The historiographical approach taken in the nineteenth and twentieth centuries to the work of Jesuit doctors and apothecaries in the La Plata region in the eighteenth century

Eliane Cristina Deckmann Fleck
Professor, Universidade do Vale do Rio dos Sinos.
Avenida Unisinos, 950
93022-000 – São Leopoldo – RS – Brazil
ecdfleck@terra.com.br

Received for publication in September 2012.
Approved for publication in July 2013.

Translated by Rebecca Atkinson.

http://dx.doi.org/10.1590/S0104-59702014000200011

LECK, Eliane Cristina Deckmann. The historiographical approach taken in the nineteenth and twentieth centuries to the work of Jesuit doctors and apothecaries in the La Plata region in the eighteenth century. *História, Ciências, Saúde – Manguinhos*, Rio de Janeiro, v.21, n.2, abr.-jun. 2014. Available at: http://www.scielo.br/hcsm.

Abstract

The positions of Pedro Arata, Moisés Santiago Bertoni, Carlos Leonhardt and Guillermo Furlong in the debate about the role of the Society of Jesus in the introduction and development of science in the La Plata region are investigated. Written between 1890 and the late 1950s, these authors' works not only analyze the medical, pharmaceutical and botanical knowledge of the Jesuit missionaries in the 1600s and 1700s, but also evaluate their contribution to scientific thinking in the countries colonized by Spain and Portugal. Their positions foretaste the historiographical debate about the reactionary nature of the Jesuit order and reflections about the contribution made by indigenous knowledge of American pharmacopeia to the knowledge the missionaries took to the continents where they were active.

Keywords: historiography of the La Plata region; history of science, Society of Jesus; American pharmacopeia; medical botany.

Keen to protect the health of bodies and souls – combining the quest for martyrdom and edification with modernity and rationalism – the Jesuit missionaries ultimately conferred indisputable originality on the Society of Jesus in the seventeenth and eighteenth centuries, as can be seen from the medical and pharmaceutical knowledge they produced and circulated around many continents. Reflections about the Jesuits' multiple activities have always divided the opinions of historians. For over four centuries, a negative appraisal of the order has prevailed, associating it with opposition to any innovation in the field of modern medicine.

This historiographical tradition altered significantly in the 1990s when a number of studies based on documents from the Society of Jesus archives in Rome and the Americas highlighted the unquestionable role played by the Jesuits in the intellectual history of the Renaissance since the beginnings of the modern era, and their influence on the medical and pharmaceutical knowledge prevailing today.

In a recent review of *Science in the Spanish and Portuguese Empires: 1500-1800* (Stanford University Press, 2009), Iris Kantor (2010, p.295-296) draws attention to the effects of the appropriation of "negative images of Iberian colonialism ... by the historiography of decadence (both its liberal and Marxist branches) which, in its turn, attributed to Inquisitorial censorship, Catholicism and the Jesuits the main obstacles to the development of scientific thought in the countries and regions subject to Iberian colonization."[1] She goes on to claim that

> [t]he studies brought together in this collection seek to definitively overcome the dichotomy between scientific practice and Catholic culture, demonstrating that the political and theological framing of the natural world – a baroque scientific sensibility that combined divine intervention with experimentalism – did not represent an impediment to the formulation of universal explanatory models (p.296).

Upon commenting on Palmira Costa and Henrique Leitão's contribution to this collection, Kantor echoes their recommendation that "researchers need to study the correspondences of the metropolitan and local authorities, the diaries of travelers and traders, and the reports of missionaries and local chroniclers in order to capture the everyday dimension of these experiences," which may contribute "to a correct assessment of the ranges and limits of the Iberian scientific culture" (Kantor, 2010, p.295-296).

The issue, as well observed by Ivonne del Valle (2009, p.240), is about

> an interpretation that seeks neither to be a history nor an apology of the Society of Jesus, nor a study that analyzes the documents themselves ... but rather a reading focused on the role played by these documents in the creation of networks of knowledge, their place in the development of a specific epistemology in the eighteenth century, and the more localized manifestations of this episteme.

Throughout the 1700s, a number of catalogs of medicinal plants and medical and surgical treatises were produced by Jesuits, notably Pedro Montenegro and Segismundo Asperger. Fathers Buenaventura Suárez, Bernardo Nusdorffer, Pedro Lozano, José Guevara and Martín Dobrizhoffer have also bequeathed us valuable information about the knowledge and healing practices adopted by the natives. Not only did the Jesuits maintain a steady flow of correspondence amongst themselves, sharing the most varied of scientific discoveries, but they also turned their hand to the preparation of remedies and the reproduction of manuscripts

of medical and surgical treatises and medicinal recipe books, which they circulated between the missions and colleges in the Jesuit provinces in the Rio de la Plata region of America and those in Europe and even the Orient.[2] In many of these spaces, there were "thinkers" who, as Ecuadorian historian Cañizares Esguerra (2007) suggests, despite living in regions on the periphery of the period's intellectual scenario – areas considered merely and traditionally receivers of knowledge produced in other parts of the world – were key players in the construction of certain types of knowledge.

In the late nineteenth century and first few decades of the twentieth century, authors like physician Pedro Arata, naturalist and botanist Moisés Santiago Bertoni, and Jesuit priests Carlos Leonhardt and Guillermo Furlong revived the discussion of the contribution the Jesuits made to medical and pharmaceutical knowledge based on their analyses of the works some of the missionaries produced and circulated amongst the continents in which they were active.

This article aims not only to situate historically the positions taken by these four authors in the works selected here with a view to identifying and analyzing what motivated their publication, how their approaches converged and diverged, and how they were linked with the rise in studies into the history of medicine and science, but also to position the works in the historiographical debate pursued as of the nineteenth century about the effective contribution made by the Society of Jesus to scientific thinking in the countries colonized by Portugal and Spain.

Historiographical approaches to scientific progress in the La Plata region of America

Upon the initiative of the Inter-Academic Committee for the Argentine Bicentennial, the National Academies published a volume in September 2010 that aimed to reconstitute the historical, cultural, and scientific knowledge that characterized the La Plata region of America in the period prior to and following the first decade of the nineteenth century with the purpose of paying tribute to the May Revolution of 1810.

Representing the Academy of the Exact, Physical, and Natural Sciences, Enrique J. Baran (2010, p.84-86), in his article "Las ciencias exactas y naturales" (The exact and natural sciences), states that a great number of Jesuits with a good scientific grounding, especially Italians and Germans, had a significant influence on several regions of America, laying the foundations for scientific knowledge about geography, ethnology and the life sciences, which circulated in the journals and letters they wrote about their exploratory or evangelizing travels.

According to Baran, the expulsion of the Society of Jesus in 1767 had a strong negative impact on the development of science and culture in Spain's American colonies, significantly delaying progress in many scientific and technological areas and hampering the continuity of events and experiments.

The same work contains an article entitled "La farmácia durante el período colonial y en los primeros años de vida independiente" (Pharmacy during the colonial period and the first years of independence), in which the authors restate the notable role of the Jesuits in the La Plata region of America for over a century and a half, describing them as devotees of philanthropy and good naturalists, botanists, nurses, apothecaries and doctors "for the circumstances of the time and environment"[3] (García et al., 2010, p.233). Their important

work as apothecaries seems to have been proven when the Protomedicato was set up in Buenos Aires on the premises of the Jesuit college on August 17, 1780.[4] The authors stress that the first public apothecary's shop in Buenos Aires belonged to the Jesuits, and had a laboratory and a dispensary, as well as a small kitchen garden for growing medicinal plants, of which Jesuit brothers Heinrich Peschke and José Hennig had great knowledge.

Manuel Luis Martí (2010, p.327), a scholar representing the National Academy of Medicine, confirms that the May Revolution found the medical institutions to be very limited and rudimentary and the medical professionals poorly qualified in the healing arts, lacking any "scientific discipline" or a "therapeutic arsenal," which seems to confirm Enrique Baran's (2010) perception that the expulsion of the Jesuits hampered scientific development in the La Plata region.

Meanwhile, the representative of the National Academy of Science of Buenos Aires, historian and philosopher of science Miguel de Asúa (2010b, p.56), highlights the "surprisingly vibrant scientific scene" in Buenos Aires in the early 1800s, despite its geographical isolation and small population. This he ascribes in part to its being a cosmopolitan port city, but mainly to the "existence of a certain material culture of science," which was translated into "collections of instruments, libraries and cabinets of natural history" run by learned clergy. The author goes on to note that in the seventeenth and eighteenth centuries the Jesuits had effected a harmonious synthesis of science and religion, devoting themselves to astronomy, cartography, medical botany, experimental physics, and natural history, producing "a basically baroque science with tardy interaction with the enlightened science of the eighteenth century, which was at the service of the religious project of the Society of Jesus" (Asúa, 2010c, p.472).

Investigating the Enlightenment, science and technology in the Americas, Mexican historian Juan José Saldaña (1995) argues that the initiatives of the Spanish crown should not be ignored, especially its support for technical and scientific expeditions and missions, as well as the influence exerted by researchers from other European countries who travelled across vast regions or worked as teachers in Spain's American territories. He then adds that it should not be forgotten that

> what really enabled this progress was what the Americans themselves did. [Thus] on the intellectual plane [one most consider] precursors of Amerindian culture, the telluric sentiment of the people, creolism and its culture. All this gave American Enlightenment its own characteristics, setting it apart in many respects from what was seen in other parts (p.23).

For this historian, modern scientific theories, especially in physics, astronomy and mathematics, had significant precursors in 1600s America, highlighting the fact that the Jesuits declared themselves in favor of probabilism and against sectarianism, which stopped them from making observations and experiments founded on modern philosophy and science. The authors that take this perspective on the influence of the Society of Jesus on science in America share to a large extent the view of the nationalist historians of the nineteenth century, who referred to the existence of a "catholic Enlightenment" and the indubitable contribution by the Jesuits to the spread of Enlightened scientific thinking in the colonial universities.

In her analysis of Argentina's twentieth century historiography, researcher Celina Lértora (1995) identified two currents, one conservative and the other liberal. The first, lasting

until 1940, was characterized by a predominance of catholic, Hispanophilic historians who criticized the liberal measures taken in Argentinean politics in the nineteenth century. As of 1920, this current took an investigative turn, studying previously unknown documents and making critical analyses of sources. Its leading exponent was Jesuit priest Guillermo Furlong.

It is worth remembering that when Furlong wrote his many works about the philosophical studies in the La Prata region,[5] the documents he used were practically unknown, which was propitious for a new approach to the disciplines and writers studied at Argentina's universities in the decades immediately prior to political emancipation in 1810. For the Jesuit historian, the real historiographical problem at the time was how to determine the extent of the influence of Spanish Enlightenment thinking on the creole mentality, which seems also to have been observed by other scholars, including some from the present day.

The liberal current of historiography was broader and made up of all those who took an ideological stance against the focus given by the previous current and also by those who, due to their adoption of different methodological procedures, made a radical criticism of the results obtained by the conservatives in their research. It was marked mainly by anti-Hispanic, anti-clerical approaches, and by scientific positivism, which did not however prevent it having a "limited view of the Enlightenment and learning" (Lértora,1995, p.121-125).

Amongst the most recent studies, and representing current historiographical trends in the analysis of the topic, we highlight *Saberes, terapias y prácticas médicas en Argentina (1750-1910)* (Knowledge, therapies and medical practices in Argentina [1750-1910]) by Argentinean historian María Silvia Di Liscia (2002), which addresses academic (scientific and Iberian), popular, and indigenous medicine not as mutually exclusive but as part of a fluid field characterized by interactions, appropriations, and loans in all directions in a "dual game of incorporation and simultaneous negation" (p.XIII). The author further adds that the incorporation of indigenous knowledge was a

> process of great complexity, beginning with learning the indigenous languages, customs and environment, the conservation of plants and growing of plants in the botanical gardens attached to the Jesuits' hospitals and colleges ... and culminating in the experimentation of certain compounds on patients followed by the written systematization of all the information (p.49).

Di Liscia (2002) argues that the close relationship between indigenous knowledge and the science of Enlightenment is borne out in the writings of Jesuits like Pedro Montenegro and Pedro Lozano and of scholarly travelers and naturalists like Hipólito Ruiz and Felix Azara, or else in the Argentinean periodicals from the early nineteenth century, like *El Semanário de Agricultura* and *Telégrafo Mercantil*.

According to the Argentinean historiography, in the late 1700s and early 1800s the texts written by the Jesuits had become important sources of reference for the naturalists of the Enlightenment, who took forth "a process of appropriation and management of flora and fauna for medicinal purposes that reached its conclusion in the late nineteenth century when the Argentinean nation state was able to channel resources into systematic scientific work" (Di Liscia, 2002, p.299).

In *La ciencia de Mayo: la cultura cientifica en el río de la Plata* (The Science of May: the scientific culture in the rio de la Plata region), philosopher and science historian Miguel de

Asúa (2010a, p.192-193) holds that "the Jesuits occupied the cultural and scientific scene of Rio de la Plata ... before the expulsion of the Society [of Jesus] in 1767," and that especially in the Jesuit missions there was some "significant scientific activity," as demonstrated by the work of Buenaventura Suárez and Ramón Maria Termeyer, "the natural histories of the New World, and the manuscripts on materia medica," which made them "the most advanced front of science in the Rio de la Plata region."

If we consider the Brazilian historiography about science and Enlightenment in America, we find that "certain theoretical and methodological conceptions prevailing until very recently were looking for scientific activities that were just the same as in Europe. The eclectic and pragmatic nature of our Enlightenment was taken as evidence that science was only pursued here as of the twentieth century" (Ferraz, Figuerôa, 1995, p.209). While for some scholars, like Simon Schwartzman (1979, p.51), "Portugal remain[ed] at the margins of modern science, isolated by the clerical yoke of the Counter-Reformation and the Inquisition," for others, like Maria Odila Leite da Silva Dias and Maria Beatriz Nizza da Silva, "scientific pragmatism of the day is seen as scientific activity itself, and no longer as evidence of our failure in this sphere of knowledge" (Ferraz, Figuerôa, 1995, p.215).

Confirming the deep-rooted controversy surrounding the production of science in Brazil, the positions taken by Dias (1968) and Silva (1986) are restated in works that present new historical, social, and cultural perspectives of analysis[6] for the study of science in Brazil during the colonial period based on reference to Portuguese archives (Figuerôa, 2007, 2009; Alfonso-Goldfarb, Maia, 1996; Alfonso-Goldfarb, Ferraz, 2002; Alfonso-Goldfarb, Beltran, 2004; Beltran, 2000; Ferraz, 1997). Likewise, countless studies have contributed to the understanding of the scientific knowledge the Jesuits produced about the wildlife in Portuguese America, especially in the seventeenth century, by highlighting both the originality of their scientific project and the eclectic philosophical positions they took, which diverged from the scholastic neo-Aristotelism evident in the intellectual disputes between its members (Camenietzki, jul.-dez. 1995, 2000, jan. 2001, 2002, 2007; Gesteira, 2006, 2012; Gesteira, Teixeira, 2009; Carolino, 1997; Carolino, Camenietzki, 2005).

Meanwhile, studies of science have been increasingly consolidated in Argentina especially since the second half of the 1990s, supplying valuable information about the reconstitution of the conditions in which scientific knowledge of the La Plata region was developed and spread, thereby filling a gap in the Hispanic-American historiography. The work of Asúa (2010a, 2010c) deserves particular attention in this context.

The positions taken by Arata, Bertoni, Leonhardt and Furlong

Pharmacist, physician, and university professor Pedro Narciso Arata was born on October 29, 1849, in Buenos Aires and died in the same city on November 5, 1922. He earned his degree in medicine in 1879 with a thesis about the chemical properties of plants, and was chairman of the National Academy of Medicine of Argentina for many years. An "American medical botanist,"[7] Arata (1898, p.419) made a comparative study of four manuscripts produced in America, "introducing medical readers to a synthesis of their contents and at the same time a criticism," which he did so "with modern ideas," highlighting the "properties

attributed to the plants they discuss and adding their corresponding scientific names, as well as observations about them."

According to Arata, the most significant works on medical botany were by Spanish physician and botanist Francisco Hernandez (1514-1587), Dutch physician and naturalist Guilherme Piso (1611-1678), and Jesuit priest Bernabé Cobo (1582-1657), who also had a great influence on the materias medicas written by Jesuit missionaries, which were diligently copied for use in the different regions in which the Society of Jesus was present. He held that there could be no more mistaken belief than that these materias medicas were original works or produced by different Jesuit priests or brothers.

Also in reference to the Jesuits as the "absolute masters of thousands of indians," amongst whom they acted as "doctors of souls and of bodies and also as nurses," Arata (1898, p.440) questioned the authorship and originality of the manuscripts produced by Jesuit missionaries in America. He claimed that Pedro Montenegro's *Materia medica misionera* contained images copied from Guillerme Piso's *De inidiae utriusque Re naturali et medica* (published in Amsterdam in 1638) without citing the source, simply adding images of birds and angels to the original. As for the content of the work, Arata stated that it consisted of modifications Montenegro made to a manuscript attributed to Jesuit priest Buenaventura Suarez.[8]

When highlighting the practice of copying and appropriating images from texts by other authors, Arata referred to another Jesuit, Father Segismund Asperger, stating that the properties he attributed to certain plants were highly questionable and that if we were to make the "effort of comparing the descriptions made by Father Asperger with those made by Father Montenegro it becomes clear that Asperger copied the writings of he who must have been his teacher, Pedro Montenegro" (Arata, 1898, p.445). Likewise, he claimed that Thomas Falkner appropriated countless copies of Pedro Montenegro's manuscript that circulated around the La Plata region of America. Meanwhile, passages of Asperger's work referred to experiments Montenegro had done using certain medicinal plants (like guava), presenting them as if he himself had done them, though at the time he was just 17 and had not yet been sent to America as a missionary.

In his denouncement of the state of social calamity in Argentina in the last decades of the eighteenth century and early decades of the nineteenth century arising from both a shortage of doctors and their poor training, Arata sang the praises of the "great botanical expedition whose purpose was to investigate American flora through a complete study of the uses of the medicinal plants of the worldly environment," funded by King Charles III, which, he assured, conferred a scientific nature on the knowledge systematized by the Jesuit missionaries. All botanic medical knowledge then existing – produced exclusively by "empiricals" – had been "rediscovered in the light of science" by Azara, Demersay, Moussy, Humboldt, Bompland, Molina, Velloso and Arruda Câmara (Arata, 1898, p.187).

Held to be one of the last encyclopedists by his biographers, Swiss naturalist and botanist Moisés Santiago Bertoni was born on June 15, 1857, and died on September 19, 1929. From an early age he showed interest in agronomy, meteorology, mineralogy, botany, and geography. Under his father's influence, he expanded the scope of his studies to include anthropology and politics.

Bertoni was just 17 when he set up his first meteorological observatory in his home town of Lottigna. In 1883, still in Switzerland, he brought out a magazine, *Rivista Scientifica Svizzeta*, which published articles in the fields of the natural sciences, anthropology, sociology, geography, statistics, and agriculture, as well as the meteorological observations he had made. He studied the law and physical and natural sciences at the universities of Geneva and Zurich, and entered "that constellation of scientists who, in the last century, came to America captivated by its novelty, exoticism, and the possibility of doing research in the expanse of virgin territory in the continent" (Baratti, 2002-2003, p.45). However, unlike a Darwin or a Humboldt, Bertoni did not go to America as an explorer or researcher, since he intended to set up an agricultural colony in the New World. This first took shape in the province of Misiones, Argentina (from 1884 and 1887), and later (from 1887 to 1929) in Paraguay,[9] where in 1894 he founded the colony called Puerto Bertoni.[10]

At a time when encyclopedism was starting to give way to specialization, Bertoni devoted his energies to studying everything "from the frequency of rainfall to the customs of the local natives. He made incursions into linguistics, drawn by his interest in indigenous languages" (Baratti, 2002-2003, p.46). If for the almost four decades he lived in the middle of the forest Bertoni did not fail to stay in contact with the output form the major scientific research centers of Latin America,[11] his main concern was the indigenous peoples, especially the Guarani, as he himself explained:

> For the serious study of wildlife – which I have proposed – life in a town or near one is of very little use. It cannot be done using the muddled data obtained in every part, nor by hurrying across fields and woods, nor by following the most frequented waterways or highways with the express desire to return to the delights and comforts of home. This is not how we can penetrate the secrets of the beings who inhabit the most remote parts. Nature jealously guards her secrets from those who do not faithfully dedicate themselves to her and do not admire her with their whole soul (Bertoni, 1914).

The project of founding a self-sufficient agricultural colony based on progressive social and political theories became a reality after the concession of a 199-hectare plot of land ten kilometers from the border with Foz do Iguaçu. Here in the upper Paraná river basin, he could not only devote himself to studying Paraguay's flora, fauna, and native peoples, but could also reflect deeply on the meanings of civilization, which, according to Bertoni, consisted of "the development of agriculture as the basis for material life, morals as the basis for psychic life, the arts as a guarantee for leisure and social relations, and liberty and democracy as means for individual and collective dignity" (Baratti, 2002-2003, p.47).

It was from Puerto Bertoni that he wrote his over 500 books in six different languages, including Guarani, which were distributed by his publisher, Ex Sylvis, as well as scientific articles sent to different scientific journals and libraries. The most important of his works include *Almanaque Agrícola* (Agricultural Almanac) the articles published in *Revista de Agronomia* and *Anales Científicos Paraguayos*, and the unfinished work, *Descripción física, econômica y social del Paraguay* (Physical, economic and social description of Paraguay). In his last years of life, Bertoni turned his attention to anthropology. His most important work in this field is the three-volume *La civilización guaraní* (The Guarani civilization). Here, we will investigate more specifically the second volume entitled *La medicina guaraní* (Guarani

medicine), dedicated to "young Paraguayan physicians" in the hope that "some of them [would] see these studies as a doubly scientific and patriotic mission" (Bertoni, 1927, p.143).

At the seat of this colony, Bertoni established a library that held over 17,000 works,[12] experimental laboratories, a printing press, and a post office, from which he dispatched his writings to different countries, yielding invitations to represent Paraguay in different international scientific events, such as the 20th International Congress of Americanists in Rio de Janeiro in 1922. There, Bertoni gave a talk entitled "El futuro de la raza americana en América Latina" (The future of the American race in Latin America), in which he severely criticized Eurocentric attitudes and the belief that indigenous peoples were on the route towards total extinction. His main aim was to show that the Guarani constituted a superior race and that their biological superiority was reflected in their morals, eating habits, and medicine,[13] thereby repudiating the association between the Amerindian and the heathen, and reinstating the fine but overlooked Guarani race.

Today, his theses can sound overly ideological and naive, but the anthropological work he did ultimately acquired an importance to the political and cultural history of Paraguay that was inversely proportional to its scientific value. Essentially, Bertoni helped the birth of a nationalist- and indigenous-oriented cultural generation that identified with the importance of the indigenous, understood as the kernel of the Paraguayan national identity, making him the target of scathing criticism by positivist and liberal intellectuals alike in their efforts to "enshrine the inferiority of the Amerindian compared with the white man" (Bareiro Saguier, 1990, p.115).

Paraguayan historians Justo Pastor Benitez and Efraim Cardozo and anthropologists Miguel Alberto Bartolomé and Branislava Susnik described the theories he defended and the ethnographic data he gathered as a veritable "ethnological delirium" (cited in Baratti, 2002-2003, p.46). Meanwhile, Paraguayan anthropologist Miguel Chase-Sardi (1990, p.95) found Bertoni's conclusions to have been reached mainly from readings done "with warped lenses and [from] an impressive bibliography" and not from field study, for despite his rigorous empirical studies in the field of the natural sciences, "he was driven by extreme romanticism, which stripped his studies of any usefulness for Paraguayan anthropology."

We know that when Bertoni wrote *La civilización guaraní*, he gathered and compiled information by colonial chroniclers like Jean de Lery, André Thevet, Pedro de Magalhães Gandavo, Yves D'Evreux, Fernão Cardim and Guilherme Piso, whose writings he had in his private library (Ramella, Ramella-Miguel, 1985). As for the Dutch physician and naturalist, Bertoni states clearly on page 6, chapter I, of Book II that his work had been fundamental for his study of Guarani medicine, which is borne out in several capitals, since he drew on Piso to confirm the advanced stage of indigenous medicine.

According to Bertoni, a comparative study of European and Guarani medical knowledge in the 1400s and 1500s would surely lead to the conclusion that the latter were far more advanced, because in their beliefs, despite the strong presence of the fantastical, there was nothing that even came close to the ludicrous concept of phytognomony,[14] a doctrine that ruled medical practice in Europe for centuries and was divulged by Renaissance occultist and botanist Paracelso, Italian natural philosopher and astronomer Juan Bautista Porta, and Spanish astrologer and astronomer Jerónimo Cortés Valenciano.

Throughout the work, Bertoni portrays the Jesuits as being prudent and correct in having adopting many of the Guarani's prophylactic measures and therapeutic procedures, not to mention their knowledge about the curative properties of native plants. The Guarani, he said, contributed greatly to the European medicine practiced by the Jesuit missionaries and especially to knowledge of medicinal plants, i.e. that the Jesuits observed and learnt from the indigenous:

> The belief that knowledge of medicinal plants can be attributed mainly to the Jesuits priests is very widespread ..., however it is not quite true. There is no doubt that the Jesuits did much, but it was in the form of gathering information from the indians – testing it through experimentation – and transmitting it. Before them, in Paraguay, the celebrated priest Bolaños had devoted a small part of his tireless work to such concerns. Later, Father Buenaventura Suarez wrote the best review of medicinal plants from these parts; but beyond the indians, his best source of information was the work by Guillermo Piso. The Jesuit priests Segismund Asperger and Pedro Montenegro also deserve mention for their important contribution. Father Lozano transmitted countless data. Others, like Montoya, Del Techo and Restivo, paid no heed to the subject. But nevertheless, the source of information consisted of the Guarani indians or Guillermo Piso, who also had access to them due to his contact with the Guarani in Brazil, even declaring that the curative properties of native medicinal plants had been discovered by the indigenous people themselves and not by the Europeans, laymen or clergy (Bertoni, 1927, p.150-151).

The next text to be analyzed is by Carlos Leonhardt, a Jesuit priest who, like fathers Pablo Hernández and Guillermo Furlong, was a historian for the Society of Jesus.[15] In the first decades of the twentieth century he set about editing the documental corpus of the *Cartas ânuas da província jesuítica do Paraguay* (Annual letters from the Jesuit province of Paraguay), which covers the long period from 1609 to 1762. Together with acclaimed historian Emilio Ravignani, he published the first annual letters between 1927 and 1929 in two volumes under the title *Cartas ânuas de la província jesuítica del Paraguay de la Compañía de Jesús* (Annual letters from the Jesuit province of Paraguay of the Society of Jesus) in *Colección de Documentos para la Historia Argentina*, more precisely volumes XIX and XX, published by the Institute for Historical Studies, part of the Faculty of Philosophy and Letters, University of Buenos Aires.[16]

In "Los jesuítas y la medicina en el rio de la Plata" (The Jesuits and medicine in rio de la Plata), published in 1937, Leonhardt states that the Jesuits were devoted to the "healing arts," despite the prohibitions that had been imposed, since "in apostolic indulgence" they should not practice medicine or surgery. Their work was forced by need – "medical penury" – resulting from the non-existence of doctors or remedies, seen as "special circumstances which demanded medical practice" (p.103), and the practice of Christian charity, designed to foster edification and therefore "forc[ing] [them] morally ... to help the needy" (p.105). Leonhardt (1937, p.103-105) notes that the authorization given by Pope Gregory XIII in 1576 specified that the missionaries should practice only under exceptional circumstances, meaning "when charity or need so demanded." Keen to justify the work of the Jesuits, Leonhardt set about describing the lamentable state of sanitation in the La Plata region and the dire sanitary conditions in the towns founded by the Spanish, referring to documents kept in public and private archives or published in works by historians.

Leonhardt (1937, p.106-107) was also at pains to demonstrate that the apothecary shops maintained by the Jesuits "were widely accepted ... enjoy[ing] increasing demand by the people for their good administration and the experience of the apothecary brothers." He added that the sale of "surplus remedies" was "not done to make a profit ... and that payment is also made by gratitude," since the apothecary shops were also sought out by those who "believe[d] in our religious faith, experience and impartiality" (p.107). He also made a point of highlighting the training of the Jesuit physicians and apothecaries, who were "well prepared for their office and generally recognized by their peers and also by modern historians" (p.112).

On this matter, Leonhardt (1937, p.117-118) noted that even those who were not well disposed towards the Jesuits still recognized the "theoretical training and practical activity of the Jesuits in this area ... even if they could not identify what the true secret of their success in this field was." This said, he still felt the need to harshly criticize all the authors who linked these activities to "egotistical motives, ambition and avarice," saying that there was no historical evidence for "such a harsh verdict" and for "such a dishonorable intention by the men of religion," who did not just "practice Christian charity, they lost their life serving and attending to the sick" (p.117-118). For the Jesuit historian, the situations experienced and recorded by the priests and brothers working as doctors, nurses and apothecaries could be likened to "cases of heroism, very frequent amongst the first Jesuits in Paraguay," who put into practice the "evangelical parable of the good Samaritan" (p.118).

We will now turn our attention to a work published in 1947 by Jesuit priest Guillermo Furlong, a notable, prolific historian of the Society of Jesus. Furlong was born on June 21, 1889, in the Argentinean province of Santa Fé, and died on May 20, 1974, aged 86. He began his training as a Jesuit in Córdoba, Argentina, and continued in Aragon, Spain, followed by a doctorate in science and philosophy from Georgetown University, Washington D.C. in 1913.

In 1920 he returned to Spain to study theology in Barcelona for four years. At this time, he researched the Indies Archive in Seville and other Spanish archives. In 1924 he returned to Argentina, where he worked as a teacher of Argentinean history, apologetics, and civic education at Colégio del Salvador. In 1939 he joined the National Academy of History, in 1942 he was one of the founders of Junta de Historia Eclesiástica Argentina (Council for the Ecclesiastical History of Argentina), and in 1956 he spearheaded the founding of the National Academy of Geography.

According to his biographers, not only did he prove the influence of Enlightenment ideas on the ideological underpinnings of the May Revolution – through the existence of works that divulged the new ideas in libraries in the La Plata region –, he also worked on elucidating the influence that the Jesuits, men of considerable learning and culture, had on the development of science and philosophy in that region of America. Others who have studied his work state that his greatest merit was that he discovered manuscripts and editions of out-of-print books, which contributed decisively to his critical analysis of the view of a barren scholasticism that was widely held at the time when he was actively producing work.

Indeed, this perception becomes very clear in *Médicos argentinos durante la dominación hispánica* (Argentinean doctors during Hispanic rule), especially in the criticism it makes of a text by Dr. Felipe Barreda Laos, preceding Father Pedro Montenegro's *Materia medica misionera*,

published in 1945 by the National Library of Buenos Aires. Furlong (1947, p.68-71) describes the text as "extremely poor and unfocused news," accusing its author of "scorning colonial medical science ... link[ing it] to the scholastic culture impregnated with Aristotelism" and thereby failing to recognize the spirit of modernity present in the work of Montenegro. Furlong targeted his criticism against all researchers who "so disdainfully" treated the subject with "decidedly unscientific concerns," showing "contempt for Scholasticism" (p.70). He claimed that such men were "not only incapable of understanding" but also of perceiving the past as "the empire of monkly obscurantism" (p.71).

In Furlong's view, even before the physicians who founded the School of Medicine of Buenos Aires, the Jesuit missionaries working as physicians, surgeons, physicists, apothecaries, and naturalists deserved to have their studies recognized, because they "worked with dedication and at the same time with singular modesty in helping the sick and studying our medicinal plants, contributing valuable data, noted by the authors who have studied such matters" (Furlong, 1947, p.72). Suárez, Asperger, Montenegro and Falkner still awaited such recognition and deserved "to have this debt recognized by new generations" (p.72).

Furlong (1947, p.73) also warned that "only when the as yet unpublished codices of missionary medicine are published will it be possible to judge how original – or not – their authors were." He and historian Felix Garzón Maceda (1916) both see Pedro Montenegro's *Materia medica misionera* as the most comprehensive work to have circulated in the La Plata region in the 1700s; it "present[ed] great originality, not just constituting a copy of works by other hands" (Furlong, 1947, p.74). Like Leonhardt, Furlong (1947, p.197-198) also highlighted the work of brothers Heinrich Peschke and José Hennig, both apothecaries, and father Tomás Falkner:

> The Jesuits certainly deserve the honor of having been those who most studied the botany of the La Plata region and who most took advantage of the medical properties of our plants. In every country the Jesuits consistently showed great inclination towards the study of natural history, but in no region did they devote themselves with more dedication and success than in the virgin lands of America. Both new species and entirely unfamiliar genera in and from the Old World, both exceedingly rare specimens and novelties ..., both in the field of botany and in that of zoology, did not fail to excite the enthusiasm of the Jesuits working in these regions of Rio de La Plata. Most justifiably did [American botanist] E. Y. [Elmer Yale] Dawson say that the natural history of the La Plata region had a debt of gratitude to the Society of Jesus.

The apostolic ardor and virtues (charity and singular modesty) of these Jesuit brothers and priests were highlighted by both Leonhardt and Furlong, as were their observational capacity and their effort in acquiring knowledge of American medicine and pharmacopeia, being shown as deriving from this exemplary conduct and above all the observance of the precepts of the Society of Jesus itself.

The reconstitution of the lives of Jesuits brothers and priests working in the healing arts made by these two Jesuit historians was without doubt designed to highlight the value of a model of missionary action – charity and abnegation – which the order has honored, celebrated and safeguarded since its creation in the 1500s,[17] but was also surely associated with the position taken by the Society in response to the anti-Jesuit historiography that

linked them to the obstruction of "scientific thought in the countries and regions subject to Iberian colonization" (Kantor, 2010, p.295).

Final considerations

After they reached America, the Jesuits produced documents about their missionary activities. The letters they sent to their superiors in Rome contain detailed accounts of their progress and setbacks and the problems they faced when dealing with the indigenous peoples and their conversion to Christianity. They also produced works of a descriptive nature about the new land, its inhabitants, and the American wildlife.

Despite the Jesuits' significant output about the wildlife and people of the New World, few have been the historians who have set about analyzing them with a view to identifying their role in the intellectual history of the Renaissance and the beginnings of the modern era. Most of the historiography about the Jesuit order focuses on the catechizing strategies adopted by the missionaries in their dealings with the indigenous people, especially the analysis of their religious work, without making any links with scientific activity or development.

In this article we have set about identifying, based on the analysis of the works by Argentinean physician Pedro Arata, Swiss naturalist and botanist Moisés Santiago Bertoni, and fathers Carlos Leonhardt and Guillermo Furlong, the positions these authors took towards the role of the Jesuits in the introduction and development of science in the La Plata region, while also reflecting on the emphases they gave and motivations they had for addressing the topic in historiographical terms.

Written between the last decade of the nineteenth century and the mid-twentieth century, the works by laypersons Arata and Bertoni and fathers Leonhardt and Furlong constitute a point of reference for this discussion, since not only did they propose to analyze the medical, pharmaceutical, and botanical knowledge produced by the Jesuit missionaries in the 1600s and 1700s, but they also took a stance on the effective contribution the Society of Jesus made to scientific thinking in the countries colonized by Spain and Portugal.

If Arata and Bertoni had different reasons for questioning the originality of the Jesuit missionaries' thinking and scientific practices, Leonhardt and Furlong reconstituted and justified in different ways the activities of the order in the La Plata region, also attributing different reasons to the fact that the fathers and priests devoted themselves to medicine and botany. While Arata and Leonhardt express the conviction that the Jesuits did not work as men of science but primarily as missionaries who, in their spiritual and charitable work, conducted experiments using medicinal plants, Bertoni and Furlong take quite a different position on the Jesuits' role in the region's scientific culture. The Swiss botanist, while acknowledging the role of some Jesuits, notably Montenegro and Asperger, essentially credits the medical and botanic advances the Jesuits practiced and divulged through recipe books and materias medicas to the Guarani people and knowledge that had already been systematized by European doctors and naturalists. Meanwhile, Furlong, keen to contest the thesis of a "barren Scholasticism," sought to lay bare the influence the Jesuits had on the development of science and philosophy, associating them with the spread of Enlightenment

scientific thinking and a rejuvenation of the intellectual scenario in the eighteenth century in the La Plata region of America.

While Leonhardt and Furlong coincide in their view that the Jesuits' experiments with medicinal plants and scientific output were at the service of their religious project, Furlong's positions seem to confirm a certain reorientation in the historiography of the Jesuits in the mid-twentieth century. Supplanting the view of the "profound missionary vocation," his works present the Society of Jesus as fundamental for the study and understanding of the history and culture of the American colonial period, not just for their having devised their "own scientific project,"[18] but also because they contributed significantly to the studies of the humanities and sciences pursued in the following decades.

Clearly, the positions taken by Arata, Bertoni, Leonhardt, and Furlong in the last decade of the nineteenth century and first half of the twentieth century are a foretaste of more recent reflections both about the innovations made by the Jesuits in the field of modern science since the 1600s and the contribution by the indigenous peoples, especially their knowledge of American pharmacopeia, to the medical, pharmaceutical, and botanical knowledge the Jesuit missionaries circulated around the continents in which they were active.

Reflecting on the "debt of gratitude" to the Society of Jesus propposed by Guillermo Furlong, and in view of the scientific studies done by the Jesuits, especially in medicine, pharmacy and botany, Heloísa M. Gesteira (2006, p.1), referring to the historiography addressing the work of the members of the order in Portuguese America, found that

> [e]ven when the work of the Jesuit missionaries is recognized ... it is normally stressed that they "appropriated" indigenous practices; at other times only isolated initiatives [are] value[d], such as Triaga Brasílica, a formula that earned profits for the Salvador college. Finally, the medical services rendered in the villages and towns are considered as a manifestation of Christian charity.

Contesting this widespread view, the historian proposes to value the "effort of collecting and systematizing medical knowledge" evidenced in the "studies about the virtues of plants and animals" that the Jesuits did based on "reference to Hippocratic medicine and natural history" (Gesteira, 2006, p.1). This view is shared by María Silvia Di Liscia (2002, p.43), for whom "interest in knowing and systematizing American flora and fauna was part of a broad process of development of western science, which could be observed amongst the brothers and the European travelers who visited rio de la Plata in the late 1700s." She adds that the Jesuits' admiration for the American flora was mixed with a certain discomfiture, because they had to "learn to recognize the plants in the countryside, to find out their properties ... to collect them, grow them, separate the leaves from the seeds and roots, study the oils and lotions; a complex process that involved trial and error and knowledge based on experience and reason, practice and theory" (Di Liscia, 2002, p.35).

Researchers Sabine Anagnostou and Fabian Fechner (2011, p.175) add that "the missionaries' natural history and pharmacy could be considered the two main facets of Jesuit naturalism in South America," since they were involved in "observing and describing the American wildlife in a profound and erudite manner." The authors add that the Jesuit missionaries' natural histories and pharmaceutical knowledge should not be seen as "poor

forerunners of current science or imperfect copies of European models, but as independent, singular forms of the history of science" (p.175). This singularity is witnessed in the "experimentation and incorporation of ethnopharmaceutical indigenous knowledge," which had its roots in the "Jesuits' relatively impartial, open-minded attitude to the indigenous people, based on Ignatian spirituality," which enabled "an intense, ongoing interchange in the field of medicine" (p.190). Also, many indigenous scribes were responsible for copying the guidelines for preventing contagion, medical formulas diligently compiled in recipe books, and botanical, medical, and surgical works, making them instrumental in the exchange and spread of a variety of healing practices and knowledge between the different, far-flung lands where the Jesuits had their missions.[19]

The historiographical approaches seen in the recent studies we have highlighted draw attention to the combined assumption that the Jesuits were behind considerable scientific progress through their work in the missions in America and the idea that the Amerindians themselves made an unquestionable contribution to this scientific knowledge spread "through the Society's networks of agents ... news and letters ... which satisfied the curiosity of teachers and students at the Jesuit colleges in the leading cities of Europe" (Millones Figueroa, 2005, p.28). The positions held by Bertoni and Furlong in their works from the first half of the twentieth century seem to have effectively prompted historians to reflect on the role that indigenous peoples and missionaries played in shaping a scientific culture in the La Plata region of America.

ACKNOWLEDGEMENTS

This article is the partial result of a research project that is funded by Fundação de Amparo à Pesquisa do Estado do Rio Grande do Sul (FAPERGS) and Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).

NOTES

[1] Beatriz Helena Domingues (2007) also questions this traditional approach that sees the Society of Jesus as being backward-looking and resistant to change, associated with the medieval catholic and baroque tradition, noting the assimilation of some key – albeit selective and catholic – ideas from the Enlightenment by the Jesuits working in the missions in America.

[2] Despite the relative isolation and long distances, priests, indigenous people, and information circulated amongst the different regions of America where the Jesuits were active, as can be seen from Pedro Montenegro's (1945, p.232) reference to the uses of copaiba by the Tupi people.

[3] In this and other citations of texts from non-English languages, a free translation has been provided.

[4] Medical practice in Spain and later in America was regulated by the Protomedicato, an entity that granted the licenses required for working in the profession and inspected the teaching of medicine, surgery and pharmacy, controlled the activities involved in the healing arts, and inspected apothecary shops.

[5] Key amongst Guillermo Furlong's works devoted to these topics are *Los jesuítas y la cultura rioplatense*, from 1933, and *História social y cultural del Rio de la Plata (1563-1810)*, from 1969.

[6] These new analysis perspectives arose in the main from the redefinition of the concept of science "as an object of historical investigation" seen in the 1970s after the publication of Kuhn's *The Structure of Scientific Revolutions* (1978). In it, the author "sought to demonstrate that a science is developed both by factors within that science itself and by external or extra-scientific factors. ... The results had a profound impact on the traditional image of science, presented until then as a set of statements with an epistemologically higher status to other forms of knowledge and autonomous from sociocultural influences" (Silva et al., 2008, p.498).

[7] The article in question was produced during the period when Arata was at the patent office (Oficina de Patentes de Invención) of the Hygiene Council (Consejo de Higiene) and the Municipal Office of Chemistry (Oficina Química Municipal), which he ran from 1883 to 1911, which seems to explain the degree of scientific pragmatism in the positions he took.

[8] The discussions about the authorship of *Materia medica misionera* began in the early decades of the nineteenth century and involved Pedro Arata, Domingo Parodi, Manuel Ricardo Trelles, and Guillermo Furlong, who, after comparing the extant manuscripts, concluded it had been written by Pedro Montenegro, since the most complete copies bore his name.

[9] From 1887 and 1893, Bertoni, now in Paraguay, was involved in setting up herbariums and recording different botanic species, which resulted in his *Las plantas usuales del Paraguay y países limítrofes*. *Introducción, nomenclatura y diccionário de los gêneros botânicos latino-guaraní* (The common plants of Paraguay and neighboring countries. Introduction, nomenclature and dictionary of the Latin-Guarani botanic genera) of 1914. This study is reflected in Part III (ethnography, knowledge) of *La civilización guaraní* (Bertoni, 1927).

[10] It is believed that Bertoni was influenced by a French friend of his, geographer and anarchist Élissée Reclus, who suggested that Venezuela and the Misiones region may be suitable for his project. The Jesuit missions project was in fact very like the colonial project idealized by Bertoni, and involved instating a self-sufficient colony in South America in a region good for agriculture and botanic studies.

[11] In "Relación sucinta de un viaje...", alongside the references to the anthropological studies being done in Argentina, Mexico, Guatemala and Ecuador, Bertoni (1924) revealed that he was familiar with the anthropological work being done in Brazil, highlighting the studies published about ethnology in *Anais da Biblioteca Nacional*, na *Revista Brasileira* and *Revista do Instituto Histórico e Geográfico Brasileiro*.

[12] The archive, with over 17,000 volumes, is currently under the custody of Centro Cultural de La República – El Cabildo, in Asuncion, Paraguay. Bertoni's library included works by Jean de Lery, André Thevet, Guilherme Piso, Fernão Cardim, Ives D'Evreux, Pero de Magalhães Gandavo, Couto de Magalhães, Alexander Von Humboldt, Johann Rudolf Rennger, Élisée Reclus, Sílvio Romero, Francisco Adolfo de Varnhagen, Telêmaco Borba, Afrânio Peixoto, Erland Nordenskioeld, Hermann von Ihering and José Ingenieros (Ramella, Ramella-Miguel, 1985).

[13] According to Bertoni (1927, p.237), few of the foreign naturalists and researchers "considered indigenous medicine to be of any great importance, while others did not have enough contact with the indigenous people" to realize that "no other people have given more medicinal plants to medical science than the Guarani" (Bertoni, 1914, p.66).

[14] The "doctrine of signatures" proposed by Paracelso and developed by Juan Bautista Porta in *Fitognomônica*, of 1588, proposes that certain of plants' external marks or features indicated their medicinal properties and applications. Phytognomy proposes that the qualities and virtues of each plant can be recognized by their specific "signature" (shape, color etc.).

[15] This concern with the past or with the institution's memory can be seen in the space history occupies in and for the Society of Jesus and consequently in the number of Jesuit historians involved in reconstituting its past. This Jesuit historiography – working to reconstitute the "notable deeds" and the "grand" work of conversion in the four corners of the world – is a ramification not just of the production and conservation of written records, but especially of the "Society's historical awareness" (Oliveira, nov.-dez. 2011, p.267).

[16] Besides preserving their archives, the order also published Jesuit sources. *Monumenta Jesuítica*, begun in Madrid in the late 1800s, the periodical *Archivum historicum*, published since 1932, *Documentos para la Historia Argentina*, published between 1927 and 1929, and *Monumenta Peruana* are a few examples of this will to preserve the written memory at the service of the identity of the Society of Jesus.

[17] Referring to what he calls "a Jesuit style of writing history," Paulo Rogério Melo de Oliveira (nov.-dez. 2011, p.268) writes that "notwithstanding the differences between the historians, Jesuit historical writing has some common features that give the Society's historical output a certain unity." Writing though they did at different times and for different reasons, Jesuit historians like Leonhardt and Furlong are linked "by institutional and devotional bonds to a common past, [and] cultivate a reverence for the written memory," producing "a self-legitimizing, self-referential historiography that combines historical research with hagiographic narrative" (p.268).

[18] This concept was reviewed and analyzed by Luis Millones Figueroa and Domingo Ledezma (2005).

[19] In *Materia medica misionera*, by Pedro Montenegro, the key role played by indigenous informants and scribes can be seen both in the identification and gathering of and experimentation on native plants and in the spread and circulation of the medical knowledge systematized by the Jesuit missionaries. See more in Fleck, Poletto (2012a or 2012b).

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