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The Place of History in the History of Science: Notes for Reflections in the Brazilian Context

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Abstract:

This article aims to reflect on the place of history in the history of science from the perspective of Brazilian historiography of science, mainly according to the thought of the Brazilian physicist and historian of science, Carlos Alvarez Maia. Since the 1990s, Maia (2013) began to question why the history of science became (and still largely remains) a “history of absent historians” in the face of the predominance of history of science in the Natural Science Departments and the absence in History Departments. The dynamic and changing historiography of science itself reaffirms the lack of historical analyses using history’s methodological and conceptual apparatus. Thus, epistemological aspects appear interrelated to political-institutional issues. Consequently, one has a political-epistemological perspective for discussing the place – or non-place – of history in the history of science. The thought of Maia (2013) acts as an essential starting point for reflection. It constitutes a possible opening in constructing a consolidation of discussions about the impacts (of the absence and the presence of the conceptual apparatus of history) in developing new historiography of science conceptually historical.

Keywords: History of Science; Absent Historians; Brazilian Historiography of Science; Public Policies for History of Science

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Why “Absent Historians” When Referring to the History of Science? The Thought of Carlos Alvarez Maia

Why has the history of science become a history of absent historians? This disquieting question that irrupts the thin layer of regularity that cradles the history of science is the guiding thread of the thought of Brazilian physicist and historian of science Carlos Alvarez

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Maia (1945-2019)² summarized in the epigraph of one of his major works: “What is the history of science? A history without history? What is it? Perhaps, simply, a history of absent historians” (Maia 2013, 11).

Maia’s reference book *History of Science: A History of Absent Historians: Preconditions for the Emergence of Science Studies* (2013) guided the reflections around the role of history for the history of science. This book is a significant part of his doctoral thesis, *The Weft of Science in Liberal Society: The Histories of Science, Science and History*, whose original manuscript, not by chance, was donated by him to the collection of the Library of the Faculty of Philosophy and Humanities FAFICH/UFMG, since the Federal University of Minas Gerais, until then, appeared as the only university offering mandatory classes of History of Science in the undergraduate curriculum of the History Department. This type of Department would be, therefore, the adequate space for the development and exchange of the problem of the “history of absent historians”, and, indeed, he did it also in honor of *Scientia: Theory and History of Science Group*, of which he was an active member, “participating in several activities and collaborating to reinforce a network more focused on the theoretical problems of the history of science and its historiography” (Ávila 2020, 150).

The contact with thinkers of the Brazilian historiography of science such as Professor Hilton Japiassu (1934-2015), in whose classes he operated the effects of the “demolition of scientific ideology” and the participation in the study group “Macumba of physics” under the guidance of Mario Bunge, whose goal was to “unravel [our] disturbances before the theoretical and epistemological innovations of twentieth-century physics” (Maia 2011, 12) and the historical and philosophical issues

became an indispensable complement to scientific knowledge. We read Kuhn, Koyré, Bohr, Heisenberg, Bohm, and Feyerabend. I graduated in physics in 1978 with many concerns but still passionate about the human capacity to develop theories with great explanatory power. (Maia 2011, 12)

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Unveiling history, its concepts and methodologies end up shaking the idea of “history of science”,³ leading Maia (2013) to believe in the existence of “an identity crisis in the history of science that is hesitant before the undefinition of roles assigned to it” (sic), questioning whether the history of science is history or if it “integrates the philosophy of science”, since, “formed basically by philosophers and scientists” with more “proximity to the philosophy of science and science historiated than with history itself” (Maia 2013, 23). Thus, “originally this area of work (history of sciences) was occupied by philosophers and scientists interested in unveiling how science – in the past – constructed its truths”, whose “objective of these early

² Maia graduated in Physics from the Pontifical Catholic University of Rio de Janeiro – PUC/RJ (1978), with a Specialization in Social History (1987). Under the guidance of Professor Shozo Motoyama, he entered, in 1988, the doctorate in Social History at the University of São Paulo – USP, at this time fully involved with historiographic studies. Under the tutorship of Professor José Carlos Reis, he did a post-doc at the Federal University of Minas Gerais – UFMG (2008) in the area of Theory and Historiography of History, thus sealing his commitment to history. He was an adjunct professor of History Theory at the State University of Rio de Janeiro and coordinator of the Laboratory of Historical Studies of Science – LEHC. Maia also worked as a researcher in history of science, astronomy, and nuclear astrophysics at the National Observatory, at CNPQ’s Research Center for History of Science, and also at the MAST – Museum of Astronomy and Related Sciences and at the State Secretariat of Science and Technology – SETEC. Available at: <http://lattes.cnpq.br/9656659906427297>. Accessed on: 12 May 2021.

³ Maia uses “history of the sciences” (plural) and warns, “the social expression of the Science is not singular, it is plural. Its singularity is in its plurality, in its multiplicity of ‘roles’” (Maia 2013, 83). And more: the “unity of all sciences supposes that there is a single method for the establishment of all knowledge with pretensions to be considered scientific. It is a reinforcement of the notion that there is only one science spelled with a capital letter in the singular: Science” (Maia 2013, 105).

times was markedly epistemological” and the history of science that calls itself history “is not produced by historians” (Maia 2010, 7), but “belong to their own historized objects”, as is the case of the history of physics or chemistry.

The absence of the historian or history in the history of science is consummated, according to Maia, by the non-use of the theories and methodologies of the scientific field of history and, not necessarily, (but sometimes also) by the absence of academic training in the field of history, that is, absent historians are not personified in the historian, but represents the absence of the theories and methodologies of history in the analysis of science. Maia (2013) adds:

We all know that **usually, the historian of science does not have the scientific preparation that allows him to master**, for example, Einsteinian physics. This is why historians of contemporary science are always scientists, physicists, mathematicians, etc. [...] However, just like historians of Philosophy, (also like) **they have the severe drawback of not knowing what history is.** [...] But, **just like the so-called historians of Philosophy Departments or retired scientists, they also do not know what history is.** (Barradas in Maia 2013, 26) (Emphasis added)

The historian José Carlos Reis (2010) considers that it is common to hear from historians of science that “historiography even belongs to the field of the history of science, but the history of science is not interested in historiography, it does not dialogue with history”. He concludes, “just look at the journals of the area; there is nothing about historiographical knowledge” (Reis 2010, 17). “The tendency of the ‘historiography’ of the sciences is to dialogue neither with the historical process nor with historiography.” And cites as an example: “the great historical changes that occurred in the sixteenth and seventeenth centuries, processes and events that every historian knows, the historiography of the Scientific Revolution mentions them vaguely”, in which the “revolutionary change is described only at the scientific-philosophical level as if this had autonomy concerning its historicity.” (Reis 2010, 17). Therefore,

the historian *strictu sensu* does not recognize himself in the so-called internalist history of sciences, made by natural scientists, and can make the same objection to it that Febvre made to the history of philosophy, made by philosophers: it is a disembodied history, “spirited”, without flesh and blood, where bonfires, inquisitions, restrictions or budgetary incentives are only mentioned rhetorically, like fireworks. (Reis 2010, 17)

Reis (2010) continues with his call for reflection and asks: “who was Thomas Kuhn? He did not invent the concept of ‘structure’ nor that of ‘revolution’ in 1962. The concept of structure goes back to Marx, Saussure, Durkheim, to the structural history of Febvre, Bloch, and Braudel” (Reis 2010, 19). It also highlighted the hegemony Lévi-Strauss’ structuralism in the 1960s. The concept of “Revolution”, according to Reis (2010), “came from astronomy, but was completely re-signified by the social sciences”. He goes on to say that “Kuhn does not dialogue with his sources, and it seems that he was the genius creator of discontinuity thinking. And he was not!” (Reis 2010, 19). Therefore, historians of science, usually theoretical scientists with backgrounds in the natural sciences, must understand that,

once **accepted by the history department, they become “historians *strictu sensu*” and must learn theory and methodology of history, history of historiography, analysis of primary sources**, to make their history of physics, chemistry, medicine, etc. in a non-amateurish way. (Reis 2010, 23) (Emphasis added)

On the other hand, Maia (2010) suggests that the classes of history itself “or its professionals, do not see scientific activity as a historical object” and there is a “resistance within history departments⁴ to the entry of science among their research objects” (Maia 2010, 8) through “barriers built among historians *tout court* who resist considering science as a historical object”, that is, as “an object apt to attend the concerns of the History departments of our universities” (Maia 2013, 20). The double face of the absence of historians is in the historians who “ignore, in their central problematics, the specific production of the history of sciences” (Maia 2013, 23), besides not conceiving science as a historical object. It is also in the “reciprocal distancing and ignorance of methodologies and problems developed by both *tout court* authors and scholars of scientific activity” (Maia 2013, 23):

As a consequence of this concern to “historicize” the sciences, this book points out the **need for criteria and conceptual parameters to promote a theoretical and methodological basis for the studies on the history of science to be effectively integrated into the territory of the courses of history.** Although there is a large and respectable production of professional historians on the subject – “history of science” – it is insufficient. It is well known that **this subfield was established independently, maintaining its academic autonomy concerning the science of history.** This autonomy was translated into particular thematic clippings and conceptual formulations of its own. (Maia 2013, 22) (Emphasis added)

With that, what is expected is the observance and use of “criteria and conceptual parameters that promote a theoretical and methodological basis, for the studies of the history of science to constitute an activity effectively integrated to the territory of the historical knowledge” (Maia 2013, 22), in which the dialogue and the field of history prevail. Recalling Thomas Kuhn, Maia attributes partially to the history the responsibility of “not ‘entering’ the effective content of science as it does with other courses”, such as art history (Maia 2013, 27).

The Problem of the “Absent Historians”

The discussion of this problem is not exclusive to Maia (2013). In different historical contexts, several other historians of science have highlighted forms of presence or absence of history (or historians). They wanted to demonstrate the relevance of history for science and the healthy approach between history and history of science by highlighting the role of historians (with or without academic training in the field) in writing the history of science. On the other hand, they also wanted to highlight the negative aspects of the distance between history and the history of science, especially regarding the non-use of the conceptual and methodological apparatus of history.

This problem is present in the unfolding of the complex historical plot in which historians *tout court*, sociologists, philosophers and historians of science dialogue (Maia 2010; 2013), which without losing sight of the role of social history for the history of science

⁴ For Condé, “**few universities have their own history of science department**, such as Harvard University. Thus, the history of science emerges in different places: departments of philosophy, physics, education, autonomous institutes within universities, etc. **We may even think that it would be natural for the history of science to emerge in a History Department, but if we analyze the multiple places where it has emerged, we will see that history departments are few in number.** In part, this is because this type of history aggregates science, a foreign element to the historical corpus. This seems to be one of the reasons why, according to Carlos Maia, the history of science becomes a ‘history of absent historians’. Fortunately, this scenario is much better today. Historians of science are beginning to appear in history departments” (Condé 2017a, viii). (Emphasis added).

pointed to a history of science of absent historians. Between 1929 and 1962, occurred what Maia (2013) called “network 33” or “historiographical hiatus”. In this period, the possibility of studying science from a social-historical perspective has weakened. Works of “sociology of knowledge” represented by books as *Ideology and Utopia* of Mannheim (1929) and reinforced by the ideas of the Polish physician and biologist Ludwik Fleck (1896-1961) in the 1930s were eclipsed. Since the beginning, for Maia, the historical-social perspective was already downplayed by the logical positivism of Rudolph Carnap (1891-1970) and the “quarrel” internalism versus externalism reinforced by the context of discovery and the context of justification of Hans Reichenbach. In Maia’s viewpoint, the duo Reichenbach/Carnap supported the longevity of the Vienna Circle’s influence.

Neopositivist ideas and internalism/externalism quarrel prominence lasted until 1962⁵ with Kuhn’s *The Structure of Scientific Revolutions*. Kuhn paved the way for the Edinburgh “Strong Program” led by sociologists Barry Barnes and David Bloor in the 1970s when they took up the foundations of Mannheim’s thought. According to Mannheim, the cognitive contents of knowledge are not acts in themselves but products of a social process.

On the one hand, the “Reichenbach dichotomy” served as an obstacle for a history of science with an effectively historical bias, since it “distinguishes two regions of immiscible competence: one external (either psychological or historical-sociological) provides the origin of the scientific event and guarantees nothing about its veracity/validity”, which would be the “context of discovery”, therefore external to the scientific content; “the other, internal, the only responsible for the legitimation of knowledge”, which would be the “context of justification” of scientific knowledge (Maia 2013, 111). On the other side, Carnap’s “logical positivism” also contributed to the isolation of natural sciences from any external influence on “scientific logic”, be it social or historical. Together, Carnap and Reichenbach served as a support for the “historiographical hiatus” until, according to Maia, the historical resumption of science by Thomas Kuhn in 1962.⁶

The result of Maia’s investigations (2013) brings evidence about one of the possible historiographical analyses capable of explaining the absence of historians *tout court* or history *strictu sensu* in the history of science. However, a historiographical analysis of the history of science with a significant time frame leads the issue of the absence of historians to the very genesis of the founding of the natural sciences and the human sciences. In other words, it branches out to the process of the constitution of the field of history and the history of science. However, it cannot be confused with a deterministic causal relationship in such a way that the absence of the historian *tout court* (or of history *strictu sensu*) and the distance between the scientific fields of history and history of science become perennial.

⁵ It is certain that the lack of consensus regarding the impacts of neopositivism and the internalism/externalism dichotomy on the writing of the history of science. There is also a lack of agreement regarding the work of Thomas Kuhn, pointed by Maia as the one responsible for reinaugurating a history of science with history. When addressing aspects of the internalism versus externalism controversy in the historiography of science, Condé highlights, by referring to the historian Steven Shapin, that various authors have valued social aspects in modern science between the end of the second war and the end of the cold war. However, he adds that “Shapin (1992, 333) suggests this demarcation and we should not understand it too rigidly. These dates would not be so precise, especially if we consider that important works by Koyré and Zilsel, authors who will be at the epicenter of the debate, had already been published in the late 1930s and even in the period of the Second World War. As for the end of the debate, the vagueness is greater. Perhaps it has been transformed rather than ended. Shapin himself acknowledges that it still presents unresolved points (Shapin 1992, 334)” (Condé 2017, 25).

⁶ Maia forges this concept based on his research and theoretical construction related to the specific scope of the analysis. So that besides not being a consensus in the Academy, it cannot be conceived in an isolated and absolute way and should be seen as part of a process that took place over decades with the contribution of several authors.

The 19th century was marked by changing movements in the sciences that oscillated between approximation and distancing, such as the approximation movement of Auguste Comte's positivism in defense of "social physics" since it intended to guide the human sciences by the natural sciences. With the historicists, a movement of distancing from the natural sciences emerged in search of the autonomy of the human sciences aiming to make history scientific. This movement meant the recognition of the theoretical and conceptual specificities of history through the development of its methodology for the sciences of the spirit (*Geisteswissenschaften*) before their specificities concerning the natural sciences (*Naturwissenschaften*) (Dilthey, 2010). Dilthey (2010) adopts the distinction proposed by Droysen between "explaining" and "understanding", on the one hand, the natural-scientific method is based on the "explanation" of causal connections; on the other hand, the sciences of the spirit are based on the mental "understanding" as apprehension of meaning.

This dichotomy extends to the stance of some "historians of science". Citing Butterfield, Kragh (2007) anticipates saying that "it is the scientist and not the historian who has shown the greatest euphoria for the history of science" and that in the work of the historian of science the relationship between "historians who write about science" and "scientists who write history" has never been accessible. The problem that Kragh (2007) points out is, "does science matter in the history of science?". Perhaps it would be necessary to persist with the recurrent question: is history relevant in the history of science? However, Kragh (2007) acknowledges that there is still a tension surrounding this question, as some scientists "call for a completely historicized and intellectually independent history of science completely 'free' of the scientists' way of thinking". However, he warns that "in some modern contextual history of science there is, at least implicitly a danger of giving priority to the context and ignoring what it is a context of, namely the content of science" (Kragh 2007, 106).

The search for a balance between a history of science with an emphasis on science or a focus on history is at stake (although it does not make sense because they are not mutually exclusive). Kragh admits that historians of science have the "obligation to think seriously and critically about our scientists" and "about our communities". Also, it would be "a disaster if the history of science divorced itself from science" and "proceeded purely according to its norms and toward its own goals", since "science is an important part of society and culture, but it cannot be treated in the same way as other sociocultural components" (Kragh 2007, 107).

However, in the debates' refinement, this discussion contributes to the plastering of the natural dynamics of history and science. It makes the acceptance of the history of science as history unfeasible, since history, being particularizing and relative, would compromise the idea of scientific objectivity, the results, and its universal laws and would go towards the relativism so combated by science. However, these two extremes are weakened in the face of current research that each day demonstrates the complex nature of science in which several dimensions, among them, the role of nature, the historical, social, economic, or political aspects, in dialogue or dispute, interact, intersect and interpenetrate.

Trends Towards a Historical History of Science

As we have seen, some causes of the distance between history and history of science may have in its genesis the positivism that led the human sciences to scientism and the historicism that sought autonomy of the human sciences in relation to the natural sciences. Both historical perspectives contributed to a particular ambiguity about the methodological identity⁷ of the history of science, which sometimes neglected history as a scientific field and

⁷ "[...] The history of science is something that people produce with the most varied backgrounds, which makes it an area with definitional problems" (Videira 2004, 290). Thus, the "history of science

wrote history based on the internal logic of science itself. This viewpoint considers that the history of science does not have history and, therefore, this field of knowledge was not inserted in the large area of the human sciences.

The trends of the historical history of science, humanities and nature, humanities and natural sciences arose in the first decades of the 20th century. Since the beginning of the 1900s, Émile Meyerson advocated the “strategic use of the history of science”, which philosophical valorization gave rise to the French “epistemological tradition” (Gattinara 2001). Its main exponents were Gaston Bachelard, Alexandre Koyré, Hélène Metzger and Georges Canguilhem. However, in 1962, with the publication of American physicist and historian of science Thomas Kuhn’s *The Structure of Scientific Revolutions*, history will assume a decisive role in transforming the dominant image of science.

Kuhn shows some refinement in the approach to the history of science when he initially establishes “a role for history” (Kuhn 2009, 19) and not for the history of science. He distinguished them and warned that only new historiography, that is, a new way of analyzing, narrating, and writing the history of science, would change the dominant scientific image of science. Moreover, Kuhn demarcates the difference between history and the history of science. Although recognizing his teacher Georges Sarton’s relevance, Kuhn points out that “there was a kind of history of science to be done that Sarton was not doing. [...] But what they taught was often not exactly history [...] it was textbook history” (Kuhn, 2006b, 341). Or still, when referring to the case histories incorporated into the curriculum reform implemented at Harvard by James B. Conant, Kuhn pointed out that unlike him, Conant “never privileged, [I privileged], the need to mention what people had believed before the event” (Kuhn, 2006, 334). This approach suggests that it was history without reference to memory and sources. Finally, the crowning achievement of Kuhn’s perception of the distinction and distancing between the fields comes with his article “The Relations between History and History of Science” (2011, [1971]).

Maia’s reflection about the absence of historians is old and not specific to the Brazilian case, which only demonstrates that this had already been a relevant concern for the history of science more than a century ago. At the beginning of the 20th century, the article “The Historian and the History of Science” (Barnes, 1920)⁸ points out the lack of dialogue, interest and cooperation between historians and historians of science, that is, keeping the “historian out of the field” of the history of science is a representative act of significant loss for scientists and historians. Furthermore, Barnes’ paper points out that the lack of more comprehensive training of students in the history of science deprives them of “adequate opportunity to familiarize themselves with what, perhaps, should constitute the most vital phase of history” (Barnes, 1920, 122). The way forward would be the reformulation of science education, which should aim at training students in the natural sciences with a proper understanding of the “relationship of the history of science and cultural and historical evolution”. Furthermore, it was necessary to enable the scientific education of the history student with a “reasonable and basic understanding of the history of science”. Thus, historians and scientists should better train their students (Barnes 1920, 123-124).

does not seem, therefore, to constitute its identity through a coherently structured body of knowledge and methods” (Vieira 2004, 291). The identity problem and the sensation of “identity crisis” of the history of science (Vieira 2007, 112) are caused by the absence of demarcation criteria arising from the tension between at least two ways of making history of science: the way of scientists and at the same time actors (and authors) of the history of science and the approach of historians and sociologists (Vieira 2007, 112-114).

⁸ Previously presented at the Conference on the History of Science at the *American Historical Association Meeting* held in Cleveland, Ohio, in 1919, this article was published in 1920. The first general session of the Association was entirely devoted to the history of science (Barnes 1920, 112).

For Maia (2013), the possibility of realizing the genuine and conceptually historical history of science did not represent only an ideal. The first incursions occurred in France with the foundation of the *Revue de Synthèse Historique* in 1900, by the French philosopher Henri Berr, which “supported by the idea of interdisciplinarity, [this journal] always opened great spaces for articles on the history of science, besides being a landmark in the gestation of the *Annales* journal” (Maia 2013, 22). Moreover, the journal’s publications were transferred to the interdisciplinary space of the *Centre International de Synthèse*. This center was composed of a wide diversity of members with different degrees of involvement (Chimisso 2008, 89). There the *Semaines de Synthèse* took place. These events enabled the consolidation of this exchange through the Seminars that allowed dialogue between different fields, including natural sciences. This movement reveals common issues resulting from interscience that would compose the final syntheses. A closer look at the administrative and organizational division of the center demonstrates this dialogue since it was a part of the “historical synthesis section”⁹ under the direction of philosopher Henri Berr and historian Lucien Febvre. Also, there was the “natural sciences section”¹⁰ directed by philosopher and historian of science Abel Rey and, finally, the “general synthesis section”¹¹ responsible for finalizing the reports of the Seminars. In December 1928, Henri Berr had announced the creation of the “history of science section”¹² that would become part of the center (Vieira 2014, 44-45). Maia (2013) conceives the *Revue* as a space of approximation between history and history of science:

There is perhaps one notable exception: the *Revue de Synthèse Historique*, created by Henri Berr in 1900, whose title was changed in 1931 to *Revue de Synthèse*. The idea of interdisciplinarity supported this journal. It always opened large spaces for articles on the history of science, besides being a milestone in the gestation of the *Annales* journal. (Maia 2013, 22)

Another emblematic representative event of a historical history of science was the support of the historian Lucien Febvre for Alexandre Koyré’s candidacy to the Collège de France in the *Orientation des recherches et projets* of 1951. Febvre identified in the Koyrerian program similar bases to the one developed by the history of mentalities, reaffirming the unity and complexity of the mental tool:

It is impossible to separate the history of philosophical thought into closed compartments from religious thought, which constantly bathes the first to inspire or oppose itself. (and it is) equally **impossible to neglect that the study of the structure of scientific thought [...] the evolution of scientific thought [...] does not form an independent series**, but on the contrary, it is very closely linked to that of trans-scientific, philosophical, metaphysical and religious ideas. (Koyré, in Zambelli 2009, 7) (Emphasis added)

⁹ The “historical synthesis section” was divided into seven committees: history, theory and methodology, sociology, psychology, geography, ethnography, and history of ideas.

¹⁰ The “natural sciences section” was divided into committees on mathematics, astronomy, physics and chemistry, biology, and later this section was joined by a subsection on the philosophy of science.

¹¹ The “general synthesis section” members were, among others, Émile Meyerson and Gaston Bachelard.

¹² This section was published in *Bulletin of the Centre International de Synthèse*, 6, dec. 1928, p. 49, *Revue de Synthèse Historique*, 50, dec. 1928. A member of the “history of science section” was the chemist and historian of science, Hélène Metzger, responsible for introducing Koyré to the group.

In the case of Brazil, the dynamics of a historical history of science was not only part of Maia's ideals but also became a reality in at least two distinct contexts and spaces in which he participated. Although the discussions sometimes remained restricted to groups, their retrieval from time to time¹³ reaffirmed their relevance.

The history of science nucleus' in the University of São Paulo – USP was initiated by physicists Maria Amélia Mascarenhas Dantes in 1964 and Shozo Motoyama in 1967. In the 1968 University Reform with the creation of the respective institutes, they opted for the transfer to the History Department. It was the first research line dedicated to the history of science and technology in Brazil in a History Program. This research line was structured around the history of science tradition in a fruitful dialogue with “social history” (impacting several generations, including Maia and Olival Freire). It was also profoundly influenced by the science studies approach. In Brazil, this movement downplayed the “historiographical hiatus” in which history was eclipsed in the scientific history of science.

Another turning point for a historical history of science would have as a landmark the year 2010 in the “1st National Meeting of Researchers in History of Science” – ENAPEHC – organized by the Graduate Program and *Scientia: Theory and History of Science Group* of the Federal University of Minas Gerais. This event intended to promote the “Theory of History” as a reference to the history of science overcoming social history as the primary reference. As a reference to the history of science, social history reached its high point in the 1980s and 1990s. However, during the round table “Is the history of science history? Explaining a tautology”, professors Carlos Alvarez Maia (UERJ), Luiz Carlos Soares (UFF) – then president of the Brazilian Society for History of Science – and the professor of Theory of History and historiography, José Carlos Reis (UFMG) presented relevant points of the theory of history for the advancement of the history of science.

With the challenge of reflecting on this tautology, Maia and Reis were categorical in reaffirming that the history of science is “history” and has historiography. Reis, however, right in the title asks: “why is it necessary to explain this tautology?” alerting us to the fact that many questions still need to be faced, such as, for example, investigating if history and history of science are built-in distinct scientific fields, if these fields dialog, how are the uses of the concepts of history by those who make the history of science, therefore, these are questions that remain.

Another vital space for a historical perspective of the history of science in Brazil is the Department of History of the Faculty of Philosophy and Human Sciences at the Federal University of Minas Gerais – FAFICH/UFMG. Since the 1990s, this Department has served as a space of integration between history and the history of science. This space brings together science and humanities. Or, as Maia advocated, it considers science an object of history.

In 1997, the Graduate Program in History launched the first initiative to create a *Center for History of Science* at the Federal University of Minas Gerais. However, this only became a reality in 1999, with professors Mauro L. Condé, Betânia Gonçalves de Figueiredo and Bernardo Jefferson de Oliveira creating the *Scientia – Theory and History of Science Group*. In 2000, the Graduate Program began the research line “science and culture in history”. In the History undergraduate program, in 1999, the course of History of Science and Technology was created, having Professor Mauro L. Condé as the first professor since its beginnings until today. The *Scientia* Group has always been active and has broadened the debate on the History of Science. The group is divided into three nuclei which carry out academic productions and scientific events. The first core focuses on the historiography of science (Mauro L. Condé, Bernardo Jefferson de Oliveira), the second core is dedicated to health

¹³ Maia received his doctorate in 1996 and only published a book about it in 2013, that is, seventeen years later. The only article that directly addressed the problem was published during his doctorate in 1992 in the journal of the *Brazilian Society for the History of Science* – SBHC entitled: “For a history of science effectively historical? The struggle for a sociological history”.

science history (Ana Carolina Vimieiro Gomes, Rita de Cássia Marques, Anny Jackeline da Silveira), and the third is committed to environmental history (Regina Horta Duarte, Ely Bergo de Carvalho, Rafael Scopacasa). The group also welcomes research in different fields of the history of science, such as the history of cartography (Junia Furtado), history of physics, history of mathematics (Mauro L. Condé), and history of biology (Regina Horta Duarte, Ana Carolina Vimieiro Gomes). All the nuclei work parallel and maintain a fruitful internal dialogue with research professors in history theory and historiography (José Carlos Reis, Douglas Atila Marcelino). There is a strong connection between *Scientia's* members with historians of science from other universities. So, the most frequent interlocutor was Carlos Alvarez Maia. In 2008, he became an official member of the group. In an interview, Maia stated:

I believe that Brazil lacks centers of collective production in this area. This is the expected role for UFMG and its research line in the history of science and its graduate program in history. UFMG has everything to, at this moment, assume the vanguard of the Brazilian university research in this area. **We need a hub for new researchers as USP was in the past.** In Latin America, ESOCITE¹⁴ has shown a good development: Colombia, Mexico, Argentina and Brazil already present some integration in “science studies”. I hope it expands this network and offers more convincing fruits. (MAIA, 2011) (Emphasis added).

On this topic, the professor of theory of history and historiography of History, José Carlos Reis, expressed himself thus:

[...] **the history department is the appropriate place for the history of sciences.** UFMG history department is to be congratulated because it is among the pioneers in integrating these essential objects of historical knowledge, the sciences, the techniques, the environment in its graduate program and now, also with undergraduate courses. (Reis 2010, 23) (Emphasis added)

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It is important to highlight two other propitious spaces for the interlocution between history and history of science that were constituted through the initiative of graduate students in History at UFMG: the journal *Temporalidades* and the “Interdisciplinary Nucleus of Theoretical Studies” (NIET). *Temporalidades* was created in 2009. It is a journal as a “space for the publication of original works produced by researchers in the area of History, or that dialogue with it”.¹⁵ In addition, it has several thematic dossiers on history and the history of science. NIET, created in 2012,¹⁶ corresponds to an unofficial initiative of graduate students of History at UFMG “to promote the interdisciplinary debate of subjects related to the Theory of History. The vocation of the nucleus of studies is the immediate theoretical questioning”, having an “interinstitutional character” currently.¹⁷

Just over 15 years after the creation of the *Scientia* group, to broaden the debates on the historical narrative of science (with the vital viewpoint of the humanities) and at the same time internationalizing the discussions, in 2016, a new space for dialogue and possibility for historical historiography of science was created, *Transversal: International Journal for the Historiography of Science*.¹⁸

¹⁴ ESOCITE is a Latin American association for the social studies of science and technology.
<https://www.esocite.la/quienes-somos/>

¹⁵ <https://periodicos.ufmg.br/index.php/temporalidades/about>

¹⁶ Founded by the then graduate students of History at UFMG, Fernando Garcia, Andréa Mara Ribeiro da Silva Vieira, Rodrigo Bianchini Cracco, Fátima Saionara Leandro Brito.

¹⁷ <https://nietufmg.wixsite.com/niet>

¹⁸ Editors-in-chief are Mauro L. Condé (UFMG) and Marlon Salomon (UFG).
www.historiographyofscience.org



Finally, even considering that since the research developed by Maia, some aspects of the debate have advanced, other measures are still necessary to affirm a historical history of science that establishes reciprocal attitudes between the fields of the history and history of science. On the side of the history of science, it is desirable that the necessary opening of the “body of its professionals who have grouped themselves in specific societies and congresses, forming a circle of researchers whose production transits through their journals” (Maia 2013, 22). On the side of history, it is essential that the “scientific activity” is conceived as a historical object. In this way, this attitude avoids possible resistance from history departments concerning recognizing science as an object of research. (Maia 2010, 8). In other words, on the one hand, scientists who practice the history of science should approach history, and, on the other hand, historians should approach the history of science. Thus, we would be better able to write the history of science or investigate science from the historical dimension, using the conceptual and theoretical-methodological apparatus. After all, the history of science is history.

The Place of History in the History of Science in Brazil

The actuality of Maia’s thought concerning the problem of absent historians lies in the complexity of the issue and the changing movements of approximation, distancing and re-approximation. Occurring in different ways and in different proportions, this situation leads, at certain moments, to a place and, at others, to a non-place for history in the history of science. In this article, serving as a reference for future deepening, the approach is divided into three groups: 1) graduation and scientific research; 2) undergraduate (teaching) and 3) science education.

These changing movements were in Maia’s thought since, at the same time, he integrated a group of historians of science whose tradition is based on social history (USP group), he could highlight the absence of history in the history of science. However, although it seems paradoxical, Maia was part of one of the few spaces that produced the history of science, giving him clarity concerning most academic research and its production spaces. As a rule, by that time, the space of these academic research used to be the history of their “own historicized objects” (Maia, 2010, 7) carried out in their respective natural sciences departments by physicists, chemists, and biologists. That was a history of science bias more scientific than historical, like science itself.

In Brazil, graduate studies, research and scientific production in the field of the historical history of science, or otherwise history, have been very active not only in the centers at USP and UFMG but also at UFRJ, the Oswaldo Cruz Foundation – FIOCRUZ, at the Astronomy and Related Sciences Museum – MAST, in associations such as *Brazilian Society for the History of Science* – SBHC, *Brazilian Society for the Progress of Science* – SBPC, *Brazilian Academy of Sciences* – ABC, among others.

The development of graduate studies in the history of science with “isolated initiatives at USP and other universities” in the area of history of science contributed institutionally to the emergence “in our country of a line of research entirely dedicated to the history of science and technology” starting the “formation of a roll of masters and doctors, including well-known names such as Ruy Gama, Olival Freire Jr., Carlos Maia, Francisco Assis de Queiroz, Ulisses Capozoli and many others” (Magalhães, 2021). However, focusing on graduate studies is a very restricted view concerning Maia’s denounce and the reference base of this work that starts from a democratic conception of science. In other words, history should integrate science education as a whole and not just circulate in an elitist way among a few scholars on the subject.

It is relevant to say that scientific production in the field of the history of science, especially if it presents a historical approach, is essential for the development and understanding of science. However, it represents a concentration of knowledge concerning

the small percentage of the population or the number of people who have higher education at the graduate level. Therefore, education, and scientific education in particular, that caters to the full development of the human being is everyone's right and the Brazilian State's duty. In this sense, besides the effort to develop graduate studies and research in the History of Science, it is also essential to invest in the teaching of the graduation level, especially given the Brazilian constitutional principle of "inseparability between teaching, research and extension".

Therefore, a broader approach to the history of science in Higher Education (training of teachers and undergraduates) is inevitable, considering the impacts of these future teachers in Basic Education. Additionally, most researchers who are part of the history of science graduate programs aspire to an academic career. Still, they will not always share the knowledge acquired with their students (future teachers of Basic Education). As we will see later, years after Maia's denounce, the not always historical history of science, therefore, more scientific, is still predominant in the natural sciences undergraduate courses and absent in humanity's undergraduate courses.

To map the existence of "mandatory classes"¹⁹ in undergraduate courses in the following fields 1) humanities, in the Departments of History and Pedagogy (Education), and 2) the natural sciences, in the Departments of Physics, Chemistry, and Biological Sciences, a quantitative survey was carried out. We analyzed the curricular matrix, curricular structure, grid and programs in the webpages of 28 (twenty-eight) Universities (26 public federal universities and two public state universities located in the Brazilian state capitals),²⁰ which resulted in the graph in annex no. 1, page 19.

Considering the mandatory courses in undergraduate studies (bachelor and licentiate degree)²¹ based on the descriptors mentioned, the results of this first phase of the quantitative research in the 28 (twenty-eight) Brazilian Universities surveyed in humanities and natural sciences are still predominantly as Maia (2010; 2013) demonstrated a decade ago. In other words, a history of science of the "historicized objects" carried out in the undergraduate courses of the respective natural sciences departments is predominant, despite the crucial advances in research and graduate studies in the historical history of science. Thus, most of the surveyed universities have only 01 (one) course offering mandatory classes (among the five courses surveyed). The most extensive offer is in the Department of Biological Sciences, with the mandatory classes provided by 17 (seventeen) universities; followed by the Department of Physics with mandatory classes in 13 (thirteen) universities; in the Department of Chemistry in 10 (ten) universities; in the Department of History in only 01 (one) university and in the Department of Pedagogy with no offer of mandatory classes with the descriptors surveyed.

¹⁹ The mandatory courses are likely to be spaces for discussion about existing debates in the field of the historical history of science. Non-mandatory courses reduce the likelihood of students seeking them.

²⁰ The survey methodology included the use of the following descriptors: "history of science", "history of physics", "history of chemistry", "history of biology", "Philosophy of science", and "Epistemology". The surveys were conducted in June and July 2019 and were revised in April 2020.

²¹ "Several variables impact the result, such as the different curricula, where the campus is and shift since the curriculum grid differs on each campus and each time (morning, afternoon or evening). Additionally, some universities only offer a licentiate's degree or bachelor's degree and not both. However, the curricular grid is different even when there is a bachelor's degree and a licentiate's degree for the course (which is the majority). In this research, the difference in the curricular grid between licentiate and bachelor's degrees is not only in the classes essential to learning research (bachelor's degree) and teaching (licentiate's degree). The unfolding is even more impactful since it can culminate in training with completely dichotomous views of science by avoiding courses with historical, epistemological or humanities approaches" (Vieira 2020, 223).

Thus, a significant part of the students, future teachers, based on the quantitative criteria presented, will possibly not have in their respective training the opportunity to have access to debates around the history of science and related issues, including the historical history of science. Biology students from 38% of the universities surveyed; physics students from 53% of the universities; chemistry students from 64% of the universities; history students from 99% of the universities surveyed; and, finally, pedagogy students from 100% of the universities surveyed will be deprived of this knowledge.

This deficiency in the training of teachers and graduates impacts the science education taught in Basic Education. The national and international scientific productions demonstrate the relevance of the history of science for teacher education. In “History, Philosophy and Science Teaching: the current trend towards approximation” (Matthews 1995), based on the proposals of the British National Curriculum and the recommendations of the American curriculum guidelines Project 2061, Matthews defends the inclusion of the history and philosophy of science in teacher training programs in this area. According to him, this would be essential in solving what he calls the “crisis in contemporary science teaching [...] as evidenced by student and teacher attrition from the classroom and the alarmingly high rates of science illiteracy” (Matthews 1995, 165). There is also intense academic debate about the importance of the history of science for understanding the Nature of Science (NOS) as one of the strategies that can promote a more contextualized science teaching, humanizing the content to be taught. This inclusion of the history of science would favor a broader understanding of scientific concepts and the way science operates, and its relationship with society.

In this line, Roxo Beltran; Saito and Trindade (2014), in *History of science for teacher education*, although they do not address the problem of the absence of history in the history of science, recognize the lack of specialized materials directed to the teaching of the history of science in higher education. For the authors, this approach is indispensable due to the specificities of the area as an interdisciplinary area. This field of knowledge has its object built at the interface of three spheres of analysis: epistemological, historiographical and conceptual.

The absence of the history of science, significantly, the lack of contact with academic debates around the history of historical science, which are still concentrated in the graduation, updates Maia’s thought (2013). The epistemological and politico-institutional analysis from the impacts on science education demonstrates that the weight of scientism is a reality, especially for science teaching (science education). This reality needs to be transformed. Studies in science teaching and science education combat scientism. Scientism “made science a territory separated from the social world, and its unfolding, the emptying of the historicity of scientific practice” (Mollo 2015, 273). In the complex plot developed by Maia (2013), he proposes an “other history of sciences” in which “history confronts scientism” (Maia 2013, 53). This process culminated in scientism versus historicism that should be seen not as an ultimate purpose but as a fruitful space for analysis.

As this analysis demonstrates, there is an urgency to create a place for the history of science in History Departments. This insertion would enable the political-institutional place of history in the history of science. Additionally, it would reaffirm the political-epistemological perspective that inaugurates a new phase with the advent of Law 14.038/20²² published on August 17, 2020. This law “regulates the profession of Historian and establishes the requirements for the exercise of the professional activity and determines the registration in the competent body” (art. 1).

“The exercise of the historian’s activity is free since provided the qualifications and requirements” (art. 2) established by law. According to Article 3, “the exercise of the profession of Historian, throughout the national territory, is guaranteed to:

²² http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2020/lei/l14038.htm

I - **holders of a degree in History**, issued by a regular educational institution; II - holders of a degree in History, issued by a foreign institution and revalidated in Brazil, following the Law; III - **holders of a Master's or Ph.D. in History**, issued by a regular educational institution or by a foreign institution and revalidated in Brazil, following the Law; IV - holders of a master's degree or doctorate obtained **in a graduate program** recognized by the Coordination for the Improvement of Higher Education Personnel – CAPES that **has a research line dedicated to History**; V- **professionals with degrees in other areas who have demonstrably exercised the profession of Historian for more than 5 (five) years**, as of the date of enactment of this law. (Brazil, 2020) (Emphasis added)

Paragraph V of Art. 3 represented one of the critical points during the processing of the proposal for regulating the profession of historian defended by the *National Association of University Professors of History* (ANPUH), as it directly affected historians of science. Furthermore, the publication of an open letter to recognize historians of science in July 2013 by the *Brazilian Society for the History of Science* (SBHC) criticized the proposal. The letter criticizes the proposal that did not “clearly provide for specific cases such as those of historians of science, who have in their ranks professionals with extensive experience, but without specific degrees”, and with the new law, many of them may be excluded or harmed. Also, the *Brazilian Society for the Advancement of Science* (SBPC) and the *Brazilian Academy of Sciences* (ABC), in support of the various scientific societies and professional associations, sent a letter to the *National Congress* manifesting against the proposal. One can read in the open letter:

These important tasks will become meaningless, however, if the law – and the public – do not recognize that there are historians in Brazil who are no less professional than other colleagues for not holding a specific academic degree in history (as the proposal requires) – this is precisely the case of a large number of historians of science represented by the SBHC, many originally trained in natural or social sciences, philosophy, or even, more recently, in new interdisciplinary graduate programs. The very consolidation of the history of science in Brazil, from the 1980s on, resulted from the joint effort of professionals with these diverse backgrounds, but who, by their practice, and not by their degrees, have earned the name of historians – which is now on the verge of being taken away from them, together with the possibility of legally exercising the activities for which they have demonstrated recognized competence. (Emphasis added)

At that moment, the normative place of the history of science in history was consolidated. However, it highlighted the theoretical and epistemological fissures of a field-constructed far from history *tout court*, which did not prevent it from being recognized as history by ANPUH in the editorial of the entity's *Electronic Newsletter* no. 5 published in April 2010:

We are not against the recognition as historians, including by law, with the proposition of an amendment to the proposal approved in the Senate, during its passage through the House, of those professionals with other backgrounds who have worked for a specific period, to be defined in our discussions, in the field of history, or who have notorious knowledge, acquired through years of practice, in our area of knowledge.²³

²³ ANPUH *Electronic Newsletter* no. 5, 2010. Available at: <https://anpuh.org/mensagem/view2?q=NTkwOTkIMkMxMTMIMkMxYjExMmE4NGJmMmZiNDIzOTNmOTMoYWJkYmlyYjVINA> Accessed on October 12, 2021.

In an interview, the then president of ANPUH, Rodrigo Patto Sá Motta, wind up the controversy by clarifying that ANPUH does not want to close the space for dialogue with historians of science, who are fundamental for the advancement of knowledge. However, “many of us believe that it would be beneficial for teachers of any area belonging to the field of history to have closer contact with specific academic training (at any level)”, which already occurs among many historians of science. He argues that historians of science without a specific degree “was more common in past times when university education was weak or non-existent. Nowadays, would there be any reason for someone with a vocation for research and teaching in history not to seek specific training, either at undergraduate or graduate level?” However, he warns that it will be necessary to consider the future effects. In a way, this is the proposal of this reflection.

This past-future of the history of science has new contours with the advent of the “legal framework of the profession of the historian”. Besides the political-institutional requirements to be observed, it also needs to consider the epistemological and theoretical-methodological debates for a historical history of science. In other words, it needs a new moment of research and scientific production that is more and more historical. In practice, as we have seen, the few classes of history of science (or related ones) are primarily taught in the area of natural sciences (Departments of physics, chemistry and biology), which, due to a legal obstacle, cannot comply with the provisions of item I of art. 3 of the law. On the other hand, according to item IV of art. 3, graduate courses in History Departments should have a line dedicated to history; otherwise, they will not legally graduate historians of science either.

Therefore, if the history of science is history from a historiographical viewpoint, also normatively, universities, especially History Departments, should prepare themselves to adapt to the current legal provisions to train historians of science. Going beyond investments in graduate studies, they will also have to create courses in the history of science. For future historians of science to have the right to exercise the attributions foreseen in art. 4 of the law and guarantee their professional spaces more widespread, it will be relevant to create undergraduate courses and invest in the training of teachers and undergraduates. Indeed, it will also be indispensable to adapt the selection process for university professors (responsible for the training of future teachers) in the history of science. Most of them have as a requirement the graduation in courses in the area of natural sciences, which restricts the candidacy of historians of science with a background in humanities. This procedure is not justified since, after all, the history of science is history and belongs to the humanities. On the other hand, courses in the humanities do not have specific competitions for the field, and graduate students in the history of science are forced to compete for positions in the field of theory of history, for example.

Reciprocally, standardization also contributes to the delimitation of the scientific field of the history of science. Also, the place of history in the history of science in which the perspective for a historical history of science in opposition to the history of science of the scientific tradition requires that the dialogues, tensions and disputes inherent to the scientific field place side by side studies of key authors for the history and philosophy of science, such as Georges Sarton, Karl Popper, James Bryant Conant, Ludwik Fleck, Gaston Bachelard, Alexandre Koyré, Thomas Kuhn, Barry Barnes, David Bloor, Imre Lakatos, Paul Feyerabend, Bruno Latour, among others. With the critical and problematized analysis of these key authors and our concepts of history, we will advance in the history of science with the tools, theories, and methodologies of history.

Therefore, it is no longer admissible a filed of knowledge call itself history and is legally recognized as such remains in a systematized way (I am not referring to some works carried out) unaware of the central discussions of the “theory of history”. The history of science cannot neglect debates about the concept of “historical time” that dialogue with Fernand Braudel, Reinhart Koselleck or Dipesh Chakrabarti. We cannot admit the historiography of

science without discussions about “narrative” involving Hayden White or Paul Ricoeur’s triple mimesis or even Michel de Certeau’s writing of the history. Such a subject needs to dedicate to the critical analysis of historical sources considering their extension and possibility of revisionism. A history of science cannot develop without the debate on how to view and conceive historical theories and currents, such as, for example, analyzing science under cover of the historicist paradigm of the *Annales*, of historical materialism, among others. Additionally, we cannot admit a history of science that does not promote the analysis of historical concepts to organize the world and scientific knowledge and think about reality.

Conclusion

The problem of the “absent historians” proposed by the historian Carlos Maia led us to reflections that evidenced multi-causal and changing conditions involving the realization of the historical history of science. The analysis of the Brazilian historiography of science in complexity demonstrated the pertinence and actuality of Maia’s denounce. Starting from it, one reached the strong indication of the epistemological, normative and institutional need to enlarge the presence of the history of science in history departments. This attitude would adjust the theoretical (and in Brazil also normative) mismatch to equate the tautology: history of science is history? Therefore, the history of science belongs to the humanities and should be performed in the history department.

Thus, the absence of the history of science in history departments reaffirms the “non-place” of history in the history of science, both from a political-institutional and epistemological perspective. This attitude hinders theoretical-methodological conceptual advances and discussions proper to the science of history. Moreover, it compromises higher education and the universities’ three constitutional principles (teaching, research, and extension).

We should aim the Certeausian “place” for history in the history of science, as a relation of stability in which the space is the practice of the place transformed by the subjects from their occupations, appropriations and experiences. Therefore, it is consolidated by the political-institutional site and in the light of the theory of history. Recalling Michael Oakeshott (2003), “practical past characterizes the past”, that of the history lived, as well as the “historical past” elaborated and constructed through the historian’s work (Oakeshott, 2003, p. 62). One cannot neglect this statement when making history.

These reflections about the humanities (especially history) are emergent in this historical, political, and social moment represented by scientific denialism, the growth of the antivaccine movement, and a certain contempt for the human sciences, in the case of Brazil. On the one hand, the fundamental force of nature represented by the virus (Covid-19) does not allow science to be only a “social construction” detached from nature (also human nature). But, on the other hand, the historical-social issues are not external to science. On the contrary, they take center stage when the economic reality of different countries and the political stances of various governments in confronting the pandemic impact research and local and global scientific development.

All this means the need to (r)establish a living dialog with the complex reality that no longer allows dichotomies, such as “man versus nature”, “human sciences versus natural sciences”, “internalism versus externalism”. These divisions do not hold in a complex world. For example, the fundamental symmetry between humans and non-humans, the non-determination of gender by biological sex, or anthropogenic human action is a reality and significantly impacts nature. They are examples of the new social-historical reality. Assume this socio-historical change imposes on science the urgency to accept its complexity and multiple dimensions to avoid (or prevent) the detachment from reality. In this sense, the place of history in the history of science becomes essential to promote the unveiling of the

living reality to provoke reflection and substantial changes in the history of science and in science itself.

Historians, present!

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Annex no. 1

Chart 1

Mandatory Courses in the Public Brazilian Universities [Departments of History, Biological Sciences, Chemistry, Physics, and Pedagogy]

History of Science, History of Physics, History of Chemistry, History of Biology,
Philosophy of Science and Epistemology [B.Sc. and licentiate's degree]

