as low again.

The Spread of Information

Soon, a new boost to the quantity of printed material came with the rise of the humanist movement and its interest in reviving literature from ancient Greece and Rome. Two printers, in particular, profited from this new demand: the Frenchman Nicholas Jensen (1420-1480 CE) and the Italian Aldus Manutius (c. 1452-1515 CE). Jensen innovated with new typefaces in his printing shop in Venice, including the easy-to-read roman type (littera antiqua/lettera antica) and a Greek font which imitated manuscript texts. Jensen printed over 70 books in the 1470s CE, including Pliny's Natural History in 1472 CE. Some of these books had illustrations and decorations added by hand to recapture the quality of older, entirely handmade books.

Meanwhile Manutius, also operating in Venice, specialised in smaller pocket editions of classical texts and contemporary humanist authors. By 1515 CE, all major classical writers were available in print, most in multiple editions and many as collections of complete works. In addition, printed classical texts with identical multiple copies in the hands of scholars across Europe could now be easily checked for accuracy against source manuscripts. Handmade books had often perpetuated errors, omissions, and additions made by individual copyists over centuries, but now, gradually, definitive editions of classical works could be realised which were as close as possible to the ancient original. In short, printed works

became both the cause and fruit of an international collective scholarship, a phenomenon which would reap rewards in many other areas from astronomy to zoology.

There was, too, a drive to print more books thanks to the Reformists who began to question the Catholic Church's interpretation of the Bible and its stranglehold on how Christians should think and worship. The Bible was one of the priorities to have translated into vernacular languages, for example German (1466 CE), Italian (1471 CE), Dutch (1477 CE), Catalan (1478 CE), and Czech (1488 CE). Reformists and humanists wrote commentaries on primary sources and argued with each other in print, thereby establishing an invisible web of knowledge and scholarship across Europe. Even the letters written between these scholars were published. As religious and academic issues raged, so the debating scholars fuelled the production of yet more printed works in a perpetuating cycle of the printed word. Ordinary folks, too, were roused by arguments presented in printed materials so that groups of like-minded individuals were able to quickly spread their ideas and organise mass movements across multiple cities such as during the German Peasants' War of 1525 CE. There were, too, plenty of works for non-scholars. As more people began to read, so more collections of poems, novellas, and romances were printed, establishing Europe-wide trends in literature. These secular works were often written in the vernacular and not the Latin scholars then preferred. Finally, many books included a number of woodcut engravings to illustrate the text. Collections of fine prints of famous paintings, sculptures, and frescoes became very popular and helped to spread ideas in art across countries so that a painter like Albrecht Dürer (1471-1528 CE) in Germany could see what Raphael (1483-1520 CE) was up to in Italy.

Censorship & Printing the Wrong Books

All of these developments were not welcomed by all people. The Catholic Church was particularly concerned that some printed books might lead people to doubt their local clergy or even turn away from the Church. Some of these works had been first released in

manuscript form a century or more earlier but they were now enjoying a new wave of popularity thanks to printed versions. Some new works were more overtly dangerous such as those written by Reformists. For this reason, in the mid-16th century CE, lists were compiled of forbidden books. The first such list, the 1538 CE Italian Index of Prohibited Books, was issued by the Senate of Milan. The Papacy and other cities and states across Europe soon followed the practice where certain books could not be printed, read, or owned, and anyone caught doing so was, at least in theory, punished. Further measures included checking texts before they were published and the more careful issuing of licenses to printers.

Institutionalised censorship, then, became a lasting reality of publishing from the mid-16th century CE as rulers and authorities finally began to wake up to the influence of printed matter. Authorities banned certain works or even anything written by a particular author. The De Revolutionibus Orbium Coelestium (On the Revolutions of the Heavenly Spheres, 1543 CE) by the Polish astronomer Nicolaus Copernicus(1473-1543 CE) was added to the forbidden list for putting the Sun at the centre of the solar system instead of the Earth. The Decameron (c. 1353 CE) by the Italian author Giovanni Boccaccio (1313-1375 CE) was added to the list because of its vulgarity. The works of Niccolò Machiavelli were added for his political cynicism.

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Many intellectuals, too, were equally dismayed at the availability of certain texts to a wide and indiscriminate audience. The Divine Comedy (c. 1319 CE) by the Italian poet Dante Alighieri(1265-1321 CE) was thought by some to contain certain moral, philosophical, and scientific ideas too dangerous for non-scholars to contemplate. Similarly, some scholars lamented the challenge the vernacular language was posing to Latin, what they considered the proper form of the written word. The tide had turned already, though, and local vernaculars became more standardised thanks to editors trying to make their material more

comprehensible to the greatest number of readers. An improved use of punctuation was another consequence of the printed word.

Another delicate area was instruction books. Printers produced trade manuals on anything from architecture to pottery and here again, some people, especially guilds, were not so happy that detailed information on skilled crafts - the original 'trade secrets' - could be revealed to anyone with the money to buy a book. Finally, the printed word sometimes posed a challenge to oral traditions such as the professionals who recited songs, lyrical poetry, and folk tales. On the other hand, many authors and scholars transcribed these traditions into the printed form and so preserved them for future generations up to the present day and beyond.

Conclusion

It was not just a development, a new way of producing books; it transformed the lives of people, changing their relationship to information and knowledge, and with institutions and authorities. Printing reduced the cost of books. Access to books created a new culture of reading. Books could be read only by the literate, and the rates of literacy in most European countries were very low till the twentieth century. Printers began publishing popular ballads and folk tales, and such books were profusely illustrated with pictures. These were then sung and recited at gatherings in villages and in taverns. Oral culture thus entered print and printed material was orally transmitted. Print and popular religious literature stimulated many distinctive individual interpretations of faith even among little-educated working people. The Roman Church, troubled by effects of popular readings and questionings of faith, imposed severe controls over publishers and booksellers and began to maintain an Index of Prohibited Books from 1558.

Bibliography

Website link

Article:- "Cartwright Mark published on 02 November 2020"- accessed on 9 July 2021

https://www.worldhistory.org/article/1632/the-printing-revolution-in-renaissance-europe/

PRINTING REVOLUTION

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INTRODUCTION

The arrival in Europe of the printing press with moveable metal type in the 1450s CE was an event which had enormous and long-lasting consequences. The German printer Johannes Gutenberg (c. 1398-1468 CE) is widely credited with the innovation and he famously printed an edition of the Bible in 1456 CE. Beginning with religious works and textbooks, soon presses were churning out all manner of texts from Reformation pamphlets to romantic novels. The number of books greatly increased, their cost diminished and so more people read than ever before. Ideas were transmitted across Europe as scholars published their own works, commentaries on ancient texts, and criticism of each other. Authorities like the Catholic Church took exception to some books and censored or even burned them, but the public's attitude to books and reading was by then already changed forever.

HISTORY

Block printing first came to Christian Europe as a method for printing on cloth, where it was common by 1300. Images printed on cloth for religious purposes could be quite large and elaborate, and when paper became relatively easily available, around 1400, the medium transferred very quickly to small woodcut religious images and playing cards printed on paper. These prints were produced in very large numbers from about 1425 onward.

Around the mid-15th century, block-books, woodcut books with both text and images, usually carved in the same block, emerged as a cheaper alternative to manuscripts and books printed with movable type. There is still some controversy among scholars as to whether their introduction preceded or, the majority view, followed the introduction of movable type, with the range of estimated dates being between about 1440 and 1460.

GUTENBERG'S PRESS

Johannes Gutenberg was a German craftsman and inventor who originated a method of printing from movable type. He engaged in such crafts as gem cutting, and he also taught a number of pupils. He had acquired skill in metalwork, comes from documents of financial transactions.

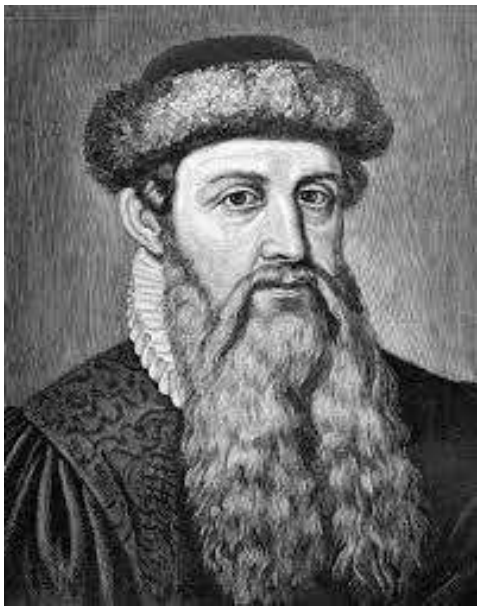

FIG. Johannes Gutenberg

Johannes Gutenberg's work on the printing press began in approximately 1436 when he partnered with Andreas Dritzehn —a man he had previously instructed in gem-cutting—and Andreas Heilmann, owner of a paper mill. However, it was not until a 1439 lawsuit against Gutenberg that an official record exists; witnesses' testimony discussed Gutenberg's types, an inventory of metals (including lead), and his type moulds. Having previously worked as a professional goldsmith, Gutenberg made skilful use of the knowledge of metals he had learned as a craftsman. He was the first to make type from an alloy of lead, tin, and antimony, which was critical for producing durable type that produced high-quality printed books and

proved to be much better suited for printing than all other known materials. To create these lead types, Gutenberg used what is considered one of his most ingenious inventions, a special matrix enabling the quick and precise moulding of new type blocks from a uniform template. His type case is estimated to have contained around 290 separate letter boxes, most of which were required for special characters, ligatures, punctuation marks, etc.

PRINTING REVOLUTION

Printing in early modern Europe was a complicated process involving the moveable type with which the impression was made and paper on which it was made. Inspired by developments in China, the European moveable type was perfected in Mainz in about 1450. The evolution of the practice of casting individual letters in separate little pieces of metal all of the same height and then arranging them in any desired sequence of printing provided the flexibility and dynamism that turned the process of printing into a socio-cultural revolution.

KEY FACTOR

The key factor in the astonishing spread of printing in the late 15th century was the unsatisfied demand for books among the merchants, substantial artisans, lawyers, government officials, doctors and teachers who lived and worked in the towns. These professional classes required to read and write for their work, get education in the Universities and thus provided a ready demand for books in the market. As the urban population in the 15th century grew in education, wealth, power and self-consciousness, their intellectual and cultural needs increased thus catering to the process of printing.

IMPACTS ON EUROPEAN SOCIETY AND CULTURE

- The most significant impact perhaps was the impact on scholarship. Manuscripts were completely dependent on the skill, learning and care of the scribes. As successive generations of scribes copies the mistakes of their

predecessors and added their own; the accuracy of the texts were further compromised. The fundamental contribution of printing to learning was that it halted this progressive corruption and made possible the restoration of the great classical texts approaching their original integrity. Printing gave all over Europe identical texts to work on.

- Printing also made knowledge much more accessible and less difficult to acquire. Printing diffused knowledge, broadened education, and increased the demand for books.
- Printing also made it possible and profitable to cater to the tastes and whims of the common people. Cheap pamphlets and ephemeral publications including many controversial tracts began to appear in large quantities stimulating a general desire for literacy and at the same time considerable intellectual unrest.
- Printing enlarged the amount of intellectual efforts applied to individual problems. This was most effectively seen in case of the development of the Scientific Revolution. For e.g., as Copernicus's book came to be published, it brought together some of the best minds in Europe into a cooperative, controversial study of the problem and a solution was found much rapidly than it would have been otherwise. Scientific research and all scholarship became through this new tool of intellect, a public dialogue.

CHINESE XYLOGRAPHY

Xylography, the art of printing from wood carving, the existence and importance of which in China was never suspected by Marco Polo, appeared in Europe no earlier than the last quarter of the 14th century, spontaneously and presumably as a result of the use of paper. It had been observed that paper was better suited than rough-surfaced parchment for making the impressions from wood reliefs that manuscript copyists used to reproduce the outline of ornamental initial capital letters.

But the results were disappointing with regard to type destined for use for text of the usual size. The letters of the roman alphabet were smaller than Chinese ideograms, and cutting them from wood was a delicate operation. Moreover, type made in this way was fragile, and it wore out at least as quickly as blocks carved with a whole text. Further, since the letters were individually carved, no two copies of the same letter were identical any more than when the text was engraved directly on a wood block. The process, thus, represented no advance in ease of production, durability, or quality.

WOODEN BLOCK PRINTING

FIG. THE WOODEN BLOCK PRINTING

The Chinese developed a form of printing using carved wooden blocks. Two earlier Chinese inventions, paper and ink, paved the way for block printing; so too did the practice of using carved seals, which dates to early Mesopotamian civilizations. As for block printing, it too had appeared outside China, where textile-makers used it for making patterns on cloth; but in China during the seventh century AD, the technique of printing large quantities of text with blocks first came to fruition.

METAL BLOCKS PRINTING

FIG. METAL BLOCK PRINTING

Movable metal type printing became popular in early thirteenth-century Goryeo as evidenced by books printed with woodblock from that period. These books demonstrate the development of Korean society at the time. This is the first record on movable metal type, and it reveals that Goryeo was already printing books with movable metal type in the early thirteenth century.

THE PRINTING PRESS (MOVABLE TYPE)

Printing press, machine by which text and images are transferred to paper or other media by means of ink. Although movable type, as well as paper, first appeared in China, it was in Europe that printing first became mechanized. The earliest mention of a printing press is in a lawsuit in Strasbourg in 1439 revealing construction of a press for Johannes Gutenberg and his associates. With the original printing press, a frame is used to set groups of type blocks. Together, these blocks make words and sentences; however, they are all in reverse. The blocks are all inked and then a sheet of paper is laid on the blocks. All of this passes through a roller to ensure that the ink is transferred to the paper. Finally, the paper is lifted, and the reader can see the inked letters that now appear normally as a result of the reversed blocks.

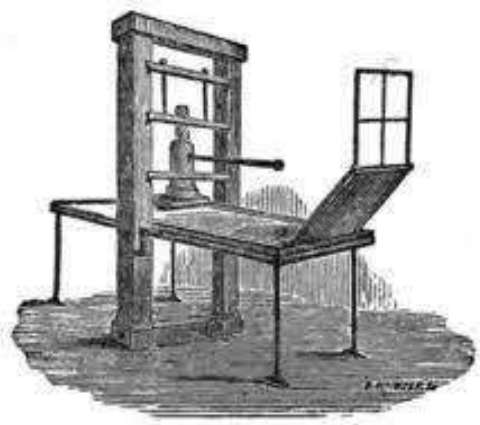

FIG. THE PRINTING PRESS

One of Gutenberg's most radical ideas was to use a press for printing. Presses had been around for a long time, but for other purposes. It is often pointed out that Gutenberg came from a wine-producing area of Germany and that he must

have been very familiar with the wine press. The printing press was essential for making the whole process fast and so, ultimately, commercially viable. Also compared with rubbing it saved a lot of money, for one could use both sides of the paper. It would not have been possible to use a press if Gutenberg had not had a way of making his pieces of type exactly the same height.

PAPER

The paper were made up of papyrus. In the medieval Europe the paper were made up of parchment i.e. skins of animals like sheep were used. During the 18th century Chinese paper were made up of mulbury bark. On the other hand paper were developed from Hemp Fibre.

The paper used in the Gutenberg Bible was imported from Caselle in Piedmont, Northern Italy being one of the most important centres for paper-making in the 15th century.

INK

The ink used by Gutenberg was also a new development. It was not really ink at all, more like a varnish or oil paint. Unlike writing-ink it is oil-based, not based on water. Water-based ink would simply run off the metal types whereas the thick, viscous oil-based varnish sticks to them.

The black colouring of the ink is carbon, perhaps lamp black. Gutenberg's printer's ink is distinctive in having a glittering surface. This is because of its high level of metal content, in particular copper, lead and titanium. It also contains sulphur. The printer's ink was made up in batches, and was of course hand-made.

CONCLUSION

Over all, the printing press is a revolutionizing invention. First, the printing press was invented during a crucial time period. The printing press had a huge effect on spreading ideas, thoughts, news, education, and being informed. By printing books and newspapers, we have learned how to communicate and spread ideas throughout the world. The printing press is one of basis invention for the creations and inspiration of many other newer inventions which also revolutionized the world. Although the printing press was a magnificent invention, some people had different views. People believed maintenance would be too difficult, that writing in Chinese would be impossible due to the intricate Chinese writing system, and that the churches and religious groups wouldn't be able to censor what was being printed. Without the printing press, we don't know how we could have possibly spread our thought and evolve over time mentally, socially, economically, politically, and religiously without the printing press.

REFRENCE

- www.Britannica.com
- Self.gutenberg.org
- www.bl.uk
- www.worldhistory.org
- www.wikipedia.com
- www.youtube.com

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:-CONTENTS:-

TOPIC NAMES PAGES –NOS

:-INTRODUCTION:-

Today's digital media have transformed the lives of people living in the west. Digitized images, text and sound mean that we have new ways of accessing what we want to learn about or enjoy, and the range of things we can know about has expanded. Yet the book we are reading is testament to the long reach of another technology that had a similarly transformative effect in the early modern period: Print. The Printing Press was one of the three inventions- alongside gunpowder and the compass that seemed to revolutionize society. Bacon's claim in relation to the invention, development and significance of printing and its role in development in the ' communications revolution' of the early-modern period and also the intellectual religious and cultural change of Renaissance Reformation and Enlightment. Printing with movable type was perfected in Mainz mainly three names Johann Gutenberg; John Fust and Peter Schoffer; but printing had important earlier beginnings.

FIG -1.1 - THE PRINTING MACHINE

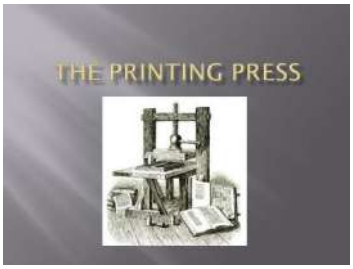

FIG-1.2- THE PRINTING PRESS

:-Preliminary Stage of Printing:-

Movable Type in Clay, Wood, and Metal had been invented centuries before in China (1041-1234), books were printed early as 1377, systematic and extensive exploration of this technology first occurred in 15th Century Europe. It was a technology better suited to the more restricted alphabets of the west than to the hundred characters required for Chinese-Printing. Xylography/Block-printing originated in China in the early eight century. China had little direct importance for the development of typography. Idea of cutting up an old block into constituent letters and then re-arranging this letters to spell out a new–text. Success starting in printed playing cards, (Chinese Inventions) religious prints, and crude block book emphasize the magnitude of the market and the potential profit to get from it.

FIG-1.3- PRE-LIMINARY STAGE OF PRINTING

:-Printing Revolution: The Permanent Renaissance:-

Paper was indispensable for economic rather than the technical reasons. Manuscript books were usually copied on parchment or on vellum and these materials were used by typographic printers aim was magnificence. Paper manufacture was introduced in Spain during 12th century in Spain; Arabs receive the technique from China. Europe the Chief materials was old rags; papermakers shredded the rags in a stamping mill driven by water powder, mixed the macerated flax and hemp fibers with water and dipped their mold a large flat wire sieve with a wooden frame, into the liquid pulp. When the pulp was distributed over the wire-mesh and the water run-out throughout the poles put the sheets on alternate layers of felt squeezed in a press dried and sized them.

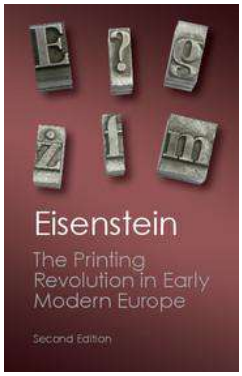

FIG-1.4- PRINTING REVOLUTION THE PERMANENT RENAISSANCE FIG-1.5, 1.6, 1.7- XYLOGRAPHY; CHIENESE XYLOGRAPHY; INCUNABULA

: - Evolution of Modern Printing Technology:-

The great Latin-Bible (forty-two-line bible) by Bibliographers was finished in 1455. The craftsmanship of its type and the art of typesetting and printing are impeccable. Mainz printers established the technology of printing on firm foundations. On august 1457, Fust and Schoffer issued the Psalms; volume was printed on the vellum type printed in red and black in noble and handsome on the Page. First printed books have further and curious characteristics their pages so closely resemble those of manuscript books to be virtually indistinguishable; Monasteries and cathedral papers contracted for Latin-Bibles; the printers clearly produce the technical aesthetic commercial aim exactly the handwritten-manuscripts. Ecclesiastical authorities dominated job printing a common order for forms indulgence. Expansion of Printing Industry was rapid.

FIG-1.8- EVOLUTION OF MODERN PRINTING PRESS

FIG-1.9- GUTENBERG- BIBLE/ BIBLICA-LATINA

: - Contribution of Printing in Education:-

Rapid spread of printing (1460-1500) was evident from the unsatisfied demand for books among merchants, artisans, lawyers, doctors; teachers lived and work in towns. Needs of clergy and nobles begins to recognize the importance of literary education for carrier of service. Printed Books met with a lively resistance for several decades in Italy wealthy and cultivated collectors. The middle-class of the towns men need to read write and cultivate in –order to manage and conduct the civic-affairs were being educated in increasing no of towns ; guilds-schools swelling the art faculties of University there was large and ready market for printing books. Expansion of Printing was that urban population and secular literacy had begun in the High-Middle Ages. Townsmen grew in number, education, wealth, power- intellectual and Cultural needs increased. Stationers provide custom books using large amounts of Capitals, hired scribes and illuminators equipped with texts and materials. Most ambitious of the men worked on a very large scale –indeed. Development of Printing marked a shift from old production relied upon handwritten copies to transforming powers of print (Press, Permitted a fixed and reliable mass of texts, images and symbol).

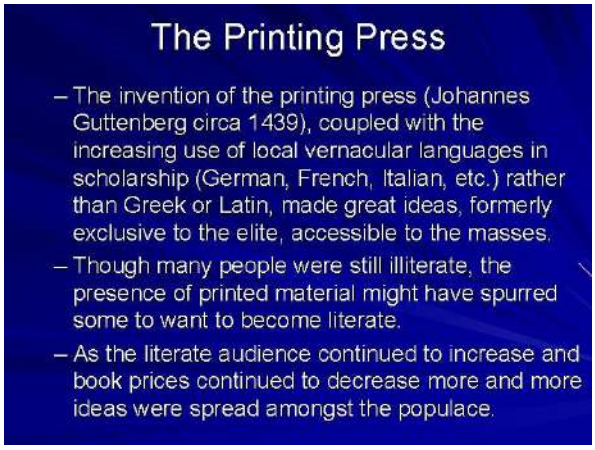

FIG-1.10- DEVELOPMENT ON VARIOUS FIELDS

FIG-1.11- JOHANNES-GUTENBERG

:-Printing Contribution to Disseminate of Renaissance Humanism and Reformation.-

A new 'print-culture' in Europe changed the early modern-world by shaping the process called Renaissance, Reformation. Printing brought new occasional groups and gathering of authors and readers in printing shops, easier to move books to the people transcended geographical borders and travel limitation. This greatly assisted the gathering and dissemination of knowledge in the 'Scientific Renaissance'. Historians of the Reformation have also noticed the importance of print. Cheap-Print, such as ballads and printers used to inculcate piety, visual satires, and print allowed the religious debates to be played out to a wide-audience, reflect and shape its thinking. The link between Print and Protestantism was clear the decision of Sweden's new king Gustavus Vasa to bring about a Lutheran Reformation led to setting up of a Swedish publishing trade for the first-time. Intellectual development in which print arguably played an essential role is the Enlightment. In the mid and later 17th century it played a very significant party in the intellectual ferment of two British Revolutions. Print was arguably a part of a revolution of science, religion, and ideas; it helped create revolution in seventeenth-century England and bring down the ANGIEN REIGME in France; it led to cultural transformations across Europe.

FIG-1.12- LUTHER SPREAD HIS IDEAS WITH THE HELP OF PRINTING-PAMPHELTS

:-Exploration of Geography and Voyage's Role: - Further influence on and its Discoveries:-

The printing press was important to early explorers in that it helped to generate interest in further exploration. Travel books were quite popular once more people learned to read; before this time, many people had little knowledge of the world outside their own villages. For example, these books could contain directions on how to provision one's fleet or which native groups to avoid. The printing press helped promote European exploration in the fifteenth century. The printing press allowed for information to be communicated faster and to reach more people. As a result of the printing press, people learned about the explorations that took place. The printing press allowed for information about the explorations to be communicated faster and to reach more people. This encouraged more explorations to occur. The printing press was not as important as inventions like the caravel (which allowed explorers to have a better chance at sailing in tough conditions) or the compass (which allowed them to know which direction they were going). However, it was important in that it allowed knowledge to spread very easily around Europe.

FIG-1.13- MAP OF THE ATLAS OF EARLY-PRINTING

:-Printing Revolution -Critiques-View on Revolution:-

Reluctant to place so much emphasis on one new technology, scholars perceive a wider early modern communications revolution. Item of Print had impact it was disseminated and relied on improvements in marketing but even more fundamentally in the means of transport. Historians argued that revolution from a hand-written and oral culture to a print-culture has been exaggerated. Workshops of late-medieval scribes had already created large number of books and manuscripts that proliferated across Europe. Indeed whereas for Simplicissimus the character of print shaped the way he wrote, scribal practices and styles could in turn influence print which aped letter forms/ imitated manuscripts formats, nor was scribal-production suddenly replaced by printing. Scribal Practices remained variant, oral culture was not undermined or even replaced by 'Print Culture'. Print and oral culture existed in manually re-in forcing and stimulating ways what was talked about found it was the way of print and what was print to talk about. Print-Revolution argues that it was instrumental in spreading information and knowledge yet can be argued that print spread dis-information. Contemporaries though used print but also distrusted it. This was common in the religious, political, social, economic areas. Far from verifying and establishing truth and reason print could be used to distort and invert them. Finally if there was a print revolution in the sense of greater production and availability of the press hard to establish a correct co-relation between text and action.

:-Assessment:-

It is certain that distribution and accessibility of texts increased Europe wide from the fifteenth century onwards. On the one hands there are many who see press as really instrumental in fostering a religion of the word other hand scholar said that print didn't provoke a radical impact in the past and that impact was often dependent on other technologies and transport. Print merely re-invigorated it in different ways print was not always available didn't fix the reason and truth but promulgated lies, propaganda and polemical irrationalities as one author trail against another. It is helpful to think of the ways in which modern digital technologies co-exist with older-ones, are taken-up at different rates with varying degrees of enthusiasm and foster new ways of thinking and behaving.

:-Conclusion:-

In Europe the Printing-Technology had been largely possible due to mainly two factors: - one was the raw-material for paper became cheaper due to certain developments made printing a viable-proposition another factor was increase of literacy rate for demands of book had increased and this demand play a crucial-role in the invention of printing techniques. The Printing revolution had brought about significant changes in the method of techiquines of education in Europe. Within the invention of Printing numerous copies of book could be produced at very short span of the time, books were made of perfect in nature. Printing Technology and the book publication expanded the horizon of human-knowledge. Printing turned intellectual work into a cooperative instead of a solitary human activity. Printing enlarged the amount of intellectual efforts applied to individual problems. This was most effectively seen in case of the development of the Scientific Revolution. Printing also made it possible and profitable to cater to the tastes and whims of the common people. Cheap pamphlets and ephemeral publications including many controversial tracts began to appear in large quantities stimulating a general desire for literacy and at the same time considerable intellectual unrest printing made the soil from which sprang modern history, science, popular literature, the emergence of the nation state and so much of everything by which modernity is defined; Printing Revolution seems to be a Valid-Terminology.

FIG-1.14- THE PRINTING PRESS OF THAT TIME

: - BIBLIOGRAPHY:-

MATERIALS SOURCES AND LINKS

Rice Eugene F. and Grafton- Anthony the Foundations of Early Modern Europe- (1460-1559) (W.W.Norton & Company- 2004)

Bacon Francis (1620) - The New Organon: Or True Directions Concerning the Interpretation of the Nature London

Phukan Meenaxi- Rise of the Modern West (Social and Economic History of Early Modern Europe) - TRINITY PRESS-(1998).

Mukherjee Rila- Transitions of Europe (900-1800) - Progressive Publishers- Publishing Date-2004

Elizabeth Aijenstine-The Printing Revolution in Early Modern Europe-Cambridge University Press-(2005)

https://www.worldhistory.org/article/1632/the-printing-revolution-in-renaissance-europe/

https://www.arcgis.com/apps/MapJournal/index.html?appid=4dec3fa4d4b34d0586a29ab534a63731#:~:text=In%201863%20William%20bulluck%20invented,developing%20modern%20day%20digital%20printing.

https://www.instantprint.co.uk/printspiration/be-inspired/the-evolution-of-print

https://www.enotes.com/homework-help/how-did-printing-press-improved-compass-helped-285893

IMAGES LINKS

https://i2.wp.com/vrworld.com/wp-content/uploads/2014/08/benjamin-franklins-printing-press-science-source.jpg

https://image1.slideserve.com/3488856/the-printing-press-n.jpg

https://www.google.co.in/imgres?imgurl=https%3A%2F%2Fsocialchangecourse.files.wordpress.com%2F2014%2F09%2Fhdf1969_18agrandesinventions_web1.jpg&imgrefurl=https%3A%2F%2Fsocialchangecourse.wordpress.com%2F2014%2F09%2F12%2Fassignment-1-the-printing-press-2%2F&tbnid=ByF4GjDTbIAiaM&vet=12ahUKEwjk_-_fvu_xAhVQk0sFHT8QBg4QMygCegQIARA7..i&docid=m2QZIhGC4QVzwM&w=566&h=349&q=priliminary%20stage%20of%20printing%20revolution&ved=2ahUKEwjk_-_fvu_xAhVQk0sFHT8QBg4QMygCegQIARA7

https://assets.cambridge.org/97811076/32752/cover/9781107632752.jpg

https://upload.wikimedia.org/wikipedia/commons/thumb/8/8a/Collage_of_printing.png/1200px-Collage_of_printing.png

https://slidetodoc.com/presentation_image_h/da456cd3540671fbf85e05299831ea57/image-18.jpg

https://image.slidesharecdn.com/unit1pp-110830094328-phpapp01/95/renaissance-reformation-powerpoint-47-728.jpg?cb=1314697621

https://miro.medium.com/max/496/1*v8CByO22q15uPhFQzStkWg.jpeg

https://3.bp.blogspot.com/-P1L8APBy1wo/Uq7nd8PQ1aI/AAAAAAAAj-c/ERD_3WZjH1I/s523/mapsmania.gif

https://www.google.co.in/url?sa=i&url=https%3A%2F%2Fmedium.com%2F%40RossAlTejada%2Fmovable-type-the-very-first-printer-and-a-brief-look-at-its-history-4228bde57e9a&psig=AOvVaw3o2I_0OMrwFdcs4u4KVCqQ&ust=1626794351205000&source=images&cd=vfe&ved=0CAsQjRxqFwoTCOjlh5q97_ECFQAAAAAdAAAAABAD

https://www.google.co.in/url?sa=i&url=https%3A%2F%2Ftwitter.com%2Fbornaiz%2Fstatus%2F762586879569104896&psig=AOvVaw31IDOxer11LNrsfSRH8521&ust=1626795870068000&source=images&cd=vfe&ved=0CAsQjRxqFwoTCMiyxoS97_ECFQAAAAAdAAAAABAD
https://www.google.co.in/imgres?imgurl=https%3A%2F%2Fupload.wikimedia.org%2Fwikipedia%2Fcommons%2Fthumb%2Fc%2Fc1%2FInkunabel.ValMax.001.jpg%2F1200px-

Inkunabel.ValMax.001.jpg&imgrefurl=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FIncunable&tbnid=DOSbunPD-TMcrM&vet=12ahUKEwiXt-78ve_xAhVXQn0KHSwkA8YQMygAegUIARDGAQ..i&docid=wQgMK7ecoRdaqM&w=1200&h=1685&q=incunabula&ved=2ahUKEwiXt-78ve_xAhVXQn0KHSwkA8YQMygAegUIARDGAQ

https://cdn.substack.com/image/fetch/f_auto,q_auto:good,fl_progressive:steep/https%3A%2F%2Fbucketeer-e05bbc84-baa3-437e-9518-adb32be77984.s3.amazonaws.com%2Fpublic%2Fimages%2F75cccef8-286a-477d-b873-9321aa8c6d94_465x599.png

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SEMESTER : IV

মুদ্রণ বিপ্লব:

ইউরোপের প্রাক আধুনিক যুগে বিভিন্ন বৈজ্ঞানিক অগ্রগতির অধিকাংশ গণপ্রচার বিদ্যা ও প্রযুক্তিবিজ্ঞান অগ্রগতির আমরা রয়েছি; অনুরূপভাবে এক অত্যন্ত সুবহু পূর্ণ প্রযুক্তিগত কৌশলবিক উদ্ভাবন ঘটেছিল; ৮ম শতক ও ৯ম শতকের ক্রমনীয় আবিষ্কার তা হল মুদ্রণ যন্ত্রের উদ্ভাবন, মুদ্রণ মিলন খুব অলস অগ্রসের সাধ্যত বদলে দিয়েছিল। মানুষের চিন্তা ভাবনা, আদান প্রদান, গ্রন্থ সৃষ্টি, প্রাচীনকালে চীনেই প্রথম তবে আসলে মুদ্রণ যন্ত্রের আবিষ্কার হয়েছিল; কিন্তু চীনের বাইরে বিস্তার ইউরোপের প্রসার সে মুদ্রণ হয় যা, 1250 - 1350 এর মধ্যে ছাপার এই পদ্ধতি চীন থেকে তারবীয়দের মাধ্যমে মূলে আসে ইউরোপ, শুরু হয় খেলনার তাস বানানোর, ইসলামী কাগজ তৈরীর রাজনীতি ও তারবীয়রা চীন থেকে ইউরোপে ছড়িয়ে দেয়, প্রথমে ইতালীয়, ফ্রান্স, স্পেন, জার্মানী ও নেদারল্যান্ড; ৮ম শতকের প্রথমার্ধকে কাঠের ফলকে খোদাই করে ছাপানোর কাজ শুরু হয়, তবে এই বুকোশীলের মাধ্যমে বই ছাপা বিশেষ ব্যয় বহুল ও সময় সাপেক্ষ ছিল; ৮ম শতকের মাঝামাঝি নেদারল্যান্ড বীজুর তৈরী, বনমালা মার্ক তামরা চিহ্ন বলি তার তুমি হয়; ৮ম শতকে নেদারল্যান্ড এইরূপ বীজের বনমালা সমসাময়িক ল্যাটিনে বই ছাপা হয়, 1450 সাল

নাজাদ জার্মানরা মেইনজ এবে প্রথম ছাপার অক্ষর বই বেরিয়ে ছিল, মুদ্রন বিপ্লবের আগে ছড়িয়ে থাকা নাম মুলি হল - Johannes Gestlaised Zum Guetenberg (1398-1468) নামে এক ব্যক্তি বই ছাপার কলা ও কৌশল কে আধুনিক রূপ দেন; বছর চোদ্দো কোর্স এবং শিরি সোনারের নাম ও এ বিষয়ে বিশেষ অভিজ্ঞতা, তবে সেকালে প্রযুক্তিগত উদ্ভাবন একজনে বা কয়েক জনের হাতে হতে পারে না, বেশ কিছু বাল বীর বিভিন্ন দেশের জন্য কৌশল নিয়ে পরীক্ষা নিরীক্ষায় সময় দিচ্ছিল তাদের হাতে হাতে নতুন নতুন পদ্ধতি গড়ে উঠে, মুদ্রন শিল্পের ক্ষেত্রেও একথা সমান ভাবে প্রযোজ্য, সীমা ইয়াজুন বা গুটেনবার্গের মত মিলিত প্রয়াসের ফল তাই মেইনজের কারুকরেরা 1450 তে মুদ্রনের ব্যাপারে অনেক এগিয়ে এবং সুফল পুনঃ সূচনা হয় অনেক আগের।

আইনোস্ত্রাসকি চীনে প্রথম শুরু হলেও ইউরোপের বিভিন্ন অঞ্চলে তা দ্রুত ছড়িয়ে পড়ে, ইতালিতে উইলিয়াম ক্যাকসটন জার্মানীর কোলন এবং এই মুদ্রন পদ্ধতি শিখে এসে নিজের দেশে তা চালু করেন; সুলতানদের প্রয়াসে মেইনজ এবং মে মুদ্রন ব্যবস্থা চালু তাই লাগানো হত, এক বিশেষ ধাতুর হরফ, কালি আঁকার তেল মিশিয়ে তৈরি হত ছাপার কালি, 14 শতকের শেষে 15 শতকের গোড়ার লাল সুতো, মিলন যোগ্যতা তারা কারুকরেরা একটি মুদ্রন যন্ত্র তৈরি করার জন্য নানা পরীক্ষা নিরীক্ষা করে ছিলেন. 1455-56 খ্রী এর মধ্যে নতুন প্রযুক্তি প্রয়োগ করে ছাপা হয় বাইবেল, ল্যাটিন ভাষায় মুদ্রিত এই বাইবেলের হরফের সৌন্দর্য দেখার মত ছাপার তার

ছাপার 'সুনিয়ানা' প্রায় 'অবাক' করার 'মত', 1457 তে
মেইন্জ এ জোহান্স প্রকাশ করেন; এর 'সাম্প্রতিক' বই
এর নাম Psalter (সাম) তাকেই 'বাইবেলের 'old Testament
এর' কিছু 'অংশ' বই, বইটি অত্যন্ত সুন্দর ভাবে 'ছাপা
হয়েছিল', "New Cambridge Modern History" তে বলা
হয়েছে' যে 'এর' প্রথম 'অক্ষরে নানারকম' কারুকাজ
ছিল', মার্জিনে 'ছিল' অলঙ্করণ নকশা', যাতে 'লেখা বইয়ের
আগে 'এর' অদ্ভুত সাদৃশ্য লক্ষ্য করা যায়',

প্রথম 'দিকের' মুদ্রিত বই গুলির এটি
ছিল 'অত্যন্ত' সুরুচি পূর্ণ বৈশিষ্ট্য যে 'জিনিস প্রথম 'থেকেই
ছিল' এতে' লেখা সূচিপত্র অনুচ্ছেদ ভেতর' সাথে' কম ফাঁক
যাতে' লেখা সূচিপত্র 'মিলিয়ে' খুলে' দেওয়া ছিল এ সব
প্রিন্টারদের 'লক্ষ্য', আসলে' যে 'সময়' মুদ্রাকরেরা' বুঝে
উঠতে' পারেন 'নি' যে 'ছাপাবই' এই' সুন্দর' অনুচ্ছেদ বা
ব্যাপারটি কতদূর' প্রথম দিকে' প্রাতিষ্ঠানিক রূপ নিয়েছিল' আমরা
ছিল' তাদের বলতে পারি না', তাই'

প্রথম দিকে

= মুদ্রণ কোম্পানি প্রতিনিয়ত' সাজসজ্জার
প্রয়োজন' মিটিয়েছিল' আর' তার' আত্মপ্রকাশ ও গোটা
ইউরোপের খ্রীষ্টধর্মান ইতালীতে নয় বছর', এরপর' স্পেইনে,
ফ্রান্স ও ফ্লান্ডার্স' সেখানে প্রথম' ছিল; তবে' 1460 - 1500
সালের' মধ্যেই' আবিষ্কৃত' হলো' বই' ছাপার' শুরু, 1468
তে' অগসবার্গ' 1465 তে' বলনিয়া', 1464 : অবশ্যকর্ম, 1470তে'
ইতালীতে' সুইজারল্যান্ড' 1468 তে' বোজাসয়াতে,
স্পেন ও পোর্তুগাল, 1474 - 76 এর' মধ্যে' সুইডেন' মন্ত্র ছাপার
শুরু, 1495, 1500 এর' মধ্যে' 40 - 210টির' অনুচ্ছেদে' ছাপা
হয়েছিল 60 লক্ষ' বই; এইভাবেই' গোটা' মধ্য' যুগের' বিশ্বের,

মুদ্রণ শিল্পের বিকাশের নিহিত আর্থসামাজিক চাহিদা তৎকালীন নগর জীবন এর বিকাশের পরিপূরক ছিল, মুদ্রণ বিপ্লবের অন্তর্নিহিত অর্থনৈতিক কারণ ব্যাখ্যাকল্পে ক্যাথেরিন অন্তব্য করেছেন - 'The Printing Press Or a practical solution to a practical Problem' বস্তুত, এই বিপ্লবী অগ্রগতি হয়েছিল নিঃসন্দেহে প্রবল চাহিদার জন্য, হাতে বইয়ের চাহিদা ও বিপুল বিস্তারের সঙ্গেই ছিল হাতে বইয়ের সরবরাহ বৃদ্ধি, আর সেই চাহিদা বৃদ্ধির বিষয়ে প্রত্যক্ষদর্শী ছিল, সেই সময়ের মত হোয়াই এক শহরে 1460 - 1500 এর মধ্যে বইয়ের প্রতি চাহিদা দেখা যায়, ব্যবসায়ী আইনজীবি, শিক্ষক, সরকারী কর্মচারী ও আরও ও বিভিন্ন পেশায় সাধারণ মানুষের মধ্যে, তখনও ইউরোপীয় কৃষকদের মধ্যে অশিক্ষাই ছিল অক্সফোর্ড, এই গ্রামে ততটা বইয়ের চাহিদা দেখা করা সম্ভব না, প্রতি সপ্তাহে পঞ্চদশ শতকে নবজাগরণের প্রভাবে শিক্ষাবিস্তার ও ব্রাহ্মণ্যবাদীদের মধ্যে খ্রিস্টিয় স্বাধীনতার বিপুলভাবে অগ্রগতি মুদ্রণ বিপ্লবের আমাদিকে উপাদানগুলোকে বলতে পরিপূর্ণ বুঝ দেয় আর অন্যতম প্রধান ফ্যাক্টর হিসাবে বাতের Key কথা চাহিদের অর্থনি; তাছাড়া হাতে লেখা পুঁথির দাম ও ছিল বেশি ও পরিমাণ ও কম, তাই সাজকের দের প্রয়োজনীয় চাহিদা মেটাতে তা ব্যর্থ হয়েছিল, তাই হাতে প্রদত্ত সাজক দের মধ্যে শাসন ভার চালনার অর্থনি করেছিল, বড়াগ্রা রাজকীয় তলভিত্তিতে অনুপ্রদানের মধ্যে ও চিকিৎসক অর্থনি হয়েছিল, তাদের প্রতিবিধার জন্য ও পুঁথিগত বিদ্যা প্রয়োজন ছিল, এবং চাহিদার মূল্য বৃদ্ধি প্রয়োজন আদের কাজ থেকে তারা হলেন ঋণদের অর্থবিত্ত শ্রেণী, তাদের সুখ স্বাচ্ছন্দের প্রয়োজন হত; তাদের ব্যবসা বানিজ্য পরিচালনার জন্য হিসাবে রাখতে হত।

অসম্ভব মিলাপেক্ষা করার প্রবণতা, তাদের লেখা পড়া ছিল আবশ্যিক, কিন্তু বিদ্যালয়ে ঢুকবার কথা কিশোর 15 বছরেই ছেড়ে দিয়েছিল; এরাই ছিল মুদ্রিত গ্রন্থের ক্রিয়াশীল ব্যবহারে, মুদ্রণ শিল্পের বিকাশের শ্রেণীর অনুশাসন বন্ধনের বেদনার অসীম দিগন্তে এক নতুন নতুন অধ্যায় করে, এই আবহে কল্পনা প্রবন করবি আন্তর্জাতিক মুক্তি ও মননশীল বুদ্ধিজীবিদের চিন্তা ভাবনার এক আলোকিক এগুলোকে মুদ্রণের মাধ্যমে তার আবিষ্কারের মধ্যে ... আজাগুদি চেপেছিল করার থেকে পরীক্ষা নিরীক্ষা সেই অসম্ভ মুক্তি হয় তা ইউরোপের বিভিন্ন ব্যবসা বাণিজ্য কেন্দ্র ও শহরের নাগরিক আধিবাসীদের দৈনন্দিন প্রয়োজনের অঙ্গ হয়ে ওঠে,

ক্লাসিক্যাল গ্রন্থানচর্চার বিস্তার ছাপা বইয়ের চাহিদা কে বৃদ্ধি করেছিল, তবে ধর্ম ও দর্শনের আবহ আবেদন অপরিবর্তিত বইয়ের অপ্রতুলতা কম ছিল না, 'ব্রিভিয়ারি' প্রন্থ (প্রেমার্থনা কেন্দ্রিক) দৈনন্দিন কাজকর্মের ব্যবহৃত প্রার্থনা প্রভৃতি ছিল এগুলোর মুদ্রিত গ্রন্থের তবে মুদ্রিত গ্রন্থের বিষয়, 1520 খ্রীঃ পূর্বে প্রকাশিত মুদ্রিত গ্রন্থের বিষয় বস্তুর তিনচতুর্থাংশই ছিল ধর্ম অনুশাসন বা ঈশ্বর এবং যিশু খ্রিস্টের 1475 - 1520 খ্রীঃ র মধ্যে প্রায় 40 টি ভাষায় বাইবেলের অনুবাদ অন্তর্ভুক্ত প্রকাশিত হয়; অধ্যকালীন নবজাগরণের চিন্তা চেতনা আবেগ মানুষের ঔপনিবেশিক পরিবর্তন ঘটি, এগুলোর প্রকাশক কনরাড যুক্তরাষ্ট্রে হয় এবং আলসি গ্রামের নামে ছাপাখানা জার্মান মুদ্রক বেনেডিক্ট ফ্রিডরিখের আদ্য গ্রন্থ 'Orator' প্রকাশ করেন, 1467 তে রোমান ধর্মশাস্ত্রের অগাস্টাইনের 'City of God' প্রকাশ করেন, এভাবে ইতালির বিশ্ববিদ্যালয়ের বন্দরের মুদ্রণ চালু হয়।

1475 খ্রীঃ এ নিকোলাস ডোনসন নামে
এক জার্মান মুদ্রকের সুন্দর রোমান হরফে বিক্রিসো
খ্রীষ্টান লেখক সিসেরো, ভার্জিল ও হোরাসের
রচনাবলী ছেপে প্রকাশ করেন; ডোনসের বিক্রিয় মুদ্রণ
'এলডাস অলাতিয়াস' নবজাগরণের মনে শ্রেণী সচেতন
অনুভূতি আবার মানুষের নিকট পৌঁছিয়েছেন; কোন কোন
দিক দিয়ে এলডাস প্রাচীন গ্রীস ও রোমান, খ্রীষ্টান
সংস্কৃতি ও রেনেসাঁস আন্দোলনের বিখ্যাত প্রতিভা সুনি গ্রীক
ল্যাটিন ও ইতালীয় ভাষায় প্রকাশ করতে থাকেন,

1300 — 1500 খ্রীঃ এর মধ্যে ইউরোপে
বিশ্ববিদ্যালয়ের সংখ্যা বৃদ্ধি পেয়েছিল, তখন University
র সংখ্যা হয় 70, এ সময় কলেজের সংখ্যা ও
বৃদ্ধি পায়, ফ্রান্সে ও ইংল্যান্ড, ইতালীতে 16,
জার্মানীতে 16; আর এসবের জন্য অসংখ্য ইউরোপে
শিক্ষকের সংখ্যা বৃদ্ধি পেয়েছিল; তবে ছাপা বইয়ের
চাহিদা আগের এর বিপরীত যে একবারে ছিল না তাহলে
শিক্ষক বিপ্লবের ফলে যে শিক্ষক না থাকিল
মুদ্রণ শিক্ষক তা ঘটে, নতুন মুদ্রিত গ্রন্থগুলি পুনরায়
আনে ভোলা এবং দাম অল্প ছিল; এই মুদ্রণ যন্ত্র
শিক্ষার, জ্ঞান ও সংস্কৃতিক ক্ষেত্রে বৈপ্লবিক পরিবর্তন
নিয়েছিল;

মুদ্রণ বিপ্লবের প্রাণবন্ত সংখ্যা বৃদ্ধির
পাশাপাশি সাংস্কৃতিক দিকে গুরুত্বপূর্ণ প্রভাব পড়েছিল,
নবজাগরণের ফলে বৌদ্ধিক ক্ষেত্রে অবাধে গুরুত্বপূর্ণ
প্রভাব পড়েছিল,
মুদ্রণ বিপ্লবের
সাংস্কৃতিক প্রভাব অনুধাবন করতে গেলে সপ্তদশ শতাব্দীর

নবজাগরণ ও মোড়শ শতাব্দীর ধর্ম সংস্কার আন্দোলনের প্রভাব ও রোমান ক্যাথলিক চার্চের মিলনে পুনরুজ্জীবন যে ব্যাপক আন্তর্জাতিক আলোড়নের জন্ম দিয়েছিল, ঐতিহাসিক হিসাবে তাকে মুদ্রণ বিপ্লবের ফল বলা যেতে পারে। মুদ্রণ বিপ্লবের ফলে অল্প সময়ের মধ্যে প্রচুর পরিমাণে বই প্রকাশিত হয়েছিল; মুদ্রণ বিপ্লবের কিন্তু ইতিহাসের শেষ নয়, রোম, স্পেন, ফ্রান্স ও জার্মানীর অগ্নিসংযোগ, লুঠতরাজ, বলপূর্বক ধর্মান্তরকরণ, ক্রীতদাস ব্যবসা বিপ্লবকে অগ্রসর হতে বাধা প্রদান করেছিল, ইউরোপে মুদ্রিত গ্রন্থের ৭৭% ছিল ল্যাটিন ভাষার, আন্তর্জাতিক ভাষার মর্যাদা ইতালিয়ান, জার্মানী, ফরাসী, ইংরেজী প্রভৃতি ভাষার মধ্যে (জাতীয়তাবাদী) মুদ্রিত গ্রন্থের মধ্যে বিশ্বের গ্রন্থের সমাবেশ অবশ্যই হতো। আর্থিক ও বিজ্ঞানে বিপ্লবের প্রভাব ছিল 10% বছরের মধ্যে সংখ্যা, অন্যান্য প্রকাশিত গ্রন্থের আকার ছোট ছিল,

মুদ্রণ বিপ্লব সুশাসন শিল্পসমাজে অবশ্য উচ্চতর স্তরে দিয়েছিল, ফলে বিপ্লবের ফলে এই ছিল শিল্প বিপ্লবের মর্মমূল, 'Potentially Regulationary and Hostile to the status Quo' বলে এই গ্রন্থের চালকদের অবস্থা ছিল প্রকৃত বৈপ্লবিক এবং ইহা ছিল সুবোধ্য ব্যবস্থার মূল নতুন ব্যবস্থার বন্ধু বলে,

কিন্তু এই মুদ্রণ শিল্পকে আরও নিয়ন্ত্রণ করার ব্যবস্থা হল তা হল চার্চের ছিল রাষ্ট্রের চুলচেরা নীতি করার অবাধে বাড়ার সম্ভাবনা, রাষ্ট্রীয় ও রাজনৈতিক নিয়ন্ত্রণের মূল হল, বিশ্বাস প্রতিযোগিতা চলতে পারে নি,

ফ্রেঞ্চ অ্যালেক্স ডে টকভিল বলে ছিলেন : "The art of Printing is useful is so far as it furthers the Circulation of useful and tested book's but it can be very harmful if it is permited to wider the influence of vicious Works"

তাই তিনি এই মুদ্রণযন্ত্রের অপর কলঙ্কের নিমূলন প্রার্থনা করেছিলেন, সত্য ও ন্যায়ভিত্তিক তাত্ত্বিক যোগ্যতা কিছু হলেও থাকা উচিত, এই বোধটি নিশ্চয়ই বইয়ের অপমৃত্যু ঘটাতে পারে, একেবারে বলা যায় মুদ্রণ বিপ্লবের ইউরোপের ইতিহাসে অপ্রত্যাশিত প্রভাব ফেলেছিল ব্যাপক ভাবে, ও যখন যে মুদ্রণপ্রযুক্তির পরিবর্তন আসে - সে অনুযায়ী Elizabeth অনুধাবন করেছেন যে " মুদ্রণ বিপ্লব আনুষের প্রচলন বিজ্ঞানের চর্চাকে কেবলমাত্র প্রাতিষ্ঠানিক কাঠামো থেকে মুক্ত করে তাকে প্রতিষ্ঠানিক ভাবনার দেয়।

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কৃতজ্ঞতা স্বীকার:

আমার এই প্রকল্পটির বাস্তব রূপায়নে আমার বিশ্ববিদ্যালয়ের শিক্ষক শিক্ষিকারা সর্বতোভাবে আন্তরিক সহায়তা করেছেন, তাদের আন্তরিক সহায়তা ব্যতীত এই প্রকল্পের রূপায়ন অসম্ভব হতো না। তাছাড়া আমি আমার সুহৃদ শিক্ষক ও অসংখ্য শিক্ষার্থী বন্ধুদের কাছে কৃতজ্ঞ, তারাও আমার প্রকল্পটি রূপায়নে অকৃপণ সহায়তা করেছেন।

তথ্যসূত্র:

আমার এই প্রকল্পটির রূপায়নে আমি বিভিন্ন প্রখ্যাত ঐতিহাসিকদের রচিত বিভিন্ন বইয়ের সাহায্য নিয়েছি। এছাড়াও আমি বিভিন্ন ইন্টারনেট সাইটের মাধ্যমেও তথ্য সংগ্রহ করেছি, নীচে আমার ব্যবহৃত বই ও সাইটগুলির একটি তালিকা দেওয়া হল—

- বিবর্তনের পথে ইউরোপ— উজ্জ্বল রায়
- An Introduction early Modern Europe (1400-1789) (Subodh Kr. Mukharjee)
- Https://www.history.com
- Https://www.wordhistory.org.

PRINTING REVOLUTION

SCOTTISH CHURCH COLLEGE

SEMESTER-IV

CU REGED NO. : 223-1111-0164-19

CU ROLL NO. : 192223-21-0041

SUBJECT : CC-8 TUTORIAL

Content

Introduction

More than the rise of national states and royal absolutism in the realm of politics, and hardly less significant than the expansion of Europe and the development of capitalism in the economic sphere, was the intellectual quickening which occurred in the 15th and 16th centuries and which has had a profound impact on modern society and civilisation. This quickening was most evident in the invention of printing and the resulting diffusion of knowledge.

Print revolution is baisically the changes that took place in the field of print before printing presses were invented by guthenburg .with the printing press, a new reading public emerged. Printing reduced the cost of books.The time and labour required to produce each book came down, and multiple copies could be produced with greater ease.Books flooded the market, reaching out to an ever-growing readership. Access to books created a new culture of reading.. Earlier, reading was restricted to the elites. Common people lived in a world of oral culture. Before the age of print, books were not only expensive but they could not be produced in sufficient numbers.Now books could reach out to wider sections of people.But the transition was not so simple. Books could be read only by the literate, and the rates of literacy in most European countries were very low till the twentieth century.

Print created the possibility of wide circulation of ideas, and introduced a new world of debate and discussion. Even those who disagreed with established authorities could now print and circulate their ideas.Through the printed message, they could persuade people to think differently, and move them to action. This had significance in different spheres of life.

Printing in early modern Europe was a complicated process involving the moveable type with which the impression was made and paper on which it was made. Inspired by developments in China, the European moveable type was perfected in Mainz in about 1450. The evolution of the practice of casting individual letters in separate little pieces of metal all of the same height and then arranging them in any desired sequence of printing provided the flexibility and dynamism that turned the process of printing into a socio-cultural revolution.

The emergence of modern paper fit for printing and the ink further facilitated the process of mechanical duplication. These processes were developed by Johann Gutenberg, Johann Fust and Peter Schoffer. The earliest known products of the new art were papal “Letters of Indulgence” and a version of the Bible--- Biblica Latina --- both printed by Gutenberg in 1454.

Where was the printing press invented ?

When someone mentions the printing press most will instinctively think of Johannes Guttenberg and his revolution 15th Century (1440 AD) technology. Whilst his invention was revolutionary in its own right it wasn't in fact, the first printing press to be developed. Not by a long shot. In fact, the history of the printing press stretches back to the 3rd Century (the technique of woodblock printing but on textiles) with its adaptation for printing text in wide use during the Tang Dynasty of China (6th-10th Century AD). Despite this fact, Guttenberg rightfully deserves his place in history for producing a machine that allowed for the mass-production of books for the first time in history. Before his invention books were transcribed by hand or 'printed' using wooden blocks. Both were a painstakingly slow and laborious process that effectively meant access to the printed word was limited to those who could afford their high price tags.

Tang Dynasty 700 CE(P-1)

More than 600 years before Guttenberg's press, Chinese monks were printing ink on paper using block printing. It was a very simple process and used carved wooden blocks to press ink onto sheets of paper.

Forgotten for centuries an example text from the time, The Diamond Sutra (that was created in around 868 AD), was discovered inside a cave near Dunhuang, China in 1907 by explorer Sir Marc Aurel Stein.Its discovery, in a single step, completely rewrote what we thought we knew

about the development of the printing press.This text is now housed at the British Library in London and is described them as “the earliest complete survival of a dated printed book”. The same process appears to have been prevalent in Japan and Korea at the same time too. These early printed books were made using either wooden or metal blocks and were primarily focussed on Buddhist and Taoist treaties.

The ‘Diamond Sutra’. Source: Themeplus/Flickr(P-2)

The process was heavily improved in the 11th Century when a Chinese peasant, Bi (Pi) Sheng, developed a form of early movable type. Although little else is known about Si (Pi), his ingenious method of producing hundreds of individual characters was a huge stepping-stone on the path to the modern printing press.

The ability for Buddhist and Taoist texts to be printed quickly and in large volumes was very important for the Chinese (and surrounding nations). This, in no small part, helped spread Buddhism around the region.And we might not know about this man if it wasn’t for a contemporary scholar and scientist named Shen Kuo. He documented Sheng’s movable type in his work “Dream Pool Essays” and explained that the moveable print was formed from backed clay. Kuo also tells his readers about the type of ink used (pine resin, wax and paper ash) and he also explains how it was a fairly efficient, and quick, method of copying documents. Despite this advancement, it would take a few centuries for it to be widely adopted across China. Other forms were developed in the 14th Century by Wang Zhen (A Chinese government official) during the Yuan Dynasty. Zhen’s system greatly improved on Sheng’s system using rotary tables to help typesetters sort and process carved wooden blocks for printing very efficiently.

Johannes Gutenberg Invention

The invention of the movable metal type printer in Europe is usually credited to the German printer Johannes Gutenberg. However, there are other claims, notably the Dutch printer Laurens Janszoon Coster (c. 1370-1440 CE) and two other early German printers, Johann Fust (c. 1400-1465 CE) and his son-in-law Peter Schöffer (c. 1425-1502 CE). There is, too, evidence that movable metal type printers had already been invented in Korea in 1234 CE in the Goryeo Kingdom (918-1392 CE). Chinese Buddhist scholars also printed religious works using moveable type presses; the earliest ones used woodblocks during the Song Dynasty (960-1279 CE). Whether the idea of moveable type presses spread via merchants and travellers from Asia to Europe or if the invention by Gutenberg was spontaneous is still a point of debate amongst scholars. In any case, like most technologies in history, the invention likely sprang from a cumulation of elements, ideas, and necessity involving multiple individuals across time and space. Gutenberg began his printing experiments sometime in the 1440s CE, and he was able to establish his printing firm in Mainz in 1450 CE. Gutenberg's printer used Gothic script letters. Each letter was made on a metal block by engraving it into the base of a copper mould and then filling the mould with molten metal. Individual blocks were arranged in a frame to create a text and then covered in a viscous ink. Next, a sheet of paper, at that time made from old linen and rags, was mechanically pressed onto the metal blocks. Gutenberg's success in putting all these elements together is indicated by his printed edition of the Latin Bible in 1456 CE.

The new type of presses soon appeared elsewhere, notably with two Germans, Arnold Pannartz (d. 1476 CE) and Conrad Sweynheym (aka Schweinheim, d. 1477 CE). This pair established their printing press in 1465 CE in the Benedictine monastery of Subiaco. It was the first such press in Italy. Pannartz and Sweynheym moved their operation to Rome in 1467 CE and then Venice in 1469 CE, which already had a long experience of printing such things as playing cards. There were still some problems such as the lack of quality compared to handmade books and the drab presentation in respect to beautifully colour-illustrated manuscripts. Also, there were sometimes errors seen in the early printed editions and these mistakes were often then repeated in later editions. However, the revolution into how and what people read had well and truly begun.

Gutenberg Press

Integral to Gutenberg's design was replacing wood with metal and printing blocks with each letter, creating the European version of moveable type.

In order to make the type available in large quantities and to different stages of printing, Gutenberg applied the concept of replica casting, which saw letters created in reverse in brass and then replicas made from these molds by pouring molten lead.

Researchers have speculated that Gutenberg actually used a sand-casting system that uses carved sand to create the metal molds. The letters were fashioned to fit together uniformly to create level lines of letters and consistent columns on flat media.

Gutenberg's process would not have worked as seamlessly as it did if he had not made his own ink, devised to affix to metal rather than wood. Gutenberg was also able to perfect a method for flattening printing paper for use by using a winepress, traditionally used to press grapes for wine and olives for oil, retrofitted into his printing press design.

The Gutenberg Printing Press(P-3)

Printing method with movable type

Gutenberg's early printing process, and what texts he printed with movable type, are not known in great detail. His later Bibles were printed in such a way as to have required large quantities of type, some estimates suggesting as many as 100,000 individual sorts.[37] Setting each page would take, perhaps, half a day, and considering all the work in loading the press, inking the type, pulling the impressions, hanging up the sheets, distributing the type, etc., it is thought that the Gutenberg–Fust shop might have employed as many as 25 craftsmen.

Gutenberg's technique of making movable type remains unclear. In the following decades, punches and copper matrices became standardized in the rapidly disseminating printing presses across Europe. Whether Gutenberg used this sophisticated technique or a somewhat primitive version has been the subject of considerable debate.

In the standard process of making type, a hard metal punch (made by punchcutting, with the letter carved back to front) is hammered into a softer copper bar, creating a matrix. This is then placed into a hand-held mould and a piece of type, or "sort", is cast by filling the mould with molten type-metal; this cools almost at once, and the resulting piece of type can be removed from the mould. The matrix can be reused to create hundreds, or thousands, of identical sorts so that the same character appearing anywhere within the book will appear very uniform, giving rise, over time, to the development of distinct styles of typefaces or fonts. After casting, the sorts are arranged into type cases, and used to make up pages which are inked and printed, a procedure which can be repeated hundreds, or thousands, of times. The sorts can be reused in any combination, earning the process the name of "movable type". (For details, see Typography.The invention of the making of types with punch, matrix and mold has been widely attributed to Gutenberg. However, recent evidence suggests that Gutenberg's process was somewhat different. If he used the punch and matrix approach, all his letters should have been nearly identical, with some variation due to miscasting and inking. However, the type used in Gutenberg's earliest work shows other variations.

Movable metal type descended from Gutenberg's press(P-4)

Impact of Printing Revolution

The Spread of Information

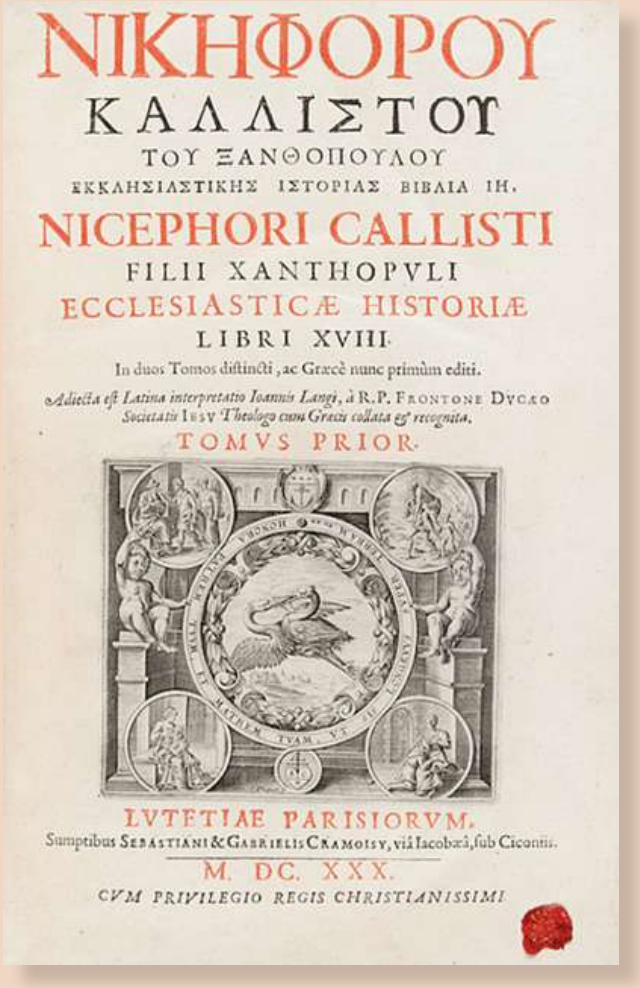
Soon, a new boost to the quantity of printed material came with the rise of the humanist movement and its interest in reviving literature from ancient Greece and Rome. Two printers, in particular, profited from this new demand: the Frenchman Nicholas Jensen (1420-1480 CE) and the Italian Aldus Manutius (c. 1452-1515 CE). Jensen innovated with new typefaces in his printing shop in Venice, including the easy-to-read roman type (littera antiqua/lettera antica) and a Greek font which imitated manuscript texts. Jensen printed over 70 books in the 1470s CE, including Pliny's Natural History in 1472 CE. Some of these books had illustrations and decorations added by hand to recapture the quality of older, entirely handmade books.

Meanwhile Manutius, also operating in Venice, specialised in smaller pocket editions of classical texts and contemporary humanist authors. By 1515 CE, all major classical writers were available in print, most in multiple editions and many as collections of complete works. In addition, printed classical texts with identical multiple copies in the hands of scholars across Europe could now be easily checked for accuracy against source manuscripts. Handmade books had often perpetuated errors, omissions, and additions made by individual copyists over centuries, but now, gradually, definitive editions of classical works could be realised which were as close as possible to the ancient original. In short, printed works became both the cause and fruit of an international collective scholarship, a phenomenon which would reap rewards in many other areas from astronomy to zoology.

There was, too, a drive to print more books thanks to the Reformists who began to question the Catholic Church's interpretation of the Bible and its stranglehold on how Christians should think and worship. The Bible was one of the priorities to have translated into vernacular languages, for example German (1466 CE), Italian (1471 CE), Dutch (1477 CE), Catalan (1478 CE), and Czech (1488 CE). Reformists and humanists wrote commentaries on primary sources and argued with each other in print, thereby establishing an invisible web of knowledge and scholarship across Europe. Even the letters written between these scholars were published. As religious and academic issues raged, so the debating scholars fuelled the production of yet more printed works in a perpetuating cycle of the printed word. Ordinary folks, too, were roused by arguments presented in printed materials so that groups of like-minded individuals were able to quickly spread their ideas and organise mass movements across multiple cities such as during the German Peasants' War of 1525 CE.

A Booming Industry

As a consequence of all this demand, those printers who had survived the difficult early years were now booming. Cities across Europe began to boast their own printing firms. Places like Venice, Paris, Rome, Florence, Milan, Basel, Frankfurt, and Valencia all had well-established trade connections (important to import paper and export the final product) and so they became excellent places to produce printed material. Some of these publishers are still around today, notably the Italian company Giunti. Each year, major cities were producing 2-3,000 books every year. In the first decade of the 1500s CE, it is estimated 2 million books were printed in Europe, up to 20 million by 1550 CE, and around 150 million by 1600 CE. There were over half a million works by the Reformist Martin Luther (1483-1546 CE) printed between 1516 and 1521 CE alone. Into the 16th century CE, even small towns now had their own printing press.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ECCLESIASTICÆ HISTORIÆ
LIBRI XVIII.
In duos Tomos distincti, ac Græcè nunc primùm editi.
Adiecta est Latina interpretatio Ioannis Langi, à R.P. Frontone Ducæo Societatis Iesv Theologo cum Græcis collata & recognita.
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Title Page of the Handbook of the Christian Soldier by Erasmus Fredrik Andersoon(P-5)

Besides established authors, many publishers helped new authors (men and women) print their works at a loss in the hope that a lucrative reprint run would finally bring in a profit. The typical print run for a first edition was around 1,000 copies although this depended on the quality of the

book as editions ranged from rough paper pocket-sizes to large vellum (calfskin) folio editions for the connoisseur. The smaller size of most printed books compared to handmade volumes meant that habits of reading and storing books changed. Now a desk was no longer required to support large books and one could read anywhere. Similarly, books were no longer kept horizontally in chests but stacked vertically on shelves. There were even odd inventions like the book wheel on which several books could be kept open and easily consulted simultaneously by turning the wheel, especially useful for research scholars. As readers accumulated their books and built up impressive private collections, so many bequeathed these to their city when they died. In this way, within 50 years of the printing press' invention, public libraries were formed across Europe.

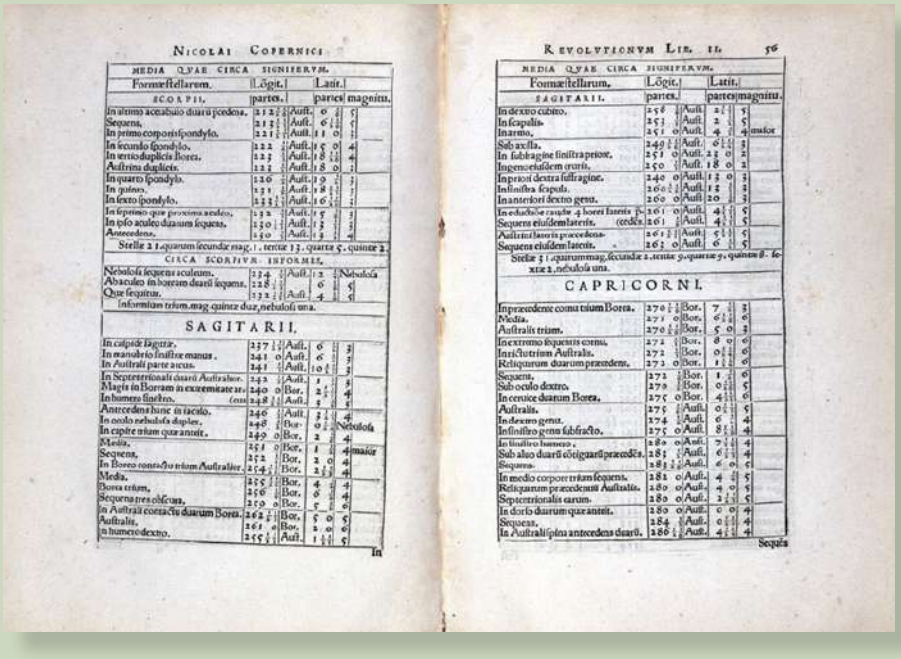
Printed works became so common, they helped enormously to establish the reputations, fame and wealth of certain writers. The Dutch scholar Desiderius Erasmus (c. 1469-1536 CE) is perhaps the best example, one of the first authors to make a living solely through writing books. There were, though, some threats to authors and printers. One of the biggest problems was copyright infringement because it was next to impossible to control what went on beyond a particular city. Many books were copied and reprinted without permission, and the quality of these rip-offs was not always very good.

Printing Powers the Scientific Revolution

The English philosopher Francis Bacon, who's credited with developing the scientific method, wrote in 1620 that the three inventions that forever changed the world were gunpowder, the nautical compass and the printing press. For millennia, science was a largely solitary pursuit. Great mathematicians and natural philosophers were separated by geography, language and the sloth-like pace of hand-written publishing. Not only were handwritten copies of scientific data expensive and hard to come by, they were also prone to human error.

With the newfound ability to publish and share scientific findings and experimental data with a wide audience, science took great leaps forward in the 16th and 17th centuries. When developing his sun-centric model of the galaxy in the early 1500s, for example, Polish astronomer Nicolaus Copernicus relied not only on his own heavenly observations, but on printed astronomical tables of planetary movements.

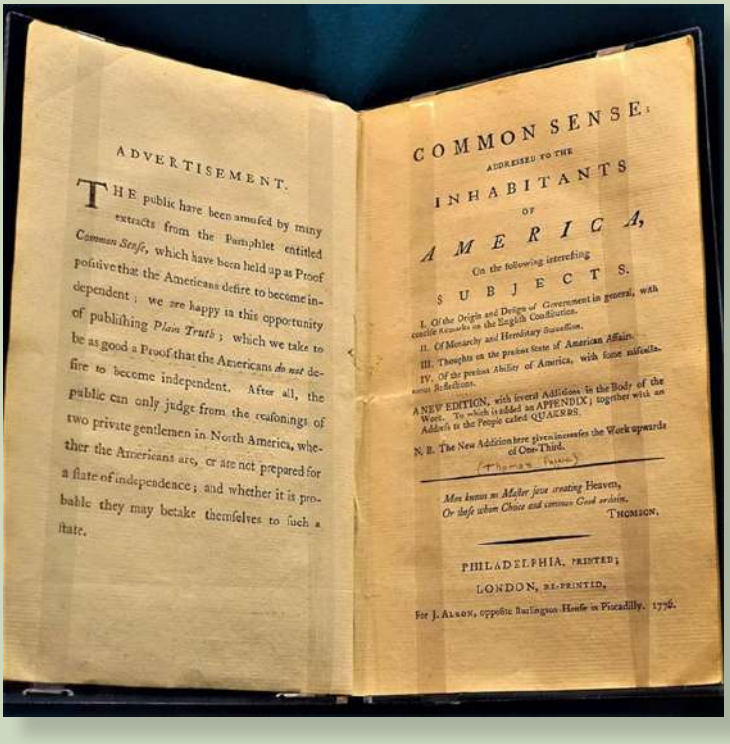
When historian Elizabeth Eisenstein wrote her 1980 book about the impact of the printing press, she said that its biggest gift to science wasn't necessarily the speed at which ideas could spread with printed books, but the accuracy with which the original data were copied. With printed formulas and mathematical tables in hand, scientists could trust the fidelity of existing data and devote more energy to breaking new ground.



Tables from Polish astronomer Nicolaus Copernicus' pioneering text "De revolutionibus orbium caelestium" (On the revolution of heavenly spheres), 1543, which represents his complete work(P-6)

From Public Opinion to Popular Revolution

During the Enlightenment era, philosophers like John Locke, Voltaire and Jean-Jacques Rousseau were widely read among an increasingly literate populace. Their elevation of critical reasoning above custom and tradition encouraged people to question religious authority and prize personal liberty. Increasing democratization of knowledge in the Enlightenment era led to the development of public opinion and its power to topple the ruling elite. Writing in pre-Revolution France, Louis-Sebástien Mercier declared:"A great and momentous revolution in our ideas has taken place within the last thirty years. Public opinion has now become a preponderant power in Europe, one that cannot be resisted… one may hope that enlightened ideas will bring about the greatest good on Earth and that tyrants of all kinds will tremble before the universal cry that echoes everywhere, awakening Europe from its slumbers.""[Printing] is the most beautiful gift from heaven," continues Mercier. "It soon will change the countenance of the universe… Printing was only born a short while ago, and already everything is heading toward perfection… Tremble, therefore, tyrants of the world! Tremble before the virtuous writer!"Even the illiterate couldn't resist the attraction of revolutionary Enlightenment authors, Palmer says. When Thomas Paine published "Common Sense" in 1776, the literacy rate in the American colonies was around 15 percent, yet there were more copies printed and sold of the revolutionary tract than the entire population of the colonies.



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THE public have been amused by many extracts from the Pamphlet entitled *Common Sense*, which have been held up as Proof positive that the Americans desire to become independent; we are happy in this opportunity of publishing *Plain Truth*; which we take to be as good a Proof that the Americans *do not* desire to become independent. After all, the public can only judge from the reasonings of two private gentlemen in North America, whether the Americans are, or are not prepared for a state of independence; and whether it is probable they may betake themselves to such a state.

COMMON SENSE:
ADDRESSED TO THE
INHABITANTS
OF
AMERICA,
On the following interesting
SUBJECTS.

I. Of the Origin and Design of Government in general, with concise Remarks on the English Constitution.
II. Of Monarchy and Hereditary Succession.
III. Thoughts on the present State of American Affairs.
IV. Of the present Ability of America, with some miscellaneous Reflections.

A NEW EDITION, with several Additions in the Body of the Work. To which is added an APPENDIX; together with an Address to the People called QUAKERS.

N. B. The New Addition here given increases the Work upwards of One-Third.

(Thomas Paine)

Men know no Master save creating Heaven,
Or those whom Choice and common Good ordain.
THOMSON.

PHILADELPHIA, PRINTED;
LONDON, RE-PRINTED,
For J. ALMON, opposite Burlington House in Piccadilly. 1776.

"Common Sense" by Thomas Paine at the Museum of the American Revolution.(P-7)

Conclusion

An invention is not a revolution, but in Europe, demand, innovation, collaboration, investment, and trade made it so.Widespread literacy and the circulation of knowledge became the distinctive traits of European society already in the early modern period: they are part of our fundamental European values, which we cherish, teach, and share today in our diverse society, together with the understanding, preservation, and dissemination of the cultural heritage which made them possible. Printing revolution ushered in the era of modern Europe by making both ancient and medieval texts available to a broader audience which produced a fertile ground for new ideas and new theories. The aim of this exhibition is to remind all of us how the printing revolution is one of the pillars of European identity because it stands for positive values which can be transmitted and shared: education, research, and cultural heritage.Over all, the printing press is a revolutionizing invention. First, the printing press was invented during a crucial time period. In this time period, there was a lot of chaos and distress, because of the black death. The printing press had a huge a effect on spreading ideas, thoughts , news, education, and being informed. By printing books and newspapers, we have learned how to communicate and spread ideas through out the world.The printing press is one of basis invention for the creations and inspiration of many other newer inventions which also revolutionized the world. Although the printing press was a magnificent invention, some people had different views. But the most important technological advance of all was the development of printing, with movable metal type, about the mid15th century in Germany. A German named Johannes Gutenberg invented the printing press in 1436. Printing press invention had a large impact on the value of the books, religion and reformation and education. But with the invention of printing press everybody could afford to buy a book and become more educated. Education was very important in the Renaissance because it opened people's minds to thinking. The power of the books and educated people were more important than the church. People were reading as much as they could and spreading their knowledge everywhere. Reading was now done silently instead of orally, which increased literacy and overall education. Also, since it was easier to print work scientist started sharing their works with each other. This was an amazing improvement in science, because now scientist could critic each other's work, improve upon it, and eventually come up with correct conclusions. It is suggested that the scientists that shared their worked helped start the scientific revolution. This is how the printing revolution as well as the printing press helped Europe to go through the various revolution.

Bibliography

Books:

Elizabeth L.Eisenstein,The Printing Revolution in Early Modern Europe (Canto Classics) – Abridged, 29 March 2012

S.H. Steinberg,Five Hundred Years of Printing-1 July 1996

Andrew Pettegree,The Book in the Renaissance

Link:

https://www.worldhistory.org/article/1632/the-printing-revolution-in-renaissance-europe/

https://www.history.com/news/printing-press-renaissance#:~:text=ClassicStock%2FGetty%20Images-,In%20the%2015th%20century%2C%20an%20innovation%20enabled%20people%20to%20share,and%20faster%20than%20ever%20before.

https://www.hawaii.edu/aln/printing.htm

SCIENTIFIC REVELUTION : HOW SCIENTIFIC WAS IT ?

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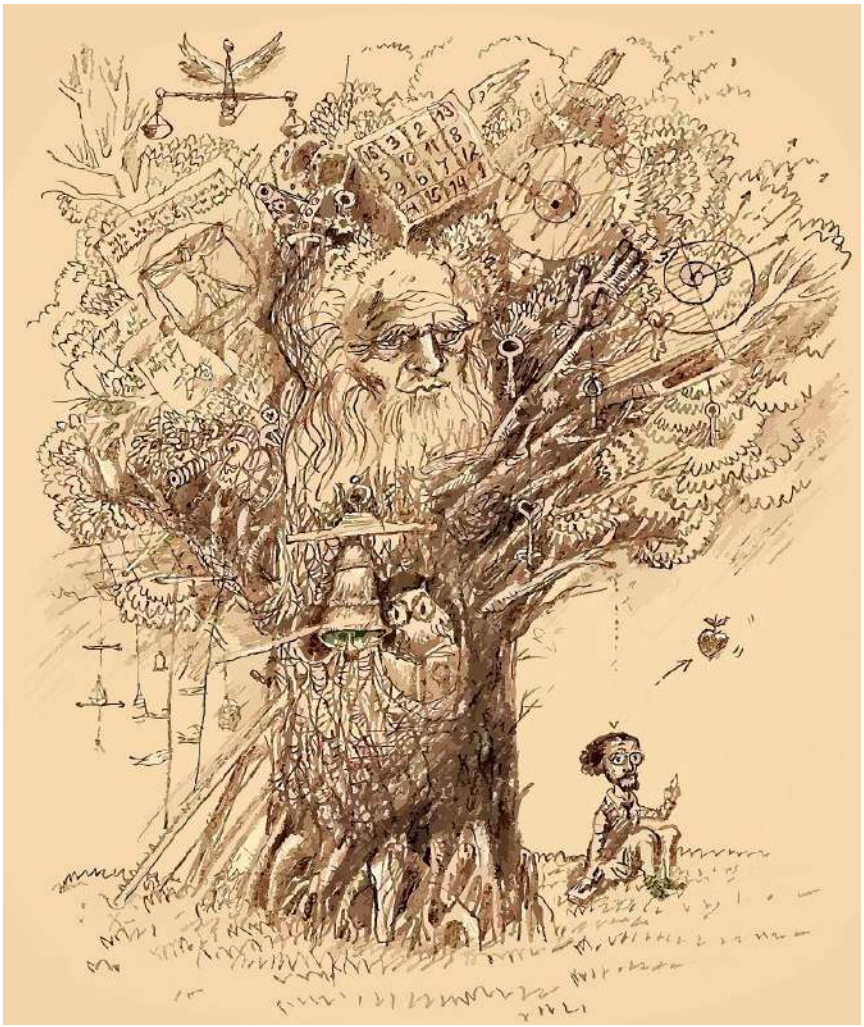

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C.U. REGISTRATION :- 223-1112-0068-19

DEPARTMENT :- HISTORY

COLLEGE :- SCOTTISH CHURCH COLLEGE

-: সূচীপত্র :-

১। ভূমিকা :- ইউরোপকে তার মধ্যযুগের অন্ধকারাচ্ছন্ন পৃথিবী থেকে মুক্তি লাভে যে উপাদানটি সবথেকে বেশি সাহায্য করেছিল, তা হল বৈজ্ঞানিক বিপ্লব। রেনেসাঁ বা ধর্মসংস্কার আন্দোলন ইউরোপকে মধ্যযুগীয় সম্মোহন থেকে জাগ্রত করেছিল ঠিকই, কিন্তু তাঁকে আধুনিক মনস্ক করে তুলেছিল বিজ্ঞান বিপ্লব। অধ্যাপক বাটারফিল্ডের ভাষায়- খ্রিষ্ট ধর্মের উত্থানকেও বৈজ্ঞানিক বিপ্লব নিষ্প্রভ করে দিয়েছিল। বিজ্ঞান বিপ্লবকে পাথেয় করেই ভবিষ্যতে ইউরোপ উন্নতি এবং চরম শিখরে উন্নতি হতে পেরেছিল। বিজ্ঞান বিপ্লব যে বিজ্ঞান মনস্কতা তথা 'Scientific Methodology'- এর জন্ম দিয়েছিল তার ওপর ভিত্তি করেই একাধারে কোপারনিকাস, গ্যালিলেই, উইলিয়াম হার্ভে, রবার্ট বয়েল, আইজ্যাক নিউটনের মত খ্যাতানামা বৈজ্ঞানিকদের আবির্ভাব ঘটেছিল – যারা কেবল ইউরোপ নয়- গোটা বিশ্বকে নতুন পথের দিশা দান করেছিল।

প্রাক রেনেসাঁ যুগে ইউরোপে বৈজ্ঞানিক ধ্যান-ধারণার প্রতি আগ্রহ যথেষ্ট সীমিত ছিল। এ বিষয়ে ইসলামীয় জগৎ তথা আরবীয় পন্ডিতদের মাধ্যমে প্রাচীন গ্রিক-রোমান বৈজ্ঞানিক ধারণার পুনঃমুল্যায়ন এই সময় শুরু হয়েছিল। এক্ষেত্রে স্পেন ছিল যথেষ্ট অগ্রগণ্য, যেখানে মূলত আরবীয় পৃষ্টপোষকতায় গণিত, জ্যোতির্বিজ্ঞান, রসায়ন, চিকিৎসাশাস্ত্র ইত্যাদির চর্চা বহু পূর্ব থেকেই অব্যাহত ছিল। একাদশ-দ্বাদশ শতক থেকে রেনেসাঁর দ্বারা উদ্বুদ্ধ ইউরোপীয়রা প্রধানত স্পেনের এই দৃষ্টান্তকে সামনে রেখেই পরীক্ষামূলক বিজ্ঞান চর্চায় (Applied Science) আগ্রহী হয়ে ওঠে। মানুষের সহজাত অনুসন্ধিৎসু মানুষিকতার ওপর ভিত্তি করেই অক্সফোর্ড সহ অন্যান্য বিশ্ববিদ্যালয়ে বিজ্ঞানচর্চা তথা পরিক্ষালব্ধ জ্ঞানের ওপর অধিক গুরুত্ব আরোপ শুরু হয়।

তবে এক্ষেত্রে বলা যায়- মুদ্রণ যন্ত্র, সামরিক বিপ্লব ইত্যাদির মতোই বিজ্ঞানের অগ্রগতির ক্ষেত্রেও প্রাচ্য জগৎ পাশ্চাত্যকে ভীষণভাবে প্রভাবিত করেছিল। শূন্যের আবিস্কার, পৃথিবী ও সৌরজগৎ সম্পর্কে বিশিষ্ট ভারতীয় জ্যোতির্বিজ্ঞানী আর্যভট্টের মৌলিক সিদ্ধান্ত সর্বোপরি প্রাচীন চৈনিক ভাবধারাও ইউরোপের বৈজ্ঞানিক জগতের বিকাশে সাহায্য করেছিল। এক্ষেত্রে পণ্যের আদান-প্রদানের মতো বৈজ্ঞানিক ভাবনা-চিন্তার আদান-প্রদানেও আরবীয় বণিকরা বিশিষ্ট ভূমিকা পালন করেছিল। তবে কেবল প্রাচ্য নয় গ্রিক-রোমান চিন্তাধারা সর্বোপরি রেনেসাঁ প্রসূত মানবতাবাদের আদর্শও এক্ষেত্রে কোনভাবেই কম ছিল না।

কোপারনিকাস পূর্ববর্তী ইউরোপে বিশ্বব্রহ্মাণ্ড ও প্রকৃতিলোক সংক্রান্ত ধারণা প্রধানত অ্যারিস্টটলীয় কলাবিদ্যা, টলেমির জ্যোতির্বিজ্ঞান এবং খ্রিস্টীয় ধর্মশাস্ত্রের ওপর ভিত্তি করেই গড়ে উঠেছিল। এই ধারণায় নিশ্চল পৃথিবীর অবস্থান ছিল ব্রহ্মান্ডের ঠিক কেন্দ্রে এবং চন্দ্র, সূর্য, গ্রহ, নক্ষত্র সব পৃথিবীকে কেন্দ্র করেই আবর্তিত হচ্ছে। এই সময় সবকিছুরই ব্যাখ্যা ছিল ঈশ্বর কেন্দ্রিক। তবে ষোড়শ ও সপ্তদশ শতকের নব্য বিজ্ঞানচর্চা প্রকৃতি ও জীবলোক সম্বন্ধীয় বহু প্রচলিত ধ্যান-ধারণাকেই ভ্রান্ত প্রমাণ করে চিন্তার জগতে বিপ্লব ঘটিয়েছিল।

অক্সফোর্ড বিশ্ববিদ্যালয়ের অধ্যাপক তথা ফ্রান্সিসকান পন্ডিত রজার বেকন – এর (১২১৪-১২৯২) মতে, বিজ্ঞান সাধনা মানুষকে শিখিয়েছে যে, ধর্মকে অবলম্বন না করেও মানব জীবন-যাপন সম্ভব। ক্ষুদ্র গন্ডি তথা ধর্মতত্বের বাইরে বিভিন্ন ঘটনার ব্যাখা খোঁজার এই অদম্য মানুষিকতাই উত্তরাধিকার সূত্রে ইউরোপীয়দের মধ্যে যেন এক অভাবনীয় উদ্দীপনার সৃষ্টি করেছিল। মানুষ মেতে উঠেছিল নতুন আবিষ্কারের নেশায়। প্রসঙ্গত উল্লেখ্য রজার বেকন – এর আলোক বিদ্যা, শব্দ ও তাপ বিষয়ক বিদ্যা, বর্ণ-তত্ত্ব, দর্শন অনুপাত বিদ্যা, বারুদের ব্যাবহার সহ একাধিক বিষয়ে মৌলিক চিন্তাধারা পরীক্ষা-মূলক বিজ্ঞান চর্চার নতুন দিক সঞ্চার করেছিল -যা ছিল রেনেসাঁ যুগের বিজ্ঞান চর্চার মূল ভিত্তি।

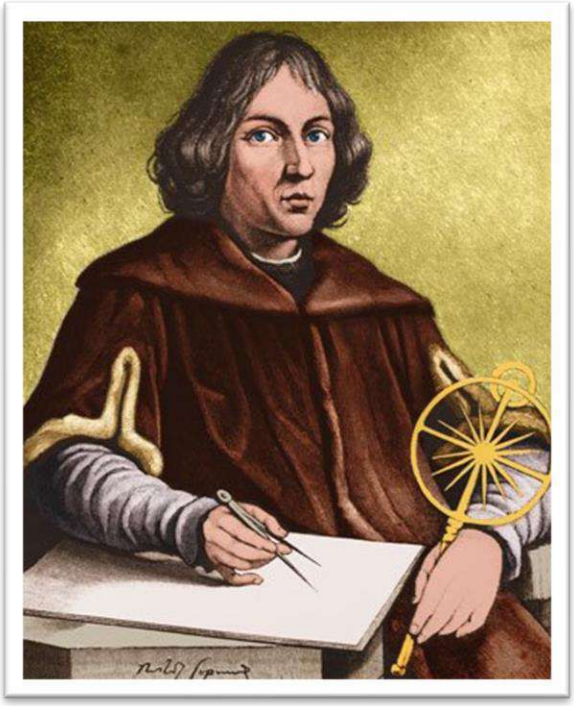
এই ঐতিহ্যকে সামনে রেখেই কোপারনিকাস, জোহানেস কেপলার, লিওনার্দো-দ্য-ভিঞ্চি, গ্যালিলিও, আইজ্যাক নিউটন প্রমুখের সান্নিধ্যে ইউরোপে বিজ্ঞানের দিগন্ত উন্মোচিত হয়। কোপারনিকাসের - 'On the revolution of the Heavenly Spheres' (১৫৪৩)- গ্রন্থের মাধ্যমে বিজ্ঞানচর্চার যে ধারা শুরু হয়েছিল আইজ্যাক নিউটনের-তে (১৬৮৭) তা পরিপূর্ণরূপে বিকশিত হয়।

২। বিশিষ্ট বিজ্ঞানীগণ :-

প্রসঙ্গত উল্লেখ্য এক্ষেত্রে বৈজ্ঞানিক বিপ্লবের যে দুইটি পর্যায় লক্ষ্য করা যায় তার মধ্যে প্রথম পর্যায় অর্থাৎ চতুর্দশ-পঞ্চদশ শতকে বৈজ্ঞানিক অনুসন্ধানের তিনটি ধারার সহাবস্থান ছিল। যথা – তর্কশাস্ত্রীয় (logical), পরীক্ষামূলক (Experimental), এবং গাণিতিক (Mathematical)। অন্যদিকে এর দ্বিতীয় পর্যায়ে এই তিনটি পৃথক ধারার সমন্বিত রূপ বিকশিত হয়, যা মানুষকে এক অভাবনীয় পরিবর্তনের মুখাপেক্ষী করে তুলেছিল। এই প্রসঙ্গে উক্ত সময়কালীন বিশিষ্ট বৈজ্ঞানিকদের অবদান আলোচনা করা যেতে পারে।

২.১। নিকোলাস কোপারনিকাস (১৪৭৩ - ১৫৪৩ খ্রিষ্টাব্দ) :-

আধুনিক জ্যোতির্বিজ্ঞানের জনক নিকোলাস কোপারনিকাস ১৪৭৩ খ্রিস্টাব্দে পোল্যান্ডের টোরান শহরে জন্মগ্রহণ করেন। ১৮ বছর বয়সে ক্র্যাকো বিশ্ববিদ্যালয়ে (১৪৯১-৯৪) পড়ার সময় তিনি সেইযুগের বিশিষ্ট বিজ্ঞানী অ্যালবার্ট রুগেসকি এর সংস্পর্শে আসেন এবং জ্যোতির্বিজ্ঞানের প্রতি আকৃষ্ট হল। অতঃপর জ্যোতির্বিজ্ঞান ছিল তাঁর ধ্যান-জ্ঞান ও চিন্তা। এই পর্বে, অর্থাৎ ১৪৯৭-১৫০৩ খ্রিস্টাব্দে তিনি ইতালির বোলোনা ও পাদুয়াতেও পড়াশোনা করেছিলেন। অবশ্য এর পাশাপাশি তিনি চিকিৎসাশাস্ত্রও অধ্যায়ন করেন এবং কিছুকাল চিকিৎসকের পেশায় নিযুক্ত থাকেন। পরবর্তীকালে রোম বিশ্ববিদ্যালয়ে গণিত ও জ্যোতির্বিজ্ঞানের অধ্যাপক রূপে তিনি প্রকৃত ও সার্থক কর্মজীবন শুরু করেন।



চিত্র : ১ - নিকোলাস কোপারনিকাস (১৪৭৩ - ১৫৪৩ খ্রিষ্টাব্দ)

আধুনিক জ্যোতির্বিজ্ঞানের জনক নিকোলাস কোপারনিকাস কেবল কয়েকটি মহামূল্যবান বৈজ্ঞানিক সত্যের প্রতিষ্ঠা নয়- পরম্পরাগত সার্বজনীন ভ্রান্ত ধারণা বা বিশ্বাসের মূলে কুঠারঘাত করেছিলেন। তিনিই সর্বপ্রথম গাণিতিক সমীকরণের মাধ্যমে ঘোষণা করেন যে সূর্যকে কেন্দ্র করেই পৃথিবী ও অন্যান্য গ্রহগুলি নির্দিষ্ট সময় ও কক্ষপথে প্রদক্ষিণ

করছে। একটি প্রচলিত ভ্রান্ত ধারণাকে মিথ্যে প্রমাণ একদিকে সেইযুগে যেমন কিছু স্বল্পসংখ্যক মানুষ আলোকিত হয়েছিল, অন্যদিকে তেমনি কুসংস্কারাচ্ছন্ন ধর্মীয় সম্প্রদায় তাঁর ওপর ক্রুদ্ধ হয়েছিল। কিন্তু এদের বিরূপ সমালোচনা তাঁকে এতটুকু বিচলিত করেনি। তাঁর মৃত্যুর অব্যাহতি আগে প্রকাশিত 'On the revolution of The Hevenly Spheres' – জ্যোতির্বিজ্ঞানের জগতে এক বিপ্লবের সূচনা করেছিল।

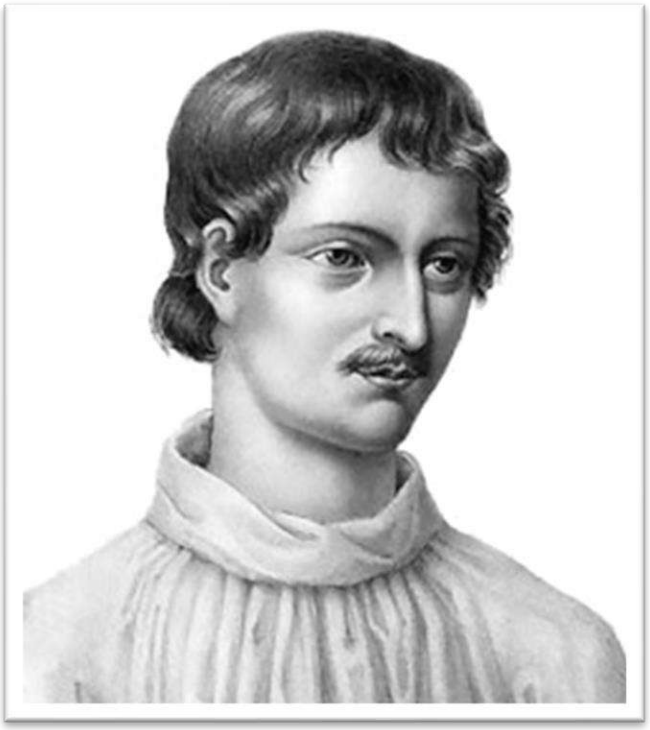
রেনেসাঁসের যুগ থেকেই মহাকাশ বিজ্ঞানের আলোচনায় টলেমির পৃথিবী কেন্দ্রিক ধারণার (Ptolemaic geocentric system) বিরুদ্ধে প্রতিবাদ শুরু হয়েছিল। কোপারনিকাসের যুগান্তকারী আবিস্কার এই চিরাচরিত চার্চ সমর্থিত আদর্শের বিরুদ্ধে তীব্র প্রতিবাদ জানিয়েছিল এবং তা পরবর্তীকালে পর্যবেক্ষণ ও নিরীক্ষণ নির্ভর বিজ্ঞান চর্চার অন্যতম মাধ্যম হিসাবে ব্যাবহৃত হতে থাকে। যার মাধ্যমে কোপারনিকাসের তত্ত্বের পরীক্ষামূলক প্রতিষ্ঠা।

২.২। গ্যালিলিও গ্যালিলেই (১৫৬৪ – ১৬৪২ খ্রিষ্টাব্দ) :- বিজ্ঞান বিপ্লবের সবথেকে মূল্যবান জ্যোতিষ্ক ছিলেন গ্যালিলিও গ্যালিলেই। ১৫৬৪ খ্রিস্টাব্দে ইতালির পিসা শহরে জন্মগ্রহণ করেন। ১৭ বছর বয়সে তিনি পিসা বিশ্ববিদ্যালয়ে চিকিৎসাশাস্ত্র অধ্যয়নের জন্য ভর্তি হন। কিন্তু কোপারনিকাসের মতো তিনিও গণিত ও জ্যোতির্বিদ্যার প্রতি যথেষ্ট আকর্ষণ অনুভব করতেন। একবার সেকালের প্রসিদ্ধ গণিতবিদ ইউক্লিডের বক্তৃতা শুনে গণিতের প্রতি অনুসন্ধিৎসু হয়ে ওঠেন। ১৫৮৯ খ্রিস্টাব্দে তিনি পিসা বিশ্ববিদ্যালয়ে গনিতশাস্ত্রের অধ্যাপক নিযুক্ত হন। এখানে থাকাকালীন তিনি নানা পর্যবেক্ষণ ও গবেষণার সাহায্যে 'দোলকের সূত্র' এবং 'পতনশীল বস্তুর সূত্র' আবিষ্কার করেন, যা ছিল এক একটি অভূতপূর্ব আবিষ্কার। ১৬১০ খ্রিস্টাব্দে তিনি তাঁর উল্লেখযোগ্য গ্রন্থ The Starry Messenger প্রকাশ করেন।

চিত্র : ২ - গ্যালিলিও গ্যালিলেই (১৫৬৪ – ১৬৪২ খ্রিষ্টাব্দ)

তিনিই প্রথম আবিষ্কার করেছিলেন একটি উন্নতমানের টেলিস্কোপ যার সাহায্যে তিনি পর্যবেক্ষণ করেন সূর্য-কলঙ্ক, বৃহস্পতির চারটি উপগ্রহ, শুক্র ও মঙ্গলের কলা এবং শনির বলয়। বলাবাহুল্য তিনি ছিলেন কোপারনিকাসের সুযোগ্য ভাবশিষ্য এবং তাঁর তত্ত্বের একজন দৃঢ় সমর্থক। তথাকথিত অলঙ্ঘনীয় ধর্মদর্শের বিরোধিতার অপরাধে তাঁর বিচার হয়েছিল। স্বয়ং পোপ তাঁকে ডেকে পাঠিয়ে ভৎসর্না করেছিলেন। দুঃসহনীয় মানুষিক চাপ ও নিপীড়নের সম্মুখে নতিস্বীকার করে তিনি তাঁর উপলব্ধ সত্য প্রত্যাহার করতে বাধ্য হয়েছিলেন। ব্যাথিত-হৃদয় মানুষটি অতঃপর গ্রামবাসী হন। গ্রামে থাকাকালীন তিনি দৃষ্টিশক্তি হারান। ১৬৪২ খ্রিস্টাব্দে এই ক্ষণজন্মা মহাবিজ্ঞানী শেষ নিঃশ্বাস ত্যাগ করেন।

২.৩। জিওরদানো ব্রুনো (১৫৪৮-১৬০০ খ্রিস্টাব্দ) :- আলোচ্য পর্বের বিশিষ্ট জ্যোতির্বিদ্যার মধ্যে অন্তত একজন বিদ্রোহী রূপে চিরস্মরণীয় হয়ে থাকবেন। ইনি ছিলেন জিওরদানো ব্রুনো। কোপারনিকাসের তত্ত্বকে সমর্থন এবং বিশ্ববিদ্যালয় তথা সাধারণ মানুষের মধ্যে প্রচারের অপরাধে তাকে চার্চ গ্রেফতার করেছিল। Inquisition বা ধর্মীয় আদালতে বিচারের (বিচারের প্রহসন) পর ইনি মৃত্যুদণ্ডে দণ্ডিত হন। অবর্ণনীয় শারীরিক এবং মানুষিক উৎপীড়ন সত্ত্বেও নবজাগরণ প্রসূত আত্মমর্যাদাবোধ ও যুক্তিবাদের দ্বারা চালিত ব্রুনো কিন্তু দোষ স্বীকার করেননি। অতঃপর এই নির্ভিক বিজ্ঞানীকে জ্বলন্ত অগ্নিকুন্ডে নিক্ষেপ করা হয়। সমকালীন শিক্ষিত সমাজ এই নৃশংসতায় স্তম্ভিত হয়ে গিয়েছিল। ব্রুনোর এই শহীদের মর্যাদাবরণ একেবারে ব্যর্থ হয়নি। এর পরবর্তীকালে কোপারনিকাসের তত্ত্ব আরোও প্রসারিত হয়েছিল এবং অভাবনীয় জনপ্রিয়তা অর্জন করেছিল। ব্রুনো অন্তত পরোক্ষভাবে Reformation আন্দোলনকেও প্রভাবিত করেছিলেন।



চিত্র : ৩ - জিওরদানো ব্রুনো (১৫৪৮-১৬০০ খ্রিস্টাব্দ)

২.৪। জোহান কেপলার (১৫৭১-১৬৩০ খ্রিস্টাব্দ) :- এই যুগের আর এক বিশিষ্ট জার্মান বিজ্ঞানী জোহান কেপলার ১৫৭১ খ্রিস্টাব্দে জার্মানির ওয়াইল শহরে জন্মগ্রহণ করেছিলেন। ১৫৯৩ খ্রিস্টাব্দে তিনি প্রাগ বিশ্ববিদ্যালয়ে গণিতের অধ্যাপক পদে নিযুক্ত হন। যেখানে থাকাকালীন প্রোটেস্ট্যান্ট মতাবলম্বীদের সঙ্গে বিরোধের পরিপেক্ষিতে তিনি তৎকালীন বোহেমিয়ার রাজধানী প্রাগ শহরে চলে যেতে বাধ্য হন।

তিনি কেবলমাত্র কোপারনিকাসের তত্ত্বের একজন একনিষ্ঠ সমর্থক ছিলেন তা নয় তিনি এই তত্ত্বকে এক নতুন ভিত্তিও প্রদান করেছিলেন। পৃথিবী তথা গ্রহগুলির কক্ষপথকে তিনি প্রথম উপবৃত্তাকার হিসেবে প্রমাণ করতে সচেষ্ট হন। কেপলারের মতে এই উপবৃত্তাকার কক্ষপথের কেন্দ্রে নয়- নাভি বা ফোকাসে সূর্য অবস্থান করছে। কেপলারের মতে এই তত্ত্বের মাধ্যমে গ্রহ নক্ষত্রের পরিক্রমন গতি এবং এর সময়কাল নিখুঁতভাবে গণনা করা সম্ভব হয়েছিল। পরবর্তীকালে এর ওপর ভিত্তি করেই দিনরাত্রি এবং ঋতু পরিবর্তনের রহস্য উদ্ঘাটন সম্ভব হয়েছিল। ১৬১২ খ্রিস্টাব্দে তাঁর গ্রন্থ 'হারমানিকস মুন্ডি' (Harmonices Mundi)। পরবর্তীকালে বিজ্ঞানী আইজ্যাক নিউটনের গবেষণায় যথেষ্ট অনুপ্রেরণা সঞ্চার করেছিল।

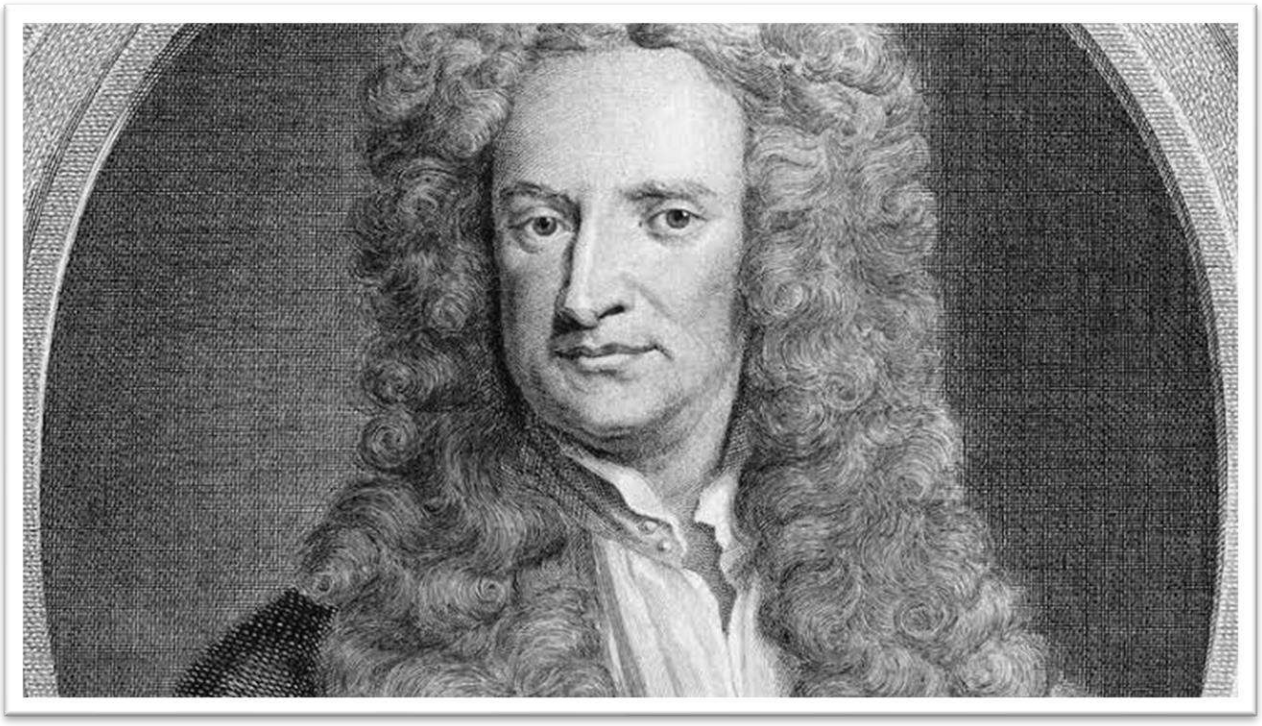
চিত্র : ৪ - জোহান কেপলার (১৫৭১-১৬৩০ খ্রিস্টাব্দ)

২.৫। ফ্রান্সিস বেকন (১৫৬১-১৬২৬ খ্রিস্টাব্দ) :- ইংল্যান্ডে বৈজ্ঞানিক গবেষণার পথিকৃৎ ছিলেন ফ্রান্সিস বেকন। তিনি অবশ্য প্রকৃত অর্থে বৈজ্ঞানিক ছিলেন না। তাঁর সমকালীন বা পূর্ববর্তী যুগের ইউরোপীয় মহাদেশে যে সমস্ত যুগান্তকারী ও বৈপ্লবিক বৈজ্ঞানিক আবিষ্কার হয়েছিল, তার সম্বন্ধেও তিনি খুব সম্ভবত ওয়াকিবহাল ছিলেন না। তাঁর প্রধান পরিচিতি ও খ্যাতি একজন সাহিত্যিক, দার্শনিক ও আইনজ্ঞ হিসাবে। কিন্তু এই সীমাবদ্ধতা সত্ত্বেও বৈজ্ঞানিক গবেষণার উজ্জ্বল সম্ভাবনার প্রতি সমকালীন ও আগামী প্রজন্মের মানসে উদ্দীপনা সৃষ্টির কৃতিত্ব তিনি দাবি করতে পারেন। তিনি ছিলেন বিজ্ঞান সাধনার পক্ষে একজন বড় মাপের প্রচারক। বৈজ্ঞানিক গবেষণার জন্য একটি 'অ্যাকাডেমি' শিক্ষায়তন প্রতিষ্ঠার কথা তিনি বলেছিলেন। যদিও তাঁর যুগে অনুরূপ কোনো প্রতিষ্ঠান গড়ে ওঠেনি কিন্তু পরবর্তীকালে তাঁর প্রচারের অনুপ্রেরণায় প্রসিদ্ধ রয়্যাল সোসাইটি প্রতিষ্ঠিত হয়েছিল স্টুয়ার্ট বংশীয় নৃপতি দ্বিতীয় চার্লসের রাজত্বকালে (১৬৬০ খ্রিস্টাব্দে)। তিনি ছিলেন এই গবেষণা কেন্দ্রের আত্মিক প্রতিষ্ঠাতা।

এছাড়া, বিজ্ঞান সাধনার পক্ষে একটি অনুকূল বাতাবরণ সৃষ্টি ছিল তাঁর অন্যতম কৃতিত্ব। ইউরোপের বহু দেশে বৈজ্ঞানিক গবেষণার পক্ষে উপযুক্ত স্বাধীন ও মুক্ত পরিবেশ ছিল না। বিশেষত প্রতি-ধর্মসংস্কারের (counter reformation) যুগে ধর্মীয় অসহিষ্ণুতা ও ভ্রুকুটি বিজ্ঞানচর্চার ক্ষেত্রে অলঙ্ঘনীয় প্রতিবন্ধকতার সৃষ্টি করত যার নিদারুণ প্রতিক্রিয়া অনুভব করেছিলেন ব্রুনো ও গ্যালিলিওর মতো বিশিষ্ট বিজ্ঞান-সাধকগণ। কিন্তু রজার বেকনের উচ্চপদ ও সুখ্যাতি বহু অনুসন্ধিৎসু মানুষকে তাঁর পৃষ্ঠপোষকতা গ্রহণ ও ছত্রছায়ায় অবস্থান করতে অনুপ্রাণিত করেছিল। তাঁর ব্যাপক বৈজ্ঞানিক গবেষণা-সংক্রান্ত পরিকল্পনার পরিচয় তাঁর ১৬২৩ খ্রিস্টাব্দে প্রকাশিত ডি অগমেন্টিস সাইন্টিয়ারাম (De Augmentis Scientiarum) গ্রন্থে পাওয়া যায়।

চিত্র : ৫ - ফ্রান্সিস বেকন (১৫৬১-১৬২৬ খ্রিস্টাব্দ)

২.৬। স্যার আইজ্যাক নিউটন (১৬৪২-১৭২৭ খ্রিস্টাব্দ) :- স্যার আইজাক নিউটনের কথা না বললে এই আলোচনা অসম্পূর্ণ থেকে যাবে। ইতিপূর্বেই বলা হয়েছে যে এই বিশিষ্ট বিজ্ঞানী কেপলারের তত্ত্বে প্রভাবিত হয়ে তাঁর বিখ্যাত মহাকর্ষের সূত্র আবিষ্কার করেন। কেপলারের তত্ত্ব অনুধাবন করে তাঁর মনে হয়েছিল এই উপবৃত্তাকার কক্ষপথে প্রদক্ষিণের জন্য অবশ্যই সূর্য এবং গ্রহগুলির মধ্যে কোনো এক বল বা আকর্ষণ অবশ্যই রয়েছে। যার দ্বারা তিনি গতির সূত্র (Law of Motion), পরমাণু তত্ত্ব, কণাবাদ, ক্যালকুলাস ইত্যাদির সূত্র আবিস্কার করেন। ১৬৯৯ খ্রিস্টাব্দে তাঁকে কেমব্রিজ বিশ্ববিদ্যালয়ে পদার্থবিদ্যার অধ্যাপক নিয়োগ করা হয়। তিনি ছিলেন রয়্যাল সোসাইটির উজ্জ্বলতম জ্যোতিষ্ক। পদার্থবিদ্যায় তাঁর অসামান্য কতৃত্বের সাক্ষ্য বহন করছে ১৬২৭ খ্রিস্টাব্দে প্রকাশিত তাঁর বিখ্যাত 'Principia' (Principia Mathametica) গ্রন্থটি। যেখানে ক্যালকুলাসের স্বার্থক ব্যাবহার ঘটিয়ে তিনি পদার্থবিদ্যার বহু গুরুত্বপূর্ণ সমস্যার সমাধান করতে পেরেছিলেন। উক্ত গ্রন্থের মাধ্যমে তিনি অভিকর্ষ বল সম্পর্কিত যে তত্ত্ব প্রদান করেছিলেন তা আজও বিশ্বে একইভাবে সমাদৃত।



চিত্র : ৬ - স্যার আইজ্যাক নিউটন (১৬৪২-১৭২৭ খ্রিস্টাব্দ)

৩। 'বিজ্ঞান বিপ্লব' কতটা 'বৈপ্লবিক' ছিল? :- অবশ্য, এযুগের বিজ্ঞানচর্চা যে সম্পূর্ণ ত্রুটিমুক্ত ছিল এটা মনে করার কোনো কারণ নেই। আলোচ্য পর্বে মানুষের অনুসন্ধিৎসা এবং সমালোচনামূলক দৃষ্টিভঙ্গি সত্ত্বেও বিজ্ঞানসাধনা প্রথাগত বিশ্ববীক্ষার ক্ষেত্রে সর্বক্ষেত্রে সবসময় উল্লেখযোগ্য পরিবর্তন ঘটাতে পারেনি। এযুগে জ্যোতির্বিদরা গ্রহ-নক্ষত্রের আবর্তন লক্ষ্য করছিলেন, কিন্তু সবসময় তার বিজ্ঞানসম্মত ব্যাখ্যা দিতে পারেননি। অবশ্য কোপারনিকাস ও গ্যালিলিও পরবর্তীকালে সৌরজগৎ ও বিশ্বব্রহ্মান্ডের কথা বলেছিলেন। আর একটি সীমাবদ্ধতা আমাদের দৃষ্টি আকর্ষণ করে। বিজ্ঞানচর্চার সূত্রপাত হওয়া সত্ত্বেও মানুষের এক অংশের জ্যোতিষশাস্ত্রের প্রতি বিশ্বাস প্রায় অক্ষুন্ন ছিল। এদের চোখে জ্যোতির্বিজ্ঞান ও জ্যোতিষশাস্ত্র প্রায় সমার্থক ছিল। এক্ষেত্রে উল্লেখযোগ্য ব্যাতিক্রম ছিলেন রেনেসাঁস পর্বের অন্যতম শ্রেষ্ঠ মনীষী পিকোদেল্লা মিরানদোলা। তিনি আবহাওয়া সংক্রান্ত তত্ত্ব সংগ্রহ করে জ্যোতিষশাস্ত্রের অসারতা প্রমাণ করতে সচেষ্ট হয়েছিলেন। কিন্তু এনার কয়েকজন সমসাময়িক বিশিষ্ট পন্ডিত, ফিসিনো ও পন্টানো বংশ, শিক্ষা ও পরিবেশের প্রভাব পুরোপুরি অস্বীকার না করেও গ্রহের তথাকথিত প্রভাবকে অগ্রাহ্য করেননি। অপ-রসায়নবিদরাও গ্রহের প্রভাব কিছুটা মেনে নিয়েছিলেন। এ যুগের বিশিষ্ট বৈজ্ঞানিকদের একাংশে গবেষণা ও ধর্মাচারণকে অভিন্ন বলে মনে করতেন। বিশ্বব্রহ্মান্ডের গতি-প্রকৃতির পশ্চাতে তাঁরা ঐশ্বরিক মহিমা লক্ষ্য করেছিলেন। স্বয়ং আইজ্যাক নিউটন তাঁর 'প্রিন্সিপিয়া' গ্রন্থে লিখেছিলেন, 'সূর্য, গ্রহ ও ধূমকেতু নিয়ে অসীম সুন্দর জগৎ গড়ে উঠেছে, তা পরিচালিত হচ্ছে অসম্ভব মেধাবী ও ক্ষমতাসম্পন্ন এক সত্তার আদেশে'। রবার্ট বয়েলের বিজ্ঞান সাধনার ক্ষেত্রে প্রোটেস্ট্যান্ট মতবাদের প্রভাব লক্ষ করা যায়। প্রধানত এইসব কারণে এইযুগের 'বৈজ্ঞানিক বিপ্লপ' কতদূর 'বৈপ্লবিক' ছিল সেই বিষয়ে সংশয়ের অবকাশ থেকেই যায়। অবশ্য, এইসব সীমাবদ্ধতা সত্ত্বেও আলোচ্য পর্বের বৈজ্ঞানিক চেতনা তথা চিন্তাধারা যে সামগ্রিক বিচারে 'বৈপ্লবিক' ছিল সেটা অনস্বীকার্য।

-: গ্রন্থপঞ্জী :-

১। চক্রবর্তী,ভাস্কর,চক্রবর্তী,সুভাষরঞ্জন,চট্টোপাধ্যায়,কিংশুক,ইউরোপে যুগান্তর,নবভারতি প্রকাশনী, কলকাতা,২০০৫

২। বসু,বাসবেন্দ্র,আধুনিক ইউরোপের বিবর্তন মধ্য পঞ্চদশ থেকে মধ্য অষ্টাদশ শতক,মিত্রম প্রকাশনী, কলকাতা,২০০৮

৩। মুখার্জি,রীলা,রূপান্তরিত ইউরোপ (৯০০ -১৮০০),প্রোগ্রেসিভ পাবলিশার্স,কলকাতা,২০০৪

৪। সেন,সমরেন্দ্র,বিজ্ঞানের ইতিহাস,শৈব্যা প্রকাশন,কলকাতা,১৯৯৬

৫। বার্নাল,জে,ডি,ইতিহাসে বিজ্ঞান,আনন্দ প্রকাশনী,কলকাতা,২০০৫

৬। Hill,Christopher,A century of Revolutions,Psychology Press,2002

৭। Hall,R, From Galileo to Newton Courier Corporation,1981

-: চিত্রসূচি :-

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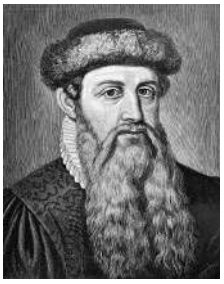
TOPIC -

PRINTING REVOLUTION

CONTENT

CONTRIBUTION OF GUTENBERG



When we talk about the printing revolution we cannot ignore the immense contribution of Gutenberg to it. In Europe the printing press did not appear until 150 years after Wang Chen's innovation. Goldsmith and inventor Johannes Gutenberg was a political exile from Mainz, Germany when he began experimenting in Strasbourg, France in 1440. He returned to Mainz several years later and by 1450 had a printing machine perfected and ready to use the Gutenberg press. Integral to Gutenberg's design was replacing wood with metal and printing blocks with each letter, creating the european version of moveable type. In order to make the type available in large quantities and to different stages of printing, Gutenberg applied the concept of replica casting, which saw letters created in reverse in brass and then replicas made from these molds by pouring molten lead. Gutenberg actually used the sand casting system that uses carved sand to create the metal molds. The letters were fashioned to fit together uniformly to create level lines of letters and consistent columns on flat media. Gutenberg was also able to perfect a method for flattening printing paper for use by using a winepress.

SPREAD OF PRINT CULTURE AND PRINTING REVOLUTION

No less significant than the rise of nation states and royal absolutism in the realm of politics and the commercial expansion of Europe and the subsequent development of capitalism in the economic sphere was the intellectual quickening in the early modern period 15th and 16th century which has had a profound impact on modern society and civilization. This quickening was most evident in the invention of printing and the resulting diffusion of knowledge.The invention of the mechanical process of knowledge texts was multiple and cumulative and it was successfully completed in Western Europe by Mainz printers - Johannes Gensfleisch Zum Gutenberg, Joharn Fust and Peter Schoffer, Fust's son in law in 1450s. However, it is noteworthy this process of printing had earlier beginnings. The concept of mechanical duplication can be traced back in the early 8th century in China where Xylography or Block printing was in vogue.

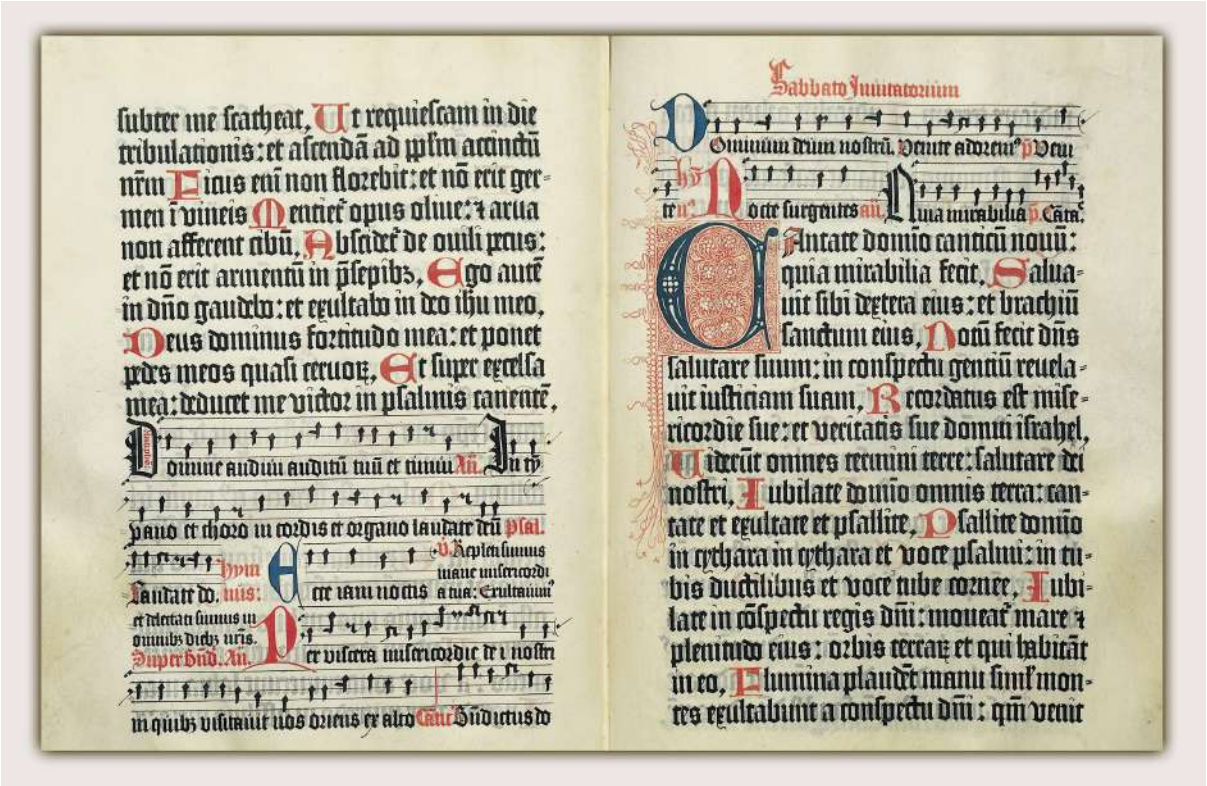
The process of block printing was simple in conception but difficult and time consuming in execution. However, its transmission to the West probably during 1250-1350 CE through the Arabs in a way contributed much to the conceptualization of the process of printing.
In order to do away with the shortcomings of block printing movable type printing technology was invented in China and perfected in the West by the Mainz Printers. The development in the process of casting individual letters in separate little places of metal (metal type), all of the same height and then arranging them in a sequence provided the flexibility and dynamism that turned the process of printing into a socio-cultural revolution. Another important Chinese invention that facilitated the printing revolution was the invention of paper. Earlier, manuscript books were usually copied on parchment(sheep skin) or a Vellum (Calf Skin). These materials were also used by typographic printers when the aim was magnificence rather than utility. But a large book like the Bible required as many as 170 calf skins or 300 sheeps skins. Hence paper became indispensable for economic rather technical reasons as pointed out by Lucier Febvre and Henri Jean Martin in "The Coming of the Book".Paper manufacture was introduced in Spain during the 12th century by the Arabs and slowly spread all over Europe. But the time of Gutenberg's youth paper was plentiful and

sold for approximately one sixty the price of parchment. Printing drew upon European methods also, as it required oil-based ink to adhere to the metal type smoothly and evenly. A suitable printer ink, consisting of a pigment (powdered charcoal) ground in a licensed oil vanish, was simply an adaptation of oil paintings used by the Fleishman artisans since the 15th century.

Thus it can be said that printing, as it was practiced in Mainz by Gutenberg, Fust and Schoffer, required a suitable ink , a press for transferring the ink to paper and metal type. The actual invention of the printing press, the dramatic fusion of familiar techniques into a new and workable process was perfected and first organised into an industry by the Mainz printers.

According to Euan Cameron(Early Modern Europe) the key to the printing revolution was this combination of accuracy and flexibility.
The oldest and surviving books,printed with movable metal type in Mainz by Gutenberg, Fust and Schoffer in 1455 was the 42 line Latin Bible named the "Biblica Latina"

The craftsmanship of its type and the art of its typesetting and printing are impeccable. According to Eugene.F.Rice and Anthony Grafton, the Mainz printers had established the technology of printing on firm foundations.On August 14, 1457, Fust and Schoffer issued the Psalms. The volume was printed on vellum.



The psalms are the oldest signed and dated books and also one of the most beautiful books printed in Europe that have survived. These first printed books have a curious feature as their pages so closely resembled those of manuscript books. The books printed before 1500 were often called " Incunabula ". It has been suggested by Rice and Grafton that the earliest printers had no conception of the unique possibilities of their invention. They considered printing as " the art of writing artificially without a pen".
At this point of discussion, it is important to briefly delve into the context in which the process of printing became widespread in Europe. From the time of the establishment of Universities in the 13th century, there had developed a growing need to get hold of

manuscripts. Yet the manuscript copying technique had not developed so much to cope up with its growing demand.
Due to this pressing need, the printing industry showed prospects of potential profit and thus attracted the entrepreneurs. Without such a motive it has been argued by Euan Cameron , no one would have begun searching for the solution that came with printing. The printing press thus evolved such a practical solution to a practical problem. The immediate effect of printing was to further increase the circulation of these works which had already enjoyed success in manuscripts. Cameron argues that religious works were mostly printed before 1520, rather than the secular works Monasteries and Cathedral chapters contracted for the Latin Bibles, Missal,psalters and antiphonaries which were the printers most important production. However as Townshend grew in number, secular education became one of their major priorities which in turn increased the demand of printed books of all sorts in Latin and in Vernacular on grammar, dictionaries, Encyclopedia and elementary texts in Mathematics, Astrology, Medicines and Law.

The taste of Renaissance also prompted the process of printing. In 1465, two German printers Konrad Swemheyn and Arnold Pannartz issued Cicero's orator in Renaissance Roman style. Nicolas Jenson produced editions of Eusebius, Cicero and Vigil between 1470 and 1475 at Venice. Henri and Martin mentioned that at the initial stage the printers supplied books in University towns like Paris, Frankfurt etc.
From 1460- 1470 printing presses expanded remarkably and by 1480 printing presses were in operation in more than 110 towns in Western Europe. By 1500, the printing press was established in those places where capital could be found, patrons sought and contracts negotiated. According to the estimate given by Rice and Grafton, printing spread from Mainz to Cologne, Augsburg and Vienna. German printers spread the art to Italy, Switzerland and Bohemia in 1468, France and the Netherlands in 1470, Spain, England and Hungary between 1474-1476 and Denmark and Sweden in between 1482-83. By 1500 the presses had issued about six billion in Europe. 

IMPACT

The printing revolution ushered in the era of modern Europe by making both ancient and medieval texts available to a broader audience which produced a fertile ground for new ideas and new theories. The printing of books has been regarded as a watershed in history. Erasmus called printing the greatest of all discoveries.Elizabeth.L. Eisenstein, in The Printing Revolution in Early Modern Europe argues that the advent of the printing press entailed a communication revolution. There was a huge increase in the volume of books produced compared to handmade works at a low cost even. More authors were published including unknown writers. There was an increase in the use and standardization of the vernacular as opposed to Latin in books.

CENSORSHIP

All of these developments weren't welcomed by all people. The Catholic churches felt that some printed books might lead people to doubt their local clergy or even turn away from the Church. Some of these works were earlier released in manuscript form but it reached a zenith due to printed versions. Some new works were more overtly dangerous such as those written by Reformists for this reason in 16th century lists compiled for forbidden books. The first such list, the 1538 CE ITALIAN INDEX OF PROHIBITED BOOKS, was issued by the Senate of Milan. The papacy and other cities and states across Europe soon started to follow the practice.Further measures included checking texts before they were published and being more careful while issuing licenses to the printers. Authorities banned certain works or even anything written by a particular author. The De Revolutionibus Orbium Coelestium by the polish astronomer Nicolaus Copernicus was forbidden because of putting sun at the Centre of the solar system instead of Earth.

Many intellectuals too were equally dismayed at the availability of certain texts to a wide and discriminated audience. The Divine Comedy by the Italian author Dante Aligheiri was thought by some to contain certain moral, philosophical and scientific ideas which were dangerous for non scholars to contemplate

CONCLUSION

Printing revolution undoubtedly played a pivotal role in shaping the further societies of all over the world. The drastic change from oral transfer of knowledge to it getting printed down and being accessible to all made people conscious of their surroundings and led to a great change in the society.

ACKNOWLEDGEMENT

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REFERENCES

1. https://www.history.com/news/printing-press-renaissance
(ACCESSED ON 28TH JUNE 2021)

2. https://courses.lumenlearning.com/suny-hccc-worldhistory/chapter/the-printing-revolution/
(ACCESSED ON 28TH JUNE 2021)

3.https://www.worldhistory.org/article/1632/the-printingrevolution-in-renaissance
(ACCESSED ON 28TH JUNE 2021)

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Printing Revolution

The early modern period in European history coincides almost with the age of the hand press. Before c.1450, literature circulated in manuscript. Printing with movable metal type was perfected in Mainz about 1450. By the early 1450s, Johann Gutenberg and his assistants Johann Fust and Peter Schoffer had devised and perfected a mechanical technique to replicate a manuscript book by other means. The Printing press was a major event in the commercial and academic world and it began to spread in different parts of Europe, particularly in the Italian city states. With the advent of printing press, book production multiplied by the end of the 15th century. Indeed, the coming of the printing book not only brought about a fundamental change in the sphere of rational thinking but it also helped to bring about a revolutionary change in the social structure and culture of the contemporary European.

Eugene F. Rice and Anthony Grafton in "The Foundation of Early Modern Europe 1460-1559 argue that though the invention of the Printing press was successfully completed by Mainz printers in the 1450's, it had important earlier beginnings. Two Chinese inventions, block printing and paper are linked with the beginning of typographic printing in Western Europe.

Though the process of Xylography or block printing is difficult, time-consuming and wasteful in execution and ill adapted to the alphabetic writing of the West, its indirect importance was great as it certainly diffused the idea of Printing and of the printed book. Manuscripts were copied on parchment or vellum. But a large book like Bible would require 170 calf skins. Thus, paper became economically indispensable as by the early 15th century paper was sold for approximately $1/6^{th}$ the price of parchment. Europeans learnt paper manufacturing from the Arabs who introduced it in Spain in the 12th century.

Printing drew upon European methods also as it required oil based ink, a press for transferring the ink to paper and metal type. By that time in many places in Europe ingenious artisans experimented with type, inks and presses and finally this new process was perfected and first organized as an industry by Gutenberg, Fust and Schoffer.

The oldest surviving books printed with moveable metal type were issued in Mainz. The 42 line Latin Bible, associated with Gutenberg, was finished in 1455. Rice and Grafton state that the Mainz printers had established the technology of printing on firm foundations and his successors followed his process even after 300 years. On 14th August, 1457, Fust and Schoffer issued the Pslams printed on Vellum. It is one of the most beautiful and the oldest signed and dated book printed in Europe that has survived. The type, printed in red and black, fits handsomely on the page. Each psalm is adorned with the beauty of large initial letters, the lacy design of these letters, ornamented with flowers and animals, is masterly. Euan Cameron in his edited book 'Early Modern Europe' points out that the key to the 'Printing Revolution' was the combination of accuracy and flexibility.

The first printed books have curios feature as their pages so closely resemble those of manuscript books. It seems that the earliest printers had no conception of the unique potentialities of their invention. They considered printing only a new and particular kind of writing. Schoffer coined it as 'the art of writing artificially without pen'.

Lucien Febvre and Henri Jean Martin in "The Coming of the Book mention that at the

Initial period printers were planning trade outlets in university towns; Fust and Schoffer were supplying books for sale in Frankfurt, Lubeck, Angers and were about to open a bookshop in Paris. From 1460-70 printing expanded markedly and the trade improved its organization in Germany. By 1480 printing presses were in operation in more than 110 towns throughout Western Europe. From that it may be said of Europe that the printed books was in universal use. No fewer than 236 towns had seen printing presses installed by 1500. Rice and Grafton point out that by 1500 printers concentrated in places like Mainz, Strasbourg, Nuremberg, Augsburg, Basle, Venice, Rome, Paris or Lyons where venture capital could be found, patrons sought and contracts negotiated.

The printers worked for profit. The immediate effect of printing was to further increase the circulation of those works which had already enjoyed success in manuscript. Euan Cameron mentions that religious works are estimated to account for three quarters of all books published before 1520: 16 editions of the Latin Vulgate Bible appeared at Paris alone between 1475 and 1517, while translations into the various vernaculars numbered at least 60 editions across Europe before 1520. Febvre and Martin argue that one of the first effects of the printing press was to multiply the number of works of popular piety generally available; the press thus testified to the depth of religious feeling among people in the late 15th century.

Euan Cameron states that the printing press evolved as a practical solution to a practical problem. In the 15th century, the number of universities, schools, colleges and the demand for books among the merchants, substantial artisans, lawyers, doctors, teachers who lived and worked in towns seems to have been the key factor in the astonishingly rapid spread of printing between 1460 and 1500. Underlying the expansion of printing was that expansion of urban population and secular literacy which had begun in the high Middle Ages. As townsmen grew in number, education, wealth their cultural needs increased and they eagerly bought entertaining and useful books of all-sorts. By 1500, the presses had issued about 6 million books in approximately 40000 editions.

Febvre and Martin state that the reading public wanted to start their own private libraries grew in the 16th century and the number of books in these private libraries rose steadily. Of 377 libraries in the late 15th and 16th centuries, 105 belonged to churchmen and 126 were owned by the lawyers. In the course of time, church declined in relative importance as purchasers of books, lawyers, members of an ascending social group, became steadily more important.

The printing of books has been regarded as watershed in history. Erasmus called printing the greatest of all discoveries. The printing press played a vital role in the spread of the new learning. The introduction of printing provided a practical way to produce books. The printing presses became important vehicles of cultural exchange and communication. Elizabeth L. Eisenstein in "The Printing Revolution in Modern Europe" argues that the advent of printing entailed a ‘communication revolution’.

Alison Brown in her "The Renaissance' argues that printing was important because it helped to diffuse Renaissance ideas by making books much cheaper and more easily available. The

visual arts reached wider public. The influence of a man of letters like Erasmus of Rotterdum rapidly touched every intellectual circle in Europe through the printed word. Eisenstein states that printing not only diffused Renaissance culture throughout the Europe but also made another revival unnecessary, since, once printed, the classics were never lost again.

Febvre and Martin criticize the notion that the Reformation was the child of the printing press. But they argue that books played a critical role in the development of Protestantism in the 16th century. When Luther began his attacks on Indulgences, he affixed his posters to the door of the Augustinian Chapel at Wittenberg on the 31st October, 1517. His thesis, translated into German, were printed as flysheets and distributed throughout Germany. Printing also played its part in fermenting the peasants' revolt.

Printing also helped the spread of the Bible. Common people read the Bible in vernacular which resulted in the loss of prestige and influence of the papacy, church and clergy. Will Durant states the printing ended the clerical monopoly of learning and the priestly control of education. Common people now could challenge the church authority.

Febvre and Martin argue that when it first appeared printing was warmly received by many bishops and clergymen who fostered the establishment of presses. But the Orthodox Church was at pains to suppress the spread the heretical works. When printing was put into service on behalf of the Reformers, the Church authorities felt it necessary to prevent the multiplication of pernicious books by the press. Thus, by making reading more democratic, printing spawned the modern censor. Both secular and ecclesiastical authorities censored books to maintain political as well as religious orthodoxy. By 1560, censorship of books in all its forms was universal in Western Europe. Rice and Grafton state that the struggle between author, printer and publisher on the one hand, and ecclesiastical and governmental censors, on the other, had become one aspect of the battle for intellectual liberty and freedom of conscience in an age of fundamental ideological conflict.

S. Ozment argues that printing served the designs of kings as readily as those religious reformers. Thomas Cromwell, the chief advisor of King Henry VIII of England, defended the king's position through the printed material.

It may be stated that with the advent of printing publishing became a new profession in society and the day of preachers were gone. Copyists protested that printing would destroy their means of livelihood. Aristocrats opposed it as a mechanical vulgarization, and feared that it would lessen the value of their manuscript libraries, statesmen and clergy distrusted it as a possible vehicle of subversive ideas. But despite this opposition printing made it triumph nevertheless. Printing virtually marked the end of medieval cultural life and ushered in the 'Modern Era in Europe'.

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Bibliography

- Notes
- Google
- Wikipedia

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PRINTING REVOLUTION

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SEMESTER: IV

Department of History

Scottish Church College

CONTENTS

INTRODUCTION

During the middle ages in Europe, most people lived in small towns and isolated villages, so the only source of information for the people was the village Catholic priest. News passed from one person to another person, which often turned into a rumor. During those times no one could read and write the language they usually spoke. Those who were literate they usually go to the universities for higher education. These people go to the universities to master on Latin. During those time books were all hand copied, thus there price was very expensive. These books were rare and were often written in Latin. Merchants, craftsmen and scholars used their memory. Like merchants kept their accounts in their mind. A single hand copied book took around one year to be copied by the Scribes. Scribes were the monks who lived in the monasteries. The scribes used calfskin called vellum and later on paper. These books had painted capital letters and margins with colorful designs and even miniature scene. This entire works were done by the specialists or by the scribes. Though these books were beautiful work of art, they were very costly, rare and time taking to make. There was a high chance of error as it was copied hand written by the people.

FIG 1: A Scribe writing a book

In 1463, Johan Gutenberg invented the printing press in the Holy Roman Empire. He was a goldsmith by profession. He developed a complete printing system that perfected the printing process. He also made a groundbreaking invention on his own.

Woodblock Printing

World's first movable type technology was invented around 1040CE in China during the North Song Dynasty by the Bi Sheng, which was made of ceramic materials. Before movable type there was another technique that was Woodblock printing or Xylography. This technique was used in the East Asia from the 8th century. In this technique, ink was applied to the letters carved upon a wooden board which was assembled using different letter types. Woodblocks printing were used mostly to print religious books; the most famous book was Diamond Sutra. The disadvantage of this technique was that once carved the block could only be used to create a single page.

Earlier Chinese people wrote records on silk or bamboo however they were very expensive and difficult to produce. Paper was invented first in China during Han dynasty around 105CE by Cai Lun. The earliest printed paper money was made in 1193.

Movable Type

In 1040CE Bi Sheng improved things by inventing movable type printing. Movable type worked by carving a single Chinese character on a block of wood, clay, or metal. These could then be combined with other characters to create words, sentences, or whole pages. Once printed these letters could then be separated and reused to create a whole new page. There was a major

disadvantage in China. The Chinese language does not have an alphabet and uses thousands of different characters, organizing these characters took a long time. But the chance of mistakes was less.

Meanwhile in Europe in year 1439, Johannes Gutenberg of Germany, developed European movable type printing technology called the Gutenberg Press.

FIG 2: The printing press

CHANGE IN INK AND THE MATERIAL OF THE PAPER

Talking about the invention of paper it is said that it is a part of revolution. Before the arrival of paper in England, the people of England used parchment, which is made from animal skin for example the skin of a sheep. In 8th century paper was made from Mulberry bark. It was first introduced to West from Arab world in the 11th century before going to England via mainland Europe

towards the 13th century. In Europe Cotton, hemp and flax was used in the 13th century. This was the paper European used.

Gutenberg invented metal alloy that could melt readily and cool quickly to form durable reusable type, an oil-based ink that could be made sufficiently thick to adhere well to metal type and transfer well to vellum or paper. This was the new ink.

PRINTING REVOLUTION AND ITS IMPACT

Printing revolution is basically the changes that took place in the field of print before printing press was invented by Gutenberg. Through his invention the books were printed in large scale. Not only the technique was renewed but also there was emergence of modern paper and ink. “Letter of Indulgence” and the version of the Bible i.e. “Biblica Latina” are the examples of Gutenberg’s new product.

IMPACT:

- Earlier in the middle ages the books took a long time to be copied by the scribes. Only one or two books were copied in a year. Thus, making the price of the books expensive. But after the invention of printing press the supply of the books increased. Now, there was around 24,000 copies of a book in a year. It reduced the cost of the books and market was flooded by books.

  Manuscripts were completely dependent on the skill and care of the scribes. Thus, sometimes it was seen that the manuscript copied by them were inaccurate. But this mistake was adjust in the printing press. It was said that the copyists of the middle ages did suffer from unemployment from the

invention of printing press. Earlier books were in restricted to the elite class and the common people were dependant on oral news by the church people. But in the printing revolution books were available to all classes.

- As we know that that with the help of printing press Martin Luther to become the first best-selling author. Luther translation of New Testament from Latin to Germany sold 5,000 copies in just two weeks. He even nailed 95 Theses to the church in the door of Wittenberg. The broadsheet copies of Luther's document were being printed in London as quickly as 17 days later.
- Though the Italian Renaissance began before Gutenberg invented his printing press. It was started when political leaders in Italian city-states like Rome and Florence set out to revive the Ancient Roman educational system that had produced giants like Caesar, Cicero and Seneca. One of the main motive was that to find long-lost works by figures like Plato and Aristotle. The revolution of printing revolution made the Renaissance rise into high gear.
- The printing press was also a factor in the establishment of a community of scientists who could easily communicate their discoveries through widely disseminated scholarly journals. It helped to bring up the scientific revolution.

BIBLIOGRAPHY

Website:

- www.centennialsd.org
- medium.com
- lumenlearning.com

Pictures:

Fig 1:
https://www.google.com/url?sa=i&url=http%3A%2F%2Fhartgalleries.lsa.umich.edu%2Fcourse_listings_w10%2F194-001.shtml&psig=AOvVaw0yuFXNz6Va_f04RjOSGyi0&ust=1627443631282000&source=images&cd=vfe&ved=0CAkQjhxqFwoTCLiWxJiqgvICFQAAAAAdAAAAABAD

Fig 2:
https://www.google.com/url?sa=i&url=https%3A%2F%2Finterestingengineering.com%2Fthe-invention-and-history-of-the-printing-press&psig=AOvVaw0yuFXNz6Va_f04RjOSGyi0&ust=1627443631282000&source=images&cd=vfe&ved=0CAkQjhxqFwoTCLiWxJiqgvICFQAAAAAdAAAAABAa

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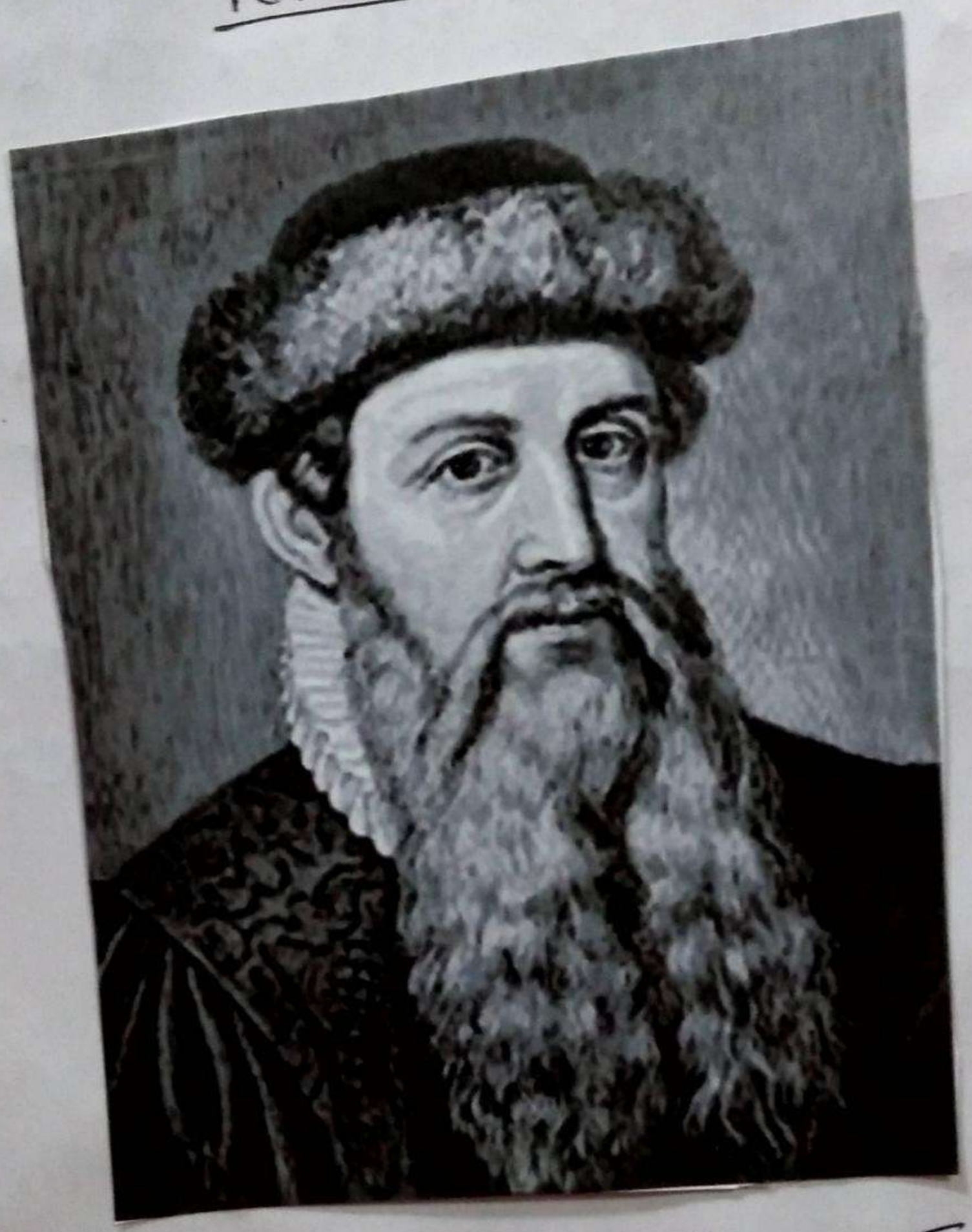


মোগল সম্রাট শাহজাহান

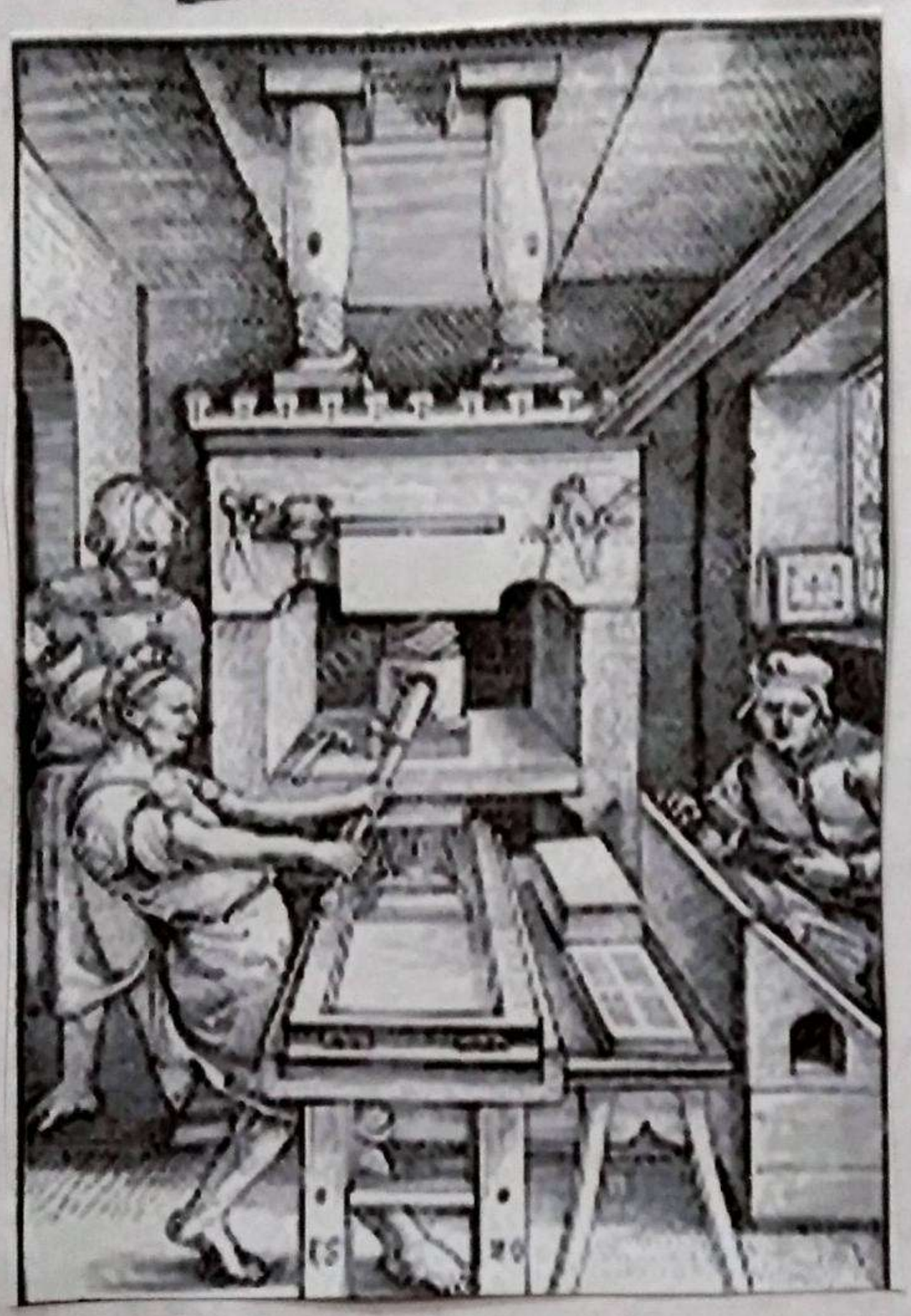
ভূমিকা : মুদ্রণ-যন্ত্রের আবিষ্কারের আগে-হাতে লেখা বইয়ের প্রচলন ছিলো, তেমই অসংখ্য লিপিকর প্রতিলিপি-তৈরিতে কম্ম হতো অনেক পরিশ্রম-করে, লিপিতে প্রতিলিপি-তুলিতে ভুল-হওয়ার সম্ভাবনা ছিলো খুব বেশি; মুদ্রণ-যন্ত্রের আবিষ্কারের পর থেকে অতি অল্পসময়ে একই প্রতিলিপি অনেক বেশি নির্ভুলভাবে ছাপানো সম্ভব হলো। ফলে-শ্রম ও অর্থ-উভয়েরই সাশ্রয় হলো, পুস্তক বিক্রেতা-শিক্ষক ছাত্রদের অল্প-মূল্যে পুস্তক পাবেরও সুযোগ আবিষ্কার জনগণের মধ্যে বৃদ্ধি পায়। ছাপানোর এই বহুলপ্রচলিত প্রসার ছাড়া ও ছেপানোর বিকাশে উল্লেখযোগ্য ভূমিকা গ্রহণ করেছিলেন জোহানেস-গুটেনবার্গ নামে এক জার্মান কিংবদন্তী ছাপাশিল্পী। মেইনজ শহরের (1400-1468 খ্রিস্টাব্দ) আধুনিক ইলইথ (ঐতিহ্যের অনুকরণে প্রস্তুত করার পদ্ধতি আবিষ্কার করলেও মুদ্রণ-ব্যবস্থায়-আমূল-পরিবর্তন হয়। তেমই তথ্যের গবেষক রাইস নামক ব্যক্তি থেকে প্রমাণ-সংগ্রহ করে দাবি করেন যে, মুদ্রণ-যন্ত্রের আবিষ্কারে জোহানেস গুটেনবার্গ (1400-1465 খ্রিস্টাব্দে) ও পিটার শ্যোফার (1420-1502 খ্রিস্টাব্দে) এই দুজনের নামও উল্লেখযোগ্য। এর কাজ মুলত দুই-ধরনের লেকপুতলি-নিয়ে কাজের। কাঠের উপরে উল্টো করে-ছবি এঁকে নেয়া হতো, তারপর ছাইনজ কালিতে তুলিয়ে-ছবির প্রিন্ট তৈরি করা হতো। চীন থেকে এই প্রক্রিয়া ইউরোপে আসের চতুর্দশ শতকের প্রথমার্ধে, আবার কেউ-কেউ মনে-করেন যে, গুটেনবার্গের আবিষ্কারের উপর চীন থেকে প্রমাণ-সংগ্রহ করে দাবি করেন যে, মুদ্রণ-যন্ত্রের আবিষ্কারের ক্ষেত্রে কোরিয়ার অবদানকে স্বীকার করা যায়। রাইস-মনে করেন যে, আবিষ্কারের জোহানেস গুটেনবার্গ (1400-1465 খ্রিস্টাব্দে) ও পিটার শ্যোফার (1420-1502 খ্রিস্টাব্দে) এই দুজনের নামও উল্লেখযোগ্য। এর কাজ মুলত দুই-ধরনের লেকপুতলি-নিয়ে কাজের। কাঠের উপরে উল্টো করে-ছবি এঁকে নেয়া হতো, তারপর ছাইনজ কালিতে তুলিয়ে-ছবির প্রিন্ট তৈরি করা হতো। চীন থেকে এই প্রক্রিয়া ইউরোপে আসের চতুর্দশ শতকের প্রথমার্ধে, আবার কেউ-কেউ মনে-করেন যে, গুটেনবার্গের আবিষ্কারের উপর চীন কোরীয় মুদ্রণের প্রভাব লক্ষ্য করা যায়। রাইস-মনে করেন যে, অক্ষরের লেক তৈরিই (Printing Revolution) বা মুদ্রণ-বিপ্লবের প্রথম-পর্যায়, একেবারে প্রথম-দিকে প্রিন্টিং-লেক কাঠের বদলে হাতির দাঁতের ব্যবহার হওয়ার জন্য তার ভূমিকা কম ছিলো বলে, টিনের কাজের ব্যবহার শুরু হলে, স্বাদিক-আজকে ইউরোপে প্রবেশ করে। তারপর বিদ্যুৎ বিভিন্ন স্থানে যেমন- ইতালিতে 1450 খ্রিস্টাব্দে, স্পেনে 1340 খ্রিস্টাব্দে, জার্মানিতে 1390 খ্রিস্টাব্দে কাগজের ব্যবহার বৃদ্ধি পেয়েছিল হয়, ইউরোপে কাগজের কলে-প্রথম ছাপিত হয়, ছাপার কাজের ক্ষেত্রে পার্চমেন্টের বদলে-কাগজ কে বেছে নেওয়া হয়, ছাপানোর পর কাগজকে শুকানো আরও সহজ হল. তাড়াতাড়ি ছড়িয়ে-পড়ে।

মুদ্রণ ব্যবস্থায় কেরোসিন ল্যাম্প বৈদ্যুতিক বাতির মতো কালিও ব্যবহার হতো। প্রাচীনকাল থেকেই কালির মূলে রয়েছে খনিজ তেলের তৈলাক্ত-কালি বা তৈলজাতীয়-রং-এর ব্যবহার। তিন তাপমাত্রা গুরুত্বপূর্ণ বিষয়; মুদ্রণ-বিশেষজ্ঞরা বেইলিস কালির জোড়াও স্পেশিফিক তেল-কালির ব্যবহার শুরু করে। যার ফলে-কালির ও কাগজের আরেকটা যথেষ্ট উন্নতি ঘটে। যাতে কালির-অপচয়ে-তোরে চাপ দেওয়ার জন্য কাঠের যন্ত্র ব্যবহার করা হত। মুদ্রণের জন্য এই যন্ত্রটি ব্যবহার করা হতো। কাগজে কালি-ব্যবহার করার পর তেমনি কালিগুলো কাগজও শুকিয়ে-নেওয়া হতো। তেমনি শুকানো জোলাপে কাগজও দ্বারাই তৈরি হতো পুস্তক। ইতিহাসবিদরা মন্তব্য করেন যে, বিংশশতাব্দীই ছিল-মুদ্রণ বিপ্লবের-এর চরমোৎকর্ষ।

জোলাপখানার ইতিহাস : আধুনিক মুদ্রণযন্ত্রের আদি পর্বের এক অবিচ্ছেদ্য অংশ ছিল-মুদ্রণ-বিপ্লবের, ১৪৫০ খ্রিস্টাব্দে নাগাদ জোলাপ আবিষ্কার করা হয়েছিল। ১৫শ-শতকের মধ্যভাগে মুদ্রণের প্রসার ঘটলে জোলাপখানা স্থাপিত হয়েছিল। ১৬শ-শতকের শেষদিকে মুদ্রণের চাহিদা বেড়ে-গেলে। সমস্তদেশে জোলাপখানা ছিল। এই শিল্পের প্রথমে সূচনা উদ্ভাবন ও উন্নতির অন্তত তিনটি নাম বিশেষভাবে উল্লেখযোগ্য, যথা-ফোহান মেনজে (১৪০০-১৪৬৫), পিটার শোয়েগার (১৪২৫-১৫০২) এবং জোহান গুটেনবার্গ (১৩৯৮-১৪৬৮)। জোলাখানার উন্নতিতে এদের ঐতিহাসিক অবদান কী ছিল তা বলা কঠিন এবং। প্রতিযোগিতা-ইতিহাসের ঐতিহাসিকরা অনুমান করেছেন যে ১৪৩০ খ্রিঃ নাগাদ জার্মানির মেনজে শহরে জোহান অথবা গুটেনবার্গ নামক এক ব্যক্তি প্রথম জোলাখানা স্থাপন করেন। গুটেনবার্গের মুদ্রণ যন্ত্রটির বৈশিষ্ট্য ছিল-দুটি ভিন্ন-অর্থে।

ঐতিহাসিকরা মনে করেন যে মুদ্রণ যন্ত্রের আবিষ্কারের আবশ্যকতার ছিল, এটি একজন ব্যক্তির মস্তিষ্ক প্রসূত নয়, বহুদিন ধরে মুদ্রণ যন্ত্রের ক্রমোন্নতির প্রক্রিয়া চলেছিল। মুদ্রণশিল্পের ব্যাপক উন্নতি ও বাণিজ্যিকীকরণে

চিত্র - 2



অধ্যাপক মণ্ডল

কোনো ব্যক্তি বিশেষের অবদান-টিলে-কিলে তা আটকে রাখা যায়না। যাইহোক এ বিষয়ে-আমরা এই টিউটোরিয়ালে আসতে পারি যে বৈজ্ঞানিক আবিষ্কার বা উদ্ভাবনগুলো মূলত ব্যক্তি বিশেষের প্রচেষ্টার ফলশ্রুতি নয়, এর মূলে-আছে তৎকালীন প্রেক্ষাপট, সামাজিক পরিস্থিতি, যেখানেই কবিতা বা চিত্রকলার ক্ষেত্রে বিভাজনের মূলে-পার্থক্য, টিউমি হাউডেন বা ডেভিলাক্রাফের মত নানা পরীক্ষানিরীক্ষার ফলেই মুদ্রণবিপ্লবের বাস্তবক উন্মেষ সম্ভব হয়েছিলো, অবশেষে এর প্রায় পূর্ণাঙ্গ-রূপ-আসছে বলা চিলেস্টোজিলে হেনরেজে।

মুদ্রণ-বিপ্লব বলতে কী বোঝায়- : পৃথিবীর ইতিহাসে-একটি গুরুত্বপূর্ণ বিষয় হল-মুদ্রণ-বিপ্লব, মুদ্রণ-বিপ্লব বলতে পৃথিবীর ইতিহাসকে প্রভাবিত করেছে তা আমাদের জানা দরকার, কারণ বর্তমান প্রায়-সবকাজেই Point টীসণভাবেই প্রয়োজন, কিন্তু সেখার আগে আমাদের বিপ্লব ফ্রেডিজলে-টুইরোপ-অঞ্চলের জার্মানির মেনজ শহরে, আর এই বিপ্লবে সবচেয়ে গুরুত্বপূর্ণ ভূমিকা রেখেছিলেন যে-ব্যক্তি তিনি হলেন জোহানেস-গুটেনবার্গ, তিনি জার্মানির মেনজ শহরে ১৪৫৪ খ্রিস্টাব্দে ইউরোপকে প্রথম কম্পোজিলের আধুনিক ছাপাখানা। যে ছাপাখানার গুণ ধরেই পৃথিবীর ইতিহাসে ছাপার জগতে এক তলাস্তুলে পরিবর্তন ঘটে যায়, যাকে আমরা ইতিহাসে বলে থাকি 'মুদ্রণ বিপ্লব' বা 'Printing Revolution'।

মুদ্রণ ছাপাখানা : জোহানেস-গুটেনবার্গ তাঁর ছাপার খানার কাজ শুরু করেন প্রায় ১৪৩৫ সালে-কাঠের টুকরোর মুদ্রণের ছাপানায়- তাঁর তৈরী মুদ্রণ যেন ছিল, মজবুত, টেকসই, এই মুদ্রণের লেখাগুলি ছিল সুন্দর প্রকার যেমন উজ্জ্বলতার ছিল, তুলনামূলক কম দামে গুটেনবার্গের ছাপাখানায় প্রতিটি বই মুদ্রিত বাইবেল-রেনেসাস-যুগের যুগান্তকারী আবিষ্কার।

মুদ্রণের পরিভাষা : মুদ্রণের মুদ্রণ পরিভাষাগুলো সবসময়ে ব্যবহার হয়-মুদ্রণ শিল্পে, নিম্নে-উল্লেখিত আলোকপাত মুদ্রণ পরিভাষার :

- এম্বার উদ্যাচ্ছাড়ে
- প্রীলেখোপত্র
- বেগ-রেও ওই
- বিল্লেও (মুদ্রণ)
- ব্রোর্ডাকাই
- বস্তুবিশ্লেষণীবিদ্যা অব বেঙ্গল
- বস্তুপ্রেমর- রেবীউ
- কাপ্ত উইক
- বস্তাচেওয়ার্ড
- উনিঅত্র অপ্রিনন্তুমান্থকে কমলাপার মতেলে
- উপ্রিঅত্তুমান্থকে কমলাপার মতেলে
- বেঙ্গলোপ্রেশন (প্রাবন্ধিকা)
- কমলাপার বিল্লিউলে (মুদ্রণ)

মুদ্রণ ব্যবস্থার সঙ্গে-
আনুষ্ঠানিক উন্নতি

- মুদ্রণ- ব্যবস্থা বৌদ্ধ- কার্যকরী
- মুদ্রণ তত্ত্বকালীন বিদ্যমান্তকদের

গুতে। তাঁরা ধর্মীয়- মুক্তিপত্র বা আত্তলাপত্ত (Indulgence) জোগাতে মুদ্রণ যন্ত্রের অবতেয়ে- যৌক্ত ব্যবহার করতেন, এজাড়া টমাস এ্যাকুইনোসের প্রবন্ধ, বাইবেল, বাইবেল বিষয়ক টীকা, বিভিন্ন ভৌতঅস্থির প্রভুর সংখ্যক জোগা হতো। প্রথমে ডিজে জোড়ে জোড়ে প্রেস, পরে যৌক্ত পরিমাণে স্ক্রুপবিহীন বিনিময়োগ করে বড় আবকারের প্রেস তৈরি করা হয়, এবস্থা type বা মুদ্রক বারবার বিভিন্ন পুস্তকে ব্যবহার করে অমিয়, মুদ্রণ ব্যয় কমে করা হতে থাকে। এতদিন কাজের শেষ পর্যায়ে- বিশ্বটিবিদ্যালয়- ও অগ্নিবিদ্যালয়ে সংখ্যা বৃদ্ধি পেলে তেমনালে তাতে সংখ্যাও বেড়ে যায়, এগুলে পুস্তকের পরিধি আরও বৃদ্ধি পায়; জোগানদার উপর নির্ভর করে মেরিকার বিকাশ ঘটে। ষোড়শ শতকে মুদ্রিত প্রন্থগুলোর অধ্যে বাইবেল থেকে শুরু করে বিশ্বকোষ, বীরগাথা বিভিন্ন প্রাচীন গ্রিক - রোমান অনুবাদ অগ্নিগ্রন্থ ও ধর্মগ্রন্থ- ভিত্তে উল্লেখযোগ্য। এজাড়াও গণিত, জ্যোতিষ শাস্ত্র, চিকিৎসা ও জ্যোতির্বিজ্ঞান বিষয়ক প্রন্থও জোগা হতো। সংক্ষেপে বলা যায় যে, মুদ্রণ ব্যবস্থার অগ্রগতির ফলে- অধিকাংশ মানুষের জ্ঞান জ্ঞানের দরজা উন্মুক্ত হয়, মাটিন লুথারের জার্মান ভাষায়

বাইবেল অনুবাদ 1520 খ্রিস্টাব্দে গুটেনবার্গ-এর জাপানথেকেই মুদ্রিত হয়।

মুদ্রণ বিপ্লবের আর্থনীতিক, আংশিক্ষিতিক ও বিশ্বনিষ্ঠ প্রভাব

- আদি আধুনিক ইউরোপের
- পঁচিশটি ক্ষেত্রে কিভাবে পরিবর্তন ঘটেছিল, যেগুলির ইতিপূর্বে

কোনো আলোচনা হয়নি। তবে পঁচিশটি হল মুদ্রণ, বারুদ এবং রাষ্ট্রব্যবস্থা এবং পৃথিবীর ইতিহাসের ক্ষেত্রে বড়ো পরিবর্তন আনিয়েছে। পশ্চিম ইউরোপে আংশিক্ষিতিক ও বৌদ্ধিক ওপরে মুদ্রণ বিপ্লবের বড় রকমের প্রভাব পড়েছিল। প্রীতিহাসিকদের মধ্যে অনেকেই মনে করেন, অন্যান্য নানান কারণের সঙ্গে মুদ্রণ-ব্যবস্থার পথ-প্রকাশও করেছিল।

মুদ্রণ বিপ্লবের আলো প্রথমে ধাক্কা দিয়েছিল হাতে লেখা-করা হত। অধিকাংশ মঠবাসী অনুবাদকারীরা এই জাতীয় কাজের সঙ্গে যুক্ত ছিলেন। এর ফলে অধিকাংশ ক্ষেত্রে ডুপ্লিকেট থেকে যেত, তাড়াহুড়ো হাতে লেখা-করা জন্যও অসাবধানতার বিষয় ছিল যে-কারণে প্রথমের জন্যও সংখ্যক কপি লেখা-করা অশুদ্ধ হত। কিন্তু মুদ্রণ-যন্ত্রের আবিষ্কারের ফলে এই দুটি ক্ষেত্রে বড় রকমের পরিবর্তনের সূচনা হয়। প্রথমত, মুদ্রণ-যন্ত্রের দরুন অত্যন্ত অল্প সময়ের মধ্যে অসংখ্য-বর্ণিত প্রতিলিপি-জাপানো অশুদ্ধ হয়। দ্বিতীয়ত, মুদ্রণ-বিপ্লবের আলো ওভালচর্চার বিষয়টি একপ্রকার প্রশ্নের মুখে দাঁড়ায়। প্রশ্ন-প্রকাশের ফলে বিশ্ববিদ্যালয় ও বিদ্যালয়গুলোতে পাঠদানের দিক থেকে পরিবর্তন সূচনা হয়। মুদ্রিত গ্রন্থের বিশ্ববিদ্যালয়ের অধিবাসীরা তাদের গ্রন্থ থেকে যা পাঠ করতেন, তাদের কাজ ছিল-ছাত্রদের নোট নেওয়া এবং পরে সেগুলি সংরক্ষণের ব্যবস্থা করা। কিন্তু মুদ্রিত গ্রন্থের ফলে এই জাতীয় অসুবিধার অবসান হয়। প্রথম দিনগুলি গ্রন্থ-ব্যবহার ফলে বিশ্ববিদ্যালয়ের পাঠদানের পদ্ধতিরও পরিবর্তন ঘটে।

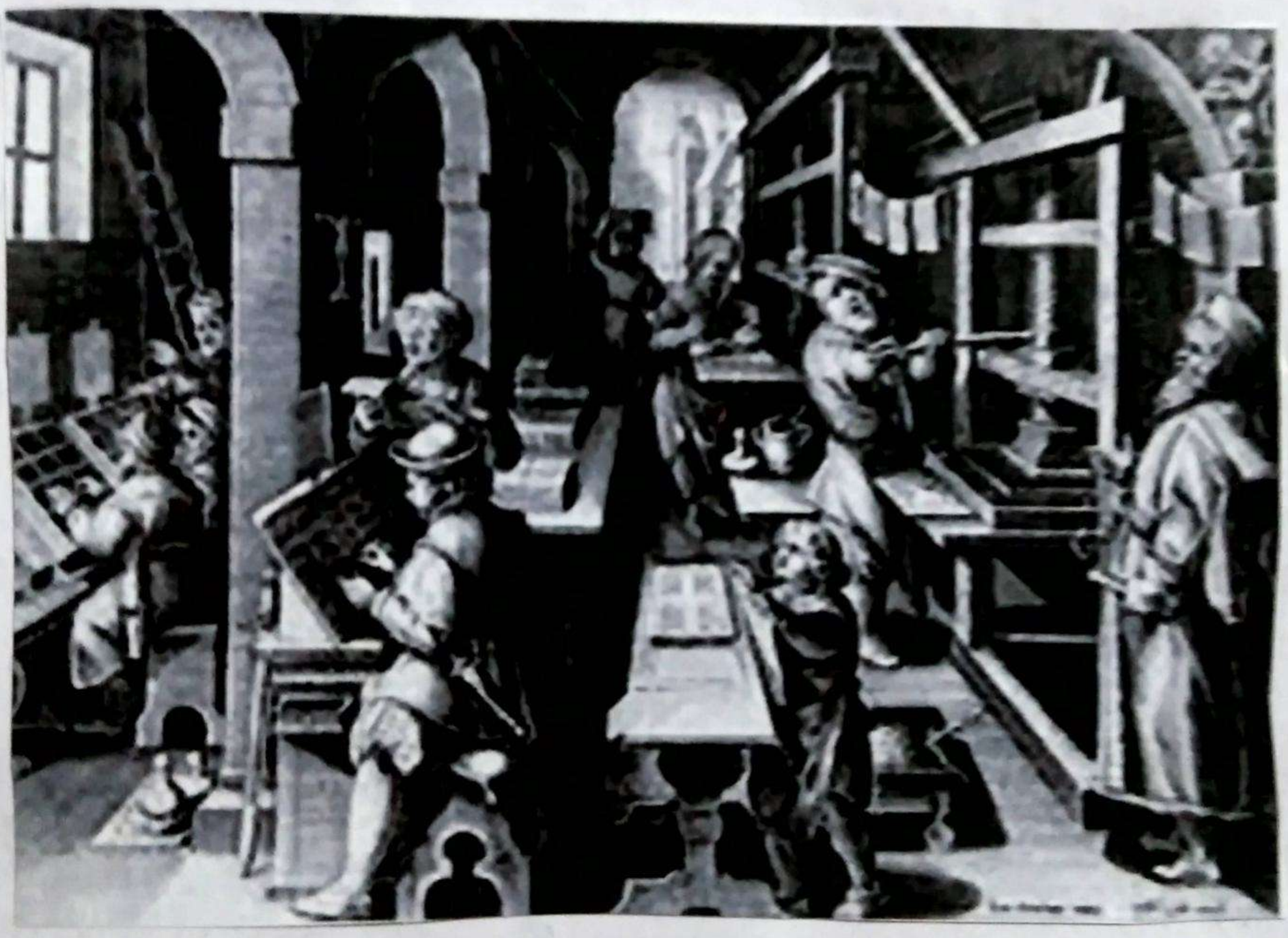
মুদ্রণের ফলে জ্ঞান বইয়ের চাহিদা

মুদ্রিত গ্রন্থের আগমনে বিভিন্নপ্রান্তিক ব্যবসায়ের গ্রন্থের প্রয়োজন হত। যখন হাতে লেখা বইয়ে এই চাহিদা মিটতে যেত। কিন্তু পাণ্ডুলিপি নানা কারণে জমা বইয়ের চাহিদা বৃদ্ধি পেতে থাকে। ঐতিহাসিক পিটোরমার্ক দেখিয়েছেন যে অক্সফোর্ড অক্সফোর্ডে শিক্ষিত শ্রেণির সংখ্যা অত্যন্ত দ্রুত বেড়ে যায়। সেই অক্সফোর্ড বাজারে নতুন নতুন পাঠ্যবিষয় সংযোজিত হয়েছিল, যেমন, ব্যাবসাবাণিজ্যের, অঙ্কের অঙ্কের নতুন নতুন যেসব গ্রন্থ উঠতে থাকে, যখন ওই যেসবগুলি প্রয়োজনীয়তা মেটানোর জন্য মুদ্রণ করতে আবশ্যিক হয়ে- ছিলেন।

মুদ্রিত গ্রন্থের আগমনে যুগান্তকারী চিন্তাবিদ বা বৈজ্ঞানিকদের বক্তব্য বিষয় দ্রুত ছড়িয়ে দেওয়া সম্ভবপর হয়। এমনও বলা যেতে পারে যে যেকোনো নতুন আবিষ্কার, যতই গুরুত্বপূর্ণ তাঁর গ্রন্থ প্রকাশের, তাদের যেসবগুলি ততটা পরিচিতি লাভ করেনি, কিন্তু গ্রন্থ প্রকাশিত হওয়ার পর দ্রুত তাঁর আবিষ্কারের বিষয়কে জনআলোড়নের সৃষ্টি করে। অন্যান্য বৈজ্ঞানিকদের ক্ষেত্রেও একই যুক্তি প্রযোজ্য হতে পারে। মুদ্রণের আগমনে আলবার্তাদী বিজ্ঞানীদের ক্রীতদাসপ্রথাকে দ্রুত ছড়িয়ে দেওয়া সম্ভবপর হয়েছিল, আবার কোপারনিকাস-পরবর্তী বড় বড় বিজ্ঞানীদের বিজ্ঞানচর্চার ফসলগুলি মুদ্রণের আগমনে ছড়িয়ে-দেওয়া সম্ভবপর হয়। বলাবাহুল্য মুদ্রণের আগমনে অনুপ্রেরণা জিনিস বলে মনে করা যেতে পারে। আবিষ্কারের বিষয়গুলিকে আমুদকে মানুষ অবগত হতে থাকে। যখনো বিজ্ঞানচর্চার ক্ষেত্রেও প্রসারিত হয়, আমেরিকা ও অস্ট্রেলিয়া আবিষ্কারের তথ্য মুদ্রণের মাধ্যমে সুফলের অনুসন্ধানীয় মানুষ ছড়িয়ে পড়ে। জীবাণুতত্ত্বের তৈরিও করার বলাবাহুল্য মুদ্রণ-বিজ্ঞানীদের তখনকার অবশ্যই গুরুত্বপূর্ণ ছিলো।

মুদ্রণকে কেন্দ্র করে ইউরোপে পুস্তকের ব্যবসা গুরুত্বপূর্ণ হয়ে ওঠে। ঐতিহাসিক বেলোটিক অলঙ্কারণ তাঁর গ্রন্থে পরিসংখ্যান বিভিন্নক একটি আলোচনা থেকে দেখিয়েছেন যে মুদ্রিত পুস্তকের সংখ্যা কীভাবে দ্রুত বৃদ্ধি পায়; ব্যবসায়ী শ্রেণি বিশেষ আগ্রহ হয়ে ওঠে, চাহিদা অনুসারী তারা পুস্তকের অবতরণ শুরু করে। এই প্রক্রিয়াকে অলঙ্কারণ Price

চিত্র-৩



মুদ্রণের কাজে ব্যবহৃত

Capitalism অনুযায়ী ফিবেভরে, ইউরোপে ইনকেলাবের তাঁর 'Transformation of Europe' নামক গ্রন্থে এ বিষয়ে আলোচনা করতে গিয়ে বলেছেন যে- মুদ্রণকে কেন্দ্র করে ইউরোপে বস্তুগুলি শহরে 'Print Industry' গড়ে ওঠে এবং সেই অঞ্চল আশে পাশি অন্যান্য অংশে গড়ে ওঠার দরুন মুদ্রণকে কেন্দ্র করে শ্রমিক আন্দোলন অন্যত্রও প্রভাব ফেলে করে।

ইউরোপের নীতিমালায় একটি গুরুত্বপূর্ণ আলোচনের মূলে প্রোটেস্টান্ট আন্দোলনের কথা বলা যেতে পারে। যা কার্যত খ্রিস্ট ধর্মকে দ্বিধাবিভক্ত করেছিল, প্রোটেস্টান্ট আন্দোলনের সূত্রপাত আসলে যাজকীয় যে- শোষণ ও তাঁর অনুগামীরা মুদ্রণের আনুকূল্যে নিয়ে তাদের বক্তব্য বিষয়- ছড়িয়ে দিতে সক্ষম হয়, যাকে দ্রুত সুফলের বানী ইউরোপের বিভিন্ন কোনে ছড়িয়ে পড়েছিলো।

উপরোক্ত আলোচনা থেকে এই সিদ্ধান্তে আসা যেতে পারে যে মুদ্রণ-বিপ্লবের ইউরোপের আর্থনৈতিক, সামাজিক ও রাজনীতি ক্ষেত্রে যৌথভাবে পরিবর্তনের সূচনা করেছিলো, এবং এই পর্যায়ে গুরুত্বপূর্ণ ভূমিকা পালন করেছিলো- তাঁর অন্যতম একটি বিষয়ে- মুদ্রণ বিপ্লবের উৎপত্তি করা যেতে পারে।

মুদ্রণ-বিপ্লবের সঙ্গে বিশ্ব-আঙ্গিনার আন্দোলনের, কী কোনও প্রত্যক্ষ সম্পর্ক ছিলো?

→ ফাভ্র ও মার্তাঁ মনে করেন যে বিশ্বআঙ্গিনার প্রত্যক্ষ কারণরূপে বই-এর ভূমিকা ছিলো, শুধু বই মানুষের মন পালটে দেয়নি, কিন্তু বই থেকে নিজের বিশ্বাস অস্তিত্বকে আরও প্রতিপন্ন করা যায়, মনে নতুন বিশ্বাস তৈরি হয়েছিলো, তাঁরা অনেকে নতুন বই থেকে এই বিশ্বাস অস্তিত্বকে উদ্ভাসিত করেছিলেন, আবার যাঁদের মনে প্রোথিত বিশ্বাস অস্তিত্বকে আরও মনোনিবেশ করেছিলো, তাঁরাও নতুন দীক্ষার অনুষ্ঠান করেছিলেন, ফাভ্র ও মার্তাঁ বলেন যে- রোমান্স ক্যাথলিক প্রোটেস্টান্ট বিশ্বের বিশ্বাসের ক্ষেত্রেও বই-এর একটি জরুরি ভূমিকা ছিলো, মনে রাখতে হবে যে এর আগে প্রতিষ্ঠিত চার্চ

অসন্তুষ্ট বৈমাত্রিবিদ্রোহীদের কেন্দ্রীভূত করতে পেরেছিলেন, তাঁদের মাউন্টেন এর আগে প্রকল্প করা যায় যে পূর্বভাগী অসন্তোষ বৈমাত্রিবিদ্রোহের অন্তরে অন্তরালে থাকলেও কী হত? কোনো অন্তের নেই সুস্থির বা বস্তুনিষ্ঠভাবে তাঁদের মত প্রচারে বইকে ব্যবহার করেছিলেন, এ বিষয়ে অবশ্যই ঐতিহাসিকদের দুটি বিভিন্ন ভাষায় অনুদিত বাইবেলের মুদ্রিত বহু-প্রচ, আবিষ্কার যে ঐতিহাসিক ঘটনা ছিল এ অন্তরে অন্তের নেই।

উপসংহার: পরিশেষে আমরা একথাই বলতে পারি যে মুক্তিযোদ্ধের মুদ্রণ-শিল্পের প্রতিষ্ঠাতে এক নতুন সূচনা সূচনা করে। মুদ্রণের আবিষ্কারের ফলে বইয়ের মূল্য কমে যায়। যিশু খ্রিস্টের জীবনী পড়তে পঠন-পাঠনে উৎসাহ আসে, ভাষান-বিভাষান, অনুবাদ ও ধর্মসংস্কার আন্দোলনে মুদ্রণ বিপ্লবের প্রভাব ছিল বহুলাংশে।

গ্রন্থ-পঞ্জি

বাংলা গ্রন্থ- : চক্রবর্তী তাপস, চক্রবর্তী সুভাষ রঞ্জন এবং চট্টোপাধ্যায় - বিশাখা - ইউরোপে সুলতানত, নবভারতী প্রকাশনী, কলেজ, ২০০৫

ইংরেজি গ্রন্থ : Anderson M.S, Europe in the Eighteenth century Holt, Rinehart & winston, 1961

website : https://www.bibostonpath.com/....

ছবির উৎস :

১) ছবি -১ : https://images.app.goo.gl/1B4Y4B8BG67h1WzaA

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৩) ছবি - ৩ : https://images.app.goo.gl/XmZ7C3hC2MkaKb6V7

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PAPER- CC8

TOPIC-

PRINTING REVOLUTION

CONTENTS

INTRODUCTION

In the late fifteenth century, the production of written materials began to move from the copyist's desk to the printer's workshop. This shift, which revolutionized all forms of learning, was particularly important for historical scholarship. In Gutenberg's day, Europe was already on the brink of a new age. Exploration, scientific discoveries, and the growth of towns, industry, and commerce were changing the political and religious structure of medieval society. Gutenberg's invention arrived just in time to push Europe firmly out of the Middle Ages and towards the modern world. The fact that identical images, maps, and diagrams could be viewed simultaneously by scattered readers constituted a kind of communications revolution in itself. *"Neither political, constitutional, ecclesiastical, and economic events, nor sociological, philosophical, and literary movements can be fully understood, without taking into account the influence the printing press has exerted upon them,"* writes Steinberg.

Printing with Movable metal Type was perfected in Mainz about 1450. Three names recur in the sources, those of Johann Gutenberg, Johann Fust and Peter Schoffer. Printing with movable type spread quickly across Europe, starting a revolution that has yet to slow down. Even as the computer age is once again changing the world, and electronic technology has largely replaced metal type and the printing press, printed matter remains a prime means of human communication. Publishers around the world are still issuing some ten thousand books a year and almost as many newspapers a day, using an estimated 130 million tons of paper annually. Gutenberg's development of the printing press became one of history's pivotal moments. Movable-type printing facilitated the spread of Renaissance ideas, modern science, and the Reformation with its emphasis on literacy and propelled Europe into a much different future.

JOHANNES GUTENBERG

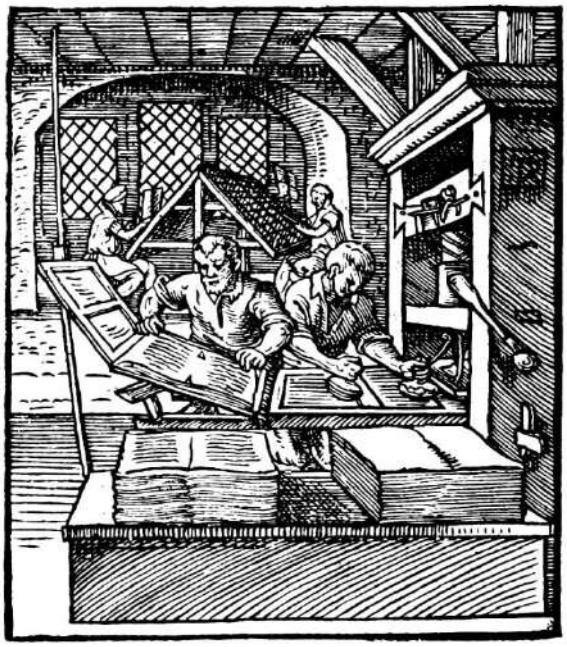
Fig 1: https://images.app.goo.gl/L5VEVPhvw5txmmseA

THE INVENTION OF PRINTING

China developed a method of printing centuries before Gutenberg was born. As early as the seventh century, Chinese artisans were engraving images and texts on wood blocks or copper plates and printing them on paper or textiles. Block printing flourished in China during the Sang dynasty (960–1279), when the National Academy issued hundreds of books. Like the manufacture of paper, block printing gradually spread westward from China across Asia and probably reached Europe in the late fourteenth century. Two Chinese inventions i.e., Block Printing and Paper are linked with the beginnings of Typographic printing in Western Europe. *Xylography or Block Printing* originated in China in the early 8th century.

The word 'Paper' is etymologically derived from *Papyrus*. Paper was first made by Ts'ai Lun in China. The paper was made from mulberry bark and hemp fibre. Manuscripts were usually copied on parchment or *vellum*, and these materials were only used by typographic printers, when the aim was magnificence rather than utility. In Europe the chief raw material was old rags. In Europe paper was made from cotton, hemp and flax in 13th century.

A suitable ink was required for transferring the ink to paper and metal-type. So, a new ink was made consisting of a pigment (lampblack or powdered charcoal) ground in a linseed-oil varnish, an adaptation of oil paint. Most crucial was the invention of the Type and finally this new process was perfected and first organized as an industry by Gutenberg, Fust and Schoffer.

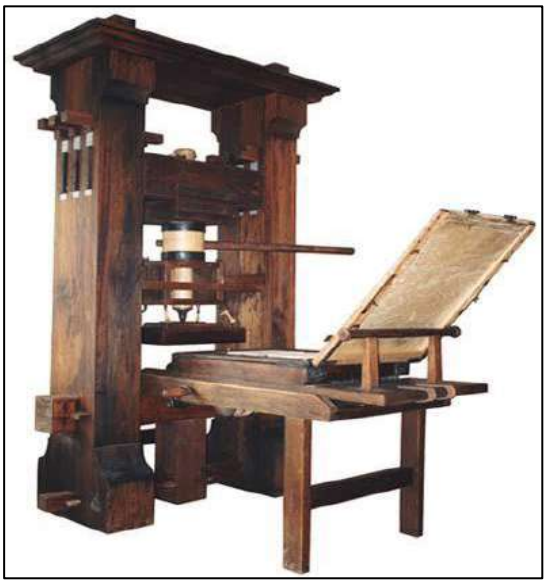


GUTENBERG WORKING ON THE PRINTING PRESS

Fig 2: https://images.app.goo.gl/TJuF1DndDG6YvjZH7

MOVABLE-TYPE PRINTING PRESS

The invention of the mechanical movable type printing press helped disseminate knowledge wider and faster than ever before. Movable-Type Printing is a way to reproduce written material, usually on paper, by first forming upraised letters or other figures on small blocks called types. A printer arranges the types within a frame on a press to form words and then prints a page of writing. By 1450, European technology had all the components in place for a movable-type printing revolution. In China, Korea, and Japan, printing with movable type required thousands of characters and cost so much that only government sponsorship made it possible. As a result, much printing was still carried out with wood blocks. The Europeans had one key advantage over the Chinese in making movable-type printing preferable than hand copying because Latin, Greek, and all the other European languages were alphabet-based.



THE MOVABLE TYPE PRINTING PRESS

Fig 3: https://images.app.goo.gl/WioCSKCu9VVGpUTz7

THE INTIAL SHIFT

The literates usually went on to master Latin, the universal language of scholarship, the law, and the Roman Catholic Church. Books were all hand-copied, were rare, expensive, and almost always in Latin. Scribes, often monks living in monasteries, each laboured for up to a year to copy a single book, usually in Latin. In the age of scribes, book making had occurred under the diverse auspices represented by stationers in university towns; royal clerks and papal secretaries working in chanceries and courts and so on. The advent of printing led to the creation of a new kind of shop structure; to a regrouping which entailed closer contacts among diversely skilled workers and encouraged new forms of cross-cultural interchange. After the advent of printing, however, the transmission of written information became much more efficient.

The first type Gutenberg designed and used for printing came to be called DK type. The font is based on a thick, rectangular handwriting called *Textura,* used in Europe for the most formal type of writing. DK type, however, was not made for printing. The earliest known products of the new art were papal. The first printed books looked exactly like the manuscripts and were called the *Incunabula*. In 1457 the firm of Fust and Schöffer issued one of the most beautifully printed books in the world, a collection of Psalms and prayers known as the *Mainz Psalter*. The type, printed in red and black and this is the oldest signed and dated book printed in Europe. Gutenberg also printed "*Letters of Indulgence*" and a version of the Bible- *Biblica Latina* in 1454.

THE MAINZ PSALTER

Fig 4**:** https://www.rct.uk/collection/1071478/the-mainz-psalter

PRINTING THE BIBLE BY GUTENBERG

The "*42-line Bible*," as Gutenberg's Bible is called by bibliographers, is a masterpiece of printing. Gutenberg's printer used Gothic script letters. Each letter was made on a metal block by engraving it into the base of a copper mould and then filling the mould with molten metal. Individual blocks were arranged in a frame to create a text and then covered in a viscous ink. Next, a sheet of paper, at that time made from old linen and rags, was mechanically pressed onto the metal blocks. Gutenberg's success in putting all these elements together is indicated by his printed edition of the Latin Bible in 1454 CE.

GUTENBERG BIBLE

Fig 5**:** https://images.app.goo.gl/F8YsdY3gwUJdJ3RZ6

SPREAD OF PRINTING

Printing was no longer a secret, and Gutenberg was evidently encouraging its spread. Metalworkers who heard about Gutenberg's invention came to Mainz hoping to master the techniques he had pioneered. Already a wide variety of texts had appeared: religious texts, official documents, political leaflets, grammar and reference books, medical advice, astrological charts, and classical and popular literature. In the year 1500, perhaps as many as two thousand different editions of books, pamphlets, and broadsides were produced in more than seventy European towns. According to lists compiled by modern librarians, nearly thirty thousand works were printed in movable type before the end of the 1500s. People marvelled at the accuracy of books produced by the printing press and equally impressive was the price. The printer is assigned the sole function of serving as a press agent; a new *"era of intense cross referencing between one book and another*" began and something rather like a knowledge explosion was experienced in the sixteenth century. Contradictions became more visible and confidence in old theories weakened. Printing encouraged forms of combinatory activities which were social as well as intellectual. It changed relationships between men of learning as well as between systems of ideas.

DEMAND FOR BOOKS AND THE PRINTING REVOLUTION

The key factor in the astonishingly rapid spread of printing between 1460 and 1500 was clearly evident due to the unsatisfied demand for books among the merchants, substantial artisans, lawyers, government officials, doctors and teachers who lived and worked in towns. The needs of the clergy and of those adaptable nobles who recognised the importance of literary education. Underlying the expansion of printing was that of expansion of urban population and secular literacy, which has begun in the high Middle Ages. Bourgeoisie brought books of all sorts: religious and secular (in Latin and also in Vernacular), grammars encyclopaedia and elementary texts. The sharp increase in literacy broke the monopoly of the

literate elite on education and learning, and bolstered the emerging middle class. Across Europe, the increasing cultural self-awareness of its peoples led to the rise of proto-nationalism, accelerated by the flowering of the European vernacular languages to the detriment of Latin's status as *lingua franca***.**

THE IMPACT OF PRINTING ON EUROPEAN SOCIETY AND CULTURE

- The impact of the new technology on European society was swift and powerful. The greater production capacity of print totally changed the book trade. Printed books brought world cultures closer together. Through print, people in conquered lands learned European languages and literature, religious practices, science, and mathematics. Printed books also recorded the Asian, African, and Native American languages and customs of conquered people for Europeans to study; a global phenomenon. New maps, charts, geographies, and natural histories were printed and disseminated, inspiring explorers and travellers to venture into distant places to trade.

- The printing press was also a factor in the establishment of a community of scientists who could easily communicate their discoveries through widely disseminated scholarly journals, helping to bring on the scientific revolution. Print benefited the spread of scientific knowledge. Before Gutenberg, scientists often made their own copies of their work to avoid the errors scribes made when copying unfamiliar material. Printed books were more accurate and it gave scientists more time for new researches. For the first time, images, maps, and diagrams in a book were the same in every copy. Printers helped readers find information quickly by using indexes, page numbers, and running headers and introduced the practice of printing title pages. The broad advances in scientific knowledge during the sixteenth, seventeenth, and eighteenth centuries as well as the telescope, the microscope, and other inventions that made such discoveries possible were all aided by the Print Revolution. The effect on education was also striking, pupils for the first time had the opportunity to learn on their own by reading books. The wider availability of printed materials also led to a drastic rise in the adult literacy rate throughout Europe.

- By the 1400s, the Renaissance had already begun in Italy, and this cultural revival was spreading to other parts of Europe. Scholars wanted more copies of the recently rediscovered writings of Aristotle, St. Augustine, Cicero, and other ancient authors. The scribes, however, could not work fast enough to meet the demand. Printing presses were soon producing great numbers of books translated into Latin from Greek, Hebrew, Arabic, and other classic languages. These books dealt with many subjects such as literature, the law, philosophy, architecture, and geography. By 1500, Renaissance Venice was Europe's printing capital with 150 presses at work.

- The end of Christian unity in Europe was one of the most significant changes that the printing revolution helped to bring about. At first, the Roman Catholic Church welcomed printing as the “divine art.” Church leaders assumed that the widespread printing of uniform Bibles and manuals for priests would strengthen and standardize Christian worship in Europe. They did not expect Martin Luther to become the world’s first best-selling author. In 1517, Martin Luther wrote an argument for scholarly debate against indulgences, known as the “Ninety-Five Theses.” Copies of this document quickly fell into the hands of printers, who distributed copies all over Europe. Luther’s printed vernacular Bible enabled anyone who could read German to study the scriptures at home. Printed vernacular Bibles in other languages soon swept the rest of Europe. Luther, too, might have been silenced had the printing press not made his writings widely available. Luther published a steady stream of tracts, sermons, pamphlets, hymns, and fliers explaining and defending his views. By 1520 his most important tracts were available in Dutch, English, Spanish, Czech, and Latin. Efforts by the church to suppress Luther’s writings were fruitless. Luther’s success inspired other reformers to organize other Protestant churches. A key role was played by the rapid spread of views critical of the Roman Catholic Church made possible by printing press. Printing fostered a movement "from image culture to word culture," a movement which was more compatible with Protestant bibliolatry and pamphleteering. In addition, printed copies of vernacular Bibles aided Luther’s insistence that Christians must read the scriptures silently on their own rather than depend on church officials for their salvation. Thus, the Protestant Reformation and the printing revolution combined to encourage reading literacy among the common people in Europe and later in America.

- Printing also brought about censorship. By making reading more democratic, printing spawned the modern censor. Both secular and ecclesiastical authorities censored books and prohibition and burning of books were designated to maintain political as well religious orthodoxy. And on the other hand, it gave a new weapon in the hands of those who wished to make their own path. By 1560 censorship of books in all its forms was universal in Western Europe. Many printers, however used the church’s banned book lists as guides for publishing works that sold well.

- During the Enlightenment era, philosophers like John Locke, Voltaire and Jean-Jacques Rousseau were widely read among an increasingly literate populace. Their elevation of critical reasoning above custom and tradition encouraged people to question religious authority and prize personal liberty. Increasing democratization of knowledge in the Enlightenment era led to the development of public opinion and its power to topple the ruling elite.

- The struggle between author, printer and publisher on one hand and ecclesiastical and government censors on the other, had become one aspect of the battle for intellectual liberty and freedom of conscience in an age of fundamental ideological conflict. Thus,

> as it has been said printing made the soil from which sprang modern history, science, popular literature, the emergence of the nation state and so much of everything by which modernity is defined.

Martin Luther called printing as, *"God's highest and most extreme gift, by which the business of the Gospel is driven forward*." In the nineteenth century, French novelist Victor Hugo said, *"The invention of printing is the greatest event in history. It is the mother of revolution. It is the mode of expression of humanity which is totally renewed; it is human thought stripping off one form and donning another."*

CONCLUSION

The printing revolution is, in all aspects, the origin of other revolution which marched the history of culture, the history of religion and politics in Europe. The discovery of printing represents a technical discovery which lead at a revolution of information which changed Europe. The debates about ideas, the access to education, the cultural and scientifical homogeneity in Europe is due to printing. Since the discovery of printing, information has been an essential factor of cultural, scientifical and even political development of Europe. A historical epoch has begun due to printing revolution. Not only the fire and discovery of iron, the development of states and wars, but also the spread of information creates culture and civilization.

Printing turned intellectual work as a whole into a cooperative instead of a solitary human activity. The Industrial Revolution didn't get into full swing in Europe until the mid-18th century, but you can make the argument that the printing press introduced the world to the idea of machines "stealing jobs" from workers. Before Gutenberg's paradigm, scribes were in high demand. Bookmakers would employ dozens of trained artisans to painstakingly hand-copy and illuminate manuscripts. But by the late 15th century, the printing press had rendered their unique skillset all but obsolete. On the flip side, the huge demand for printed material spawned the creation of an entirely new industry of printers.

REFERENCES

WEBSITES

https://www.crf-usa.org/bill-of-rights-in-action/bria-24-3-b-gutenberg-and-the-printing-revolution-in-europe

https://courses.lumenlearning.com/suny-hccc-worldhistory/chapter/the-printing-revolution/

https://www.history.com/.amp/news/printing-press-renaissance

JOURNAL ARTICLE

Cartwright, Mark. "The Printing Revolution in Renaissance Europe." World History Encyclopedia. Last modified November 02, 2020. https://www.worldhistory.org/article/1632/the-printing-revolution-in-renaissance-europe/.

BOOKS

Childress, Diana. 2008. Johannes Gutenberg and the Printing Press. Minneapolis: Twenty-First Century Books. pp 20-45

Rice, Eugene F, and Anthony Grafton. 1994. The Foundations of Early Modern Europe: 1460-1559. New York; London: W.W. Norton & Co. pp 2-10

IMAGES

Fig1: “Johannes Gutenberg” https://images.app.goo.gl/L5VEVPhvw5txmmseA

Fig2: “Gutenberg Working on The Printing Press” https://images.app.goo.gl/TJuF1DndDG6YvjZH7

Fig3: “The Movable Type Printing Press”

https://images.app.goo.gl/WioCSKCu9VVGpUTz7

Fig4: “The Mainz Psalter” https://www.rct.uk/collection/1071478/the-mainz-psalter

Fig5: “Gutenberg Bible” https://images.app.goo.gl/F8YsdY3gwUJdJ3RZ6

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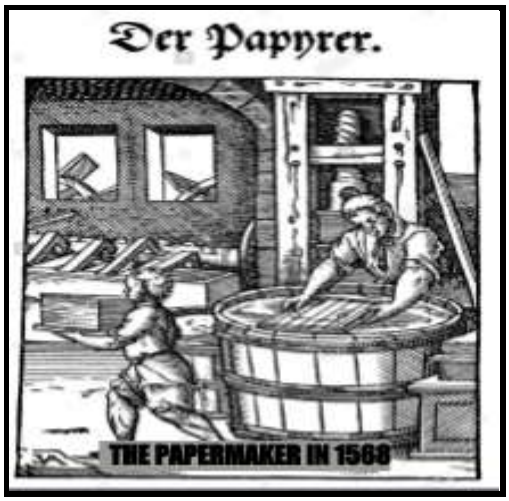
INDEX

INTRODUCTION



Printing with movable metal type was perfected in Mainz about 1450.Three names recur in the sources,those of Johann Gutenberg ,Johann Fust,and peter Schoffer,Fust's son-in-law.These sources are scanty,often unclear, and sometimes of doubtful authenticity. So it is impossible to determine accurately the contribution of a particular individual to the development of typography and its commercial exploitation.Our relative ignorance about the origins of printing does have advantages,however it discourages the misguided effort to attribute complex technological innovation to a single man,and forces us to realise that an invention is in any case not the creation of an individual,as is in any case not the creation of an individual,as is a poem or a painting,but a social product. Like the development of the steam engine or the telegraph,the " invention" of a mechanical process of duplicating texts was multiple and cumulative.It was successfully completed by Mainz printers in the 1450s.But it had important earlier beginnings.

Two chinese inventions,block painting and paper, are linked with the beginnings of typographic painting in Western Europe. Xylography or block printing originated in China in the early eighth century.The printer drew in reverse on a block of wood the text or the picture he wished to reproduce,carved the wood so that the graphic pattern stood out in relief,inked the block,and transferred the design to paper.The process is simple in conception,difficult,time consuming,and wasteful in execution and ill adapted to the alphabetic writing of the west.Its transmission to the west probably during the century from 1250 to 1350,when European contact with China was unusually close-had title direct importance for the development of typography.

EARLIER METHODS OF PRINTING

Nearly 600 years before Gutenberg, Chinese monks were setting ink to paper using a method known as block printing, in which wooden blocks are coated with ink and pressed to sheets of paper. One of the earliest surviving books printed in this fashion — an ancient Buddhist text known as "The Diamond Sutra" — was created in 868 during the Tang (T'ang) Dynasty (618-909) in China. The book, which was sealed inside a cave near the city of Dunhuang, China, for nearly a thousand years before its discovery in 1900, is now housed in the British Library in London.

The carved wooden blocks used for this early method of printing were also used in Japan and Korea as early as the eighth century. Private printers in these places used both wood and metal blocks to produce Buddhist and Taoist treatises and histories in the centuries before movable type was invented.

An important advancement to woodblock printing came in the early eleventh century, when a Chinese peasant named Bi Sheng (Pi Sheng) developed the world's first movable type. Though Sheng himself was a commoner and didn't leave much of a historical trail, his ingenious method of printing, which involved the production of hundreds of individual characters, was well-documented by his contemporary, a scholar and scientist named Shen Kuo.In his 11th-century work, "Dream Pool Essays," Kuo explains that Sheng's movable characters were made out of baked clay. The ink he used was a mix of pine resin, wax and paper ashes, and as Kuo tells it, Sheng's method could be used to print thousands of copies of a document fairly quickly.

While earthenware movable type was used by several other Chinese printers throughout the 12th and 13th centuries, Sheng's movable type didn't go mainstream in China or elsewhere until many centuries later.In the 14th century, Wang Chen, a Chinese government official of the Yuan Dynasty, independently created his own set of movable characters out of wood. His motivation for developing this new method of printing was the publication of a voluminous series of books on agriculture, titled "Nung Shu."In his 11th-century work, "Dream Pool Essays," Kuo explains that Sheng's movable characters were made out of baked clay. The ink he used was a mix of pine resin, wax and paper ashes, and as Kuo tells it, Sheng's method could be used to print thousands of copies of a document fairly quickly.While earthenware movable type was used by several other Chinese printers throughout the 12th and 13th centuries, Sheng's movable type didn't go mainstream in China or elsewhere until many centuries later.In

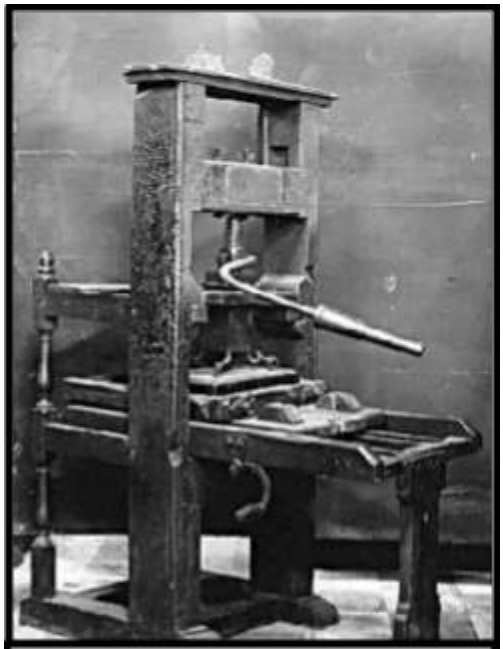
the 14th century, Wang Chen, a Chinese government official of the Yuan Dynasty, independently created his own set of movable characters out of wood. His motivation for developing this new method of printing was the publication of a voluminous series of books on agriculture, titled "Nung Shu.""Nung Shu" was eventually printed in 1313 using tried-and-true woodblock methods, not movable type. But Chen's printing method did catch on, albeit slowly, and was used for reproducing documents in the centuries that followed. Metal type — made from bronze and perhaps tin — was also used in China for the printing of books and paper money until at least the 18th century.Historical evidence suggests that metal movable type was also developed independently in Korea in the late 14th century. In 1377, a Korean monk named Baegun is credited with printing a compilation of Buddhist sayings using movable metal type. The two-volume book, known as "Jikji," is believed to be the

oldest book in the world printed with metal type. One volume of the work is held at the National Library of France.

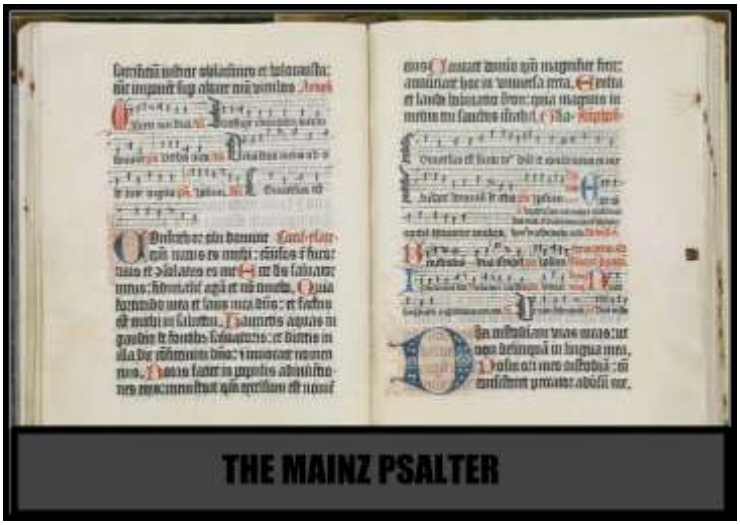
Europeans, however, took to movable types quickly. Before the invention of the printing press — sometime between 1440 and 1450 — most European texts were printed using xylography, a form of woodblock printing similar to the Chinese method used to print "The Diamond Sutra" in 868. Manuscripts not printed with woodblocks were painstakingly copied by hand. Both processes were extremely labor intensive and, as a result, books in Europe were very expensive and few could afford to buy them.But all that changed in the middle of the 15th century, when Johannes Gutenberg established himself as a goldsmith and craftsman in Strasbourg, Germany. In Strasbourg,Gutenberg began experimenting with both xylography and the development of a more efficient method of printing.

JOHANNES GUTENBERG

By the time of Gutenberg's youth,paper was plentiful and sold for approximately one sixth the price pf parchment.Western typography drew upon European methods also more immediate technical relevance.Printing as it was practiced in Mainz by Gutenberg,Fust,and metal type.To adhere to metal smoothly and evenly,ink must have an oil base.By the early fifteenth century,Flemish artists had begun to paint in oils,a suitable printers ink,consisting of a pigment ground in a linseed-oil varnish,was simply an adaptation of oil paint,The immediate ancestor of the wooden press was also at hand;the press used in paper mills for squeezing water from the damp sheets,a device easily adaptable to printing.Most crucial was the invention of type - the mirror image of each of the letters of the alphabet made in metal by precision casting from matrices. The skills which contributed to the development of typecasting were understandably those connected with the more delicate forms if metallurgy,those of the metal engraver and the designer of coins and medals,of the goldsmith adept at casting small objects of craftsmen who made punches for stamping letters on the bells,pewter vessels, and bookbindings. We must imagine that in many places in Europe during the first half of the fifteenth century ingenious artisans experimented with type,inks,and presses that many parallel efforts were made to replace the scribe by mechanical device that the actual invention of printing,the dramatic fusion of familiar techniques into a new and workable process-also occurred independently familiar techniques into a new and workable process-also occurred independently in several places,that,finally,this new process was perfected and first organised as an industry by Gutenberg,Fust,and Schoffer. The best among them astonish still by their technical perfection,further evidence that the Mainz printing



THE FIRST PRINTING PRESS



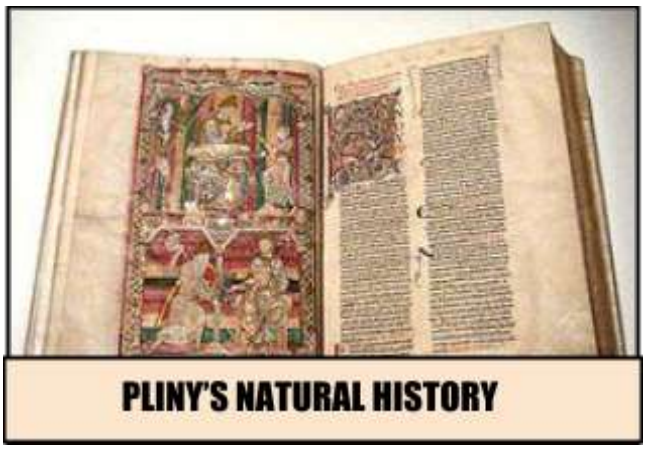
THE MAINZ PSALTER

forms had inherited considerable expertise from earlier experiment and discovery.The great Latin Bible popularly by bibliographers was finished in 1455.The craftsmanship of its type and the art of its typesetting and printing are impeccable.Clearly,the Mainz printers had established the technology of printing on firm foundations,and indeed for over three hundred years Gutenberg's successors cut punches,fitted matrices,cast type,composed,and printed substantially as he had done.On August 14,1457,Fust and Schoffer issued the Psalms.The volume was printed on vellum.The type,printed in red and black is noble and fits handsomely on the page.Each Psalms ,as the printers boasted in a note at the end,is "adorned with the beauty of the large initial letters",the lacy design of these letters,ornamented with flowers and small animals and printed in red and blue,is masterly.Fust and Schoffer's Psalms is the oldest signed and dated book printed in Europe that has survived.In its sober magnificence it is also one of the most beautiful.

SPREAD OF PRINTED MATTER

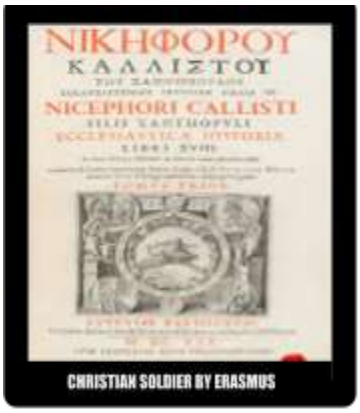
There was already a well-established demand for books from the clergy and the many new universities and grammar schools which had sprung up across Europe in the late medieval period. Indeed, traditional book-makers had struggled to keep up with demand in the first half of the 15th century CE, with quality often being compromised. This demand for religious material, in particular, was one of the main driving forces behind the invention of the printing press. Scholars had access to manuscripts in private and monastic libraries, but even they struggled to find copies of many texts, and they often had to travel far and wide to get access to them. Consequently, religious works and textbooks for study would dominate the printing presses throughout the 15th century CE. It is important to remember, though, that handmade books continued to be produced long after the printing press had arrived and, as with many new technologies, there were people still convinced that the flimsy printed book would never really catch on.The availability of things to read for people in general massively increased thanks to printing. Previously, the opportunity to read anything at all was rather limited. Ordinary folks often had little more than church notice boards to read. The printing press offered all sorts of new and exciting possibilities such as informative pamphlets, travel guides, collections of poems, romantic novels, histories of art and Architecture, cooking and medicinal recipes, maps, posters, cartoons, and sheet music. Books were still not as cheap as today in terms of price compared to income, but they were only around one-eighth of the price of a handmade book. With printing matter being varied and affordable, people who could not previously do so now had a real motive to read and so literacy rates increased.Further, printed books were themselves a catalyst for literacy as works were produced that could be used to teach people how to read and write. Soon, a new boost to the quantity of printed material came with the rise of the humanist movement and its interest in reviving literature from ancient Greece and Rome. Two printers, in particular, profited from this new demand: the Frenchman Nicholas Jensen (1420-1480 CE) and the Italian Aldus Manutius (c. 1452-1515 CE). Jensen innovated with new typefaces in his printing shop in Venice, including the easy-to-read roman type (littera antiqua/lettera antica) and a Greek font which imitated manuscript texts. Jensen

printed over 70 books in the 1470s CE, including Pliny's Natural History in 1472 CE. Some of these books had illustrations and decorations added by hand to recapture the quality of older, entirely handmade books.Meanwhile Manutius, also operating in Venice, specialised in smaller pocket editions of classical texts and contemporary humanist authors. By 1515 CE, all major classical writers were available in print, most in multiple editions and many as collections of complete works. In addition, printed classical texts with identical multiple copies in the hands of scholars across Europe could now be easily checked for accuracy against source manuscripts. Handmade books had often perpetuated errors, omissions, and additions made by individual copyists over centuries, but now, gradually, definitive editions of classical works could be realised which were as close as possible to the ancient original. In short, printed works became both the cause and fruit of an international collective scholarship, a phenomenon which would reap rewards in many other areas from astronomy to zoology.There was, too, a drive to print more books thanks to the Reformists who began to question the Catholic Church's interpretation of the Bible and its stranglehold on how Christians should think and worship. The Bible was one of the priorities to have been translated into vernacular languages, for example German (1466 CE), Italian (1471 CE), Dutch (1477 CE), Catalan (1478 CE), and Czech (1488 CE). Reformists and humanists wrote commentaries on primary sources and argued with each other in print, thereby establishing an invisible web of knowledge and scholarship across Europe. Even the letters written between these scholars were published. As religious and academic issues raged, the debating scholars fuelled the production of yet more printed works in a perpetuating cycle of the printed word. Ordinary folks, too, were roused by arguments presented in printed materials so that groups of like-minded individuals were able to quickly spread their ideas and organise mass movements across multiple cities such as during the German Peasants' War of 1525 CE.



A BOOMING INDUSTRY

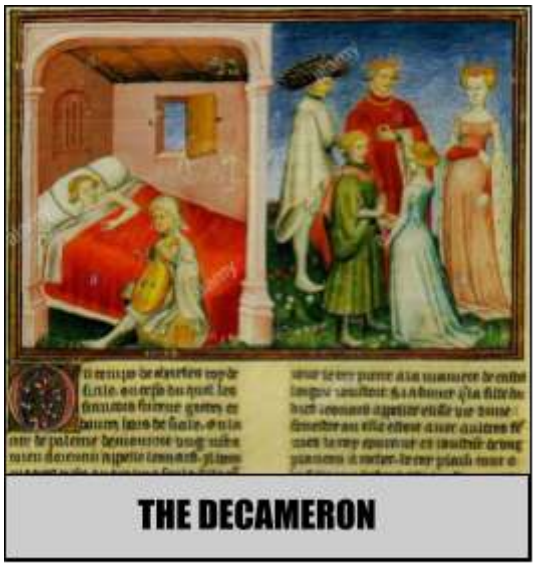
As a consequence of all this demand, those printers who had survived the difficult early years were now booming. Cities across Europe began to boast their own printing firms. Places like Venice, Paris, Rome, Florence, Milan, Basel, Frankfurt, and Valencia all had well-established trade connections (important to import paper and export the final product) and so they became excellent places to produce printed material. Some of these publishers are still around today, notably the Italian company Giunti. Each year, major cities were producing 2-3,000 books every year. In the first decade of the 1500s CE, it is estimated 2 million books were printed in Europe, up to 20 million by 1550 CE, and around 150 million by 1600 CE. There were over half a million works by the Reformist Martin Luther (1483-1546 CE) printed between 1516 and 1521 CE alone. Into the 16th century CE, even small towns now had their own printing press.Besides established authors, many publishers helped new authors (men and women) print their works at a loss in the hope that a lucrative reprint run would finally bring in a profit. The typical print run for a first edition was around 1,000 copies although this depended on the quality of the book as editions ranged from rough paper pocket-sizes to large vellum (calfskin) folio editions for the connoisseur. The smaller size of most printed books compared to handmade volumes meant that habits of reading and storing books changed. Now a desk was no longer required to support large books and one could read anywhere. Similarly, books were no longer kept horizontally in chests but stacked vertically on shelves. There were even odd inventions like the book wheel on which several books could be kept open and easily consulted simultaneously by turning the wheel, especially useful for research scholars. As readers accumulated their books and built up impressive private collections, so many bequeathed these to their city when they died. In this way, within 50 years of the printing press' invention, public libraries were formed across Europe.Printed works became so common, they helped enormously to establish the reputations, fame and wealth of certain writers. The Dutch scholar



CHRISTIAN SOLDIER BY ERASMUS

Desiderius Erasmus (c. 1469-1536 CE) is perhaps the best example, one of the first authors to make a living solely through writing books.

Censorship & Printing the Wrong Books



All of these developments were not welcomed by all people. The Catholic Church was particularly concerned that some printed books might lead people to doubt their local clergy or even turn away from the Church. Some of these works had been first released in manuscript form a century or more earlier but they were now enjoying a new wave of popularity thanks to printed versions. Some new works were more overtly dangerous such as those written by Reformists. For this reason, in the mid-16th century CE, lists were compiled of forbidden books. The first such list, the 1538 CE Italian Index of Prohibited Books, was issued by the Senate of Milan. The Papacy and other cities and states across Europe soon followed the practice where certain books could not be printed, read, or owned, and anyone caught doing so was, at least in theory, punished. Further measures included checking texts before they were published and the more careful issuing of licenses to printers.Institutionalised censorship, then, became a lasting reality of publishing from the mid-16th century CE as rulers and authorities finally began to wake up to the influence of printed matter. Authorities banned certain works or even anything written by a particular author. The De Revolutionibus Orbium Coelestium (On the Revolutions of the Heavenly Spheres, 1543 CE) by the Polish astronomer Nicolaus Copernicus (1473-1543 CE) was added to the forbidden list for putting the Sun at the centre of the solar system instead of the Earth. The Decameron (c. 1353 CE) by the Italian author Giovanni Boccaccio (1313-1375 CE) was added to the list because of its vulgarity. The

works of Niccolò Machiavelli were added for his political cynicism.The worst works singled out for censorship were burned in public displays, the most infamous being the bonfire of the 'vanities' orchestrated by Girolamo Savonarola, a Florentine Dominican friar, in 1497 CE. On the other hand, some works were eventually allowed to be published (or republished) if they were appropriately edited or had offending parts removed. Most printers did not fight this development but simply printed more of what the authorities approved of. There was certainly, though, an underground market for banned books.Many intellectuals, too, were equally dismayed at the availability of certain texts to a wide and indiscriminate audience. The Divine Comedy (c. 1319 CE) by the Italian poet Dante Alighieri (1265-1321 CE) was thought by some to contain certain moral, philosophical, and scientific ideas too dangerous for non-scholars to contemplate. Similarly, some scholars lamented the challenge the vernacular language was posing to Latin, what they considered the proper form of the written word. The tide had turned already, though, and local vernaculars became more standardised thanks to editors trying to make their material more comprehensible to the greatest number of readers. An improved use of punctuation was another consequence of the printed word.Another delicate area was instruction books. Printers produced trade manuals on anything from architecture to pottery and here again, some people, especially guilds, were not so happy that detailed information on skilled crafts - the original 'trade secrets' - could be revealed to anyone with the money to buy a book. Finally, the printed word sometimes posed a challenge to oral traditions such as the professionals who recited songs, lyrical poetry, and folk tales. On the other hand, many authors and scholars transcribed these traditions into the printed form and so preserved them for future generations up to the present day and beyond.

CONCLUSION

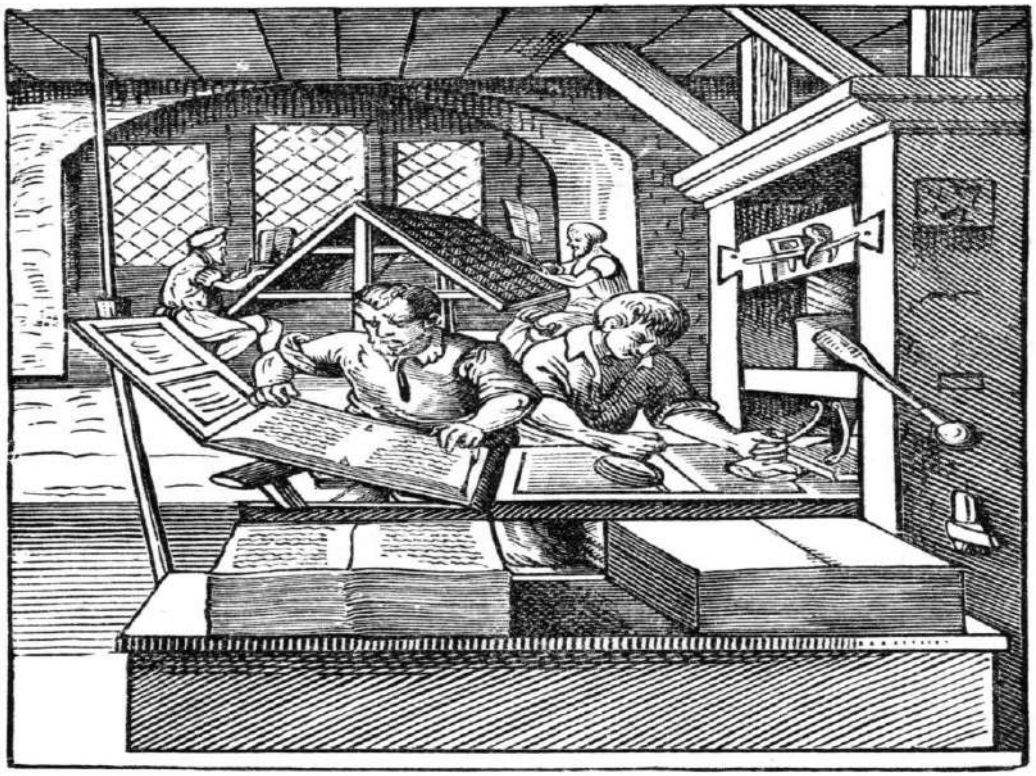
The printing press, one of the most revolutionary inventions in human history, is made up of paper, type, ink, and rollers. The printing press has allowed ideas and knowledge to spread, transforming every aspect of daily life from the time of the Gutenberg bible in the fifteenth century to the mass-produced books of the twenty-first century. Simultaneously, printing has aided in shaping changes in social relations made possible by industrial development and economic transformations.In most countries, information of all kinds has reached all levels of society through books, pamphlets, and the press.Print is still an extremely powerful platform for influencing thought, belief, and culture, and it has given little ground to the power of other modern media. Some observers believe that printing is doomed to extinction as a result of current competition for some of its traditional functions. On the other hand, those who argue that information in printed form has distinct advantages over other audio or visual media have dismissed this viewpoint as unrealistic.Printed texts and documents, while taking longer to produce, are always available and thus allow for reflection. Printing is easily accessible. Printing, far from being doomed to extinction, appears more likely to undergo an evolution marked by its increasingly close association with these various other means of putting information at the disposal of humankind.

BIBLIOGRAPHY

- Blockmans, Wim & Hoppenbrouwers, Peter. *Introduction to Medieval Europe 300–1500*. Routledge, 2017.
- Campbell, Gordon. *The Oxford Illustrated History of the Renaissance*. Oxford University Press, 2019.
- Hale,J. R. Hale (ed). *The Thames & Hudson Dictionary of the Italian Renaissance*. Thames & Hudson Ltd, 1985.
- Holmes, George. *The Oxford History Of Medieval Europe*. Oxford University Press, U.S.A., 2001.
- Rice, Eugene F., and Anthony Grafton. The Foundations of Early Modern Europe 1460-1559. W.W. Norton & Co., 1994.
- Rundle, David. *The Hutchinson Encyclopedia of the Renaissance*. Hodder Arnold, 2000.
- Wyatt, Michael. *The Cambridge Companion to the Italian Renaissance*. Cambridge University Press, 2014.

PRINTING REVOLUTION

SCOTTISH CHURCH COLLEGE



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INDEX

INTRODUCTION

Printing is a process for mass reproducing text and images using a master form or template. The earliest non-paper products involving printing include cylinder seals and objects such as the Cyrus Cylinders and the Cylinders of Nabonidus. The earliest known form of printing as applied to paper was woodblock printing, which appeared in China before 220 AD for cloth printing. However, it would not be applied to paper until the seventh century. Later, developments in printing technology include the movable type invented by Bi Sheng around 1040 AD and the printing press invented by Johannes Gutenberg in the 15th century. The technology of printing played a key role in the development of the Renaissance and the Scientific Revolution and laid the material basis for the modern knowledge based economy and the spread of learning to the masses. During the half century before 1500, Europeans read the first books printed in the West. In 1500 Copernicus lectured on mathematics in Rome, and soon after, he began to teach that the earth rotates on its axis and at the same time revolves in orbit around the central sun. Each of these innovations, discoveries, and rediscoveries influenced profoundly the future course of Europeans and world history. Together they transformed European's relation to non-European civilizations and to its own past. Until the sixteenth century, Europe was the technical and central pupil of Greco-Roman antiquity and of the civilizations of the near and Far East. The Voyages of Columbus and Vasco da Gama coincided with the beginning of the end of that dependence. Europe acquired and exercised, along with political and economic predominance, technical and leadership. Before 1500, Europe imported ideas and techniques; after 1500, Europeans were cultural creditors.

HISTORY OF PRINTING REVOLUTION

For fewer people would be able to read, many would still speak Latin, news of historic events would never have reached us, and the greatest scientific discoveries would have arrived centuries late. If printing had not been invented, that is. First stage: Woodblock printing- In the sixth century China, during Tang dynasty, one of many inventions emerged from this great empire was a system of printing using wooden matrices that were engraved, inked and pressed onto a sheet of paper. The scope of this invention was such that, in modern Chinese historiography, printing is considered one of the four great inventions of Ancient China. One of the first books printed with woodblocks was a copy of the Diamond Sutra (868 AD), a six sheet scroll over five meters long. Recently, a Korean Pagoda was discovered with an even older text dating to 750-761 AD. Second stage: movable-type printing- We have arrived at one of the most important stages in the history of printing: the advent of movable type. And once again, this invention came from China. In 1041, the printer Bi Sheng invented movable clay type. However, it had the drawback of breaking easily. In 1298, the inventor Wang Zhen began using much stronger wooden type and invented a complex system of tables that improved the quality of printing. Now fast forward to the 15th century and the introduction of movable type in Europe by Johannes Gutenberg. The centerpiece of his technique was the punch, steel parallel piped whose head was engraved in relief and back to front, with a character: a number, letter or punctuation mark. The punch created the matrix in which type was cast, then placed on a tray, inked and pressed onto paper.

So, what were Gutenberg's three major innovations?

(i) He was the first to use oil-based inks, which lasted longer than the water-based inks used previously.

(ii) His type was more robust because it was made from an alloy of lead, tin and antimony.

(iii) And he invented the first printing press, which was inspired by the grape press.

On 23rd February, 1455, after about a year's experimentation, the first Gutenberg Bible was published with a print run of 180 copies.

THE INVENTION OF PRINTING

Printing with movable type was perfected in Mainz about 1450. Not only Gutenberg was the sole person to invent the printing press, but there were other two heads also, Johann Fust (c. 1400-1465) and Peter Schoffer (c. 1425-1502). Peter Schoffer was the son-in-law of Johann Fust. Two Chinese inventions block printing and paper are linked with the beginnings of typographic printing in Western Europe. Xylography, or block printing, originated in China in the early eighth century. The process is simple in conception; difficult, time consuming, and wasteful in execution; and ill adapted to the alphabet writing of the West. Its transmission to the West was probably during the century from 1250 to 1350. Paper was indispensible, but for economic rather than technical reasons. Manuscript books were usually copied on parchments (made form split sheep skin) or on vellum (calf skin), and these materials were used also by typographic printers when the aim was magnificence rather than utility. But a single large book like the Bible required as many as 170 calf skins or 300 sheep skins; the absence of paper soon would have nullified the promise of mechanical duplication: the cheap, rapid production of books in large numbers. Paper manufacturer was introduced in Spain during the twelfth century by the Arabs. It spread slowly during the next two centuries to much of Europe: Italy (c. 1270), France (c. 1340), Germany (c. 1390) and Switzerland (1411). In Europe, the chief raw material was old rags. By the time of Gutenberg's youth, paper was plentiful and sold for approximately one-sixth the price of parchments. Printing, as it was practiced in Mainz by Gutenberg, Fust and Schoffer required a suitable ink, a press for transferring the ink to paper, and metal type.

What is certain is that the oldest surviving books printed with movable metal type were issued in Mainz. The great Latin Bible popularly associated with Gutenberg, named as 'Forty-two-line Bible', was finished in 1455. On August 14, 1457, Fust and Schoffer issued Psalms. The volume was printed on vellum. These first printed books have a further, and curious, characteristic: their pages so closely resembled those of manuscript books as to be virtually indistinguishable to the unpracticed eye. Clearly the printers' technical, aesthetic, and commercial aim was to reproduce exactly the handwritten manuscript. The practice suggests rather that the earliest printers had no conception of the unique potentialities of their inventions that they considered as only a new kind and particular kind of writing, and that they thought that what had to sell consisted simply of less expensive manuscripts in great numbers.

IMPACT OF THE PRINTING PRESS ON RENAISSANCE

The printing press was invented by the German man, Johannes Gutenberg around 1440s. The printing press made books easier and cheaper to produce, which increased the number of books, and lowered the cost of books so that more people could learn to read and get more reading materials. It made it easier to spread material through the time of the Renaissance and Reformation. It spread religious beliefs and eventually led to the translation of the Bible. The invention of the printing press was one of the main causes of the Renaissance. The printing press promoted the spread of ideas to places that had not been possible before. When it was invented, popularity of books skyrocketed. Even though it was so popular, it was still a very slow process. The printing press led to an overwhelming amount of books leading to everyone filled with knowledge. The effects of the printing press are especially apparent when one examines life of Martin Luther. Luther was a religious man who spread his ideas through literature such as pamphlets. If Luther had not had access to the printing press, he would not have had such a scholarly effect on Europe.

Beginning with religious works and textbooks, soon presses were churning out all manner of texts from Reformation pamphlets to romantic novels. Ideas were transmitted across Europe as scholars published their own works, commentaries on ancient texts, and criticism of each other. Authorities like the Catholic Church took exception to some books and censored or even burned them, but the public's attitude to books and realizing was by then already changed forever.

Let's conclude in a nutshell, that what was the exact impact of printing presses in Renaissance and Reformation:

(i) A huge increase in the volume of books produced compared to handmade works.
(ii) An increase in the access to books in terms of physical availability and lower cost.
(iii) More authors were published, including unknown writers.
(iv) A successful author could now earn a living solely through writing.
(v) An increase in the use and standardization of the vernacular as opposed to Latin in books.
(vi) An increase in literacy rate.
(vii) The rapid spread of ideas concerning religion, history, science, poetry, art and daily life.
(viii) An increase in the accuracy of ancient canonical text.
(ix) The censorship of books by concerned authorities.
(x) The creation of public libraries.
(xi) The censorship of books by concerned authorities.

The English philosopher Francis Bacon, who is credited with developing the scientific method, wrote in 1620 that the three inventions that forever changed the world were gunpowder, the nautical compass and the printing press. For millennia, science was a largely solitary pursuit. Great mathematicians and natural philosophers were separated by geography, language and the sloth- like pace of hand written publishing. Not only were hand written copies of scientific data expensive and to come by, they were also prone to human error. With the new found ability to publish and share scientific findings and

experimental data with a wide audience, science took great leaps forward in the 16th and 17th centuries. When developing his sun-centric model of the galaxy in the early 1500s, for example, Polish astronomer Nicolas Copernicus relied not only on his own heavenly observations, but on printed astronomical tables of planetary movements. When historian Elizabeth Eisenstein wrote her 1980 book about the impact of the printing press, she said that its biggest gift to science was not necessarily the speed at which the ideas could spread with printed books, but the accuracy with which the original data were copied. With printed formulas and mathematical tables in hand, scientists could trust the fidelity of existing data and devote more energy to breaking new grounds.

MASS COMMUNICATION

In Renaissance Europe, the arrival of mechanical movable type printing introduced the era of mass communication, which permanently altered the structure of society. The relatively unrestricted circulation of information and (revolutionary) ideas transcended borders, captured the masses in the Reformation, and threatened the power of political and religious authorities; the sharp increase in literacy broke the monopoly of the literate elite on education and learning and bolstered the emerging middle class. Across Europe, the increasing cultural self-awareness of its peoples led to the rise of proto-nationalism, accelerated by the flowering of the European vernacular languages to the detriment of Latin's status as *lingua franca.*

EFFECT ON SCHOLARSHIP AND LITERACY

The printing press was also a factor in the establishment of a community of scientists, who could easily communicate their discoveries through widely disseminated scholarly journals, helping to bring on the scientific revolution. Because of the printing press, authorship became more meaningful and profitable. It was suddenly important who had said or written what, and what the precise formulation and time of composition was. This allowed the exact citing of references, producing the rule, "one author, one work (title), one piece of information". Before, the author was less important, since a copy of Aristotle made in Paris would not be exactly identical to one made in Bologna. For many works prior to the printing press, the name of the author has been entirely lost. Because the printing process ensured that the same information fell on the same pages, page numbering, tables of contents, and indices became common, though they previously had not been unknown. The process of reading also changed, gradually moving over several centuries from oral readings to silent, private reading. The wider availability of printed materials also led to a drastic rise in the adult literacy rate throughout Europe.

CONCLUSION

The printing revolution has changed the life of the human beings. We all know that, knowledge plays a very important role in our day to day life. If printing press was not invented then of course, we might stay in the era of oral readings. We did not be able to know our world, the universe, the sun, planets, mathematics, science, technology, etc. may be, and only one or two sections of the societies would be literate and had higher ranks in the work field. All these were very obvious, if printing press was not invented. But actually the main credit should go to the Chinese men, who did the invention first, and later Gutenberg made it a revolution. Not only the printing press, rather paper and ink should also be credited in the printing revolution. Which made the common peoples to afford books, because previously parchments and vellums were very costly, on which the books were printed. Revolutions like Renaissance, Reformation and Scientific changed the face of the human history for ever. The spread of the ideas were all possible through only books and pamphlets. Even today, if printing presses were not invented, we would never get to know about these histories, which are all possible through the books. Even now, every invention, every new idea, whatever its medium, has eventually to be "registered in print": fixing what has been fluid or undefined is still the major function of the press. But the greatest change of all was the simplest: the new bond between man and woman of a common literacy. The *Nature of the Book* has attracted numerous accolades and prizes. It is an impressive work in many ways. But according to some historian, it does a real disservice to historical understanding by treating the shift from script to print as inconsequential.

Printed books not only educate us the various things, but it made a connection between different people, different community and among different countries. And this, gave a new path way to acknowledge with great ideas and philosophies to break the barriers of superstitions, applied by and taught by different higher authorities. But Gutenberg cannot be credited all alone, along with him Fust and Schoffer had done a great job. They funded Gutenberg when he was in need, and also evolved the printing press with new ideas. Finally, we can conclude printing revolution, as it is still a revolution, because many new ideas and theories are yet to come with time.

BIBLIOGRAPHY

References from books:

1. Rice Eugene F. Jr and Grafton Anthony, The Foundations of Early Modern Europe 1460-1559, W. W. Norton and Company, New York, London, Second Edition.

References from websites:

1. https://en.m.wikipedia.org/wiki/Printing#:~:text=Around%201450%2C%20Johannes%20Gutenberg%20introduced,softer%20and%20more%20absorbent%20paper.
2. https://www.pixartprinting.co.uk/blog/brief-history-printing/
3. https://www.cram.com/essay/Invention-Of-The-Printing-Press-Essay/PJJE9CV7XT
4. https://www.worldhistory.org/article/1632/the-printing-revolution-in-renaissance-europe/
5. https://www.history.com/news/printing-press-renaissance
6. https://courses.lumenlearning.com/suny-hccc-worldhistory/chapter/the-printing-revolution/

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সূচিপত্র

● ভূমিকা :—

পঞ্চদশ শতকেই ইউরোপে নবজাগরনের আবির্ভাব ঘটেছিল। নবজাগরনের পটভূমি হিসেবে ইউরোপ সমাজ, রাজনীতি, অর্থনীতির সঙ্গে সঙ্গে চিন্তাতেও রূপান্তরের সূত্র লক্ষ করা যায়। কলম্বাসের আমেরিকাতে পদার্পণ বা ভাস্কো-দা-গামার কালিকটে আগমন ইউরোপের ভৌগোলিক সীমানা বিস্তৃত করেছিল। বারুদ ও আগ্নেয়াস্ত্র-এর ব্যবহার যুদ্ধের চেহারা পালটে দিয়েছিল। বিজ্ঞান ও প্রযুক্তির ক্ষেত্রেও ব্যাপক পরিবর্তনের আভাস পাওয়া যাচ্ছিল। সব মিলিয়ে ইউরোপের মানসিক গঠনে প্রায় বিপ্লব সৃষ্টি হয়েছিল। ইউরোপের সঙ্গে অ-ইউরোপীয় বিশ্বের এক নতুন অনুসন্ধান শুরু হয়েছিল। অর্থনীতি, যুদ্ধ, বিজ্ঞান ও প্রযুক্তিতে ইউরোপের আধিপত্যের সূচনা এই পর্বেই হয়েছিল।

ইয়োহানেস গুটেনবার্গ যান্ত্রিক পরিবর্তন ঘোরা বইয়ের মুদ্রণ ব্যবস্থা ইউরোপে ১৫ শতাব্দীতে চালু করেন। তার দ্বারা আনা একটি গুরুত্বপূর্ণ ভূমিকা পালন করে রেনেসাঁ যুগের, সংস্কারের, আলোকিত যুগের এবং বৈজ্ঞানিক বিপ্লব উন্মেষের এবং এটি আধুনিক জ্ঞান-ভিত্তিক অর্থনীতির উপাদানের ভিত্তি স্থাপন করে এবং জনগনের মধ্যে শিক্ষার প্রসার ঘটায়। আমাদের আলোচ্য বিষয় এটাই।

● মুদ্রণ বিপ্লবের পূর্বসূত্র:—

কাচে মুদ্রণ প্রথম এসেছিল ইউরোপে কাগজে মুদ্রণের পর, ১৩০০ সালের মধ্যেই এটি সবার কাছে পরিচিত হয়ে ওঠে। বিলীয়ন উদ্দেশ্যে ব্যবহৃত দুধির কাগজে বেশ বড় এবং সম্পূর্ণ মুদ্রণ করা হয়। সস্তা কাগজ আবিষ্কারের ফলে ছাপাখানা খোলা শুরু হয়, প্রায় ১৪০০ সাল নাগাদ, এই শিল্পটি খুব দ্রুত স্থানান্তরিত হয় কাগজে, ছোট কাচে সোদাই করা বিলীয়ন দুধিতে ও তাদের মুদ্রিত ছাপাখানা খোলা শুরু হয়। ১৯২৫ সাল থেকে এই মুদ্রণ ব্যবস্থা কার্যকর হবে শুরু হয়। সোদাইকৃত পাথরখণ্ড অক্ষরের মতই ছাপা, লিখিত অক্ষর ও দুধির কাচের টুকরা-বই, কাচে সোদাইকৃত বই হিসাবে ছাপাখানা খোলা শুরু করে। এ সমস্ত বিকল্প হিসাবে একই টুকরায় সোদাই করা পরিবর্তনযোগ্য ধরনের মুদ্রণ পদ্ধতির আবিষ্কারে পাণ্ডুলিপি ও বই তৈরি করা হত। এই সময়কার সবচাইতে বিক্রিত কাজ ছিল মুদ্রিতচিত্র সম্বলিত চিত্রের মুদ্রণগুলো, যার বার বার পুনরাবৃত্তি হত বিভিন্ন কাচের টুকরা—বই সংস্করণে তাদের সোরিএন্টি এবং বিল্লিয়া পাইলোক্স সবচাইতে বেশি ছাপাখানা খোলা। পন্ডিতদের মধ্যে এখনও কিছু বিতর্ক রয়েছে পরিবর্তনযোগ্য ধরনের মুদ্রণ পদ্ধতির আবিষ্কারের সময় নিয়ে, অধিকাংশ বিশ্বাস করেন এটির প্রবর্তনের আনুমানিক তারিখের পরিসীমা হল প্রায় ১৪৪০—১৪৬০ সাল।

সর্বপ্রথমে বই অক্ষর ছিল না। কিন্তু তার রূপ ছিল লিখিত পুঁথি। পরবর্তী শতকের মাঝামাঝি সময়ে ইউরোপে নতুন বিষয়-এর আবির্ভাব ঘটিল। এই বই দেখতে পুরানো পুঁথির থেকে খুব আলাদা না হলেও, এগুলি কাগজ বা ভেলামের উপরে মুদ্রণযন্ত্রে এবং নতুন কালির সাহায্য ব্যবহার করে ছাপা হয়েছিল। এই ধরনের নতুন সাহিত্য পুনর্ব্যবহার করা হয়েছিল।

ছাপানো বই-এর আগেও এরকম বই ছিল। আমরা জানি এই বই ছিল হাতে লেখা পুঁথি। তাতে অলঙ্করণ থাকত, ছবি থাকত, সুন্দর বাঁধাই থাকত। হয়তো বিষয় বৈচিত্র্য কম ছিল। তবুও পুঁথির ঐতিহাসিক গুরুত্ব কম ছিল না। প্রথম দিকের ছাপানো বই প্রায় পুঁথির অনুরূপই ছিল।

ঐতিহাসিকেরা পুঁথির ইতিহাসকে সাধারণত দুভাগে ভাগ করে দেখেন : মধ্যযুগ এবং রেনেসাঁস নিরপেক্ষ যুগ। রোমের পতনের পরে প্রায় ৭০০ বছর ধরে পুঁথির রচনা, অনুকরণের কাজের ওপর মঠ ও অন্যান্য ধর্মীয় প্রতিষ্ঠানের প্রায় একচেটিয়া নিয়ন্ত্রণ ছিল। দ্বাদশ শতক থেকে এক্ষেত্রে কিছুটা পরিবর্তন লক্ষ করা যায়।

মুদ্রিত গ্রন্থকের পূর্বসূরি পুঁথির এগুলোকে একটু দেখা প্রয়োজন। যে যুগকে ঐতিহাসিকেরা পুঁথির 'ক্লেকুলার যুগ' বলেছেন, সে সময়ে পুঁথির অলঙ্করণ ও সৌষ্ঠবে পরিবর্তন ছাড়াও কিছু প্রযুক্তিগত উন্নতি ঘটেছিল। এর মধ্যে প্রধান ছিল কাগজের ব্যবহার। এর ফলে পুঁথির রচনা একটু কম ব্যয়সাপেক্ষ হয়েছিল।

অলঙ্করণ, মুদ্রণ-ব্যবস্থা আবিষ্কৃত হবার আগেই বই-এর একটা বাজার তৈরি হয়েছিল। মুদ্রণযন্ত্র আবিষ্কারের পেছনে এই চাহিদার নিশ্চিত প্রভাব ছিল।

• ইয়োহানেস গুটেনবার্গ :-

জার্মানির মাইন্ৎস শহরে ১৩৯৮ সালে জন্মগ্রহণ করেন। তিনি স্যাকরার দোকানে কাজ করতেন। ১৪১৯ থেকে ১৪৩৪ পর্যন্ত তার ব্যাপারে তেমন কোনো তথ্য পাওয়া যায়নি। ১৪৩৪ সালের মার্চ মাসে তার লেখা একটি চিঠি থেকে জানা যায় যে তিনি স্ট্রাস-বুর্গ শহরে বসবাস করছিলেন। সেখানে তিনি কমপক্ষে ১৪৪৪ সাল অবধি ছিলেন। ১৪৪০ সালে তিনি ছাপাকল তৈরি পদ্ধতির উপর তার গবেষণা প্রকাশ করেন।

তিনি একাধারে জার্মান উদ্ভাবক এবং প্রকাশক যিনি ইউরোপে মুদ্রণ চালু করেন। সাশ্রয়ী চলমান প্রকারের প্রিন্টিংয়ের প্রবর্তন; ইউরোপে প্রিন্টিং বিপ্লব শুরু হয়। এবং যা মানব ইতিহাসের দ্বিতীয় সহস্রাব্দের একটি সাইলফলক হিসেবে গণ্য করা হয়। এটি রেনেসা এবং বৈজ্ঞানিক বিপ্লবে একটি গুরুত্বপূর্ণ ভূমিকা পালন করে, এবং জনসাধারণের শিক্ষার বিস্তারের জন্য গুরুত্বপূর্ণ উপাদান এটি কাজ করে।

গুটেনবার্গের এই আবিষ্কারের ফলে দ্রুত মুদ্রণ সম্ভব হয়। রেনেসাঁস এর সময় ইউরোপে ফলে দ্রুত মুদ্রণ সম্ভব হয়।

তিনি চতুর ব্যবসায়ী ছিলেন না এবং তিনি তার আবিষ্কার থেকে বিক্রির প্রাপ্য টাকা পাননি, তিনি আইনি সমস্যার মধ্যে ছিলেন এবং তার ব্যবসা-য়িক সঙ্গী জোহান ফাউস্টের কাছে তিনি হেরে যান। এবং তার আবিষ্কৃত সবের স্বত্ব হারান। ১৪৬৮ সালের ৩রা ফেব্রুয়ারি তিনি মারা যান।

● মুদ্রণ বিপ্লব:—

পঞ্চদশ শতকের সাধারণভাবে যে বৈপ্লবিক পরিবর্তন আসে তার প্রধান কারণ মুদ্রণযন্ত্র এবং পুনর্ব্যবহারযোগ্য টাইপ এর আবিষ্কার। এই শতক থেকেই বই-এর চাহিদা বৃদ্ধি পায়। সমসাময়িক লেখকেরা বিশেষত হিউম্যানিস্টরা সক্রিয় এবং বেশি অধ্যয়ন বইয়ের উৎপাদন সম্পর্কে বিশেষ আগ্রহী ছিলেন। সুতরাং চাহিদা তৈরিই ছিল। মুদ্রণযন্ত্র আবিষ্কৃত হলেও বই ছাপার জন্য অন্যতম প্রয়োজনীয় সামগ্রী ছিল কাগজ। কাগজের ব্যবহার মুদ্রণ-বিপ্লবকে বিশেষ ভাবে সাহায্য করেছিল।

মুদ্রণযন্ত্রের ব্যবহার সম্ভব হয়েছিল নতুন ধরনের টাইপের উদ্ভাবনের ফলে। তাছাড়া কালির ব্যবহারও গুরুত্বপূর্ণ ছিল। এই সময়ে শিল্পীরা তেল-মিশ্রিত রঙ দিয়ে ছবি আঁকা শুরু করেছিলেন। এই রঙের ব্যবহার ছাপার জন্য উপযুক্ত ছিল। সুতরাং কোনো খোদাই করা ব্লক থেকে নয়, নতুন আলাদা অক্ষরের টাইপ দিয়ে ছাপার কাজ শুরু হয়। গোটা প্রক্রিয়ায় বিভিন্ন পেশায় যুক্ত কারিগরদের খুব উল্লেখযোগ্য ভূমিকা ছিল। স্বর্ণকারেরা খুব ছোট ধাতুর ওপরে সূক্ষ্ম খোদাইয়ের কাজ করতে পারতেন। তাদের ভূমিকা বিশেষ গুরুত্বপূর্ণ ছিল। ধাতুবিদ্যার উন্নতিও নতুন ধরনের টাইপ তৈরিতে সাহায্য করেছিল। এভাবেই মুদ্রণ বিপ্লবের পটভূমিটি তৈরি হয়।

জার্মানির মাইনৎস্ (Mainz) শহরেই প্রথম ছাপানো বই-এর কাজ শুরু হয়। ইয়োহানেস গুটেনবার্গ, যোহান ফুস্ট এবং পিটার শোফার এ প্রসঙ্গে বিশেষ উল্লেখযোগ্য। অনুমান করা হয় যে ১৪৫৩ সাল

ঘিরেই ইউরোপের বিভিন্ন অঞ্চলে কারিগরেরা নতুন ধরনের টাইপস, কালি বা মুদ্রণযন্ত্র নিয়ে পরীক্ষা-নিরীক্ষা চালাচ্ছিলেন। ফলে মুদ্রণযন্ত্র আবিষ্কার ও বই ছাপানোর প্রক্রিয়াও বিভিন্ন স্থানে প্রায় একই সময়ে শুরু হয়েছিল। কিন্তু পুরো প্রক্রিয়াকে একসঙ্গে মেশে মুদ্রণ ব্যবস্থাকে একটি সুগঠিত শিল্পে পরিণত করার কৃতিত্ব প্রাপ্য জার্মানির ফুস্ট ও শোফারের প্রাপ্য।

১৪৫০ সালকে পুরানো ছাপা যে বইগুলি পাওয়া যায় তা ইনকুনাবুলা-এ উৎপাদিত। জার্মানির বিখ্যাত মুদ্রিত বাইবেল যা প্রচলিত তাকে প্রথম মুদ্রিত গ্রন্থের সন্ধান পায় ১৪৫৫ তে সমাপ্ত হয়েছিল। এই গ্রন্থগুলি মুদ্রণ ও উৎপাদন পারিপাট্যে বিশেষ আকর্ষণের বস্তু। প্রায় নিঁখুত ছাপা, সুন্দরভাবে বাঁধানো বইগুলি আজও নজর কাড়ে। ১৪৫৭ খ্রীঃ ফুস্ট ও শোফার psalms-এর একটি সংকলন প্রকাশ করেন। লাল কালো কালিতে ছাপা বইয়ের প্রত্যেকটি গানের প্রথম অক্ষরটি বর্ণময় ও অলঙ্কৃত ছিল।

১৫০০ খ্রীঃ পর্যন্ত ছাপা বইগুলিকে ইনকুনাবুলা (Incunabula) বলা হয়। প্রথম দিকে ছাপা বইগুলির আর একটা বিশিষ্টতা ছিল পুঁথির মতো বইয়ের গঠন করা। তখনও এটাই লেখকেরা লেখার বদলে কৃত্রিম উপায়ে যন্ত্রের সাহায্যে ছাপা।

এরকম ছোট আকারে শুরু হলেও মুদ্রিত বইয়ের সংখ্যা ক্রমশ বৃদ্ধি পেয়েছিল এবং মুদ্রণযন্ত্র অন্যত্র ছড়িয়ে পরে।

• মুদ্রণ বিপ্লবের প্রভাব:—

* **পরিমানগতভাবে:** এটা অনুমান করা হয় যে, গুটেনবার্গের দ্বাদশ শতাব্দীর পর থেকে ইউরোপের বই উৎপাদন বেড়ে কয়েক মিলিয়ন কপি থেকে প্রায় এক বিলিয়ন কপিতে, মাত্র চার শতাব্দীর কম সময়ে।

* **বিপ্লবী প্রভাব:** স্যামুয়েল গ্রাইলির মিনি নির্বাসিত হয়েছিলেন বিদেশে থেকে এবং তিনি ইংরেজ ছিলেন সামাজিক ও সাংস্কৃতিক সংস্কার সম্পর্কে, তিনি ১৬৪১ সালে লিখেছিলেন "মুদ্রণ নিশ্চিত এমনভাবে জ্ঞান ছড়িয়ে দেবে যে সাধারণ মানুষ, তারা তাদের নিজের অধিকার ও স্বাধীনতা সম্পর্কে জানবে, তাদের নিশ্চিত করা যাবে না নিপীড়নের আশ্রয়ে"।

ইহুদের জন্য জার্মানিতে মুদ্রণকৃত গাইড ছিল নিষিদ্ধ। সে কারণে ইতালিতে হিব্রু মুদ্রণ বৃদ্ধি পায়, ১৪৭০ সালে রোমে শুরু হবার পরে বিভিন্ন শহরে ছড়িয়ে পড়ে। মাত্র ১৫০০ সালে অন্তত ১৯ ছিল বারি, সিসা, লিভোরনো ও মানতুয়া। অটোমান শাসকদের হাতে ক্ষমতা ছিল হিব্রু বই মুদ্রণের অনুমতি বা লাইসেন্স প্রদানের বা বাতিলের এবং ঐ সময় প্রকাশিত বিভিন্ন বইয়ের সূচনাপত্রের পাতায় লিখা থাকত 'লাইসেন্সজো দা শুপারিওরি'।

এটা ধারনা করা হয় যে মুদ্রণ ব্যবস্থার আগমনের ফলে বিপ্লব ব্যবস্থা আরো শক্তিশালী হবে এবং রাষ্ট্রশাসকদের ক্ষমতা আরো বৃদ্ধি পাবে। অধিকাংশ বইয়ের মূল বিষয়বস্তু ছিল ধর্ম উপাসনা, আর বিষয়বস্তু নিয়ন্ত্রন করত চার্চ ও রাজা শাসকরা। এর ফলে মূল বিষয়ের মুদ্রণ-এর ফলাফল ছিল মারাত্মক।

বাইবেলের ব্যাপক হারে বিতরণ প্রকাশ বিপ্লবী প্রভাব ফেলে, কারণ পুরোহান সংগঠনিক শক্তি ও ঈশ্বরের শব্দের অনুবাদক হিসাবে পরিচিত ক্যাথলিক চার্চের ক্ষমতা এটি কমিয়ে দেয়।

* সামাজিক প্রভাব:

মুদ্রণ দিয়েছে পাঠকদের একটি বৃহত্তর পরিসীমায় জ্ঞান অর্জনের ক্ষমতা এবং পরবর্তী প্রজন্মকে সরাসরি পূর্ববর্তী প্রজন্মের সরাসরি পূর্ববর্তী প্রজন্মের বুদ্ধিজীবীদের অর্জিত জ্ঞান গ্রহণের সুযোগ কোন রকম পরিবর্তন ছাড়াই, যা পরিবর্তন হওয়া সম্ভব মৌখিকভাবে জ্ঞান প্রদানের ঐতিহ্যে। একদিনের অভিজ্ঞ অমর ফিসেটারির বক্তব্য অনুযায়ী, "নিশ্চয়তা দিয়েছিল রেনেসাঁ যুগের কাজ ক্ষমতা হবে কিনা, তা লেখা হবে তা সবার কাছে গ্রহণযোগ্য হবে কিনা, জ্ঞান এবং ধারণার মুক্তির মাধ্যমে এমনভাবে সাজানো হয় যে মধ্যযুগে অন্ধকার সময় এসেছিল তার সাথে আর পুনরাবৃত্তি না ঘটে, একটি চিন্তা চেতনাও সময়ে হারিয়ে না যায়।

সমাজে বই পড়ার ধারণা পরিবর্তনের প্রধান হাতিয়ার ছিল মুদ্রণ।

এলিজাবেথ আইজেনস্টাইন মুদ্রণ আবিষ্কারের ফলে দুটি দীর্ঘমেয়াদি প্রভাব খুঁজে বের করেন। তিনি দাবী করেন মুদ্রণ একটি ক্ষমতা ও সমতাপূর্ণ জ্ঞানের তথ্যসূত্র তৈরি করে, একই সাথে তুলনা তুলে ধরে অসামঞ্জস্যপূর্ণ দুষ্টিভঙ্গির ভিতরে।

মুদ্রণ আবিষ্কারের সাথে সাথে ইউরোপীয় সমাজে কাজকর্মের গঠনের পরিবর্তিত ঘটে। একটি নতুন শিল্পী গুছ হিসাবে মুদ্রণের আবির্ভূত হয় যাদের কাছে শিল্প ছিল অপরিহার্য, যদিও শ্রম-নিবিড় হস্ত লেখকদের কাজ স্বাভাবিকভাবেই বন্ধ হয়ে যায়। প্রুফ সংশোধন হয়ে ওঠে নতুন একটি কাজ, পুস্তকবিক্রেতা ও গ্রন্থাগারিকদের কাজ স্বাভাবিকভাবেই বৃদ্ধি পায় বিপুল অনুসন্ধান বহু বৃদ্ধি পাওয়ায়।

• উপসংহার:—

সবকিছু ছোট শহরে শুরু হলেও বইয়ের চাহিদা (মুদ্রিত) ক্রমশ বৃদ্ধি পেয়েছিল এবং মুদ্রণযন্ত্র অন্যত্র ছড়িয়ে পড়েছিল। জ্ঞানচর্চার চাহিদা পুঁথির অনুলিখিত উৎপাদন দিয়ে গত দু' তিন শতক ভালোভাবেই মেটানো হচ্ছিল। বস্তুত, প্রথম দিকে কিছু মানুষ মুদ্রিত গ্রন্থ সম্পর্কে কিছুটা অনুকোরাচ্ছন্ন ছিলেন। এবং বিশেষ করে ইটালির শিক্ষিত রুচিবান ধনী মানুষ একে কিছুদিন উপেক্ষাও করেছিলেন। কিন্তু অবশ্যম্ভাবী রূপেই নতুন পাঠক শ্রেণি মুদ্রিত বইয়ের প্রতি আকৃষ্ট হয়েছিলেন। এঁদের মধ্যে ছিলেন নতুন শিক্ষিত শহুরে মধ্যশ্রেণি। ব্যবসা বাণিজ্য এবং পৌর প্রশাসনের জন্য শিক্ষার প্রয়োজন ছিল এবং শহুরের বিদ্যালয়ে এঁরা ক্রমশ বেশি সংখ্যায় শিক্ষা লাভ করছিলেন। পঞ্চদশ শতকে এঁদের অনেকেই বিশ্ববিদ্যালয়ের পেশা নিচ্ছিলেন ছাত্র এবং শিক্ষকরূপে। সুতরাং নতুন চাহিদার পশ্চাতে ছিল শহুরের জনসংখ্যার প্রসারণ এবং ধর্ম নিরপেক্ষ বিদ্যাচর্চার বিস্তার। এক্ষেত্রে রেনেসাঁসের শিক্ষিমণ্ডল গুরুত্বপূর্ণ ছিল। নতুন মুদ্রিত বইয়ের জন্য ইতালিয় লাতিন এবং ধ্রুপদীয় ভাষায় রচিত গ্রন্থের চাহিদা ছিল। ব্যাকরণ, অলঙ্কারশাস্ত্র, জ্যোতিষশাস্ত্র, অঙ্ক, দর্শন, ডিক্টেশনবিদ্যা, ইতিহাস এবং ভার্জিল, সিসেরো, প্লিনির ধ্রুপদী গ্রন্থ অবশ্যই চাহিদা সৃষ্টি করে।

● তথ্যসূত্র:

* গ্রন্থপঞ্জি

① চক্রবর্তী তাপস কুমার, চক্রবর্তী সুভাষরঞ্জন, চট্টোপাধ্যায় কিশলয়; মুদ্রণে সুপারিন্টেন্ডেন্ট; ২০০৫; নবভারতী প্রকাশনী; কলকাতা; ২০১৬।

* Links

① https://bn.m.wikipedia.org/wiki/

② https://bn.m.wikipedia.org

* চিত্র

① https://www.quora.com

② https://en.m.wikipedia.org

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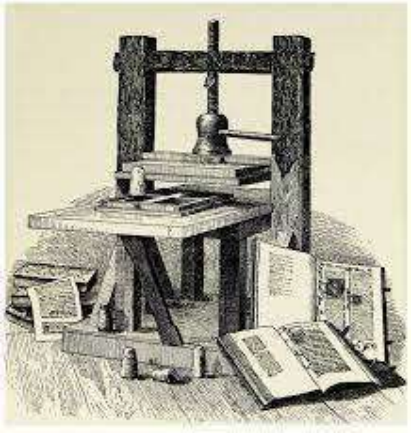
INDEX

INTRODUCTION

The printing press was invented in the Holy Roman Empire by the German Johannes Gutenberg around 1440, based on existing screw presses. Gutenberg, a goldsmith by profession, developed a complete printing system that perfected the printing process through all of its stages by adapting existing technologies to printing purposes, as well as making ground-breaking inventions of his own. His newly devised hand mould made possible for the first time the precise and rapid creation of metal movable type in large quantities, a key element in the profitability of the whole printing enterprise.



The printing press spread within several decades to over 200 cities in a dozen European countries. By 1500, printing presses in operation throughout Western Europe had already produced more than 20 million volumes. In the 16th century, with presses spreading further afield, their output rose tenfold to an estimated 150 to 200 million copies. The operation of a press became so synonymous with the enterprise of printing that it lent its name to an entire new branch of media, the press.

More than the rise of national states and royal absolutism in the realm of politics, and hardly less significant than the expansion of Europe and the development of capitalism in the economic sphere, was the intellectual quickening which occurred in the 15th and 16th centuries and which has had a profound impact on modern society and civilisation. This quickening was most evident in the invention of printing and the resulting diffusion of knowledge.

Johannes Gutenberg

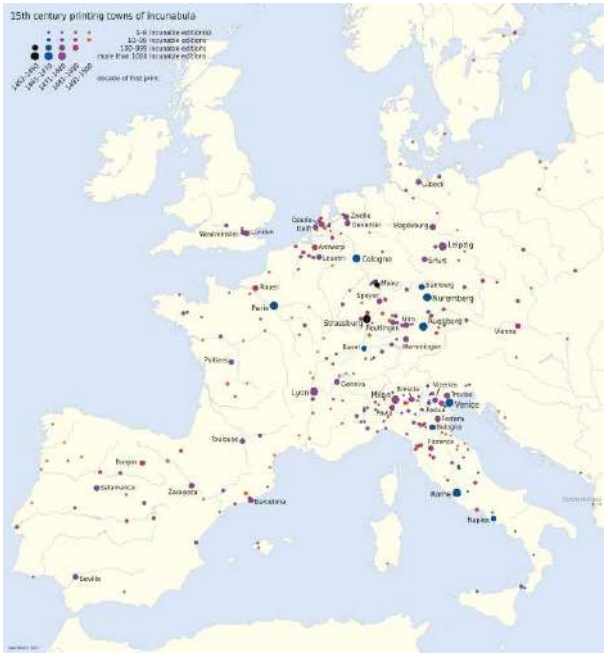
Johannes Gutenberg's work on the printing press began in approximately 1436 when he partnered with Andreas Dritzehn—a man he had previously instructed in gem-cutting—and Andreas Heilmann, owner of a paper mill. However, it was not until a 1439 lawsuit against Gutenberg that an official record exists; witnesses' testimony discussed Gutenberg's types, an inventory of metals (including lead), and his type molds.

Early wooden printing press, depicted in 1568Such presses could produce up to 240 impressions per hour. At the left in the foreground, a "puller" removes a printed sheet from the press. The "beater" to his right is inking the form. In the background, compositors are setting type.

Having previously worked as a professional goldsmith, Gutenberg made skillful use of the knowledge of metals he had learned as a craftsman. He was the first to make type from an alloy of lead, tin, and antimony, which was critical for yielding durable type that produced high-quality printed books and proved to be much better-suited for printing than all other known materials. To create these lead types, Gutenberg used what is considered one of his most ingenious inventions, a special matrix enabling the quick and precise molding of new type blocks from a uniform template.

Mass Communication

In Renaissance Europe, the arrival of mechanical movable type printing introduced the era of mass communication, which permanently altered the structure of society. The relatively unrestricted circulation of information and (revolutionary) ideas transcended borders, captured the masses in the Reformation, and threatened the power of political and religious authorities; the sharp increase in literacy broke the monopoly of the literate elite on education and learning and bolstered the emerging middle class. Across Europe, the increasing cultural self-awareness of its peoples led to the rise of proto-nationalism, accelerated by the flowering of the European vernacular languages to the detriment of Latin's status as *lingua franca*.



As early as 1480 there were printers active in 110 different places in Germany, Italy, France, Spain, the Netherlands, Belgium, Switzerland, England, Bohemia, and Poland.

From that time on, it is assumed that "the printed book was in universal use in Europe." By 1500, the printing presses in operation throughout Western Europe had already produced more than 20 million copies. In the following century, their output rose tenfold to an estimated 150 to 200 million copies.

The vast printing capacities meant that individual authors could now become true bestsellers; at least 750,000 copies of Erasmus's works were sold during his lifetime alone (1469–1536). In the period from 1518 to 1524, the publication of books in Germany alone skyrocketed sevenfold; between 1518 and 1520, Luther's tracts were distributed in 300,000 printed copies.

Evolution of modern printingtechnology

An invention changed how books were made and dramatically changed people's lives. "Movable-type printing" is a way to reproduce written material, usually on paper, by first forming upraised letters or other figures on small blocks called types. A printer arranges the types within a frame on a press to form words and then prints a page of writing. The types can be broken apart, moved around, and set to print other pages of writing. This process was first developed in China about A.D. 1040 when Pi Sheng made Chinese language characters on ceramic types.

The Chinese language, however, consists of tens of thousands of characters that alone or together represent things or concepts. Movable type did not catch on in China because it took too long to reproduce multiple copies of the many thousands of characters needed for printing. The old method of artistic handwriting, called calligraphy, was often faster and more economical.

In the Middle Ages, Europeans knew nothing about Chinese moveable-type printing. But by 1450, European technology had all the components in place for a movable-type

printing revolution. This included paper, oil-based ink, metal alloys, casting methods, and presses used for centuries to make wine and olive oil.

Effect On Scholarship And Literacy

The printing press was also a factor in the establishment of a community of scientists who could easily communicate their discoveries through widely disseminated scholarly journals, helping to bring on the scientific revolution. Because of the printing press, authorship became more meaningful and profitable. It was suddenly important who had said or written what, and what the precise formulation and time of composition was. This allowed the exact citing of references, producing the rule, "one author, one work (title), one piece of information." Before, the author was less important, since a copy of Aristotle made in Paris would not be exactly identical to one made in Bologna. For many works prior to the printing press, the name of the author has been entirely lost.

Because the printing process ensured that the same information fell on the same pages, page numbering, tables of contents, and indices became common, though they previously had not been unknown. The process of reading also changed, gradually moving over several centuries from oral readings to silent, private reading. The wider availability of printed materials also led to a drastic rise in the adult literacy rate throughout Europe.

How did the demand for books led to the Printing Revolution?

Mostly catering to monastic and papal needs, the initial years of the new technology was confined to small religious circles and little technological experiments. The early printers were satisfied to simply reproduce exactly the handwritten manuscripts. But as the art of printing began to spread in Europe, it began to cater to the larger markets that stimulated further changes.

The key factor in the astonishing spread of printing in the late 15th century was the unsatisfied demand for books among the merchants, substantial artisans, lawyers, government officials, doctors and teachers who lived and worked in the towns. These professional classes required to read and write for their work, get education in the Universities and thus provided a ready demand for books in the market. As the urban population in the 15th century grew in education, wealth, power and self-consciousness, their intellectual and cultural needs increased thus catering to the process of printing.

Such increase in secular literacy prompted printing of books of all sorts--- religious, secular, in Latin and in Vernacular, grammars, dictionaries and encyclopedias, elementary texts in mathematics, astrology, medicine and law, local and universal histories, manuals of popular devotion and Latin classics of popular texts like that of Virgil, Cicero, Livy, etc. and the popular University texts of Thomas Aquinas, Peter Lombard and others.

All of this was facilitated by the existing city based entrepreneurs or stationers who in the late middle ages had been running successful guilds of producing handwritten manuscripts. The existing methods of finance and distribution and demands of the urban markets released the inherent dynamism of typography.

Impact on European society & culture

The supply of books materially increased. Earlier, a skilled copyist may have produced two books in a year. Now in a single year of the 16th century, some 24,000 copies of a popular book were being printed by one printing press. It may be noted in this context that the copyists and illuminists of the middle ages did suffer unemployment as printing gathered momentum.

The most significant impact perhaps was the impact on scholarship. Manuscripts were completely dependent on the skill, learning and care of the scribes. Thus, making it many times inaccurate and unreliable. As successive generations of scribes copies the

mistakes of their predecessors and added their own; the accuracy of the texts were further compromised. The fundamental contribution of printing to learning was that it halted this progressive corruption and made possible the restoration of the great classical texts approaching their original integrity. Printing gave all over Europe identical texts to work on.

Printing also made knowledge much more accessible and less difficult to acquire. Printing diffused knowledge, broadened education, and increased the demand for books. Moreover, because of the greater standardisation of print, learning to read was easier.

Along with scholarship, printing also accelerated diffusion of images a s the visual arts reached a new and a wider public specially from the 16th century. For e.g., the engraving works of Michelangelo made the paintings of Sistine Chapel the most common property of his most distant contemporaries.

Printing revolution – THE PERMANENT RENAISSANCE

By the 1400s, the Renaissance had already begun in Italy, and this cultural revival was spreading to other parts of Europe. Scholars wanted more copies of the recently rediscovered writings of Aristotle, St. Augustine, Cicero, and other ancient authors. The scribes, however, could not work fast enough to meet the demand.

Printing presses were soon producing great numbers of books translated into Latin from Greek, Hebrew, Arabic, and other classic languages. These books dealt with many subjects such as literature, the law, philosophy, architecture, and geography. By 1500, Renaissance Venice was Europe's printing capital with 150 presses at work.

Printing was a highly competitive business. Printers were always trying to outdo each other with new ways to make their books more readable, attractive, and profitable. They produced books with title pages, tables of contents, numbered pages, indexes, and engravings of pictures, maps, and diagrams. They also began to use standard punctuation marks and broke down text into paragraphs.

Printers soon expanded their lists of books from those in Latin to those in Europe's vernacular languages. These were the everyday spoken languages such as German, Italian, and English. The books covered all kinds of subjects such as astrology, folklore, history, and fashions. "How to" books, such as mastering the skills of a craft, were common. The first novels appeared. "Polyglot Bibles" written in multiple languages side-by-side were popular.

Martin Luther Becomes the First Best-Selling Author

There's a famous quote attributed to German religious reformer Martin Luther that sums up the role of the printing press in the Protestant Reformation: "Printing is the ultimate gift of God and the greatest one."

Luther wasn't the first theologian to question the Church, but he was the first to widely publish his message. Other "heretics" saw their movements quickly quashed by Church authorities and the few copies of their writings easily destroyed. But the timing of Luther's crusade against the selling of indulgences coincided with an explosion of printing presses across Europe.

As the legend goes, Luther nailed his "95 Theses" to the church door in Wittenberg on October 31, 1517. Palmer says that broadsheet copies of Luther's document were being printed in London as quickly as 17 days later.

Thanks to the printing press and the timely power of his message, Luther became the world's first best-selling author. Luther's translation of the New Testament into German sold 5,000 copies in just two weeks. From 1518 to 1525, Luther's writings accounted for a third of all books sold in Germany and his German Bible went through more than 430 editions.

conclusion

Printing turned intellectual work into a cooperative instead of a solitary human activity. Printing enlarged the amount of intellectual efforts applied to individual problems. This was most effectively seen in case of the development of the Scientific Revolution. For e.g., as Copernicus's book came to be published, it brought together some of the best minds in Europe into a cooperative, controversial study of the problem and a solution was found much rapidly than it would have been otherwise. Scientific research and all scholarship became through this new tool of intellect, a public dialogue.

Printing also made knowledge much more accessible and less difficult to acquire. Printing diffused knowledge, broadened education, and increased the demand for books. Moreover, because of the greater standardisation of print, learning to read was easier.

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However, it was the spread of Lutheranism that first made clear the revolutionary significance of printing for the communication of ideas. The astonishing speed at which Europe witnessed the spread of Reformation would not have been possible without the printing press. The most remarkable contribution was the availability of the Bible in vernacular that allowed the learned European to re-evaluate his spiritual existence.

Printing also brought about censorship. Both secular and ecclesiastical authorities censored books and prohibition and burning of books were designated to maintain political as well religious orthodoxy. And on the other hand it gave a new weapon in the hands of those who wished to make their own path. Thus, as it has been said printing made the soil from which sprang modern history, science, popular literature, the emergence of the nation state and so much of everything by which modernity is defined.

Sources of photographs

Picture.1-
https://www.google.co.in/imgres?imgurl=https%3A%2F%2Fwww.history.com%2F.image%2Ft_share%2FMTY2NTE2OTU2MzQ0Njl0MzUx%2Fg961d16d5-5443-409c-ac14-23c67cb6592f.jpg&imgrefurl=https%3A%2F%2Fwww.history.com%2Fnews%2Fprinting-press-renaissance&tbnid=L-sg70NVugT3VM&vet=12ahUKEwjKmuverP3xAhXD3XMBHXElCHAQMygBegUIARC4AQ..i&docid=nd51nb4m4pS18M&w=1129&h=1200&q=printing%20revolution%20&ved=2ahUKEwjKmuverP3xAhXD3XMBHXElCHAQMygBegUIARC4AQ

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Bibliography

Johnson, Paul. *The Renaissance: A Short History*. 2002.

Man, John. *Gutenberg: How One Man Remade the World with Words*. 2002

Rees, Fran. *Johannes Gutenberg*. 2006.

Pollak, Michael (1972). "The performance of the wooden printing press". *The Library Quarterly*.

Prateek Raj. "How the Postal System and the Printing Press Transformed European Markets". Evonomics. Retrieved 3 August 2017.

Meggs, Philip B. *A History of Graphic Design*. John Wiley & Sons, Inc. 1998. ISBN 0-471-29198-6

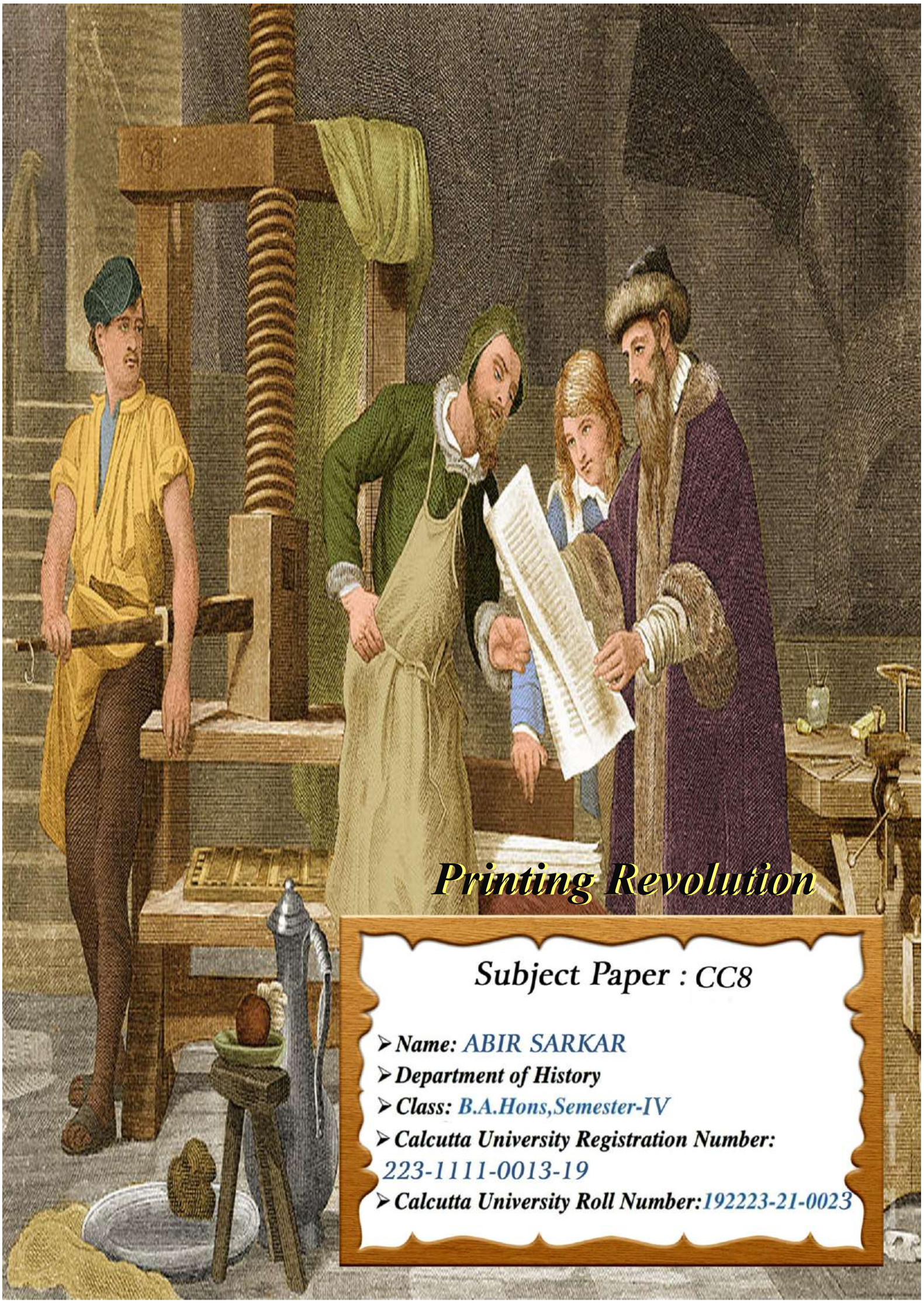
Jeremiah Dittmar. "Information technology and economic change: The impact of the printing press". VoxEU. Retrieved 3 August 2017.

Mukharjee Rila. "Europe Transformed: 1350-1789", progressive publishers. Paperback – 3 January 2004

Phukan Meenaxi. "Rise of Modern West- social and economic history of early modern Europe". Laxmi publications 2013.

"The New Cambridge History of Europe." Vol.1,8

Rice,Eugene F. and Grafton ,Anthony, The Foundations of Early Modern Europe, 1460-1559. WW NORTON &COMPANY,2004.



Printing Revolution

Subject Paper : CC8

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Printing Revolution

Content

PRINTING REVOLUTION
Introduction

More than the rise of national states and royal absolutism in the realm of politics, and hardly less significant than the expansion of Europe and the development of capitalism in the economic sphere, was the intellectual quickening which occurred in the 15th and 16th centuries and which has had a profound impact on modern society and civilisation. This quickening was most evident in the invention of printing and the resulting diffusion of knowledge. Printing in early modern Europe was a complicated process involving the moveable type with which the impression was made and paper on which it was made. Inspired by developments in China, the European moveable type was perfected in Mainz in about 1450. The evolution f the practice of casting individual letters in separate little pieces of metal all of the same height and then arranging them in any desired sequence of printing provided the flexibility and dynamism that turned the process of printing into a socio-cultural revolution. The emergence of modern paper fit for printing and the ink further facilitated the process of mechanical duplication. These processes were developed by **Johann Gutenberg, Johann Fust and Peter Schoffer**. The earliest known products of the new art were papal "Letters of Indulgence" and a version of the Bible--- ***Biblica Latina*** --- both printed by Gutenberg in 1454.

The printing revolution opens, probabily, the modern era in Europe. The timing between Renaissance and the printing emergence are open in the discussions about humanism and Renaissance as an Europeean phenomena, the true border in history, between the Middle Ages and the Modern Era, a time in which the history of the continent developed in a quick and triumphal rithm. The Renaissance is however just an arthistic phenomena, with Italian roots, which became soon an artistic current in almost entirely Europe. This arthistic manifestation is generating an identic structure for two medieval styles of the Occident – the Romanic and the Gothic. The first one arise in Germany and the second one in France (well-known through revolutions in architecture, while the Renaissance was born as a revolution in fine arts) and spread almost instantly in the Occidental Europe. The situation is, under different aspects, with a similar path in evolution as the Renaissance.

The key factor in the astonishing spread of printing in the late 15th century was the unsatisfied demand for books among the merchants, substantial artisans, lawyers, government officials, doctors and teachers who lived and worked in the towns. These professional classes required to read and write for their work, get education in the Universities and thus provided a ready demand for books in the market. As the urban population in the 15th century grew in education, wealth, power and self-consciousness, their intellectual and cultural needs increased thus catering to the process of printing.

pic1

Europe's first printed book

Development of Printing Press

Chinese Xylography :

Definition of xylography
: the art of making engravings on wood especially for printing

Printing was invented in China during the Tang Dynasty (618-906 AD). The first mentioning of printing is an imperial decree from 593 AD, in which the Sui Emperor Wen-ti orders Buddhist images and scriptures to be printed.

The earliest form of Chinese printing relied on blocks cut from wood. These blocks were used to print textiles and reproduce Buddhist texts. Short religious texts printed in this fashion was carried as charms.

Eventually, the Chinese also began printing longer scrolls and books. One of the oldest surviving books is a Buddhist scripture dated to 868 AD. It was found in a cave near Dunhuang, a major stop on the Silk Road.

We also know that comparatively large quantities of books existed in Shu in the 800s and could bet purchased from private book . Shu was an ancient state in what is now China's Sichuan Province.

As the 9th century gave way to the 10th, book printing seems to have become well-established and something that was carried out in many different parts of China. Examples of what was printed are Buddhist scriptures, Confucian scriptures, dictionaries, and books about mathematics. By the year 1000 AD, paged books had largely replaced scrolls.

Chinese Wood Block Technique

Woodblock printing or block printing is a technique for printing text, images or patterns used widely throughout East Asia and originating in China in antiquity as a method of printing on textiles and later paper. As a method of printing on cloth, the earliest surviving examples from China date to before 220 AD. Woodblock printing existed in Tang China by the 7th century AD and remained the most common East Asian method of printing books and other texts, as well as images, until the 19th century. Ukiyo-e is the best-known type of Japanese woodblock art print. Most European uses of the technique for printing images on paper are covered by the art term woodcut, except for the block-books produced mainly in the 15th century.

In the 11th century, movable type was invented in China. The combination of movable type and the invention of comparatively inexpensive paper (as an alternative to the very expensive silk fabrics used before), helped make printed books much more widely available in China during the Song Dynasty (960 – 1279).

Process of Chinese woodblock printing

1. First, the text was written on a piece of thing paper.
2. The paper was glued face down onto a wooden plate.
3. With the written characters as a guide, characters were carved out to make a wood-block printing plate.
4. The wood-block printing plate was used to print. An expert printer could print 2,000 or more sheets per day from one plate.

pic2

Chinese woodblock printing

Wooden blocks

pic3

Chinese Moveable Type 11th century

European Movable Type

pic4

Metal Block Technique (Movable Type)

Movable type was invented in the 1040s by a commoner named Pi Sheng. Instead of carving a unique wood-block plate for each page in a book, he used movable Chinese characters that could be fastened on a plate, used for printing, removed, and fastened again in new spots on the plate to create a new text.

Each of Pi Sheng's movable types had one Chinese character on it, carved in relief on a small block. The character was carved into moistened clay, and the type was then hardened by fire to make it more durable.

The plate used was made from iron, and a removable resin-based glue was used to glue on the types prior to printing.

For many centuries, wood-block printing and movable type printing existed side by side in China.

Movable-Type Printing :

An invention changed how books were made and dramatically changed people's lives. "Movable-type printing" is a way to reproduce written material, usually on paper, by first forming upraised letters or other figures on small blocks called types. A printer arranges the types within a frame on a press to form words and then prints a page of writing. The types can be broken apart, moved around, and set to print other pages of writing. This process was first developed in China about A.D. 1040 when Pi Sheng made Chinese language characters on ceramic types.

The Chinese language, however, consists of tens of thousands of characters that alone or together represent things or concepts. Movable type did not catch on in China because it took too long to reproduce multiple copies of the many thousands of characters needed for printing. The old method of artistic handwriting, called calligraphy, was often faster and more economical.

In the Middle Ages, Europeans knew nothing about Chinese moveable-type printing. But by 1450, European technology had all the components in place for a movable-type printing revolution. This included paper, oil-based ink, metal alloys, casting methods, and presses used for centuries to make wine and olive oil.

The Europeans had one key advantage over the Chinese in making movable-type printing preferable to hand copying. Latin, Greek, and all the other European languages were alphabet-based. They did not have tens of thousands of characters like Chinese. The Europeans only had to produce types for a limited number of letters (26 in the case of English).

To print an entire book, printers would have to make hundreds of precisely identical types for each letter. Someone had to invent a way to do this quickly.

Gutenberg printing press

pic5

Gutenberg's printing press: The father of printing revolution

Johannes Gutenberg's work on the printing press began in approximately 1436 when he partnered with Andreas Dritzehn—a man he had previously instructed in gem-cutting—and Andreas Heilmann, owner of a paper mill. However, it was not until a 1439 lawsuit against Gutenberg that an official record exists; witnesses' testimony discussed Gutenberg's types, an inventory of metals (including lead), and his type molds.

Early wooden printing press, depicted in 1568Such presses could produce up to 240 impressions per hour. At the left in the foreground, a "puller" removes a printed sheet from the press. The "beater" to his right is inking the form. In the background, compositors are setting type.

Having previously worked as a professional goldsmith, Gutenberg made skillful use of the knowledge of metals he had learned as a craftsman. He was the first to make type from an alloy of lead, tin, and antimony, which was critical for yielding durable type that produced high-quality printed books and proved to be much better-suited for printing than all other known materials. To create these lead types, Gutenberg used what is considered one of his most ingenious inventions, a special matrix enabling the quick and precise molding of new type blocks from a uniform template. His type case is estimated to have contained around 290 separate letter boxes, most of which were required for special characters, ligatures, punctuation marks, etc.

Gutenberg's Secret :

Johann Gutenberg was born around 1400 into one of the leading families of Mainz, Germany. Mainz was a busy commercial port on the Rhine River. Johann's father worked as an official in the town's mint, which produced coins for the Holy Roman Empire.Nothing is known about Johann's education, but he probably attended a university because he knew Latin well. Some historians think that he learned how to make gold coins at the Mainz mint. This involved a "punch," a chisel-like tool used to engrave small letters and designs on a metal mold for casting coins. In his mid-30s, Gutenberg decided to look for better prospects upriver in the German town of Strasburg (today Strasbourg, France). In Strasburg, he borrowed money from three men who became his partners in manufacturing and selling metal mirrors to religious pilgrims. The pilgrims traveled to religious sites and used mirrors supposedly to capture the healing powers of holy objects. Outbreaks of the plague, however, were still occurring. Known as the Black Death, it had killed about a third of Europe's population in the 14th century. A new outbreak interrupted the pilgrimages, and the mirror business failed.

Apparently, Gutenberg had spent most of his years in Strasburg experimenting with a method of using movable type to print books. With no knowledge of printing from China and no one else in Europe to help him, Gutenberg worked alone to invent a unique movable-type printing process. Gutenberg used trial and error to adapt a coin-maker's punch to make a mold for casting types, using just the right alloy of metals. This mold enabled him to mass-produce identical types for each letter of the Latin alphabet plus punctuation marks and symbols. He could reuse the types numerous

times for different jobs.Gutenberg also experimented with ink and paper. He needed ink that dried quickly and did not smear. After trying numerous ingredients, he found the perfect ink by combining linseed oil and lampblack. He also discovered that paper had to be a certain thickness and slightly dampened for the ink to stick properly. Finally, be built a press that applied the exact pressure needed to print words clearly from the types onto paper. Gutenberg hired craftsmen to make the Latin letter types, construct six presses, and manufacture the ink. He also purchased paper for printing most of the Bibles and vellum for a small, more expensive edition.

Gutenberg took at least five years to manufacture the types and equipment and print nearly 200 Bibles. He used a type font called "black letter gothic," which attempted to duplicate the look of the hand-copied Bibles.

Gutenberg printed most of the letters in black ink but some in red, which required pressing a page two times. After the pages were printed, artists decorated large-sized letters and added colorful designs on the borders of certain pages. Skilled workers then sewed the pages of each Bible together into two volumes with covers.

The Gutenberg Bible was a work of art and a wonder of technology. Up to 75 complete and partial copies still exist today, mainly in libraries and museums. You can view paper and vellum copies at the British Library web site.

The Printing Revolution:

Gutenberg's partner, Fust and Schoffer tried to hide the secret of movable-type printing. But the workers Gutenberg had trained spread knowledge of his invention throughout Europe. Schoffer married Fust's daughter and inherited the printing business in Mainz when her father died of the Black Plague in 1466. Schoffer died rich and famous 37 years later.

Less than 50 years after Gutenberg printed the Bible, over 1,000 print shops had sprung up in more than 200 European cities and towns. They turned out more than 10 million copies of books in Latin and other European languages. Books became cheaper in price and available to anyone who could read them. Books were no longer chained in libraries. The spread of knowledge, both factual and not, exploded throughout Europe. Books began to appear for the first time with the author's name on a title page. This made writers responsible for the content of their books, thus improving their accuracy. It also gave rise to the first copyright laws, protecting authors from having others publish their works without permission. The increasing supply of books and other printed materials in vernacular languages spurred more people to learn how to read. Printers began to publish newspapers to meet the demand of readers for more information about national and world affairs.

Printing and the Reformation :

The end of Christian unity in Europe was one of the most significant changes that the printing revolution helped to bring about. At first, the Roman Catholic Church welcomed printing as the "divine art." Church leaders assumed that the widespread printing of uniform Bibles and manuals for priests would strengthen and standardize Christian worship in Europe. They did not expect Martin Luther to become the world's first best-selling author.

A Catholic priest from Wittenberg, Germany, Luther despised the Catholic Church's practice of selling indulgences to assure a sinner's place in Heaven. In 1517, he wrote an argument for scholarly debate against indulgences, known as the "Ninety-Five Theses." Copies of this document quickly fell into the hands of printers, who distributed copies all over Europe. Luther's printed vernacular Bible enabled anyone who could read German to study the scriptures at home. Printed vernacular Bibles in other languages soon swept the rest of Europe. In 1526, the son of Peter Schoffer printed the New Testament in English, which was smuggled from Germany to England. The Catholic Church tried to defend its domination of religion in Western Europe by declaring that only the Latin Bible and Latin mass were appropriate for Christian worship. The church also attempted to ban books by those who contradicted its religious teachings. Many printers, however, used the church's banned book lists as guides for publishing works that sold well. By the middle of the 1500s, the Christian church in Western Europe had split apart. Called the Reformation, this religious division set Catholics, Lutherans, and other Protestants against one another because of their different Christian beliefs and worship practices. The printing revolution did not cause the Reformation. But the movable-type printing press produced many more copies of religious writings critical of the Catholic Church than would have been possible before Gutenberg's invention.

For centuries, Europe had lagged far behind the Muslim world in the arts, sciences, and literature. The Muslims also possessed all the components for a printing revolution, including an alphabetic language. Religious authorities, however, considered Arabic sacred since it was the language of God in the Koran. Muslims believed that only handwritten copies of books were appropriate. As a result, most Muslim countries prohibited printing until the 1800s.Muslim learning stalled, due in part to the resistance to printing. Meanwhile, Europe made rapid advances in all fields of knowledge. Movable -type printing facilitated the spread of Renaissance ideas, modern science, and the Reformation with its emphasis on literacy and propelled Europe into a much different future.

Paper Development

History of paper:

The word "paper" is etymologically derived from papyrus, Ancient Greek for the Cyperus papyrus plant. Papyrus is a thick, paper-like material produced from the pith of the Cyperus papyrus plant which was used in ancient Egypt and other Mediterranean societies for writing long before paper was used in China. Papyrus is prepared by cutting off thin ribbon-like strips of the interior of the Cyperus papyrus, and then laying out the strips side-by-side to make a sheet. A second layer is then placed on top, with the strips running at right angle to the first. The two layers are then pounded together into a sheet. The result is very strong, but has an uneven surface, especially at the edges of the strips. When used in scrolls, repeated rolling and unrolling causes the strips to come apart again, typically along vertical lines. This effect can be seen in many ancient papyrus documents

Papyrus

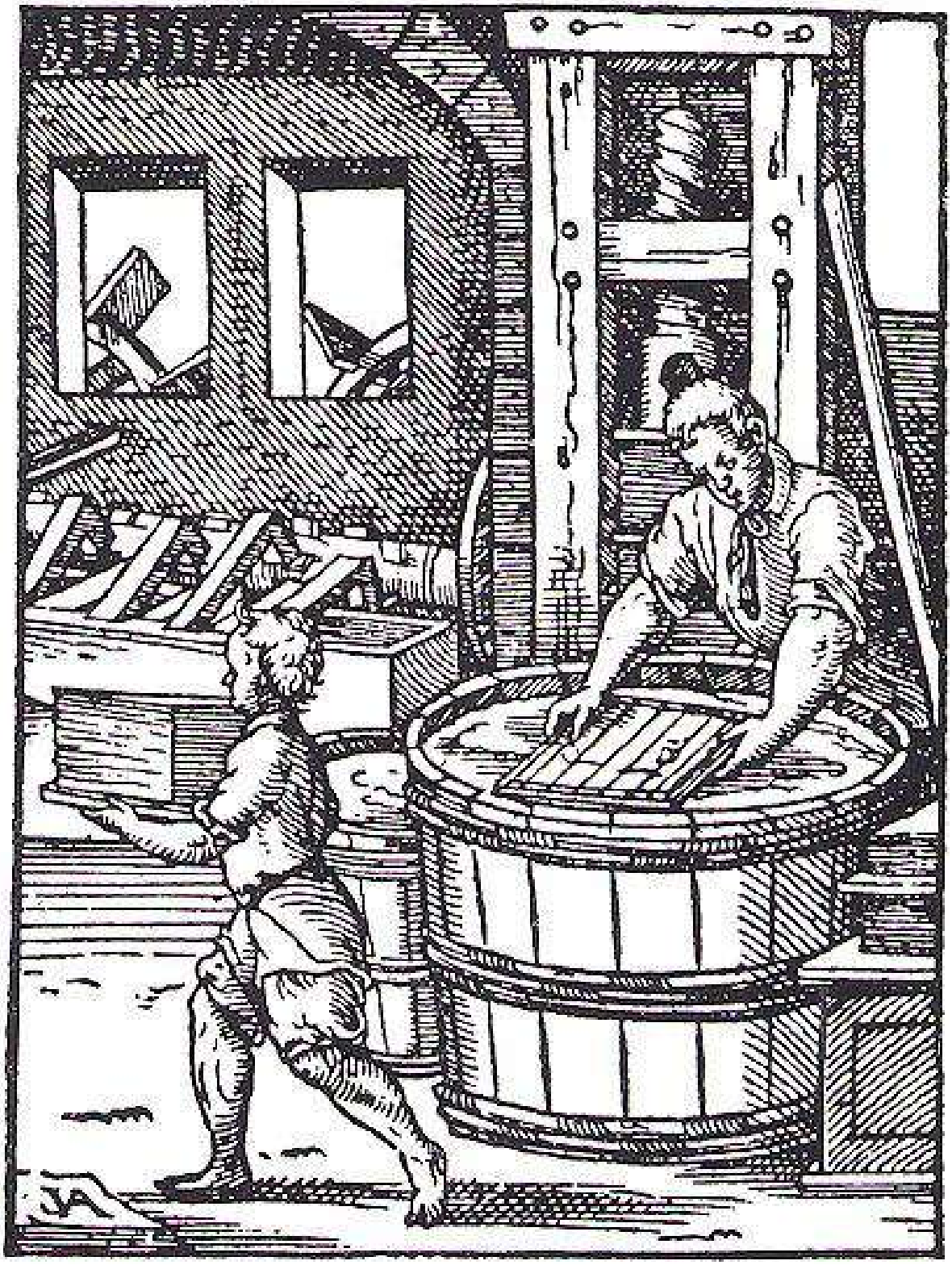
Paper in China:

Archaeological evidence of papermaking predates the traditional attribution given to Cai Lun,[6] an imperial eunuch official of the Han dynasty (202 BCE – 220 CE), thus the exact date or inventor of paper can not be deduced. The earliest extant paper fragment was unearthed at Fangmatan in Gansu province, and was likely part of a map, dated to 179–141 BCE.[7] Fragments of paper have also been found at Dunhuang dated to 65 BCE and at Yumen pass, dated to 8 BCE.

The invention traditionally attributed to Cai Lun, recorded hundreds of years after it took place, is dated to 105 CE. The innovation is a type of paper made of mulberry and other bast fibres along with fishing nets, old rags, and hemp waste which reduced the cost of paper production, which prior to this, and later, in the West, depended solely on rags.

Paper in Europe :

The oldest known paper document in Europe is the Mozarab Missal of Silos from the 11th century,[66] probably using paper made in the Islamic part of the Iberian Peninsula. They used hemp and linen rags as a source of fiber. The first recorded paper mill in the Iberian Peninsula was in Xàtiva in 1056.[67][68] Papermaking reached Europe as early as 1085 in Toledo and was firmly established in Xàtiva, Spain by 1150. It is clear that France had a paper mill by 1190, and by 1276 mills were established in Fabriano, Italy and in Treviso and other northern Italian towns by 1340. Papermaking then spread further northwards, with evidence of paper being made in Troyes, France by 1348, in Holland sometime around 1340–1350, in Mainz, Germany in 1320, and in Nuremberg by 1390 in a mill set up by Ulman Stromer.[69] This was just about the time when the woodcut printmaking technique was transferred from fabric to paper in the old master print and popular prints. There was a paper mill in Switzerland by 1432 and the first mill in England was set up by John Tate around 1490 near Hertford,[70][71] but the first commercially successful paper mill in Britain did not occur before 1588 when John Spilman set up a mill near Dartford in Kent.[72] During this time, paper making spread to Poland by 1491, to Austria by 1498, to Russia by 1576, to the Netherlands by 1586, to Denmark by 1596, and to Sweden by 1612.Arab prisoners who settled in a town called Borgo Saraceno in the Italian Province of Ferrara introduced Fabriano arti sans in the Province of Ancona[clarification needed] the technique of making paper by hand. At the time they were renowned for their wool-weaving and manufacture of cloth. Fabriano papermakers considered the process of making paper by hand an art form and were able to refine the process to successfully compete with parchment which was the primary medium for writing at the time. They developed the application of stamping hammers to reduce rags to pulp for making paper, sizing paper by means of animal glue, and creating watermarks in the paper during its forming process. The Fabriano used glue obtained by boiling scrolls or scraps of animal skin to size the paper; it is suggested that this technique was recommended by the local tanneries. The introduction of the first European watermarks in Fabriano was linked to applying metal wires on a cover laid against the mould which was used for forming the paper.They adapted the waterwheels from the fuller's mills to drive a series of three wooden hammers per trough. The hammers were raised by their heads by cams fixed to a waterwheel's axle made from a large tree trunk.



pic6

Europe : Cotton, hemp and flax by 13th century was being used

Ink Development

Many ancient cultures around the world have independently discovered and formulated inks for the purposes of writing and drawing. The knowledge of the inks, their recipes and the techniques for their production comes from archaeological analysis or from written text itself. The earliest inks from all civilizations are believed to have been made with lampblack, a kind of soot, as this would have been easily collected as a by-product of fire. Ink was used in Ancient Egypt for writing and drawing on papyrus from at least the 26th century BC. Egyptian red and black inks included iron and ocher as a pigment, in addition to phosphate, sulfate, chloride, and carboxylate ions; meanwhile, lead was used as a drier. Chinese inks may go back as far as three or maybe four millennia, to the Chinese Neolithic Period. These used plants, animal, and minerl inks based on such materials as graphite that were ground with water and applied with ink brushes. Direct evidence for the earliest Chinese inks, similar to modern inksticks, is around 256 BC in the end of the Warring States period and produced from soot and animal glue. The best inks for drawing or painting on paper or silk are produced from the resin of the pine tree. They must be between 50 and 100 years old. The Chinese inkstick is produced with a fish glue, whereas Japanese glue (? "nikawa") is from cow or stag.India ink was first invented in China, though materials were often traded from India, hence the name. The traditional Chinese method of making the ink was to grind a mixture of hide glue, carbon black, lampblack, and bone black pigment with a pestle and mortar, then pouring it into a ceramic dish to dry. To use the dry mixture, a wet brush would be applied until it reliquified. The manufacture of India ink was well-established by the Cao Wei Dynasty (220–265 AD). Indian documents written in Kharosthi with ink have been unearthed in Chinese Turkestan. The practice of writing with ink and a sharp pointed needle was common in early South India. Several Buddhist and Jain sutras in India were compiled in ink. In ancient Rome, atramentum was used; in an article for the Christian Science Monitor, Sharon J. Huntington describes these other historical inks: About 1,600 years ago, a popular ink recipe was created. The recipe was used for centuries. Iron salts, such as ferrous sulfate (made by treating iron with sulfuric acid), were mixed with tannin from gallnuts (they grow on trees) and a thickener. When first put to paper, this ink is bluish-black. Over time it fades to a dull brown. Scribes in medieval Europe (about AD 800 to 1500) wrote principally on parchment or vellum. One 12th century ink recipe called for hawthorn branches to be cut in the spring and left to dry. Then the bark was pounded from the branches and soaked in water for eight days. The water was boiled until it thickened and turned black. Wine was added during boiling. The ink was poured into special bags and hung in the sun. Once dried, the mixture was mixed with wine and iron salt over a fire to make the final ink.The reservoir pen, which may have been the first fountain pen, dates back to 953, when Ma'ad al-Mu'izz, the caliph of Egypt, demanded a pen that would not stain his hands or clothes, and was provided with a pen that held ink in a reservoir.

In the 15th century, a new type of ink had to be developed in Europe for the printing press by Johannes Gutenberg.[18] According to Martyn Lyons in his book Books: A Living History, Gutenberg's dye was indelible, oil-based, and made from the soot of lamps (lamp-black) mixed with varnish and egg white. Two types of ink were prevalent at the time: the Greek and Roman writing ink (soot, glue, and water) and the 12th century variety composed of ferrous sulfate, gall, gum, and water. Neither of these handwriting inks could adhere to printing surfaces without creating blurs. Eventually an oily, varnish-like ink made of soot, turpentine, and walnut oil was created specifically for the printing press.

Conclusion

Over all, the printing press is a revolutionizing invention. First, the printing press was invented during a crucial time period. In this time period, there was a lot of chaos and distress, because of the black death. The printing press had a huge a effect on spreading ideas, thoughts , news, education, and being informed. By printing books and newspapers, we have learned how to communicate and spread ideas through out the world.The printing press is one of basis invention for the creations and inspiration of many other newer inventions which also revolutionized the world. Although the printing press was a magnificent invention, some people had different views. People believed maintenance would be too difficult, that writing in Chinese would be impossible due to the intricate Chinese writing system, and that the churches and religious groups wouldn't be able to censor what was being printed.without the printing press, we don't know how we could have possibly spread our thought and evolve over time mentally, socially, economically, politically, and religiously without the printing press.

Bibliography

. Books:

1) Phukan,Meenaxi.(2016).Rise of the Modern West: Social and Economic History of Early Modern Europe. New Delhi: Trinity Press
2) Eugene F. Rice Jr. & Anthony Grafton(1994). *The Foundations of Early Modern Europe, 1460-1559:* W. W. Norton & Company.
3) Rees, F. (2006). *Johannes Gutenberg: inventor of the printing press.* Minneapolis, Minn: Compass Point Books.
4) Orenstein, P. (2016). *Printing Revolution: How it helped to give birth of a New Europe*. New York, NY: HarperCollins.

. Articles & Journals:

1) Sorensen, R. (2016). *Printing Revolution in Early-Modern Europe*. London, UK; New York, NY, USA: Anthem Press. Retrieved June 23, 2021, from http://www.jstor.org/stable/j.ctt1dfntn4
2) Cartwright, M. (2020, November 02). The Printing Revolution in Renaissance Europe. *World History Encyclopedia*. Retrieved June 24,2021,from https://www.worldhistory.org/article/1632/the-printing-revolution-in-renaissance-europe/
3) Gwynn, A. (1962).Censorship in the Age of Printing Revolution*: An Irish Quarterly Review, 51*(203), 349-365. Retrieved January 31, 2021, from http://www.jstor.org/stable/30087760

Websites:

1) https://en.wikipedia.org/wiki/History_of_printing_in_East_Asia
2) https://www.merriam-webster.com/dictionary/xylography
3) http://www.silk-road.com/artl/printing.shtml
4) https://www.crf-usa.org/bill-of-rights-in-action/bria-24-3-b-gutenberg-and-the-printing-revolution-in-europe
5) https://en.m.wikipedia.org/wiki/Woodblock_printing
6) https://en.wikipedia.org/wiki/History_of_paper#Paper_in_Europe
7) https://en.wikipedia.org/wiki/Ink
8) https://invention-of-the-printing-press.weebly.com/conclusion.html#:~:text=Over%20all%2C%20the%20printing%20press%20is%20a%20revolutionizing%20invention.&text=The%20printing%20press%20had%20a,ideas%20through%20out%20the%20world

Web Resources of Pictures:

1) https://www.google.com/search?q=first+printed+book&safe=active&sxsrf=ALeKk02s4zMUrLV8n6P7EVjAPQVvjsZyJw:1625559516315&source=lnms&tbm=isch&sa=X&ved=2ahUKEwjFvJ-Mgc7xAhXBdCs KHWF1DIEQ_AUoAXoECAEQAw&biw=1536&bih=760&dpr=1.25#imgrc=ii3ozH2c1jfISM

2) https://www.google.com/search?q=chinese+woodblock+printing&tbm=isch&ved=2ahUKEwj14oqCiM7xAhWfrmMGHWmcAdUQ2-cCegQIABAA&oq=chinese+woodblock+printing&gs_lcp=CgNpbWcQAzICCAAyAggAMgYIABAFEB4yBggAEAUQHjIGCAAQBRAeMgQIABAYMgQIABAYOgQIIxAnOgYIABAIEB46BAgAEB5QuhFYx0lg7asBaABwAHgAgAHXAogB_SCSAQYyLTE2LjGYAQCgAQGqAQtnd3Mtd2l6LWltZ8ABAQ&sclient=img&ei=HhnkYPXbAp_djuMP6biGqA0&bih=760&biw=1536#imgrc=zzeoqTi7T-ERxM

3) https://www.ancientpages.com/2014/12/30/chinese-invention-worlds-first-known-movable-type-printing/

4) https://en.wikipedia.org/wiki/History_of_paper#Paper_in_Europe

5) https://tricycle.org/magazine/buddhist-history-moveable-type/

6) https://www.sciencephoto.com/media/993656/view/printing-workshop-16th-century-1870-

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Scientific Revolution & Its Impact

Galileo is accused of heresy

Contents

Introduction

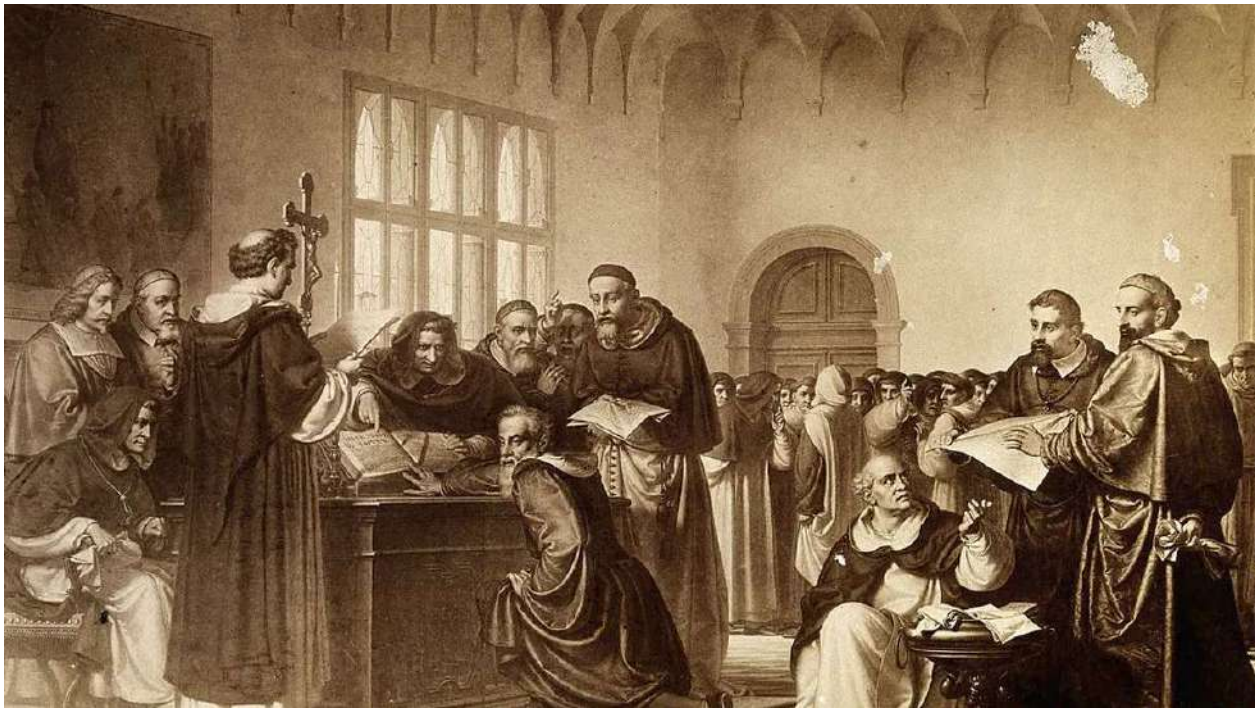
The Middle Ages were long centuries of stability in the intellectual world. All scientific and philosophical expression was monitored extensively by, and most often produced from within, the Church. During the Middle Ages, the Church ruled conclusively on a number of truths about the natural world, which it claimed were undeniable. These alleged truths were produced by Biblical study and the widely accepted Aristotelian system, which became official Church doctrine. The Aristotelian system defined the laws of physics erroneously in many cases. It claimed that the rate of fall of an object was determined by its weight, held that matter was constructed out of four possible elements, with different matter containing different combinations of these four, and described the universe as the Greek astronomer Ptolemy had described it, as a static and finite thing in which the Earth occupied the central position, with the sun and planets in revolution and the distant stars inhabiting its farthest edges.

Causes of the Scientific Revolution

With the rise of the Renaissance, new interest sparked in reference to the physical world. In part boosted by the spirit of geographical exploration, which dominated

Europe and provided many new specimens for study and experimentation, the artists and thinkers of the Renaissance were infused with the desire to know and portray reality, prompting a dramatic rise in scientific exploration.
Born out of the Scientific Revolution was the Enlightenment, which applied the scientific method developed during the seventeenth century to human behavior and society during the eighteenth century.
Few European scholars challenged the scientific ideas of the ancient thinkers or the church by carefully observing nature for themselves.

In the 17th century, then, the clear definition of scientific methodology was completed and the traditional Aristotelian worldview was abandoned to be replaced by a new, science-based, view of the world. This era of invention and discovery was later dubbed the “Scientific Revolution”. At the end of this period the view of the world had revolutionized and would later provide the basis for a new age, the “Modern” Age.



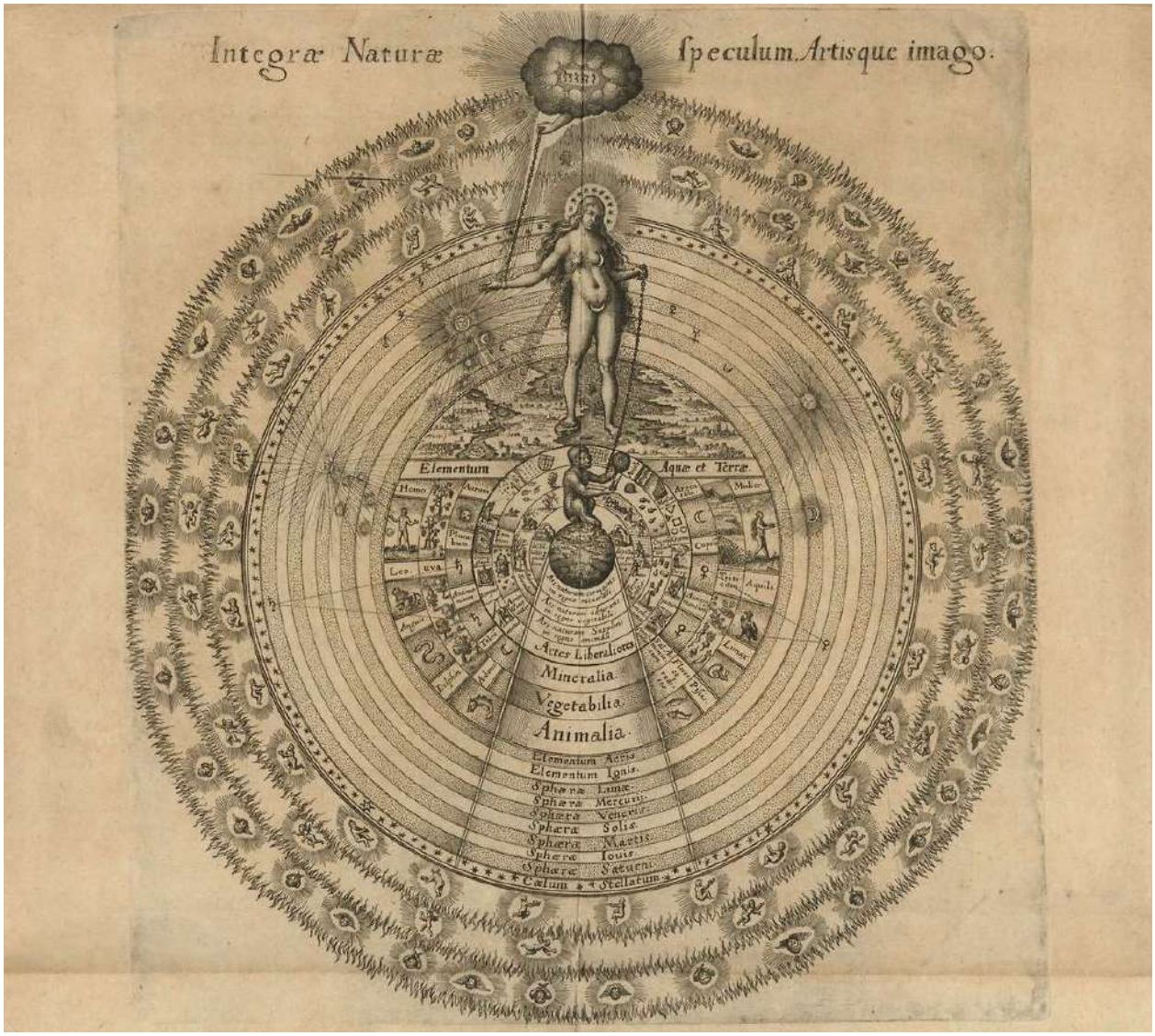
The Medieval View During the Middle Ages, most scholars believed that the earth was an immovable object located at the center of the universe. According to that belief, the moon, the sun, and the planets all moved in perfectly circular paths around the earth. Common sense seemed to support this view. After all, the sun appeared to be moving around the earth as it rose in the morning and set in the

evening. This earth-centered view of the universe was called the geocentric theory. The idea came from Aristotle, the Greek philosopher of the fourth century B.C. The Greek astronomer Ptolemy.

In addition, Christianity taught that God had deliberately placed the earth at the center of the universe. Earth was thus a special place on which the great drama of life unfolded.

A New Way of Thinking Beginning in the mid-1500s, a few scholars published works that challenged the ideas of the ancient thinkers and the church. As these scholars replaced old assumptions with new theories, they launched a change in European thought that historians call the Scientific Revolution. The Scientific Revolution was a new way of thinking about the natural world. That way was based upon careful observation and a willingness to question accepted beliefs.During the Renaissance, European explorers traveled to Africa, Asia, and the Americas. Such lands were inhabited by peoples and animals previously unknown in Europe. These discoveries opened Europeans to the possibility that there were new truths to be found. The invention of the printing press during this period helped spread challenging ideas—both old and new— more widely among Europe's thinkers. The age of European exploration also fueled a great deal of scientific research, especially in astronomy and mathematics. Navigators needed better instruments and geographic measurements, for example, to determine their location in the open sea. As scientists began to look more closely at the world around them, they made observations that did not match the ancient beliefs.

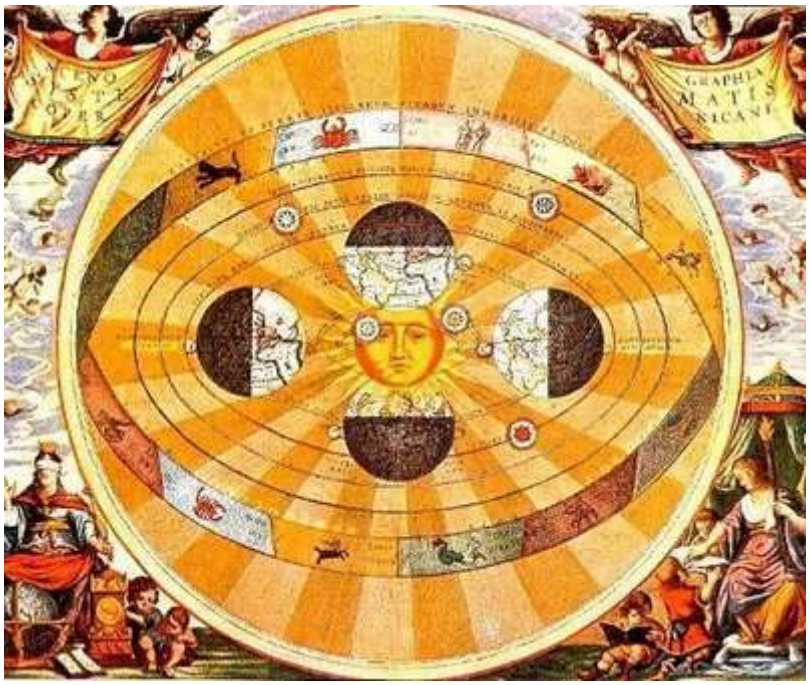
During the Renaissance new impetus was provided for the development of a scientific worldview. When in the first half of the 15th century the Byzantine Empire was finally overthrown by the Turks, a large number of Greek scholars and intellectuals fled to the West. They brought with them the texts of those ancient Greek philosophers who contradicted Aristotle. As a consequence, the absolute authority of Aristotle as a natural philosopher was challenged.



The Development of Scientific Methodology

The foundations for a specifically scientific methodology were laid down by some scholastic thinkers from the 13th century onwards (see the chapter on Science and Technology in the Middle Ages). Roger Bacon, for example, only accepted knowledge which had been inquired at the original source. To him, Scientia experimentalis, i. e. science based upon empirical methods was the only "true" science, and he expressed strong disapproval of theoretical speculation or assumption, as he thought they would lead away from truth. Characteristic of his methodology was the cycle of observation, hypothesis, experimentation, and the possibility of objective verification. Bacon also promoted mathematics, which he

regarded as the ABC of philosophy. His ideas were, however, denounced as heretical by his Church authorities, however, and thus became almost forgotten.



The Heliocentric Theory Although backed by authority and common sense, the geocentric theory did not accurately explain the movements of the sun, moon, and planets. This problem troubled a Polish cleric and astronomer named Nicolaus Copernicus (1500s). After studying planetary movements for more than 25 years, Copernicus reasoned that indeed, the stars, the earth, and the other planets revolved around the sun. Copernicus's heliocentric, or sun centered, theory still did not completely explain why the planets orbited the way they did. He also knew that most scholars and clergy would reject his theory because it contradicted their religious views. Fearing ridicule or persecution, Copernicus did not publish his findings until 1543, the last year of his life. He received a copy of his book, *On the Revolutions of the Heavenly Bodies*, on his deathbed.

Galileo's Discoveries An Italian scientist named Galileo Galilei built on the new theories about astronomy. As a young man, Galileo learned that a Dutch lens maker had built an instrument that could enlarge far-off objects. Galileo built his own telescope and used it to study the heavens in 1609. Then, in 1610, he published a small book called *Starry Messenger*, which described his astonishing observations. Galileo announced that Jupiter had four moons and that the sun had dark spots. He also noted that the earth's moon had a rough, uneven surface. This shattered Aristotle's theory that the moon and stars were made of a pure, perfect substance. Galileo's observations, as well as his laws of motion, also clearly supported the theories of Copernicus.

Conflict with the Church Galileo's findings frightened both Catholic and Protestant leaders because they went against church teaching and authority. If people believed the church could be wrong about this, they could question other church teachings as well. In 1616, the Catholic Church warned Galileo not to defend the ideas of Copernicus. Although Galileo remained publicly silent, he continued his studies. Then, in 1632, he published Dialogue Concerning the Two Chief World Systems. This book presented the ideas of both Copernicus and Ptolemy, but it clearly showed that Galileo supported the Copernican theory. The pope angrily summoned Galileo to Rome to stand trial before the Inquisition. Galileo stood before the court in 1633. Under the threat of torture, he knelt before the cardinals and read aloud a signed confession. In it, he agreed that the ideas of Copernicus were false.

Newton Explains the Law of Gravity
By the mid-1600s, the accomplishments of Copernicus, Kepler, and Galileo had shattered the old views of astronomy and physics. Later, the great English scientist Isaac Newton helped to bring together their breakthroughs under a single theory of motion.Newton studied mathematics and physics at Cambridge University. By the time he was 26, Newton was certain that all physical objects were affected equally by the same forces. Newton's great discovery was that the same force ruled motion of the planets and all matter on earth and in space. The key idea that linked motion in the heavens with motion on the earth was the law of universal gravitation. According to this law, every object in the universe attracts every other object. The degree of attraction depends on the mass of the objects and the distance between them. Newton is generally considered the culminating genius of physics. His mathematical achievements (e. g. the development of calculus) together with his systematic and innovative experiment-based research made him

the founding father of modern physics. It was his achievements in the fields of optics and, more so, mechanics and gravitation, which provided the basis of the physical sciences and which could, in later decades, be extended to a system of scientific knowledge that was universally accepted until late into the 19th century. Newton's work was generally accepted and acclaimed, not only in Britain, but also across Europe.

Impact of Scientific Revolution

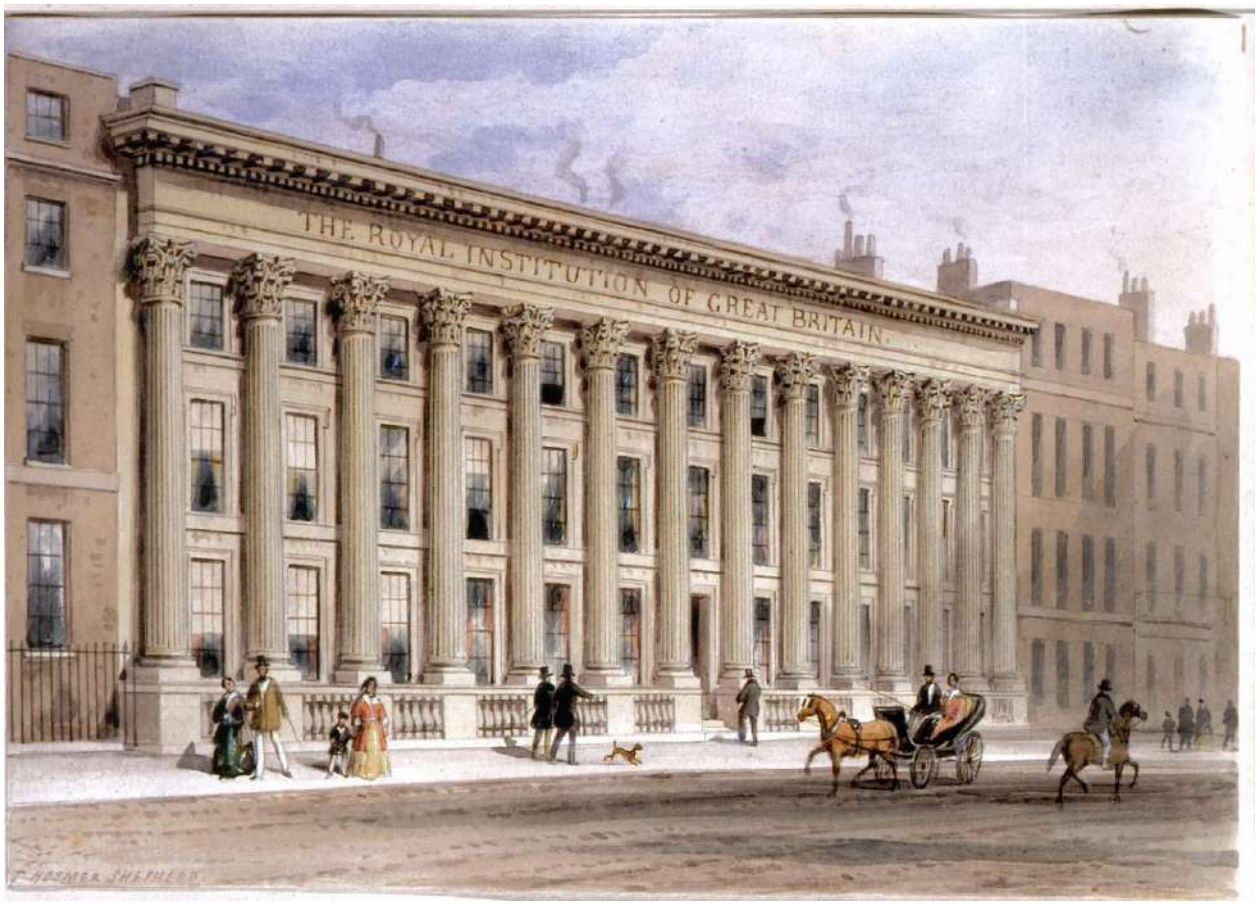
Scientific Instruments Scientists developed new tools and instruments to make the precise observations that the scientific method demanded. The first microscope was invented by a Dutch maker of eyeglasses, Zacharias Janssen in 1590, In the 1670s, a Dutch drapery merchant and amateur scientist named Anton van Leeuwenhoek used a microscope to observe bacteria swimming in tooth scrapings. He also examined red blood cells for the first time.

Medicine and the Human Body During the Middle Ages, European doctors had accepted as fact the writings of an ancient Greek physician named Galen. However, Galen had never dissected the body of a human being. Instead, he had studied the anatomy of pigs and other animals. Galen assumed that human anatomy was much the same. A Flemish physician named Andreas Vesalius proved Galen's assumptions wrong. Vesalius dissected human corpses and published his observations. His Enlightenment book, *On the Structure of the Human Body* (1543), was filled with detailed drawings of human organs, bones, and muscle.

In the late 1700s, British physician Edward Jenner introduced a vaccine to prevent smallpox. Inoculation using live smallpox germs had been practiced in Asia for centuries. While beneficial, this technique could also be dangerous. Jenner discovered that inoculation with germs from a cattle disease called cowpox gave permanent protection from smallpox for humans. Because cowpox was a much milder disease, the risks for this form of inoculation were much lower. Jenner used cowpox to produce the world's first vaccination.

William Harvey (1578–1657) demonstrated that blood circulates, using dissections and other experimental techniques.

Post Revolution Impact



Some national governments encouraged scientific research. They hoped that even the states would someday profit from scientific discoveries. They expected more power and more material gain for themselves. In 1662, Charles II of England founded and funded the Royal Society of London for Improving Natural Knowledge.

This institution promoted scientific enquiry by providing buildings, research facilities, and money. Moreover, they enabled the exchange of ideas by publishing scientific books and by bringing eminent members together in regular sessions. The French government, four years later, followed the English example; the Académie des Sciences of Paris was founded in 1666 by the French chief minister Colbert.

The notions of reason and order, which spurred so many breakthroughs in science, soon moved into other fields of life. Philosophers and scholars across Europe began to rethink long-held beliefs about the human condition, most notably the rights and liberties of ordinary citizens. These thinkers helped to usher in a movement that challenged the age-old relationship between a government and its people, and eventually changed forever the political landscape in numerous societies.

Sources :

- https://plato.stanford.edu/entries/scientific-revolutions/
- https://oyc.yale.edu/physics/phys-200/lecture-3
- Cohen, I. Bernard (1976). "The Eighteenth-Century Origins of the Concept of Scientific Revolution". Journal of the History of Ideas. 37 (2): 257–88.

- https://www.sparknotes.com/history/european/scientificrevolution/context/
- Clagett, Marshall (1961) The Science of Mechanics in the Middle Ages.
- https://rfb.bildung-rp.de/fileadmin/_migrated/content_uploads/The_Scientific_Revolution.pdf

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মুদ্রনবিপ্লব

ভূমিকা :- মুদ্রনপূর্ববর্তী যুগে বই আগে ছিলনা, কিন্তু তা ছিল হাতে লিখিত পুঁথি, তাই হাতে বই বলতে আগে আলেকজেন্দ্রিয়ার গ্রন্থাগারের কথা মনে আসে, সেভাবে বই হাতের তল ছিলনা, কিন্তু পঞ্চদশ শতাব্দীর মুদ্রন বিপ্লবের ফলে ইউরোপের সমাজে আনাগোনায় এক বৈপ্লবিক পরিবর্তন হয়েছিল, মুদ্রিত পুস্তক পাঠের ফলে মানুষের জ্ঞান চর্চার উৎকর্ষ হয় যাকারে বিজ্ঞান মনস্কতা বেড়ে গেলে, যার ফলে আমেরিকা বিপ্লব, ফরাসি বিপ্লব প্রভৃতি ঘটে, ইউরোপ অন্যান্য মহাদেশের তুলনায় অনেকটাই এগিয়ে যায় এবং পৃথিবীর দুই অংশের মানুষের মধ্যে তীব্র পার্থক্য নজরে আসে,

মুদ্রনের আবির্ভাব :- 1450 খ্রীষ্টাব্দ নাগাদ জার্মানির যোহান গুটেনবার্গ নামে হাতে কলমে ছাপা শিল্প উদ্ভাবিত আবিষ্কার করে হয়েছিল, এই শিল্পের প্রথম পুরুষ উদ্ভাবক ও উদ্ভাবিত ছাপা বিদ্যা নামকরণ হয়েছিল

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যখন মোহান হর্থ, তিনির কোম্পের, মোহান ম্যানেজার, চুধানন্দ
আসত ছিল কিন্তু আছিল মূলত দুখি আকারে, যাপজুর চামড়ার
ঠের হাতে লেস হত, বস্ত্রচক্ষ শতকের ক্লামাক্লি সময় স্কুটনবুহার যে
ঐস্মরিক পরিবর্তন আসে তার কারন স্কুটনযন্ত্র ও দুর্নবুহারাদস্তু টিইপ,
তবে স্কুটন শিল্পের আদি ছিল ঠেডামনের সভ্যতার সময়ে
আছে চুধম হল Block Printing এর অন্যতম হল কাগজ, স্ক্রানের
মোত স্কে ও কাগজ ছিল সেকেন্ড প্রাচীনতম, অষ্টাদশতম শতাব্দি
প্রযুক্তির কারনেও কাগজে বুহার চাহিদা ছিল, খুব আগের পার্চমেন্ট
হাত স্কুটনযন্ত্রে চুধার কাজ খুব অসুবিধা ছিল, এছাড়া সেই বুকম ছিল
চাহিদাও, তাই কাগজের বুহার একটা সিস্টেম স্থালি দেয়, কাগজ প্রথম
বুহার হয় চিনে, চামড়ানির কাই নতুন (maize) শহার করে প্রথম
স্কুটন-এর কাজ শুরু হয়, মোহান ম্যানেজার, মোহান যুধ ও তিনির লেখার

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অনুমান করা যায় যে সেদিন থেকেই ইউরোপের বিভিন্ন অঞ্চলে ছাপাখানার নতুন ধারনার সৃষ্টি হয়, ফলে ক মুদ্রনযন্ত্র নিয়ে অসীম বিপ্লব ঘটে। সেই সকল মুদ্রনযন্ত্রের ব্যবহার ও বই ছাপানোর প্রক্রিয়াও বিভিন্ন ধরনের প্রায় একই সময়ে শুরু হয়েছিল। 1500 খ্রীষ্টাব্দ পর্যন্ত ছাপা বইগুলিকে ইনকুনাবুলা বলা হত। সেই বইগুলি আকারে ছোট ও সুবিধাজনক হত কিন্তু বৃত্তাকার ঠোলাকে ছাপা অক্ষরে মুদ্রিত হত। পরবর্তীকালে মুদ্রিত বই এর আঙ্গিকে একে নতুন বিপ্লব শুরু হয়।

ভৌগলিক প্রসার:- পশ্চিমা জগতের সাথে সাথে অন্যান্য অঞ্চলেও ছাপাখানার ব্যবহার ও মুদ্রিত পুস্তক ছড়িয়ে পড়তে শুরু করেছিল কিন্তু একে ক্ষেত্রে হার পার্থক্য ছাপাখানার ব্যবহার প্রায় সমান ভাবে চলতে থাকে। ক্ষেত্রবিশেষ চীন জাপানি থেকে ভেনিসে গিয়ে কিছুকাল বই ছাপান। 1470 এর দশকে নতুন শিল্পের

উল্লেখযোগ্য বিকাশ হয়। ফ্রান্সিসে ভেনিস (1473), লন্ডনে (1475), ভেনিসে (1469)। ইতালিতে ভেনিস ছাড়াও মিলান, রোমান, লেখনিস, পাভিয়া, ফ্লোরেন্স, অনুযায়ী 14H-72 নাগাদ মুদ্রনের কাজ শুরু হয়। প্যারিতে মরণনে 1470-এ প্রথম ছাপা বই বার করেন সেরিন ও তার অনুগামীরা। প্যারি থেকে ছাপার কাজ লিয়োঁতে প্রসারিত হয়। পেন্যাতের কাজে সেন্ট বেলজিয়ামের লুভ্রাঁতে ছাপাখানা প্রতিষ্ঠিত হয়। 14H-এ ইংল্যান্ড উইলিয়াম ক্যাক্সটান ছাপাখানার কাজ শুরু করেন। 1480-এ পশ্চিম ইউরোপের প্রায় 180টি শহরে মুদ্রনযন্ত্রের প্রাণকেন্দ্র ছড়ায় শুরু হয়েছিল। প্রকাশিত গ্রন্থের তালিকা থেকে অনুমান করা হয় যে 1482 নাগাদ ভেনিসই ছিল সমগ্রের বড় কেন্দ্র। 1500টী ছাপার প্রায় 40টি শহরে ছাপার কাজ শুরু হয়। মুদ্রনযন্ত্র আবিষ্কারের পর প্রায় 3500 বছর ছাপা হয় তার পর কাঠ খোদাই ও কাঠের ছাপ সেই থেকে হয়।

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গুরুত্ব :- মুদ্রণ বিপ্লব সমাজে এক বৈপ্লবিক পরিবর্তন নিয়ে আসে। নানা বিষয়ে গুরুত্ব সম্পন্ন বই প্রকাশিত হতে থাকে। বিভিন্ন ভাষার ব্যাকরণ হয় যেমন লাতিন, বিভিন্ন ধর্মগ্রন্থ গুলি লিপিবদ্ধ হতে শুরু করে। কারণ যেই সময় বেশিরভাগ মানুষই ধর্মীয় ভাষাতে কথা বলে, তাই অধিকাংশ বেশি মুদ্রিত হত বাইবেল। 100 এর উপর লাতিন বাইবেল ছাপা হয়েছিল। প্রথমদিকে মূলত ধর্মীয় গ্রন্থ মুদ্রিত হলেও পরবর্তীকালে সাহিত্য, আইন, চিকিৎসাবিজ্ঞান, আঞ্চলিক ও বিশ্বের সাহিত্য, ইতিহাস, ধর্মনিরপেক্ষ সাহিত্য, ব্যবসা প্রভৃতি প্রচুর পুস্তক মুদ্রিত হতে শুরু করে।

সেই সময় প্রচুর বিখ্যাত ব্যক্তির লেখা প্রচুর পরিমাণে মুদ্রিত হতে থাকে যেমন সেই সময় যেসব জনপ্রিয় লাতিন ক্লাসিক প্রকাশিত হয়েছিল তার মধ্যে অন্যতম ছিল ভার্জিলের 'ইলিয়ড', ও সিসেরোর 'ডি অফিসিয়াস'। এছাড়া বহু লেখকের গ্রন্থ প্রকাশিত হয়েছিল।

লাতিন ভাষার চর্চায় নতুন- শিল্পের প্রভাব ফেলেছিল। প্রাচীন গ্রীকদের সভ্যতা এবং লাতিন সম্পর্কে অধিক পুস্তক প্রকাশনার আগ্রহ প্রতিফলিত হয়েছিল। এক্ষিয়ে প্রবৃত্ত বিদ্বান অবশ্যই ইতালিতে মানবতাবাদের আবির্ভাবের দাবিদার হয়েছিল। ফ্লোরিন্স বুকের ও ফ্রেঞ্চী লাতিন গ্রন্থ প্রকাশকদের তালিকায় গুরুত্বপূর্ণ স্থানে ছিল। ফ্রেঞ্চী লেখকদের আগ্রহ ভার্জিল ও অভিদ-এর লেখার পুনর্মুদ্রণ হয়েছিল। সেনেকা লিভি ও দার্শনিকদের আগ্রহ কোনক্রমে জনপ্রিয় ছিল কিন্তু জনপ্রিয়তার দাবিদার ছিলেন সিসেরো। সেনেকা লিভি ও দার্শনিকদের আগ্রহ কোনক্রমে লেখা জনপ্রিয় ছিল, তাই তাদের স্থানীয় ভাষায় পুস্তকও মুদ্রিত হত। যখন দান্তের Devine Comedy-র ১৫টি সংস্করণের কথা জানা যায়। পেত্রার্কের ও বোকাচ্চিও-র প্রথম মুদ্রিত হয়েছিল।

শিক্ষাক্ষেত্রে আলোচনায় বইয়ের একটি গুরুত্বপূর্ণ ভূমিকা ছিল। ফাদুর ও মার্তি মনে করেন যে শিক্ষাক্ষেত্রে এ বইয়ের ভূমিকা ছিল বহুমুখী। বই থেকে উদ্ভূত তথ্য মানুষ গ্রহণ করে, বই মানুষকে নিজের শিক্ষায় অংশগ্রহণে আগ্রহী করে। যাদের মনে নতুন শিক্ষার তৈরী হয়েছিল, তারা আলোচ্য নতুন বই থেকে সেই শিক্ষায় অংশগ্রহণে উৎসাহ লাভ করেছিল। ফাদুর ও মার্তি বলেন যে যেকোন শুরুতে প্রোটেস্টেন্ট শিক্ষার যেমন বইয়ের চাহিদা ভূমিকা ছিল।

উপসংহার:- মুদ্রণশিল্পের মানবতাবাদকে অন্যতম গুরুত্বপূর্ণ শিল্প। কারণ এই শিল্পের ফলেই প্রচলিত ধারণা থেকে বাস্তবিক বইয়ের জন্ম হয়। মুদ্রণশিল্পকে কেন্দ্র করে সেসময়ে যেমন চাহিদার পরিবর্তন হয়েছে তেমনই সেই ধরনের কুফল গড়ে উঠে যা সমাজে উন্নতির পথে বাধা সৃষ্টি করে।

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গ্রন্থপঞ্জি

- বসু, রামরাম, আধুনিক ইতিহাসের বিবিধ, কবিতাপুস্তক থেকে অর্থনৈতিক তত্ত্ব, কলকাতা, বিজয়া, 2008
- চক্রবর্তী, জাফর, চক্রবর্তী, মুজাফফর হুসেন, চট্টোপাধ্যায় কি·খুব, ইতিহাসের যুগান্তর, কলকাতা, 2012.
- রায়, উজ্জ্বল, বিবর্তনের সাথে ইতিহাস, কলকাতা, মেঘ, 2011.

চিত্রপঞ্জি:-

1) HttPS://images.app.goo.gl/xiM3eiPtaV
2) HttPS// images.app.goo.gl/NiSuavcde
3) HttPS// images.app.goo.gl/CSzxacde
4) HttPS// images.app.goo.gl/J8coPae
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6) HttPS// images.app.goo.gl/WC1NDO1
7) HttPS// images.app.goo.gl/I8u9DCXV

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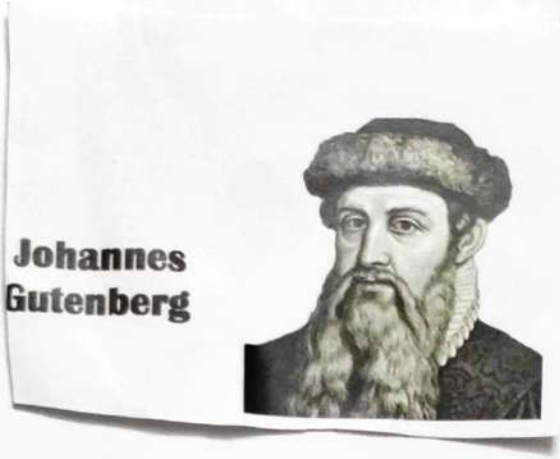
Johannes
Gutenberg

PRINTING REVOLUTION

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INDEX

Introduction

The arrival in Europe of the printing press with moveable metal type in the 1450s CE was an event which had enormous and long-lasting consequences. The German printer Johannes Gutenberg (c. 1398-1468 CE) is widely credited with the innovation and he famously printed an edition of the Bible in 1456 CE. Beginning with religious works and textbooks, soon presses were churning out all manner of texts from Reformation pamphlets to romantic novels. The number of books greatly increased, their cost diminished and so more people read than ever before. Ideas were transmitted across Europe as scholars published their own works, commentaries on ancient texts, and criticism of each other. Authorities like the Catholic Church took exception to some books and censored or even burned them, but the public's attitude to books and reading was by then already changed forever.

➢ Johannes Gutenberg: invention of Printer

Johannes Gutenberg's work on the printing press began in approximately 1436 when he partnered with Andreas Dritzehn—a man who had previously instructed in gem-cutting—and Andreas Heilmann, owner of a paper mill. However, it was not until a 1439 lawsuit against Gutenberg that an official record existed; witnesses' testimony discussed Gutenberg's types, an inventory of metals (including lead), and his type molds.

Having previously worked as a professional goldsmith, Gutenberg made skillful use of the knowledge of metals he had learned as a craftsman. He was the first to make type from an alloy of lead, tin, and antimony, which was critical for producing durable type that produced high-quality printed books and proved to be much better suited for printing than all other known materials. To create these lead types, Gutenberg used what is considered one of his most ingenious inventions a special matrix enabling the quick and precise molding of new type blocks from a uniform template. His type case is estimated to have contained around 290 separate letter boxes, most of which were required for special characters, ligatures, punctuation marks, and so forth.

Gutenberg is also credited with the introduction of an oil-based ink which was more durable than the previously used water-based inks. As printing material he used both paper and vellum (high-quality parchment). In the Gutenberg Bible, Gutenberg made a trial of colour printing for a few of the page headings, present only in some copies. A later work, the Mainz Psalter of 1453, presumably designed by Gutenberg but published under the imprint of his successors Johann Fust and Peter Schoffer, had elaborate red and blue printed initials.

Pic:1 Johannes Gutenberg and his printing press.

The Printing Revolution

1. Mass production and spread of printed books

The invention of mechanical movable type printing led to a huge increase of printing activities across Europe within only a few decades. From a single print shop in Mainz, Germany, printing had spread to no less than around 270 cities in Central, Western and Eastern Europe by the end of the 15th century. As early as 1480, there were printers active in 110 different places in Germany, Italy, France, Spain, the Netherlands, Belgium, Switzerland, England, Bohemia and Poland. From that time on, it is assumed that "the printed book was in universal use in Europe".

In Italy, a center of early printing, print shops had been established in 77 cities and towns by 1500. At the end of the following century, 151 locations in Italy had seen at one time printing activities, with a total of nearly three thousand printers known to be active. By 1500, the printing presses in operation throughout Western Europe had already produced more than twenty million copies. In the following century, their output rose tenfold to an estimated 150 to 200 million copies.

Of Erasmus's work, at least 750,000 copies were sold during his lifetime alone (1469–1536). In the early days of the Reformation, the revolutionary potential of bulk printing took princes and papacy alike by surprise. In the period from 1518 to 1524, the publication of books in Germany

alone skyrocketed sevenfold; between 1518 and 1520, Luther's tracts were distributed in 300,000 printed copies.

The rapidity of typographical text production, as well as the sharp fall in unit costs, led to the issuing of the first newspapers which opened up an entirely new field for conveying up-to-date information to the public.

2. Circulation of information and ideas

The printing press was also a factor in the establishment of a community of scientists who could easily communicate their discoveries through the establishment of widely disseminated scholarly journals, helping to bring on the scientific revolution. Because of the printing press, authorship became more meaningful and profitable. It was suddenly important who had said or written what, and what the precise formulation and time of composition was. This allowed the exact citing of references, producing the rule, "One Author, one work (title), one piece of information" .Before, the author was less important, since a copy of Aristotle made in Paris would not be exactly identical to one made in Bologna. For many works prior to the printing press, the name of the author has been entirely lost.

Because the printing process ensured that the same information fell on the same pages, page numbering, tables of contents, and indices became common, though they previously had not been unknown. The process of reading also changed, gradually moving over several centuries from oral readings to silent, private reading. Over the next 200 years, the wider availability of printed materials led to a dramatic rise in the adult literacy rate throughout Europe.

The printing press was an important step towards the democratization of knowledge. Within 50 or 60 years of the invention of the printing press, the entire classical canon had been reprinted and widely promulgated throughout Europe.More people had access to knowledge both new and old, more people could discuss these works. Book production became more commercialised, and the first copyright laws were passed.[On the other hand, the printing press was criticized for allowing the dissemination of information which may have been incorrect.

A second outgrowth of this popularization of knowledge was the decline of Latin as the language of most published works, to be replaced by the vernacular language of each area, increasing the variety of published works. The printed word also helped to unify and standardize the spelling and syntax of these vernaculars, in effect 'decreasing' their variability. This rise in importance of national languages as opposed to pan-European Latin is cited as one of the causes of the rise of nationalism in Europe.

A third consequence of popularization of printing was on the economy. The printing press was associated with higher levels of city growth. The publication of trade related manuals and books

teaching techniques like double-entry bookkeeping increased the reliability of trade and led to the decline of merchant guilds and the rise of individual traders.

Effects of the Printing Revolution

Martin Luther Becomes the First Best-Selling Author

Luther wasn't the first theologian to question the Church, but he was the first to widely publish his message. Other "heretics" saw their movements quickly quashed by Church authorities and the few copies of their writings easily destroyed. But the timing of Luther's crusade against the selling of indulgences coincided with an explosion of printing presses across Europe.

As the legend goes, Luther nailed his "95 Theses" to the church door in Wittenberg on October 31, 1517. Palmer says that broadsheet copies of Luther's document were being printed in London as quickly as 17 days later.

Thanks to the printing press and the timely power of his message, Luther became the world's first best-selling author. Luther's translation of the New Testament into German sold 5,000 copies in just two weeks. From 1518 to 1525, Luther's writings accounted for a third of all books sold in Germany and his German Bible went through more than 430 editions.

Pic:2 Martin Luther nailing his 95 theses on the door of Wittenberg castle church.

Printing Powers the Scientific Revolution

The English philosopher Francis Bacon, who's credited with developing the scientific method, wrote in 1620 that the three inventions that forever changed the world were gunpowder, the nautical compass and the printing press.

For millennia, science was a largely solitary pursuit. Great mathematicians and natural philosophers were separated by geography, language and the sloth-like pace of hand-written publishing. Not only were handwritten copies of scientific data expensive and hard to come by, they were also prone to human error.

With the newfound ability to publish and share scientific findings and experimental data with a wide audience, science took great leaps forward in the 16th and 17th centuries. When developing his sun-centric model of the galaxy in the early 1500s, for example, Polish astronomer Nicolaus Copernicus relied not only on his own heavenly observations, but on printed astronomical tables of planetary movements.

When historian Elizabeth Eisenstein wrote her 1980 book about the impact of the printing press, she said that its biggest gift to science wasn't necessarily the speed at which ideas could spread with printed books, but the accuracy with which the original data were copied. With printed formulas and mathematical tables in hand, scientists could trust the fidelity of existing data and devote more energy to breaking new ground.

- Literacy and Printing

Handwritten books were slow and expensive to make. Only the wealthy could afford them, so there was no incentive for most people to learn to read. Printing made it possible to mass-produce books the public could afford; by 1500 there were 15-20 million copies of 30,000-35,000 publications.

Part of the impact of the printing press on education was that it gave people a reason to become literate. Protestant Christianity, which taught that everyone should and could read the Bible themselves, gave European Christians an added incentive to learn. Protestant churches promoted education and started Sunday schools for children who worked during the week.

While textbooks were originally printed in Latin, most people spoke in their country's native tongue. This led to printers translating Latin texts into English, French and other languages. Literacy spread as more people were able to read in their own tongue.

- Educational Advantages of Printing Press

Before the printing press, knowledge spread orally or through expensive handwritten books. The printing press made it possible to educate people faster than ever before. New ideas and knowledge could be shared with more people than even the best teacher could hope to reach in their lifetime.

The printing press also changed the teaching process itself, particularly in technical subjects. Printed textbooks could reproduce complex diagrams in engineering, mathematical or architectural works much more accurately and efficiently than a copyist. Students could learn from studying their textbooks, even without a teacher present.

A well-written book could gather together more knowledge than the teacher possessed. Updated editions of mathematical texts made it possible for students to surpass not only their teachers but the wisdom of the ancients. Students across Europe could discuss the ideas they read, confident they were drawing on identical copies of the books.

Conclusion

Over all, the printing press is a revolutionizing invention. First, the printing press was invented during a crucial time period. In this time period, there was a lot of chaos and distress, because of the black death. The printing press had a huge a effect on spreading ideas, thoughts , news, education, and being informed. By printing books and newspapers, we have learned how to communicate and spread ideas throughout the world. The printing press is one of basis invention for the creations and inspiration of many other newer inventions which also revolutionized the world.

Bibliography

- Books

1. Ref: Briggs, Asa and Burke, Peter (2002) A Social History of the Media: from Gutenberg to the Internet, Polity, Cambridge.
2. Kipphan, Helmut (2001). Handbook of print media: technologies and production methods (Illustrated ed.). Springer.
3. Eisenstein in Briggs and Burke, 2002

- Websites

1. https://www.printrunner.com/blog/printing-press-changed-world/
2. https://printinghistory.org/timeline/
3. https://www.bbrgraphics.com/news/the-benefits-of-the-printing-press/
4. https://www.biography.com/people/johannes-gutenberg-9323828
5. https://www.history.com/topics/inventions/printing-press

Thank you.

SCINTIFIC REVOLVTION
HOW SCINTIFIC
IS IT?

TUTORIAL

SEMESTER: 4

PAPER: CC8

SCOTTISH CHURCH
COLLAGE

Department of History

C.U. REG. NO. : 223-1211-0149-19

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সূচিপত্র

ভূমিকা : ইউরোপকে তার মধ্যযুগের আচ্ছন্নকারাচ্ছন্ন প্রথিবী থেকে মুক্তি পাবার যে উল্লাদনা — সবথেকে বেশি সাহায্য করেছিল, তা হল বৈপ্লবিক বিপ্লব। রেনেসাঁ-বা নবজাগরণের আন্দোলন ইউরোপকে মধ্যযুগীয় সম্মোহন থেকে প্রভাবিত করেছিল ঠিকই, কিন্তু তাঁকে আসলিকর অর্থে সত্য করে তুলেছিল বিপ্লব বিজ্ঞান বিপ্লব মানে বৈপ্লবিক ও প্রযুক্তিগত আবিষ্কার-গুলি যা সাধারণত বয়ে নেওয়া হয়। এই বিপ্লব উপেক্ষা করে বিভিন্ন ধারণার পরিবর্তন; যেমন — মধ্যবিশ্ব, প্রথিবী ও মহাজাগতিক স্থান সম্পর্ক, মহাবিশ্বের কেন্দ্রে মানবজাতির অবস্থান। বৈপ্লবিক বিপ্লব ছিল মূলত দুটিগুলি; বীজগণিত এবং দর্শনের বিপ্লব।

১৯৫০ — এর দশকের পরিসংখ্যান প্রথিবীর ইতিহাসের সবচেয়ে গুরুত্বপূর্ণ আলোচিত বিষয় হয়ে দাঁড়িয়েছিল ঐতিহাসিক রূপে এই বিজ্ঞান-বিপ্লব। ষোড়শ শতাব্দের মধ্যভাগ থেকে আঠারোশ শতাব্দের প্রথমার্ধ অবধি এই প্রায় দুশো বছর ধরে মানুষের চেতনার বিশ্বচরাচর সম্পর্কে যে নতুন দিশা খুঁজে পেয়েছিল, তাকেই আমরা বৈপ্লবিক বিপ্লবের নাম বলে আখ্যায়িত চিহ্নিত করি।

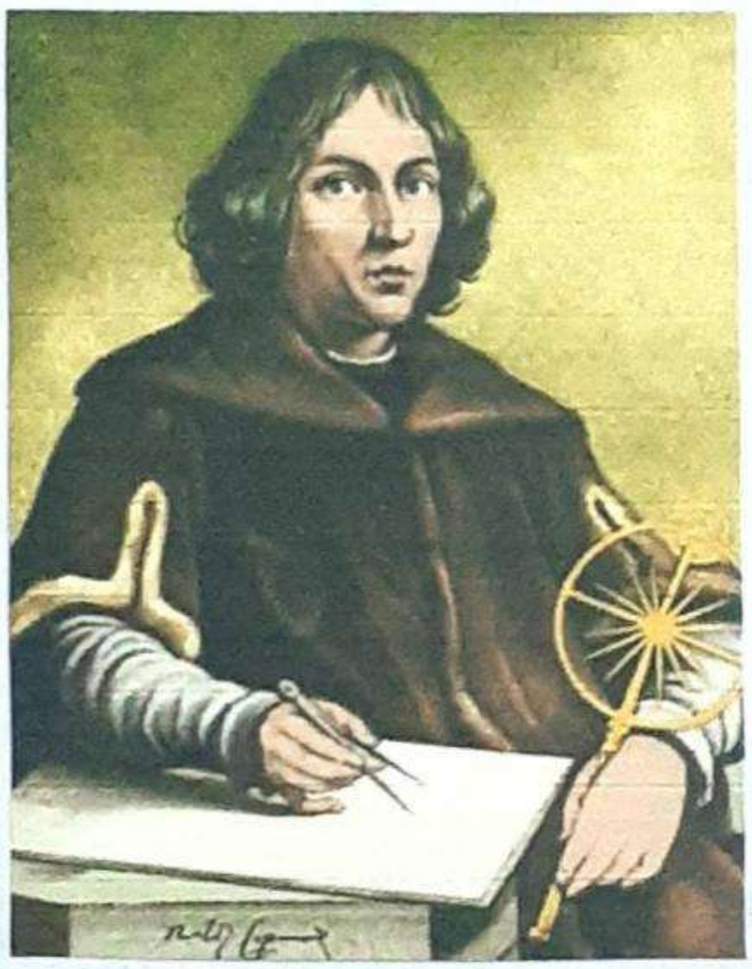
বিজ্ঞান বিপ্লবকে ঘিরে যে সংশয়টি প্রথম দিকে আসে। যেমন বিজ্ঞান বিপ্লব বলতে কী বোঝায়? — কতটা বৈপ্লবিক-ছিল? কী ছিল তার স্বরূপ? বিজ্ঞান বিপ্লবের — কপার্নিকাস ও কেপলারের কী অবদান? এমনকি বিজ্ঞান বিপ্লব আদৌ কোনো বিপ্লব ছিল কিনা — তা নিয়েও অনেক প্রশ্ন তুলেছেন।

প্রথমত বিজ্ঞান বলতে কী বোঝায়? — Chamber's Dictionary-তে বলা হয়েছে — knowledge ascertained by observation and experiment critically listed, systematized and brought-under general principles — অর্থাৎ, যে জ্ঞান পর্যবেক্ষণ ও পরীক্ষা-

— নীতিমালার দ্বারা নিরূপিত বা নির্ণীত, সমাসমত্বভাবে সেবাশ্রিত, নিয়ন্ত্রিত, সুসংগঠিত ও কার্যকরী আবিষ্কার সূত্রে উদ্ভাবিত, তাকেই বিজ্ঞান বলে। বিজ্ঞানের সংজ্ঞা দিতে গিয়ে অধ্যাপক Rodney Stark বলেছেন— "Science is a method utilized in organized efforts to formulate explanations of nature always subject to modifications and correction although systematic observations." দ্বিতীয়ত বিজ্ঞান বলতে বোঝায় ক্রমাগত পরিবর্তন, কিন্তু পরিবর্তন আসে সবসময় অতীতের অনেক অসম্পূর্ণতাকে, সমস্যসমূহের বিচ্ছিন্নতাকে বা অতীতকে পুরোপুরি উপেক্ষার কারণে; কারণ পৃথিবীর ইতিহাসে এমন অনেক বিজ্ঞান আছে, যা অতীতের চলার ভিত্তি কয়েক গাড় উঠেছে পরবর্তীকে। ষোড়শ ও সপ্তদশ শতাব্দীর বিজ্ঞানীরা যে বিজ্ঞানচর্চার শুরু করেন, বৈপ্লবিক পরিবর্তন এনেছিলেন, যাদের আমরা ছবি আবাসন করেছেন: কপার্নিকাস, গ্যালিলিও, কেপলার, টমাস ও কুন, প্রমুখ, নিউটন প্রভৃতি বিজ্ঞানী। এই সময়কালকে বিজ্ঞানের বিপ্লব বলে চিহ্নিত করার প্রবণতা লক্ষ্য করা যায়। প্রাচীন গ্রিক, ইসলামিক বা আরব ও খ্রিস্টান বর্বরতাত্ত্বিকেরা যেসব বৈজ্ঞানিক তত্ত্ব গড়ে তুলেছিলেন বা যে পদ্ধতিতে বিজ্ঞানচর্চা করতেন, তার অনেক কিছু প্রাচ্য প্রতিপন্ন করে বাতিল করার করেন। প্রতিষ্ঠাসিক Herbert Butterfield বিজ্ঞান বিপ্লব সম্পর্কে লিখতে গিয়ে বলেছেন, —

"It outshines everything since the rise of Christianity and reduces the Renaissance and the information to the rank of mere episodes. It looms large as the real origin of the modern world." আধিবিদ্যা-ধর্মের দিক থেকে সরে এসে সূত্র হয়েছিল কোপারনিকাস, গ্যালিলিও, কেপলার ও নিউটনের মধ্য। দ্বিতীয়ত, বিজ্ঞানচর্চার ও পদ্ধতির ক্ষেত্রে আরেক চিন্তা ধারার পরিবর্তে ঘটিত-

— হল নতুন ও আধুনিক — চর্চিতেই যা গড়ে উঠেছিল
গবেষণাগারে আগত প্রেরণা যেমন ও দেবপাতির —
চিত্তাসারার টানার নিয়ে কাজ, পেমবেস্টন ও পেরিস্টিল.
—স্পাকল পেছাতির স্বপ্নে মুক্ত হল ব্যাপক ভোবে
গানিতের ব্যবহার। মহাকাশ গাবেষণা ও বেদাধ্যবিদ্যার —
স্থিতে পেমবেস্টন থেকে আহরিত নিয়মাবলী ও তথ্যের
নিভিতে ব্যাখ্যা করার চেষ্টা হয়েছে বলা হল গানিত-
ও - বলবিজ্ঞানকে। এ সূত্রের প্রায় সব বিষয়টাই ও
গানতত্ত্ব যেমন — গ্যালিলিও, কেপলারিকাস, বেকনার,
দেকার্ত, বয়েল্স, হুক, হাইগেন্স, থালে ইত্যাদি
—সবাই প্রকৃত পেমের পেমিক। এই কারণে — পোরম্পর্যতা
পোপ নষ্টচন্দ্রের মৃত্যু। 'Principa' প্রকাশিত হওয়ার মধ্যে
—মধ্যেই তা হয়ে উঠে গব্য বিদ্যাভাগের বাইবেল। নিউটনের
— মহাকাশ তত্ত্ব, বিদ্যাভাগচর্চার ক্ষেত্রে এক বিপ্লবের
সূচনা করল। প্রাচীন দার্শনিকদের প্রিয় পদ্ধতিগুলি
— বিশ্বের কারণীয় প্রয়াসকে নিয়ে প্রতিষ্ঠা করেছিল
এক গাতময় বিশ্বলোক। প্রসঙ্গে উল্লেখ্য এখানে
বৈজ্ঞানিক বিপ্লবের যে দুটী দেমাঙ্গের পাশ্চাত্য করা যায়
তার মধ্যে প্রথম দেমাঙ্গ অন্যান্য চতুর্দিক পূর্ণোদ্যম
সাতক বৈজ্ঞানিক অনুসন্ধানের তিনটি ধারণা রূপায়ণ
সহায়তা ছিল, যথা — তর্কশাস্ত্রীয় (logical); পরীক্ষা-
মূলক (Experimental), এবং — গানিতিক (Mathematical)
এদিকে এর দ্বিতীয় দেমাঙ্গে এই তিনটি প্রথক ধারণা
সমন্বিত রূপ বিকশিত হয়, যা মানুষকে গভীর
অন্বেষণীয় দেহবর্তনের মুখাপেক্ষী করে তুলেছিল।
—এই প্রসঙ্গে ও অন্যান্য বিশিষ্ট বৈজ্ঞানিকদের
ভাবধারা আলোচনা করা যেতে পারে।



১. নিকোলাস কোপারনিকাস

☐ অন্নকালীন বিশিষ্ট বিজ্ঞানীগণ :

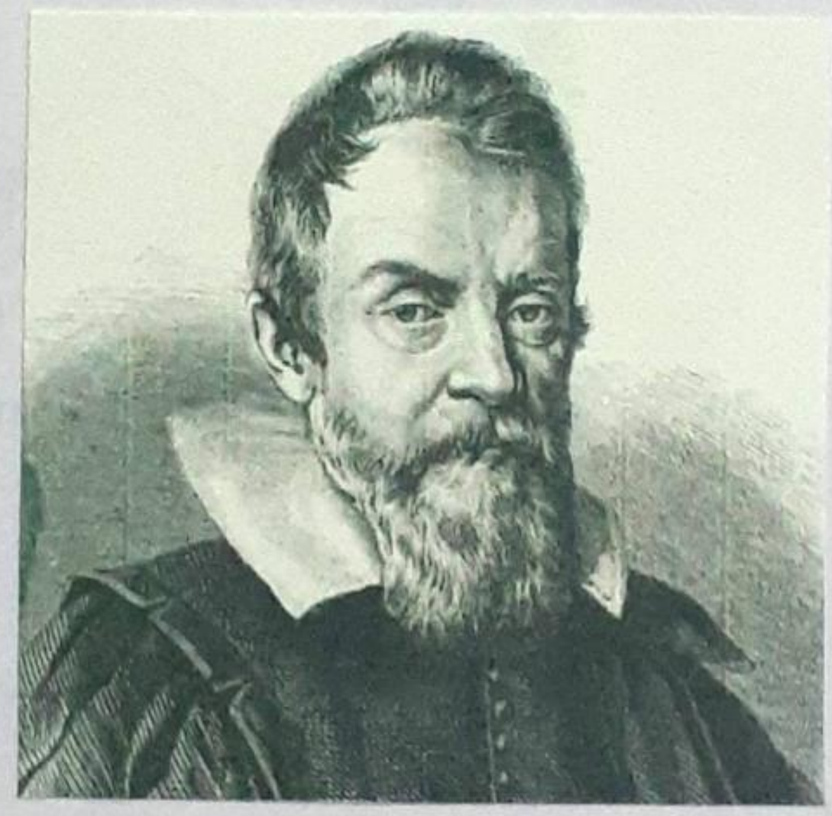
কোপারনিকাস, গোথ্রাপের বেকন, লিওনার্দো-দা-ভিঞ্চি, গ্যালিলিও, আইজ্যাক নিউটন প্রমুখের আবির্ভাব ইউরোপে অন্নকালীন সময় বিজ্ঞানের দিগন্ত উন্মোচিত হয়। কোপারনিকাসের 'On the revolution of the Hevenly Spheres' (1543) গ্রন্থের সার্বিক বিজ্ঞানপ্রচার যে বাঁরা সৃষ্টি হয়েছিল আইজ্যাক নিউটনের 'Principia' তে (1687) এসে পরিপূর্ণতা বিবর্তিত হয়, যা মানুষকে এক অপেক্ষাকৃত পরিবর্তনের সুধাপেক্ষী করে তুলেছিল। এই প্রেক্ষাপটে এই সময়কার বিশিষ্ট বৈজ্ঞানিকদের অবদান আলোচনা করা হল —

◆ নিকোলাস কোপারনিকাস :- আধুনিক জ্যোতির্বিজ্ঞানের জনক নিকোলাস কোপারনিকাস ১৪৭৩ খ্রিষ্টাব্দে পোল্যান্ডের টোরান শহরে জন্মগ্রহণ করেন। ১৮ বছর বয়সে ক্র্যাকো বিশ্ববিদ্যালয়ে (১৪৯৪-৯৪) পড়ার সময় তিনি সেইসময়ের বিশিষ্ট বিজ্ঞানী আলবার্ট ব্রুজোস্কির সংস্পর্শে আসেন এবং জ্যোতির্বিজ্ঞানের প্রতি আকৃষ্ট হন। অতঃপর জ্যোতির্বিজ্ঞান চর্চা তাঁর ধ্যান-জ্ঞান ও চিন্তা। এই পাবে, অর্থাৎ, ১৪৯৭-১৫০৬ খ্রিষ্টাব্দে তিনি ইতালির বোলোগা ও পাদুয়াতে ও পড়াশোনা করেছিলেন। অবশ্য এর পাশাপাশি তিনি চিকিৎসাশাস্ত্রও অধ্যয়ন করেন এবং কিছুদিন চিকিৎসাবৃত্তে পেশায় নিযুক্ত থাকেন। আরও পরবর্তীকালে তিনি বিশ্ববিদ্যালয়ে গণিত ও জ্যোতির্বিজ্ঞানের অধ্যাপনা করে। এরপর তিনি স্বদেশে ফিরে আসেন এবং জ্যোতির্বিজ্ঞান সম্পর্কে ব্যাপক পড়াশোনা করেন। তিনি সর্বপ্রথম ঘোষণা করেন যে সূর্যকে কেন্দ্র করে পৃথিবী ও

– অন্যান্য গ্রহগুলি নির্দিষ্ট সময়ে প্রদক্ষিণ করছে। এরপর প্রচলিত থাকে বিরণাবের বিদ্যা প্রমাণ একদিকে সেইসূত্রে মেলা কিছু স্বল্পসংখ্যক মানুষ আলোকিত হয়েছিলেন, তাঁদিকে তেমনি কুসংস্কারাচ্ছন্ন বর্বরীয় সমাজ-দ্বারা তাঁর উপর জুলুম হয়েছিল। কিন্তু এদের নিরপেক্ষ সমালোচনায় তাঁকে সঠিক বিচলিত করেনি, তাঁর লেখা কিছু সংখ্যক পুস্তক নিয়মিত তোষণা করা হয়। ১৫৪০খ্রীষ্টাব্দে তিনি তাঁর শেষ এবং সর্বাধিক উল্লেখযোগ্য জ্যোতির্বিজ্ঞান বিষয়ক গ্রন্থ 'Six Books on the Revelations of the Celestial Spheres' – রচনা শেষ করেন। কোপার্নিকাসের একেবারে শেষ মুহূর্তে যদিও সেটি সমাপ্ত ও প্রকাশিত হয় (১৫৪৩)।

কোপার্নিকাসের মৃত্যু খোকেই জ্যোতির্বিজ্ঞানের আলোচনায় টলেমির পৃথিবীকেন্দ্রিকতা বারবার বিরুদ্ধে প্রতিবাদ উঠে হয়েছিল। কোপার্নিকাসের মূলগ্রন্থের ভাবিষ্যতের এই চিরাচরিত চর্চা অনুযায়ি বর্ষণ নাকে চ্যালেঞ্জ করেছিল। এটাই ছিল কোপার্নিকাসের বিরুদ্ধে চার্চের প্রথমে ক্ষোভের মূল কারণ। ১৫৪০ খ্রীষ্টাব্দে বিখ্যাতের মৃত্যুর তাঁর আদি গ্রন্থটি প্রকাশিত পুস্তিকার আকারে প্রকাশিত হয়েছিল। এটি অন্যান্য 'Commentariolus' ছিল তাঁর মতামত গবেষণার সংক্ষিপ্তসার, আরও পরবর্তীকালে তাঁর দুর্ণাম-পুস্তিকাটি প্রকাশিত হয় (১৫৪৭)।

আমার বেরি মনে করেন যে সমস্ত জ্যোতির্বিজ্ঞান সাহিত্যে Revolutions.. – এর গুরুত্ব টলেমির Almagest এবং নিউটনের Principia – এর সঙ্গে করা যায়। জ্যোতির্বিজ্ঞান ক্ষেত্রে কোপার্নিকাস রচিত এই গ্রন্থের প্রধান দিক ছিল দুটি মূলগত কাঠামো। এটি যথাযথ 'বিপ্লব' ছিল, এই বিপ্লবের কেন্দ্রীয় বিষয় — আপাতদৃষ্টিতে গ্রহ-নক্ষত্র জ্যোতিষ্কের যে গতি আমাদের দৃষ্টিগোচর হয়, আসলে তাদের প্রকৃত গতি নয়, গতিশীল পৃথিবীর কেন্দ্রে বসে থেকে বার্ষিক গতির প্রভাবে গ্রহ নক্ষত্রের গতিশীল মনে হয়, অন্যান্য জ্যোতিষ্কের যে গতি আমরা পর্যবেক্ষণ-



২. গ্যালিলিও গ্যালিলি

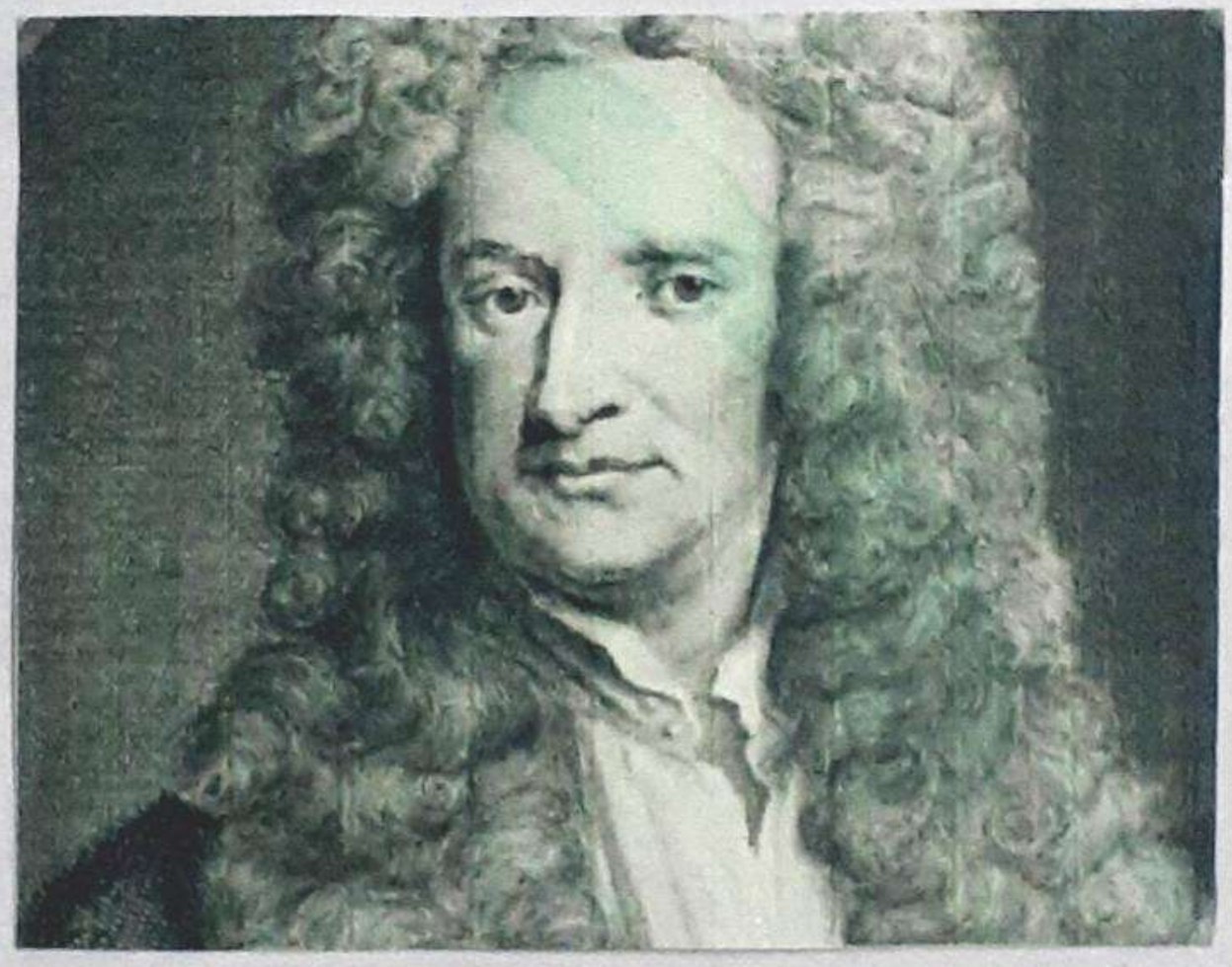
- বাড়ি থেকে আদের প্রকৃত গতি নয়, আলোকিক গতি, সৌরজগৎ কোপারনিকাস বোর্ণিলের নীতি বেষ্টিত সূর্যকে কেন্দ্র হিসাবে ঘিরে তার সমস্ত বিশ্বসৃষ্টি তাদের প্রাক্তন কবেছেন, "Provehimur portu, terraeque urbesque recedunt" — অর্থাৎ, আমরা বাড়ি ছেড়ে যাচ্ছি - দিনাম ও দেশ ও নগর দূরে সরে যেতে থাকল।" — সুর্য বৈজ্ঞানিকের আবিষ্কারের হিসাবেই সূর্য কেন্দ্রীয় মতবাদ যুক্তিযুক্ত বলে ছিল এটা মনে রাখতে কোথাও কার্পণ্য নেই। পাশ্চাত্য সোচ্চার মানুষের কাছে এই ঘটনা এবং বিদারুণ চাঞ্চল্যকর সৃষ্টি বলেছিল।

◆ গ্যালিলিও- গ্যালিলি (১৫৬৪-১৬৪২):-

এই সূত্রের আলোকে এবং বিশিষ্ট - ইতালীয় বিজ্ঞানী গ্যালিলিও ১৫৬৪ খ্রিষ্টাব্দে ইতালির পিসা শহরে জন্মগ্রহণ করেন। ১৭ বছর বয়সে তিনি পিসা বিশ্ববিদ্যালয়ে চিকিৎসাশাস্ত্র অধ্যয়নের জন্য ভর্তি হন। কিন্তু কোপারনিকাসের মতো তিনিও গণিত ও জ্যোতির্বিদ্যার প্রতি মারাত্মক আকর্ষণ অনুভব করেছিলেন। একবার ক্যাথেড্রালের প্রাচীন গাণিতিক ঝাড়বাতির দোলন থেকে গণিতের প্রতি তাঁর আগ্রহ সৃষ্টি হয়। ১৫৮৯ খ্রিষ্টাব্দে তিনি পিসা বিশ্ববিদ্যালয়ে গণিতশাস্ত্রের অধ্যাপক নিযুক্ত হন। এখানে থাকাকালীন তিনি পদার্থ আপেক্ষিক ও গবেষণার সাহায্যে 'দোলকের সূত্র' এবং 'পতনশীল বস্তুর সূত্র' আবিষ্কার করেন। ১৬০০ খ্রিষ্টাব্দে তিনি তাঁর উল্লেখযোগ্য গ্রন্থ - 'The Starry Messenger' — প্রকাশ করেন।

তিনি প্রথম আবিষ্কার করেছিলেন একটি অত্যন্ত উন্নত মানের টেলিস্কোপ যার সাহায্যে তিনি পর্যবেক্ষণ করেন সূর্য-কলঙ্ক, বৃহস্পতির চারটি উপগ্রহ, শুক্র ও বুধগ্রহের কলা এবং আরো - বলায়, অনেকগুলো, তিনি ছিলেন কোপারনিকাসের - সুযোগ্য উত্তরসূরি এবং তাঁর তত্ত্বের প্রবক্তা হন -

৩. জোহান কেপলার



৪. স্যার আইজাক নিউটন

◆ জোহান কেপলার (১৫৭১-১৬৩০):-

জার্মান বিজ্ঞানী জোহানেস কেপলার কেবলমাত্র কোপার্নিকাসের তত্ত্বের একজন একনিষ্ঠ সমর্থকই ছিলেন তা নয়, তিনি এই তত্ত্বকে এক নতুন ভিত্তি প্রদান করেছিলেন। পৃথিবী তথা গ্রহগুলির কক্ষপথকে প্রথম উপবৃত্তাকার হিসাবে প্রমাণ করতে সচেষ্ট হন। কেপলারের মতে এই উপবৃত্তাকার কক্ষপথের কেন্দ্রে নয় - নাভি বা ফোকাসে সূর্য অবস্থান করছে। কেপলার এই তত্ত্বের মাধ্যমে গ্রহ নক্ষত্রের - পরিক্রমণ গতি এবং এর সময়কাল নিখুঁত ভাবে গণনা করা সম্ভব হয়েছিল। পরবর্তীকালে এর ওপর ভিত্তি করেই দিনরাত্রি এবং ঋতু পরিবর্তনের রহস্য উদ্ঘাটন সম্ভব হয়েছিল। ১৬১৯ সালে তাঁর গ্রন্থ 'হারমোনিকস মুন্ডি' বিজ্ঞানী আইজ্যাক নিউটনের গবেষণায় যথেষ্ট অনুপ্রেরণা সঞ্চার করেছিল।

◆ স্যার আইজাক নিউটন (১৬৪২-১৭২৭):-

স্যার আইজাক নিউটনের কথা না বললে এই আলোচনা অসম্পূর্ণ থেকে যাবে। ইতিপূর্বেই বলা হয়েছে যে এই বিশিষ্ট বিজ্ঞানী কেপলারের প্রভাবে বিখ্যাত মহাকর্ষ সূত্র আবিষ্কার করেছিলেন। কেমব্রিজের ট্রিনিটি কলেজে অধ্যয়নের সময় কেপলারের অভিমত থেকে তাঁর মনে হয়েছিল যে সূর্য ও গ্রহের মধ্যে অবশ্যই কোনো আকর্ষণ বল কাজ করে। ১৬৬৯ খ্রিস্টাব্দে তাঁকে কেমব্রিজ বিশ্ববিদ্যালয়ের পদার্থবিদ্যার অধ্যাপক নিয়োগ করা হয়। এই বিশিষ্ট ইংরেজ বিজ্ঞানীর অন্যান্য যুগান্তকারী আবিষ্কারের মধ্যে

৫. ফ্রান্সিস বেকন

- তাপতত্ত্ব ছিল আলোচ্য গতি সম্পর্কে গভীর তত্ত্ব বলাবাহুল্য, ব্যালিস্টিক্স, বীজগণিতের একটি নতুন শাখা এবং Law of Motion বা গতিসূত্র। ১৬৮৭ খ্রিস্টাব্দে তিনি তাঁর বিখ্যাত Principia-গ্রন্থটি রচনা করেন, তিনি ছিলেন রয়্যাল সোসাইটির ও ট্রেজারারের গবেষক।

◆ স্যামুয়েল বেকন (১৫৬১-১৬২৬):—

ইংল্যান্ডে বৈজ্ঞানিক গবেষণার পথিকৃত স্যামুয়েল বেকন প্রকৃত অর্থে বিজ্ঞানী না হলেও তাঁর নিজস্ব সৃষ্টির বাইরে তিনি বৈজ্ঞানিক গবেষণার উদ্দেশ্য সম্পর্কে প্রতি যে সাম্মনির্দেশ করেছিলেন তার গুরুত্ব অবশ্যই আশাতীত প্রশ্নের কাছে তিনি ইতিস্থ দাবি করতে পারেন। সবচেয়ে বৈজ্ঞানিক এলাকেমি বা শিক্ষানবিশ প্রতিষ্ঠার চিন্তার উদ্গাতা হিসাবে তিনি চিরস্মরণীয়-গ্রন্থ অগ্রগামী। বৈজ্ঞানিক উদ্যোগ সবচেয়ে অনুদান পেশাদারি সৃষ্টির পারিবেশপ্রসার করা ১৬২৩-আলো প্রকাশিত তাঁর 'The Advancement of Learning' গ্রন্থ থেকে জানা যায়।

☐ বৈজ্ঞানিক বিপ্লব কতদূর 'বৈপ্লবিক'?

বিজ্ঞানের অগ্রগতিকে কোনো কোনো ক্ষেত্রে যেখানে বিপ্লব নয় বলে চিহ্নিত করা হয়, সে কথা বলা কঠিন। উদাহরণস্বরূপ Rodney Stark-এর কথা বলা যেতে পারে। তিনি তাঁর "For the Glory of God" — গ্রন্থে দেখাতে চেয়েছেন যে, বিজ্ঞানে বিপ্লব বলে কিছু ছিল না। তাঁর মতে, একাদশ শতাব্দীর 'Scholastic' - পণ্ডিতেরা যে অগ্রগতির সূচনা করেছিলেন, ষোড়শ শতাব্দীর 'অভিজ্ঞতাশ্রিত' বিজ্ঞানে বিপ্লব, ছিল তারই প্রত্যাবর্তন পরিণতি। তাঁর মতে কপার্নিকাস পুরোপুরি অপ্রত্যাশিত ছিলেন বলে মনে করার কোনো কারণ নেই। কপার্নিকাসের প্রস্তাবের গতি অবশ্যই ষোড়শ বা সপ্তদশ শতাব্দীর বিজ্ঞানের অগ্রগতির মতো দ্রুত বা চমকপ্রদ ছিল না। এই অনুসারে মত প্রত্যাহার ও পরাজয় স্বীকার বৈজ্ঞানিকদের অভ্যাসে হয়েছিল মধ্যযুগে। এ ছাড়া তাঁদের চিন্তাধারা বা আবিষ্কার মধ্যযুগে দার্শনিক প্রভাবিত প্রান্ত ধারণাসমূহকে সম্পূর্ণ দূর করতে সক্ষম হয়েছিল, মধ্যযুগের বিজ্ঞানীরা তা করতে পারেননি, তাত্ত্বিক দিক থেকে বিজ্ঞানচর্চায় পদ্ধতি অনেক উন্নত ছিল। এই দিক থেকে বিচার করেই আমরা এই দুই শতাব্দীর বৈপ্লবিক বলে গণ্য করতে পারি, উন্নতি মাপেই বিপ্লব এই ধারণা সত্য নয়, অন্যদিকে বিপ্লবের অর্থ ভাবনার প্রকাশ মোক্ষম্ভ আকস্মিক বোলো অভ্যাবশ্যিক ঘটনা নয়, ষোড়শ এবং সপ্তদশ শতাব্দীর বিজ্ঞান বিপ্লবের শ্রেণি এই ধরনের কোনোই ঘটে ছিল।

— অবশ্য, অসুরের বিজ্ঞানচর্চার যে অসম্পূর্ণ

প্রকৃতিগুরু ছিলো এটা মাপ বাড়ার শোনো কারণ
নেই। আলোচ্য পর্বে মানুষের তাৎমাত্মিংসা এবং সমালোচনা-
মূলক দৃষ্টিভঙ্গি সত্ত্বেও বিজ্ঞানসাধনা প্রসারিত বিশ্ব-
বীক্ষার ক্ষেত্রে সর্বক্ষেত্রে সবসময় ঈপ্সিতযোগ্য পরিবর্তন-
আনতে পারেনি। এসময়ে জ্যোতির্বিদ্যা গ্রহ-নক্ষত্রের আবর্তন
সম্পর্কে বায়োছলোগ, কিন্তু সবসময় তার বিজ্ঞানসম্মত
ব্যাখ্যা দিতে পারেননি। ত্রিকোণমিতি জ্যোতির্বিজ্ঞান ও গ্যালিলিওর
পরবর্তীকালে কোপারনিকাস ও বিশ্বব্রহ্মাণ্ডের কথা বলেছিলেন।
আর একটি সীমাবদ্ধতা আমাদের দৃষ্টি আবর্তন করে।
বিজ্ঞানচর্চার সূত্রপাত হওয়া সত্ত্বেও মানুষের একক
তথা পৃথিবীর জ্যোতিষ্কদের প্রতি বিশ্বাস প্রায় অটুট ছিল।
এদের চোখে জ্যোতির্বিজ্ঞান ও জ্যোতিষ্কদের প্রতি
বিশ্বাস প্রায় অভিন্ন ছিল। এদের চোখে জ্যোতির্বিজ্ঞান-
ও জ্যোতিষ্কদের প্রায় সমার্থক ছিল। এইদের ঈপ্সিতযোগ্য
ব্যতিক্রম ছিলেন কেপলার যাঁর তাপতত্ত্ব বিষয়ে
মনোযোগ লিবনাদেওয়া নিরূপণযোগ্য। তিনি তাপহওয়া
সংক্রান্ত তত্ত্ব সংগ্রহ করে জ্যোতিষ্কদের তাপমাত্রা
পরিমাপ করতে সচেষ্ট হয়েছিলেন। কিন্তু এগারো কয়েকজন
সমসাময়িক বিশিষ্ট পণ্ডিত, যিনি যে ও দার্শনিক বৃহৎ,
শিক্ষা ও সাহিত্যের প্রভাব সংকোচনের অস্বীকার-
না করেও গ্রহের তথাকথিত প্রভাবকে তাৎপর্য-
বহনে নি, অপ-রসায়নিবাবিদ্যা ও গ্রহক প্রভাব কিছুই-
মেনে নিয়েছিলেন। এ যুগের বিশিষ্ট বৈজ্ঞানিকদের
একাংশ সংবেদনা ও বর্ণালোকের অতিরিক্ত বলে মনে করতেন।
বিশ্বব্রহ্মাণ্ডের গতি-প্রকৃতির পরিচালনে তাঁরা ঐশ্বরিক
মহিমা লক্ষ্য করেছিলেন। স্বয়ং নিউটন তাঁর প্রিন্সিপিয়াতে
লিখেছিলেন, "সূর্য, গ্রহ এবং ধূমকেতু নিয়ে অত্যন্ত
সুন্দর গোষ্ঠী গড়ে উঠেছে, তা পরিচালিত হচ্ছে অসীম
মেধাবী ও শক্তিমান এক সত্তার তাদেরো।"
কথা বলেছেন বিজ্ঞানের সাধারণ স্তরে প্রোটেস্ট্যান্ট
মতবাদের প্রভাব লক্ষ্য করা যায়। প্রকৃতপক্ষে এই সব -

— বর্ণনে— এই সূত্রে— 'বৈজ্ঞানিক বিপ্লব' বলতে যে 'বৈপ্লবিক' চিন্তা সে বিষয় আলোচনার অবতারণা সেখানেই যায়। — অবশ্য, এইসব সীমাবদ্ধতা সত্ত্বেও— আলোচ্য পর্বের বৈজ্ঞানিক চেতনা তথা চিন্তাধারা যে আমূলিক বিচারে 'বৈপ্লবিক' ছিল সেটা অনস্বীকার্য।

গ্রন্থপঞ্জি

❖ Shapin Steven.

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❖ মুখার্জী — রীনা

"ঔপনিবেশিক ইতিহাস" (৩০০-১৮০০)

প্রকাশক: প্রোগ্রেসিভ পাবলিশার্স

প্রথম প্রকাশ: মার্চ, ২০০৪.

❖ চক্রবর্তী বিপ্লব ও চক্রবর্তী সুলোচনা এবং চট্টোপাধ্যায়-
— কিংশুক.

"ইউরোপ সুপ্রভাত"

প্রকাশ: নবজাগরণী প্রকাশালী

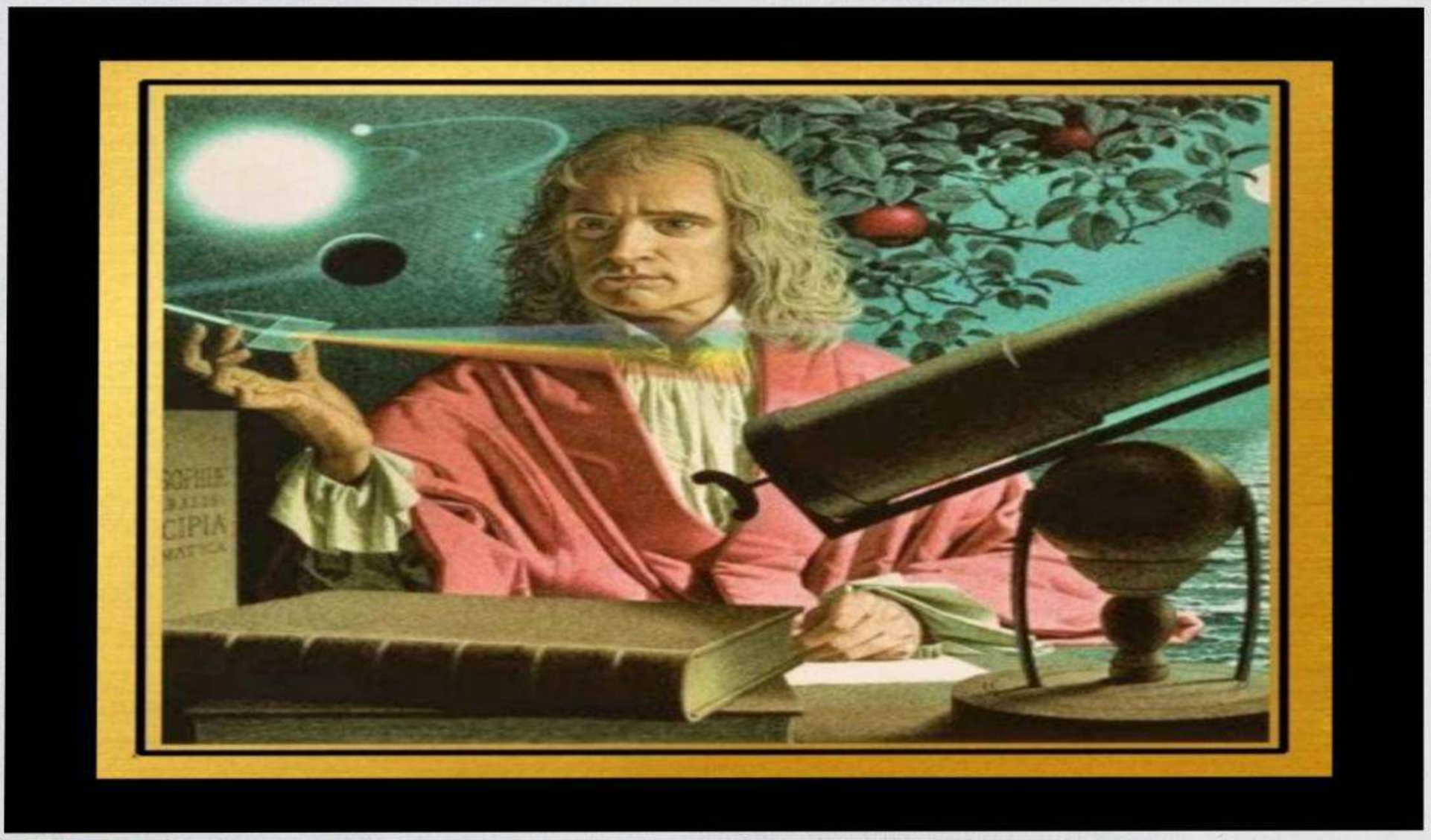
প্রথম প্রকাশ: ডিসেম্বর, ২০০৫

❖ রায় সুলাবেশ, দাস আমন্তুন.

"ইউরোপের পথে ইতিহাস"

প্রকাশক: নিউ বসুধারা প্রকাশালী, কলকাতা।

চিত্রসূচি



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TOPIC : SCIENTIFIC REVOLUTION: HOW SCIENTIFIC WAS IT ?

~ : সূচিপত্র : ~

❖ ভূমিকা :—

বৈজ্ঞানিক বিপ্লব মানে বৈজ্ঞানিক ও প্রযুক্তিগত আবিষ্কার ছিল না যা আবারণত ধরে নেওয়া হয়, এই বিপ্লব উল্লেখ করে বিভিন্ন ধারণার পরিবর্তন যেমন - মহাবিশ্ব, পৃথিবী ও মহাজগতের অর্থে যোগ, মহাবিশ্বের ভিতর মানবজাতির স্থান, বৈজ্ঞানিক বিপ্লব ছিল মূলত দৃষ্টিভঙ্গি, ধারণা এবং দৃষ্টান্তের বিপ্লব, ১৯৫০-এর দশকে আধুনিক পৃথিবীর উত্থানের একটি দিকচিহ্ন হিসেবে ঐতিহাসিক মহলে বিজ্ঞান-বিপ্লব একটি গুরুত্বপূর্ণ আলোচিত বিষয় হয়ে দাঁড়িয়েছিল, ষোড়শ শতকের মধ্যভাগ থেকে অষ্টাদশ শতকের প্রথমার্ধ অবধি এই প্রায় দুশো বছর ধরে মানুষের চেতনার বিশ্লেষণের মধ্যে যে নতুন চিন্তা স্থান পেয়েছিল, তাকেই আমরা বৈজ্ঞানিক বিপ্লবের যুগ বলে আবারণত চিহ্নিত করি,

বিজ্ঞান বিপ্লবকে কেন্দ্র করে কয়েকটি প্রশ্ন উঠে আসে, যেমন বিজ্ঞান বিপ্লব কতটা বৈপ্লবিক ছিল? কী ছিল তার স্বরূপ? বিজ্ঞান বিপ্লবের সঙ্গে ধর্ম ও রেনেসাঁসের কী সম্পর্ক? এমনকি বিজ্ঞান বিপ্লব আদৌ কোনো বিপ্লব ছিল কিনা - তা নিয়েও অনেকে প্রশ্ন তুলেছেন, তবে বিজ্ঞানের ইতিহাস বলতে কী বোঝায় তা নিয়ে বিভিন্ন দৃষ্টিকোণের কথা উল্লেখ করা যেতে পারে, যেমন জর্জ স্যার্টনের মতো পান্ডিত মনে করেন বিজ্ঞানের ইতিহাসকে আলোচনা করতে হবে মানুষের বুদ্ধিগত দৃষ্টিকোণে, কীভাবে তা মানব অভ্যতার বিকাশে সহায়ক হয়েছে এবং কীভাবে বৈজ্ঞানিক চিন্তাধারা রাজনৈতিক ও অর্থনৈতিক জীবনকে প্রভাবিত করেছে, তা যাচাই করে দেখতে হবে, তাঁর বিখ্যাত গ্রন্থ 'Introduction to the History of Science' -> এই বক্তব্য রেখেছেন,

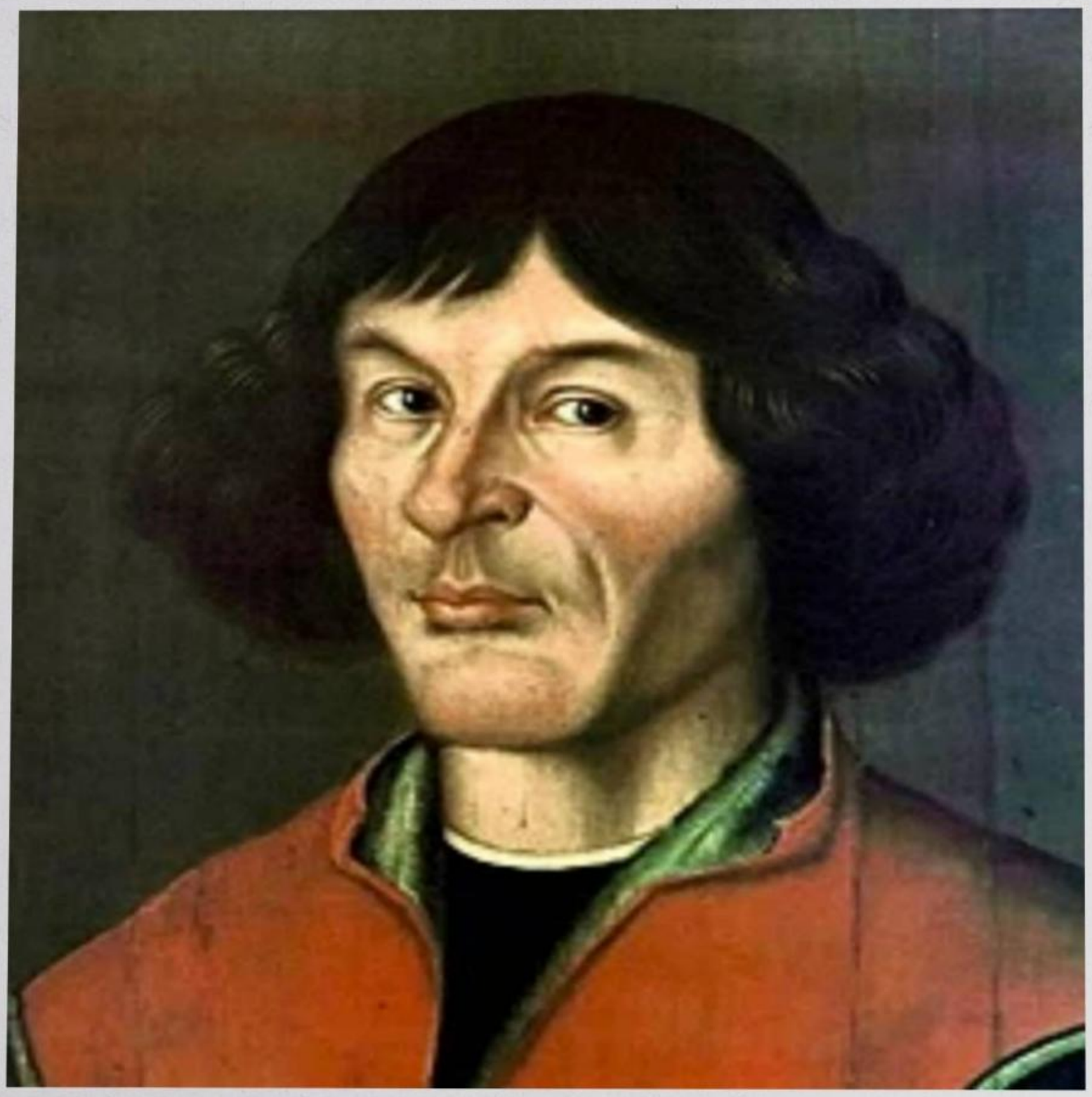
∴ বৈজ্ঞানিক বিপ্লব :—

বিজ্ঞানের ইতিহাস চর্চার শুরুতে দুটি বিষয় স্পষ্ট করে নেওয়া দরকার, প্রথমত, বিজ্ঞান বলতে কী বোঝায়? Chamber's Dictionary-তে বলা হয়েছে, Knowledge ascertained by observation and experiment critically listed, systematized and bought under general principles — অর্থাৎ যে জ্ঞান পর্যবেক্ষণ ও পরীক্ষানিরীক্ষার দ্বারা নিরূপিত বা নির্ণীত, যথাযথভাবে পরীক্ষিত, বিশ্লেষিত, সুসংগঠিত ও কয়েকটি আধারণ সূত্রে উপনীত, তাকেই বিজ্ঞান বলে. বিজ্ঞানের সংজ্ঞা দিতে গিয়ে অধ্যাপক Rodney Stark বলেছেন, "Science is a method utilized in organized efforts to formulate explanations of nature always subject to modifications and corrections through systematic observations." দ্বিতীয়ত বিপ্লব বলতে বোঝায় মৌলিক পরিবর্তন, কিন্তু পরিবর্তন মানেই অবশ্যম্ভাবী অতীতের সঙ্গে সম্পূর্ণভাবে যোগসূত্রের বিচ্ছিন্নকরণ নয় বা অতীতকে পুরোপুরি অস্বীকার করা নয়, কারণ, পৃথিবীর ইতিহাসে এমন অনেক বিপ্লব ঘটেছে, যা অতীতের উপর ভিত্তি করেই গড়ে উঠেছে নতুনের জন্ম ঘটেছে, যা অতীতের উপর ভিত্তি করেই গড়ে উঠেছে নতুনের জন্ম দিয়েছে। ষোড়শ ও অষ্টাদশ শতকের বিজ্ঞানীরা বিজ্ঞানচর্চার ক্ষেত্রে একটা বৈপ্লবিক পরিবর্তন এনেছিলেন, যেদিকে আমাদের দৃষ্টি আকর্ষণ করেছেন বার্নাল, বাটারফিল্ড, টমাস কুন, হল, কোলিন প্রভৃতি লেখক, এই অন্ধসংস্কারকে বিজ্ঞানের বিপ্লব বলে চিহ্নিত করার প্রধান কারণ নিহিত আছে প্রাচীন গ্রিক, ইসলামি বা আরবি ও খ্রিস্টান ধর্মতাত্ত্বিকেরা যেসব বৈজ্ঞানিক তত্ত্ব গড়ে তুলেছিলেন বা যে পদ্ধতিতে বিজ্ঞানচর্চা করতেন, তার অনেক কিছুই ভ্রান্ত প্রতিপন্ন করে বাতিল করার মধ্যে, ঐতিহাসিক Herbert

Butterfield বিজ্ঞান বিপ্লব সম্বন্ধে লিখতে গিয়ে বলেছেন, "It outshines everything since the rise of Christianity and reduces the renaissance and the information to the rank of mere episodes. It looms large as the real origin of the modern world." অ্যারিস্টটল - টলেমির দিন শেষ হয়ে শুরু হয়েছিল কোপারনিকাস, গ্যালিলিও, কেপলার ও নিউটনের যুগ, দ্বিতীয়ত, বিজ্ঞানচর্চা ও পদ্ধতির ক্ষেত্রে আবেকি চিন্তাধারার পরিবর্তে গৃহীত হল নতুন ও আধুনিক দৃষ্টিভঙ্গি, যা গড়ে উঠেছিল নব্য-বিজ্ঞানের অন্যতম প্রবক্তা বেকন ও দেকার্তের চিন্তাধারার ওপর নির্ভর করে, পর্যবেক্ষণ ও পরীক্ষামূলক পদ্ধতির সঙ্গে যুক্ত হল ব্যাপকভাবে গণিতের ব্যবহার, মহাকাশ গবেষণা ও পদার্থবিদ্যার ক্ষেত্রে পর্যবেক্ষণ ও আহরিত নিরীক্ষাবলী ও তত্ত্বের ভিত্তিকে ব্যাখ্যা করার জন্য প্রয়োগ করা হল গণিত ও বলবিজ্ঞানকে। এ যুগের প্রায় সব বিজ্ঞানী ও গণিতজ্ঞ যেমন গ্যালিলিও, কেপলার, দেকার্ত, বরোল্লি, হুক, হ্যালে, হাইগেনস সবাই এই পথের পথিক। এই ধারার পরিপূর্ণতা পায় নিউটনের দ্বারা, 'Principia' প্রকাশিত হওয়ার সঙ্গে সঙ্গেই তা হয়ে ওঠে নব্যবিজ্ঞানের বাইবেল, নিউটনের মহাকর্ষ তত্ত্ব বিজ্ঞানচর্চার ক্ষেত্রে এক বিপ্লবের সূচনা করল, প্রাচীন দার্শনিকদের প্রিয় স্থিতি-শীল বিশ্বের ধারণার জায়গায় নিউটন প্রতিষ্ঠা করলেন এক গতিময় বিশ্বলোক।

অষ্টাদশ শতাব্দীর বিজ্ঞানচর্চায় বস্তুর একটা গুরুত্বপূর্ণ ভূমিকা ছিল, বিজ্ঞান বিপ্লবের প্রেক্ষাপটে বিজ্ঞানী ছিলেন ধর্মজগতের মানুষ, লক্ষণীয় যে, প্রচলিত ধর্মবিরোধী কোনো অভিমত বিজ্ঞানসম্মত হলেও চার্চ কখনোই তা বরদাস্ত করত না, এর চরম শাস্তি ছিল প্রাণদন্ড, কোপারনিকাস ও গ্যালিলিওর মতো বিজ্ঞানীকে চার্চের কোপে পড়তে হয়েছিল, ব্রুনোকে দেওয়া হয়েছিল প্রাণদন্ড, চার্চ অবশ্য বিজ্ঞানচর্চার

প্রতিটি যুগে বিরোধী ছিল না, যেমন জীববিজ্ঞান ও ভূগোলের আবিষ্কার নিয়ে চার্চ কোনো উচ্চবাচ্য করেনি, কিন্তু জ্যোতির্বিদ্যার ক্ষেত্রে মতান্তরকারী আবিষ্কার চার্চের রোষের কারণ ছিল, চার্চের দৃষ্টিতে সইসব তত্ত্ব ছিল খ্রিস্টধর্ম বিরোধী, চার্চ এই বিজ্ঞানীদের কণ্ঠ রুদ্ধ করতে বদ্ধ পরিকর ছিল এবং তাতে কিছুটা সফলও হয়েছিল, কিন্তু তাতে বিজ্ঞানের জয়যাত্রা ব্যাহত হয়নি, এইভাবে ক্রমাগত চার্চের বিরুদ্ধে লড়াই করে বিজ্ঞানীরা বিজ্ঞানচর্চার ক্ষেত্রে একটি বিপ্লব এনেছিল, অন্ধবিশ্বাসের জায়গায় প্রতিষ্ঠিত ছিল যুক্তিবাদী বিজ্ঞান-মনস্কতা, আনস্কিতার এই পরিবর্তনের কারণে ষোড়শ ও সপ্তদশ শতকের বিজ্ঞানীরা চার্চের সঙ্গে যুক্ত ছিলেন না, বিজ্ঞানঐতিহাসিকের অন্যতম প্রবক্তা Edward Grant তাঁর "A Source Book of Medieval Science" গ্রন্থে বলেছেন, আধারণভাবে পাশ্চাত্যে আধুনিক বিজ্ঞানচর্চার ভিত্তি রচনা করেছিল মধ্যযুগের বিশ্ববিদ্যালয়গুলি, অনেক বিশ্ববিদ্যালয়ই ধর্মীয় অনুদানে চলত এবং চার্চ সংগঠনের দ্বারা পরিচালিত হত, ইউরোপের বিশ্ববিদ্যালয়গুলি ছিল স্বশাসিত সংস্থা এবং তারা নিজেদের নিয়মকানুন নিজেরাই তৈরি করত, অনেক সময়ই এদের বিপুল অস্থাবর থাকত, কিন্তু তার অর্থ এই নয় যে যেগুলির উপর কোনো ধর্মীয় প্রভাব ছিল না, ধর্ম মধ্যযুগের জ্ঞানচর্চার একটা বড় অংশকে অধিকার করেছিল, তবুও এগুলির পাঠ্যসূচিতে কাঁচামাল এমন ছিল, যেখানে আইনশাস্ত্র, নীতিশাস্ত্র, 'Natural Philosophy', 'Metaphysics'-এর চর্চা অসুবিধা ছিল, ধীরে ধীরে 'Astronomy'-ও একটি স্বতন্ত্র বিষয় হিসেবে প্রতিষ্ঠিত হচ্ছিল, এই ধরণের বিজ্ঞানচর্চার আলে যে বই লেখা হচ্ছিল ঐতিহাসিকেরা তাকে বলেছেন 'Corpus Astronomicus', মহাকাশ ও জ্যোতিষ সম্বন্ধীয় নানা বিচিত্র তথ্য যেভাবে সংগ্রহ করা হয়েছিল, তাই জ্ঞানভান্ডার আধুনিক বিজ্ঞানচর্চার পথ তৈরি করেছিল।



: কোপার্নিকাস :

[চিত্র : 1]

'অষ্টাদশ শতকের বিজ্ঞান আবিষ্কার প্রেক্ষাপটে হিউমের অবদান বড় অবদান হল বৈজ্ঞানিক অতিবাদ থেকে বিজ্ঞানের মুক্তি। বিখ্যাত বৈজ্ঞানিক গ্যালিলিও বেকন যখন পর্যবেক্ষণ ও পরীক্ষণের অর্থ দিয়ে প্রকৃতির অন্তর্নিহিত জ্ঞান অর্জনের কথা বলেছেন, তখন তাঁর চিন্তার অন্তরালে প্রচ্ছন্ন ছিল বৈজ্ঞানিক দর্শন থেকে বিজ্ঞানকে মুক্ত করার ইচ্ছা, প্রকৃতিকে বোঝার জন্য অ্যারিস্টটলও প্রাকৃতিক কারণের অন্বেষণ করেছিলেন আধুনিকগণ পর্যবেক্ষণের ভূমিকা থেকেই, বেকনও প্রাকৃতিক জগতের পূর্বনির্ধারিত অবস্থান থেকে বেরিয়ে এসে পর্যবেক্ষণের উপর গুরুত্ব দিয়েছিলেন, দেকার্ত, বেকনকে অনুসরণ করে সিদ্ধান্ত নিয়েছিলেন, পর্যবেক্ষণ যদি বিজ্ঞানের মূলকথা হয়, তাহলে সেখানে প্রাকৃতিক জগৎ অন্বেষণে কোনো পূর্বনির্ধারিত তত্ত্বের স্থান নেই, তাহলে প্রকৃতিতে ঈশ্বরের স্থান কোথায়, এ প্রশ্ন এসে যায়, প্রকৃতি সৃষ্টির ক্ষেত্রে কোনো ঐশ্বরিক ভূমিকা ছিল কী না, তা নিয়ে সংশয় স্বাভাবিক ছিল, এই সংশয়ের অর্থ দিয়েই ধর্ম ও বিজ্ঞানের বিযুক্তি ঘটেছিল, বিজ্ঞান আবিষ্কার সম্ভব ধর্মকাঠামোর জ্ঞান অন্বেষণে প্রশ্ন তুলেছিল।

প্রসঙ্গত উল্লেখ্য বৈজ্ঞানিক বিপ্লবের দুটি ধারায় লক্ষ্য করা যায়, এই প্রসঙ্গে সমকালীন বিভিন্ন বৈজ্ঞানিকদের অবদান আলোচনা করা হল ——

* কোপারনিকাস :—

আধুনিক জ্যোতির্বিজ্ঞানের জনক নিকোলাস কোপারনিকাস কেবল কয়েকটি মহামূল্যবান বৈজ্ঞানিক সত্যের প্রতিষ্ঠা নয়- পরম্পরাগত আরিস্টটলীয় ভ্রান্ত ধারণা বা বিশ্বাসের মূলে কুঠারাঘাত করেছিলেন, তিনি সর্বপ্রথম গাণিতিক সমীকরণের মাধ্যমে ঘোষণা করেন যে সূর্যকে কেন্দ্র করেই পৃথিবী ও অন্যান্য গ্রহগুলি নির্দিষ্ট সময় ও ক্রমপথে প্রদক্ষিণ করছে, তাঁর মৃত্যুর অব্যবহিত আগে প্রকাশিত 'On The revolution of The

: গ্যালিলিও গ্যালিলেই :

[পৃষ্ঠা : 2]

Heavenly Spheres' জ্যোতির্বিজ্ঞান জগতে এক বিপ্লবের সূচনা করেছিল, কোপারনিকাসের এই আবিষ্কার চার্চ অনুমোদিত আদর্শের বিরুদ্ধে তীব্র প্রতিবাদ জানিয়েছিল এবং তা পরবর্তীকালে পর্যবেক্ষণ ও নিরীক্ষণ নির্ভর বিজ্ঞান চর্চার অন্যতম মাধ্যম হিসেবে ব্যবহৃত হতে থাকে, যার অবধারক উৎকর্ষ উদাহরণ হল গ্যালিলিও -এর দূরবীক্ষণ যন্ত্রের মাধ্যমে কোপারনিকাসের তত্ত্বের পরীক্ষালব্ধ প্রতিষ্ঠা।

* গ্যালিলিও গ্যালিলেই :—

বিজ্ঞান বিপ্লবের অবধারক মূল্যবান জ্যোতিষ্ক ছিলেন গ্যালিলিও গ্যালিলেই, উন্নতমানের টেলিস্কোপ আবিষ্কারের জন্য অমগ্র বিশ্ব তাঁর কাছে ঋণী হয়ে থাকবে, সেই টেলিস্কোপের সাহায্যে তিনি চন্দ্রের কলঙ্ক (দাগ), বৃহস্পতির চারটি উপগ্রহ, শুক্র ও মঙ্গলের কলা, শনির বলয় ইত্যাদি পর্যবেক্ষণ করেন, যা কোপারনিকাসের সূর্যকেন্দ্রিক মতবাদ তত্ত্বের বাস্তবিক প্রয়োগ, কেবল কোপারনিকাসের তত্ত্বের পর্যবেক্ষণ নয়, পিসা বিশ্ববিদ্যালয়ের গণিত শাস্ত্রের অধ্যাপক থাকাকালীন তিনি নানান গবেষণার মাধ্যমে একবারে দোলকের সূত্র, পতনশীল বস্তুর সূত্র ইত্যাদি আবিষ্কার করেন, যা ছিল এক একটি অদ্ভুতপূর্ব আবিষ্কার।

* টাইকোব্রাহ :—

ডেনিশ জ্যোতির্বিজ্ঞানী টাইকোব্রাহ কোপারনিকাসের তত্ত্বকে সমর্থন না দিলেও নিজে একজন বিজ্ঞান আগ্রহী ছিলেন, ১৫৭৭ খ্রীস্টাব্দে তাঁর পর্যবেক্ষণের দ্বারা ধূমকেতু ও গ্রহ নক্ষত্রের গতি সম্পর্কিত তত্ত্ব এক নতুন দিশা পেয়েছিল।

* জনো :—

এই পর্বের বিজ্ঞানী তথা জ্যোতির্বিদদের অর্থ্য নিম্নোক্ত

: ফ্রোয়েনস কেপলার :

[চিত্র ; 3]

হিসাবে চিহ্নিত করা ছিলেন কোপারনিকাসের তত্ত্বের সমর্থক। রোমান আদালতে বিচারের পর অবর্ণনীয় শারীরিক ও মানসিক নিপীড়ন সত্ত্বেও তিনি তাঁর চোখ রাঙানী অস্বীকার করেননি। ফলে এই নির্ভীক বিজ্ঞানীকে জলন্ত অগ্নিকুন্ডে নিক্ষেপ করে হত্যা করা হয়।

* জোহানেস কেপলার :—

জার্মান বিজ্ঞানী জোহানেস কেপলার কেবলমাত্র কোপারনিকাসের তত্ত্বের একজন একনিষ্ঠ সমর্থক ছিলেন তা নয় তিনি এই তত্ত্বের এক নতুন ভিত্তিও প্রদান করেছিলেন। পৃথিবী তথা গ্রহগুলির কক্ষপথকে তিনি প্রথম উপবৃত্তাকার হিসেবে প্রমাণ করতে সচেষ্ট হন। কেপলারের মতে এই উপবৃত্তাকার কক্ষপথের কেন্দ্রে নয়, নাভি বা ফোকাসে সূর্য অবস্থান করছে। কেপলারের এই তত্ত্বের আধ্যমে গ্রহ নক্ষত্রের পরিক্রমণ গতি এবং এর অতিবাহিত সময়কাল নিখুঁতভাবে গণনা করা সম্ভব হয়েছিল। পরবর্তীকালে এর ওপর ভিত্তি করেই দিন-রাত্রি এবং ঋতুপরিবর্তনের রহস্য উদ্ঘাটন সম্ভব হয়েছিল। ১৬১২ সালে তাঁর গ্রন্থ 'হারমানিকাস মুন্ডি' বিজ্ঞানী আইজ্যাক নিউটনের গবেষণায় যথেষ্ট অনুপ্রেরণা সঞ্চার করেছিল।

* আইজ্যাক নিউটন :—

ইংরেজ বিজ্ঞানী আইজ্যাক নিউটন কেপলারের তত্ত্বে প্রভাবিত হয়ে তাঁর বিখ্যাত মহাকর্ষের সূত্র আবিষ্কার করেন। কেপলারের তত্ত্ব অনুধাবন করে তাঁর মনে হয়েছিল এই উপ-বৃত্তাকার কক্ষপথে প্রদক্ষিণের জন্য অবশ্যই সূর্য এবং গ্রহগুলির মধ্যে কোনো এক রূপ বা আকর্ষণ অবশ্যই রয়েছে, যার দ্বারা

আইজ্যাক নিউটন :

[চিত্র : 4]

তিনি গতির সূত্র, পরমাণু তত্ত্ব, কণাবাদ, ক্যালকুলাস ইত্যাদির সূত্র আবিষ্কার করেন, পদার্থবিদ্যায় তাঁর অসামান্য কৃতিত্বের আখ্য বহন করছে 'Principia' গ্রন্থটি, যেখানে ক্যালকুলাসের সার্থক ব্যবহার দেখিয়ে তিনি পদার্থবিদ্যার বহু গুরুত্বপূর্ণ সমস্যার সমাধান করতে পেরেছিলেন, উক্ত গ্রন্থের মাধ্যমে তিনি অভিকর্ষ বল সম্বন্ধিত যে তত্ত্ব প্রদান করেছিলেন তা আজও বিশ্বে একইভাবে সমাদৃত.

* ফ্রান্সিস বেকন :—

ইংল্যান্ডে বৈজ্ঞানিক গবেষণার পথিকৃত ফ্রান্সিস বেকন প্রকৃত অর্থে বিজ্ঞানী না হলেও তাঁর নিজস্ব গন্ডির বাইরে এসে তিনি বৈজ্ঞানিক গবেষণার উজ্জ্বল সম্ভাবনার প্রতি যে পথনির্দেশ করেছিলেন তার জন্য অবশ্যই আগামী প্রজন্মের কাছে তিনি কৃতিত্ব দাবি করতে পারেন. একক উদ্যোগ নয়, বৈজ্ঞানিক অ্যাকাডেমি বা শিক্ষায়তন প্রতিষ্ঠার চিন্তার উদ্গাতা হিসেবে তিনি চিরস্মরণীয় হয়ে থাকবেন. বৈজ্ঞানিক স্বার্থে এক অনুকূল পরিবেশ সৃষ্টির পরিকল্পনার কথা ১৬২৩ সালে প্রকাশিত তাঁর 'De Augmentis Scientiarum' গ্রন্থ থেকে জানা.

❖ বৈজ্ঞানিক বিপ্লব কতদূর 'বৈপ্লবিক' : —

এযুগের বিজ্ঞানচর্চা যে সম্পূর্ণ অভিন্ন ছিল এটা জানে করার কোনো কারণ নেই। আলোচ্য পর্বে মানুষের অনুসন্ধিৎসা এবং অমালোচনামূলক দৃষ্টিভঙ্গি সত্ত্বেও বিজ্ঞানসাধনা প্রথাগত বিশ্ববীক্ষার ক্ষেত্রে সর্বক্ষেত্রে আমূল উল্লেখযোগ্য পরিবর্তন আনতে পারেনি। এযুগে জ্যোতির্বিদরা গ্রহ-নক্ষত্রের আবর্তন লক্ষ্য করেছিলেন, কিন্তু অবজারভেটরি তার বিজ্ঞানসম্মত ব্যাখ্যা দিতে পারেননি। অবশ্য কোপারনিকাস ও গ্যালিলিও পরবর্তীকালে সৌরজগৎ ও বিশ্বব্রহ্মাণ্ডের কথা বলেছিলেন। আর একটি আশ্চর্যজনক আমাদের দৃষ্টি আকর্ষণ করে, বিজ্ঞানচর্চার সূত্রপাত হওয়া সত্ত্বেও মানুষের এক অংশের জ্যোতিষশাস্ত্রের প্রতি বিশ্বাস প্রায় অক্ষুণ্ণ ছিল। এদের চোখে জ্যোতির্বিজ্ঞান ও জ্যোতিষশাস্ত্র প্রায় সমার্থক ছিল। এক্ষেত্রে উল্লেখযোগ্য ব্যতিক্রম ছিলেন রেনেসাঁস পর্বের অন্যতম শ্রেষ্ঠ মনীষী পিকোদেল্লা মিরানদোলা। তিনি আবহাওয়া সংক্রান্ত তত্ত্ব সংগ্রহ করে জ্যোতিষশাস্ত্রের অসারতা প্রমাণ করতে সচেষ্ট হয়েছিলেন, কিন্তু এনার কয়েকজন সমসাময়িক বিশিষ্ট পন্ডিত, যিনি নো ও সনজানো বংশা, শিক্ষা ও পরিবেশের প্রভাব পুরোপুরি অস্বীকার না করেও গ্রহের তথাকথিত প্রভাবকে অগ্রাহ্য করেননি। অপ-রজায়নাবিদরাও গ্রহের প্রভাব কিছুটা মেনে নিয়েছিলেন। এযুগের বিশিষ্ট বৈজ্ঞানিকদের একাংশ গবেষণা ও বিশ্লেষণকে অন্তিম বলে মনে করতেন। বিশ্বব্রহ্মাণ্ডের গতি-প্রকৃতির পশ্চাতে তাঁরা ঈশ্বরিক মহিমা লক্ষ্য করেছিলেন। স্বয়ং নিউটন 'প্রিন্সিপিয়াতে' লিখেছিলেন, "সূর্য, গ্রহ এবং ধূমকেতু নিয়ে অসীম সুন্দর জগৎ গড়ে উঠেছে, তা

পরিচালিত হচ্ছে অভ্রান্ত যৌক্তিকতা ও আমন্ত্রণসম্পন্ন এক অন্তরের আদেশে।" রবার্ট বয়েলের বিজ্ঞান আবিষ্কার ক্ষেত্রে প্রোটেস্ট্যান্ট মতবাদের প্রভাব লক্ষ্য করা যায়। প্রধানত এইসব কারণে এই যুগের 'বৈজ্ঞানিক বিপ্লব' কতদূর 'বৈপ্লবিক' ছিল সে বিষয়ে সংশয়ের অবকাশ থেকেই যায়। অবশ্য, এইসব অস্পষ্টতা সত্ত্বেও আলোচ্য পর্বের বৈজ্ঞানিক চেতনা তথা চিন্তাধারা যে আমূলিক বিচারে 'বৈপ্লবিক' ছিল এটা অনস্বীকার্য।

গ্রন্থপঞ্জি :—

- Steven Shapin
  — Scientific Revolution
  * Published by :— The University of Chicago Press
  * First Published :— 1996

- মুখার্জী রীলা
  — রূপান্তরিত ইউরোপ (১৩০০-১৮০০)
  * প্রকাশক :— প্রগ্রেসিভ পাবলিশার্স, কলকাতা
  * প্রথম প্রকাশ :— মার্চ, 2008

- চক্রবর্তী ভাস্কর ও চক্রবর্তী সুভাষরঞ্জন এবং চট্টোপাধ্যায় বিপ্লব
  — ইউরোপে যুগান্তর
  * প্রকাশক :— নবভারতী প্রকাশনী, কলকাতা
  * প্রথম প্রকাশ :— জুলাই, 2005

- রায় প্রসেনজিৎ, দাস আয়ন্তন
  — উত্তরণের পথে ইউরোপ
  * প্রকাশক :— নিউ কল্পনা প্রকাশনী, কলকাতা

❖ চিত্রসূচি :—

* চিত্র : 1 : — https://images.app.goo.gl
* চিত্র : 2 : — https://images.app.goo.gl
* চিত্র : 3 : — https://images.app.goo.gl
* চিত্র : 4 : — https://images.app.goo.gl

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Contents
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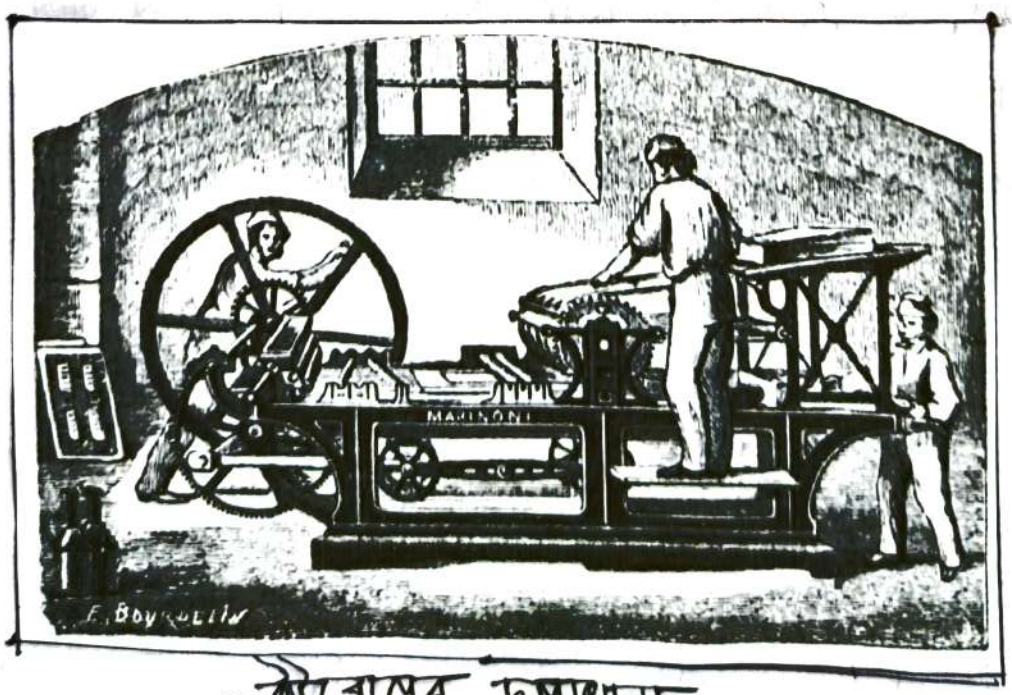
জোহানেস গুটেনবার্গ

Printing Revolution In Europe

(ইউরোপের মুদ্রণ বিপ্লব)

(i) ভূমিকা :→ মুদ্রণ অর্থাৎ প্রক্রিয়া যার মাধ্যমে একটি পৃষ্ঠায় কালি বা অন্য কোনো পদার্থ ব্যবহার করে লেখা ও ছবির প্রতিলিপি তৈরি করা হয়। মুদ্রণের অসংখ্য দিকের কাজের উদাহরণের মধ্যে অন্তর্ভুক্ত সিলিন্ডার মিল ও অন্যান্য বস্তু যেমন— ফাইবার সিলিন্ডার কাপ্য সিলিন্ডার অফসেট প্রিন্টিং। কাঠের ব্লকে মুদ্রণের সূচনা ঘটে ২২০ খ্রীষ্টাব্দে চীন দেশে। পরবর্তীকালে বর্ণকে সহজে পরিবর্তন যোগ্য করে তোলার জন্য ১০৪০ খ্রীষ্টাব্দ নাগাদ চীন দেশে মৌলিক পরিবর্তন আনা হয়। জোহানেস গুটেনবার্গ মৌলিক পরিবর্তনযোগ্য মুদ্রণ ব্যবস্থা ইউরোপে ১৫০০ শতাব্দীতে চালু করলেন। তাঁর ছাপাখানা ইউরোপের রেঁনেসাস যুগের একটি গুরুত্বপূর্ণ ভূমিকা পালন করে। গুটেনবার্গের মুদ্রণ ব্যবস্থার ফলে বৈজ্ঞানিক বিপ্লব ঘটে যায়। আধুনিক জ্ঞানভিত্তির অর্থনৈতিক উপাদানের ভিত্তি স্থাপন করে এক জনগোষ্ঠীর মধ্যে শিক্ষার প্রসার ঘটায়। আধুনিক বড় মাপের মুদ্রণ যন্ত্র যে-কোনো ধরনের প্রিন্টিং করতে সমর্থ হয়।

কাঠের টুকরোয় মুদ্রণ



ইউরোপের ছাপাখানা

(iii) ছাপাখানার ইতিহাস :->

(ক) কাঠের ব্লকের মুদ্রণ :-> কাঠের ব্লকের মুদ্রণ ব্যবস্থাটি

হল লিখিত কাজ, চিত্র বা নকশা মুদ্রণের জন্য একটি কৌশল। কাপড়ের মুদ্রণের জন্য কাগজের মুদ্রণের প্রচলন হয়েছিল ২২০ খ্রীষ্টাব্দে চীনে। বিভিন্ন মহাদেশে বিভিন্ন সময়ে এই মুদ্রণ ব্যবস্থার ইতিহাস গুলি আলাদা।—

(খ) পূর্ব এশিয়ায় :-> মুদ্রণ বিপ্লবের সূচনা ঘটে

পূর্ব এশিয়ায়। ২২০ খ্রীষ্টাব্দ নাগাদ, চীনের হান রাজবংশের সময়কালে কাঠের ব্লকের মুদ্রণ তৈরী করে ছাপানো হত। নবম শতাব্দীতে এই কাগজের ওপর মুদ্রণ ব্যবস্থার বহুল প্রচলন লক্ষ্য করা যায়। চীনে ৮৬৮ খ্রীষ্টাব্দে 'ডায়মন্ড সূত্র' নামে বইটি ছাপা হয়েছে। সেটি ব্রিটিশ লাইব্রেরীতে এখনো সংরক্ষিত আছে। চীনের হাত ধরে কোরিয়া, জাপান, ভিয়েতনাম প্রভৃতি দেশগুলিতে মুদ্রণ যন্ত্রশিল্প দ্রুত ছড়িয়ে পড়তে থাকে।

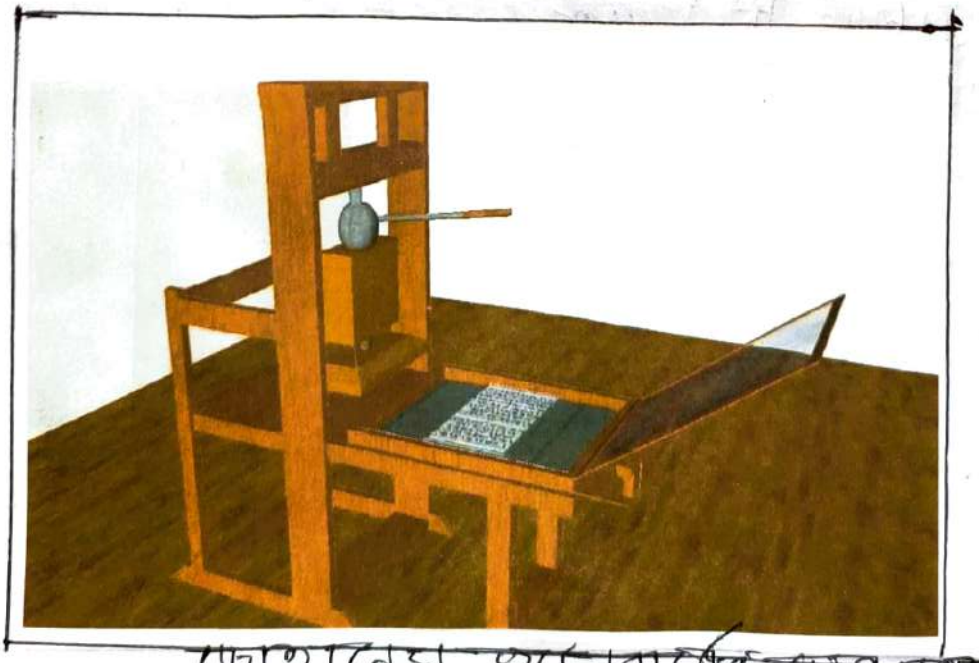
পরিবর্তনযোগ্য মুদ্রণ

(গ) মধ্যযুগ :→ কাঠের মুদ্রণকে আরবি ভাষায় বলা হয় ঐকাশ, মা আরব, মিশর প্রভৃতি দেশে নবম - দশম শতাব্দীর দিকে নামাজ বা তাবিজের ছাপানোর জন্য ইত্যাদি কাজে ব্যবহার করা হত। সম্ভবত: চীন, জিজা দিয়ে সেই ব্লক তৈরী হত।

(ঘ) ইউরোপ :→ কাঠের মুদ্রণ সম্ভবত সেভেন্থ ইউরোপে কাপড়ের ওপর মুদ্রণের জন্য। ১৩০০ সাল নাগাদ আবার কাছেই এই মুদ্রণ জনপ্রিয় হয়ে ওঠে। বর্মীয় উদ্দেশ্যে ব্যবহৃত ছবির কাপড়ে বেশ বড়ো আকৃতি অনুসারিত মুদ্রণ করা হত। তখন কাজে অপেক্ষাকৃত সহজেই পাওয়া যেতে থাকল তখন সেই মাধ্যমটি খুব দ্রুত স্থানান্তরিত হয়। কাগজে, ছোটো কাজে খোদাই করা বর্মীয় ছবিতে ও তাসে মুদ্রিত হতে থাকে। ১৯২৫ সাল থেকে এই মুদ্রণ ব্যবস্থা ব্যাপক হারে শুরু হয়ে যায়। মোটামুটি পনেরো শতকের মাঝামাঝি সময়ে লিখিত অক্ষর ও ছবির কাঠের টুকরো, বই, কাজে খোদাইকৃত বই ছাপা হতে থাকে।

(ঙ) পরিবর্তনযোগ্য মুদ্রণ :→ পরিবর্তনযোগ্য ধরণটি হল মুদ্রণের সেই পদ্ধতি যেখানে পরিবর্তনযোগ্য ধাতুর টুকরোর দ্বারা তৈরী মুদ্রণ ব্যবস্থা ও মুদ্রণ বিদ্যার ব্যবহার করা হয়। ম্যাগ্নিয়ুস - এর বাইবেল

জীভা, টিন ও অ্যান্টিমনি, তামা ইত্যাদি পদার্থের ব্যবহার মুদ্রণে

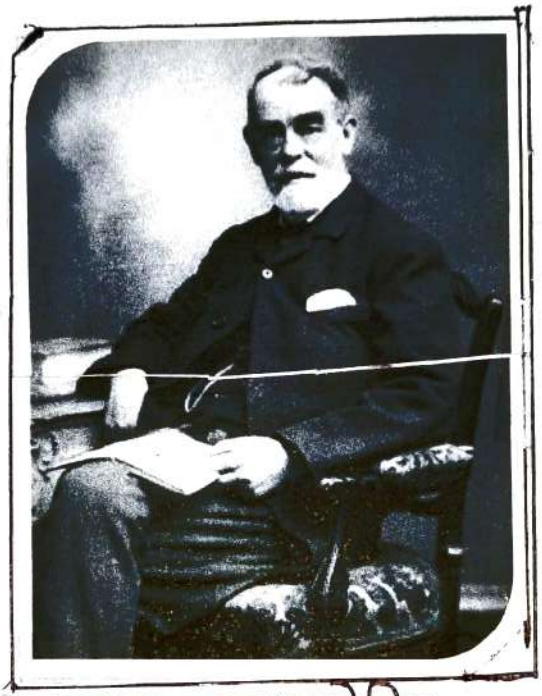


জোহানেস গুটেনবার্গের মুদ্রণ যন্ত্রপাতি

দ্বারা চালিত অক্ষর পাঞ্চ দিয়ে সেই মুদ্রণ করতে হয়। সাল ২০৪০ সাল নাগাদ অর্থপ্রসঙ্গ পরিবর্তনযোগ্য মুদ্রণ মন্ত্র বি-জ্যে নামক ব্যক্তি টীনে প্রথম মন্ত্র তৈরী করলেন। ২২৩০ সাল নাগাদ কারিগররা বাঁশের তৈরী পরিবর্তনযোগ্য মুদ্রণ তৈরী করলেন।

মুদ্রণ বিপ্লবের সবচেয়ে গুরুত্বপূর্ণ আবিষ্কারটি হল ১৪৫০ সাল নাগাদ জোহানেস গুটেনবার্গ মুদ্রণ ব্যবস্থা শুরু করেন যা আধুনিক পরিবর্তনযোগ্য মুদ্রণের অন্যতম সংযোজন। একই সাথে তিনি প্রবর্তন করলেন স্যাটিক্সে ব্যবহারের জন্য কালি তৈরি করার টাইপিস্ট। সেইসঙ্গে হস্তচালিত ছাঁচ। তিনি শুধু ছাপাখানার অতিযোজন হিসাবে ব্যবহার করেন, কালি হিসাবে তিনি তিসি তেল বেস কালি হিসাবে ব্যবহার করেন। গুটেনবার্গ ছিলেন প্রথম ব্যক্তি যিনি তাঁর টাইপিস্ট তৈরী করতে সীসা, টিন, অ্যান্টিমনি, তামা ইত্যাদি পদার্থের ব্যবহার শুরু করেন যা আজও প্রচলিত আছে।

(৮) মুদ্রণ ছাপাখানা :-> জোহানেস গুটেনবার্গ তাঁর ছাপাখানার কাজ শুরু করেন সাল ১৪৩৬ সালে কাঠের টুকরোর মুদ্রণের তুলনায় তাঁর তৈরী মুদ্রণ বেশ শক্ত, মজবুত, টেকসই। এই মুদ্রণের লেখনী শৈল্পিক মানের ওপর প্রভাব ফেলত উচ্চস্তরের এবং তুলনামূলক কম দামে গুটেনবার্গের



স্যামুয়েল হ্যানিম্যান

ছাপাখানায় প্রতিষ্ঠিত মুদ্রাঙ্কিত বাইবেল বেঁনেআজ মুদ্রণের যুগান্তকারী আবিষ্কার।

(ছ) জ্ঞানের পরিবর্তনমেয্য ছাপাখানার প্রভাব :-> সেটা অনুমান করা

সম্ভব যে, গুটেনবার্গের ছাপাখানা উদ্ভাবনের পর ইউরোপে বেঁনেআজ যুগের সূচনা হয়। ছাপাখানা বিভিন্ন দিক দিয়ে প্রভাব বিস্তার করে।

(ছ) বর্বরীয় প্রভাব :-> অ্যানুয়েল স্কাটলির মিনি নিবাসিত হয়েছিল সিটেন থেকে অবশ্য তিনি উত্তমাশী ছিলেন আনুষ্ঠানিক ও আনুষ্ঠানিক অনুষ্ঠানের সম্পর্কে, তিনি ১৬৪১ সালে লিখেছিলেন "মুদ্রণ শিল্পটি এমন ভাবে জ্ঞান ছড়িয়ে দেবে যে অবারণ মানুষ, তারা তাদের নিজস্ব অধিকার ও স্বাধীনতা সম্পর্কে জানবে, তাদের নিয়ন্ত্রিত করা যাবে না নিপীড়নের মাধ্যমে"। মুসলিম বিশ্বের মধ্যে মুদ্রণ, বিশেষ করে আরবি স্ক্রিপ্ট মুদ্রা ছিল আধুনিক সময়ে দৃঢ়ভাবে বিরোধিতাপূর্ণ, যদিও কখনও কখনও, তুর্কি বা আর্মেনিয়ান স্ক্রিপ্ট মুদ্রণের অনুমতি দেওয়া হত। তাই, প্রথম পরিবর্তনমেয্য বর্বরের মুদ্রণ উসমানীয় সাম্রাজ্য হয়েছিল হিব্রুতে ১৪৯৩ সালে। সোলোমন আবীর নামক ইস্তানবুলের হাব্রুদ্বত হিসাবে, ঘোষণা করেন

পিটার ব্রুবেক

স্যামুয়েল ক্রাচলিব

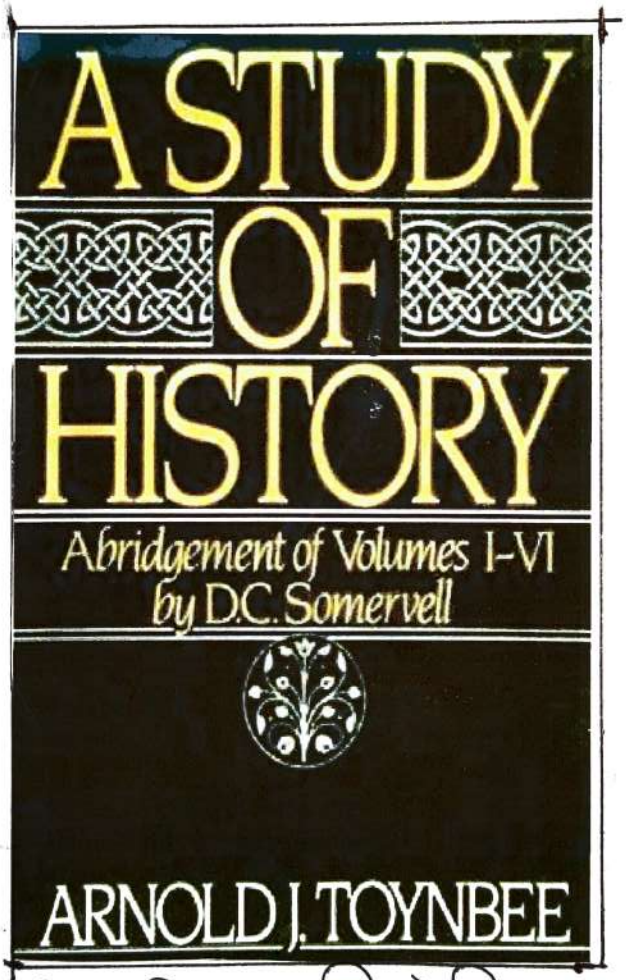
বর্ণমালা বই মুদ্রণ ছিল একটি পাপ। ১৫১৫ সালে সুলতান সেলিম প্রথম, একটি ডিক্রি জারি করেন, যার অধীনে বলা ছিল বর্ণমালা বই মুদ্রণ অনুশীলন করার শাস্তি হল মৃত্যু দন্ড। ষোড়শ শতাব্দীর শেষে সুলতান মুরাদ তৃতীয় আরবি অক্ষরে প্রথম অ-বর্ণমালা মুদ্রিত বই বিক্রয়ের অনুমতি দান করেন, যদিও তখনো সচিত্র মুদ্রক বই আমদানি করা হত ইতালি থেকে। ইব্রাহিম মুতেফেরিকা উসমানীয় সাম্রাজ্যে প্রথম আরবিতে মুদ্রণের ছাপাখানা প্রতিষ্ঠিত করেন লিপিবিশারদগণ ও উলামা দের বিরোধীতার মধ্যে। এটি চলু থাকে ১৭৪২ সাল পর্যন্ত, সর্বমোট সতেরোটি মুদ্রণ কাজ সম্পন্ন করে, যার অধিকাংশ ছিল অ-বর্ণমালা, ঔপনিবেশিক বিষয়ে। মুদ্রণ ইতালীয় ছাপানোর কাছে ২০ শতাব্দী পর্যন্ত সমান রণ কোন বিষয় ছিল না।

এটা বলা করা হত যে মুদ্রণ ব্যবস্থার আগমনের ফলে বর্ণমালা ব্যবস্থা আরো শক্তিশালী হবে এবং রাষ্ট্রশাসকদের ক্ষমতা আরো বৃদ্ধি পাবে। অধিকাংশ বইয়ের মূল বিষয়বস্তু ছিল ধর্ম অর্থাৎ, আর বিষয় বস্তু নিয়ন্ত্রণ করতে চার্চ ও রাজ্য শাসকরা এর কারণ মূল বিষয়ের মুদ্রণের ফলাফল ছিল নাটকীয়। এলিজাবেথ ইস্টেনস্টাইন এর উইনিয়াম কাক্সটনের উদাহরণ টেনে বলেন, "মে ১৫৮৪ সালে ক্যাথোলিক প্রভাবিত

ইংল্যান্ডে একটি আপত্তিজনক সাক-ক্যাথোলিক পুস্তিকা মুদ্রণ করেন। সে ঘটনার কারণে তাকে ফাঁসি দিয়ে হত্যা দেয়া হয়।"

বাইবেলের ব্যাপক হারে বিতরণ একটি বিপ্লবী প্রভাব ফেলে, কারণ এটা এমন অনুষ্ঠানিক শক্তি ও ঈশ্বরের শব্দের অনুবাদক হিসাবে পরিচিত ক্যাথলিক চার্চের ক্ষমতা অটি কমিয়ে দেয়।

(খ) সামাজিক প্রভাব :→ মুদ্রণ দিয়েছে পাঠকদের একটি বৃহত্তর পরিসীমায় জ্ঞান অর্জনের ক্ষমতা এবং পরবর্তী প্রজন্মকে সমসাময়িক পূর্ববর্তী প্রজন্মের বুদ্ধিজীবীদের অর্জিত জ্ঞান গ্রহণের সুযোগ কোন রকম পরিবর্তন ছাড়াই বা পরিবর্তন হওয়া সম্ভব মৌখিক ভাবে জ্ঞান প্রদানের ঐতিহ্যে। মুদ্রণ, এবং এর অটি অমর বিজোড়ি (এলিজাবেথ) বক্তব্য অনুযায়ী, "নিশ্চয়তা দিয়েছিল রেনেসাঁস যুগের কাজ স্থায়ী হবে কিনা, বা লেখা হবে তা সবার কাছে বোধগম্য হবে কিনা, জ্ঞান একবারে মুদ্রণের মাধ্যমে এমন ভাবে আজানো হয় যে সর্বযুগ যে অন্ধকার অনুভব করেছিল তার মাঝে আর পুনরাবৃত্তি না ঘটে, একটি চিন্তা-চেতনাও মাঝে হারিয়ে না যায়। আগা বিস্ত একং পিছে বুকে মুদ্রণ



দি স্টাডি অব হিস্ট্রি প্রন্থ

আবিষ্কারের আগে আগে গঠনের পাঁচ ধরনের পরিবর্তন হওয়া দেখতে পান :

মুদ্রণের গঠন :→

১. ক্লিকিবন্যাল গঠন :→ এটা অর্থ যে মুদ্রণের ফলে তথ্য আবারও জনগণের কাছে সহজলভ্য হয়ে ওঠে, ক্লিকিবন্যাল গঠন আবির্ভূত হয় কারণ মানুষকে তথ্যের উপর তাদের নিজের গতাগত প্রকাশের সুযোগ দেওয়া হয়।

২. বিপ্লবনেক গঠন :→ গঠনকে দেখা হত একটি বিপ্লবনেক আবেদন হিসাবে কারণ এটাকে বিবেচনা করা হত বিদ্রোহী এবং অসামাজিক হিসাবে বিশেষ করে নারীদের ক্ষেত্রে, কারণ পড়তে পারে বিপ্লবনেক আবেগ যেমন প্রেমকে জড়িত করতে এবং যদি সে নারী পড়তে পারে, তেমন সব পড়তে পারে।

৩. সৃজনশীল পড়া :→ মুদ্রণ সুযোগ করে দেয় মানুষকে চিন্তে পড়া এবং তথ্যগুলোকে নিজেদের মত সৃজনশীলভাবে ব্যাখ্যা করার, যেমনটা লেখকের চেয়ে ভিন্ন ভাবে।

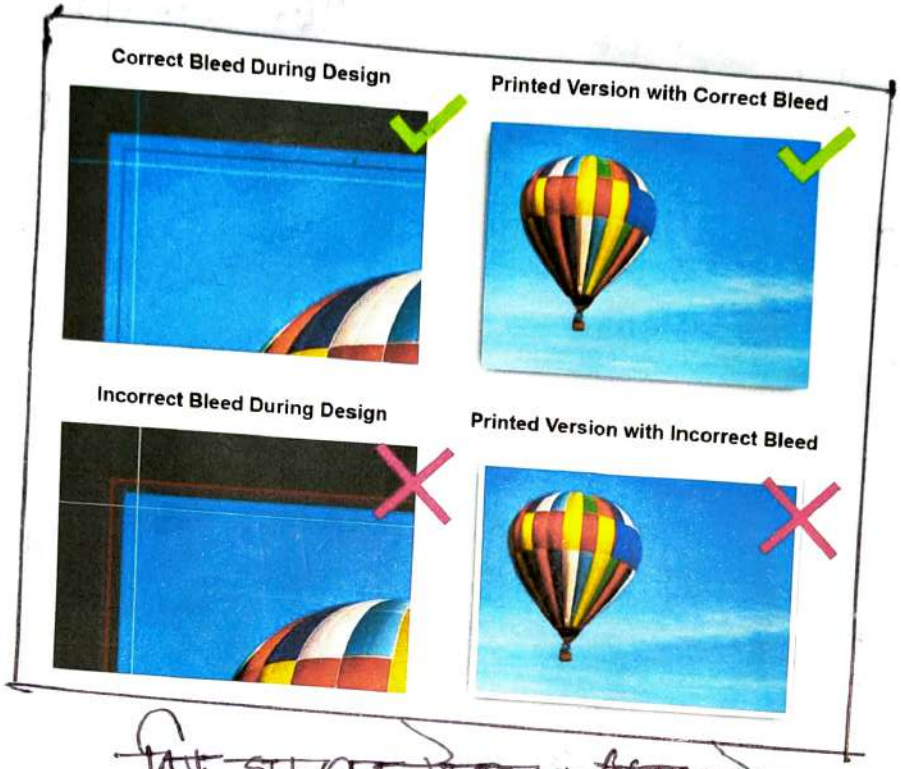
৪. ব্যাপক গঠন :→ মুদ্রণ সুযোগ করে দেয় বিস্তৃত জ্যোগ্যক প্রেন্ছে পাবার। সুতরাং পাঠের সুযোগ দিচ্ছে। ব্যাপ্ত নিবিড়ভাবে শুরু থেকে শেষ করার

কলার প্লেট্স (মুদ্রণ)

প্রেস চেক (মুদ্রণ)

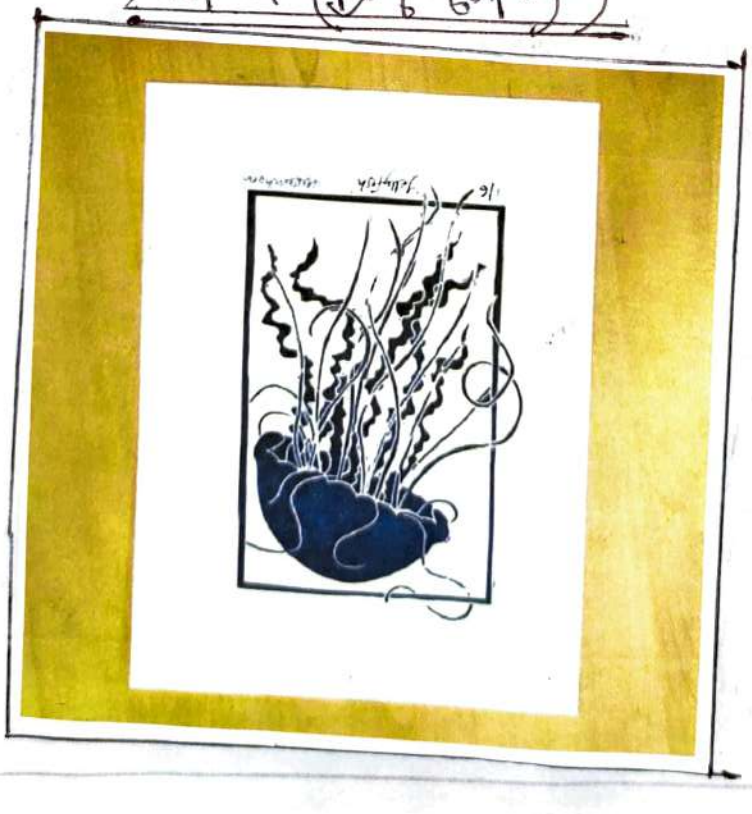
(ঙ) মুদ্রণের পরিভাষাগুলো :→ মুদ্রণ পরিভাষাগুলো নির্দিষ্ট ভাবে ব্যবহৃত হয় মুদ্রণ শিল্পে। নিম্নলিখিত তালিকাটি হল মুদ্রণ পরিভাষার:

- অমার্জ্যামেন্ট
- অনিলোক্স
- বেন – ডে – ডট
- ব্লিড (মুদ্রণ)
- ব্রোডশিট
- ব্যানিশোনিয়া ড্রেব কেস
- ক্যামেরা – রেডি
- কার্ড স্টক
- ক্যাচআপ
- সিএমইকে কালার মডেল
- সিএমওয়াইকে কালার মডেল
- কোলোফোন (পাবলিশিং)
- কালার রিডিং (মুদ্রণ)
- কম্পোজিং স্টিক
- কম্পিউটার টু প্লেট
- কম্পিউটার টু প্রিন্ট
- কন্টিনিউয়াস টোন



বিট ব্লিডের উদাহরণ (কোনোটা ঠিক)

প্রিন্টিং (প্রিন্ট মেকিং)



- বেনেডৌন (মুদ্রণ)
- ডাই (সিলাডেলি)
- ডট গেইন
- প্রতি সেন্টিমিটারে বিন্দু
- প্রতি ইঞ্চিতে বিন্দু
- ডাবল ট্রাক
- শুকনো স্থানান্তর
- ড্রপ্ডৌন
- ড্রাইফ্লেক্স মুদ্রণ
- এচিং (রিসিস্টেন্স)
- ইরোর ডিফিউশন
- ফ্লেক্স
- ফটোগ্রাফিক্স
- ফোলিও (মুদ্রণ)
- ফন্ট ফ্যামিলি অনলি
- ফ্রিকোয়েন্সি
- গ্যালি প্রুফ
- গ্যাং রান মুদ্রণ
- গ্রে কম্পোনেন্ট রিপ্লেসমেন্ট
- হাফটোন
- হস্ত চালিত ছাঁচ
- হেলবক্স
- হাইড্রোক্লোরাম

- ই স্ট্যাম্পিং
- ইংকোমিটার
- আইরিস প্রুফার
- আমবন অন
- ডে ডেফিনেশন ফরম্যাট
- কি প্লেট
- কিলাইন
- কোডাক সুমিত্র অমলেন্দুসার
- মেমোরিনি
- ন্যানোটেক্সচার প্রুফ
- নন- ফটো ব্লু
- ডিভারসিনি
- সুপার কল
- পেস্ট আপ
- সাক-লাইট (প্রুফ)
- সাবপ্রেস
- সাবপ্রেস সুমিত্র
- প্রেস চেক (প্রুফ)

তথ্যসূত্র :-> ১. Caves of the thousand Buddhas : chinese art from the silk route / British Museum Publications / ২০০০-০২-০২ / আইএসবিএন 07141114472

2. "Great Chinese Inventions । তথ্যসূত্র মেলানো আর্কাইভকৃত । ৩ ডিসেম্বর ২০২০ তারিখে". Minnesota—china.com. Retrieved July 29, 2010.

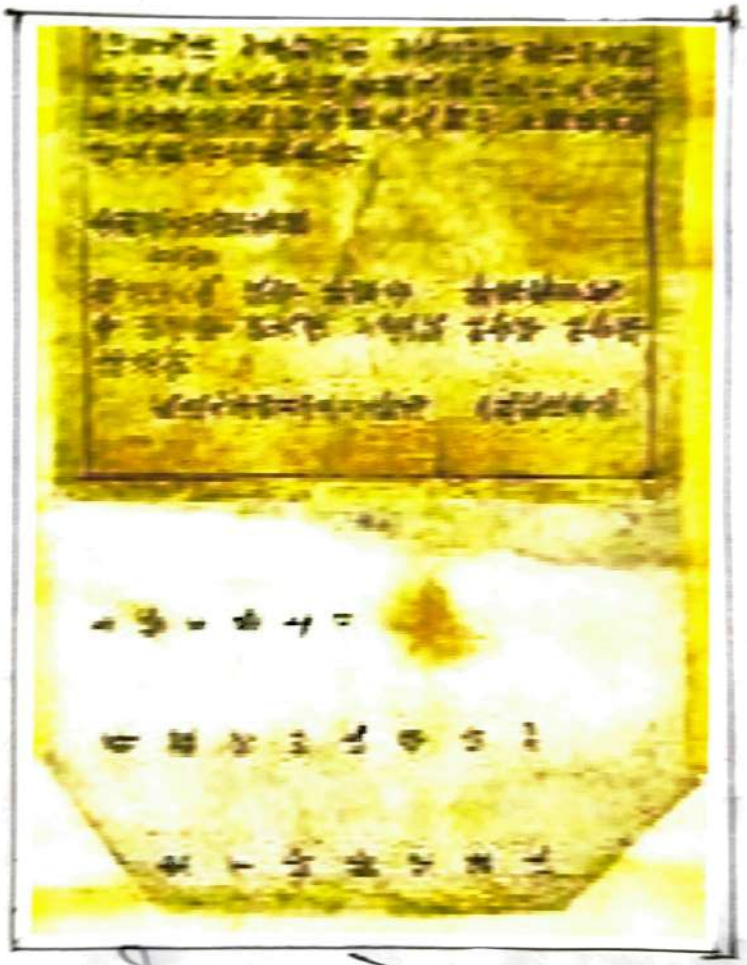
৩. Rees, Fran. Johannes Gutenberg: Inventor of the Printing Press ।

৪. "Online Gallery: Sacred Texts". । British Library. Retrieved March 10, 2012.

৫. Tsuen-Hsuin, Tsien; Needham, Joseph (1985). Paper and Printing. Science and civilisation in China. ৫ Part 1. Cambridge University Press. PP. 158, 201.

৬. Thomas Franklen Carter, The Invention of Printing In China and its ~~spread~~ Spread Westward, The Ronald Press, NY 2nd ed. 1955, PP. 176–178.

৭. Hyatt., Mayar, A. (২৯৬০-০২-০২) | Prints & People; a social history of printed pictures ।, Princeton University Press | আইএসবিএন 069/003262,



প্রাচীন বাংলার বই ছাপানো হচ্ছে

19. Richard W. Bulliet (1987), "Medieval Arabic Tarsh: A Forgotten Chapter in the History of Printing ↗". Journal of the American Oriental Society 107(3), P. 427–438.

20. Master E.S., Alan Shestack, Philadelphia Museum of Art, 1967

21. ...)., Beckwith, Christopher I. (1945–(2022-02-02)) Empires of the Silk Road a history of Central Eurasia From the Bronze Age to the present / Princeton University Press, আইএসবিএন 9780691150345,

22. Tsien 1985, P. 330

23. Briggs, Asa and Burke, Peter (2002) A Social History of the Media: From Gutenberg to the Internet, Polity, Cambridge, PP. 15–23, 61–73.

24. Palenz, Peter Von. (1991). Deutsche Sprachgeschichte Vom Spatmittelalter bis zur Gegenwart: I Einfuhrung, Grundbegriffe, Deutsch in der fruhburgerlichen Zeit (in)

২৪. Mendoza, Juan Gonzalez de (1585). Hes taria de las cosas mas notables, ritos y costumbres del gran reyno de la China ↑ (In Spanish).

২৫. Stavros, Stavrianos, Leften (২২২২-০২-০২)। A global history : From Prehistory to the 21st Century ↑ Prentice Hall, আইএসবিএন 9780139238970।

২৬. Five hundred years of Printing ↑, Penguin Books। ২২৭২-০২-০২। আইএসবিএন 0140203435।

২৭. Encyclopaedia Britannica. Retrieved November 27, 2006, from Encyclopaedia Brittanica Ultimate Reference Suite DVD – entry 'Printing'

২৮. In 1997, Time – Life Magazine Picked Gutenberg's invention to be the most important of the second millennium. In 1999, the A&E Network

Vated Johannes Gutenberg "Man of the Millennium". See also 1,000 Years, 1,000 People: Ranking The Men and Women Who Shaped The Millennium ↗ ওয়েব্যাক আর্কাইভে ↗ ২ জুন ২০০৮ তারিখে which was composed by four prominent US Vol. 69, No. 2 (2009), PP. 409–445 (417, table 2)

২৯. Ref: Briggs, Asa and Burke, Peter (2002) A Social History of the Media: from Gutenberg to the Internet, Polity, Cambridge, PP. 15–23, 61–73.

20. A., Gulergüz, Naim (2022-02-02), Bizans'tan 20. yüzyıla Türk Yahudileri ↗, Gözlem, আইএসবিএন 9789944995450,

22. Watson, William J., "Ibrahim Mute feorika and Turkish Freunaleuka", Journal of the American Oriental Society, 1968, Volume 88, issue 3, Page 436

22. "A lifetime's collection of Texts in Hebrew, cat Sotheby's ↗, Edward Rothstein, New York Times, Feb 11, 2019

২৬. Meyrowitz: "Mediating Communication: What Happens?" in "Questioning the Media", P.41.

২৪. Eisenstein in Briggs and Burke, 2002: P21

২৫. Kipphan, Helmut (2001), Handbook of Print media: technologies and production methods ↑ (Illustrated সংস্করণ), Springer.

উপসংহার :-> পরিশেষে আমরা অবশ্যই বলতে পারি যে, ইউরোপের মুদ্রণ শিল্প ভূমিকাতে অবশ্য নতুন যুগের সূচনা করে। মুদ্রণের আবিষ্কারের ফলে ইউরোপে বইয়ের চাহিদা বেড়ে যায়। বিশ্ব বিদ্যালয়গুলিতে পঠন-পাঠনের জোয়ার আসে। জ্ঞান-বিজ্ঞান, সাহিত্য ও ধর্মসংস্কার আন্দোলনে মুদ্রণ বিপ্লবের প্রভাব ছিল ব্যাপক। মুদ্রণ বিপ্লবের ফলে ইউরোপের গতি হারিয়ে আবার বিশ্বে শিল্পায়ন-দাঁড়াবার, জ্ঞান-বিজ্ঞানের অবশ্য পুনর্জন্ম হয়। ইউরোপে যে নবজাগরণ ঘটেছিল তাঁর মূলে ছিল মুদ্রণ বিপ্লব তা বলার কোনো অপেক্ষা রাখে না।

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Index

Introduction

A crisis, by definition, is ideally suited to explaining a transition. A crisis must first arise out of some kind of a steady state which is made acute in a moment of critical decision, all of which is followed by a resolution to a new steady state. What is a better term than crisis to describe changes as momentous as those that ushered in the modern world? The language of crisis had appeal to cultural, demographic, economic, intellectual, political, and social historians alike.

The early seventeenth century in Europe has often been regarded as a period during which a single general crisis afflicted the entire continent to some degree, affecting the economy, demography and the political stability of most countries. Certainly, there were problems, with revolts breaking out in France, England, the Spanish Empire and elsewhere, and many areas suffering terrible economic difficulties which were in marked contrast to the steady growth of the economy of the sixteenth century, but to classify all of these under the one heading of a general crisis may be more difficult to justify. The extent to which the problems affected the whole of Europe evenly call into question the validity of terming it a general crisis, while questions could be asked about how novel the situation of the early 1600s was:-

Whether it was a crisis at all or simply a continuation of normality?

Before dealing with the historiography on the nature of the 17th century crisis, we ought to know as to what caused or what

circumstances prevailed in Europe at that time which gradually changed into a period of ‘crisis’?

The vast expansion that began in the second half of fifteenth century slowly came to an end in many European regions between 1600 and 1620. Some parts experienced decelerated growth; some stagnated, while the economies of many other regions witnessed a steady decline. During the 16th century, the center of economic activities and bustling of trade first shifted from the Italian city states in the Mediterranean to the Iberian states of Spain and Portugal.

After 1600, many parts of Europe experienced uprisings, major conflicts and wars and breakdown of political orders. Demographic trends suggest downward movement or stagnation in different parts of Europe.

○ DEMOGRAPHIC CHANGE

The climatic change and its impact on agriculture across Europe are echoed in the population statistics. The general figures show that the sixteenth century saw a rise to a peak European population of 100 million in 1600, followed by stagnation and then decline to a low of around 80 million some 50 years later[1]. Some areas saw a far more disastrous decline than others, Spain, for example, losing around 1/3rd of its population from 1600 to 1650. Others were more fortunate, some, such as England, actually continuing to see population growth, although this was at a much reduced rate. It can therefore be said that although we cannot speak of a uniform population decline across Europe, the demographic growth of every country in Europe was

slowed or retarded in the 17th century when compared to that of the previous hundred years.[2]

○ CLIMATIC CHANGE

There is a good deal of evidence that one of the main roots of the economic problems which affected Europe in the early 1600s was some kind of climatic change. Deposits of carbon rose enormously during the seventeenth century, a phenomenon closely associated with a cooling climate, and possibly related to the reduction in the occurrences of sunspots which was recorded at the time. The 'Little Ice Age' is generally reckoned to have seen a fall in temperature across Europe of 10°C, the effect of which "restricts the growing season of plants by three or four weeks and reduces the maximum altitude for cultivation by about 500 feet[3]. In a world in which the vast majority of the population depended directly on agriculture in order to make a living, and where the growth of population which took place in the previous century had driven most of Europe to the limits of subsistence, such a change produced a

[1] Past & Present, Volume 5, Issue 1, November 1954, Pages 33–53, https://doi.org/10.1093/past/5.1.33

[2] https://publishing.cdlib.org/ucpressebooks/view?docId=ft500006j4&chunk.id=ch4&toc.depth=1&toc.id=ch4&brand=ucpress

[3] Robinson, Kristen, "Trevor-Roper, Hugh", The Encyclopedia of Historians and Historical Writing, pp. 1204–5.

disastrous relative overpopulation, allowing both starvation and disease to take a heavy toll.

- **COMBINED EFFECT OF DEMOGRAPHY AND CLIMATE**

Agriculture, influenced to a large degree by the difficulties of both demography and climate, suffered in many areas of Europe. As the agricultural labor force declined and the weather generally worsened, yield ratios began to stagnate or decline with worsening harvests, notably in Eastern Europe which had been

the major food-producing region of the continent. In spite of lower production though, food prices actually fell, reaching their peak from the inflation of the sixteenth century during the first decades of the seventeenth and remaining low for the remainder of the century. This points to a decline in demand which was faster than the fall in production, a factor partly explained by falling population levels, but also as a result of "the inability of the population to buy food grains and their inability to survive."

- **INCREASE IN CESSES**

One of the main reasons behind this inability to buy food grains was the increasing burden of tax. From the 1580s, Europe moved into an era of greater international hostility, with wars occurring more frequently and becoming increasingly costly to fight. As each country's military capacity increased, others had to follow in order to compete, and a form of arms race developed in which the size of armies rose dramatically. The Spanish army, which in 1550 had stood at 150,000 men rose to 300,000 by the 1630s, the French increased from 50,000 to 150,000, and the English from 20,000 in 1550 to 70,000 in 1650. The only way to pay for all this was through higher taxation: in Spain taxes increased fivefold under Philip II, in France the tax burden quintupled between 1609 and 1648. Since it tested the capacity of both rich and poor to contribute to the unprecedented demands of the state, government taxes became the crucial ingredient of crisis.[4]

[4] https://www.econ.cam.ac.uk/people-files/faculty/sco2/full-texts/Ogilvie-1997-Germany.pdf

The state, and in particular the military, became the major buyer in the market, but was interested in war industries rather than

those which had served domestic demand. This shift of demand seriously de-stabilized national economies, causing unemployment at a time when money was short as a result of a depressed agricultural market and high taxes, and caused a further fall in living standards. All areas suffered some problems, the most severe coming in the traditional Mediterranean centers, but the industry of England and the Netherlands hardly saw any decline at all, England's production actually increasing on the strength of the new draperies. In addition, decline in the urban centers came at the same time as an increased tendency to 'put out' work to rural industry, the increase of which went largely unrecorded.

The overall economy of Europe during the first half of the seventeenth century did see a number of problems which in many areas combined to make up a local crisis. The climatic change, which affected Europe more-or-less evenly, affected demography and to a lesser extent agriculture to varying degrees (although all areas suffered, some were harder-hit than others), also the increased burden of taxes and high rate of unemployment proved to be a catalyst in bringing about the 17th century crisis.[5]

The impact of the 17th century crisis is dealt further in detail at the end of this assignment.

[5] https://www.cambridge.org/core/journals/modern-asian-studies/article/seventeenthcentury-crisis-in-south-asia/8FCEBE5D2C41856BD70617503F498FFA

THE DEBATE

Several scholars describe the 17th century as a period of crisis. A debate has been going on among historians on the nature and the scale of the problems that Europe experienced. Though the debate is still alive, the majority of scholars believe that the 17th century was a period of crisis. Further discussions are elaborated below.

The term was coined by English Marxist historian Eric Hobsbawm in his pair of 1954 articles entitled "The Crisis of the Seventeenth Century" published in Past and Present, and cemented by his contemporary, Hugh Trevor-Roper, in a 1959 article entitled "The General Crisis of the Seventeenth Century" published in the same journal. Hobsbawm discussed an economic crisis in Europe; Trevor-Roper saw a wider crisis, "a crisis in the relations between society and the State"

Trevor-Roper argued that the middle years of the 17th century in Western Europe saw a widespread break-down in politics, economics and society caused by a complex series of demographic, religious, economic and political problems. In this “general crisis”, various events such as the English Civil War, the Fronde in France, the climax of the Thirty Years War in Holy Roman Empire and revolts against the Spanish Crown in Portugal, Naples and Catalonia were all manifestations of the same problem. The most important cause of the “general crisis”, in Trevor-Roper’s opinion, was the conflict between “Court” and “Country”; i.e. between the increasingly powerful centralizing, bureaucratic, sovereign princely states represented by the court, and the traditional, regional, land-based aristocracy and gentry representing the country. In addition, the intellectual and religious changes introduced by the Renaissance and the Protestant Reformation were important secondary causes of the "general crisis".[6]

The “general crisis” thesis generated much controversy between those, such as the Marxist historian Eric Hobsbawm, who believed in the “general crisis” thesis but saw the problems of 17th-century Europe as being more social and economic in origin than Trevor-Roper would allow, and those who simply denied there was any “general crisis”.

[6] https://www.routledge.com/The-General-Crisis-of-the-Seventeenth-Century/Parker-Smith/p/book/9780415128827

Current historians interested in the General Crisis include Geoffrey Parker, who has authored a book on the subject. It is generally accepted by historians that there was a crisis' that blanketed all of Europe during the 17th century. A myriad of revolts, uprisings and economic contractions occurred almost simultaneously and had a profound impact on the socio-economics of the entire continent. Eric Hobsbawm's, theory states that the 17th century crisis was the catalyst for the transition from feudal society to capitalism in England and ultimately the genesis of the industrial revolution. Hobsbawm argues that it was the crisis of the 17th century, particularly the Puritan Revolution, which enabled capitalism to escape the confines of feudalism and flourish as the dominant ism' in England. Hobsbawm offers the 17th century crisis as the watershed responsible for the transformation.[7]

Hugh Trevor-Roper in his book "The General Crisis of the Seventeenth Century" instead focused on confrontations that pitted the Renaissance fiscal, political, intellectual, and moral system (court) against reform-minded opponents (country). This "crisis in the relations between society and the State" eventually spawned the Enlightenment and a range of radical, stabilizing, and indecisive political initiatives.

Both articles inspired searching critiques as well as widespread approval. Early modernists have questioned the generality, severity, and duration of crisis proposed in each hypothesis. The Soviet historian A. D. Lublinskaya contended that the heterogeneity of economic structures and trends across Europe precluded the appearance of general crisis on any level. Like Roger B. Merriman, who's earlier work--Six Contemporaneous Revolutions--found that only chronology linked mid-seventeenth-century revolts. Nor did all social groups experience crisis: wage-earners, for example, saw their living standards improve. Immanuel Wallerstein maintains that economic downturn represented only a phase of contraction and consolidation within a capitalist world-system that had already substantially come into existence during the sixteenth century. Many Dutch historians minimize the extent of distress faced by the Dutch Republic during its "Golden Age," and England's economy--as opposed to political problems--have been presented as relatively mild and short-lived. Capitalism during the 17th century is generally described as a parasite operating under the constraints of a feudal apparatus. Hobsbawm

[7] https://warwick.ac.uk/fac/arts/history/ghcc/event/events/40_2_de-vriesjih2009.pdf

held that if "capitalism is to rise, feudal or agrarian society must be revolutionized". In his paper The Crisis of the Seventeenth Century, he outlined the criteria necessary for capitalism to become dominate. First, there must be enough accumulated capital to fund capitalistic expansion. Second there must be increase in the division of labor so production can increase to capitalistic levels. A large quantity of wage earners who exchange their monies for goods and service at market is also required. And lastly, the current colonial system must be revolutionized as well.[8]

HISTORICAL VIEWS OF THE 17TH CENTURY CRISIS

○ ECONOMIC CRISIS

England and Netherlands overcame the crisis and took over the economic leadership of Europe. England crossed the obstacles and became the first industrial capitalist society. In France industrial capitalism was delayed by a century and even further in Poland, Spain, and Italy. Carlo Maria Cipolla has commented on this that 17th century was a black century for Spain, Italy and Germany and at least a grey one for France, but for Holland it was the golden age, and for England if not golden at least silver. This not so colorful explanation is denied many scholars.

Neils Steensgaard believed that there was a fall in the rate of growth of the European economy. While Jan De Vries believed that a type of Malthusian crisis of population pressing upon a fixed ceiling of agricultural prices rose and most classes suffered a drastic reduction of purchasing power.

According to many scholars there was a shift in population from southern Europe towards the channel region. Population decline has been attributed to several factors such as thirty years war, epidemics like bubonic plague, small pox, typhus and influenza. This along with the absence of knowledge of medicine was the other factors. Cipolla believed that a decline in birth rate resulted partly from a change in the moral attitude, a system of conscious family planning, and by way of late marriages (therefore fewer births).

The European trade and industry was hit by depression but at different times. The demographic trends and agricultural prices and production indicate that

[8] https://www.carsoncenter.uni-muenchen.de/events_conf_seminars/event_history/2014-events/2014_lectures/parker_vortrag/index.html

there was something seriously wrong with the 17th century European economy.

POLITICAL CRISIS

The English Marxist historian Christopher Hill believed that there was an economic and political crisis all over western and central Europe in the 17th century. The crisis of the 17th century was of long duration, although the timing varied in different countries. Reactions to this crisis took very different forms in different countries and were influenced by differing national circumstances, which in turn must be analyzed in relation to social and political structures and to religious institutions and beliefs. It affected countries unequally and while some never recovered, others suffered temporary setbacks.

The non-Marxists historians and among them Hugh Redwald Trevor-Roper has seen the political upheavals of the mid-17th century as a watershed between one age and another, the renaissance and enlightenment, a crisis caused by basic defect in the pre-existing political structure which made it incapable of withstanding the strains imposed upon it. H.R.Trevor Roper interpreted neither the crisis of 17th century as merely a constitutional crisis nor a crisis of economic production, but a crisis in the expansion, and wastefulness of a parasitic state apparatus and in the size and cost of the court.[9]

The more successful societies of Holland, England and France, adjusted to the situation by increasing their economic resources, partially by the application of mercantilist ideas. In England the crisis was the result of a conflict between the Puritan minded opposition, and a parasitical bureaucracy created by the renaissance state. As the central governments grew, the parasitic and overloaded government generated increasing resentment among those left outside the favored circle. They were tolerated as long as prosperity lasted. But in the second quarter of the 17th century, a new puritanism, which was not a religious doctrine, but an ascetic distaste for court extravagances, created a deep chasm between the court and the country.[10]

Roland Mousnier and John Elliot have made amendments to this view. Mousnier stressed that sometimes office holders themselves rose against the

[9] https://reviews.history.ac.uk/review/187

[10] https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1468-0289.1967.tb00134.x

state while Eliot believed that Spain's difficulties were due to the struggle between the peripheral regions and the center rather than dislike of an overloaded court. Though Ropers "general crisis" theory can be applied to every revolt, the revolts were by no means directed against a stagnating parasitism but against a dynamic absolutism, which, its policy of taxation, violated the customary laws and threatened to disrupt the social balance or deprive apart of the population of their livelihood.

Both Elliot and Mousnier have stressed on the pressures of war. In fact, Vicens Vives and F.C.Lane regarded the modern state as primarily a war making machine. According to Vives, the 16th century renaissance state was a product of international warfare and internal disorder, its most striking manifestation being the standing army, often composed of foreign mercenaries. These historians indicated have indicated war, and taxes and its manifestations as contributory causes of the economic difficulties and social conflicts of the 17th century.[11]

But J.H.Elliot firmly believed that with regard to Spain, it was the proportion of revenue devoted to military purpose, rather than the expenses of court and government, which was of significance. The diversion of money away from economically productive fields of investment can be explained if we look at the crippling difficulties that attended the industrial development and commercial expansion in Castile.[12]

[11] https://www.tandfonline.com/doi/pdf/10.1179/007817282790176690

[12] https://www.spectator.co.uk/article/global-crisis-by-geoffrey-parker---review

ABSOLUTIST PERSPECTIVE

The establishment of absolutism in several European states is generally taken as a direct sign of economic weakness. In his Peasant Uprisings, Mousnier saw the connection between the taxation pressure and the revolts. According to him, the increased fiscal demand hit all social groups, and so is of decisive importance in the revolt of the peasants in the 17th century France. Mousnier defended the government foreign policy as being a political necessity. The soviet historian Porshnev believed that the wars were responsible for the subjection of the exploited class. Though Mousnier and Porshnevs's viewpoints are contradictory, they both believed that the government is an institution that acts rationally in the interest of either a nation or of a social class.

CAPITALISTIC PERSPECTIVE

The Marxist hypothesis is propounded by Eric Hobsbawm who has seen the problem in primarily in economic terms. The 'abnormal' clustering of revolutions between 1640 and 1660, are regarded as one of the recurrent periods of crisis in the development of modern capitalism between c.1300 and the 18th century. Thus, for Hobsawm the crisis was one of production.

The crisis of production was general in Europe, but it was only in England that the forces of capitalism, owing to their greater development and representation in the parliament, were able to triumph. Consequently while other countries made no immediate advance towards modern capitalism, in England, the old feudal structure was shattered and a new form of economic organization was established.

According to Hobsbawm, the crisis brought about a new concentration of capital and cleared the way for the industrial revolution. The implication is that the troubles of the 17th century somehow set clear what was right with the economy in the previous period, removed obstacles, and allowed a new economic situation to emerge from the earlier crisis.in short, it overcame the difficulties which ha stood in the way of capitalism. Moreover, when viewed from a Marxist perspective, this transition is presented as a decisive stage in the progression from feudalism to capitalism.

Another historian, Earl J Hamilton has emphasized the production aspect of the crisis. According to him when prices are high, and cost of production increases,

more people are encountered to invest in production. Therefore the only way the economic growth of the 16th century could have taken place and have sustained itself was by continuing to inject money into the economy of Europe.

Witold Kula, in response to Hamilton's price theory explains that production responds to rising price only under capitalism, when factors of production (land and labor) are freely available as commodities, and can be purchased with money and organized to any specification.

The first impetus behind historiographical revival came from the French journal annales, founded in 1929 by Marc Bloch. The Annales school adopted what was regarded as the 'Interdisciplinary approach' i.e. study of various disciplines-geography, history and sciences-to arrive at the conclusion that

factors like biological and climatic changes determine the size of the population and sustain it. So when there was a great increase in population, and as the availability of fresh lands ended the fragmentation of farms took place. Exhaustion of soil resulted in declining harvests. Famines and diseases destroyed human life. There was a contraction of economic life.

The second major impetus was centered around the English Journal Past and Present founded in 1952 by the Oxford and the Cambridge Scholars. Crisis in Europe 1560-1600, edited by Trevor Aston, is the first book of essays which discuss the crisis thesis. Christopher Hill has stated in it, that now a basis of agreement may have been reached on some features of the 17th century history.

The problem, according to Hill, lay within the feudal mode of production, the limitation of the feudal market, the unproductive nature of feudal relations of production, and the role of feudal state in maintain these conditions. Summing up the problem was 'the limits to the development of capitalism within the feudal framework'.

IMPACT OF THE CRISIS

The 17th century crisis brought about significant changes in Europe but its impact was far from uniform. On the one hand it created conditions for a new phase of expansion by removing tensions within the productive sectors and restoring balance between population and food supplies, and on the other hand it fastened feudal grip over a sizeable population of Europe.

DEMOGRAPHIC TERMS

When considering the impact in demographic terms, the crisis resulted in high mortality in several parts of the continent. The impact was greater in urban centers. The demographic losses caused extensive dislocation of trade and industry. Prolonged wars accompanied by natural calamities like plague epidemics and famines, caused extensive dislocation of social life. Most of the battles in the thirty years war were fought in central Europe. the population loses varied from 25% to 40%. It took another half century for Europe to recover from the demographic loses.

ECONOMIC TERMS

Military operations, economic disruptions and population loses caused a severe strain on government resources. It placed heavy strain on already burdened economy of Europe by increasing the burden of taxation on the lower classes. Except for England the crisis led to the extension of power of the rulers over their subjects to extract the maximum from all possible sources.

One of the most important developments in the post-crisis period was the shift away from the continental countries towards the sea powers of the north-west. The gap between the eastern and western regions was further widened during the 17th century. Another important consequence of the crisis was the displacement of industry to the countryside and the spread of proto-industrialization in some parts of western and central Europe. This marked the first phase of industrialization. Many of the manufacturers and the entrepreneurs moved to the countryside because of the rising labor costs in the urban centers and began to depend on cheaper rural labor. The declining prices further turned them towards mass production to reduce the unit costs by higher output, thereby increasing profits by means of large turnovers. This resulted in the manufacture of inexpensive draperies instead of more expensive cloth. The third means of increasing their profits was to expand the

volume of trade with the colonial world to compensate the reduced demand in the domestic markets.

This trend resulted in profound transformation in urban industrial organizations which now faced competition from rural industries and in 18th century the guilds began losing their economic significance.

Scholars suggest that it was the improved technology of England, the Netherlands and the northern France that enabled them to overcome the problem of low prices and make substantial economic progress. Robert Brenner and Pierre Vilar emphasize the role of a strong feudal structure in preventing the progress of capitalism.as labor in lands remained tied up in petty production, heavy feudal exaction and the exploitative role of feudal monarchies played a vital role in prolonging such conditions. This situation led to stagnation of technology and kept the market structure extremely limited.

For capitalism to develop, it was necessary for peasants to turn into landless laborers. This situation developed in England where peasant unity had given way to social differentiation consisting of different layers of peasantry but in other places, the absolute monarchs protected small peasants in order to remain in power.

SOCIAL TERMS

The long and continuous war had created a serious shortage of labor, which was needed to work on demesne lands. The demographic loses had made labor very costly. In such situations, the lords instead of hiring fresh labor to work in their private lands opted to utilize the existing serfs by placing additional responsibilities on them Thus, whereas in Western Europe the extension of the demesne was carried out through impetus towards capitalism, in Eastern Europe, because of chronic shortage of manpower, it led to strengthening and consolidation of serfdom. Hence the gap between eastern and western Europe was greatly widened after the 17th century crisis.[13]

[13] https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.haikudeck.com%2Fenglish-revolution-education-presentation-y5AdwvhiCQ&psig=AOvVaw0DrD4Fl6j4mGgqkEZ5UMYx&ust=1627271053801000&source=images&cd=vfe&ved=0CAQQtaYDahcKEwjIhcqfp_3xAhUAAAAAHQAAAAAQDQ

CONCLUSION

Numerous empirical and theoretical aspects of the seventeenth-century crisis therefore remain subject to debate. Moreover, neither Hobsbawm's Marxist teleological stage theory of economic development nor Trevor-Roper's court/country distinction, command much assent today. But the concept widely continues to stimulate new research and new explanations of existing data. As a result, the outlines of a new interpretation are beginning to appear. It emphasizes continuities--for example, the acceleration of previously initiated regional differentiation, agrarian specialization, commercialization, and ruralization of industry. And while contributing to the role it played in changing the path of history or as some scholars suggests being a ‘catalyst’ in bringing the pre-industrial era it thereby contributes to a more discriminating understanding of both the significance of the seventeenth century and the nature of crisis in the early modern world.

Bibliography

1. **Aston, Trevor, ed. (1965), Crisis in Europe 1560–1660: Essays from Past and Present.**
2. **Hill, Christopher. (1961), The Century of the Revolution. W.W. Norton & Company Inc.ISBN 0393003655**
3. **Parker, Geoffrey; Smith, Lesley M, eds. (1997) [1978]. The General Crisis of the Seventeenth Century. Psychology Press. ISBN 9780203992609.**
4. **Parker, Geoffrey (2008), "Crisis and Catastrophe: The Global Crisis of the Seventeenth Century Reconsidered", American Historical Review, 113 (4): 1053–79, doi:10.1086/ahr.113.4.1053.**
5. **Parker, Geoffrey (2013), "Global Crisis: War, Climate Change & Catastrophe in the Seventeenth Century", Yale University Press.**
6. **——— (2010), "States Make War But Wars Also Break States" (PDF), Journal of Military History, 74 (1): 11–34.**
7. **Rabb, Ted, ed. (1975), Struggle for Stability in Early Modern Europe.**
8. **Trevor-Roper, Hugh (1959), "The General Crisis of the Seventeenth Century", Past and Present, 16: 31–64, doi:10.1093/past/16.1.31**

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INTRODUCTION

The 17th century Europe was the period of revolution where historians used to describe the period as the changes that differed from place to place in different parts of Europe. It was also the period of global conflict and instability that occurred from early 17th century to the early 18th century in Europe. This term was coined by Eric Hobsbawm in his 1954, "The crisis of the 17th century" published in Past and Present. It is regarded as the most wide ranging debates in history throughout Europe in the 17th century. There were major political upheavals in different parts of Europe taking place in different time and place. There were a series of innumerable revolts and rebellions taking place in Europe during the 17th century .

The 17th century European crisis that happened in Europe in the 17th century was one of the toughest in history of Europe. After the process of expansion and growth experienced during the 15th and 16th century, Europe found itself in a big crisis that nearly lasted for century. A crisis that was characterised by various features, foremost the demographic because after the late Middle Ages the population had increased steadily until it stops abruptly in the 16th century even to reside in many places. Other reasons that were attributed for causing this crisis included hunger, revolts, wars, plagues, politics and climatic changes. Eric Hobsbawm in his article entitled "The crisis of the 17th century" that it was the economic and social forces that created this mid 17th century crisis. On the other hand, Trevor Roper emphasized that the main causes for this crisis were the religious political conflict. Although both

argument may be valid and present in this disaster, It is believed that the roots causes of the crisis were religious and political differences, which ultimately led Europe to have economic and social conflicts as well. The general crisis appears to be constituted by two contemporaneous but separate phenomenon one, a series of individual local political confrontation, some of which developed into revolution, and other a truly a general Crisis in the demographic and economic development of the world. Each had a different set of causes i.e. political and non political. Naturally to contemporary observers it served that society itself was in crisis and was general in Europe. " These days are days of shaking and these shaking is universal.

Its major issues:

I. One of the most important example of this crisis is the thirty years war. It was a war that took. place in central Europe between 1618 and 1648, in which majority of the great European powers intervened. It was originated as religious struggle between the Protestant religion and the Roman Catholics. The origin of the war goes back to the Peace of Augsburg, which stated that the religion of the ruler of the land will be the religion of the people. This is confirmed that the event that sparked the war, the revolt in Bohemia. In this revolt, the members of the predominantly Protestant Bohemian legislature threw two catholic government official pot the widow, as a sign of Protest against the religious policies of the newly elected king, the catholic Ferdinand II. However the Catholics defeated the Protestants, and this leads us to another e.g. of religion causing the 30 years war.

II. The intervention of Danish and Swedish. This happened because of the fear of these kingdoms and their sovereignty as Protestant lands was threatened by the Catholics , and also because the declarations of the King Frederick the 5th where he said that all Europe should be back to catholic. Nevertheless, at this point the Catholics are still winning the war, and this catches the awareness of Cardinal Richelieu, who was the chief minister of King Louis the 12th of France. From this point of view, this religious war becomes political, because even though he was catholic, France decides to join the war and help the Protestants. The reason for this was simple, balance of power, the French felt that Habsburg have gained too much power and they did not want just one great power to control power in Europe.

III. This war is a great example of how religious and political reasons shaped this European crisis, and how these events led to the economic and social problems that a war brings in order to fund the war with money and men. After all, this war ended with the Treaty of Westphalia, which ended up being like the Treaty of Augsburg that stated that the religion of the prince is the religion of people. The political effects of war were very traumatic as well, first it weakened the powers of the empire, and the individual territories of the Germany gained more autonomy ever than before war.

IV. Another crisis which took place was the war of three kingdoms. This is another great example to argue that Trevor Roper was correct in explaining the main cause of crisis. This war happened after England, Ireland and Scotland became united under the power of only

one ruler .This was possible since Queen Elizabeth of England had no direct heir to the throne, next in line was James Stuart, king of Scotland. So how were the problems created .. First, James was a firm believer of "the divine right monarchy" which basically means that that he was placed there by god and does not have to report to anyone else. This belief did not bring problems to other nations however the fact that England had a parliament created a political tensions in this era. The fact that this happenings bring back to our thesis and shows a religious problems becoming political, which ultimately becomes social. I argue with this because the parliament starts to have power from the times of King Henry, when he needed approval to separate the catholic church. Years after this backfires to King James because it gives more authority to the wealthy parliament. Subsequently creating a lot of tensions and confusions among the people of three kingdoms whose laws and taxes kept changing as the power of monarchy and the parliament would fluctuate.

V. Trevor and Hobsbawm use the Fronde in France as another general crisis. It begun because of general discontent of the people. His beginnings were based on the economic crisis and increasing the tax burden generated to address the cost of participation of France in the Thirty Years War. Its most direct cause can be found in the means used by the monarchy to raise taxes. With the arrival of regent the people expected the monarchy to cut the rates but not so. Cardinal Mazarin thought that France could support the war and did not let up the pressure. The parliament of Paris tried to limit the power of King Louis the 14th and also the nobility felt threatened by the king and wanted voice in the goverment.

CONCLUSION

Therefore the 17th century European crisis was characterised by a series of wars, revolts, decline of population and political and social changes that in many cases could have been avoided if right precautions would have been taken. However, the fact Europe was undergoing a time political absolutism and the close relations between church and government made it impossible to avoid the conflicts. During this period there was a significant decline in population particularly in Europe and China. The cause for this demographic decline is complicated and significantly unproven, but the war climate change and migration are the main factors that contributed to the population crisis. The numerous wars that happened aided by plagues and diseases, caused the first decline in the population after the middle ages, therefore creating social and economic problems in the region. This is the reason why I believe that Trevor Roper was right by saying that the root cause of the crisis was political and religious which led to economic and social problem, aggravating even more the situation.

BIBLIOGRAPHY

•**Aston, Trevor, ed (1965), Crisis in Europe (1560 – 1660): Past and Present.**

•https://www.ukessays.com The General Crisis accessed on 16th,July,2021.

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CC8 TUTORIAL PROJECT

Printing Revolution

Printing Revolution

Introduction:-

Printing press, machine by which text and images are transferred to paper or other media by means of ink. Although movable type, as well as paper, first appeared in China, it was in Europe that printing first became mechanized. The earliest mention of a printing press is in a lawsuit in Strasbourg in 1439 revealing construction of a press for Johannes Gutenberg and his associates. Gutenberg and the Printing Revolution in Europe Johann Gutenberg's invention of movable-type printing quickened the spread of knowledge, discoveries, and literacy in Renaissance Europe. The printing revolution also contributed mightily to the Protestant Reformation that split apart the Catholic Church. During the Middle Ages in Europe, most people lived in small, isolated villages. If people travelled at all, they typically ventured only a few miles from where they were born. For most people, the only source of both religious and worldly information was the village Catholic priest in the pulpit. News passed from one person to another, often in the form of rumour. Written documents were rare and often doubted by the common people as forgeries. What counted in important matters was oral testimony based on oaths taken in the name of God to tell the truth. Almost no one could read or write the language they spoke. Those few who were literate usually went on to master Latin, the universal language of scholarship, the law, and the Roman Catholic Church. Books, all hand-copied, were rare, expensive, and almost always in Latin. They were so valuable that universities chained them to reading tables. Most people passed their lifetime without ever gazing at a book, a calendar, a map, or written work of any sort. Memory and memorization ruled daily life and learning. Poets, actors, and storytellers relied on rhyming lines to remember vast amounts of material. Craftsmen memorized the secrets of their trades to pass on orally to apprentices. Merchants kept their accounts in their heads. Even scholars literate in Latin used memory devices to remember what they had learned. One device involved visualizing a building with various rooms and architectural features, each representing a different store of knowledge. A university scholar imagined walking through this virtual building along a certain pathway to recall the contents of entire books for his lectures. Scribes, often monks living in monasteries, each laboured for up to a year to copy a single book, usually in Latin. The scribes copied books on processed calfskin called vellum and later on paper. Specialists or the scribes themselves "illuminated" (painted) large capital letters and the margins of many books with colourful designs and even miniature scenes. These books were beautiful works of art. But they took a long time to make and were very costly

Printing Before Gutenberg:-

Johannes Gutenberg is often hailed as the father of printing. However, it's much more accurate to say that he is the father of *modern* printing, considering that he didn't invent the process. In fact, printing was invented a thousand years prior, in China. The use of woodcut printing started in China during the Han Dynasty. The technique uses a block of wood, hence the name, which is carved to form a relief pattern. The parts of the print that are "white" are cut away using a knife, chisel, or sandpaper until only the "black" (where ink is intended) of the print remains. Ink is then applied on the pattern, and pressed on paper or cloth. One of the earliest printed fragments from China used silk, and it is also the earliest coloured print. Movable type was also *not* invented by Johannes Gutenberg. It was again, a technique invented in China, that used porcelain china material during the Song Dynasty. The Chinese movable type used ceramic for its letters that can be rearranged for each new page. However, the Chinese, and the subsequent Korean movable type, experienced several difficulties. The material used for movable type is expensive. The

process itself is labour-intensive, considering that the ancient Chinese alphabet has thousands of characters.

The Invention of the Printing Press:-

During the 1430s, English text had to be written by hand, which was prone to many mistakes. The growing literacy, especially in the middle class, prompted the people to clamour for books, which are reserved only to the elite. Stumped by debt from a previous financial mishap, Johannes Gutenberg worked on developing the printing press. He recognized the demand for books and how lucrative it would be for him to mass produce a cheap product. Drawing inspiration from the movable types of East Asia and the screw type press of farmers in Europe, Gutenberg invented his famous printing press. Gutenberg's major contribution was the letter moulds. Using his knowledge of goldsmithing and metallurgy from his early years, he used metal alloy to create durable types. He also modified an existing oil-based ink for use in his press. The new system of printing developed was still tedious. However, it was simple and the most efficient system during that time. Arranging the letters in a type tray took a full day for a single page of text, but the durability of the letters and the tray itself provided for a more cost-saving approach to mass production. One of the hallmarks of Gutenberg's printing press was the printing of the Vulgate version of the Christian Bible in 1455. By this time, the Catholic Church had been the most lucrative partner of Gutenberg, with the printing of thousands of indulgences for its members. Unfortunately, when the first finished copies of the Gutenberg Bible were sold, Gutenberg no longer had the rights to it, as well as his operation. He was sued by his financier and partner, Johann Fust. Gutenberg went back to his hometown in Germany and carried out his printing activities there. He died poor in 1468.

Printing As Revolution and its impact :-

Gutenberg's method was largely unchanged for 300 years. News and books travelled faster across Europe. The cheap, mass produced books of the lower class toppled the elegant, handwritten books of the elite. This had several implications, especially in science, religion, and society. AS the cost of books dropped, the literacy of the commoners sharply rose. They even held yearly book fairs in some of the major cities in Europe. This facilitated research and scientific publishing, which birthed the Renaissance movement. Before the printing press, only the Catholic Church held the authority for the interpretation of the Scriptures. This was reverted with Martin Luther and his Protestant Reformation. His *95 Theses* used broadsheets to spread his protest against indulgences, the same broadsheet that developed into the newspaper. The invention of printing also changed the labour structure of Europe, with printers rising as new artisans. Proofreading and lay outing also became a new occupation, as well as the rise of the book industry and libraries.

Printing revolution ushered in the era of modern Europe by making both ancient and medieval texts available to a broader audience which produced a fertile ground for new ideas and new theories. Shift from predominantly oral culture to print culture also affected the nature of human consciousness in that print represented an abstraction of thought which gave precedence to linearity, sequentially and homogeneity. This mode of thinking is very much evident not only in

rationalist philosophy, realistic fiction, but also in the rise of scientific materialism in the following centuries. Printing also led to the standardization of various European languages as works began to be published in these languages. Eventually this standardization of vernacular languages contributed toward promoting literatures which were used to create national mythologies. Whereas maps were in circulation since ancient times, cartography as a science is the child of print revolution. And cartography was not only important in demarcating national boundaries, but also mapping the territories that were colonized in the new world.

The modes of communication transform modes of production as well as modes of consumption. In the preprint era, when only a small percentage of the population had access to written sources of information or knowledge, both public and private affairs were primarily conducted through oral communication. The primacy of physical presence in communication promoted community formations that were very much dependent on geographical togetherness and within that constraint further determined by communities based on parochial and family bonds. Printing revolution changed all that--for the first time, it was possible for political, economic, and culture producers to reach people who were dispersed geographically. As a result new types of communities were formed that were based on personal or professional interests, or political affiliations. Printing was seen initially as a more efficient way of mass copying of manuscripts rather than as a totally new medium which would transform the way people read, wrote, as well as handled texts.

Printing brought about a revolutionary change in the ways in which knowledge was preserved, used and passed on to the succeeding generations. Unlike the print era, copying in the scribal era was a laborious process and it was almost impossible to get exactly similar copies of the original manuscripts. Thus, a number of variant manuscripts would be in circulation. Due to limited number of copies, each manuscript was unique and had to be guarded in public places, usually chained to bookshelves, or stowed away in vaults and other safe places, so it was not lost or destroyed. The distinction that we make now between the original and the copy came into existence with the rise of the print culture. Printing made it possible for the mass production of identical copies which could be distributed widely amongst people separated geographically as well as historically. As printing made ancient as well as medieval texts available, it also allowed opportunities to future scholars, literary men, or scientists to be able to study, compare, and synthesize this knowledge and come up with their own theories. Describing "typographical fixity “as necessary for "rapid advancement of learning," Eisenstein notes that what chiefly distinguished the print era from the preprint was the accumulation of knowledge made possible through the preservative powers of print. In the preprint era due to the scarcity of manuscripts it was not possible for the general public to have recourse to the accumulated knowledge of the past. Thus, even before the close of the sixteenth century, the areas of charting the planets, mapping the earth, synchronizing chronologies, codifying laws or compiling bibliographies underwent a major change in that the old knowledge was retrieved and given typographical fixity which made it available for broader study and perusal, soon to be replaced by new schemes and charts which were continually corrected and refined by the following generations. The error free compilation and distribution of technical literature, for example, astronomical or geographical data, maps, charts and so on, freed the technical personnel to engage in observation and data collection.

Conclusion :-

Over all, the printing press is a revolutionizing invention. First, the printing press was invented during a crucial time period. In this time period, there was a lot of chaos and distress, one of the most revolutionary inventions in the history of the world. From the time of the Gutenberg bible in the fifteenth century to the mass-produced books of the twenty-first century, the printing press has permitted ideas and knowledge to spread, transforming every aspect of everyday life. At the same time, printing has helped to shape alterations in social relations made possible by industrial development and economic transformations. By means of books, pamphlets, and the press, information of all kinds has reached all levels of society. The printing press had a huge a effect on spreading ideas, thoughts , news, education, and being informed. By printing books and newspapers, we have learned how to communicate and spread ideas through out the world. The printing press is one of basis invention for the creations and inspiration of many other newer inventions which also revolutionized the world. Although the printing press was a magnificent invention, some people had different views. People believed maintenance would be too difficult, that writing in Chinese would be impossible due to the intricate Chinese writing system, and that the churches and religious groups wouldn't be able to censor what was being printed. Without the printing press, we don't know how we could have possibly spread our thought and evolve over time mentally, socially, economically, politically, and religiously without the printing press.

References:-

Websites:-

- https://www.worldhistory.org/article/1632/the-printing-revolution-in-renaissance-europe/
- https://www.history.com/news/printing-press-renaissance
- https://www.psprint.com/resources/printing-press/
- https://www.britannica.com/technology/printing-press
- https://www.open.edu/openlearn/history-the-arts/history/history-science-technology-and-medicine/history-technology/printing-revolution
- https://www.bbrgraphics.com/news/the-benefits-of-the-printing-press/

PDF:-

- https://euromentor.ucdc.ro/euromentor/theprintingrevolutionandthebeginningofniadicorinacernica_5.pdf

Image:-

- https://www.google.com/amp/s/publishistory.wordpress.com/2013/08/05/johannes-gutenberg-and-the-printing-press/amp/

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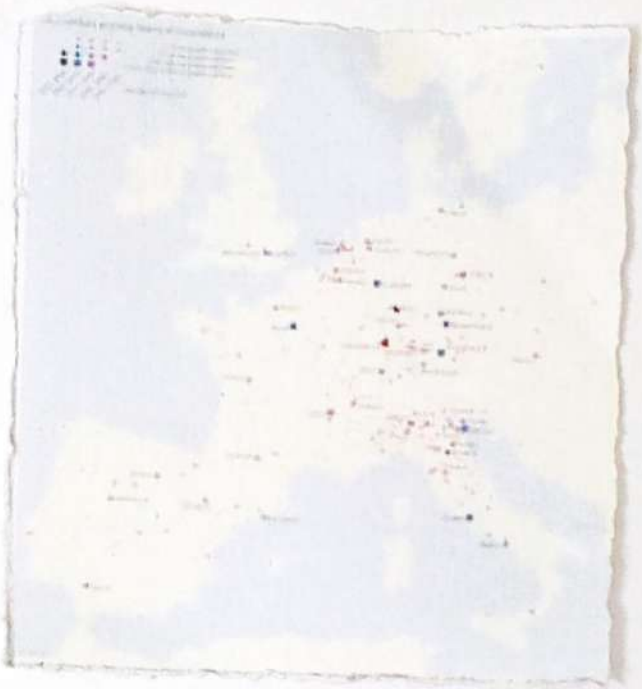
INDEX:

PRINTING PRESS

INTRODUCTION:

The printing press was invented in the Holy Roman Empire by the German Johannes Gutenberg around 1440, based on existing screw presses. Gutenberg, a goldsmith by profession, developed a complete printing system that perfected the printing process through all of its stages by adapting existing technologies to printing purposes, as well as making groundbreaking inventions of his own.

The printing press spread within several decades to over 200 cities in a dozen European countries. By 1500, printing presses in operation throughout Western Europe had already produced more than 20 million volumes. In the 16th century, with presses spreading further afield, their output rose tenfold to an estimated 150 to 200 million copies. The operation of a press became so synonymous with the enterprise of printing that it lent its name to an



Spread of printing in the 15th century from Mainz, Germany.

entire new branch of media, the press.

THE INVENTION OF PRINTING:

Printing with movable metal type was perfected in Mainz about 1450. Three names recur in the sources, those of Johann Gutenberg (c. 1395 - 1468), Johann Fust, and Peter Schoffer, Fust's son-in-law. These sources are scanty, often unclear, and sometimes of doubtful authenticity. So, it is impossible to determine accurately the contribution of a particular individual to the development of typography and its commercial exploitation. Our relative ignorance about the origins of printing does have advantages, however. It discourages the misguided effort to attribute complex technological innovation to a single man, and forces us to realize that an invention is in any case not the creation of an individual, as is a poem or a painting, but a social product. Like the development of the steam engine or the telegraph, the "invention" of a mechanical process for duplicating

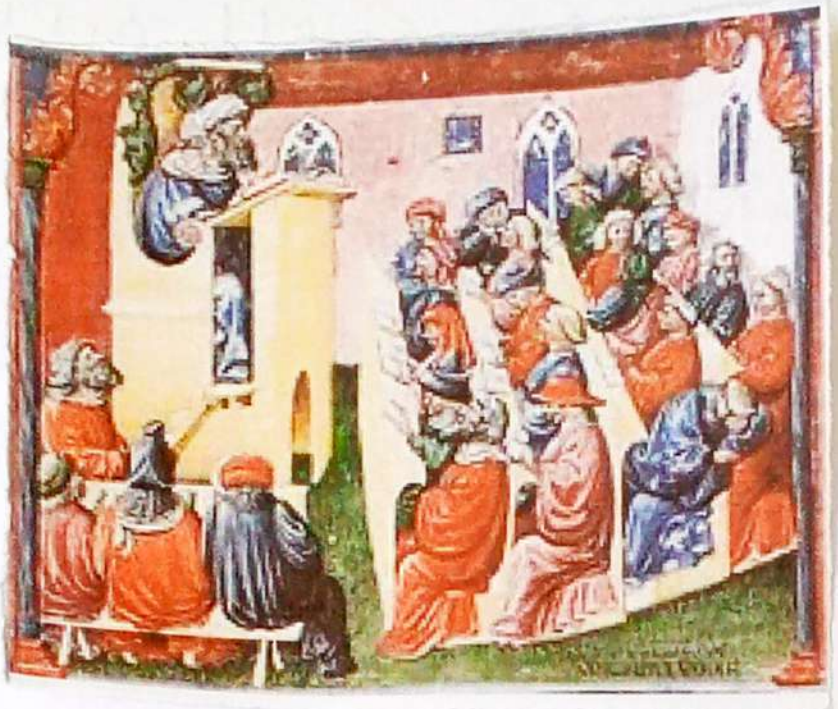
texts was multiple and ~~exhaustive~~ cumulative. It was successfully completed by Mainz printers in the 1450s, but it had important earlier beginnings.

Two chinese inventions, block printing and paper, are linked with the beginnings of typographic printing in western Europe. Xylography, or block printing, originated in china in the early eighth century. The printer drew in reverse on a block of wood the text or the picture he wished to reproduce, carved the wood so that the graphic pattern stood out in relief, inked the block, and transferred the design to paper. The process is simple in conception; difficult, time-consuming, and wasteful in execution, and ill adapted to the alphabetic writing of the west. Its transmission to the west — probably during the century from 1250 to 1350, when European contact with China was unusually close — had little direct importance for the development of

Recreated Gutenberg press
at the International Printing
Museum, Carson, California.

typography. Its in direct importance, on the other hand, was great. It probably suggested the next crucial step: cutting up an old block into its constituent letters and then rearranging these letters to spell out a new text. It certainly diffused the idea of printing and of the printed book, while the lively commercial success starting, religious prints, and crude block books emphasized the magnitude of the market and the potential profit to be got from it.

Paper was indispensable, but for economic rather than technical reasons. Manuscript books were usually copied on parchment (made from split sheep-skin) or on vellum (calf skin), and these materials were used also by typographic printers when the aim was magnificence rather than utility. But since a single large book like the Bible required as many as 170 calf skins or 300 sheep skins, the absence of paper soon would have nullified the promise of mechanical



Medieval university class

duplication.

: PRINTING REVOLUTION :

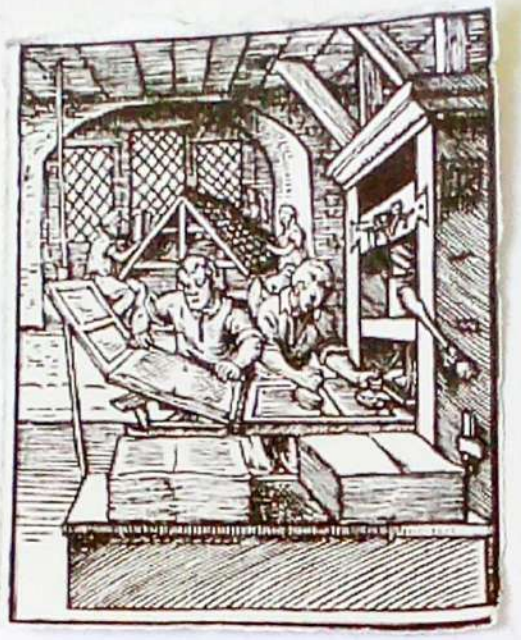
The printing revolution occurred when the spread of the printing press facilitated the wide circulation of information and ideas, acting as an "agent of change" through the societies that it reached. The invention of mechanical movable type printing led to a huge increase of printing activities across Europe within only a few decades. From a single print shop in Mainz, Germany, printing had spread to no less than around 270 cities in central, western and Eastern Europe by the End of the 15th century. As early as 1480, there were printers active in 110 different places in Germany, Italy, France, Spain, the Netherlands, Belgium, Switzerland, England, Bohemia and Polan. From that time on, it is assumed that "the printed

Early modern wine press.

book was in universal use in Europe."

In Italy, a center of early printing, print shops had been established in 77 cities and towns by 1500. At the end of the following century, 151 locations in Italy had been seen at one time printing activities, with a total of nearly three thousands printers known to be active. Despite this proliferation, printing centres soon emerged; thus, one third of the Italian printers published in Venice.

By 1500, the printing presses in operation throughout western Europe had already produced more than twenty million copies. In the following century, their output rose tenfold to an estimated 150 to 200 million copies. European printing presses of around 1600 were capable of producing between 1,500 and 3,600 impressions per workday. By comparison, Far Eastern printing, where the back of the paper was manually rubbed



The woodcut from 1568 shows the left printer removing a page from the press while the one at right inks the text-blocks.

to the page, did not exceed an output of forty pages per day. In the Early days of Reformation, the revolutionary potential of bulk printing took princes and ~~popes~~ papacy alike by surprise. In the period from 1518 to 1524, the publication of books in Germany alone skyrocketed sevenfold; between 1518 and 1520, Luther's tracts were distributed in 300,000 printed copies.

The rapidity of typographical text production, as well as the sharp fall in unit costs, led to the issuing of the first newspapers which opened up-to-date information to the public. Incunable are surviving pre-16th century print works which are collected by many of the libraries in Europe and North America.

In Renaissance Europe, the arrival of mechanical movable type printing introduced the era of mass communication, which permanently altered the structure of society. The relatively unrestricted circulation of information and (revolutionary) ideas transcended borders, captured the masses in the Reformation, and threatened the power of political and religious authorities; the sharp increase in literacy broke the monopoly of the literate elite on education and learning and bolstered the emerging middle class. Across Europe, the increasing cultural self-awareness of its peoples led to the rise of proto-nationalism, accelerated by the flowering of the European vernacular languages to the detriment of Latin's status as lingua franca.

The vast printing capacities meant that individual authors could now become true best sellers; at least 750,000 copies of Erasmus's were sold during his lifetime alone.

EFFECT ON SCHOLARSHIP AND LITERACY

The printing press was also a factor in the establishment of a community of scientists who could easily communicate their discoveries through widely disseminated scholarly journals, helping to bring on the scientific revolution. Because of the printing press, authorship became more meaningful and profitable. It was suddenly important who had said or written what, and what the precise formulation and time of composition was. This allowed the exact citing of references producing the rule, "one author, one work (title), one piece of information". Before, the author was less important, since a copy of Aristotle made in paris would not be exactly identical to one made in Bologna. For many works prior to the printing press, the name of the author has been entirely lost.

Because the printing process ensured that the same information fell on the same pages, page numbering, tables of contents, and indices became common, though they previously had not been unknown. The process of reading also changed, gradually moving over several centuries from oral readings to silent, private reading. The wider availability of printed materials also led to a drastic rise in the adult literacy rate throughout Europe.

The printing press was an important step towards democratization of knowledge. within 50 or 60 years of the invention of the printing press, the entire classical canon had been reprinted and widely promulgated throughout Europe. More people had access to knowledge both new and old, more people could discuss these works. Book production became more commercialised, and the first copyright laws were passed. On the other hand, the printing press was criticized for allowing the dissemination of information which may have been incorrect.

A third consequence of popularization of printing was on the economy. The Printing press was associated with higher levels of city growth. The publication of trade related manuals and books teaching techniques like double-entry bookkeeping increased the reliability of trade and led to the decline of merchant guilds and the rise of individual traders.

:CONCLUSION:

Over all, the printing press is a revalutinizing invention. First, the printing press was invented during a critical time period. In this time period, there was a lot of chaos and distress, because of the black death. The printing press had a huge effect on spreading ideas, thoughts, news, education, and being informed. By printing books and newspapers, we have learned how to communicate and inventions which also revolutionized the world. The printing press is one of basic invention for the creations and inspiration of many other newer inventions which also revolutionized the world. Although the printing press was a magnificent invention, some people had different views. People believed maintenance would be too difficult that writing in chinese would be impossible due to the intricate chinese writing system and that the churches and religious groups wouldn't be able to censor what was being printed.

BIBLIOGRAPHY:

BOOKS:

(i) Rice, Eugene F., and Anthony Grafton, The Foundations of Early Modern Europe 1460 - 1559. ww. Norton & Co. 1994.

(ii) Rundle, David, The Hutchinson Encyclopedia of the Renaissance Hodder Arnold, 2000.

Websites:

(i) https://www.britannica.com

(ii) https://m.jagranjosh.com.