

利马窦学术及科学才能培养之背景

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1571年8月15日，19岁的利马窦来到罗马奎利纳尔圣安德烈修道院门口，受到代理院长范礼安的欢迎。范礼安在此暂代法比奥·德·法比神甫一个月。两位未来的中国传教团创始人因而进行了首次会晤。

会晤增进了互敬、友谊和团结。他们不仅有着共同的赴华传教理念和计划，而且在人文、宗教乃至思想方面也保持一致，这在现代传教史上十分罕见。他们俩无愧是中国天主教的创始人。

李约瑟赞利马窦为“历史上最出色、最有才者之一，”是“有史以来沟通中西文化的最杰出人物”（W. 弗兰克尔语），是“一个丰碑式人物”（孟德卫语）

马切拉塔

利马窦生于1552年10月6日。同年，沙勿略在华传教壮志未酬，客死上川岛。利马窦将实现沙勿略的梦想。

利马窦的老家是马切拉塔的教皇国，该市位于波坦察河与基恩蒂河之间的平行河谷之山巅，即今马尔凯的中心地区，居民约1.3万。

利马窦之父乔万尼·巴蒂斯塔·利奇，是个草药师，兼民法委员会委员。利马窦赴华后，其父于1596年成为市政厅（由该市贵族组成的机构）议员。

利奇家族有数百年的贵族血统，为马切拉塔第三望族，其族徽的紫色背景上有一只蓝色刺猬。17世纪末，利奇家族被赐韦奇奥城堡（今马尔凯大区的蒙特波齐奥附近）侯爵。

利马窦之母乔万娜·安乔莱利，同样身出名门。

利马窦的父母子女众多，他居长，有四个妹妹，八个弟弟。其中一个弟弟安东尼奥·玛丽亚后来成为马切拉塔教堂的神甫，另一个弟弟奥拉齐奥在市府身居要职。

利马窦被托付给外婆/奶奶拉莉娅照料，并拜西耶纳司铎尼古拉·塞伦盖利（又名本奇文尼）为师，学至七岁。这段师生缘分因塞伦盖利加入耶稣会而结束。多年以后，即1608年，利马窦在北京询问过老师的下落，说明塞伦盖利神甫对小利马窦产生过深刻的影响。利马窦在他1599年的一封信中提到塞伦盖利神甫，表明追寻启蒙老师的足迹，是他加入耶稣会志愿的动力。

1540年，教宗保禄三世将一所创建于1290年的法学院正式改为大学。这所至今犹存的大学，与博洛尼亚大学和帕多瓦大学享有相同的权利。

今天，该大学拥有一家利马窦东方关系研究所，与其他意大利机构一道，积极弘扬利马窦的知识。

马切拉塔的耶稣会士

1561年，13名耶稣会神甫来到马切拉塔，并开办了一所耶稣会寄宿学校。罗耀拉的依纳爵有意在马切拉塔开设一所耶稣会修院。1556年1月29日，依纳爵（当年晚些时候去世）下令向马切拉塔派遣优秀司铎，使之成为“一座名副其实的幸运之城”。

起初，耶稣会士住在维尔吉尼城外的圣母堂。四年后，按照教堂司铎理事会的安排，他们迁进城里，安顿在圣乔万尼教堂。

九岁的利马窦是耶稣会学校的首批学生之一。该校很快就招收到城里的富家子弟140名。

后来，鲁道夫·阿奎维瓦、范礼安及圣罗伯托·贝拉尔米诺也先后做客该院。

1773年耶稣会遭到迫害后，学院的地产被改为莫齐·博尔格蒂图书馆，至今犹在。该图书馆是马尔凯地区最大的图书馆之一，拥有藏书35万册，手稿一万份，15世纪前的古籍300册，16世纪的文献4,000余份，绝大部分从利马窦少年时就读的学院继承而来。

1561至1566年，利马窦就读于该院，14岁终止了人文学科的学习。利马窦的第一位传记作者熊三拔神甫称，利马窦在学业上鹤立鸡群，并初露投身宗教生涯的倾向。但其父似乎对他另有期望。

利马窦1566至1568年在做什么，不太清楚。很可能是在家继续接受教育。

利马窦在罗马

1568年，乔万尼·巴蒂斯塔将16岁的儿子利马窦送到罗马大学（La Sapienza，今罗马第一大学）学习法律。父亲做这个决定有两个原因：马切拉塔大学经济困难，前途未卜；同时他对儿子的未来寄予了厚望。乔万尼·巴蒂斯塔或许希望，利马窦将来能在教皇国从事行政管理工作。

罗马当时约有居民 10 万人，为世界主要艺术中心之一。当时，圣彼得大教堂的兴建（象征着教会的伟大），造就了一部分文艺复兴时期最伟大的艺术家。罗马人把圣彼得大教堂看作永不停息的工厂。修建工程持续了 176 年，其间换了 28 位教皇。利马窦未能欣赏到米开朗基罗设计的著名穹顶，因为它在他离开罗马后的 1588 年才告竣工。早在利马窦抵达首都的前四年，米开朗基罗就已于 1564 年辞世。

利马窦到罗马时，教宗碧岳五世已逊位两年。这位严厉苛刻、禁欲苦行的教皇，后于 1712 年被克雷芒十一世封为圣人。安东尼奥·弥格尔·熙列里这位多明我会士，是宗教裁判所的法官，而意大利则大体上是一些被割裂的小邦，由西班牙管理，唯有威尼斯共和国及教皇国保持着有效的自治。

西班牙和葡萄牙这两大海洋天主教霸主，控制着整个海洋。他们对全球的探索，改变了世界的面貌，改变了地图，也改变了非基督教民族对神学的认识。天主教世界的传教精神再度勃发。方济各会、奥古斯丁会、多明我会和耶稣会的传教士，沿着探险家和商人开辟的道路向前挺进。传教士的方法和目的，常与征服者的不谋而合。当然也有许多值得注意的例外，其中就包括著名的耶稣会传教士沙勿略、利马窦、范礼安、罗伯托·德·诺比利及亚历山大·德·罗德斯，也包括其它教派的传教士，如奥古斯丁会的马丁·德·拉达主教及在拉丁美洲的多明我修士巴托洛米·德·卡萨斯。

日新月异的世界，变得更为复杂，更为矛盾。新观念与旧思想哲学混存。现代科学刚刚迈出第一步。在探索 and 认识自然现象的过程中，作为工具的数学发挥了关键作用。技术赢得了新的力量和相关性。

罗马大学

La Sapienza 名为罗马大学，1303 年由教宗伯尼法八世创办。由于该校位于梵蒂冈城外，因而拥有一定的学术独立性。又由于世界各地的学者纷至沓来，该校因之名震寰宇。1431 年，教宗尤金四世不得不在那弗纳广场及万神殿（今国家档案馆）之间的圣尤斯塔修区，为该校增添宽敞的新建筑。

利马窦就是在那里学习法律的。16 世纪初，教宗利奥十世，即洛伦佐·德·美迪奇之子，广纳欧洲贤士，提高了罗马大学的声誉，使之成为欧洲最先进的科学中心之一，特别是在医学和解剖学领域。其他著名学科包括史学、人文学和考古学。

罗马大学的俗名 *Sapientia*，首见于 1568 年的文件。¹

不幸的是，我们非常缺乏关于利马窦在罗马大学法学院三年学习期间（1568-1571）的史料。

奎利纳尔的圣安德烈教堂

1569 年，利马窦开始参加罗马学院圣母堂的弥撒集会，并向耶稣会士忏悔。他很快意识到，世俗生活不是为他而设的。在完成三年的大学学业之前，他决定离开法学院，加入耶稣会。

1571 年 8 月 15 日，利马窦在奎利纳尔的圣安德烈教堂被耶稣会修道院接纳。

同一天，范礼安神甫签署了他第一份至今保存完好的推荐利马窦的文件，“来自马切拉塔的利马窦”。根据资料，除了范礼安所起的作用外，正式接纳利马窦入会的，是依纳爵最重要的同事之一纳达尔神甫。1571 至 1572 年，纳达尔是圣弗朗西斯科·德·博尔吉亚地区的代主教，即耶稣会总会长。

耶稣会保存了范礼安准备的文件。它记录了利马窦的成功接纳，而且他承诺：

仰赖圣恩，谨遵耶稣会的一切规章制度及生活方式。对会里的职务，不谋不争，随遇而安。一切遵命。

（见接受利马窦加入耶稣会的审查报告。）

据利马窦的传记作者称，其父动身前往罗马，欲使儿子退出修院。行至离马切拉塔 18 公里的托伦蒂诺，其父突发高烧，遂幡然醒悟：此必天主圣意，令我勿阻儿子所选之道。

修道院院长法比奥·德·法比神甫，是一位不顾家人反对而加入耶稣会的罗马贵族。利马窦一生都与他保持着亲密的通讯联系。

1571 年 1 月，利马窦被派往格苏的普罗菲萨修院，实习卑微的家政服务。

5 月 25 日，他许下初愿，随即被派往托斯卡尼或佛罗伦萨的寄宿学校。在后来的书信中，他不时将中国城市如南京比作佛罗伦萨。

《教学大纲》

1572 年 9 月 17 日，利马窦入读罗马学院。同年，乌戈·邦孔帕尼当选教皇，称格列高利十三世。新教宗将在耶稣会历史上发挥重大作用。

欧洲的耶稣会士特别醉心于教学。他们具有极其广阔的文化背景，有的还担任亲王或国君的顾问及忏悔神甫。各级学校、学院和大学均提供教育。16 世纪末，全欧洲共有修道院和耶稣会学院 500 多所。

教学计划按依纳爵的亲自指示设计。他希望为学生提供广泛的学科，包括文法、诗歌、修辞、自然和道德哲学、玄学及数学。

教学法初循依纳爵及其早期合作者拟定的方针制订，后又在《教学大纲》中详细阐明。《大纲》的早期版本见于 1566 年，定本由 1581 年起任耶稣会总会长的克劳迪奥·阿夸维瓦于 1599 年颁布施行。阿夸维瓦担任总会长职务 30 余年，其间利马窦一直身在中国。

《大纲》的前身，为杰罗姆·纳达尔神甫 1551 年为西西里的墨西拿学院制订的计划，他后来的称之为《教学管理条例》（1566）的计划，罗耀拉的依纳爵起草的《耶稣会章程》第四部分及詹姆斯·莱德马神甫（利马窦在罗马学院就读期间任教务长）的《罗马学院教学大纲及管理条例》。

《教学大纲》是一批优秀管理者及教师多年计划及实验的结晶。文艺复兴理论与实践的多重影响，特别是巴黎大学的影响，以及分布在许多国家的一百所耶稣会学院长期实验的实践经验，也为它的制定提供了参考。

《大纲》和以前的教学计划迥然不同。它囊括了人文学科如文学、历史、戏剧，以及传统的神学科目如神学和哲学，既针对世俗学生，也适用于耶稣会士。因此，它结合了文艺复兴时期的人文学科和中世纪的学术科目。据耶稣会学者约翰·欧马雷称，《大纲》的影响，“远远超出了耶稣会的机构，因为它被视为现代欧洲早期教育家共有的理想、方法及目的的清晰流畅之陈述。耶稣会学校成了它们所在城市的文化中心，不仅排演话剧和芭蕾，而且还设有天文观象台。”

罗马学院

罗马学院 1551 年由圣依纳爵创建，是最重要的耶稣会大学，被奉为所有学校的楷模，免费教授文法、人文及基督教义。校舍（今已不存）位于“卡皮托利纳路”（今卡比多利奥广场附近的阿拉科埃利广场）的卡比多利奥山麓。随着生源的增长，学院曾四度迁址。

根据依纳爵的一封信件，学院的教授须由学界泰斗担当。所录学生须经过充分准备，经验丰富，智力超群，品行优良。罗马学院应培养耶稣会士中的最优秀者。1556 年，教宗保禄四世批准这所以巴黎大学为榜样的学院为高等教育中心。

在利马窦那时，就读于罗马学院的有 1,000 多名来自欧洲各国的青年。这所别称“万国大学”的学费全免。

利马窦就读的罗马学院，当时坐落在今圣依纳爵教堂附近，是其创办以来的第四个校园，之后又修建了最后一座大学校园。那是一座庄严肃穆的文艺复兴式宫殿，由托尔法侯爵夫人（卡米洛·奥西尼的遗孀、教宗保禄四世的侄女/外甥女）捐资兴建。该宫殿（今已不存）由两座独立建筑构成，围绕着两个宽阔的庭院和谐排列，四面都有券廊。一个庭院作为教室供学生使用，另一个是耶稣会社区。安农齐阿教堂（今圣依纳爵教堂的所在范围）与该院相邻。

即便是那个校园也小不敷用，这不奇怪。1582 年，格列高利十三世开始自掏腰包，在宫殿后面为罗马学院兴建新校园，并于 1584 年剪彩。教宗格列高利十三世被称为该大学的“创办人和保护人”，自那以后，为了纪念他，学校更名“格列高利”，尽管新名称到了 1873 年才正式采用。

罗马学院在该校园一直办到 1870 年。是年，维克托·伊曼纽二世率军侵入罗马，攻占了校园，并将其改作兵营。宫殿的一部后来成为新意大利国最负盛誉的中学——维斯康蒂中学。罗马学院的大图书馆成了意大利国家图书馆的雏形，以维克托·伊曼纽二世（即那个把它从耶稣会抢走的人）的名字命名。该馆收藏的资料，多从其他受意大利压迫的教会团体掠夺而来，后于 1975 年转到罗马的卡斯特罗·普勒托里奥新址。

利马窦在罗马学院

在来自欧洲各国的 1,000 多名学生中，有 130 人是像利马窦那样的耶稣会士。

学院旨在提供的综合教育，只能通过“寄宿”并尽量减少与父母亲友的接触才能完成。利马窦与教师和同学组成了新的家庭，并与他们发展了深厚的友情。他在去世前一直爱着并思念着他们，这一点可以通过阅读其亚洲来信得到证明。1580 年 11 月，利马窦从印度的科钦向他在罗马学院时任院长的鲁多维科·马塞利发出了第一封信，称：

离开我的世俗家人，纵然我是十分的世俗，也未像离开神甫您那样引起如此之多的伤感。我爱您胜过爱我的父亲。

耶稣会学生所修的学术课程包括：

修辞学两年，
哲学三年，

神学三年。

修辞学

在罗马学院的头两年，利马窦修了希腊语、希伯来语和教学语言拉丁语。老师提议将基督教以前的古代作家的作品作为文体范本。这个选择紧步人文主义之后尘。这一始于前一世纪的思想运动，导致了希腊语和拉丁语经典著作的重新发现及欣赏。

然而课本是经过教会当局事先审查的，因此有些被认为不可接受的部分遭到了删除。利马窦读过的拉丁作家包括马夏尔、霍拉斯、奥维德、维吉尔和昆体良，希腊作家包括荷马、赫西奥德、修昔底德及德谟斯梯尼。

就拉丁文体来说，无人超越的西塞罗被奉为拉丁语修辞学典范。利马窦的在华著述，如《交友论》（1595）及《西国记法》（1596），均以那两年修辞课上吸收的文化信息为基础。

尽管存在教会当局的审查，教师们仍然显得相当独立。在耶稣会学院，可以读到鹿特丹的伊拉斯姆斯，尽管其作品在教宗保禄四世（1557/1559）颁布的《禁书索引》上榜上有名。

哲学

为期三年的哲学课程包括逻辑学、道德学、亚里斯多德玄学、斯多葛伦理学、塞尼加和埃佩克塔特。

为了提高辩证法技能，学生们每个月都参加辩论，在老师和同学面前辩论一个哲学命题。

利马窦是学术学会（一个鼓励学生在各领域冒尖的学习团体）的尖子生之一。参加课堂学习和学术学会的活动，可以被描述为一种持续的智力锻炼，一种经常的实习，一种不间断的心智体操。

在哲学课程的最后一年，利马窦修了一门由年轻神学教授罗伯多·贝勒明开设的新课“争议”。贝勒明这位未来的主教、圣人和圣师，是耶稣会历史上最具影响力的人物之一。

数学

哲学课程包括当时叫做自然哲学的科学科目。数学是科学的基础，包括天文、音乐、地理及应用学科如工程（力学）和建筑。16 世纪后半叶，数学开始在技术和自然研究等方面发挥显著的渗透作用。

商业和银行业务的发展，建筑业、火炮铸造、弹道研究和其他许多技术及工艺活动，都需要进行算术的高级运算，因为它们都离不开精确的测算。

在造型艺术方面，要想画出层次感，几何技能就不可或缺。这一前一世纪才完善起来的技术，被用来表现画布上的立体感。这些原理为射影几何学的发展奠定了基础。

数学在下一世纪发挥的作用更为显著。伽利略把数学当作一种探索物理世界的工具。在其《试金者》一书中，伽利略写下了这句最近我听到教宗本笃十六世引用的名言：

“数学是天主用以书写字宙的语言。”

对神学来说，数学知识十分重要。据修正古希腊数学自然观的基督教学者称，世界是天主按数学法则设计并创造的。探索主宰宇宙的法则，就是宗教探索；发现自然现象中隐含的数学规律，就是对天主创世之伟大及荣耀的颂扬。伟大的天文学家开普勒称：

一切外部世界探索的主要目的，在于发现天主的理性及其赋予世界的和谐。天主用数学语言表达了这些奥秘。

克拉维乌斯大师的弟子

数学是罗马学院的重要课程。在 1566 年颁布的《教学大纲》中，我们发现：

关于数学，数学教师应按以下顺序教授欧几里得的（前）六本书、算术、（萨克罗博斯科的）天球论、宇宙结构学、天文学、行星理论、阿方索星表、光学和计时。只有修学第二年哲学课程的学生才有资格听讲，但经特许，辩证法学生有时亦可旁听。

说服同事将算术、代数和几何纳入课程设置的，主要是德国人克里斯托弗·克拉维乌斯（1537-1612），即著名天文学家、数学家、1563 年起任罗马学院教授的“丁先生”。他是对青年利马窦的成长影响最大的教师之一，也被誉为 16 世纪的欧几里得。自 1574 年发表了译自希腊语的欧几里得的《原

本》（公元前三世纪的算术与几何名著）注释本之后，他便赢得了该美誉。丁先生本人是耶稣会士，发表过天文学、数学和教育学方面的论文。

丁先生知道，绝大部分青年修士对科学鲜有兴趣。有些教师认为，没有必要给未来的司铎和传教士讲授数学。但丁先生坚信，哲学和数学是相通的，因此他在师生中间发起了一场运动，称数学教学不仅会给耶稣会增光添彩，而且数学学科还是学习其他科学与应用学科的基础前提。利马窦赞同大师的观点，并且就像报告里所说的那样，相当成功地跟着他的班学习。

伽利略

德国教授从其他学者那里赢得的尊敬，可以从他与当时一些大科学家的通信及其与青年伽利略（多次征询过丁先生的意见）的友谊中得到印证。

在罗马学院将近 50 年的教学生涯中，丁先生推出了一系列教材，规定了罗马学院乃至所有耶稣会学院的耶稣会科学教育。耶稣会数学教育的影响，也波及到其他非耶稣会大学。在过去的二十年间，有人证明，伽利略在比萨大学当学生时所做的听课笔记，追根溯源是罗马学院的数学讲座。

天文学

如果将数学比作科学基础，那么天文学就是女王。丁神甫定期在罗马学院的天台上夜观天象。他 1572 年观察到的一颗“新”星，在仙后座持续闪耀了 18 个月才消失。

16 世纪中叶使用的术语不是“天文学”，而是“占星学”，分“气象占星学”和“决疑占星学”两支。前者在观察和计算的基础上研究天体，后者今称“占星术”，利用星象观察来占卜人的吉凶祸福。当时不仅大学开设占星课程，就连开普勒这样的大科学家也乐此不疲。虽然人们普遍认为，天体对人事有影响，但决疑占星学在各学院是遭禁的，因为耶稣会士认为，星象预示的未来和基督教的自由意志理念，是水火不容的。

利马窦在罗马学院学到的宇宙描述（后来他教给了中国人），可以追溯到亚里斯多德。这一描述先经天文学家、地理学家托勒密（约 138-180）的数学公式解释，后又根据阿奎那的理论进行了修正。

根据这个模式，宇宙是完美的成品（*finito*），地球仍是宇宙的中心，八光或天环绕着地球公转。除了星体之外，还存在最后一种称之为晶莹天的光，晶莹天以外便是天主的住所最高天，是唯一能够带动其他天运动的不动天。

利马窦在罗马学院就读期间，哥白尼的日心说（更为正确的宇宙结构新观点）著作《天体运行论》（1543），业以问世 30 年，哥白尼革命的种子已经开始萌发。虽然我目前还不敢断言，当时在罗马学院就有并且可以读到哥白尼的书，但我相信是那么回事，因为尽管哥白尼的著作受到了一些人的批评，但它当时并未遭禁。直到 80 年后的 1616 年，天主教教会当局才开始对《天体运行论》采取官方行动，先对其实行查禁，后又于 1620 年对其作了修正。这些事情都发生在伽利略争端期间。另外，支持哥白尼观点的伽利略，是丁先生的密友。利马窦没有受到这些争端的牵连，因为它们发生在他去世之后。

格列高利历

天文学和数学知识被直接应用于日历推算。以利马窦的科学秉赋，可以推测，他就是那批致力于永年历的制订、行星表研究和天文学计算的人之一。教宗格列高利十三世任命了一个委员会，其中包括丁先生，来修订公元前 46 年起执行的凯撒历（即儒略历）。当时儒略历虽有错误，但仍在用。虽然历法改革（颁布了格列高利历，今仍在用）完成于利马窦前往东方之后的 1582 年，但他很可能和他的老师一起分析了某些计算问题。

早在 1589 年，利马窦就制定了一个中文版的 1582 年格列高利历（即公历）。利马窦根据中国阴历的 24 节气（约 15 天为一节气），成功地对公历进行了“调整”。但是为了“避嫌”，他拒绝印制他的日历，“因为制定历法乃皇上专利。”利马窦去世后，耶稣会士才在中国发布了公历。

地理与制图

利马窦也醉心于地理学和制图学这两门当年发展得如火如荼的学科。罗马学院使用的基础教材，是前一世纪译自希腊文的托勒密的《地理学》。

16 世纪 70 年代的学者们得以利用各类地图。德国人彼得·冯·比内维茨，拉丁名为皮艾特罗·阿皮安努，在其编制的一份 1520 年地图中，首次将新世界定名为“亚美利加”（即美洲）。1569 年，弗莱芒人格拉德·墨卡托，拉丁名为格哈德·克雷默，开发出了一种以其名字命名的几何地图绘制技术。另一位弗兰德人亚伯拉罕·奥泰里奥，拉丁名亚伯拉罕·奥厄特尔，和当时的大部分地理学家合作，系

统地收集了全世界的最新地图，发表了第一部现代意义上的地图集——《寰宇全图》。继 1570 年初版后，后续版本定期更新。

罗马学院的刻苦制图学习，在中国产生了非凡的成果。包括利马窦在内的许多传教士，纷纷写信给他们在罗马的老师，汇报他们的地理学和天文学观察结果。在华传教士利马窦、艾儒略、汤若望、卫匡国、卜弥格、南怀仁（其中一些是罗马学院的学生），采用新的现有信息绘制了地图。利马窦的世界地图有以下几个版本：1584 年的肇庆版，1600 的南京版及 1602、1603、1608、1609 年的北京版。

技术科目

罗马学院的训练包括技术科目及动手能力的培养。利马窦学到了很多，包括利用最新技术制作地球仪及绘制地图。他学过等高仪（即古代用来测量星体距地平面高度的仪器）的作用机理。

利马窦不仅学了日晷的制作原理及技术（因为丁先生是这种老古董的行家），还学了敲钟报时的机械钟的奥秘。自鸣钟于 14 世纪问世以后，日渐流行。

这一理论和实践知识，将被利马窦用于其传教工作。利马窦在中国不仅绘制了地图，而且还制作了自鸣钟、地球仪、浑天仪、等高仪和日晷。

数学、天文学及天学

利马窦和其他耶稣会士（包括阳玛诺），被人（特别是谢和耐）指责为将天文学和神学混为一谈。但是这一指控颇有些关公战秦琼的意味，因为早在 17 世纪初，现代法国世俗主义对宗教和科学的严格区分，尚无人知晓。事实上，那个观点就连当代科学家也没有完全接受。李之藻 1626 年所编的《天学初函》，辑独立天学著述 20 种。作为研究对象，“天”是广义的天：是关于天空（即天文）和天（天主，即神学）的研究。两种学派的现代区分或对立，并不属于 17 世纪的科学。阳玛诺在其《天问略》（北京，1615）自序里解释了他的“天学”观。²天学将天（即造物主）与诸天（即造物主之所造）的研究，揉合在了一起。造物主使诸天运转，天文虽是观察诸天运动的科学，但也关乎天主事，因为天主既是其源头，也是其最终实现。³

利马窦和耶稣会同仁认为，宗教信息和欧洲科学是一个不可分割的、称之为“天学”的整体。在这一整体中，科学和神学相互支持，两者均以理性的面貌出现。对耶稣会士和中国教徒来说，这是显而易见的，尽管有些文人试图对它们加以区别：他们对欧洲科学及其实际应用颇感兴趣，但却对天主的“迷信之说”无动于衷，或者干脆反对。

西学与天学的概念截然不同。艾儒略在 1623 年出版的、题为《西学凡》的著作中，介绍了欧洲学校的课程设置。《西学凡》后被李之藻辑入《天学初函》，这意味着天学的概念要大于西学，即前者包括了后者。艾儒略在《西学凡》中介绍了学术型院校提供的欧洲基本文化。欧洲教育被分为六科：文科、理科（含逻辑学、物理学、玄学、数学和伦理学）、医科、法科、教科和道科。这再次证明，在 16 和 17 世纪的欧洲学术教育中，“俗”学和“圣”学既无区分，也不互相对立，而是统一协调的课程设置中的有机组分。天文学属数学的一部分；数学又属理科；而理科又是以上最后一科——道科的预科。

前引伽利略名言说，“不学书写宇宙的语言文字，就读不懂宇宙。宇宙是以数学语言书写的。”⁴表明数学和天文学被认为是与神学相关的，而非对立的。

以下是与利马窦在罗马学院的学习相关的中文著述目录：

- 1、《與地山海全图》（1584，1600，1603，1608 及 1609）；
- 2、《交友论》（1595）；
- 3、《西国记法》（1596，1625 出版）；
- 4、《四元行论》（1599 或 1600）；
- 5、《西琴曲意八章》（1601）
- 6、《乾坤体义》（1602 或更早）；
- 7、《天主实义》（1603）；
- 8、《二十五言》（1605）；
- 9、《天主教要》（1605）；
- 10、《畸人十篇》（1608）。

徐光启、李之藻和利马窦合著，或受利马窦启发而作的科学著述，也可归因于利马窦在罗马学院的学习：

- 1、《几何原本》（欧几里得原著，利马窦、徐光启合译，1607）；
- 2、《测量法义》（利马窦、徐光启 1607 年合著，1617 年由徐出版）；

- 3、《勾股义》（徐光启撰，利玛窦之所授，1607）；
- 4、《浑盖通宪图说》（李之藻撰，利玛窦之所授，1607）；
- 5、《同文算指》（丁先生原著，利玛窦口述，李之藻笔录，1613年由李出版，附其原创）；
- 6、《圜容较义》（丁先生原著，1609年利玛窦、李之藻合译，1614年由后者出版）；
- 7、《星宿论解》（丁先生原著，李之藻译，著述及出版年份不详）。

赴印申请书

1576年末，利玛窦在修学第三年哲学课程期间，印度传教团总务长、葡萄牙神甫马蒂诺·达·席尔瓦抵达罗马。这位传教士的来访，激起了利玛窦这位学究参加外方传教团的欲望。他呈交了申请。

青年耶稣会士要求被派往海外传教的申请，称之为 *indipetae*（赴印申请），是耶稣会独有的文献种类。

据估算，从耶稣会成立伊始到其受迫害（1773）为止，共收到约 2.2 到 2.4 万份赴印申请书（一个申请人可能不止写一份申请）。

我尚未读到利玛窦的赴印申请。如果它还在的话，应该藏于罗马耶稣会档案馆。到目前为止，我尚未能确认它的存在，而且也未见利玛窦的传记作者引用过它。

但我读过其他人的申请，对另一位明末时期在华的伟大的耶稣会传教士艾儒略的申请记忆犹新。艾儒略是利玛窦的第一位中文传记（1630）作者，被认为是利玛窦传教法最杰出的执行者之一。因此我认为，艾儒略的赴印申请，应与利玛窦的相似。艾儒略的申请写于 1607 年 12 月 2 日，比利玛窦晚了 29 年。以下为艾儒略申请书中的段落：

值此新使命开端之际，我恭伏于您的脚下，以促使我写此申请的救世主的血，恳求您允许我在这一明显的天职中与主合作。我恳请您降恩垂顾，准我赴印。即使我在那里做不了皈依灵魂之类的大事，至少不至于，为了圣主的爱，缺少受苦受难的机会。为显主荣，我极欲赴印，因为我无心做其他事情。

自从在那个耶稣受难日追思主耶稣受难时起，蒙主亲切召唤并促使我以非凡及热切的愿望，令我献身于改善印度穷人的福祉，已整整六年。

笔者认为，利玛窦的申请书很可能包括了类似的想法，使用了类似的虔诚语句，即便艾儒略比利玛窦展现出更多的虔信倾向。

写了赴印申请，并不一定意味着就真的能去传教。上级的选拔十分严格。传教国的生活极具挑战，这一点众所周知。范礼安出任亚洲区巡视员后亲自要求，人员的选拔要以最高智力和心理条件为准。

前往印度

1577年初，马蒂诺·达·席尔瓦总务长向总会长艾弗拉多·墨丘里阿诺呈交了一份随行传教士名单。利玛窦榜上有名，即使他还不是司铎，因为他还未开始为期三年的神学学习。

1577年5月18日，经格列高利十三世祝福，利玛窦随鲁道夫·阿夸维瓦、巴范济和罗明坚从罗马圣安德烈教堂启程。

利玛窦没回老家马切拉塔。他们直奔热那亚，然后从那里乘船前往西班牙的卡塔赫纳，接着舍舟登岸，经陆路于7月到达里斯本。由于葡萄牙东方保教权的关系，离开里斯本前往远东，只有春天才有可能。利玛窦一边等候下一趟班船，一边在科因布拉学院修学第一年的神学课程，直到1578年3月。其间学会了后来经常使用的葡语。

1578年3月24日，利玛窦与14名耶稣会士搭乘“圣路易”号大帆船启程前往果阿（葡萄牙殖民地）。狂风差点将帆船吹到了巴西海岸。在好望角，帆船几乎沉没。经过六个月的航行，他们于1578年9月13日抵达了果阿这座埋葬着沙勿略的城市。

从10月份开始，利玛窦在耶稣会学院教授人文课程（拉丁语和希腊语），直到1580年因健康原因被送到科钦为止。他在那里的授课时间为四到五个月。7月25日，他晋升司铎，1580年9月，利玛窦返回果阿，继续修他的第二年和第三年的神学课程。

描述耶稣会士的神学训练，会耗费许多时间。今天我只想说，如果耶稣会士学的是亚里斯多德哲学，那么他们学的就是圣托马斯·阿奎那的神学。依纳爵更中意他的神学著述，而不喜欢皮艾特罗·隆巴尔多的《格言》。

与此同时，利玛窦的老友及同伴罗明坚神甫驻在澳门。罗明坚因在汉语方面遇到麻烦，要求尽快派利玛窦赴澳门。东方管区巡视员范礼安决定批准该项请求，并派利玛窦前往澳门学习汉语，以期进入中国。1582年4月26日，利玛窦与巴范济神甫离开果阿，经在科钦短暂休息并在马六甲滞留两周后，于同年8月7日抵达澳门。他随身携带有“一座印度总会长捐赠的、美奂美仑的带‘轮子’的钟，准备带入

中国。”在马六甲到澳门的航程中，利马窦病倒了，差一点死去。“但蒙天主恩典，一踏上澳门的土地，我的病就好了。”

1582年8月7日，利马窦从澳门这里开始了他的“进京”历险。

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柯毅霖，宗座外方传教会司铎，在大中华地区（台、港、澳和大陆）生活了18年，目前驻香港。其研究、教学及著述无不与中国和基督教相关，特别关注基督教的接受问题、传教工作和传教方法。除从事中国天主教当前形势及宗教政策的观察及评论外，柯神父还讲授传教神学。著述包括专著多本，论文50余篇。

注释：

1 大约一个世纪后，罗马大学有了自己的教堂——圣伊芙教堂，为贝尼尼的竞争者波诺米尼设计的最伟大的杰作之一。大约在利马窦离开罗马80年后，贝尼尼在奎利纳尔山上修建了一座耶稣会神学院教堂，即圣安德烈教堂，被公认为罗马巴洛克建筑的最光辉典范。贝尼尼认为它是自己唯一的完美之作。据其子回忆，贝尼尼晚年常去教堂内欣赏，一坐就是几个小时。教堂内部为椭圆形，入口和高高的祭坛位于椭圆的短轴上。圣安德烈教堂可以视为许多亚洲耶稣会修院小教堂——包括果阿、马尼拉、北京和澳门圣若瑟堂——的原型。

2 《天问略》，见《天学初函》，第5卷，第1619页。

3 同上，第2630页。

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.*”见伽利略，《试金者》，1623。

郭颐顿译

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

Macau Ricci Institute
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By
Gianni Criveller

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 Matteo'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 4,000 sixteenth-century documents, 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 fields 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 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

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.

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 Cochín, 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** (lunar) 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 (better delete this phrase 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 includes 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 century 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.

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 Songs 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* (delete this, 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: Images 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 Isoperimetric Figures* (translation of a Clavius’ book, composed by Ricci and Li in 1609, and published by the latter [latter] 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 sparked in the “scholastic” Matteo Ricci the desire to be assigned to the foreign missions. Ricci presented his application.

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).

² *Tianwen lue*, in TXCH, vol. 5, p. 2619.

³ *Ibid.*, p. 2630.

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 saggiaiore*, 1623.

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** (necessarily) 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 (1578).

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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