The return of the Jesuits to postcolonial America:  
Science, modernity and Catholicism in nineteenth-century Ecuador

Abstract
In the second half of the nineteenth century, the Ecuadorean president Gabriel Garcia Moreno invites the Society of Jesus to return to Ecuador as part of a nation-building plan that seeks to modernize the country. This article reflects on the equation behind this political strategy: nation-building / modernity / Jesuits. How do these concepts connect? A postcolonial Latin American country wants to be modern: call the Jesuits. Is Garcia Moreno calling the Jesuits because they are Catholics, because they are modern Catholics, because they are teachers or because they are scientists? How can they contribute to Latin American modernity? We will analyze a political, historical and cultural story about the dilemmas of modernity, science, nation building and postcolonial states. The historiographical debate on the nature of nineteenth-century secularism and whether or not the waves of modernity connect with the decline of Catholicism will play a dominant role in the argument.

Key words
Jesuits, modernity, periphery, science, postcolonial nation building, Catholicism.

“The triumph of humanity”: nation building in the Andes
After the Independence movements of the beginning of the nineteenth century, the new Andean postcolonial territories face the challenge of building nation-states. The European path defined as “modernity” resonates in the mind of many Latin American politicians. What is modernity and how to achieve it? Gabriel Garcia Moreno (1821-1875), a political and intellectual figure that dominates Ecuadorean politics between 1858 and 1875, has a plan on how to move towards what he considers modernity. Being at the same time a devout catholic and a man of science, his nation-building experiment of “Catholic modernity” (Demelas and Saint-Geours 1988; Maiguaschca 1994) understands religious moral to be the basis of genuine and lasting economic progress. His government would respect religion and humanity (Garcia Moreno 1851:52).

Garcia Moreno bases his strategy largely on education. He intends to give impulse to what he considers to be an imperfect and decaying system of public
instruction. How to extend schooling to every corner of the State, within reach of the poor and helpless? “The oppressed and numerous indigenous race” that “continue as hitherto, reduced to the class of degraded outcasts, without more political rights than the sole privilege of the tribute and the honours of beasts of burden” is one of his main concerns (García Moreno 1851 :52).

For the sake of the people and of Catholicism I aspired, and still do, a moral reform through solidly religious education of the younger generation, and I thought that for this vital work I would find in the Society of Jesus my most respected collaborators (García Moreno 1862, 12 Abril).

In García Moreno’s plan the Jesuits play a crucial role. He cannot build a nation without “overcoming the ignorance and corruption that the colonial regime and forty years of war and anarchy had left” (García Moreno 1851) and in order to conquer this situation he promotes a Jesuit-led education system. In 1851, García Moreno writes “In the defense of the Jesuits”, a pamphlet which denounces the intentions of Nueva Granada (today's Republic of Colombia) to question the permanence of the Society of Jesus in Ecuador after its expulsion from their territory. He cites Voltaire’s Essay on the Customs and the Spirit of the Nations (1756) that describes the missionary work of the Jesuits as being “in some way the triumph of humanity”. Voltaire describes the penetration of missionaries to Paraguay in the early seventeenth century as an odyssey that matches that of the conquerors of the New World. Religious values are thus portrayed as being “at least as strong” as the values of the warrior (García Moreno 1851 :46).

Garcia Moreno is seeking an army. The Jesuits seem to fit the role. He tells the Society of Jesus to:

Go and teach, awaken the people from the lethargy of brutalization, open the eyes of this Sovereign that is asleep, spread knowledge and piety from the beaches of the Pacific to the shores of the Amazon, blow the meaning of faith and social life to the savage tribes that populate our eastern forests, and prepare emerging generations in the future happiness of this unfortunate country (García Moreno 1851 :52).

The President thus hopes to find freedom for his country by ways of the civilizing influence of Christianity. His plan traces a clear link between the work of the Jesuits and the progress of the nation; between Catholicism and modernity. He expects civil discord to disappear, “or at least lose the character of bitterness and fury that it holds today” (García Moreno 1851 :52). For him, this is the only way to empower the people
of Ecuador to have the will and the strength to force the ending of what he calls “the sovereignty of the sword”.

**A preliminary question: Jesuits in colonial America**

*A long-distance network*

The President of Ecuador has called the Jesuits: who are they and what is their relationship with America. Before its suppression in the late eighteenth century, the Society of Jesus mastered the difficult organizational and administrative tasks required to operate what John Law (1986) and Bruno Latour (1987) have called long-distance networks. Harris (1998) compares the scope of the Jesuit colonial network with that of other legally constituted corporations engaged in overseas activities such as the East and West Indies trading companies, colonial administrative bureaus, and (eventually) the larger scientific academies capable of launching foreign expeditions. O’Malley (2000: 132) argues that the Society of Jesus was the most strongly centralized religious order of the early modern period both in its administration and its cultural and educational activities; and, although Jesuits around the world operated with a great deal of local autonomy and initiative, they ultimately were responsible to their Superior General in Rome. This successful expansion and mobility were largely due to two decisive strategies in the philosophical foundations of the Society in the beginning of the sixteenth century. One is its focus on education, and specifically, on the education of students who were not members of the Society; and the other its interest in the overseas missions (Harris 1996: 289). The institutional culture developed by the Society in colonial South America manifests these strategies.

The Jesuits who were sent out to Peru in 1568 were members of a new religious order founded less than thirty years earlier, in 1540, and formed in the knowledge of the existence of the Americas. Unlike older religious orders who preceded the Jesuits into America (Franciscans, Dominicans, Mercedarians and Augustinians), the Jesuits were not monks: they constituted a new, intermediate category between the secular priesthood and these older religious orders (Fraser 1992: 19). The Society’s members lived in communities, but unlike monks they did not wear any distinctive dress, neither did they have to comply with rigorous guidelines. In fact, their position enabled their insertion in lay society (Roehner 1997). They were above all subject to the Pope rather than to the Spanish Crown. From the point of view of the Church, the existence of America was an invitation to a difficult quest; the discovery of the hitherto unsuspected
size of God's created world introduced to Western culture an enormous group of people in urgent need of conversion. The Jesuit rose to meet this challenge. In this sense, their enterprise can be seen as emblematic of certain traits of modern Europeans as they interact with the “Other” in colonial and postcolonial contexts (O’Malley 2000). Despite this fundamentally intercultural scenario where the large, complex and internationally diversified body of the Jesuit system evolved, Jesuit historiography has been marked by what R.G. Collingwood (1956 :42-45) has called “substantialism”; that is the tendency to see the Society or “Jesuitism” as an unchanging substance unaffected by the “Other” it encountered. There has been a constant failure to take account of how the ministry effected changes in the Society that undertook it (O’Malley 2000).

Nevertheless, a fundamental shift has taken place from a European to a multicultural perspective in the study of Catholicism emphasizing the interaction between Europeans and non-Europeans, as a reciprocal process. For the study of the Jesuits, this has meant a new perception of the interactive character of whatever they undertook where themes of negotiation, adaptability and assimilation render a more complex picture of Jesuit culture (O’Malley 2000: 26).

The first six Jesuits who arrived in the American Spanish Empire in 1568 settled in Lima, the capital of the Viceroyalty of Peru, from where they rapidly expanded throughout the American territory¹. Two centuries later, the 1767 royal edict of expulsion signed by King Charles III and Pope Clement XIV’s edict of suppression of the Society of Jesus in 1773 put an end to two hundred years of Jesuit activity in America. 2,267 Jesuits, many of them Creole (like Francisco Clavigero and Juan de Velasco) were sent into exile in Europe (Prieto 2011). The Jesuits had a profound influence on colonial, pedagogical, scientific², evangelical and political developments in America. During these two hundred years, the Society of Jesus had become one of the most influential intellectual communities of the colonial period.

¹ This expansion brought a series of administrative subdivisions within the order. Quito became a vice province in 1605, depending on Peru and comprising the territory of today’s Ecuador, Colombia and Venezuela. Paraguay and Chile became independent provinces in 1607 and 1683.
² On the introduction of the theories of Descartes, Copernicus and Newton in the Jesuit Universities of Quito and Santa Fe in the eighteenth century see Soto Arango, D. (2010). "La enseñanza de los "sistemas del mundo" en las universidades de los jesuitas de Quito y Santafé, Siglo XVIII." Revista Historia de la Educación Latinoamericana 51.
Nineteenth-century Jesuits and postcolonial America

The return of the Jesuits to South America: a heated debate

The mid-nineteenth-century discussion on Ecuador’s modernity, the State and its relationship with science and the Church frames the dispute over the return of the Jesuits. The complex political and intellectual antimonies between Liberals and Conservatives represent the two specters of the dispute; antipathetic and mutually undermining principles of postcolonial South American politics: the one's gain was always the other's loss. To liberal and anticlerical critics, Jesuits appear as the chief protagonists of an obsolete, unenlightened and hierarchical order. A binary opposition between the darkness of “Jesuitism” and the light of Enlightenment and modern science depicts the relationship between this old order and a secularised modernity (Kaiser 2003: 73). To the general debate on the contribution of a traditional catholic institution of higher learning to “modernity”, the South American Jesuit dispute also implied key issues of sovereignty and political autonomy. Anti clericals aligned themselves with the cause of the nation, imagined as an autonomous collectivity of unbound consciences. They denounced their opponents as the stooges of a foreign power structure bent on undermining the integrity and distinctiveness of the nation-states. They struggled over the very soul of the nation itself, its independence, its cultural, political and economic modernity (Clark 2003: 7).

Nevertheless, it would be a mistake to get carried away by the provocative yet deceitful path traced by essentializing tendencies such as the Liberal/Conservative dispute. As Papenheim (2003: 208) stresses, the culture wars were by no means the struggle of a monolithic “liberal bloc” against a homogenous “Catholic bloc”. Nor should we assume that State and Church were two entities that stood in irreconcilable opposition to each other. This is especially not the case in nineteenth-century Ecuador. The “culture wars” (Clark 2003) were not fought along clearly defined lines, and the Jesuit context affords an excellent opportunity to appraise the overlapping and fluid character of the conflict.

As Feingold (2003: 3) argues, from its inception in the sixteenth century, the Jesuit Order engendered deep-seated ambivalence among friends and foes alike, and this tension was no different in the newly independent Latin American countries. In contrast to the other significant religious orders (such as Benedictines, Franciscans or Dominicans), Jesuits raised sharp antipathy and provoked strong reactions. Because they had to guarantee total compliance to their General in Rome, Jesuits became the
target of nationalistic activism. Because they succeeded in winning the favour of political leaders, they were subject to the jealousy of the nobility and the high clergy. Because their colleges were successful, they were seen as unjust competitors by the universities. In other words, as Roehner (1997) states, whether we consider the State, the Church or the universities their reaction toward the Jesuits is fairly revealing of their particular purposes and ambitions.

In fact, in the writings of one of Garcia Moreno’s fiercest opponents, the liberal Juan Montalvo, we can see how these tensions unfold. In an essay written from exile in Panamá in 1874 and titled “The perpetual dictatorship” (“La dictadura perpetua”) Montalvo addresses the editors of the "Star and Herald" in response to a series of articles published in this newspaper that recommended to the Ecuadorian people the re-election of Garcia Moreno (for his third consecutive period). Montalvo writes with irony that

They missed the feature that most illustrates the character of their hero and the events that make him more sympathetic to American eyes: I mean the public and repeated attempts to sell his country to the European monarchies (Montalvo 1874: 1).

In the voice of one of the most prominent critics of Garcia Moreno’s style of government, we find many negative references to the role of the Jesuits in Ecuador.

Montalvo (1874) asks himself how can a nation be happy while it receives the pestilent flood that comes from the dregs of the convents of Italy, Spain and elsewhere, and where public instruction is purely a matter for the convent. The books, Montalvo continues, are confiscated articles: they go from customs directly to the Curia. The bishops of Garcia Moreno, he denounces, what light, what conscience do they have? He then compares Garcia Moreno’s plan with the “dark, killing force of colonial times” that to him was no blinder. He is surprised at the assessment that Ecuador, under Garcia Moreno’s rule, has achieved a considerable amount of moral progress. He criticizes that without books, without reading it is impossible to become civilized:
The soldier over the citizen, the friar over the soldier, the executioner over the friar, the tyrant over the executioner, the devil over the tyrant, all swimming in a sea of corrupt shadows (Montalvo 1874: 9).

Montalvo points out to the paradox that the men, whom civilization repels, find their paradise in Ecuador, and concludes with irony: “naturally, Ecuador will be more civilized than Europe and America”. Montalvo’s view shows a different approach to the dialectic nation building / modernity / Jesuits. He agrees with Garcia Moreno on the first part of the equation that is on the need of building a nation towards modernity but utterly disagrees on calling the Jesuits for this end.

The historiographical debate: a secular century?
The Bourbon monarchs forced on Rome the suppression of the Society of Jesus in 1773. This was one of a number of manifestations that suggested the decline of the Catholic Church in an age of Enlightenment. By the end of the eighteenth century, a decisive turning point in the history of the Church was about to unfold: first end of the Jesuits who were the greatest representatives of papal authority, then the 1786 synod of Pistoia that challenged that authority openly; furthermore, only three years later, in 1789, the French Revolution unleashed violent outbursts of anticlericalism and dechristianization (Blackbourn 1991).

A liberal, nationalist, materialist and scientific age was about to be born: the century of Darwin and Marx. These developments suggested that the European mind of the nineteenth century had to be understood as a consequence of this framework of growing secularization\(^3\). But in recent decades, Europe’s “Revolutionary century” has experienced its own historiographical revolution. In fact, the vitality of Catholicism has put in question the dominant secularization paradigm (Anderson 1995: 668). How to understand the nineteenth-century religious revival alongside widespread dechristianization? Encouraged by the advent of the so-called “new cultural history” in the 1990s and the decline of modernisation theories, religious topics have emerged as a significant focus of scholarship that contrasts with the dominant direction to think in terms of secularization (Howard 2011: 59). Apparently paradoxical, long-obscured phenomena like the modernity of anti-modern ultramontanism or the anti-Catholic

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\(^3\) See also Chadwick, O. (1975). The secularization of the european mind in the nineteenth century. United Kingdom, Cambridge University Press.
fundamentalism of the Liberals, have become intelligible; religion no longer interpreted as the residue of tradition, but as a powerful historical force within modernity (Borutta 2003: 254). What this literature suggests is that the history of nineteenth-century Europe can best be understood by the paradoxical intertwining of two transformative processes: secularization and religious revival. The role that the Society of Jesus plays in postcolonial America points precisely in this direction.

At the beginning of the twentieth century, Weber (1905) wrote about the Protestant ethic and the spirit of capitalism, recapitulating what had become a familiar European trope about the backwardness of Catholics and the Church. As Blackbourn (1991) argues, what was undeniably true from the perspective of a particular grand narrative of progress and modernity can seem less obvious when understood from the point of view of the success story of the continuing strength of Catholicism in the nineteenth century. This was true in a sphere that Weber’s theory recognized: bureaucratic organization. In fact, in a period where the State and business opted for centralization and bureaucratization strategies, the church followed the same road. As Clark (2003: 11) notes “the New Catholicism of later nineteenth-century Europe was more uniform, more centralised, and more “Roman” than the eighteenth-century Church had been”. This was especially true of papal power. One irony of the late eighteenth-century revolutionary period was that it discredited the Catholic opponents of papal supremacy and eroded the power base of the national churches, thus opening the way to the ascendancy of Rome. The proclamation of infallibility (1870) and the manipulation that accompanied it were the most obvious symbols of papal absolutism and Roman centralization (Blackbourn 1991: 780). Church was 'ultramontanized' (Anderson 1995: 655).

How to understand the building of a Catholic modernity? What is the meaning of modernity for Catholicism? McGreevy (2010) claims that the Jesuits are central to any understanding of the Catholic revival and expansion across the world. In fact, no group is as crucial to understanding modern Catholicism: growing from six hundred aged members in 1814 when the Order was reestablished, to almost 17,000 members a

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4 The term ultramontane (literally “beyond the mountains”) refers to those Catholics in northern, central and Western Europe who looked beyond the Alps towards Rome. The central “paradox” of ultramontanism was that an “authoritarian pope” could be invoked in the interest of the “liberty” of Catholics in the face of state interference. Chadwick, O. (2003). A History of the Popes 1830-1914. USA, Oxford University Press.
century later, the Society is able to move from the margins of Catholic life to its center. As was the case for the Society of Jesus before its suppression at the end of the eighteenth century, the most noteworthy observation to make about nineteenth-century Jesuitism is its global orientation. By initiative of Father General Jan Roothaan, who leads the Society from 1829 to 1853, Jesuits are once again sent to the far-flung corners of the world. This growing expansion continues under Father General Peter Beckx’s direction between 1853 and 1887. This successful development strategy outside Europe takes place in spite of the fact that, since their recreation in 1814 and all throughout the nineteenth century, Jesuits suffer confiscation of property, suppression and exile in one European country after another—Spain, Italy, France, Belgium, Germany—to be allowed back, usually after a few decades or less. Bismarck’s banishment of them from Germany, however, lasted for forty years, from 1873 until 1913 (O’Malley 2000: 14). This translation from a European Catholic world in crisis to different latitudes is not exempt from conflict and rejection: in Latin America, Jesuits suffered similar persecutions, trudging in exile from one country to find welcome in another.

**Jesuit science and the periphery**

When Garcia Moreno calls the Jesuits, he is not only looking for religious educators. The idea that Jesuits will bring the seeds of modern science to Ecuador also motivates him. This element throws a new dimension to the equation nation building / modernity / Jesuits. Science, a totem of modernity, becomes an instrument of government and administration of the newly independent countries and, in the case of Ecuador; it is promoted by ways of the Jesuit institutions of learning. In 1857, the National Congress approves a law stating that the teaching of science is a mandatory element for the progress of the Republic. This law defines the relationship between science and the Ecuadorean State (Miranda 1972: 30-31). The State becomes the main promoter of

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5 In the 1830s and 1840s alone the order established new missions in Syria (1831), Calcutta (1834), Argentina (1836), Madurai (1837), Nankin (1841), Albania (1841), Canada (1842), Madagascar (1844), Algeria (1848) and Australia (1848).
6 Cuba (1853), Colombia (1858), Philippines (1859), Madagascar (1861), India (1878), Zambezi (1879), Armenia (1881), Australia (1882), etc.
scientific research and actively encourages European scientists to come to Ecuador and become part of its nation-building strategies.

What is the Jesuit scientific tradition that Garcia Moreno is after?

*Science in the “Old Society” and science in the “New Society”*

As Udiás (2001) points out, the early scientific work of Jesuits and their contribution to the establishment of modern science have received considerable academic attention (Jardine 1979; Grant 1984; Dear 1987; Feldhay 1987; Harris 1989; Harris 1996; Harris 1998; Feldhay 2000; Gorman 2000; Giard 2005; Harris 2005; Núñez Freile 2010; Soto Arango 2010; Prieto 2011). In fact, what this literature confirms is that one of the most striking aspects of Jesuit science is the magnitude of its literary output. According to Harris (1989: 40-41), between 1600 and 1773, Jesuit authors wrote more than 4000 published works, 600 journal articles, and 1000 manuscripts. A dominant tradition centered in the fields of natural philosophy, astronomy, mathematics and physics marks this scientific corpus that consists of nearly 6000 original works. Furthermore, half of the total literary output came from just 200 authors, the vast majority of whom were Jesuit educators, a fact that points to the institutional base of Jesuit science being unquestionably the Jesuit college and university. This crucial element of Jesuit science is no surprise taking into account that on the eve of the Society's suppression “Jesuits occupied more than eighty-five chairs in mathematics, oversaw more than a dozen physical cabinets (most of which were established in conjunction with chairs in experimental physics), and operated a total of twenty-five teaching observatories, most of them founded and funded by the Society” (Harris 1989). Finally, the Society's exceptional intellectual and institutional commitment to scientific activity is confirmed by the fact that, for the period 1550-1775, the Jesuits produced more scientific writings than all the other orders combined, even though that throughout this period, the Society ranked as the fourth or fifth largest order, far behind the Franciscan and Dominican orders.

The scientific work of Jesuits in the nineteenth century is less well known. An exception to this tendency is an article written in the 1950s by the Director of the Vatican Observatory, the English Jesuit Daniel O’Connell (1956) who describes the

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8 (Jardine 1979; Grant 1984; Dear 1987; Feldhay 1987; Harris 1989; Harris 1996; Harris 1998; Feldhay 2000; Gorman 2000; Giard 2005; Harris 2005; Núñez Freile 2010; Soto Arango 2010; Prieto 2011.)
contributions of the Society of Jesus after 1814 to astronomy and seismology. Another author who analyses nineteenth-century Jesuit science is Whitehead (1986) who focuses on the changes of the curriculum of St Francis Xavier's College, Liverpool, the first British manifestation of the renaissance of Jesuit day-schools throughout nineteenth-century Europe, to embrace scientific training. Udias (2003) describes the history of Jesuit observatories as an important part of the Jesuit scientific tradition.

Despite this limited bibliography on the phenomenon of Jesuit science in the Society after the reestablishment of the order in 1814, the lives and works of three Jesuit scientists have received considerable scholarly attention. The first is the Italian astronomer Father Angelo Secchi (1818-1878) who is recognized as a pioneer in the study of solar physics (Robitaille 2011) and stellar spectroscopy. He was the director of the observatory and the Chair of Astronomy at the Roman College for 28 years (1850-1878). He was also the second Jesuit to become a Fellow of the Royal Society, in 1856 (the first was Roger J Boscovich (1711–87), professor at the Collegio Romano, elected in 1761). Bruck (1979) notes that Secchi published in the course of his life 700 publications. “Being the Pope’s astronomer he was very much the Pope’s scientific adviser, and the Pope of his days was not only the Head of the Church but also the supreme ruler of the Papal States. This meant that Fr. Secchi was frequently consulted on semi-scientific problems, which might affect the well being of the Pope’s subjects in his territories” (Bruck 1979: 18). Mazzotti’s (2000) article describes one of Secchi’s many tensions: being both a scientist and Pope Pius IX’s protégé; an apparent paradox that could explain his resistance to the complete secularization of knowledge. The second Jesuit scientist who has received scholarly attention is the English astronomer Stephen Perry (1833-1889) director of Stonyhurst College Observatory (Great Britain). He was also elected Fellow of the Royal Society in 1874, the third Jesuit to deserve this honour. Perry worked on many aspects of astronomy and geophysics and led several scientific expeditions, specially one to the Kerguelen islands to observe the transit of Venus (Hingley 2005). Finally, the third Jesuit scientist who deserves a noteworthy mention is the German Jesuit evolutionist Erich Wasmann (1859-1931). Stumper (1954) talks about Wasmann’s importance for the understanding of social insects. Betts (1859), Barantzke (1999) and Lustig (2002) mention Wasmann as an example of the contradictions and tensions of Darwinism and Catholic thought in the nineteenth century. Richards (2008) describes his disputes over evolution with Ernst Haeckel. Kolbl-Ebert (2010) analyses how Wasmann had to relate scientific data to a religious
conviction in a period of conflict between the Catholic Church and secular society in Germany. He was able to defend evolutionary ideas despite adverse Church politics and censorship.

The question to be posed here is if there existed a Jesuit scientific tradition in the nineteenth century or if there were individual Jesuit scientists within a wider group of contemporary Jesuits that, like other Catholic priests, were no longer commonly associated with serious scientific accomplishments. Geschwind (1998: 28) claims that, by the nineteenth century, the earlier Jesuit scientific tradition had faded. Udias (2003: 9), on the other hand, considers that precisely because of the fact that science during the nineteenth and early twentieth century was a field considered as alien and even hostile to religious faith, that Jesuits felt the responsibility to engage in science. This apparent contradiction has to do with an aspect of the Jesuit mentality pointed out by Udias, that is the preference of Jesuits to work among those outside the Church and in frontier subjects. According to Udias’s argument, “the scientific community became the parish of the Jesuit scientist”. Science was able to bring the Jesuit in contact with a group of people that would otherwise not have had this opportunity. Being a scientist in this context would break many barriers. Ecuadorean historiography, in turn, shows that members of the Society of Jesus played a determinant role in the development of a scientific culture. Is this a manifestation of an institutional scientific tradition? Does it have to do with the character and interests of individual members of the society and a State-led campaign towards the development of science?

Is Catholicism, as a cultural force, a poor sponsor of science?

Harris (1989) reformulates Merton's (1938) basic questions about the impact of deeply held religious values on the encouragement (or discouragement) of scientific activity in order to understand the role of science within the Society of Jesus and Catholicism in the growth of early modern science. Merton establishes a correlation between Puritan religious values and involvement in what he calls “new science”. His investigation of seventeenth-century English science is presented as a case study of how religious and social values are able to direct cultural interest toward scientific activity. At the core of Merton's thesis is the observation that ideologically motivated groups (like Puritans) who adopt a specific scale of values are predisposed to accept active-empirical forms of science as legitimate cultural activities. Harris questions the relationship drawn by Merton between Protestantism and science by stating that this formulation implies a
more silent counter thesis of Catholicism being a poor patron of science. His understanding of Jesuit science seeks to go beyond the Puritan-science linkage. He wants to show that Puritans were not the only religiously motivated individuals who participated in the scientific culture of early modern Europe. Harris notes that the case of Jesuit science “does, in fact, seem to be a (qualified) confirmation of a (generalized) version of the Merton thesis” (1989: 60).

What were the enduring qualities of Jesuit science in the “Old Society”? The first and most obvious feature is that it was, in fact, a tradition. Harris links this tradition with the order’s “apostolic spirituality” that strongly encouraged an activist mentality among Jesuits, which finally led to the acceptance of modern science as a useful means in fulfilling the goals of the Society’s apostolates in education and mission work. For Harris, the elements of apostolic spirituality are first, an emphasis on Christian service which leads to activities not usually linked to religious life, an active engagement with the world which leads to respect of experience, and finally an esteem for learning that manifests itself in the enormous effort of Jesuits in the field of education. As Udias (2003) argues, although Harris’s work is examining seventeenth and eighteenth-century Jesuit scientific tradition, his analysis can be extended also to the scientific work after the Restoration of the Society in the nineteenth century.

However, this dominant perception of Jesuit scientific activity as motivated by religious concerns seems problematic for the case we are studying. In this context, Feingold (2003) addresses an issue that has received poor scholarly attention: the identity of the Jesuit practitioners. All too often, it seems, Jesuit individuality is presumed to be an oxymoron. Additionally, following Bourdieu’s (1993) notion of the “cultural field”, Feldhay (2000) relates the space of Jesuit scientific discourse with its institutional setting and the wider political context. This three-dimensional notion of the field points to the fact that the space of scientific discourse is not fixed, but rather constantly negotiated. In the same line of thought, Gorman’s (2000) analysis of the consumption of the scientific productions of members of the Jesuit order contradicts the notion of conceiving Jesuit’s engagement with the natural world as a disposition entirely reducible to the desire to further the apostolic goals of the order. By focusing on the consumption of scientific productions, the author points to the flexible boundaries placed by the consumer culture around Jesuit scientific practice.

Udias (2003) and Gabor (2010) who are two contemporary Jesuit scientists agree on the idea that there are two types of Jesuit apostolate: a pastoral ministry and a
scientific ministry. Gabor considers that the scientific apostolate, despite the fact that it is theoretically legitimate within Jesuit philosophy, in practice has always been obliged to justify itself. There always seems to be a need to give pragmatic, pastoral, pedagogical, spiritual and other extraneous reasons to science itself. On the other hand, Udias, when analyzing the history of Jesuit observatories, concludes that they were mostly created by local initiatives. The order did not come from Rome, but was based on the will of the Jesuits in the periphery, which was then confirmed with a nod from the Superiors in Rome. This gives us a clue about the dynamics of the Jesuit power structure in which the scenario we study is immersed. The Society of Jesus is able to extend its arms to every continent precisely because it gives power to its representatives in the peripheries.

*Garcia Moreno’s plan in action: a Jesuit-run Polytechnic University*

The President of Ecuador invited the Jesuits back to Ecuador in the 1860s to take over the education system of the country (Garcia Moreno 1861, 13 Febrero). Religious orders played a role in filling the large gap that opened up between the rhetoric and the reality of progress in the nineteenth century (Blackbourn 1991: 781). Most of the Jesuit priests were Spaniards who did not share a specific concern for scientific subjects as part of their pedagogical approach, an element that, from the beginning, created considerable conflict with the project of Garcia Moreno (1862, 12 Abril). Ten years later, in the 1870s, the government issued a second invitation (Garcia Moreno 1869a, 9 Septiembre; Garcia Moreno 1869b, 17 Febrero); this time young German Jesuit scientists arrived in Ecuador to run a Polytechnic University. The Polytechnic University was the first place where many scientific ideas were discussed for the first time in Ecuador. The relationship between these two groups of Jesuits was tense. To the traditional fractions of the clergy, science was a distraction while the Jesuit scientists were battling between the ignorance they resisted from the clergy and the lights of science (Miranda 1972).

On August 30 1869, during the second term of Garcia Moreno, the National Convention issues a decree for the establishment of the Polytechnic University in Quito, the capital of the country (Perez 1921). The decree is based on the assumption that the development of local businesses and industries for the construction of roads and the improvement of cities and ports, will contribute to the progress and happiness of the Republic. For this end, the decree establishes the urgent need of forming “men able to
perform with skill and brilliance” the public destinations that require fundamental knowledge in mathematics, natural sciences and other studies necessary for the exercise of certain professions of importance (Escuela Politécnica 1871). The resolution sought to train teachers of technology and science, architects, and civil and mining engineers. The executive branch would deliver, from the national income, the amount of funds necessary to bring a group of qualified teachers from overseas. The instruction would be free.

In 1870, a group of teachers from the Society of Jesus in Germany arrived to Ecuador: John B. Menten (Professor of Astronomy and Geodesy), Luis Sodiro, (Professor of Botany) and Theodor Wolf (Professor of Geology and Geognosy). On October 3 1870, classes began. According to the list taken from the registration book, during 1870-1871, twenty students enrolled in Mathematics and Physics and eight students in Natural Sciences. The Polytechnic operated for six years. Between 1870 and 1876, ninety-seven students enrolled in the various courses and sixteen additional professors participated. After the arrival of the first three Jesuit priests in 1870, in 1871 Luis Dressel (Professor of Chemistry), Luis Heiss (Professor of Chemistry), Joseph Kolberg (Professor of Mathematics), José Epping (Professor of Mathematics), Christian Boetzkes (Professor of Zoology), Emilio Müllendorf (Professor of Descriptive Machinery) and A. Wenzel (Professor of Mathematics, Physics and Languages) arrived to Ecuador. Then in 1873 came the priests Edward Brugier (Professor of Mathematics) and Albert Claessen (Professor of Mathematics). In the same year, James Elbert (Professor of Architecture and Drawing), Nicolas Grünewalt (Professor of Civil Engineering) and Charles Honshteter (Animal curator for the Zoological Museum of the Polytechnic University) were also hired. Finally, in 1874 came the father Clement Faller who served as dean of the School from 1874 to 1876. With this large faculty, the range of subjects the school taught was extremely extensive: algebra, trigonometry, geometry, geodesy, astronomy, mechanics, construction of roads and railways, machinery, architecture, physics, geology, geognosy, crystallography, mineralogy, chemistry, physiology, agriculture, preparation of medicinal substances, pharmacy, toxicology, zoology, Darwinism, botany, natural drawing, topography, French, English, German. Each year, the University published detailed programs of the courses. A scientific investigation of one of the professors always preceded these programs.

An unstable arrangement
In a way, the Polytechnic University of Quito tells the story of how the mission of the President became fulfilled: the Jesuits came, science professors and researchers then followed, an educational institution was set up and science was done in Ecuador. There is also a sense in which the project fell apart being done by Jesuits. We will turn to that aspect of the story in this section.

**Letters to Rome**

In order to sustain its corporate nature and long distance reach across different continents, the Society of Jesus relies on a heavy administrative organization and a chain of command and decision-making. At the central Archives of the Society of Jesus in Rome (ARSI) the interaction, at an official level, between the Jesuits in Rome and the American missions is easy to trace. In fact, all the letters directed to the Superior General in Rome father Beckx are kept in the “Inventory of documents sent to the General Curia” (Inventario dei documenti inviati alla Curia Generalizia) and are classified under the group of North and Latin American Assistances – Province of Ecuador (Assistencia America Latinae Septentrionalis. Provincia Aequatoriana- Ecuador). Between 1861 and 1874, the period in which Garcia Moreno is actively promoting and executing his plan, we find six letters that he wrote to father Beckx. The letters convey a sense of frustration and hopes for something that fails to happen. Garcia Moreno proposes three things to the Society, of which only the work of the German Jesuits of the Polytechnic finally fills him with pride. All the other roles that the Society accomplishes are a source of annoyance for him: the Jesuits also manage education in schools and start a mission in the Amazon jungle to evangelize local populations. In 1862, he writes to Rome after many months of waiting for the first Jesuits to return to Ecuador:

> I'm tired of waiting, and after a year and a half I have not gotten over that disappointment. It seems that the superiors of the Order are inspired more by fear than by the desire to do good, and so have seen from afar the situation in Ecuador not as the solid and relatively prosperous that it is, but on the edge of an abyss. This motif has prevented them to come to take charge of the schools that I wanted to entrust them (García Moreno 1862, 12 Abril).

When they finally come and start teaching in schools all over the country, in 1874 Garcia Moreno gives another negative assessment in one of his letters:
I must add that I am not happy with the Schools as they are. My child, if he would be thirteen instead of four, he would not go there to waste his time (Garcia Moreno 1874, 18 Julio).

The administrative organization of the Order leaves the Latin American missions as dependent of Spain’s Superiors. For the Ecuadorian president, this is a total misfit that jeopardizes his entire educational project since the Spanish Jesuits don't have the interest or the intellectual preparation to lead the scientific development of his country. He asks to be reassigned either to France, Germany or England or to have a local, independent administration. In fact, he has a decidedly specific definition of the type of collaborators he hopes to find for his project. He needs religious and scientific men that have the courage to venture into Ecuador’s uncharted territory.

The other side of this debate, that of the Spanish Jesuits, appears in a letter sent to Rome by the Visiting Father San Roman (1875, 3 marzo) who gives an evaluation of the tense situation of the Polytechnic University. His letter shows an absolute clash of paradigms that, in his desperate view, could only be overcome by “some sort of revolution”. For him, the President’s complete preference for the German Jesuits who seem to be the only ones who live up to his expectations is becoming an intolerable situation.

*Theodor Wolf: a Jesuit scientist “par excellence”*

Garcia Moreno’s concept of a Jesuit scientist is embodied in the German geologist Theodor Wolf (1841–1924). He is part of the project of revival of the Society of Jesus in its global dimension as well as in its involvement in science. Wolf’s life story gives certain clues to the question whether the New Society was able to regain its importance in the scientific sphere. Father Peter Beckx’s Generalate (1853 – 1887), under which Wolf was formed, is crucial for addressing this problem. As we have stated, during his Generalate there was an enormous growth of the Jesuit order and a strong emphasis on science (Whitehead 1986). He modernized the *Ratio Studiorum*, the document that defines Jesuit education, giving more room to science subjects and encouraging the discussion of modern philosophers. Intellectual work was encouraged, and several journals were started: *La Civiltà Cattolica* (Italy, 1850), *The Month* (London, 1864), *Etudes* (Paris, 1865), *Stimmen aus Maria-laach* (Germany, 1865) and others in Ireland, Poland and Belgium.
In 1862, Wolf was chosen by the Provincial of the Jesuit Order in Germany, Father Anderledy, to go to the University of Bonn, in order to receive a complete training in science (Schade 1925). Faith and Jesuit philosophical training were intertwined in his education in an effort to reconcile Catholicism with modernity. He studied at Bonn between October 1862 and the end of winter term 1863/1864. During the winter semester 1862-1863 he took a course of Natural History with Professor Dr. Troschel, a course of Geology with Professor Dr. Noeggerath, a course of Mineralogy with Dr. Andrae, a course of Plant Anatomy and Physiology with Professor Dr Hildebrand, a course of Plant Fecundity with Professor Dr. Schacht and a course of Geology with Professor Dr. Bischof. During the summer semester of 1863, he took another course of Botany with Professor Dr. Schacht, a course of Zoology with Professor Dr. Troschel and another course of Mineralogy with Professor Dr. Andrae. He also attended Professor Dr. von Rath’s lectures (Bonn 1862-1863).

Wolf was also part of a troubled cultural setting. His life was intimately related to the context of the German Kulturkampf (“cultural struggle”) of the 1870s and 1880s, which confronted the Catholic Church against the newly united German government of Bismarck. The Jesuit Order was expelled from Germany in 1872 and Wolf spent most of his scientific carrier outside of his country.

In 1870, Wolf travelled to Ecuador to take an active part of the project of Garcia Moreno. He taught at the Polytechnic University for four years (between 1870 and 1874) and gave various courses in geology, zoology, mining, palaeontology, mineralogy and Darwinism. He was also in charge of building a museum of natural history and mineralogy. He travelled extensively around the country, under the President’s orders, to gather geological and geographical information of the unexplored territory. Every trip was accompanied by a detailed description published in Spanish in the official Newspaper “El Nacional” and also published in a slightly modified German version in different European Journals. Over time, these expeditions found increasing opposition.

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among the more orthodox Jesuits, who considered that Wolf was doing too much science and saw with suspicion the intimacy between him and the government. This tension unfolds in 1873 when Wolf writes a letter to Rome asking for an authorization to organize a scientific expedition to the Galapagos Islands. In Rome, Father Anderledy, Wolf’s former promoter in Germany, who had become Assistant of the Father General in Rome, in a letter dated May 30 1873, leaves the decision in the hands of the Jesuits in Ecuador. Anderledy’s letter clarifies that permission should not be given if the trip is considered to be harmful to Wolf’s religious spirit. He considers Wolf to be a man of strong will but “perhaps too addicted to natural history and without an appreciation for philosophy that is truly necessary precisely for those who in our time are devoted to the physical sciences” (Miranda 1972). The Jesuits in Ecuador finally deny the permission for the trip to the Galapagos Islands alleging arguments over the negative imbalance between Wolf’s spiritual and scientific fervour.

**Wolf’s separation from the Jesuit Order**

In November 1874, a little over three years after having arrived to Ecuador, Wolf’s resignation to the Jesuit Order is formalized. In the Jesuit Archives in Rome, in the


register book of all the letters sent from the Superior General to the different provinces in South America, there is a reaction from the Superior General Father Beckx to Wolf’s desire to leave the Order (Beckx 1874a, 18 Septiembre). Beckx manifests his concern for Wolf’s decision and says he finds no valid reason in Wolf’s argument. He finishes the letter hoping that his prayers will be answered and that no matter how hardened Wolf’s mind is, he will be able to destroy the illusion that deceives him. Regarding the context around his decision to leave the order, Wolf (1904-1911) would describe, years later, in a letter to the German geologist Hans Meyer, that he left under sad conditions to face an uncertain future. He describes himself as "being subject to internal and external hard struggles after having made and executed the decision to break all corporate relations at any price and establish a new and free existence".

Wolf’s case can be seen as a way to confront Garcia Moreno and Montalvo’s dispute with facts and also a way of testing the historiographical framework. In fact, the explosive charge of Wolf is that all the forces we have presented come together in his figure: he was a Jesuit, he was a scientist; he was modern, and he contributed to nation building. His case could be used to analyze how all these forces interact and finally break Wolf apart. It turns out that he can't do all things at once: the system gives. His situation is over determined. He has too many masters pulling him in different directions. He has to abandon one, and he abandons the Jesuits. He can do nation building, he can do science, and he can't be apparently also a Jesuit.

Wolf leaves the Andean city of Quito and travels by foot and on horseback to the city of Guayaquil; the main port of the country situated in the gulf of the river Guayas that flows to the Pacific Ocean. In Guayaquil, he gives public lectures on Darwinism in order to finance his first trip to the Galapagos Islands that had been discouraged by the Jesuits (Martínez 1994 (1934){Schade, 1925 #425}). The first of August 1875 he sails to the Galapagos and returns to Guayaquil four months later to find a remarkably different scenario; the president had been assassinated:

A terrible drama played out in the capital city that only too often undermines the South American Republics. The President Garcia Moreno was, on a bright afternoon, walking to the government palace when, from the main square, a small committee armed with daggers, knives and revolvers, cut him down and murdered him. I learned this momentous event only nearly two months later, when I was on the island of Albemarle (Wolf 1879b: 266).

On his return to Guayaquil, in November 1875, Wolf receives a letter from Professor von Rath, his former teacher at Bonn University, who had extended him an invitation as
an Associate Professor at Bonn. Before he could make any travel arrangements to return
to Europe, he receives the news that the liberal government now in power under
President Antonio Borrero appointed him as State geologist with a handsome, monthly
salary. Wolf’s friend and biographer Alwin Schade (Schade 1925) describes this event
as follows:

Before him lay a wide field of science to operate as he could wish no better.
He accepted the position.

Even though he did not accept the offer of the University of Bonn, he maintained close
relationship with this institution. In fact, in 1878 he is awarded the title of Doctor in
Philosophy Honoris Causa for his work in Ecuador (Wolf 1878). As State geologist he
continued to travel extensively around the country for almost two decades. One of the
responsibilities attributed to him was to validate and complete the cartographic
knowledge of the country, in order to produce a new geographical map (Sevilla 2011a).
The cartographic knowledge in the second half of the nineteenth century consisted
mainly of calculations and observations made by La Condamine from the early
eighteenth century, and the data collected and validated by the expeditions of Humboldt
(1802), Boussingault (1831), Stübel and Reiss (1871-1874) and finally Whimper (1879-
1880). Additional to this work is the map and geographical text produced by Manuel
Villavicencio in 1858 (Sevilla 2010).

Wolf signs contracts with the governments of Jose Maria Placido Caamaño
(Quito, 19 of May 1884) and Antonio Flores Jijón (Guayaquil, 25 of February 1891),
where the conditions for publication of a map and a geographical text are defined. The
result of Wolf’s effort of over twenty years, is published in 1892: a complete work on
the geography and geology of Ecuador10 and a map of the territory11. Wolf travels back
to Germany in 1892 to take charge of the printing process and never comes back to
Ecuador. From Desden he writes a Preface to his work where he shows his appreciation
to the Ecuadorian government and to the Ecuadorian people:

Without the moral and material support of the Ecuadorian government, it
would have been exceedingly difficult to build the map and publish the book,
and so I am pleased of publicly expressing my deep appreciation for the

10 Wolf, T. (1892). Geografía y Geología del Ecuador publicada por orden del Supremo Gobierno de la
República por Teodoro Wolf, Dr. Phil, antiguo profesor de la Escuela Politécnica de Quito y geólogo del
Estado. Leipzig, Tipografía de F. A. Brockhaus.
government, especially for the last two presidents of the Republic, the EE. J. M. Placido Caamaño and Antonio Flores, who contributed effectively to the completion of the work. Since this may be the last time I address myself to the people of Ecuador, I take the opportunity to say goodbye and profess my eternal gratitude for the generous hospitality, that I enjoyed for more than twenty years in this beautiful and unforgettable country "Dresden, July 15, 1892 (Wolf 1892 (1975) : 7).

The title of Wolf’s book is revealing of the argument we have put forward in this article. It states the key elements surrounding science in nineteenth-century postcolonial America. First of all, it enunciates a specific scientific field that is immensely linked to nation-building: geographical and geological studies (Craib 2004). Second it specifically states that the work is published by order of the Supreme Government of the Republic of Ecuador. Then, it gives four pieces of information to describe the author. First of all comes the author’s name. It is essential to note that Wolf’s name is translated into Spanish in all of the publications or public mentions made in Ecuador. The case of his geographical text is no different. He is then called “Teodoro”, the Spanish translation of “Theodor”. The second piece of information about the author is his academic credentials: his philosophy doctorate is so mentioned. Immediately afterwards, Wolf is described as being a “former professor of the Polytechnic School in Quito”; a curious remark if we think of the complicated scenario in which Wolf parted from the project. Finally, he is described as “State geologist”. As we can see, science and nation-building are all over the title of Wolf’s work, and nothing of the Jesuits is ever mentioned.

We have reconstructed the interaction of diverse factors including nation-building in South America, the educational mission of the Society of Jesus and the circulation of scientific knowledge. The result is a complex picture of the rise of science-based modernity and the interaction of science and power. The question that finally arises is whether Catholicism is adapting itself to the requirements of modernity or if it can be considered as a driving force of modernity. The conventional approach has been to plot the stages by which a recalcitrant Church gradually came to terms with science, the social question, and political democracy; in short, with modernity. Inside this framework, enlightened clergy would drag the church into the twentieth century, constantly fighting against its structural rigidities. The Church, under this perspective, would always be coming to terms with modernity (Blackbourn 1991). There is an implicit antinomy between modernity and “tradition” that still informs the way we think
about this conflict {Clark, 2003 #317}. One of the reasons for this is that the teleological, secular concept of “progress” celebrated by the liberal and anticlerical positions lives on in the “modernisation theory” whose assumptions frame the culture wars as a struggle between “modernity” and a backward-looking worldview that has no legitimate place in a modern society. Although modernisation is not understood anymore in terms of a linear decline in religion, there is still a tendency to view the phenomenon of religious revival as a detour, a distraction, from the “norm” of an irreversible process of secularisation. The effects of this way of thinking detach Catholicism from the history of modernity as if it inhabits a simultaneous but parallel universe. The case we study in this article suggests a different interpretation of the relationship between Catholicism and modernity. In fact, liberalism, anticlericalism and secularism were all parts of South American political modernity, but so were Catholicism and the Jesuits.

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