

Chapter Four: The Rise of Europe

4.1 Introduction

Until around year 1000, the European culture lagged far behind that of the Arabian Empire in Middle East and that of the Eastern Roman Empire in Constantinople, not to mention the Chinese culture in the Tang (618-907) and Sung (960-1279) dynasties, which Europe only vaguely knew in myth. And that was indeed the case. During the almost six hundred years long Dark Age, Western Europe had not been able to produce a single noteworthy musician, painter, poet, architects, scientist, or philosopher. All that it had left us was a long list of Saints and hundreds of hagiographies.

4.2 The Spiritual Awakening¹

¹ The following secondary source materials have been consulted for this section: Alfred Andrea, *The Medieval Record*; Lester K. Little, *Religious Poverty and the Profit Economy in Medieval Europe* (New York: Cornell University Press, 1978); Richard William Southern, *Scholastic Humanism and the Unification of Europe* (Oxford University Press; Massachusetts: Blackwell, 1995); Constance Brittain Bouchard, *Strong of Body, Brave and Noble: Chivalry and Society in Medieval France* (New York: Cornell University Press, 1998); Richard William Southern, *Medieval Humanism and Other studies* (Oxford: Blackwell, 1970); Marie-Dominique Chenu, *Nature, Man, and Society in the Twelfth Century* (University of Chicago Press, 1968); Roland Herbert Bainton, *Medieval Church* (Princeton: Van Nostrand, 1962); John Hine Mundy, *Europe in the High Middle Ages* (New York: Longmans, 2000); David Knowles, *The Evolution of Medieval Thought* (London: Longmans, 1962); Robert N. Swanson, *The Twelfth-Century Renaissance* (Manchester; New York: Manchester University Press, 1999); Chris Humphrey and W. M. Ormrod, eds., *Time in the Medieval World* (New York: York Medieval Press, 2001); Edward Peters, "Mutations, Adjustments, Terrors, Historians, and the Year 1000," in *The Year 1000: Religious and Social Response to the Turning of the First*

However, Europe soon underwent a transformation that would wash out most of her Dark Age characteristics. An exciting new culture emerged at around year 1000, which the historians usually referred as the "High Middle Ages" culture. This term is highly similar to the other name of the Dark Age, namely the Early Middle Ages, and it readily gives rise to the impression that the High Middle Ages was merely an extension of the Early Middle Ages. While this will not create any trouble if the High Middle Ages was indeed a continuation of the Early Middle Ages, the truth is that these two phases of the so-called "Middle Ages" were so fundamentally different from each other that it is totally misleading to group them under the same label "Middle Ages"

The term "Middle Ages" was originally coined by Melchior Goldast (1578?-1635) in 1604. This German legal historian used the term *medium aevum* (the age in the middle) to refer to the thousand years between the end of Antiquity somewhere in the fifth or sixth century and the beginning of the Italian Renaissance somewhere in the fourteenth or fifteenth century. This is a very important concept to bear in mind. "Middle Ages" was not originally defined by some unique characteristics that it possessed, but instead merely by how it served as an interlude between Antiquity and the Italian Renaissance. In other words, this early historian must have seen the thousand years long Middle Ages as uniform, and completely failed to notice the fundamental differences between the two phases of Middle Ages. Unfortunately, albeit this error, this convention of uniformly labelling those thousand years as "Middle Ages" passed down to us.

Another reason to abandon the term "High Middle Ages" is that in the last few hundred years, the term "Middle Ages" has acquired the meaning of "old-fashion", "stagnant", "anti-intellectual" and all kinds of other negative qualities that it really did not possess. As mentioned in chapter three, the more closely one looks at the

Millennium, ed. Michael Frassetto (New York: Houndmills; England: Palgrave Macmillan, 2002), pp. 9-28.

“Middle Ages”, the less dark it will appear. Thus, only by abandoning this corrupted term may one gain a clear vision on the “Middle Ages”.

In short, for the reasons provided above, a more accurate label, namely the “Twelfth Century Renaissance”, will be employed to designate this epoch currently known as the “High Middle Ages”, roughly spanned from year 1000 until 1350. Please note that “Twelfth Century” has been added in front of “Renaissance” so as to distinguish it with the later “Italian Renaissance” from the fourteenth to the sixteenth century.

4.2.1 Economic, Political, and Social Mutation

Perhaps the most eye-catching difference between these two phases of “Middle Ages”, or, to be precise, between the Dark Age and the Twelfth Century Renaissance, was the revival of commerce and urban life. To recall, in the Dark Age, both inland and maritime trade, whether it be long-distance and short-distance, completely vanished from the European continent. Almost all the cities of Antiquity had turned into ashes. Those that had survived transformed into diocesan centres and lost their economic significance. Similarly, the money economy was replaced by a barter-type self-sufficient economy. As such, silver and gold lost their meaning as medium of exchange and were melted to produce relics like a silver dish or some gold coins of commemoration. Thus, both trade and money had almost entirely disappeared from the continent, and the community was spiritually united under the local church.

Nevertheless, once Europe entered the Twelfth Century Renaissance, the picture completely changed. A contemporary writer called Jacques de Vitry (1170?-1240; sometimes known as James of Vitry) had recorded the following scene in a town: “In one and the same house, there were schools above and brothels below. On the floor above, masters lectured; below them, whores exercised their

depraved profession.”² Here the point is obviously not to ridicule the sexual behaviour of these Twelfth Century Renaissance Europeans. Rather it is intended to show how a completely new type of economy has connected various types of people through the anonymous and impersonal medium of money. Through money, the students were related to their masters; through money, men were related to the prostitutes; and through money, various parts of society were linked together again.

It was the revival of trade, after having disappeared for more than four hundred years, which brought money back into the European economy. This revival of trade was mostly a result of the restoration of peace. Towards the end of the millennium, the Vikings, the Saracens and the Hungarians had all ceased their raids partly due to their conversion to Christianity, and partly due to the weaknesses in their internal fabric. Ironically, many Vikings shortly turned into merchants in the North Sea, thanks to their superior navigation technology, and contributed to the revival of maritime trade. Furthermore, in the second half of the eleventh century, the Roman Church has issued the “Peace of God” and “Truce of God” doctrines that had enormously helped to reduce the endless feuds amongst the lords. In short, along with the arrival of the new millennium, both the inland and maritime trade roads attained a level of peace unseen for centuries.

As peace has been restored, commerce slowly developed. Merchants carrying their merchandises from Constantinople, Baghdad or even China were found everywhere in the continent or at sea. Shortly after, in locations favourable for trade, like Venice and several other Italian shore cities, merchants gathered regularly and eventually these seaports developed into a town, then a city. Farmers and even warlords soon found the exciting town life much more fascinating than the monotonous rural life and moved in the towns.

² Jacques de Vitry, *The Historia Occidentalis of Jacques de Vitry: A Critical Edition*, ed. John Frederick Hinnebusch, Spicilegium Friburgense 17 (Fribourg: University of Fribourg, 1972), vii, pp. 91.

At the same time, the role of government quickly changed. In the Dark Age, the kings were merely ritual figures with hardly any administrative functions and were under immense pressures of the church. With the revival of trade and the growth in wealth, however, no longer was it enough for kings to govern through rituals and symbols, as new financial and legal problems that inevitably came together with a money economy must be urgently solved by the central government. Accordingly, thousands and thousands of lawyers were trained and hired by the central government and were responsible to enforce laws that became increasingly complex.³ All of a sudden, governments throughout Europe had to perform all sorts of secular functions and became much more administration-oriented.

In summary, the end of raids and the reduction in feuds restored peace in Europe and led to a general revival in commerce and urban life. People usually interpreted these political, social and economic mutations as the first signs of secularization of the European society.

4.2.2 Revival of Humanism

³ As an anecdote, there was a record of an otherwise insoluble dispute where a married man was reported to be killed in a military expedition. His wife later remarried and had two children and continued to live on the land of her ex-husband. But a couple of years later, a man came to the village and claimed to be the ex-husband of the wife. The wife denied it but a few neighbours recognized him and said that his story of escaping from captivity appeared trustworthy. Should the man have the right to claim back what was his, and were the two children legitimate? This kind of complex cases, along with thousand others, could obviously not be solved by amateurs but only by professionals who had been specially trained. Quoted in Richard William Southern, *Scholastic Humanism and the Unification of Europe*, vol. 1, pp. 151-2.

However, the various new trends of development in economy and politics that would probably appear interesting to nowadays people were far from being the most significant features of the Twelfth Century Renaissance. Much more pertinent was the revival of the interest in human nature.

As usual, in order to understand the mentality of a certain epoch, it is best to begin by looking at its artistic production. In the Twelfth Century Renaissance, hagiography was no longer the mainstream in literature and its previous position had by then been taken over by the so-called chivalric literature. Hagiographers in the Dark Age, as shown in the previous chapter, completely ignored the human nature of the Saints and presented them as emotionless agents of God with supernatural power. From their writings, the Saints hardly exhibited even the slightest trace of humanity.

The authors of the chivalric literatures in the twelfth century, meanwhile, filled their heroes in their stories with highly complex human sentiments, making them appear as genuine human beings. Let's take a quick look at *Tristan*, a typical chivalric story composed by Gottfried von Strassburg (fl. 13th century; sometimes known as Godfrey of Strasbourg) written probably in year 1210. Tristan was a knight with sworn loyalty to his uncle King Mark of Cornwall. One day, he mistakenly drank a love potion with the bride of the King, the Irish princess Isolde, leaving them eternally in love with each other. As such, Tristan was caught in the contradiction of two sets of ideals – between his sworn loyalty to his uncle and his idealized love for the queen. Should he keep his loyalty or should he follow his passion? At last, in loving the Queen, Tristan finally realized that he has “forgotten chivalry and the life of a knight at court.”⁴ This was a typical chivalric literature where the hero, while struggling with circumstances, strived to preserve various chivalric virtues including for example certain warlike abilities, courtliness, and loyalty. Thus, similar to the case with Homeric virtues in Classical Greece, chivalry

⁴ Bérout, *The Romance of Tristan* (Harmondsworth: Penguin, 1970), xi, pp. 96.

was a certain pre-defined set of ideals of human nature, and one must resort to the training of one's body and soul to achieve these virtues. Hence, chivalric literatures provided valuable hints in the revived interest in the shaping of humanity in the twelfth century.

Chivalric literature was certainly not the only kind of literature that showed interest in the portrayal of human nature. In fact, as will further be shown below, all the poems and prose written after the eleventh century unambiguously regarded the human nature as the only theme worth writing about. All of a sudden, human nature, human feelings, human sentiments, human virtues, human struggle in life, hence all the complex issues about human experience in this world once again caught the attention of all authors of the age. What had been lost since the Classical Age, namely the interest on humanity, finally made its reappearance in the Twelfth Century Renaissance. If the word *Renaissance* could be loosely defined as the rediscovery or the rebirth of anything that was genuinely Classical Greek, then the Twelfth Century Renaissance was much more unmistakably the beginning of the Renaissance spirit.

Literature was definitely not the only area where Twelfth Century Renaissance Europeans filled out with humanist concerns. Christianity, no doubt the focus of all Europeans until the arrival of the Scientific Age, equally showed an emphasis on the issues about human nature. To recall, for Dark Age Europeans, the early Christianity appeared highly symbolic. Their Dark Age religious mood tended to portray Jesus as the Judge and God as the angry Father. By penance and gift to church and by turning the world into ascetic monastic life, man may avert God's anger. As such, "man chiefly knew themselves as a vehicle for divine activity [...and t]here was a profound sense of littleness and sinfulness of man."⁵ There was not the slightest interest in the humanity of Jesus and God.

⁵ Richard William Southern, *Medieval Humanism and Other studies*, pp. 32.

However, with the arrival of the Twelfth Century Renaissance, Christianity witnessed a substantial transformation. God father, Virgin Mary and Jesus Christ all of a sudden were filled with human passion. For instance, there emerged a new religious trend of worshipping Virgin Mary. Churches, particularly cathedrals, were dedicated in dramatically increasing number throughout Western Europe to *Notre Dame* (French, literally Our Lady). Yet people were not worshipping the supernatural power of Mary as in the Dark Age, but were rather emphasizing her mother love to Jesus Christ and to all human beings. Such highlighting on her humanity side could be demonstrated with the numerous poems, prose and paintings devoted to her. For example, both *Homily on the Virgin Mary* by Saint Bernard of Clairvaux (1090-1153) and *Everyday Sermons*⁶ by Jacques de Vitry repeatedly mentioned the motherly tendresse to Jesus and to all human beings, while paintings devoted to her almost exclusively showed her caressing the infant Jesus Christ in her arms. Virgin Mary, therefore, has acquired what she needs to become a human being, namely a vivid humanity; and through these artistic productions, mankind came to experience her human nature.

A similar story happened to Jesus. In the Dark Age, Jesus appeared totally symbolic and lacked emotion of any sort. He was at most a symbol that represented the power of the Heaven. But in the Twelfth Century Renaissance, the Christians shifted their attention to His poor life on earth, His suffering for the mankind, the perfect virtues that He represents, and the methods to establish personal spiritual relation with Him so as to experience His human virtues.

Evidences on these new religious moods were ubiquitous. Twelfth Century Renaissance was a period of great religious

⁶ For a copy of these two works, see Saint Bernard of Clairvaux, *The Life and Works of St. Bernard of Clairvaux*, vol. 3, ed. Samuel John Eales (London: Burns and Oats, 1912), pp. 298ff; and James Harvey Robinson, ed., *Readings in European History*, vol. 1 (Boston: Ginn, 1904), XVI.iii.139, pp. 357-8.

enthusiasm. Various new religious orders were founded, either by the laity alone, like the Waldensians and the *Humiliati* (Latin, the humbled ones), or with the help of existing Christian institutions, like the *mendicant friars* (begging brothers) and the Franciscans. The differences among these orders were fairly complex and were beyond the scope of the current analysis. It was rather their similarities with each other that interest us the most. Their most important parallel was that they all followed a so-called *vita apostolica* or apostolic life. From the New Testament, they learnt that Jesus lived a very poor life on earth and was a most meek man as He washed His apostles' feet.⁷ After all, the Bible says: "blessed are the poor in spirit"⁸ and "blessed are the meek"⁹. Accordingly, they renounced all of their worldly rich and lived like beggars in the meekest way. Suddenly, people began to concern with the virtues of Christ as illustrated in the Bible and strived to imitate him from his humanity to his way of life. In short, Christ ceased to be an unapproachable and incomprehensible symbolic divine power with no humanity; instead, He emerged as a quasi-human with a rich human nature and the perfect model to imitate in course of achieving sanctity. It was as if the Bible became *Odyssey* and *Iliad*.

4.2.3 The Attempts of the Scholastics

The religious enthusiasm of the European in the twelfth century was equally shown in their rational assessment of Christianity, as people attempted to learn more about their faith. In any rational analysis, there must be a system of logic, and the one that those European chose was that of Aristotle. Throughout the Dark Age, people had completely left Aristotle's works behind, which after all they had no use of anyway. Fortunately, copies of his

⁷ See The Bible, John 13:4-11.

⁸ The Bible, The Sermon on the Mount in Matthew 5:3.

⁹ *Ibid.*, 5:5.

introductory level works on logic¹⁰ had been preserved by some far-sighted individuals, and were already being used by scholastics as the basis to cast light on basic religious and ethical issues by year 1100. Later by 1160, thanks to the revived cultural exchange with Constantinople and the Arabian Empire, the more advanced works on Aristotle's logic¹¹ was known to the West as well and immediately revolutionized Latin Christianity's approach to theology. Soon, the first universities emerged¹² where theology was by far the most prestigious and demanding branches of learning, even though they also taught the *trivium*¹³ and *quadrivium*¹⁴, which people regarded as "instruments for the mitigation of human frailties."¹⁵

At first glance, one might wonder the utility of logic in the course of satisfying one's religious enthusiasm and in the searching of meaning of faith. Yet the scholastics in those days somehow believed that they could unveil the will of God as well as other religious truths by analyzing the bible. To acquire such knowledge through rational assessment, one must resort to the following procedure. First of all, one must assume that the world created by God is an "ordered aggregation of creatures"¹⁶, meaning that everything in the world is perfect orderly, henceforth the belief that,

¹⁰ This included works like *Categories*, *On Interpretation*: definition, *Ascription of Qualities*, *Elementary Syllogisms*. They are usually referred as the so-called *Old Logic* of Aristotle.

¹¹ This included *Prior Analytics*, *Posterior Analytics*, *Sophistical Refutations*. They are the *New Logic* of Aristotle.

¹² Although we cannot date their precise beginnings, by 1200 Europe already had three universities – Bologna, Paris, and Oxford.

¹³ *Trivium*: Grammar, Dialectic, and Rhetoric.

¹⁴ *Quadrivium*: Astrology, Arithmetic, Geometry, and Music. These seven disciplines were normally known as the seven liberal arts of Greece.

¹⁵ Richard William Southern, *Medieval Humanism and Other studies*, pp. 40.

¹⁶ William of Conches, *Glossa in Timaeumi*; quoted in Marie-Dominique Chenu, *Nature, Man and Society in the Twelfth Century*, pp. 7.

...God distributed things in nature like members of a great body, assigning to all their proper places and names, their fitting measures and offices. Nothing is confused in God. By God's moderating rule, diverse and contrary things meet in the unity of peace, and static and erratic things are brought into orderly line. The entire fabric of the world continues in its lawful and ordered way, solid, harmonious and with no dread prospect of ruin.¹⁷

This is a critical step because such "orderliness" implies that the world is comprehensible and manageable by logic. It is only with this assumption in mind that the scholastics confidently took the next important step, namely to pose various questions on this order. Doubting things around us is crucial in the process of any type of learning. After all, Aristotle once wrote: "To entertain doubts on particular points will not be unprofitable."¹⁸ The Bible similarly says that: "seek and you shall find, knock and it shall open."¹⁹ And as Peter Abelard (1079-1142), one of the most celebrated scholastics of this epoch, once mentioned: "...by doubting we come to inquire, and by inquiry we arrive at the truth..."²⁰ Hence, only by doubting may the path to the truth be opened.

The next step was to choose the actual questions to pose, and then solve them with logic. This section might yield surprises since the type of questions posed by those Christian scholastics would probably be out of the imagination of readers in the twenty-first century. For example, in his famous work entitled *Sic et Non* or *Yes and No*, Peter Abelard posed 158 theological questions like "should human faith be based on reason, or no?" and "is God the author of

¹⁷ J. P. Migne, *Patrologiae Latina*, CLXXXIX, 1515-1516; quoted in Marie-Dominique Chenu, *Nature, Man and Society in the Twelfth Century*, pp. 9.

¹⁸ Quoted by Peter Abelard in *Sic et Non*; quoted in Brian Tierney, Donald Kagan, and L. Pearce Williams, *Great issues in Western Civilization*, 2nd ed., vol. 1 (New York: Random House, 1972), pp. 414.

¹⁹ The Bible, Matthew 7:7.

²⁰ Aberlard, *Sic et Non*; quoted in Brian Tierney, Donald Kagan, and L. Pearce Williams, *Great issues in Western Civilization*, pp. 414.

evil, or no?", which he expected people to apply rules of Aristotelian logic to resolve. In a similar way, another highly celebrated scholastic at that time called Saint Thomas Aquinas (1225-1274) posed all kinds of seemingly absurd questions in his *Summa Theologica* or *A Synthesis of Theology* concerning the existence of God, the essence of God, the nature of soul, the traits of angels,²¹ plus many others, which then he solved with dreaded logic.

In brief, by posing questions on the order of the world and then by solving them with Aristotelian logic, the twelfth century scholastics had acquired a lot of knowledge concerning the creation of God; and with this knowledge in hand, they convinced themselves that they had learnt about the will and wisdom of God. As an example, Thomas Aquinas once wrote that:

...the knowledge of naturally known principles is instilled into us by God, since God Himself is the author of our nature. Therefore the divine Wisdom also contains these principles. Consequently whatever is contrary to these principles, is contrary to the divine Wisdom...²²

A pupil of Peter Abelard called John of Salisbury (1115?-1180) similarly said that:

²¹ See for example Saint Thomas Aquinas, *The Summa Theologica*, trans. English Dominican Fathers (New York: Benziger Brothers, 1911), Question 52, a.3 for his discussion on angels. Originally, Thomas Aquinas was concerned with the physical qualities of angels – that is, if they have substance. However, philosophers in the later Scientific Age made fun of him and said he was counting how many angels can spin around a pin in the same moment.

²² Saint Thomas Aquinas, *The Summa Contra Gentiles of Saint Thomas Aquinas*, trans. English Dominican Fathers (London: Burns, Oates & Washbournes, 1923), i.7, pp. 14. After all, the title of the chapter from which the passage above is quoted is "That the Truth of Reason Is Not in Opposition to the Truth of the Christian Faith."

I do not deny the value of those signs which divine disposition has given to educate God's creatures. 'For in many places and many ways, God instructs his creature,' making clear what will happen now by the voices of the elements, now by the evidences of sensible and insensible things.²³

Thus, although God is visually absent, studying the nature that He created would nevertheless reveal his presence and wisdom, thereby teaching us the meaning of faith. This was the reason why Thomas Aquinas wrote in another place that "philosophy (which then meant the study of nature as a whole) proves things that help to understand faith,"²⁴ thus his concept that reason teaches faith. To sum up, these twelfth century scholastics turned logic to the service of theology and studied the nature created by God, and this allowed them to learn about their faith, thereby satisfying their religious enthusiasm.

4.2.4 Origins of the Great Awakening

As with all other major events in history, modern historians strived to identify the origins of this great spiritual awakening in the twelfth century. The majority of writers tended to associate this abrupt yet long-lasting European revitalization²⁵ to various economic

²³ John of Salisbury, *Policraticus*, II.ii.1-3; quoted in John Mundy, *Europe in the High Middle Ages*, pp. 311; for the quote from Bible, see Hebrews 1:1.

²⁴ *In Boetium de trinitate*; quoted in John Mundy, *Europe in the High Middle Ages*, pp. 312.

²⁵ Such spontaneous nature of this rebirth was apparently confirmed by Guibert of Nogent (1053-1121), one of the most interesting writers in the Twelfth Century Renaissance. He wrote in his autobiography that,

...there had been a little before, and there still reigned partly in my time, so great a scarcity of grammarians, that scarcely any would be found in the towns, and few indeed in the cities; moreover, even such as could be found were of slender learning, not to be compared even with the wandering hedge-clerks of modern days.

and political factors like the cessation of barbarian raids, the recovery of commercial activities, the emergence of urban life in the new economic cities, and sometimes even the surge in agricultural productivity. Equally frequent was the explanation that the series of crusades beginning from 1095 brought Europe in contact with the much more advanced civilizations in Constantinople and Baghdad, thereby stimulating the cultural development of the then less developed European civilization. Especially important, they claimed, was the conquest of Constantinople in 1204 during the dramatic Fourth Crusade, which brought a first-hand experience of Greece to the Christians in Western Europe. The perfect timing of these economic and political events made these explanations highly appealing.

In the meantime, some other historians went further back to the ninth and tenth century and maintained that the literary revival in the ninth century initiated by the mild educational reform of Emperor Charlemagne was the first indispensable step of the later Renaissance.²⁶ Moreover, the founding of the great monastery of Cluny in east-central France in 910 inaugurated the centuries-long reform of European monasteries and gave the future generations of monks more time to study the old manuscripts instead of clearing forest and tilling the land. These Cluny monks were said to have paved the way for the great scholastic movement later in the twelfth century.

However, the various factors listed above failed to explain one of the most important features of this Twelfth Century Renaissance, namely the origin of the revived religious enthusiasm and the interest in human nature. After all, such a spiritual revival

See Guibert's *Own Life*, originally cited in J. P. Migne, *Patrologia Latina*, CLVI, 856; translated and quoted in G. G. Coulton, ed. and trans., *Life in the Middle Ages*, vol. 4 (Cambridge: The University Press, 1928), pp. 138.

²⁶ For a short account on the Carolingian educational reform, see David Knowles, *The Evolution of Medieval Thought*, pp. 71-8.

was well beyond the reach of any economic or political events. Moreover, one must not forget that this grand spiritual awakening could not be “assigned to a single cradle [... since] it appears everywhere within a very wide area.”²⁷ As such, it appeared that the restoration of peace in Western Europe, the short literary revival that began in 800 by Charlemagne, the cultural exchange with Constantinople and the Baghdad, the revival of trade, the surge in agricultural productivity, and the development of towns were certainly not the originating causes of such a spiritual transformation.

The so-called terror of year 1000 was sometimes considered a crucial factor of this great spiritual awakening, although this theory was less widely accepted by serious historians. Such terror seemed to be rooted in the fact that the Book of Revelation kept mentioning that “the time is near”²⁸ and that the Bible has several references to a thousand years.²⁹ Among the most consistently cited primary contemporary sources for any consideration of such terrors were the *Liber apologeticus*³⁰ or *The Book of Apologetics* by Abbo of Fleury (945?-1004?) in 998, and the *Quinque libri historiarum*³¹ or *The Five Books of Histories* written by Rodulfus Glaber (980?-1048?), in the second quarter of the eleventh century.³²

²⁷ Ibid., pp. 83.

²⁸ The Bible, Revelation 1:3, 22:6.

²⁹ For instance, “...and bound him a thousand years...” in Revelation 20:2, “...that one day is with the Lord as a thousand years, and a thousand years as one day” in II Peter 3:8, and “For a thousand years...” in Psalms 90:4.

³⁰ For full text in Latin, see J. P. Migne, *Patrologia Latina*, CXXXIX, 461B-472A. Unfortunately, there currently exists no English translation of this work, and the discussion below is based on an analysis on this work. See Edward Peters, “Mutations, Adjustments, Terrors, Historians, and the Year 1000,” in *The Year 1000*, ed. Michael Frassetto, pp. 9-28.

³¹ For full text, see Rodulfus Glaber, *The Five Books of the Histories*, ed. and trans. John France (Oxford: Clarendon, 1989).

³² For more coverage on this topic, see Edward Peters, “Mutations, Adjustments, Terrors, Historians, and the Year 1000,” in *The Year 1000*, ed. Michael Frassetto, pp. 9-28.

In *Liber apologeticus*, Abbo told us the story of a sermon he had heard preached in Paris when he was a young man, in which the preacher claimed that when a thousand years were completed, Antichrist³³ would appear and the Last Judgment follow not long after. He also stated that his own abbot had received a letter from some monks to the effect that a rumour had filled almost the entire world that when the feast of the Annunciation fell on Good Friday, the world would surely end.³⁴

Abbo’s text must be combined with Glaber’s work and the above quotes from the Bible in order to produce a complete interpretation of this millennium terror. Glaber dealt in the first two books of his *Quinque libri historiarum* with the general decay of religious life until the late tenth century, including the resurgence of simony and heresy and the decrease of charity around the year 1000.³⁵ Then all of a sudden near year 1000, there was a distinct improvement in the quality of devotional life and a new religious enthusiasm that had spread throughout Europe, signalled by a remarkable wave of church-building.³⁶ Such surge in religious mood was probably due to the references of a thousand years in the Bible and the consequential preach of terror, which had perhaps raised people’s awareness of their religious life to a level unseen in the past. Equally noteworthy was the appearance of a comet around 1000,³⁷ which thereafter many men prophesied that others like them would

³³ Antichrist: The epithet of the great antagonist who was expected by the early Church to set himself up against Christ in the last days before the Second Coming.

³⁴ Since there currently exists no English translation of *Liber apologeticus*, the discussion on Glaber’s work above mostly comes from Edward Peter’s essay cited in an earlier footnote.

³⁵ See for instance Rodulfus Glaber, *The Five Books of the Histories*, II.vi.11-12, II.xi.22, and II.xii.23.

³⁶ Ibid., III.iv.13.

³⁷ Ibid., III.iii.9. Note that people in those days were very superstitious, meaning that they saw abnormal natural occurrences as portents of great events.

occur at the millennium of Christ's passion in 1033.³⁸ Once again, these prophecies on Christ most likely had impressed a strong mark in people's mind and contributed to the later curiosity in Christ Himself.

However, this theory lacked the supports of convincing evidences and must remain speculative in nature. Consequently, it has not gained wide acceptance among the historians who always preferred categorical data.³⁹ Still, such speculation represents a possible substitution to the existing theories that heavily focused on economic and political factors. To sum up, it appears that the revival of interest in human nature must remain as a mystery, as least for the moment. But such missing link does not obstruct our current analysis since its emphasis is on the characteristics of each epoch instead of their roots.

4.3 Renaissance and Reformation⁴⁰

³⁸ Ibid., IV.i.1.

³⁹ See David Knowles, *The Evolution of Medieval Thought*, pp. 79.

⁴⁰ The following secondary source materials have been consulted for this section: G. R. Potter, ed., *The Renaissance, 1493-1520*, vol. 1, The New Cambridge Modern History (Cambridge University Press, 1957); John Randall, *The Making of the Modern Mind*; Horst Woldemar Janson, *History of Art*, 3rd ed. (New York: Harry N. Abrams, 1986); Boris Ford, ed., *The Age of Shakespeare*, vol. 2, The Pelican Guide to English Literature (Harmondsworth: Penguin Books, 1957); Columbia College, *Chapters in Western Civilization*, 3rd ed., vol. 1 (New York: Columbia University Press, 1961); Jill Craye, ed., *The Cambridge Companion to Renaissance Humanism* (Cambridge; New York: Cambridge University Press, 1996); Alfred Andrea, *The Medieval Record*; Lester Little, *Religious Poverty and the Profit Economy in Medieval Europe*; Lisa Jardine, *Worldly Goods: A New History of the Renaissance* (New York: Nan A. Talese, 1996); Max Weber, *The Protestant Ethic and Spirit of Capitalism*, trans. Talcott Parsons (New York: Scribner, 1976);

After the spectacular cultural development in the twelfth and thirteenth century, the Western civilization soon faced a major crisis whose magnitude could only be compared with the two World Wars in the twentieth century. That was the so-called Black Death whose first onslaught took place between 1347 and 1350 and whose origin still largely remained as a mystery. In less than three years, Europe lost close to one-half of her population.

Fortunately, Europeans exhibited a great capacity for resilience in the face of this disaster and by the fifteen century she was ready to expand along both new and traditional lines. This second phase of spiritual revival unmistakably shared many essences found in the Twelfth Century Renaissance, but it also differed from the first phase in that there was less focus on Christianity and more emphasis on secular values. This was the era of Renaissance, originated in Italy and later spread to the Netherlands and England.

4.3.1 The Italian and Northern Renaissance

The Italian Renaissance was perhaps best-known for her artistic achievements. After all, it is enough to recall the big names like Leonardo da Vinci (1452-1519), Raphael (1483-1520), and Michelangelo (1475-1564), and their works that are filled with natural beauty and fine details will automatically emerge in our mind.

Another equally well-known characteristic of this era was the tremendous economic success of the Italian cities. For half a millennium, shore cities like Venice, Genoa, Milan, and Florence completely dominated the trading activities in Western and Central Europe. In those finest days, the above mentioned Italian ports were the staples through which most merchandise must first pass before reaching the European market. This easily made the Italians the richest people in Europe.

Such tremendous cultural and economic development easily convinced many people to label this epoch as the beginning of the Modern Age – however this term was defined. Such obsession with secular values made it a hard choice for us not to draw any links between the Italian Renaissance and the contemporary world. For instance, Leopold von Ranke (1795-1886) the German historian in the nineteenth century once said that “we can see in 1500s features of modern world: nations-states, bureaucracy, secular values in public policy, and a balance of power.”⁴¹ After all, the voluminous series entitled *The New Cambridge Modern History* from which the quote above was drawn began its first volume with the Renaissance Era from 1493 to 1520. It is as if the “Modern Age” was a direct offspring of Italian Renaissance.

Such rash, though convenient and appealing, generalization should be reserved for amateurs of history. There is one thing which nowadays people highly value but which the Renaissance Italians enormously despised, that is the preoccupation of physical science. Not only were advances in this field extremely limited, but the pursuit of scientific knowledge was not even encouraged by the society as a whole. This was because they were much more interested in their human nature than the physical world. For instance, the great Italian humanist Francesco Petrarca (1304-1374) scorned the interest in the popular bestiaries and the books of travel and wrote that:

Even if all these things (knowledge of the natural world) were true, they help in no way toward a happy life, for what does it advantage us to be familiar with the nature of animals, birds, fishes, and reptiles, while we are ignorant of the nature of the

race of man to which we belong, and do not know or care whence we come and whither we go?⁴²

Petrarch’s comment was strikingly similar to a statement of Socrates: “the fields and the woods have nothing to teach me; I learn my lessons from men.”⁴³ Similarly, Desiderius Erasmus (1466?-1536) the great humanist in the Netherlands showed no concern for the great scientific discoveries of his days and even ridiculed the natural philosophers and mathematicians in one of his work entitled *Praise of Folly*.⁴⁴

It was the study of human nature through readings of ancient literature that had attracted the primary attention of the Italians. The very word “renaissance” explained everything. The prefix “re-” of this French word means “anew”, while “naissance” means “birth”. Together it suggests that something that is dead long time ago is resurrecting. That “something” is of course the ancient Greek and Latin culture. To recall, the ancients, especially the Classical Greeks, were the genuine humanists. Everything they studied, worshipped, produced, and wrote, thus everything they did was tightly associated with issues on human nature. Thus, the revival of interest in the Greek and Latin literature signified an interest in studying human nature.

Their enthusiasm on ancient literature could not be overstated. As early as the twelfth century, John of Salisbury was said to have collected tons of Latin poems and delighted to read them.⁴⁵ This fervour continued well into the fourteenth century, where humanists like Petrarch looked for genuine copies of Latin

⁴¹ Quoted in Denys Hay, “Introduction,” in *The Renaissance, 1493-1520*, ed. G. R. Potter, vol. 1, *The New Cambridge Modern History*, pp. 1.

⁴² See Francesco Petrarca, *Petrarch, the First Modern Scholar and Man of Letters*, trans. James Harvey Robinson (New York & London: G. P. Putnam’s sons, 1898), pp. 41-2.

⁴³ Quoted in William Greene, *Achievement of the Greeks*, pp. 312.

⁴⁴ Desiderius Erasmus, *The Praise of Folly*, trans. Hoyt Hopewell Hudson (Princeton: Princeton University Press, 1941), passim.

⁴⁵ John Randall, *The Making of the Modern Mind*, pp. 117.

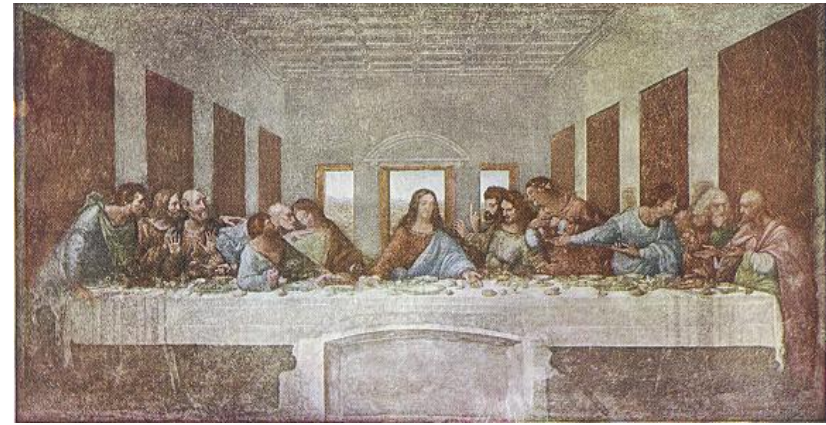
literature everywhere around the Mediterranean Sea. Not long afterwards, the interest in Greek literature had revived as well. As another humanist called Leonardo Bruni (1369-1444) once remarked: “For seven hundred years, no one in Italy has possessed Greek letters.”⁴⁶ Yet, towards the end of the fifteenth century, a whole generation of scholars sprang and began their studies on Greek literature. Petrarch even went so far as to lament to be born in Renaissance Italy, as he wrote in his *Letter to Posterity* that:

...among the many subjects which interested me, I dwelt especially upon antiquity, for our own age has always repelled me so that, had it not been for the love of those dear to me, I should have preferred to have been born in any other period than our own.⁴⁷

Such was their passion on Greek and Latin literature.

The paintings and sculptures produced during this epoch also revealed their interest in human nature. The remarkable thing about Renaissance visual arts was not the fact that these new-era artists could skilfully delineate the physical appearances of the world, as the rich colour, fine details and perspective found in their works might so easily suggest; instead, its real significance lied in the fact that their works of art was a study of human nature.

Figure 4.1: The Last Supper, by Leonardo da Vinci



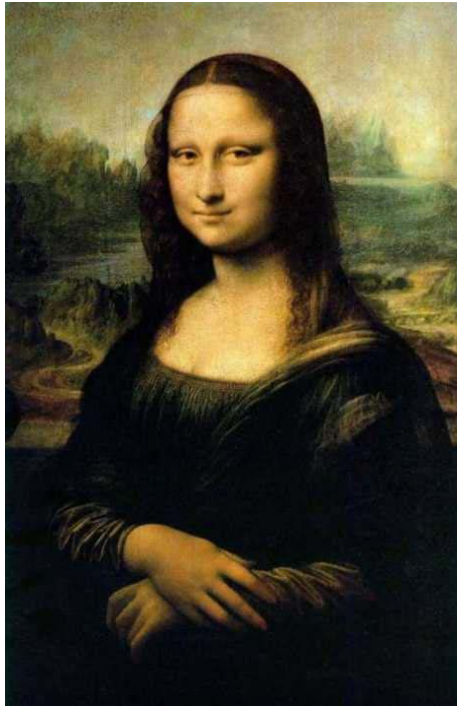
Let's take Leonardo da Vinci's *The Last Supper* as an example. In the painting, the Saviour sitting in the middle presumably has just spoken the fateful words, “One of you shall betray me,” and the disciples were asking, “Lord, is it I?” The reaction of the twelve apostles however did not end here. As depicted in the work, each apostle reacted differently, based on their gestures, movement of limbs, eye contact, and facial expression. These fine details nakedly revealed the personality of each apostle and their personal relationship to the Lord. They exemplified what the artist wrote in one of his notebooks, that the highest and most difficult aim of painting is to depict “the intention of man's soul”⁴⁸ through gestures and movements of the limbs – a dictum to be interpreted as referring not to momentary emotional states but to man's inner life as a whole.

Figure 4.2: Mona Lisa, by Leonardo da Vinci

⁴⁶ Quoted in Henry Osborn Taylor, *Thought and Expression in the Sixteenth Century*, vol. 1 (New York: Macmillan, 1920), pp. 36.

⁴⁷ Francesco Petrarca, *Petrarch, the First Modern Scholar and Man of Letters*, pp. 64.

⁴⁸ Quoted in Horst Janson, *History of Art*, pp. 439.



Similarly, in his most famous work entitled *Mona Lisa*, Leonardo aimed to express his understanding of human nature. Perhaps the most intriguing feature of this monumental work was the psychological fascination of the sitter's personality and especially her smile which he took twelve years to draw. It is of course impossible to examine Leonardo's complex stylistic motifs in any meaningful detail here. After all, people have written hundreds of books and essays discussing the meaning the smile which, among all the smiling faces ever painted, has been singled out as "mysterious". For the present purpose, it suffices to conclude that his concern to delineate the soul of mankind – in this case, the maternal tenderness which was to Leonardo the timeless essence of womanhood – was even more evident here than in *The Last Supper*. This method of using visual art to delineate certain universal human nature as opposed to momentary feeling was certainly not unique to the

Leonardo. Such style could be identified from works of other contemporary artists like Raphael, Michelangelo, and in fact of most Renaissance painters. Visual arts, in those days, were means to study human nature.

Literary pieces composed in that epoch expressed a comparable concern with human nature. Ever since the close of the Dark Age, there emerged a new trend in European literature that found interests in human nature. One could easily identify such tendency from the chivalry literature in the twelfth century that dealt with the hero's inner struggle between two sets of contradicting virtues. That new temper could likewise be found in the writings of the great humanists of the Italian Renaissance like Petrarch, Alighieri Dante (1265-1321), Giovanni Boccaccio (1313-1375), plus numerous others.

This humanist mood was especially evident in the works of William Shakespeare (1564-1616), the greatest of all British playwrights. Like other contemporary humanists, Shakespeare based his works on the forces of humanity, which in his framework was the only thing that determined the decision and reaction of mankind. To put it differently, "Shakespeare's characters struggle, not with any limited ideas or philosophies of his own age, but with the universal forces of human nature that transcend all particular intellectual formulation."⁴⁹ His characters lived by their pure humanity, oblivious to the abstract settings of life like Christian doctrines and scientific knowledge.

This was where Shakespeare's genius really lied. He understood, head to toe, every single side of the rich spectrum of humanity. He knew what it meant to be a true human, and he taught us about it through his plays. For instance, in *Hamlet*, he described human action in a morally corrupted world; in *Macbeth*, he delineated the self-destructive nature of evil; and in *The Tempest*, he

⁴⁹ John Randall, *The Making of the Modern Mind*, pp. 128.

told us about human kindness and the regeneration of human nature. No doubt that John Dryden (1631-1700) an outstanding literary figure in the seventeenth century once described Shakespeare in his *Of Dramatic Poesy* as “the man who of all modern, and perhaps ancient, poets, had the largest and most comprehensive soul... When he describes anything, you more than see it, you feel it too.”⁵⁰

Humanity was what the Italian and Northern Renaissances were all about.⁵¹ It is quite clear from the writings and paintings of those humanists that they considered themselves primarily as philosophers on human nature and that they deemed morality to be the most important, the only essential, part of human life. This attitude could be clearly traced from Petrarch to Leonardo to Shakespeare, and it has significant implications: Only those problems that are of direct human concern are worth drawing and writing about, while the problems of logic and of physics are unimportant since they have no bearing on us, on our conduct, and on our happiness. They also maintained that the study of rhetoric, of poetry, of painting and of history, which they advocated and cultivated, had a formative influence on moral character and thought of the students and thus were of great human concern. This explained the humanists’ preoccupation with education. Such exclusive concern with the shaping of human nature (as opposed to development of intelligence) and the human significance in their artworks were the principal hallmarks of this epoch.

4.3.2 The Coming of Reformation

In the sixteenth century, the interest in human nature, in human feelings, in inner life, in spiritual experience, in introspection

⁵⁰ Quoted in Kenneth Muir, “Changing Interpretations of Shakespeare,” in *The Age of Shakespeare*, vol. 2, *The Pelican Guide to English Literature*, pp. 286.

⁵¹ This paragraph is a summary from Columbia College, *Chapters in Western Civilization*, vol. 1, pp. 289-335.

of human soul, thus in everything that will make human a true human reached a climax. That was the era of the Reformation, usually accredited to Martin Luther (1483-1546) the leader of the movement. By far the biggest loser of this reform was the Orthodox Roman Church in Rome, which saw its position rapidly declining in favour to a number of new and independent religious orders.

The waning of the Roman Church had its own historical origins and was certainly not due to the effort of Luther alone. As a brief account on the history of the Roman Church, during the Dark Age, churches in each village functioned independently and were only nominally under the rule of the Pope in Rome. To put it differently, they formed at most a loose confederation of churches.

In the eleventh century, however, Henry III (1017-1056; r. 1039-1056) the Emperor of the Holy Roman Empire successfully reformed the Roman church, thereby inaugurating the dominance of papacy in Europe that would last for a few centuries to come. Such supremacy could be clearly demonstrated with the First Crusade (1095-1098) that Pope Urban II (1035?-1099; r. 1088-1099) launched almost single-handedly. In the famous Synod of Clermont in 1095, he appealed Europe to launch a Holy War against the Muslim who had occupied Jerusalem the Holy City. Later during the pontificate of Innocent III (1161?-1216; r. 1198-1216), the influence of papacy had even reached such a height so as to constantly exert authority even in the internal politics of various European kingdoms and empires.

Yet, several factors worked together to seriously jeopardize the prestige of the Roman Church. The first was the wealth and corruption of the papacy. Strictly speaking, Christianity fundamentally opposed avarice. Jesus himself had lived a poor life in this world. The Bible also says: “blessed are the poor in spirit.”⁵² A contemporary canon law similarly asserted that “a merchant is rarely

⁵² The Bible, Matthew 5:3.

or never able to please God.”⁵³ Avarice, in that age of economic recovery, was regarded as “the root of all evil”⁵⁴.

Sarcastically, the churchmen themselves seemed unable to avoid avarice, and unmistakable symptoms of corruption emerged. The sale of church offices became so common in those days that hardly anyone regarded it as sinful anymore when compared with other much worse cases. For instance, the canons of Arezzo were reported to be so busy getting rich that they had to hire priests to conduct services of worship; some faint-hearted clerics with benefices could not get out of bed when offices were to be sung but later showed up at *spectacula*; the blatantly simoniac Archbishop Manasses of Reims was supposed to have said: “The archbishopric of Reims would be a good thing, if only one did not have to sing mass because of it”; in 1139, the Second Lateran Council condemned clerics who accepted money for administering sacraments, where 75 years later, the Fourth Lateran Council repeated the same condemnation;⁵⁵ in 1471, when the new Pope Sixtus IV (1414-1484; r. 1471-1484) ordered to sell the personal assets of his predecessor Paul II (1417-1471; r. 1464-1471) to cover Paul’s personal debt, an embarrassingly fine collection of precious gems and art objects was unveiled.⁵⁶ These exemplars of avarice and corruption ironically reminded me of a quote in the Bible: “Do not store up riches on earth, for your heart will always be where your riches are.”⁵⁷

These infamous acts, needless to say, dealt a blow to the reputation of the Roman Church, and many sober-minded Christians began to raise doubts on these rotten practices of churchmen. Otto I

⁵³ Quoted in Lester Little, *Religious Poverty and the Profit Economy in Medieval Europe*, pp. 38.

⁵⁴ *Ibid.*, pp. 36.

⁵⁵ All the above references to churchmen’s misbehaviours come from Lester Little, *Religious Poverty and the Profit Economy in Medieval Europe*, pp. 31.

⁵⁶ Lisa Jardine, *Worldly Goods*, pp.95

⁵⁷ The Bible, Luke 12:34.

the bishop of Freising (1114?-1158) once said: “Speaking frankly, I do not really know whether the current prosperous condition of the church is more pleasing to God than its earlier humility.”⁵⁸ The early religious reformer John Wycliffe (1328?-1384) even wrote a whole pamphlet to argue that the pope “is the very Antichrist and not Christ’s vicar on earth.”⁵⁹ To sum up, the avarice and corruption mentioned above was one of the origins of European dissent on Roman Church.

Another factor contributing to the general disappointment vis-à-vis the Roman Church was the series of political struggle between the papacy and the secular rulers in the fourteenth century. The first one was the so-called “Babylonian Captivity”. In 1303, Philip IV (1268-1314; r. 1285-1314) the French King sent henchman Guillaume de Nogaret (1265?-1313) to Italy with a mandate to kidnap Pope Boniface VIII (1235?-1303; r. 1294-1303) and bring him to France because Boniface forbade him to tax the French clergy. Nogaret captured Boniface in his hometown of Anagni, but the citizens rioted and forced him to release the pope. Boniface died a short while thereafter. Between 1305 and 1377, all seven consecutive popes were Frenchmen, and from 1309 onward even the papal court itself was removed to the French protected territory Avignon. The popes at Avignon were certainly not evil men and most of them were conscientious in their attempts to rule well. Yet since the court was

⁵⁸ Otto I, Bishop of Freising, *The Two Cities* (New York: Columbia University Press, 1928), pp. 274.

⁵⁹ John Wycliffe, *Concerning the Pope*; full text cited in John Wycliffe, *Select English Writings*, ed. Herbert E. Winn (London: Oxford University Press, 1929), pp. 70-2. Other attacks on the pope in *Concerning the Pope* include: “Christ was very poor from His birth to His death and forswore worldly riches, but Antichrist [...], from the time he is made pope to the time of his death, covets worldly wealth and tries in many shrewd ways to gain riches. Christ was a most meek man [...], but people say that the pope is the proudest man on earth, and he makes lords kiss his feet, whereas Christ washed His apostles’ feet.” See The Bible, John 13:4-11 for the account on Christ washing His apostles’ feet.

now located in a region under French royal influence, the papacy soon gained the reputation, no matter how poorly deserved, of being a puppet of French royal policies. From the viewpoint of the Christians, the papal court has degraded into a protectorate of a secular ruler and had lost its former spiritual supremacy.

Pope Gregory XI (1331-1378; r. 1370-1378) finally returned the papal court to Rome in 1377, and died the following year. His successor Urban VI (1318-1389; r. 1378-1389) however proved to be a disastrous choice and soon alienated a sizeable percentage of the largely French cardinals. Accordingly, the dissident cardinals declared Urban's election invalid and elected another pope, a Frenchman who assumed the title Clement VII (1342-1394; r. 1378-1394). Immediately they returned to Avignon with their new Pope, leaving Urban and his remaining supporters in Rome. This was the beginning of the so-called "Great Schism". For the next couple of decades, there were two rival popes – one in Avignon and one in Rome, each with his own papal court and subordinate clergy. Such a chaotic situation that should never happen to a religious entity had further damaged the Church's authority and reputation in the mind of the general public.

A third factor contributing to the decline of the Roman Church was the spiritual awakening beginning in the eleventh century. Traditionally, the church served as Christ's only agent on earth, and it offered to its followers many symbolic sacraments like Baptism, Penance, Holy Eucharist, Confirmation, Matrimony, Holy Orders, and Anointment,⁶⁰ all aimed to satisfy the meagre spiritual need of the Christians in those early days.

However, along with the millennium religious enthusiasm, the general public was no longer satisfied with the above mentioned rituals that only answered questions like "what rituals to perform so as to be granted salvation and remission of sins". Instead, there

⁶⁰ Together they are called "The Seven Sacraments".

emerged a curiosity on the spiritual significance of Christian faith. In place of the sacraments offered by church, these new generations of Christians resorted to the preaching of various new religious orders like the above-mentioned Waldensians that did not belong to the hierarchy of the Roman Church. These religious orders offered no sacraments but instead they brought the Bible with them and preached the gospel directly to the general public, for the Bible says "preach the gospel to every creature."⁶¹ Perhaps to everyone's surprise, this was actually the first time that the mass got to hear the gospel, as hagiographies had been more commonly used in the Dark Age in place of the Bible. Furthermore, these new-era priests no longer focused solely on His omnipotence and omnipresence, but instead on His love, His humanity as well as the morality behind the biblical stories. In summary, these new religious orders rejected the symbolic type of religious life offered by the church, and adopted a new route to Christian faith through spiritual experience of God's humanity.

As expected, the more conservative Roman Church was not glad with these new religious orders in the slightest sense. The fact was that those orders were so successful that many Christians abandoned the traditional church life and resorted to the non-orthodox preachers. Thus, if the Roman Church allowed them to survive and thrive, it ran the risk of losing its very *raison-d'être*, namely to serve as the only intermediary between God and mankind. Eventually, the threatened Roman church, which seemed to care more about its survival than the new spiritual needs of its followers, accused Pierre Valdès (1140?-1217?; also spelled Valdez, Valdo, Waldes, and Waldo) the founder of the Waldensian order of heresy and excommunicated him in 1184.⁶² Yet, the church soon copied the model of Valdès and sent Saint Francis of Assisi (1182?-1226) to

⁶¹ The Bible, Mark 16:15.

⁶² This was the beginning of the era where people would be accused of heresy if they did not learn their faith through the Church but through individual reading of the Bible.

launch the Franciscan order in 1209 so as to win back the lost followers.

It is of course not the purpose here to trace the myriad factors that eventually converged and produced the Reformation. After all, the three factors mentioned above are hardly sufficient to “explain” this revolutionary movement. Rather, the purpose here is to demonstrate the fact that the Roman Church could not meet the expectation of the general public, due to its wealth and corruption, its internal chaos, and the insufficiency of its good-old sacramental system. Everywhere in Europe people awaited the arrival of a religious order that would satisfy their new spiritual needs.

4.3.3 Lutheranism, Calvinism and Puritanism

In the second decade of the sixteenth century, Pope Leo X (1475-1521; r. 1513-1521) planned to build a Basilica of Saint Peter in Rome, and so he did what his predecessors did to collect money, namely to sell indulgences. Generally speaking, after a Christian confesses his or her sin at confession, he or she still has to face punishment either on earth while living or in purgatory after death. The Roman Church, however, grants partial or plenary indulgences for those who contribute money to such activities as crusades and the building of churches. In other words, as a general saying about the indulgence system in those days: “As soon as the coin in the coffer rings, the soul from purgatory springs.”⁶³ This was yet another typical symbolic ritual offered by the church.

But Martin Luther, as many of his contemporaries similarly believed, claimed that the Pope has no jurisdiction over purgatory, thus it is impossible for the church to promise immediate release from purgatory. Also, he was deeply convicted that a Christian who is truly contrite should seek rather than flee penalties.⁶⁴ So in

October 31st 1517, he posted on the door of the Castle Church at Wittenberg his famous ninety-five theses, attacking front-to-front the sacramental system of the Church. This immediately created a huge wave of anti-Church movement and officially began the Great Reformation.

Generally speaking, Luther offered to his followers a new type of religious experience that was more spiritual and less symbolic. He believed that people could not be saved through good works and sacraments but through faith in Jesus Christ alone. His innovative view of Christianity was dominated by his personal deep sense of sin and inner struggle, and the spiritual rest and peace he attained when he found in Christ’s gospel the message of God’s mercy and forgiving love for all who err – another example of interest in the humanity of God. This made him to see the corruption and condemnation of the natural man as the central fact in human experience, and release from God’s wrath as the supreme need of all humanity. In the mean time, Luther assured his followers that once man believes in the gospel message of a God of loving kindness, he is already saved and at peace. In other words, the new and true means of salvation is faith alone, faith that God is the loving Father seeking the lost sheep and welcoming the prodigal. To sum up, Luther placed mankind directly in the arms of God, trusting Him and relying on His forgiving grace.

One of the most important innovations of Luther was that he recognized religious feelings as the central fact of Christian faith. Under the Lutheran system, salvation was to be achieved through an inner and intensely personal relation between God and one’s soul. It fills a Christian’s soul with various intensive religious sentiments like the love of God, the sinfulness of humanity, the desire of salvation, the forgiving grace of God, and the delight of contrition. Such humanist nature of Lutheranism is especially evident when compared to the highly symbolic sacramental system of the Roman Church that provides meagre religious experience to one’s spiritual

⁶³ See Columbia College, *Chapters in Western Civilization*, vol. 1, pp. 346.

⁶⁴ The Bible says: “He is damned who flees damnation.” See *ibid*.

life during the process of achieving salvation. In short, Luther provided his followers with a rich and intense spiritual life.

Calvinism, founded by John Calvin (1509-1564) the French-born Swiss theologian, was yet another product of the Reformation. With dreaded logic, Calvin argued that the true message of the Bible is not the love of God as proposed by Luther but the utter corruption and impotence of man in the face of God's omnipotence.⁶⁵ Accordingly, salvation is wholly in His hands; whom He will save He will, whom He will damn is predestined to the eternal flames. This is the basics of his theory of *Predestination*.

As such, obedience to God's command was then their only guideline for life in this world. God's commands the godly man will obey, not because they are good in themselves, but simply because He has commanded them. After all, "everything pertaining to the perfect rule of a good life the Lord has so comprehended in his law that there remains nothing for man to add to that summary."⁶⁶ Christian life became a rigorous subjection to God's prescriptions.

In the meantime, Calvin also insisted that a true Christian should live a perfect moral life as suggested in the Bible. At first glance, this seemed to contradict his concept of Predestination. After all, if salvation is already predestined by God before we were even born, then what is the purpose of good works we do on earth? However, Calvin also made his followers believe that those who have been elected by God for salvation must be those who lived a strict moral life. A virtuous life does not guarantee salvation, but a vicious life however ascertains non-salvation. Thus, by living a perfect moral life, a Christian can at least receive partial conviction of being elected.

⁶⁵ See Calvin's most influential work entitled *Institutes of the Christian Religion* published in 1536.

⁶⁶ John Calvin, *Institutes of the Christian Religion*, ed. John T. McNeill, trans. Ford Lewis Battles (Philadelphia: Westminster, 1960), IV.x, par. 7.

In summary, a similar humanist concern with one's inner feelings and one's human nature could be found in Calvinist doctrines as well. The overwhelming preoccupation of living a virtuous life and of persuading other brethren to follow them suggested an enormous interest in human nature, similar to the case of apostolic life in the Twelve Century Renaissance and the Classical way of living in Classical Greece. On a similar tone, the concept of predestination made the Calvinists to always experience an intense religious feeling when following God's commandments, since they sincerely believed that God had called them to enchant the entire world with various virtues prescribed in the Bible. In short, the Calvinists constantly enjoyed a spiritual life full of variety.

Lutheranism and Calvinism were mostly restricted to the European Continent. In North America, the new dominating religious force was Puritanism, sometimes regarded as a variation of Calvinism. Yet the Puritans were more extreme in that not only did they consider the Bible as the only source of religious truth, but they went so far as to reject every single Catholic sacrament from their religious life. For them, the only method to achieve religious virtue was to serve God to the best of their abilities by concentrating their energy on tasks to which they felt themselves called; and to fulfill His service they needed a firm sense of responsibility and a strict discipline that would let no energy go waste, which they acquired through careful reading of the Bible. They were really the stern warriors of God with an indomitable will.

One of their common tasks that they felt called was, similar to the case of Calvinism, to follow a strict moral life as prescribed in the Bible. As an example of this Puritan ideal at its best, in a wonderful portrait of Colonel Hutchinson, it was mentioned that neither in youth nor in riper years did he descend to any moral impurity. His aim was to attain self-command, to be master of himself, of his thought, of his speech, and of his acts. His life was orderly, sparing of diet and self-indulgence; he rose early, he never was at any time idle, and hated to see any one else so. He had a

loving and sweet courtesy to the poorest, and would often employ many spare hours with the commonest soldiers and poorest labourers. His life was overshadowed by an intense moral concentration. With this kind of dreadfully disciplined life, he was no doubt qualified to say: “if ever God instilled an intense love of moral beauty into the mind of any man, He has instilled it into mine.”⁶⁷ In short, Colonel Hutchinson had lived his warrior-type of moral life under strong religious calling.

Other than the pursuit of a strict moral life, a second area where the Puritans constantly felt the calling of God was, surprisingly enough, in everyday labour of their profession. One of the most fundamental effects of Puritanism was that it added a religious consecration to all labour in Lord’s vineyard, namely this earth. Under these new doctrines, “the only way of living acceptable to God was not to surpass worldly morality in a monastic asceticism, but solely through the fulfilment of obligation’s imposed upon individual by his position in this world.”⁶⁸ In other words, the Puritans received an intense religious feeling from their everyday divine duty that they thought they were performing. To sum up, a similar set of humanist concerns could be identified in the Puritan doctrines. No doubt that the age of Reformation should be classified as the most humanist era after the close of Dark Age.

In summary, the Twelfth Century Renaissance, the Italian and Northern Renaissances, and the Reformation all demonstrated enormous interest in human nature, human feelings, and spiritual life. That was the second time when human spirit in the West received a high regard from the mankind himself.

⁶⁷ For the complete account on Colonel Hutchinson, see John Richard Green, *A short History on English People* (New York: American Book Company 1916), ch. 7, sec. 1, pp. 462-4.

⁶⁸ Max Weber, *The Protestant Ethic and Spirit of Capitalism*, pp. 80.

4.4 Philosophers and the Scientific Revolution⁶⁹

So far in this chapter, it has been shown that the development of European culture in the first six hundred years of the second millennium AD had been encompassing various humanist issues. However, a series of epoch-making philosophers in the seventeenth century soon struck a decisive blow to this hard-won humanist victory. These philosophers were interested in neither the religious experience of Christian faith nor the rhetoric in Greek and Latin literature. Rather, they were obsessed with the natural world. They were the first generation of modern scientists.

4.4.1 Study of Nature in the West before Copernicus

Science, the systematic study of the natural world, was certainly not a new discipline. Back in Classical Greece, people already began to study the nature in philosophical and metaphysical terms. For instance, early Greek natural philosophers like Thales (624?-546?), Anaximander (610?-546) and Anaximenes (570?-500?) were interested in the metaphysical aspect of the universe, as each of them proposed that matter is composed of one single element (water, chaos, and air, respectively). Later towards the end of the Classical Age, natural philosophers like Leucippus (490?-430?) and Democritus (460?-370?) founded the theory of atomism, stating that everything in the universe, including our spirit, is a complex

⁶⁹ The following secondary source materials have been consulted for this section: Edward Grant, *Physical Science in the Middle Ages* (Cambridge, New York: Cambridge University Press, 1977); Anneliese Maier, *On the Threshold of Exact Science: Selected Writings of Anneliese Maier on late Medieval Natural Philosophy*, ed. and trans. Steven D. Sargent (Philadelphia: University of Pennsylvania Press, 1982); John Randall, *The Making of the Modern Mind*; Frank S. Taylor, *A Short History of Science* (London; Toronto: Heinemann, 1939); Colin M. Turbayne, *The Myth of Metaphor* (Columbia: University of Carolina Press, 1970); Julian Harris, ed., *The Humanities: An Appraisal* (Baltimore: University of Wisconsin, 1950).

composition of some simple atoms. However, it must be borne in mind that scientific study of the natural world had never occupied a dominant position in their culture, since it was the shaping of body and soul that was central to their life.

From the Hellenistic Age onwards, however, the Greeks no longer restricted their energy on humanist issues but instead diverted it into other areas, especially science. The most important difference between science in Classical and Hellenistic Age was that the latter put a much stronger emphasis on the mechanical and mathematical instead of philosophical and metaphysical aspect of nature. In astronomy, for instance, Aristarchus of Samos (310?-230?) theorized the radical view that earth and planets revolve around the sun – a full 1800 years before Copernicus suggested the same thing. He had also used the occasion of lunar and solar eclipses to measure various advanced physical qualities of the celestial bodies.⁷⁰ In mathematics, Euclid (325?-270?) wrote his treatise on geometry entitled *Elements of Geometry*, which later served as the textbook of all teaching on geometry until the mid of nineteenth century. In geology, Eratosthenes of Cyrene (284?-192?) correctly calculated the circumference of the earth, and devised the most precise world map of his time. In medicine, Herophilus of Chalcedon (335?-280?), through dissection of human body, identified the brain as the centre of the nervous system and the site of intelligence. In physics, Archimedes (287?-212?) discovered the formulas for the area and volume of various geometric figures, applied geometry to hydrostatics and mechanics, devised numerous ingenious mechanisms such as the Archimedean screw, and formulated the principle of buoyancy. This was the first great Scientific Age in the west.

⁷⁰ Apart from the size of the moon, the earth and the sun, he had also estimated the angular diameter of the moon, the distance between the moon and the earth, and other measures. His measures were later proved to be inaccurate, but the fault was in his lack of accurate instruments rather than in his correct method of reasoning.

The pursuit of scientific knowledge had considerably slowed down with the arrival of the Roman Age. There had been only sparse scientific discoveries, like those by Galen (129?-200?) in anatomy, physiology, and therapeutics. The Roman scientists were better reputed as encyclopaedists. For example, Pliny the Elder (23AD-79) wrote the 37-volume *Historia Naturalis* or *History of Art* that discussed everything from cosmology to economics. Similarly, Aulus Cornelius Celsus wrote an encyclopaedia called *Artesa* in which he talked about agriculture, military science, rhetoric, jurisprudence, philosophy, and medicine. Unfortunately, only the eight books on medicine have survived and are now known as *De Medicina* or *Of Medicine*. Preservation of existing scientific knowledge had replaced creation of new one – a clear sign of slowdown in scientific progress.

Unfortunately, even this lingering interest in nature completely vanished from the continent once Christianity has embraced the West. That was mainly because the church opposed all pursuits of scientific knowledge⁷¹ and had soon drawn most of the talented men into its service. Furthermore, knowledge of Greek letters had become rare, and without access to the hardcore of Greek science, the Western world could never rise above the level of Latin encyclopaedists. Hence, there was hardly any scientific works composed in the Dark Age, let alone new discoveries. Nonetheless, astronomy survived in form of astrology, chemistry transmuted into alchemy, and mathematics was still used in creation of Calendar and fixation of dates for the feasts.

From the Twelfth Century Renaissance until the Italian Renaissance, a new vigorous wave of study on nature emerged,

⁷¹ As an extreme example, the theologian Tertullian (160 – 230) once described the natural philosophers as “purveyors of damnation and heresy.” See Edward Grant, *Physical Science in the Middle Ages*, pp. 4. This made any alliance between Athens and Jerusalem unthinkable.

usually known as the scholastic movement mentioned above.⁷² The scholastics were, first and foremost, philosophers who approached problems not from the standpoint of physical theory, but rather from that of metaphysics and ontology. They did not attempt to describe the natural world in exact mathematical and mechanical terms with the help of precision instrument, experiment and mathematics. Instead, they were more interested in ontological and metaphysical issues like “what things are” and “how we know what they are” through readings of the Bible and other authoritative theological works. It is not surprising, therefore, that their achievements could be found in their speculations about various basic principles, concepts, and methods of natural philosophy. Almost every fundamental concept later used by the scientists in the seventeenth century was discussed and given a clear ontological definition by scholastic thinkers: space, time, mass, force, energy, motion, velocity, density, gravity, inertia, and so on. Apart from this ontological emphasis, it must also be borne in mind that scholasticism exclusively served to teach and strengthen faith. Thus, “science” in this epoch was unlike “science” in the sixteenth century both in terms of methodology and purpose.

The great humanists later in the Italian Renaissance equally did not show much concern with science. To recall, these humanists who were mostly interested in their human nature came to feel dissatisfied with a certain study of nature that seemed quite irrelevant to the immediate issues of humanity. For this reason, Petrarch and Erasmus doubted or even ridiculed the pursuit of scientific knowledge. Had Renaissance Italy not centred the energies

⁷² Most of the important studies on the evolution of science during the first half of this second millennium were written by a German nun called Anneliese Maier (1905-1971). However, given the importance of her works for the field of scholastic natural philosophy, it is perhaps surprising that virtually nothing she wrote is available in English. The discussion on scholasticism below is mostly taken from a brief introduction of her only translated work. See Anneliese Maier, *On the Threshold of Exact Science*, pp. 14-6.

of her best intellects on the essentially non-scientific wisdom, she might have inherited the vigorous interests in nature found in the Twelfth Century Renaissance and produced a Galileo long before the seventeenth century. In that case, the West might have been spared three hundred years of weary wrestling with the bare bones of a Latin and Greek culture whose true spirit she had rarely understood.

The Italian humanists’ disdain of science however did not mean that their deeds had been entirely reactionary. Quite contrarily, their ferocious attack on the scholastics’ ontological study of nature had cleared the floor for the coming of experimental and mathematical science in the seventeenth century. To understand this point, let’s not forget that the methodology of Thomas Aquinas and other “natural philosophers” was mostly based on Aristotelian logic. This system of logic eschewed actual experimentation and depended for its premises upon authority or common observation, both of which are usually erroneous and insufficient. To be precise, Aristotelian science was itself the outgrowth of argument for the sake of convincing an opponent; its logic was the method of getting him to admit a general principle, and then showing that his conclusions were wrong. Such logic is admirable for expounding and developing an authoritative body of principles, like the law, or a theology rooted in revelation. Unfortunately, it could teach little that was not already known. For this reason, Roger Bacon (1214?-1292) an early English scientist once wrote:

There are two modes in which we acquire knowledge: argument and experiment. Argument shuts up the question, and makes us shut it up too; but it gives no proof, nor does it remove doubt and cause the mind to rest in the conscious possession of truth, unless the truth is discovered by way of experiment... Therefore reasoning does not suffice, but experiment does.⁷³

⁷³ Roger Bacon, *The Opus Majus of Roger Bacon*, trans. Robert Belle Burke (Philadelphia: University of Pennsylvania Press; London: Oxford University Press, H. Milford, 1928), vol. 2, part. 6, ch. 1.

Thus, in a sense, the violent attack of the Italian humanists on scholasticism greatly helped to draw an end to the ontological and argumentative methodology that proved to be insufficient.

In the meantime, another contribution the humanists could fairly claim to have made to the rise of mathematical and physical science was to bring back to Europe the long-disappeared ancient works of Hellenistic scientists and mathematicians. This was no doubt a by-product of their feverish search of Latin and Greek literature in Constantinople and the Arabian world. Particularly noteworthy amongst the Hellenistic scientists was Archimedes who was known for his mathematical methodology.

Another important fact to bear in mind was that even during the height of the humanistic preoccupation with literary and ethical interests, there were still many seeking natural knowledge. There were two major scientific schools during the Renaissance era, the Ockhamites in Oxford and Paris, and the Averroistic Aristotelians in Padua. About 1500 in Paris, there was a revived interest in uniformly accelerated motion, falling bodies and infinitesimals, which Erasmus at once ridiculed as “silly discussions.”⁷⁴ Yet, despite the tease of humanists, the scholars in Paris persisted.

In summary, natural science in the eve of Copernicus hardly represented a complete break with the past, but was rather intimately connected to the curiosity in nature found in the Twelfth Century Renaissance as well as the discovery of Hellenistic scientific works during the Italian Renaissance. The West was all set for a scientific revolution. She only awaited some great minds to launch it. The first among them was Copernicus.

4.4.2 The Copernican Revolution

⁷⁴ See John Randall, *The Making of the Modern Mind*, pp. 216.

The epoch-making discovery of Nicolaus Copernicus (1473-1543) is usually used to mark the beginning of modern science. At first glance, this Polish astronomer did not appear much different from the scholastics. He believed in Heaven and God; he believed in the simplicity and harmony of the cosmos; most important, like other scholastics of his time, his ground-breaking discovery came not from his own observation of the stars, but by reading works of Cicero, Aristarchus, and Ptolemy (100?-170?). Only after analyzing their conclusions did Copernicus set to formulate his own cosmology, and even then without much reference to fresh observation of his own.

Until many years after the posthumous publication of his *De Revolutionibus Orbium Celestium* or *On the Revolution of the Heavenly Spheres* in 1543, the West was for a very long time satisfied with geocentricism⁷⁵ that sat easy with the Christian doctrines and simple observation. After all, people were mostly interested in the ontological and metaphysical significance of the celestial bodies, without much reference to their physical qualities and mathematical relationships. For this reason, few people had seriously questioned the validity of the tremendously complicated theories of epicycle⁷⁶ and transposition⁷⁷ proposed by the authorities. Although these theories could barely cover the insufficiency of pure

⁷⁵ This theory proposed by the Greek astronomer Ptolemy suggested that all heavenly bodies are perfectly spherical and revolve around the earth in perfectly circular orbits and in perfectly constant velocity.

⁷⁶ In Ptolemaic cosmology, the planets were assumed to revolve in small circles, called epicycles, whose centres revolved around the earth in the vast circles, or deferents, of the spheres. Later to account for the precession of the equinoxes and other phenomena, astronomers found it necessary to add more epicycles and to make both epicycles and deferents eccentric. Although the theory of epicycle preserves the concept of perfectly circular orbits of the celestial bodies, it nevertheless rendering Ptolemaic cosmology extremely complicated.

⁷⁷ Because geocentricism occasionally cannot adequately explain the seemingly irregular appearance of certain celestial bodies even with the help of epicycles, some natural philosophers hopelessly proposed that planets at times transpose from one position to another.

geocentricism, it nevertheless had greatly damaged the concept of simplicity of the mathematical relationships between the celestial bodies.

However, dissatisfied with the intricate geocentricism, Copernicus set out to formulate a simpler cosmology that would better explain the apparent irregular velocity of the heavenly bodies in terms of a series of simple and uniform motion. He summarized his cosmology called heliocentricism in the following way:

...I eventually found by long and intensive study [of ancient astronomical records] that if the motions of the wandering stars are referred to the circular motion of the Earth and calculated according to the revolution of each star, not only do the phenomena agree with the result, but also it links together the arrangement of all the stars and spheres, and their sizes, and the very heaven, so that nothing can be moved in any part of it without upsetting the other parts and the whole universe.⁷⁸

To put it differently, he believed that the simplest and most systematic explanation of the heavenly motion required that every planet, including the earth, revolve around the sun in perfectly circular orbits and in perfectly constant velocity. This new cosmology explains the seemingly irregular appearance of the celestial bodies without the excessive use of transposition and epicycles.⁷⁹ Such was his serene confidence in the mathematical simplicity of the universe.

⁷⁸ A passage from his "Letter to Pope Paul III" which he used as preface for his *De Revolutionibus*. See Nicolaus Copernicus, *On the Revolutions of the Heavenly Spheres*, trans. Alistair Matheson Duncan (New York: Barnes & Nobles; Newton Abbot: David & Charles, 1976), pp. 26. For the whole letter, see *ibid.* pp. 23-27.

⁷⁹ To be precise, because he retained the ancient belief that the planets move in perfect circles, he was forced to slightly utilize epicycles to explain the incongruity between his theory and his astronomical records at hands.

To sum up, through reason and simple mathematics, Copernicus discovered that the earth moves around the sun in a simple orbit. His most important contribution to the rise of modern science, however, was that old authorities, simple observation and common sense were not infallible; only reason operating by mathematical calculation could be trusted. He passed down to later generations of natural philosophers a conviction that mathematical analysis must take place of vulgar observation and is the only unshakable source of knowledge.

Johannes Kepler (1571-1630) later followed Copernicus' footprint of spending the entire life looking for the exact mathematical relations between the celestial bodies. Like his great predecessor, this German astronomer shared the passion for simplicity by rigorous mathematics and reasoning. He had an important edge over Copernicus, namely that he had at his disposal an accurate and comprehensive set of astronomical observations collected by his Danish master Tycho Brahe (1546-1601). When trying to figure out the shape of orbit that would fit all Brahe's observations, Kepler noticed that Copernicus' conclusion on perfectly circular orbits is theoretically impossible. Through trials and errors, he soon discovered that the orbit must be a simple ellipse without any epicycles and that the sun locates not at the centre but at one of the focuses of the ellipse, which success confirmed his faith of "the simplicity and ordered regularity of nature."⁸⁰ Elated at this discovery, he continued his study and found two other important laws on planetary movement.⁸¹

⁸⁰ See John Randall, *The Making of the Modern Mind*, pp. 231.

⁸¹ Kepler's second law quantitatively specifies that, supposing an imaginary line is drawn from the sun to a planet, the area swept out by the line in equal periods of time is the same at all points in the orbit. This means that planets move faster when closer to the sun, and vice versa; and his third law states that the ratio of the cube of the average distance of the planet from the sun to the square of the time to complete one revolution around the sun is the same for all the planets including the earth.

Kepler's contribution to the rise of modern science is that he had furthered Copernicus' success of seeking simple mathematical relations in the natural world. He had shown that the celestial bodies follow universal, simple and regular laws that can be fully illustrated in mathematical terms. Moreover, he went further than his predecessor to stress the necessity of mathematically verifying his theories by fresh observation, something that Copernicus was never able to do. The necessity of experiment was established.

Galileo Galilei (1564-1642; generally referred by his first name) was yet another important figure in the Copernican revolution. In 1604, a new star appeared and he used it to prove that changes take place in the heavens. Later with the help of the newly invented telescope, he discovered mountains on the moon, thus destroying the belief in the smoothness and the perfect sphericity of the moon. He also discovered that Jupiter has four satellites and that Venus is a dark body, thereby providing powerful proofs for Copernicus' heliocentricism.

Again, it is not his discoveries but his methodology that mainly interests us. Thanks to the effort of Galileo, all later scientists followed his footprints and resorted to mathematics and experimentation in all study of the universe. This meant that the metaphysical method of Thomas Aquinas that resorted to authoritative texts and simple observation failed to compete with the new experimental and mathematical approach. The difference in terms of attitude between the scholastics and the later scientists is best illustrated from the following attack of a Galileo's opponent. That opponent wrote that the satellites of Jupiter that Galileo discovered "are invisible to the naked eye, and therefore can exercise no influence on the earth, and therefore would be useless, and therefore do not exist."⁸² To such old-fashion attack Galileo could

⁸² See John Randall, *The Making of the Modern Mind*, pp. 233.

only sigh: "these people believe there is no truth to seek in nature, but only in the comparison of texts."⁸³

Another significance of this Italian astronomer, which was in fact shared by Copernicus and Kepler as well, was the heightened focus on the physical and mathematical side of the natural world, and a decreasing interest in the metaphysics of the heavens. Galileo put this new spirit quite candidly in one of his book. For him, the kind of truth that he sought in his scientific investigation "is not the true and inner essence of substances, but knowledge of some of their qualities."⁸⁴ This was the exact opposite of the aim of scholasticism. While the old spirit exclusively sought to study the heavens in terms of their significance and purposes to humanity, the new spirit neglected the essence of things but solely focused on some immutable physical qualities of the nature with the help of mathematics. That was an unmistakable divergence with the humanist tradition since the Twelfth Century Renaissance.

4.4.3 The Cartesian Revolution

This new scientific spirit that exclusively focused on the mathematical and physical side of nature took another giant leap forward with René Descartes (1596-1650). Roughly speaking, up to the day of Descartes, the absolute majority of people in the West still believed that mysterious divine power governs everything on earth. Kepler, for instance, in his earliest publication entitled *Mysterium Cosmographicum* or *Mystery of the Universe*, still thought that the universe is the image of Trinity: the central sun is the Father, the surrounding spheres the Son, and the geometrical relations between the sun and the spheres constitute the Holy Spirit.⁸⁵ In the later stage

⁸³ Quoted in Frank S. Taylor, *A Short History of Science* (London; Toronto: Heinemann, 1939), pp. 225.

⁸⁴ Galileo Galilei, *Opere*, v.187; Quoted in John Randall, *The Making of the Modern Mind*, pp. 221.

⁸⁵ See John Randall, *The Making of the Modern Mind*, pp. 236

of his life, he recalled his earlier thinking and wrote that “formerly, I believed that the force which moves the planets was really a soul.”⁸⁶ Even Galileo rarely challenged the old authorities on some larger issues like how exactly the universe works. He was mostly a physicist who confined himself to the study of mechanical and astronomical phenomena, and he strongly hesitated to generalize his mathematical methods and principles to the entire universe so as to construct a completely new world view.

This speculative work was almost single-handedly accomplished by Descartes. In 1637, this French philosopher published his most well-known opus entitled *Discours de la Méthode* or *Discourse upon Method*. The most important idea to be found in this book was that he infinitely generalized the mathematical method by reducing the once mysterious and spiritual nature into a purely mathematical and physical system with kinetic energy as the only source of momentum, utterly neglecting the metaphysical side of the natural world. To put it differently, he suggested that we should stop studying the nature in theological and metaphysical terms and stop considering it as a divine creation ran by mysterious spiritual forces. Rather, the nature should be seen as a spirit-free and purely mechanical machine, in which kinetic energy is the only source of change and in which mathematics is the only relation among all the objects in the nature.

This purely mathematical interpretation of nature is what modern science is all about. Under this brand new worldview, all kinds of formerly spiritual and divine energy were reduced to plain energy of motion; while all qualitative differences in God’s creations were seen as quantitative differences in terms of size, shape, and speed of motion of particles. In Descartes’ own words, “[I have] described this earth, and generally the whole visible world, as if it were merely a machine in which there was nothing at all to consider

⁸⁶ Johannes Kepler, *Opera*, i.176; Quoted in John Randall, *The Making of the Modern Mind*, pp. 237.

except the shapes and motions of its parts.”⁸⁷ In the case of living creatures, for example, life “becomes” a mere matter of chemical and physical changes, and even the body of human is merely a physical machine.⁸⁸ Life is no longer a divine creation running with mysterious spiritual energy, but merely a body of organic substance with complex physical operations at work. His strong conviction in this purely mechanical method could be shown in his following quote in Archimedean rhetoric: “Give me extension and motion, and I will construct the universe.”⁸⁹ This corresponded to the observation of Anneliese Maier:

Seventeenth-century philosophers were interested above all in constructing large-scale systems and forming a new world view, and they paid far less attention to the detailed articulation of their metaphysics...[especially, the Cartesians] tried to eliminate completely the qualitative aspect of motive force.⁹⁰

Descartes had reached the notion of seeking an explanation of all things in the world in purely mathematical and mechanical terms.

Merely inventing a new worldview is certainly not enough. What is equally important is to demonstrate through experiments that everything in the world indeed functions in purely mechanical and mathematic fashion. In 1637, along with his *Discourse upon Method*,

⁸⁷ See René Descartes, *Principles of Philosophy*, IV.188; full text cited in René Descartes, *Descartes: Selected Philosophical Writings*, trans. John Cottingham, Robert Stoothoff, and Dugald Murdoch (Cambridge; New York: Cambridge University Press, 1988), pp. 160-212.

⁸⁸ Interestingly enough, this very concept had already been suggested by Leonardo da Vinci more than a hundred years ago, as he once wrote that “the bird is a machine working through mathematical laws.” Quoted in John Randall, *The Making of the Modern Mind*, pp. 236.

⁸⁹ René Descartes, *The World and Other Writings*, ch. VI; quoted in Colin Turbayne, *The Myth of Metaphor*, pp. 67. Archimedes said something similar about his theory on leverage in 230BC: “Give me a lever long enough and a place to stand, and I will move the world.”

⁹⁰ Anneliese Maier, *On the Threshold of Exact Science*, pp. 15-6.

he published the first fruits of his new methodology by applying it in geometry, optics, and general physics. Unfortunately, his unexpected early death in 1650 at the age of fifty-four forbade him to further generalize his new method. Nevertheless, he had successfully spread the fame of his mathematical interpretation of nature through the length and breadth of Europe, encouraging many lonely investigators to continue his unfinished works.

Much of Descartes' uncompleted work was accomplished by Sir Isaac Newton (1642-1727). To recall, Descartes proposed people to take the nature as a great machine in which the language of mathematics could be universally applied. However, Descartes' cosmic picture was only a sketch which progresses in mathematics and technology did not permit him to fill in by the time of his early death. Thus, he left to his disciples a system of nature worked out as a provisional hypothesis, which he had not had time to verify by careful experiments.

All the experimental works were completed by Newton. This English scientist invented, perhaps by accident, calculus, the method of measuring movement of continuous growth. Calculus is the last link in the mathematical interpretation of the world. From then on, people could bring all measurable phenomena into the unified world of mathematics, and calculate, predict, and control light, heat, magnetism, and electricity. With this powerful new tool of calculus, Newton proceeded "to subject the phenomena of nature to the laws of mathematics"⁹¹, most noticeably in physics. He first figured out the mathematical description of a falling object, then he proceeded to generalize his law to all motions on earth, and later further generalize it to describe the motion of all planets in the universe.⁹² All these discoveries were made when he was but twenty-three years of age.

⁹¹ Sir Isaac Newton, *Mathematical Principles of Natural Philosophy*, trans. Andrew Motte, vol. 34, *Great Books of the Western World* (Chicago: Encyclopaedia Britannica, 1952), preface, pp.1.

⁹² Following his death there was found in his papers part of a draft letter that the elderly Newton had written, a letter which people usually regard as his

At long last, what Descartes had dreamed came true: men had arrived at a completely mechanical and mathematical interpretation of the entire universe in exact, mathematical, and deductive terms. The world became one huge, related, and uniform machine, the fundamental principles of whose action were known. One law can describe the whirling planet and the falling grass blade; and the same law could explain the action of every object in the universe. Thus, the universe now truly became a vast perpetual motion mathematical machine, and every event in it can be deduced mathematically from the principles of its mechanical action.

4.4.4 The Enlightenment Age

Newton's great mathematical system struck the imagination of the educated class of his time and spread with amazing swiftness. Intellectuals everywhere in Europe soon began to apply this Cartesian

self-evaluation: "In the beginning of the year 1665 I found the Method of approximating series and the Rule for reducing any dignity of any Binomial into such a series. The same year in May I found the method of Tangents of Gregory the Slusius, and in November had the direct method of fluxions (i.e. Calculus) and the next year in January had the Theory of Colours and in May following I had entrance into the inverse method of fluxions. And the same year I began to think of gravity extending to the orb of the Moon and having found out how to estimate the force with which a globe revolving with a sphere, presses the surface of the sphere, from Kepler's rule I deduced that the forces which keep the planets in their orb must be reciprocally as the squares of their distances from their centres: and thereby compared the force requisite to keep the moon in her orb with the force of gravity at the surface of the earth, and found them to answer pretty nearly. All this was in the two plague years of 1665 and 1666, for in those days I was in the prime of my age for invention and minded Mathematics and Philosophy more than at any time since." Additional Manuscripts in Cambridge University Library 3968.41, f. 85; quoted in Richard S. Westfall, *Never at Rest: A Biography of Isaac Newton* (Cambridge; New York: Cambridge University Press, 1980), pp. 143.

method in every domain, and it suddenly became the only way to obtain knowledge. This Cartesian revolution completed by Newton towards the end of the seventeenth century abruptly sent Europe into the Enlightenment Age.

It should not be surprising that the enlightened minds had applied this Newtonian method in practically every discipline in natural science. No in-depth understanding on the inner mechanics of nature is possible without first knowing more about its physical qualities. This was the reason why the enlightened intellects turned themselves to the amassing of a vast body of concrete descriptive facts about things in the nature, which they were content for the most part to gather and classify. For example, Abraham Gottlob Werner (1749-1817) the German geologist spent his life mapping out different types of rocks and succeeded to demonstrate the chronological succession of rocks, thereby laying the foundations for the later epoch-making theories of Sir Charles Lyell (1797-1875); Henry Cavendish (1731-1810) the British chemist, on the other hand, spent his life figuring out the properties of hydrogen and water. Some impatient minds even began to construct a mathematical system outside physics. For instance, in chemistry, Antoine Laurent Lavoisier (1743-1794) the French chemist, with his superior organizing ability, introduced effective quantitative methods in the study of chemical reactions and successfully founded the science of quantitative chemistry. In anatomy, Giovanni Borelli (1608-1679) did a classic analysis of muscular and skeleton motion in human body in terms of simple machines and explained locomotion, respiration, and digestion as purely mechanical process. In short, everything in nature was regarded as a machine that could be described in full with the language of mathematics.

Some bold minds had even begun to apply the Cartesian method in the study of human nature and human society, in hope of producing a purely mechanical and mathematical “social physics”. The methodology of these early social scientists was highly similar to that of Newton. To recall, Newton first sought the mathematical

way to describe the free fall of an object on earth, and then generalized this law of gravitation to all motion in universe. The social scientists likewise began with some fundamental investigation of human nature in mechanical and sometimes mathematical terms. A rapid glance over the titles of works belonging to this category shall suffice to illustrate their essence: *Enquiry concerning Human Understanding* by John Locke (1632-1704), *Treatise of Human Nature* and *Inquiries concerning the Human Understanding* by David Hume (1711-1776), *Ethics* by Baruch Spinoza (1632-1677), and *Principles of Morals and Legislation* by Jeremy Bentham (1748-1832). As an example, Spinoza attempted in his *Ethics* to deal with men’s passions and motives as if they were part of a geometrical system. Bentham even went so far as to develop a calculus of pleasures and pains for human beings, usually known as the utilitarianism.

These social scientists then applied their fundamental principles concerning human nature to problems in moral, economics and politics, similar to Newton’s universal application of his law of gravitation. As an example, Thomas Hobbes (1588-1679) the English political theorist hoped for a science of human nature in the rigorous sense of a human physics. Its source was to be observation and analysis of the processes of thought within one’s own mind; its fundamental principle was sensationalism, namely that all knowledge and all mental life began from the reception of sensations from without; its laws were those of association of these elements into various more complex groups. The analogy with Newtonian physics was complete.

In a comparable fashion, Montesquieu (1689-1755; title of Charles de Secondat) the French philosopher, in his *Esprit des Loix* or *The Spirit of Laws*, studied human nature, human morality as well as human society as if they were objects in Newton’s world of physics, meaning that human always passively responded to invariable laws of human physics. For example, he attempted to explain the differences among nations with weather as the main

factor, as if differences in weather had a direct impact on a nation. This was yet another piece of evidence on how the enlightened minds considered the human society as a mechanical system that was subjected to various immutable laws.

The application of Newtonian physics in the social study later proved to be critical in the formation of modern society. As the enlightened minds spent more and more time on the investigation of humanity, they came to realize that the perfectly harmonious order of nature represented a sharp contrast to the chaotic social order with misfortunes, crimes and disorders. They set off looking for the roots of such chaos in human society and the possible remedies for it.

From their mechanical and deductive studies on human nature and human society, they realized that the ideal social order should be “linked together in the bonds of eternal, immutable, ineluctable, and inevitable laws, which individuals and governments would obey if they were once made known to them.”⁹³ “These laws are the rules of justice, of morality, of conduct, useful to all and to each. Neither men nor governments make them nor can make them. [...] these laws are irrevocable, they pertain to the essence of men and things; they are the expression of the will of God.”⁹⁴ Thus, once the population have learnt these basic component elements that together constituted the ideal society, the chaos in the current public order should vanish at once.

They concluded that chaos in human society came from the state interference and the privileged aristocracy because these artificial agencies disturbed the natural harmonious order by disrupting the above mentioned immutable laws, and they subsequently urged the government to assist in the protection of

⁹³ Charles Gide, *A History of Economic Doctrines from the Day of the Physiocrats to the Present Day* (Boston: D. C. Heath and Company, 1900), I.i, introduction. pp. 2.

⁹⁴ Pierre Samuel Dupont de Nemours, *Maximes du Docteur Quesnay*; quoted in John Randall, *The Making of the Modern Mind*, pp. 323

these natural laws but refrain from doing anything else. In other words, they sought to build up by pure reasoning an ideal conception of social order best suited for human being. This was the origin of humanitarianism: all men have equal rights to happiness and liberty, and no man has the right to deprive any other man of the exercise of his rights. This humanitarian ideal later shaped the American constitution in 1776 and provided the intellectual background for the French Revolution in 1789.

Even Christianity could not avoid being “enlightened”. A new natural religion that emphasized on reason and morality rather than the omnipotence and the love of God emerged in the Enlightenment Age. This new religious movement stressed that humanity should be “acting according to the reason of things considered in themselves [...rather than] the will of God.”⁹⁵ Locke, the great founder of social physics, similarly wrote that:

...in all things of this kind, there is little need or use of revelation, God having furnished us with natural and surer means to arrive at a knowledge of them. For whatsoever truth we come to a clearer discovery of knowledge and contemplation of our own ideas, will always be container to us than those which are conveyed to us by traditional revelation.⁹⁶

Thus, the new religion was to be based on rational analysis instead of divine revelation.

Moreover, only the moral guidance that has been proven useful to the society has survived into the new natural religion. Loosely speaking, people sought a morality of reasonableness that, discarding whatever seemed irrational and unnatural in the Christian doctrines, emphasized those elements that seemed sound and useful

⁹⁵ Matthew Tindal, *Christianity as Old as the Creation*, trans. Günter Gawlick (Stuttgart-Bad Cannstatt: Frommann-Holzboog, 1967), pp. 272;

⁹⁶ John Locke, *An Essay Concerning Human Understanding* (Oxford Clarendon Press, 1975), vol. 2, bk. 4, ch. 18, sec. 4, pp. 418.

for the ordering of the good life. François Marie Arouet Voltaire (1694-1778), the great French Enlightenment philosopher, said: “I understand by natural religion the principles of morality common to the human race.”⁹⁷ In a similar tone, Denis Diderot (1713-1784) the French philosopher once asked: “If a man once admits the existence of a God ...and supposing him initiated in all the mysteries of transubstantiation, consubstantiation, the Trinity, hypostatical union, predestination, incarnation, and the rest (i.e. everything in Christianity that are non-scientific), will he be any the better citizen?”⁹⁸ Such was the test – anything that would produce good citizenship and social utility would remain in the religion of reason, while others that do not would be discarded.

From the bold application of the Cartesian method on nature, society and religion, their expectation and confidence in the scientific method were no doubt extremely high. After all, Newton gave the impression that all mysteries in this universe could be solved with human intelligence using the Cartesian method.⁹⁹ The whole educated world in the eighteenth century was convinced that the most beneficent and the most divine force in human life, man’s supreme achievement and his brightest jewel, is science. For this reason, Pierre-Paul Le Mercier de la Rivière (1719?-1794) the French economist wrote: “Without science, man would rank below the brutes.”¹⁰⁰ George Louis Leclerc de Buffon (1707-1788) the French naturalist similarly said: “What enthusiasm is nobler than believing man capable of knowing all the forces and discovering by

⁹⁷ Voltaire, *The Elements of Sir Isaac Newton’s Philosophy*, ch. 6; quoted in John Randall, *The Making of the Modern Mind*, pp. 287.

⁹⁸ John Morley, *Diderot and the Encyclopaedists*, vol. 1 (London: Macmillan, 1923), pp.72.

⁹⁹ As Descartes put it himself, his mathematical method “is the whole secret of success in science, that method which is a more powerful instrument of knowledge than any other that has been bequeathed to us by human agency, as being the source of all others.” See John Randall, *The Making of the Modern Mind*, pp. 222.

¹⁰⁰ Louis Ducros, *Les Encyclopédistes* (Paris: Champion, 1900), pp. 315.

his labours all the secrets of nature?”¹⁰¹ Never had the faith in science been higher than during this age of reason.

Certainly, given the lack of precise measuring instruments like those for measuring brain waves and atomic structure, these enlightened minds could not expect themselves to solve all the phenomena in the nature, especially those concerning human psychology. What was their view on this issue? Thomas Sprat¹⁰² (1635-1713) put it this way:

Amongst the study of God, of human soul, and of nature, the first is excluded; the third is the principal allegiance; the second should also be excluded because the Reason, the Understanding, the Tempers, the Will, the Passions of Men, are so hard to be reduced to any certain observation of the sense,¹⁰³ and afford so much room to observers to falsify or counterfeit.

Interestingly, Thomas Sprat continued:

[...but once people] made more progress in material things, they will be in a condition of pronouncing more boldly on these subjects too. By long studying, there may, without question, be very near guesses made, even at the more exalted and immediate actions of the soul.”¹⁰⁴

¹⁰¹ Ibid., pp. 316.

¹⁰² Sprat is best remembered for his *History of the Royal Society* of which he was one of the first members. The business and design of this Royal Society, as another member of the society called Robert Hooke (1635-1703) once described, was to “improve the knowledge of natural things, and all useful Arts, Manufactures, Mechanik practices, Engynes and Inventions by Experiments – (not meddling with Divinity, Metaphysics, Moralls, Politicks, Grammar, Rhetoricks, or Logick.” Quoted in Martha Ornstein Bronfenbrenner, *The Role of Scientific Societies in the Seventeenth Century* (Chicago: University of Chicago Press, 1928), pp. 108-109, fn. 63.

¹⁰³ Thomas Sprat, *The History of the Royal Society of London, for the Improving of Natural Knowledge*, 3rd ed. (London: T. R., 1722), pp. 82.

¹⁰⁴ Ibid., pp. 82-83.

Such was the confidence in science in the Enlightenment Age.

To sum up, Descartes made people to perceive nature as a mathematical system whose infinite wisdom can be comprehended even by lowly man, and simultaneously it became amenable to human control. The study of nature became humanized, and less divine; it is ready to serve the rising commercial and industrial classes, not God. As Francis Bacon (1561-1626) the English philosopher once wrote, “the true and lawful goal of science: that human life be endowed with new discoveries and powers.”¹⁰⁵ For the first time, man believes that happiness and knowledge goes together.

4.5 The Romantic Protest¹⁰⁶

¹⁰⁵ Francis Bacon, *The New Organon* (Cambridge; New York: Cambridge University Press, 2000), i.81. There exist many other quotes of this kind. For instance, Adam Smith (1723-1790) the Scottish economist wrote in his *Wealth of Nations* that “the great object of the political economy of every country, is to increase the riches and power of that country.” See Adam Smith, *An Inquiry into the Nature and Causes of Wealth of Nations* (London: Methuen, 1930), vol. 1, bk.2, ch.5, pp. 351. Similarly, Charles Gide (1847-1932) the modern economic historian wrote that “Science has always been chiefly concerned with the business side of the State, especially which the material welfare of the citizens.” See Charles Gide, *A History of Economic Doctrines*, bk. 1, ch. 1, introduction, pp. 1.

¹⁰⁶ The following secondary source materials have been consulted for this section: Crane Brinton, *The Shaping of Modern Thought* (New Jersey: Prentice-Hall, 1963); George Lefebvre, *The French Revolution*, trans. Elizabeth Moss Evanson (London: Routledge & K. Paul; New York: Columbia University Press, 1962-64); Albert Soboul, *A Short History of the French Revolution, 1789-1799* (Berkeley: University of California Press, 1977); John Randall, *The Making of the Modern Mind*; University of Wisconsin, *The Humanities*; Boris Ford, ed., *From Dryden to Johnson*, vol. 4, *The Pelican Guide to English Literature* (Harmondsworth: Penguin Books, 1957); William B. Yeats, ed., *The Oxford Book of Modern Verse* (Oxford: Clarendon Press, 1936); Tim Smith, *The NPR Curious Listener’s Guide to Classical Music* (New York: Berkeley, 2002);

The Enlightenment Age that roughly began in the second half of the seventeenth century reached a climax during the French Revolution (1789 – 1799). The achievement of Newton as depicted in the previous section gave an impression to the contemporaries that every natural phenomenon in the universe could be comprehended by human intelligence through scientific method. Later on, some philosophers like Voltaire and Jean Jacques Rousseau (1712-1778) began to extend the Cartesian method into the study of human society, and proclaimed *Equality, Freedom, Social Contract* and *Human Rights* to be the indispensable components of a rational society. Thus, before the revolution officially began in 1789, the enlightened intellects had already prepared its theoretical background and made it well known to the public. It was for this reason that, when talking about the responsibility of the revolution, the French wit says: “c’est la faute à Voltaire; c’est la faute à Rousseau” or “it is the fault of Voltaire; it is the fault of Rousseau.”¹⁰⁷

From May 1789 until August 1792, the revolution proceeded in a moderate tone, with the aim of peacefully transforming France into a constitutional monarchy through means of legislation. It has been widely expected that the revolution would soon bring in the promised society based on freedom, equality, and fraternity. And given relative success of this early phase of the revolution, enlightened philosophers all over Europe generally welcomed it and deemed the revolution as a logical development of the Enlightenment philosophy.

Nonetheless, in June 1791, King Louis XVI (1754-1793; r. 1774-1792), felt imprisoned by the revolutionaries in Paris, attempted to flee to North-Eastern France to seek refuge from his brother. Unfortunately, he was captured not far from the destination, and such outcome preordained the failure of both constitutional monarchy and peaceful revolution. From then on, the mood of the

¹⁰⁷ Crane Brinton, *The Shaping of Modern Thought*, pp. 132.

revolution turned from moderate to extreme. In February 1792, Louis XVI and other aristocrats in exile successfully persuaded Prussia and Austria to militarily intervene in the revolution. However, in July the coalition force, on their way to Paris, warned the revolutionaries that the King must be safe, or else Paris would be destroyed. The entire French nation was at once outraged, accused their King of treason, and voted (361 against 360) to send Louis XVI to guillotine in January 1793. Immediately after, fights both between and within factions began and resulted in the so-called “reign of terror”. From then on, all the noble ideals that formerly held the revolutionaries together vanished, to be replaced by waves and waves of insane massacre of presumed enemies of the state.

During the reign of terror that lasted until July 1794, around seventeen thousand people had been officially condemned to death in the court, yet this number excluded those who had been sent to guillotines without even a hearing. It is of course impossible to obtain the exact death tolls, but historians generally believed it to be around forty thousand. Besides, horrible conditions in the prisons had no doubt caused high mortality among the approximately three hundred thousand prisoners. Moreover, during the revolution from 1789 to 1799, around six hundred thousand soldiers fell in combat, adding in another four hundred thousand during the subsequent Napoleonic Wars from 1800 to 1815. In a country with a population of no more than twenty-five million, these numbers are indeed enormous.¹⁰⁸

Partly as a result of these insane massacres during the reign of terror and the series of bloody battles that accompanied the supposedly rational revolution, people all over Europe felt that the Enlightenment ideals failed to live up to its utopian promise. They were disappointed with what human rationality and intelligence had created in France during those years, and this disappointment

¹⁰⁸ For the analysis of death tolls during the entire revolution, see George Lefebvre, *The French Revolution*, pp. 120, 315; and Albert Soboul, *A Short History of the French Revolution, 1789-1799*, pp. 105.

gradually created a mistrust on the very Enlightenment philosophy. A counter movement to the Enlightenment ideology became inevitable.

4.5.1 Conflict between Science and Experience

The Enlightenment Age certainly did not end solely because the French Revolution could not meet the expectation of people. Rather, the failure of the revolution acted like a trigger that right away let go the widespread resent on the Enlightenment philosophy that had long puzzled some farsighted intellectuals.

To recall, in the heyday of Enlightenment Age, people deemed their reasoning power as the most precious gift of humanity and adopted a new goal of life, namely to subject both natural world and human nature into a mathematical system. Yet, when analyzing human nature in mathematical terms, the enlightened minds neglected the fact that human is much more than an animated calculating machine. After all, however powerful is the Cartesian method, mathematics operating with reason was still a far less adequate vehicle for the expression of all the manifold tendencies of human feelings and human nature, thus everything distinguished human from a purely rational animal. Moreover, the truth was that the majority of the enlightened souls had chosen to apply the Newtonian system in the natural world and paid far less attention to the study of humanity. Their fervour in the study of nature was captured by Diderot who wrote in the initial volume of his *Encyclopédie* or *Encyclopaedia* in 1775 that “men’s minds seem caught in a general movement towards natural history, anatomy, chemistry, and experimental physics.”¹⁰⁹ In short, the genuine interest in human nature as found in Renaissance and Reformation disappeared with the coming of Enlightenment spirit.

¹⁰⁹ Denis Diderot, *Encyclopédie*, art; quoted in John Randall, *The Making of the Modern Mind*, pp. 264.

A number of sober minds in the Enlightenment Age perceived all too clearly how science, by transforming everything in the world into a mere complex watch, expelled human feelings, human nature, and Christian faith from people's imagination. For example, a playwright called Thomas Shadwell (1642?-1692) once wrote a play to ridicule his uncle "who has broken his Brains about the nature of Maggots, who has studied these twenty years to find out the several sorts of Spiders, and never cares for understanding mankind."¹¹⁰ In a more extreme tone, another scholar once proposed a theory that:

...scientists deal with only stubborn facts, and transform the wondrous nature into anaesthetic graphs and mathematical functions, thus hopelessly materialistic with no practical purpose other than amusement of themselves. [...] Science deals with the unanimated nature, if not only its mathematical shadow land, while humanities deal with rich and varied spectrum of human experience.¹¹¹

In brief, science has attracted man's attention out of the studies of human nature.

There existed in fact another dark side with the Cartesian method, which is so fundamental to the upcoming discussion on the Romantic Age that it deserves a lengthy treatment here. This trouble with science initially came to light when the Cartesians revealed a world of matter in motion governed by mathematical laws, which looked in no way similar to how the world actually appeared to genuine human experience. Bear in mind that in the days of Classical Greeks and post-millennium Christians where metaphysics reigned, nature remained to be just what they appeared to the mind to be. For instance, water was thought as a fluid, wet, formless, of a certain temperature, which did a great many things obviously useful not only for man but also for the other objects it touched. This naked and

genuine observation of the natural world through naked human feelings constitutes *human experience*, which the Classical Greeks and the Renaissance Europeans feverishly sought to cultivate since human experience is our only window to observe human nature in humanist terms (as opposed to scientific terms).

However, the Cartesians revealed a new universe. Descartes and his disciples shoved off all the metaphysical qualities of nature, so inconvenient for their mathematical analysis. From then on, water became nothing but a number of particles of matter whose motion followed definite laws, and whose ontological meanings were irrelevant to scientific investigation. No doubt Descartes believed that scientific knowledge is built not upon human experience but upon axioms of geometry and mechanics which the mind intuitively perceived to be true. He was not worried about the fact that this procedure made the world that science described a totally different thing from the picture of experience which the mind actually saw. The trouble was, how, then, could the mind be certain that physics was a genuine knowledge of the world in which man was really living without being able to experience it?

Such discrepancy between scientific vision and human experience gradually made certain people to feel that the scientific knowledge from Newtonian science would never reveal to us how exactly nature, human society, and humanity look like; that the Cartesian object of science, a knowledge of the real world as it actually is, was both impossible and misdirected; that science should confine itself to what can actually be verified by human experience; and that the fact that we can formulate a mathematical physics of the nature was merely a happy accident. In short, these people believed that only things perceived through our human experience could be trusted.

To sum up, the Age of Reason was in disrepute not because the type of truth it offered was not true, but because the life experience that it offered men was thin, flat, and meagre. To put it in

¹¹⁰ University of Wisconsin, *The Humanities*, pp. 101.

¹¹¹ *Ibid.*, pp. 87.

different terms, people grew dissatisfied that they had lost the spiritual contact with both the natural world and the human nature that was possible through human experience. Such negligence of human experience made it inevitable that the Age of Reason should provoke men to a reaction.

4.5.2 Arts in the Age of Reason

Given their obsession with mathematical treatment of nature and their lack of interest in humanity, it should not be surprising that the Enlightenment Age, though a great scientific epoch, had produced little that could rank in the world's greatest art and literature. After all, it appears that most of the great artworks that people would label as "immortal" are almost uniformly those that were produced during humanist epochs like Classical Greece and Renaissances. Surely, there were still the palaces and gardens of Versailles, the sparkling comedy of Jean Baptiste Boquelin Molière (1622-1673), the wit of Voltaire and several others – these were the natural fruits of the Newtonian world. However, when compared with the climax of artistic production during Renaissance and the later Romantic Age, arts produced in this age of reason indeed included but a small part of the experiences that have been expressed in the highest works of art in human history. After all, how can Newtonian science that only deals with the immutable mechanics of an emotionless nature compete in arts with the humanist spirit of Renaissance and Romantic Age that specifically dealt with the rich and varied spectrum of human experience? Therefore, one should not expect the Enlightenment Age to breed another Shakespeare or Michelangelo, which was in fact the case.

The mischief in art began at the end of the seventeenth century when Descartes cut the throat of art by reducing everything in nature into a mathematical system. Thanks to the spread of the Cartesian method, scientific vision replaced human experience as our way to look at the world, and this shift at once suffocated all artistic

imagination that required observation through and expression of our human experience. In literature, for instance, a noted modern poet once wrote that:

...one does not need to examine a great deal of the inferior verse of the eighteenth century to realize that the trouble with it is that it is not prosaic enough – lacking poetic beauty... This is decadence. The eighteenth century in English verse is not an age of courtly verse. It seems more like an age of retired clergymen and schoolmasters.¹¹²

Similarly, another modern writer remarked that:

...literature written after 1660 is markedly more modern in style and spirit than much that was written only a few years earlier. This modernity, as also a depression of the poetic imagination that went with it, is to be explained in part by the remarkable advance of science in the seventeenth century and the dominance of the scientific attitude through the eighteenth... It was a climate unfavourable to religion and poetry.¹¹³

Interestingly enough, even the leading figures in this age of reason seemed to show little sympathy with poetry, usually regarded as the highest form of literature. For example, Newton once said that "poetry was a kind of ingenious non-sense"¹¹⁴ In a similar tone, Locke said that "poetry at best was a pleasing cheat, supplying pleasant pictures and agreeable visions."¹¹⁵ Thomas Sprat put it more clearly:

Poetry could be of no assistance in scientific enquiries. Its deceitful fables, apt enough for primitive ages, must now be

¹¹² T. S. Eliot, "Poetry in the Eighteenth Century," in *From Dryden to Johnson*, vol. 4, *The Pelican Guide to English Literature*, pp. 273-4.

¹¹³ C. J. Horne, "Literature and Science," in *From Dryden to Johnson*, vol. 4, *The Pelican Guide to English Literature*, pp. 188.

¹¹⁴ Quoted in *ibid.*, pp. 189.

¹¹⁵ Quoted in *ibid.*, pp.189.

banished with the fairies. Reason must be its rule, and science could supply it with better matter and imagery than the outworn lore of the Ancients.¹¹⁶

Again, the main problem of poetry and other forms of art in this age of reason was that artists became passive in front of the new mathematical and mechanical interpretation of nature.¹¹⁷ They could no longer *produce* with their quills a lively world through their human experience, as all Renaissance writers did. Rather, poetry became a mere *reflection* of the external world, a world which the enlightened poets could no longer experience but only reflect on using their intelligence. Literary imagination has atrophied as a reflecting instrument.

4.5.3 Romantic Philosophy

Given the long-existing general resentment on Newtonian science described in an earlier section, the failure of the French Revolution was at most a trigger of the subsequent anti-rational movement, usually referred as the Romantic Age or Romanticism. Loosely defined, Romanticism was a reaction against a too narrowly construing of human experience in terms of reason alone. It was an emphasis on the less rational side of human nature, on everything that differentiates man from a cold thinking machine; and correspondingly a revolt against viewing the world as nothing but a vast mechanical order. It was the voicing of the conviction that life is broader than intelligence, and that the world is more than what physics can find in it. It represented the belief that only through human experience could human learn how the world really looks like.

This new attitude of life was most clearly shown in the revival of Christianity. To recall, in the Enlightenment Age, the

objective of developing a human was to make him a good and useful citizen in a rational society. As a result of this general social atmosphere, Christianity has been stripped of all non-scientific elements and adopted the mission of assisting people in developing a set of socially welcomed moral behaviour that would be “useful” to the rational society. To put it differently, anything in Christianity that would produce utility for the society became the moral guidance in this age of reason, while those that did not were purged.

Just as the genuine concept of Christian faith appeared to be on the brink of collapse, a group of German philosophers led by Immanuel Kant (1724-1804) in the late Enlightenment Age saved the day for Christianity. Kant had conclusively proven in his *Kritik der reinen Vernunft* or *Critique of Pure Reason* that reason and science are only valid within a certain field, and that “all attempts at a mere speculation use of reason in the field of theology are entirely fruitless and in their very nature null and void.”¹¹⁸ Gradually, under the influence of the infantile Romantic conviction that not intelligence but human experience is the single path to any meaningful knowledge of the world, a new religious enthusiasm often known as Evangelicalism arose.

This new religious mood was certainly not founded on the now besieged Newtonian physics, but instead on the long-abandoned Christian faith that would breed inner religious experience, just as John Wesley (1703-1791) a British religious leader once wrote: “Faith is that divine evidence whereby the spiritual man discernth God and the things of God... It is the spiritual sensation of every soul that is born of God”¹¹⁹ Thus, it differed from the Calvinists and Puritans doctrines that no longer would the new religious men of Romantic Age do their duty recognizing it as God’s will. Instead, they would do it merely because they deemed the vivid religious

¹¹⁶ Quoted in *ibid.*, pp.191.

¹¹⁷ See chapter one of University of Wisconsin, *The Humanities* for more details on this issue.

¹¹⁸ Immanuel Kant, *Critique of Pure Reason*, trans. F. Max Muller (London: G. Bell, 1881), vol. 2, div. 2, bk. 2, ch. 3, sec. 7, pp. 546.

¹¹⁹ John Wesley, *Works*, bk. 8; quoted in John Randall, *The Making of the Modern Mind*, pp. 408.

experience and the ever-present consciousness of the divine power that faith would produce as the essential part of the new Romantic life. In short, the general effect of Evangelicalism was that:

...it put an end to the barren rationalism of the eighteenth century; it substituted immediate experience for reasoned demonstration; [...] it brought the feelings once more into repute, and aided the nineteenth century reaction against the narrow intellectualism of the eighteenth century.¹²⁰

Under the influence of the Romantic sentiment, Europe quickly washed away much that has been added during the Enlightenment Age. Religion and morality ceased to be a deductive science, but a matter of heart, a rich spiritual life to be lived;¹²¹ art is more than about aesthetic beauty, but also about rich sentiment and feeling; society is not a cold-blooded enterprise founded on self-interest, but a vast organism pressing onward to realize dimly seen ideals; the whole aim of education is not to train a man to be a rational machine, but to ensure that the habits he forms are those in which his human nature will flower of itself; the universe is not a machine, but a living body to be interpreted on the analogy of man's life; God is no longer the watch maker but the soul of the world; and the new ideal man in the Romantic Age is not the rational utilitarian thinker, but rather the man of passion and feeling. In short, humanity, as the Romanticists claimed, is not fundamentally rational and intellectual. Instead, it is at bottom composed of instincts and feelings, which only our human experience would reveal; and it should be his instinctive and emotional life that dominate his career

¹²⁰ Arthur Cushman McGiffert, *Protestant thought before Kant* (New York: Charles Scribner's Sons, 1922), ch. 9, sec. 3, pp. 175.

¹²¹ Rousseau once said that "morality and religion are not matters of reasoned thinking, but of natural feeling. Man's worth depends not on his intelligence, but on his moral nature, which consists essentially of feeling; the good will alone has absolute value" Quoted in Walter T. Marvin, *The History of European Philosophy* (New York: Macmillan, 1930), xxvi.2a, pp. 370.

and paint for him both his conception of the world and his conception of human life. In this sense, the poet whose task is to describe the world using their human experience is definitely a truer and better guide on the pathway of life and thought than the scientists.

To sum up, human experience and various complex human feeling became the new interest of Romantic European. As George Santayana (1863-1952) the American philosopher once put it, "the great merit of the Romantic attitude is that it puts us back at the beginning of our experience. [...] It restores us to the immediate perception and primordial will."¹²² Human experience, in its infinite richness and colour and warmth and complexity, is something greater than any intelligible formulation of it and is a much more reliable source of knowledge than Newtonian science. After all, the fact that they sought to interpret the universe in human terms shows that they believed that will and aspiration, the deepest things in human experience, must be akin to the fundamental forces of nature. This was why the Romanticists insisted that "we cannot sacrifice experience to the requirements of any systems"¹²³, and why they focused on the development of sentiments and neglected the development of reason. Reason and science, in any case, no matter how well-developed, are still a far less adequate method for the expression of all the manifold passion of human nature. This corresponded to their belief that not through the development of the intelligence does man become perfect, but through the development of our feeling and experience.

4.3.4 Romantic Paintings, Literature and Music

¹²² George Santayana, *Three philosophical poets: Lucretius, Dante, and Goethe* (Cambridge: Harvard University, 1910), ch. 4, pp. 196.

¹²³ Henri Bergson, *Creative Evolution* (New York: H. Holt, 1911), ch. 1, pp. 39.

As any attentive readers might have expected, Romantic arts confirmed us about the mindset of the Romanticists described above, as they unmistakably revealed the artists' intention of using their human experience to comprehend the world. In visual art, for example, Romantic painters often used dramatic and unconventional strokes to invoke the deepest emotion. This new style substantially differed from the good old Classicism that belonged to the Enlightenment Age. Loosely defined, Classicists emphasized the order, balance and simplicity of the structure of their artworks. They valued reason, analysis and beauty, and would often follow formal rules of composition. They understood that reality is complex but would try to approach it through simple structure. This explained the feeling of artificial harmony found in many Classicist paintings. Yet, Romantic painters rejected Classicism and adopted a completely different mindset when creating their works of art. Instead of struggling to express the harmony of the nature through conventional structure and form, Romantic painters concentrated their energy to express their innermost feelings and beliefs through their own unique style and techniques so as to make them understood. This corresponded to a popular saying of the Romantic Age: "If necessary, break all the laws of God and man in order to express yourself."¹²⁴

One of the reasons why they all strived to delineate their emotion was that they assumed themselves the status of prophet and moral leader. To recall, people at that time believed that the spiritual nature could only be comprehended through our primordial feeling and vision. To do so, these primordial receptors must be substantially cultivated, just as the enlightened minds demanded the training of one's rationality. In this regard, art became the best vehicle to develop one's capability to experience the new spiritual Romantic world. This was because, similar to the training of intelligence and rationality by systematically solving logical problems, we might familiarize ourselves with our natural receptors through everyday

¹²⁴ Anonymously quoted in CB57 John Randall, *The Making of the Modern Mind*, pp. 415

appreciation of art since every piece of Romantic art is in fact an example of using human experience to comprehend the nature. In short, art in the Romantic Age somehow assumed an educational and active role in the shaping of one's human experience.

Figure 4.3: The Great Day of His Wraith, by John Martine



Take *The Great Day of His Wrath* by John Martin (1789-1854) as an example. Concentrated into this huge landscape, under an ominously dark sky, are all the intensely dramatic effects that Martin could muster to show the awesome power of nature. It is nothing less than the end of the world. Mountains crumble, fires rage, and bolts of lightning fall as God exacts his final revenge on mankind. In the centre, tiny figures, naked in their shame and disgrace, are sucked into the primeval void from whence they came. Solely judging from the dramatic theme in this work, no doubt that Martin shared the belief with other Romantic painters that nature is far from a harmonious mathematical system but instead a spiritual

being filled with humanity. He captured this spiritual aspect of nature with his primordial vision so as to convey the message that our human experience is the only reliable tool to comprehend our animated world.

The picture looked similar in art of letters. Let's take as an example *Faust* from Johann Wolfgang von Goethe (1749-1832), one of the most celebrated Romantic writings which he took over sixty years to complete. Faust, the weary student, has learned the vanity of all sciences after all those years of toil which have brought him nothing but barren learning. He turns in disgust to magic, in the hope of finding himself face to face with truth. He does; but he finds also, as the romanticists felt in rejecting eighteenth century science, that not even perfect science, perfect truth, will suffice; it is of life, not the picture of life, for which he yearns. Experience, the totality of human experience and life – that alone will satisfy him. So he summons Mephistopheles, the spirit of growth and development and the two go out into the world to experience various events that can come to man like festivity, love, crime, remorse, power, wealth, beauty, and glory of past. Finally, from all these experiences of life, Faust finds satisfaction, and in that moment his life is done and his lesson learned. As Goethe wrote in this work:

Gray and ashen, my friend, is every science,
And only the golden tree of life is green.¹²⁵

Readers of *Faust* generally believed that Goethe wrought into *Faust* his youthful passion and aspiration, and his mature wisdom, the distillation of his own varied experience to express his personal passionate yearning for richness and fullness of life. Yet *Faust* was at the same time a model of life for all the Romanticists. From the delineation of Faust's growth and development through his manifold experience, readers learnt to experience the genuine Romantic attitude to vividly live our life.

¹²⁵ Johann Wolfgang von Goethe, *Faust*, 2nd ed., trans. Walter Arndt (New York: W. W. Norton, 2001), Part I, "Study", 2038-2039, pp. 53.

Even in the music may one find the same interest of boldly expressing one's passion and innermost feelings. A brief comparison with music in the Enlightenment Age shall illustrate the nature of Romantic Music. Music in the eighteenth century, usually referred as Classical Music, witnessed a new set of values that stressed clarity of line and directness of expression. It abandoned usage of counterpoint (multiple independent lines played simultaneously), the complex polyphonic style of the previous Baroque era, and the accompanying practice of embellishing melodies with excessive and unabashed bravura. Instead, music adopted a new style that found many parallels with Newtonian science – the simpler homophonic style with a single melodic line taking prominence and supported by clear-cut harmony. The ear no longer had to contend with many ideas vying for attention simultaneously, but could focus easily on one at a time. And, similar to paintings during the Enlightenment Age, the new musical structures put heavy emphasis on proportion and symmetry so as to produce a sense of orderly and mathematical harmony. This new structure and style together summoned the beauty of elegance but at the same time moderated and restrained emotion.

As in the case with other forms of art, music adopted a new style in the Romantic Age and aimed to express in its emotional outpourings. Symphonies, concertos, sonatas, and chamber pieces all grew ever more directly expressive, with hearts on sleeves. It often possesses melodies in extremes volume and tempo to enhance more overtly expressive melodies and more daring harmonies. Harmony has also been enriched to heighten expression, to extract great feeling or deeper thought from music. It is unmistakable in its lyricism and power of expression, with melodies that stick in the ear and try to stir up strong feelings. The heart, which had been kept politely under control a generation earlier, now is worn on the sleeve.

The difference between Classical Music and Romantic Music should at once become clear when one compares side by side

Wolfgang Amadeus Mozart (1756-1791) and Ludwig van Beethoven (1770-1827) – both the most representative figure of each epoch. Generally speaking, music of Mozart possesses an aristocratic feeling, based on the underlying elegance, moderation, and perfection. Music of Beethoven, however, is much more expressive and easily stirs up a much stronger impression on the audience's mind. Simply listen to the Fifth Symphony or Moonlight Sonata of Beethoven which everyone must have heard somewhere in life, and then immediately switch to Mozart's *Rondo alla turca* and *Eine Kleine Nachtmusik*, and their difference would become clear. In short, human feelings and human experience have both made their return to the imagination of humanity.