The Background of Matteo Ricci
The Shaping of his Intellectual and Scientific Endowment

Macau Ricci Institute
October 6, 2008

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On August 15, 1571, nineteen-year-old Matteo Ricci, arrived at the door of the St. Andrea novitiate at the Quirinale in Rome and was welcomed by Alessandro Valignano. Valignano had come to St. Andrea's as a one-month replacement for the master of novices, Fr. Fabio de Fabii. Thus, the two future founders of the China mission met for the first time.
A strong bond of mutual esteem, friendship and solidarity was formed. They had a common vision and plan for the evangelization of China, and a human, religious and intellectual accord that is quite uncommon in modern missionary history. To them we owe the definitive foundation of the Catholic Church in China.

Matteo Ricci has been praised by J. Needham as "one of the most remarkable and brilliant men in history," and as "the most outstanding cultural mediator between China and the West of all time," (W. Frankle) and a "a monumental figure" (D. E. Mungello).

Macerata

Matteo Ricci was born on October 6, 1552. In the same year Francis Xavier died on the island of Shangchuan, before he was able to fulfill his task of evangelizing China. Ricci would realize Francis Xavier's dream.

Matteo was born in the Papal States in Macerata, a city of about 13,000 inhabitants, located on top of a hill between the parallel valleys of the rivers Potenza and Chienti, in what is now the central region of Le Marche.

Matteo's father, Giovanni Battista Ricci, was a herbal pharmacist (*speziale*), and a member of the civic judiciary board. In 1596, when Matteo was in China, his father became a member of the city council, a body comprised of the noblemen of the city.

For centuries the Ricci family belonged to nobility and was the third oldest family in Macerata. Its noble coat of arms portrayed a blue hedgehog (*riccio*) on a purple background. At the end of the seventeenth century, the family was awarded the title of Marquis of Castel Vecchio (today a locality near Monteporzio, in the same region of Le Marche).

His mother, Giovanna Angiolelli, was also of noble birth.

Matteo was the firstborn of a large family. He had four sisters and eight brothers. One of his brothers, Antonio Maria, became canon in Macerata and another, Orazio, filled important positions in the city government.

Matteo was placed in the care of his grandmother, Laria, and studied until he was seven years old under the guidance Nicolò Serangeli (*alias* Bencivegni), a priest from Siena. These studies ended when Serangeli entered the Society of Jesus. Many years later, in 1608, when he was in Beijing, Matteo asked about his teacher, revealing that Fr. Serangeli had a deep influence on the young Matteo, and a reference to Fr. Serangeli in one of Ricci's letters (1599) suggests that Mattteo's desire to enter the Society of Jesus was motivated by a wish to follow in the steps of his first teacher.

In 1540, Pope Paul III officially founded a university, through the conversion of a law school which dated back to 1290. This university, which is still in existence, had the same rights as Bologna and Padua Universities.

Today the university includes the Matteo Ricci Institute for the Relations with the East**,** which is very active in promoting the knowledge of Matteo Ricci in collaboration with other local institutions.

The Jesuits in Macerata

In 1561, 13 Jesuit fathers arrived in Macerata and opened the Jesuit Boarding School. Ignatius of Loyola himself had wished to open a Jesuit house in Macerata. On January 29, 1556, Ignatius (who died later that year) gave the order that outstanding priests should be sent to Macerata to make it "to be a city of fortune as it is".

At first the Jesuits stayed in the Church of Saint Maria of the Vergini, outside the city walls. Then, after four years, they moved into the city and settled in the Church of Saint Giovanni, as the Chapter (Council of priests) of the cathedral assigned them.

Nine year old Matteo was one of the first students of the Jesuit School. Soon the school had 140 pupils from the most important families in the city.

Later, at different times, the Blessed Rodolfo Acquaviva, Alessandro Valignano and Saint Roberto Bellarmino, were received as guests at the college.

After the 1773 suppression of the Society of Jesus, the premises of the College were turned into the 'Mozzi Borgetti' Library, which is still in existence. The library is one of the largest in Le Marche, with 350,000 volumes, 10,000 manuscripts, 300 incunabula and over 4000 sixteenth-century document, mostly inherited from the college where the young Ricci had studied.

Matteo studied at the college from 1561-1566, and at fourteen ended his humanities studies. According to Ricci's first biographer, Sabatino de Ursis, Matteo distinguished himself as one of the best students, showing, even then, an inclination for a religious vocation. But, it seems that his father had other aspirations for him.

What Matteo did from 1566 to 1568 is not clear. He certainly must have continued his education at home.

Matteo in Rome

In 1568, Giovanni Battista sent his 16 year old son Matteo to study law at the "La Sapienza" University of Rome. The father made this decision for two reasons. The University of Macerata had economic difficulties leading to an unstable situation. He also had high hopes for his son's future. Giovanni Battista probably hoped that Matteo could make a career in the administration of the Papal States.

Rome had almost one hundred thousand inhabitants and was one of the major artistic centers of the world. At that time, the construction of the Saint Peter Basilica, a symbol of the greatness of the Church, helped some of the greatest artists of the Renaissance. The Romans regarded Saint Peter as a never-ending factory. The work lasted for 176 years through the rotation of 28 popes. Ricci could not have been able to admire the famous dome designed by Michelangelo, as it was

completed in 1588, after he left Rome. Michelangelo died in 1564, four years before Matteo's arrival in the capital.

When Ricci arrived in Rome, Pope Pius V (1556-1572) had reigned for two years. He was a severe and austere pope, and would be canonized by Clement XI in 1712. The Dominican friar Antonio Michele Ghislieri was an inquisitor. Italy was a patchwork of states in large part administered by Spain, among which only the *Serenissima* Republic of Venice and the Papal States retained effective autonomy.

The two maritime Catholic powers, Spain and Portugal, dominated the seas. Their exploration of the globe changed the image of world, altered the maps, and also changed the theological understanding of non-Christian peoples. A renewed missionary spirit animated the Catholic world. Franciscan, Augustinian, Dominican, and Jesuit missionaries traveled along the routes opened by explorers and merchants. Often the method and purposes of the missionaries coincided with those of the *conquistadores*, but there were many and noteworthy exceptions to this rule. Among them we have prominent Jesuit missionaries such as Francis Xavier, Matteo Ricci, Alessandro Valignano, Roberto de Nobili, Alexander De Rodhes. But there were also members of other orders including the Augustinian, Martin De Rada, and the Dominican, Bartolomé de Las Casas, in Latin America.

The world was changing fast and becoming more complex and contradictory. New ideas mixed with old visions and philosophies. Modern science made its first steps. Mathematics acquired a central role as a tool to investigate and understand the natural phenomena. Technology earned new strength and relevance.

La Sapienza

La Sapienza was founded in 1303 by Pope Boniface VIII, and named *Studium Urbis*, the University of Rome. The university was located outside the Vatican walls, and consequently had some academic independence. It became very prestigious, with scholars from all over the then-known world. In 1431 Pope Eugene IV had to provide the university with new and more spacious buildings which were built in the district Sant' Eustachio, between Piazza Navona and the Pantheon (now State Archives).

It was there that Matteo Ricci studied law. In the early sixteenth century, Pope Leo X, who was the son of Lorenzo de' Medici, drew famous scholars from all over Europe to Rome enhancing the prestige of the university. It was one of the most advanced scientific centers in Europe, especially in the field of medicine and anatomy. Other prominent subjects included history, humanities and archaeology.

"Sapientia", the popular name for the *Studium Urbis*, first appeared in 1568 documents.[1]

Unfortunately we have very scarce historical data for the three years in which Matteo Ricci attended the Law Faculty at *La Sapienza* (1568-1571).

Sant'Andrea al Quirinale

In 1569, Matteo began to attend the Marian congregation (of *Annunciata*) of the Roman College. He also used to go for confession to the Jesuits and soon he became convinced that a

[1] About a century later, the University had its church, *Sant' Ivo alla Sapienza,* one of the greatest masterpieces by Francesco Borromini, the rival of Gian Lorenzo Bernini. The latter built the church of the Jesuit seminary on Quirinal Hill in Rome, *Sant' Andrea al Quirinale*, about 80 years after Ricci was there. It is considered one of the finest examples of Roman Baroque architecture. Bernini considered it his only perfect work. In his later years, his son recalls, he spent hours sitting in the interior and looking at it. The shape of the interior of the church is oval, with the entrance and high altar on the short axis of the ellipse. The church of Sant' Andrea might have been taken as the prototype of a number of chapels of Jesuit novitiates in Asia, including Goa, Manila, Beijing and the Saint Joseph Chapel here in Macau.

secular career was not for him. Before completing three years of university, he made the decision to leave law studies and enter the Jesuits.

On August 15, 1571 Matteo was admitted to the Novitiate of the Society of Jesus at the Church of Saint *Andrea al Quirinale*.

On the same day Father Alessandro Valignano signed his first extant document that referred to Ricci, as "*Riccio Mattheo from Macerata*". According to sources, besides the role played by Valignano, Ricci was formally accepted into the Society by Fr. Jeronimo Nadal, one of Ignatius's most important colleagues. From 1571 to 1572, Nadal was acting as vicar general of Francisco de Borja, the General Superior of the Society.

The Society of Jesus preserved the document prepared by Valignano. It records the successful admission of Matteo, who made the promise of

> Observing, with the help of the divine grace, all the constitutions and rules and the way of life of the Society of Jesus. And to be indifferent and resigned to accept any position and office from the Society. And to be obedient to all the orders.
>
> (From the report of the examination for the admission of Matteo Ricci into the Society of Jesus).

According to Ricci's biographers, his father set out for Rome to withdraw Matteo from the novitiate. When he was in Tolentino, eighteen kilometers from Macerata, he was struck by a high fever, which he interpreted as an indication of God's will to stop him from standing in the way of his son's choice.

The master of the novitiate was Fr. Fabio de Fabii, a Roman nobleman who entered the Society of Jesus against the wishes of his family. Ricci maintained a close and warm correspondence with him during his whole life.

In January 1572 Matteo was sent to the *Professa* House, at the *Gesu'*, in order to practice humble house services.

On May 25, he made his first religious vows. Then he was sent to a boarding school in Tuscany, probably Florence. In his later letters, he sometimes compares some Chinese cities like Nanjing to Florence.

The *Ratio studiorum*

On September 17, 1572, Ricci entered the Roman College. In the same year Ugo Boncompagni was elected pope. He took the name Gregory XIII, and was going to play a remarkable role in Jesuits' history.

The members of the Society of Jesus in Europe were especially dedicated to teaching. Their cultural background was very extensive, and some of them were advisers and confessors of princes and sovereigns. Education was offered in schools of all levels, colleges and universities. At the end of the sixteenth century, there were more than 500 houses and Jesuit colleges throughout Europe.

The study program followed the directions of Ignatius himself, who wanted the students to be provided with a wide range of disciplines including grammar, poetry, rhetoric, logic, natural and moral philosophy, metaphysics and mathematics.

The teaching method followed the guidelines developed by Ignatius and early collaborators, and subsequently illustrated in the *Ratio studiorum*. An early version of it appeared in 1566, and then in its final form in 1599, promulgated by Claudio Acquaviva, Superior General of the Society since 1581. Acquaviva held the post for more than three decades, covering the time when Ricci lived in China.

The *Ratio*'s progenitors were Father Jerome Nadal's 1551 plan for the college at Messina in Sicily; his later plan called *Ordo Studiorum* (1566); the Fourth Part of the Jesuit *Constitutions*,

written by Ignatius of Loyola; and the *De Ratio et Ordine Studiorum Collegii Romani* of Father James Ledesma (the dean of studies when Ricci was at the Roman College).

The *Ratio studiorum* was the result of many years of planning and experimentation by a group of talented administrators and teachers. The manifold influence of Renaissance theory and practice, particularly the influence of the University of Paris, and the practical wisdom gained from prolonged tests in a hundred Jesuit colleges in many countries also contributed.

The *Ratio* differed significantly from previous study plans. It was intended for lay students as well as Jesuits. It incorporated the humanities: literature, history and drama, as well as the traditional clerical subjects of theology and philosophy. Thus it combined the humanistic program of the Renaissance with the scholastic program of the Middle Ages. According to Jesuit Scholar John O'Malley, the *Ratio* "had impact far beyond Jesuit institutions because it was seen as a coherent and lucid statement of ideals, methods and objectives shared broadly by educators in early modern Europe. Jesuit schools became their city's cultural centers, producing plays and ballets and maintaining astronomical observatories."

The *Collegio Romano*

The Roman College was the most important Jesuit university and considered a model for all others. It was founded by Sant'Ignatius as *"Scuola di grammatica, umanità e dottrina cristiana, gratis"* in 1551. It was located in a building no longer in existence, at the foot of the Campidoglio hill, in "Via Capitolina" (today piazza d'Aracoeli, near Piazza del Campidoglio). As the number of students increased, the location of the college had to be changed four times.

According to a letter that Ignatius wrote, the professors of the college had to be only of exceptional quality. The students, in order to be accepted, had to be well prepared and experienced, intelligent and virtuous. The Roman College was supposed to prepare the best among the Jesuits. Organized on the model university in Paris, it was approved by Pope Paul IV as a center of higher education in 1556.

There were more than a thousand young people from across Europe studying at the Roman College at the time of Matteo Ricci. Attendance was free of charge at the University of Nations as the college was called.

The residence of the Roman College where Ricci studied was the fourth since its founding, and the last to host the University before the building of the final residence. The college was then located in an area near the present day church of Saint Ignatius. It was a solemn Renaissance palace built with a donation by the marquise of Tolfa, widow of Camillo Orsini and niece of Pope Paul IV. The palace, which is no longer in existence, consisted of two separate buildings, harmoniously arranged around two large courtyards with quadrilateral arcades. One courtyard was devoted to classrooms and students; the other to the Jesuit community. The church of the *Annunziata* (in the area where now is located the Church of *Saint'Ignazio*) was next to that courtyard.

Not surprisingly, even that residence was insufficient. In 1582, Gregory XIII started spending his own money, building the new residence for the Roman College at the back of the palace. He inaugurated this residence in 1584. Pope Gregory XIII was called 'Founder and protector' of the university, which since then, in his honor, was called *Gregoriana*, although the new name was formally adopted only in 1873.

The Roman College remained at this residence until 1870, when Victor Emmanuel II's army invaded Rome and took the building, making it barracks for his soldiers. Part of the palace became the *Liceo Visconti*, the first and most prestigious high school of the new Italian state. The large library of the Roman College became the beginning of the Italian National Library, named after Victor Emanuel II, the same man who stole it from the Jesuits. The library included material coming from other ecclesiastical institutions suppressed by Italian state and was transferred to the new location, a *Castro Pretorio* in Rome, in 1975.

Ricci's studies at the Roman College

Among the more than one thousand students from all over Europe, one hundred and thirty were Jesuits, like Matteo.

The comprehensive education the college aimed to offer was achievable only through the *'internato'* and the minimization of contacts with parents and relatives. The faculty and his peers became Matteo's new family with whom he developed strong ties of affection. Until the end of his life, he remembered them with fondness and nostalgia, as is evident by reading his letters from Asia. In November 1580, he wrote one of his first letters from Cochin, India to Ludovico Maselli, who was rector of the Roman College when Ricci attended, that reads:

> Staying away from my family *secundum carnem*, even if I am very much carnal, does not cause as much sadness as staying away from Your Reverence, whom I love more than my father.

The academic curriculum for the candidates belonging to the Society consisted of:

Two years of Rhetoric,
Three years of Philosophy,
Three years of Theology.

Rhetoric

In the first two years, Ricci studied Greek, Hebrew and Latin, which was the teaching language. The teacher proposed as models of style pre-Christian authors of antiquity. The choice was made in the wake of humanism, the intellectual movement that in the previous century had led to the rediscovery and appreciation of classical Greek and Latin.

The texts studied, however, were subject to prior scrutiny by Church authorities, so parts not considered acceptable might be omitted. Ricci read, among others, the Latin authors such as Martial, Horace, Ovid, Virgil and Quintilianus. Among the Greek authors, Ricci studied Homer, Hesiod, Thucydides and Demosthenes.

As for Latin style, the paradigm to follow was Cicero, the unsurpassed example of Roman rhetoric. Ricci's writings in China, such as *On Friendship* (1595) and the *Method of Memory of the Western Countries* (1596) were based on the cultural information absorbed during these two years of rhetoric.

In spite of the censorship, the teachers showed significant independence from ecclesiastical authority. In Jesuit colleges, Erasmus of Rotterdam was read, despite the fact that his writings were included in the *Index* of prohibited books by Pope Paul IV (1557/1559).

Philosophy

The three years of philosophy studies included logic, moral, and the metaphysics of Aristotle, ethics of the Stoics, Seneca and Epictetus.

To sharpen their skills in dialectics, students participated in monthly debates, during which they had to argue a philosophical thesis before an audience of teachers and students.

Matteo was one of the particularly brilliant students who took part in the academies, a kind of study group that encouraged students to excel in all areas. The teaching in class and the participation in the academies can be described as a sort of a continuous mental exercise, a constant practice, a kind of continual gymnastics of the mind and the spirit.

During the last year of philosophy, Ricci followed the new course on "*Controversies*" inaugurated by a young professor of theology, Robert Bellarmine, the future cardinal, saint and doctor of the Church, one of the most influential figures in the history of the Society of Jesus.

Mathematics

The philosophical study included the sciences which were then called natural philosophy. Mathematics was the foundation of science and included astronomy, music, geography and applied disciplines such as engineering (mechanics) and architecture. In the second half of the sixteenth century mathematics assumed a significant and pervasive role in technique (technology) and in the study of nature.

Arithmetic advanced processes were required in the developing commercial and banking businesses, in architecture, in the manufacture of cannons, in the study of projectile motion (bullets), and many in other technical and craft activities, all of which required precise measurements and calculations.

In the figurative arts it was essential to possess geometric skills in order to paint using perspective. This technique, perfected in the previous century, was employed to represent three dimensional realities on canvas. These principles anticipated the development of projective geometry.

Mathematics would play an even more significant role in the next century, when Galileo Galilei employed it as an instrument of investigation of the physical world. Galilei wrote the following famous passage in the *Saggiatore* that I have recently heard quoted by Pope Benedict XVI:

> "Mathematics is the language in which God has written the universe."

Mathematical knowledge was considered important for theology. According to the Christian scholar who had revised the mathematical conception of nature from the Greek, God had designed and created the world according to mathematical laws. The search for the laws that governed the universe was a religious research and the discovery of the mathematics underlying the natural phenomena became a way of celebrating the greatness and glory of God's work. According to the great astronomer Johannes Kepler:

> The main objective of all investigations of the outside world is the discovery of the rational and of the harmony that God imposed and that He has revealed in the language of mathematics.

Disciple of Master Clavius

Mathematics was very important at the Roman College. In the *Ratio Studiorum* promulgated in 1566, we find the following:

> Concerning mathematics, the mathematician shall teach, in this order, the [first] six books of Euclid, arithmetic, the sphere [of Sacrobosco], cosmography, astronomy, the theory of the planets, the Alphonsine Tables, optics, and timekeeping. Only the second year philosophy students shall hear his lectures, but sometimes, with permission, also the students of dialectics.

It was mainly the German Christoph Klau (1537-1612), known by the humanistic name of Christophorus Clavius, a prestigious astronomer and mathematician, professor at the Roman College from 1563, who convinced his colleagues to include arithmetic, algebra and geometry in the curriculum. He was one of the teachers who most influenced the formation of young Ricci. Clavius was considered the Euclid of the sixteenth century, a reputation that he had earned after the 1574 publication of a translation from the Greek, with a commentary, of Euclid's *The Elements* , the famous third century BC text of arithmetic and geometry. Clavius, a Jesuit himself, had also written treatises on astronomy, his field of choice, and on pedagogy.

Clavius knew that most young novices showed little interest in science and that some teachers thought that teaching mathematics to future priests and missionaries was unnecessary. But Clavius, convinced, as he was, that philosophy and mathematics are related, conducted a campaign of persuasion among teachers and students, arguing not only that the teaching of mathematics would give prestige to the Society of Jesus, but also that the discipline was a fundamental prerequisite for learning other sciences and applied disciplines. Ricci shared the master's vision and, as it is reported, followed his classes with much success.

Galileo Galilei

The respect that the German professor had from other scholars is proved by the correspondence with some of the greatest scientists of the time, and by the friendship with the young Galileo Galilei, who turned to Clavius on more than one occasion for advice.

During the nearly 50 years of teaching at the Roman College, Clavius produced a series of textbooks that defined Jesuit scientific education not only in the *Collegio Romano* but in all Jesuit colleges. The influence of Jesuit mathematical education was felt in non-Jesuit universities as well. It has been shown over the past two decades that Galileo's lecture notes from his days as a student at the University of Pisa had, as their ultimate source, the lectures of the mathematicians at the *Collegio Romano*.

Astronomy

If mathematics was the foundation of science, astronomy was the queen. Father Clavius regularly observed the sky from the terrace of the Roman College. In 1572 he witnessed the appearance of a "new" star (*nuova*) that remained visible for eighteen months in the constellation of Cassiopeia before disappearing.

In mid-sixteenth century the term used was not 'astronomy' but 'astrology.' divided into 'meteorological astrology', study of celestial bodies on the basis of observation and calculation, and 'judicial astrology', a study of the stars for horoscopes on human affairs (now called simply astrology). The latter was also taught in universities and practiced even by great scientists like Kepler. Despite the commonly accepted belief that celestial bodies influence human affairs, judicial astrology was banned in colleges, because Jesuits believed that a future written in the stars was incompatible with the Christian idea of free will.

The description of the cosmos that Ricci studied at *Collegio Romano*, and that he would then teach to the Chinese, dated back to Aristotle. This description had been explained in mathematical form by the astronomer and geographer Claudius Ptolemy, who lived about 138-180 AD, and later revised in the light of Thomas Aquinas's doctrine.

According to this model, the universe was finished (*finito*) and the earth was still at its centre, and around it the eight beads, or heaven, rotate. Besides the stars, there was one last bead, called First Mobile, and beyond it the Empyrean, the abode of God, the only un-mobile heaven capable of transmitting the movement to all others.

When Ricci was studying at the Roman College, the work of Nicolaus Copernicus, *De revolutionibus orbium coelestium* (1543), which contained new and more correct ideas of the structure of the universe, with the sun at the centre of the planetary system, had been in existence for thirty years and the seeds of Copernican Revolution had begun to sprout. At the present, I am not in position to assert with certainty that Copernicus' book was available and read at the Roman College. I believe it was. Although criticized by some, Copernicus's work was not prohibited at that time. The authority of the Catholic Church took official action against *De revolutionibus orbium coelestium* only eight decades later in 1616 when it was suspended, and in 1620 when it was amended. This was during the Galilei controversy. Moreover, Galilei, who supported Copernicus's ideas, was a close friend of Clavius. Ricci was not touched by these controversies as they took place only after his death.

The Gregorian calendar

The astronomical and mathematical knowledge had an immediate application in the calculation of the calendar. Given Ricci's predisposition for science, it must be assumed that he was part of the group dedicated to the construction of perpetual calendars, to the study of planetary tables and to astronomical calculations. Pope Gregory XIII appointed a commission, which included Christopher Clavius, to fix Julius Caesar's 46 BC calendar. This calendar was still in use but incorrect. Although the calendar reform was completed in 1582, after Ricci's departure for the East, with the promulgation of the Gregorian calendar – still in use today – it is likely that the Ricci had taken part with his teacher in the analysis of some calculation problems.

As early as 1589, Matteo Ricci produced a Chinese version of the 1582 Gregorian calendar. The Gregorian calendar was "accommodated" by Ricci according to the 24 periods of about 15 days of the Chinese solar calendar. The calendar was a success, but Ricci refused to print it in order "not to arouse suspicion, since making the calendar was an activity reserved to the Emperor". The Jesuits published the calendar in China only after Ricci's death.

Geography and cartography

Ricci also devoted himself to geography and cartography, disciplines which were in full development during those years. The basic textbook used at the *Collegio Romano* was Claudius Ptolemy's *Geography*, translated from the Greek in the previous century.

In the 1570s scholars could avail themselves of various maps. A 1520 map was compiled by Pietro Apiano, Italianized name for the German Peter von Bienewitz, who used the name "America" for the first time to designate the New World. In 1569, the Flemish Gerard Mercator, Italianized name of Gerhard Kremer, had developed a technique, which still bears his name, to draw geometric maps. Another Flanders native, Abraham Ortelio, Italianized name of Abraham Oertel, published the first atlas in the modern sense of the term, *Theatrum Orbis Terrarum*, a systematic collection of the most recent maps of the world, prepared with the collaboration of most geographers of the time. First published in 1570, it was regularly updated in subsequent editions.

The diligent cartographical studies at the Roman College produced exceptional results in China. Various missionaries, including Ricci, kept a close correspondence with their teachers back in Rome, reporting their geographical and astronomical observations. China missionaries Matteo Ricci, Giulio Aleni, Adam Shall, Martino Martini, Michael Boym, Ferdinand Verbiest (some of them students of the Roman College) compiled maps adopting the newest available information. The editions of Ricci's world maps are the following: Zhaoqing 1584, Nanjing 1600, Beijing 1602, 1603, 1608, 1609.

Technical disciplines

The training at the Roman College included technical disciplines and development of manual skills. Ricci learned, among other things, to build globes and draw maps using the latest techniques. He studied the functioning mechanisms of the astrolabe, an ancient device which was used to measure the apparent height of the stars over the horizon.

Ricci learned the principles and techniques of manufacturing sundials, ancient instruments of which Clavius was a connoisseur. He also learned the secrets of mechanical clocks which denoted the hours by playing a bell. Clocks were introduced in the fourteenth century and were becoming quite popular.

This theoretical and practical knowledge would be used by Ricci in his missionary work. In China, Ricci manufactured not only maps, but also clocks, globes, armillary spheres, astrolabes, and sundials.

Mathematics, Astronomy and Heavenly Studies

Matteo Ricci along with other Jesuits (including Manuel Dias) have been accused, especially by Jacques Gernet, of mixing astronomy and theology. But such an accusation is anachronistic since the rigid religion/science dichotomy of modern French secularism was unknown in the early seventeenth century. In fact it is not universally accepted by contemporary scientists as well. 天學初函 *Tianxue chuhan* is the title of a 1626 collection by 李之藻 Li Zhizao of 20 previously independent writings on 天學 *tian xue* or "heavenly studies". Heaven is the object of the studies, and it is intended in a broad sense: studies concerning heaven (the sky, *i.e.* astronomy) and Heaven (God, *i.e.* theology). The modern division, or even the opposition, among the two learnings does not belong to seventeenth century science. Manuel Dias explained his concept of "heavenly studies' in the Preface to his 天問略 *Tianwen lue* ("Treatise on Astronomy", Beijing 1615).[2] 天學 *Tianxue* links Heaven, the Creator, to the study of the heavens, his creation. The Creator set the heavens revolving, and astronomy (天文) is the science of observing the movements of the heavens but also relates to theology (天主事) since *Tianzhu* is its origin and its final fulfilment (益學永學 *yixueyongxue*).[3]

Ricci and fellow Jesuits considered religious message and European science as an integrated whole, precisely called 'heavenly studies', where science and theology supported each other and where both were presented in rational terms. For the Jesuits and Chinese converts this was self-evident, while a number of *literati* opted for a separation: they showed interest for European sciences and their practical application, while remaining indifferent or even objecting to the 'superstitious talk' about the Lord of Heaven.

The concept of 西學 *Xixue* (western studies) is quite different from 天學 *Tianxue*. 西學凡 *Xixue fan* (Summary of Western Learning) is the title of a book by Giulio Aleni, published in 1623, where he presented European academic curriculum. 西學凡 *Xixue fan* was included in the 天學初函 *Tianxue chuhan* of Li Zhizao, which means that the concept of *Tianxue* is larger and *Xixue*: the first include the second. In his *Summary of Western Learning* Aleni introduced the basic European culture as offered by the academic institutions. European learning is divided into six disciplines: Rhetoric; Philosophy (which includes logic, physics, metaphysics, mathematics, ethics); Medicine; Civil law; Canon law; Theology. Again: it is evident that in sixteenth and seventeenth European academic training 'secular' and 'sacred' sciences are not separated and opposed to each other, but rather part of a unified and coherent curriculum. Astronomy belonged to mathematics; mathematics to philosophy and philosophy was propaedeutic to theology, the last (on the top) of academic disciplines.

[2] *Tianwen lue*, in TXCH, vol. 5, p. 2619.
[3] *Ibid.*, p. 2630.

The same Galileo famous saying that
"The universe cannot be understood without first learning the language and the characters in which it is written. It is written in mathematical language"[4]

shows that mathematics and astronomy were perceived in relation to theology, not in opposition to it.

Here follows the list of Ricci's Chinese writings correlated to his studies at the Roman College:

1. The various editions of the world map 與地山海全圖 *Yudi Shanhai Quantu* (1584 1600, 1603, 1608 and 1609).
2. On Friendship 交友論 *Jiaoyou lun* (1595).
3. The Method of Memory of the Western Countries 西國記法 *Xiguo jifa* (1596, published in 1625).
4. Treatise on the Four Elements (1599 or 1600).
5. The Eight Song for Western Harpsichord 西琴曲意八章 *Xiqin quyi bazhang* (1601).
6. The Sun is Larger than the Earth, and the Earth is Larger than the Moon. (1602 or earlier).
7. The True Meaning of the Lord of Heaven 天主實義 *Tianzhu Shiyi* (1603).
8. Twenty-five Sentences Ershiwu Yan 二十五言 *Ershiwu yan*(1605).
9. The Christian Doctrine 天主教 要 *Tianzhu jiaoyao* (1605).
10. Ten Discourses by a Paradoxical (Strange) Man 畸人十篇 *Jiren shipian* (1608).

A number of scientific writings by Paul Xu Guanqi and Leo Li Zhizao, compiled in collaboration with Matteo Ricci, or inspired by him, are also indebted to Ricci's studies at the Roman College:

1. *Elements of Geometry* (translation of Euclid by Ricci, in collaboration with Xu, 1607).
2. *Theory and Method of Measurements* (written in 1607 by Ricci in collaboration with Xu, and published in 1617 by Xu).
3. *Explanation on the Triangle* (written by Xu in 1607, on the basis of Ricci's lessons).
4. *Astrolabe and Spheres: Imagines and Commentary* (Written by Li 1607, on the basis of Ricci's lessons).
5. *Treatise on Arithmetic* (translation of a Clavius' book, "dictated" by Ricci to Li, and published by him in 1613, with his own original contribution).
6. *Treatise on* isoperimetriche *figures* (translation of a Clavius' book, composed by Ricci and Li in 1609, and published by the letter in 1614).
7. *Treatise on constellations* (translation of a Clavius' book by Li, the date of composition and publication is uncertain).

Litterae Indipetae

When Ricci was completing the third year of philosophy, at the end of 1576, the Portuguese father Martino da Silva, procurator of the missions of India, arrived in Rome. The missionary's visit sparkled in the "scholastic" Matteo Ricci the desire to be assigned to the foreign missions. Ricci presented his application.

[4] *"L'universo non si può intendere se prima non s'impara a intender la lingua, e conoscer i caratteri, ne' quali è scritto. Egli è scritto in lingua matematica."* Galileo Galilei, *Il saggiatore*, 1623.

The letters of request by young Jesuits to be sent to the missions were called *indipetae*, (petition for the *Indies*). This is a special and unique genre of Jesuit literature.

It has been calculated that from the beginning of the Society to its suppression (1773) 22.000 to 24.000 *Litterae Indipetae* have been written (the same candidate might have written more than one letter).

I have not read Matteo Ricci's *indipeta* letter, which, if still in existence, is kept at the Jesuit Archives in Rome. So far, my attempts to confirm its existence have not been successful, and I have not seen it quoted by his biographies.

I have read other letters; in particular, I remember the one of Giulio Aleni, another great Jesuit missionary in late Ming China. Aleni wrote the first Chinese biography of Matteo Ricci (1630), and is considered one of the most remarkable followers of Ricci's missionary method. I therefore believe Aleni's *littera indipeta* might be somewhat similar of Ricci's. Aleni wrote his on December 2, 1607, 29 years after Ricci has written his. Here follows a passage of Aleni's letter:

> At the opening of the new mission, humbly prostrated at your feet, I beg you by the blood of the Savior who has moved me to this, of being willing to cooperate with the Lord in such an evident vocation. I beseech you to grant the so much desired grace to go to the Indies, where, if I cannot do great things for the conversion of souls, at least will not be lacking the opportunity to suffer a lot for the love of His Divine Majesty. I desire to do this especially for His glory, since I am not able to do other things.
>
> Six years have already passed since, on Good Friday, the Lord pleased during the meditation on the Passion of the Lord, to call me and to move me with an extraordinary and ardent desire to dedicate all my life to the welfare of the poor souls in India.

I believe Ricci's letter might have included similar kind of thoughts, and employed similar devotional expressions, even if Giulio Aleni might have shown more inclination toward devotion than Matteo Ricci.

Writing a letter *indipeta* did not necessary mean that one actually went to missions. The selection by the superiors was very strict. Life in the missionary lands was known to be challenging in the extreme. Valignano himself, after becoming Visitor of the missions in Asia, ensured candidates were chosen with the highest intellectual and psychological qualities.

Departure for the *Indies*

Early 1577, Procurator Martino Da Silva submitted to the General Superior Everardo Mercuriano a list of missionaries to be taken with him. This list included Matteo Ricci even though Ricci was not yet a priest, as he had not yet even started the three years of theological studies.

On May 18 1577 after the benediction of Gregorio XIII, Ricci set off on his voyage from Saint Andrea in Rome with Rodolfo Acquaviva, Francesco Pasio and Michele Ruggieri.

Ricci did not go back to his hometown, Macerata. The group went directly to Genoa; then they sailed from Genoa to Cartagena, in Spain. From there they traveled by land to Lisbon where they arrived in July. Because of the Portuguese patronage on the East Missions, it was possible to leave from Lisbon for the Far East only in spring. While waiting for the next ship, Ricci went to the College of Coimbra to study the first year of theology. He stayed there until March 1578. He also had the opportunity to learn the Portuguese language, which he would often use during the coming years.

On March 24 1578 Ricci set out for Goa (a Portuguese Colony) on a galleon called «Saint Louis» with 14 Jesuits. A heavy storm almost took the galleon to the Brazilian coast. At the Cape of Good Hope, the galleon almost sunk. After about six months' travel, they reached Goa, the city where Francis Xavier is buried, on September 13, 1579.

Ricci taught humanities (Latin and Greek) at the Society's college from October until he was sent to Cochin in 1580 for health problems. He taught humanities there for four or five months.

On July 25, he was ordained as a priest and in September 1580, Ricci returned to Goa where he completed the second and third years of theology studies.

It will take too long to describe Jesuit theological training. For today, I will just say that if the Jesuits followed Aristotle in philosophy, they followed St. Thomas Aquinas's lessons in theology. Ignatius preferred his theological writings over Pietro Lombardo's *Sentences.*

In the meantime, Ricci's older friend and companion, Father Michele Ruggieri, was stationed in Macau. Ruggieri was having difficulty with the Chinese language and he proposed that Ricci should be sent to Macau as soon as possible. Alessandro Valignano, Visitor of the Mission of the East, decided to grant the request, and sent Ricci to Macau in order to study Chinese and to get ready to enter China. Ricci left Goa with Father Francesco Pasio on April 26 1582, and reached Macao on August 7 the same year after a short break in Cochin and a two week stay in Malacca. He took with him "a very beautiful clock 'with wheels', donated by the Superior in India, to be brought into China". During the voyage from Malacca to Macau, Ricci got ill, and was on the verge of death. "But as soon as I touched ground in Macau, with the grace of God, I got better."

And here, in Macau, on August 7 1582, the 'ascent to Beijing', as the adventure of Matteo Ricci in China was rightly called, had its beginning.

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