

Rediscovering irony: Narrative categorisation in the study of centre/periphery interactions

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Resumo

Este artigo sugere que as análises das interações entre centros e periferias na América Latina poderiam se beneficiar do uso da ironia como categoria narrativa. O potencial da trama irônica é estudado à partir de trabalhos que desafiam indicações de submissão e passividade de comunidades científicas periféricas. Um estudo de caso irá demonstrar como as possibilidades analíticas intrínsecas à tramas irônicas podem servir como uma efetiva alternativa à perene inconsistência de modelos teóricos.

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Palavras-Chave

História Narrativa, Ironia, Interação Centro-Periferia, STS.

Abstract

This paper analyses the attempts carried out by historians of science to replace diffusionist models of scientific interaction from the perspective of narrative history. I argue that historians focusing on centre and periphery interactions have been using ironical emplotments in their scholarship without realizing the analytical potential this narrative approach offers. It is suggested that a more critical appraisal of the possibilities offered by narrative categorisation may provide insightful alternatives to more symmetrical histories about centre/periphery interactions. A case study is presented to demonstrate the practical use of this change of perspective.

Keywords

Narrative history, centre-periphery interaction, STS.

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The history of scientific development in Latin America has for decades been described as a tale of interactions and exchanges. Early theoretical models used to analyse these interactions portrayed Southern nations as passive receivers of knowledge produced in central regions of the Northern hemisphere. The objective of this paper is to analyse attempts by historians to replace these early, diffusionist models of scientific interaction from the perspective of narrative history. I argue that historians focusing on centre and periphery interactions have been using ironical emplotments in their scholarship without realizing the analytical potential this narrative approach offers. My argument, therefore, is that a more critical appraisal of the possibilities offered by narrative categorisation may provide insightful alternatives to more symmetrical histories about centre/periphery interactions.

Narrative in STS and History of Science

The potential of narrative categories in relation to the studies of centre/periphery interactions may be situated in the context of recent discussions urging the ‘dismantling’ of boundaries between STS and the history of science (DASTON, 2009; DEAR & JASANOFF, 2010). I contribute to this effort by demonstrating in this chapter that works on narrative categorisation in the historiography of science provide analytical insights that could be also useful to STS scholars studying Latin American science. At first glance, discussions about the methodological potential of narrative might appear an odd choice as a way of dismantling boundaries. Several authors have pointed out the uneasiness of social scientists with the historians’ use of narrative. Margaret Somers, for instance, argues that for most social scientists historical narrative is too discursive, non-explanatory and, above all, excessively non-theoretical (SOMERS, 1994). Similarly, John Law argues that social science theory and narrative history were simply driven by irreconcilable ‘kinds of concerns and interests’ (LAW, 1991: 377).

However, recent works have demonstrated that social scientists are increasingly interested in the analytical possibilities offered by narratives. Susan Cozzens and her colleagues point out that narrative is already a common choice, in particular, among STS scholars interested in questions of knowledge and development (COZZENS et al., 2008). In fact, a brief survey of the last edition of the *The Handbook of Science and Technology Studies* reveals that the term ‘narrative’ is already incorporated into the vocabulary and methodology of several STS scholars (HACKETT et al., 2008). This increasing familiarity with narrative reflects an

overall tendency in several branches of the social sciences. For instance, in recent years a reconsideration of the value of narrative and narrativity as ‘concepts of social epistemology and social ontology’ has been identified in diverse disciplines, from gender and cultural studies, to psychology and social research (SOMERS, 1994: 606).

In the case of the history of science, the revival of narrative has emerged not only due to its discursive potential, but also for the methodological possibilities it creates (STONE, 1979). Clark William’s work on narratology, for example, offers a consistent analysis of the diverse categories in which history of science narratives can be classified (WILLIAM, 1995). The work of Martin Rudwick, in particular, became a reference after the author’s eloquent defence of narrative for the study of scientific controversies (RUDWICK, 1985: 11-14). Jan Golinksy identifies in Rudwick’s work a crafted narrative that results from an ‘immersion in the temporal order of intellectual work’ and by careful study of a wealth of archival materials (GOLINSKI, 2005: 195-197). Steven Turner also discusses narrative in the context of controversies over science policy in Canada (TURNER, 2001). Turner argues that narrative awareness allows not only analyses of opposite sides in controversies, but enables a more critical description.

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However, this increasing awareness to the potential of narrative has not yet taken place in the context of centre/periphery studies. Frameworks provided by specific theoretical models are still the predominant choice to justify methodological approaches. Therefore, the categorisation put forward by Clark William will be used in this chapter in order to explore the extent to which centre/periphery studies in Latin America might benefit from a more critical appraisal of the analytical possibilities of narratives. Clark used the work of the literary critic Northrop Frye to demonstrate the ways in which different scholarship in the history of science may be classified among several narrative categories (FRYE, 1957). Differences among categories stem from specific elements, such as plot, agency, place and voice, which are markedly distinct from each other. As noted above, I argue that the structure of ironical narratives is uniquely suited for both the methodological and analytical requirements of centre and periphery studies, and thus might offer an insightful alternative to the study of centre/periphery interactions.

Models of Interaction

As the structural analysis of ironical narratives is presented in contrast to traditional models of centre/periphery interaction, it is necessary to understand first their use and importance. In Latin America the use of models to study interactions between its countries and “central” nations follows a coherent logic. In the past, certain regions, called “centres”, produced and concentrated more scientific knowledge than other regions, labelled “peripheries”. At the same time, similar institutional arrangements, social relations and cultural values related to scientific practices were located in both central and peripheral regions, suggesting that patterns of transmission or exchange between them existed.

Models of interaction were, therefore, a result of trying to identify and, if possible, predict these patterns. These models tended to reflect theoretical orientations that can be historically situated. For instance, right after the Second World War, theories of economic development, ‘which held that all societies progress through similar stages of development’, influenced projects to apply the same principle to science in order to accelerate scientific development in poor nations (ROSTOW, 1959). In the late 1960s, a host of studies investigating the imbalance of scientific development between nations would pull on similar teleological assumptions. George Basalla’s diffusionist model is perhaps the most prominent example of this period, although Joseph Ben-David and Robert K. Merton also offered frameworks that were used to explain different rates of exchange between centres and peripheries (BASALLA, 1967; BEN-DAVID, 1984; MERTON, 1979). From the late 1970s onwards severe criticism against such diffusionist and teleological models began to emerge, which in turn, lead to the development of new models of interaction.² For instance, Xavier-Polanco’s concept of ‘multiple peripheries’ is a good example of this second phase (POLANCO, 1990; 1992). More recently, new models have been put forward, building upon what has been learned, and the concept of ‘moving metropolis’, created by Roy MacLeod, is one of the most widely known examples of this latest period (MAcLEOD, 1982).

After decades of attempts to improve, reject and recycle models, there are at least two common justifications for their resilience. The first relates to the use of case-studies, the staple of contemporary histories of science (HOLTON, 1981:

2 (Chambers 1991) provides a comprehensive list of critics of Basalla’s model. For a summary of criticisms about Ben-David and Merton’s positions see (Lenoir 1997) and specifically about Ben-David’s assessment of peripheral science in France see (Nye 1986).

46). An inherent difficulty of working with case-studies is discovering a way of relating the specific to the general, the local to the global (GRIJALVA, 2002); or as Peter Galison suggested, carrying out a history of science without being naively grounded in typicality (GALISON, 2008). This is a challenge given that the concept of typicality itself is one of ‘social history’s proudest achievements’ (EUSTACE, 2003: 88). The use of models to analyse individuals, institutions and scientific programmes in peripheral regions allows the historian to concentrate on the specific, but at the same time to situate the specific within a broad theoretical framework. Provided that the model has been tested and accepted by the scholarly community, any case-study, however small or peripheral, is deemed worthy of investigating.

One model that operates well along these lines for historians of Latin American science is Xavier Polanco’s idea of world-science as an analogy of world-economy by Fernand Braudel (POLANCO, 1990; POLANCO, 1992). This framework has been widely adopted as a substitute for diffusionist models such as George Basalla’s (BASALLA, 1967). Polanco’s model frequently emerges in Latin American historiography as a means to justify the study of particular examples of scientific initiatives (BARONA, 1994; FIGUERÔA, 1997; FILGUEIRAS, 2001; LÓPEZ-ÓCON and BADÍA, 2003; MATEOS, 2002; VOS, 2006). Polanco loosely maintained the dialectic idea of centre and peripheries, but introduced new methodological devices, such as ‘semi-peripheries’, and hierarchies within scientific communities (QUEVEDO, 1999).

A second major explanation for the resilience of models of interaction is an uneasiness with the use of the narrative style without a proper theoretical alignment. Narrative without a clear theoretical statement seems, to some scholars, as not properly academic, despite the fact that many do not recognise any necessity to justify their narrative choices on theoretical grounds (BROWNW, 2003; DESMOND and MORE, 2009; SECORD, 2000). However, as Steven Shapin has put it, historians of science sometimes simply feel the urge to ‘upgrade’ their products (SHAPIN, 2010: 9). In the case of social scientists there seems to be an even greater concern to explain and define their theoretical orientations as a means to position their texts. Given the proliferation of grand narratives in the early stages of the discipline, the historiography of science has a peculiar position in this context (KOHLELER, 2005). Such grand narratives of progress, and histories of ‘great’ scientists and discoveries led some scholars to come up with new definitions to differentiate these early approaches to more recent attempts of

writing critically-oriented narratives. Allan Megill, for example, coined the word recounting to define a narrative structure that is more aware of methodological and analytical aspects (MEGILL, 1989: 637). These efforts to rebrand narrative, however, reveal a common misconception about the flexibility that different narrative categories offer. The term narrative is usually used uncritically, as if there was only one possible way of narrating historical events. In the case of the history of scientific practices, descriptions of heroic individuals solving riddles and puzzles follows, in many ways fit the profile of a traditional romantic emplotment, whereas unexpected resolutions of scientific controversies are more inclined to comedic plots (WILLIAM, 1995). But these are only two (romantic and comedic) out of several distinct forms of narratives, each one enabling specific analytical and interpretative frameworks that defy a simplistic definition of narrative.

Learning from Mistakes

Despite the popularity of models of interaction, decades of empirical work proved the existence of a plethora of problems associated with their use. Basalla's model, for instance, became a theoretical anathema for a generation of Latin American historians (LOPES and PODGORNY 2000; MACLEOD, 2000: 3). In the specific case of Brazilian historiography, Basalla appeared to be so off the mark that his model served to direct an entire historiographical school that sought to demonstrate how the case of Brazil defied his model KROPF and HOCHMAN, 2011: 398). The literature pointing to the problems of early models is immense and may be consulted for issues other than interactions and exchanges between centres and peripheries (CHAMBERS, 1991). There are, nevertheless, specific methodological and theoretical difficulties that must be briefly outlined here as they help to understand the usefulness of narrative categorisation.

David Wade Chambers and Richard Gillespie have extensively dealt with several of the problems that plagued early centre/periphery models; and, like MacLeod, investigated science in the Australian context (CHAMBERS and GILLESPIE, 2000). They call attention, for example, to the fact that models used to study colonial science failed to portray symmetrically the complex interactivity between the 'great divides: centre/periphery, local/global, national/colonial and traditional/modern' (CHAMBERS and GILLESPIE, 2000). This limitation emerges in several case-studies where active peripheries challenge the assumption of their inherent passivity. The Brazilian mathematician Luiz de Barros Freire, for

instance, who lived relatively isolated in the city of Recife, managed to not only actively interact with French scientists, but to train a generation of researchers who ended up in central regions of Brazil, such as Sao Paulo and Rio de Janeiro (ALBUQUERQUE and HAMBURGUER, 1996).

Chambers and Gillespie also highlight the fact that models of interaction often do not give the deserved attention to the diversity of ‘vectors of communication, exchange and control’ (CHAMBERS and GILLESPIE, 2000). As pointed out by Antonio Botelho, the assumption that control within scientific communities can be explained through centre/periphery models is particularly problematic in Polanco’s case, because in Botelho’s estimation the existence of a hierarchical structure falls short of explaining an erratic adherence of peripheral scientists to foreign communities (BOTELHO, 1993). A practical example of Botelho’s point is the case of the Colombian naturalist Antonio Zea. The historian Luiz Arboleda has demonstrated that Zea’s interest in the natural sciences practiced in Spain during the colonial period was driven by an intense search of local elites for ‘legitimacy, superiority and prestige’(ARBODELA, 2000). To become a member of the local elites it was necessary more than ‘wealth and ostentation’ and knowledge of the natural world was the element local elites resorted to as a mark of distinction (ARBODELA, 2000). An even more incisive criticism against traditional models of interaction and control is elaborated by Sagasti (SAGASTI, 1974). Using Argentina as a reference, Sagasti challenged the idea that Latin American countries might reach what early models called “independent” stages of scientific development. Rather, to Sagasti the final stage of centre/periphery models of interaction should be characterised by ‘marginalisation of research efforts’, ‘substitution of imports’, and ‘dependent economies vulnerable to wider patterns of international trade’ (MAcLEOD, 1982: 5).

According to Chambers and Gillespie, early models also did not leave much room to grapple with social infrastructures that accommodated different knowledge systems (CHAMBERS and GILLESPIE, 2000). Marcos Cueto, for example, analysed this issue in the context of Latin America and identified a general dissatisfaction of historians with traditional model’s lack of focus on the diversity of local responses to Western science (CUETO, 1997). Cueto, therefore, developed five areas that could be further explored by historians to capture this diversity – concentration, utilitarianism, nationalism, technology and networks – and demonstrated how these elements effectively provided a framework to explore, for example, the role of entities like the Rockefeller Foundation in Latin America.

Latest Developments

If the appeal of theoretical models discussed above has stood the test of time, their popularity, in many ways, is simply proportional to the problems they offer. A common way of dealing with this paradoxical situation is by formulating alternatives specifically dealing with the shortcomings of traditional models. Roy MacLeod's concept of moving-metropolis, in particular, has been interpreted as not possessing a predictive character, but instead only heuristically providing guidelines that focus on what should be avoided. Based on several problems he identified in previous models, including Basalla's, MacLeod's model has received more attention by historians of Latin American science than other alternatives (KROPF and HOCHMAN, 2011: 397). If history serves as any guide, however, as a model becomes more widely adopted, it is inevitable that it will become problematised. It is already possible to point out, for instance, that in order to avoid the formulation of a unifying theory of any sort, and in order to remain non-prescriptive and non-predictive, MacLeod's model allows for great heterogeneity. As long as case-studies based on his model avoid problematic areas, any approach is permitted. The end result is a plethora of local studies focusing on different and particular aspects, which, when combined, form a group of disconnected and heterogeneous works that are related to each other only through their mutual theoretical commitment. As heterogeneity has increasingly become considered one of the main challenges to the historiography of science, it would not be far-fetched to consider that MacLeod's model might end up having the same fate of its predecessors (SECORD, 2004). More specifically, MacLeod's model is clear on how to avoid triumphalist descriptions of central figures, but less so on how to escape the trap of replacing them with tales of heroic efforts of peripheral figures. Previous models were usually portrayed as focusing excessively on figures and ideas from centres rather than on peripheries. However, by shifting the focus away from central individuals and institutions to peripheral ones, there is no indication of where the limit of this 'shift' is to be found. A symmetrical picture of centres and peripheral interactions is still more often the result of well-crafted narratives than the demands of theoretical models.

Historians have identified that trying to simply insert ad hoc elements to address problems such as lack of symmetry and heterogeneity in MacLeod's model might be a fruitless enterprise. David Wade Chambers and Richard Gillespie, therefore,

call for a ‘new framework for comparing histories of local science’ away from the usual centre/periphery models. But they also concede that such an ideal model would demand consideration of a disproportional amount of particular cases that would render the task hopeless (CHAMBERS and GILLESPIE, 2000). Similarly, Corsi argues that although models are portrayed as important tools for guiding empirical work and providing a broad canvas upon which case-studies can be compared, they are rarely used heuristically (CORSI, 2011). For this reason, my objective in this chapter is to draw attention to the fact that certain narrative categories have intrinsic analytical features, and can be used methodologically, not only to deliver symmetrical centre/periphery overviews, but also to address the main problems identified in previous models. In addition, I believe that a more critical appraisal of the potential of different narrative categories might serve as a useful heuristic device to replace the permanently tentative nature of theoretical models. In order to show the analytical and methodological potential I am referring to, I will use the narrative category of irony to analyse its applicability to studies on centre and periphery interactions, based on the aforementioned suggestions put forward by David Wade Chambers and Richard Gillespie (CHAMBERS and GILLESPIE, 2000).

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In relation to narrative devices, Lawrence Stone draws attention to the fact that different narrative categories have distinct themes and arguments that provide space for specific analytic demands (STONE, 1979). Among the most traditional of these categories, irony has a specific theme and argument that has, perhaps unknowingly, already been adopted by historians working on interactions between centres and peripheries. Similar to satire, irony sets out to ‘thwart normal expectations about the kinds of resolutions provided by stories’ (GOLINSKI, 2005: 194; WILLIAM, 1995). In particular, ironical narratives have proved effective in subverting and deconstructing traditional assumptions (JACOBS and SMITH, 1997). As a result, in the field of centre/periphery studies, works presenting evidence contrary to expectations generated by early models of unilateral diffusion – the most common approach of the Latin American historiography presented above – can be described as already deploying essentially ironical emplotments.

Clark has made a similar point arguing that an intrinsic characteristic of irony is the disintegration of traditional plots (WILLIAM, 1995). In the context of centre/periphery studies, traditional plots can be interpreted as those provided by models such as Polanco’s or Basalla’s. Steve Turner calls attention to the misconception that such traditional models do not provide ‘story-context’ and possess no ‘explanatory

function' (TURNER, 2001: 500). Theoretical models determine a specific sort of emplotment, which may give little flexibility to the narrator. In this sense, it is an ironical emplotment that allows destabilisation, deconstruction and subversion of traditional stories produced by traditional models. This is another feature that fits with Chambers and Gillespie's argument in favour of 'nonlinear, nonstaged and nonprescriptive' frameworks to analyse centre/periphery interactions. In practice, this is deployed in ironical narratives by openly acknowledging deficiencies, conflicts, shortcomings and inconsistencies in the background in which interaction takes place. As Golinski argues, irony is especially appropriate to 'recapture the openness and uncertainties of scientific practice' (GOLINSKI, 2005). For instance, if the study of institutional exchanges, circulation of ideas, or people, between central and peripheral regions is the primary goal of the narrator, analyses may focus not only on successes, but also on failures. If interaction occurs at the level of disciplines, it may be necessary to welcome inconsistencies and to acknowledge the patrolling of disciplinary boundaries (GIERYN, 1999: 233-335). The attention to failures and inconsistencies requires a specific emplotment that allows and welcomes the depiction of uncertainty and ruptures. In some Latin American countries, such as Brazil, this feature of ironical emplotments is particularly useful, given that common analytical categories that support the so-called 'history of winners' has little use in the study of institutional trajectories and research programmes that are often dysfunctional and discontinuous (ARDIGO, 2011; KROPF and HOCHMAN, 2011).

In addition, ironical narratives welcome a 'reflexive consciousness' that is often not allowed in other narrative categories (JACOBS and SMITH, 1997: 70). For instance, according to Clark William, whereas some early narratives in the history of science portrayed 'sacralised' practices for the study of nature, ironical emplotments are characterized by the focus on "profane" engagements with knowledge production (WILLIAM, 1995: 47). This characteristic can be applied to Chambers' suggestion of focusing on infrastructures that accommodate different knowledge systems. Recent centre/periphery scholarship already tends to focus on the profane when it attempts to desacralise central forms of knowledge and highlight localised research programmes in the peripheries (CUETO, 1997). More importantly, the focus on the profane is the element that yields symmetry to narratives as the systematic analysis of individuals, publications, institutions and ideas that does not constitute mainstream scientific activity, must take place both in the centre and in the periphery. The result is a perspective that symmetrically

portrays virtues and vices in the two extremes of scientific exchanges.

The profane can also be interpreted in the analysis between motivations and discourses, commonly present in ironical narratives. This particular feature may be related to Chambers and Gillespie's suggestion of a systematic investigation of 'vectors of communication, exchange and control' (CHAMBERS and GILLESPIE, 2000). For instance, although some scholars disagree with this definition, to many authors, irony is to say one thing while meaning the opposite (CURRIE, 2010: 4). Jacques Derrida, for example, is often described as an ironic philosopher, because analyses his sources not for what they 'intended to say manifestly', but the meanings that lay 'behind' the text (COLEBROOK, 2004: 92). Graeme Gooday uses irony when exploring the limits of scientists' interpretative schemes and describes their own awareness of their shortcomings (GOODAY, 2004). Finally, Clark William identifies ironical alongside satirical elements in Sandra Harding's portrayal of the motivations behind the constitution of a new scientific discipline, primatology (WILLIAM, 1995). These examples constitute evidence that the recurrent contrast between discourses and motivations is a common feature of ironical emplotments that could serve to usefully analyse the 'vectors of communication, exchange and control' pointed out by Chambers and Gillespie (CHAMBERS and GILLESPIE, 2000).

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A Case Study

The analysis of a case study will help identify the extent to which well-crafted ironical narratives are suited for uncovering the interaction of centre and peripheries, while still meeting the theoretical requirements of academic texts. The example investigated in this chapter is on nineteenth century Italian geology, *Fossils and Reputations*, because, in many ways, it resembles the reality found in several Latin American countries (CORSI, 2008). Pietro Corsi unveils in rich detail the interaction between central and peripheral regions within European geology, revealing a reality that is commonly found in several contexts of Latin American science. The scarcity of books, collections and journals, for instance, was a problem for Italians as much as it was for Brazilians. In the 1940s entomologists in the south of Brazil struggled to get access to articles and had to carefully plan their alliances in order to make up for their lack of resources (ARDIGO, 2011). The fact that Italians 'turned necessity into virtue' by, for example, insisting that research was conducted outdoors – while sources reveal they could not afford

doing otherwise – is similar to what Peruvian scientists carried out by promoting high altitude experiments from necessity, while their American counterparts used low pressure chambers (CUETO, 1997).

In addition, Corsi explored the history of Italian geology because the European institutional landscape has been to a great extent mapped out. This context is similar to the one found in Latin America, given that the institutional landscape of scientific centres and research programmes, say, in Buenos Aires, Sao Paulo, and Mexico City have traditionally received much attention from historians of science, whereas the same cannot be said about peripheral regions in Argentina, Brazil and Mexico. In the case of Brazil, scholarship has only recently begun to investigate the scantily known periphery of the country's science; and these uncharted waters in many ways demand narrative strategies that resemble the scholarship carried out on research programmes in the European periphery (SCHWEICKARDT, 2011; HODARA, 2003).

More importantly, Corsi deals with many of the critical issues highlighted by Chambers without conforming to a specific model. Through the study of correspondence exchanged between Giuseppe Meneghini, located in Pisa, and Igino Cocchi first in Paris, and then in London, Corsi's case study is essentially a study of centre/periphery interaction. In terms of narrative choices, Corsi deployed many elements that resemble to the ironical emplotments described above, whereas the analytical strength of his work can be found in the constitutive elements of the narrative approach analysed further below.

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Methodological Narrative

The first element that stands out in Corsi's narrative discussed above is its use of comparative perspective. Although Corsi does not justify this methodology, his work is clearly comparative. Such comparative perspectives are increasingly described as important methodological devices in the historiography of science (LIVINGSTONE, 1995). Jordanova quite correctly points out that, until very recent, the historiography of science did not possess a broad range of comparative models beyond the sociologically oriented (JORDANOVA, 1993: 470). Nevertheless, Lewis Pyenson has demonstrated that 'comparative studies have been among the most innovative and the most durable of scholarly undertakings' in the historiography of science by compiling a long list of works that are essentially comparative even if not admittedly so (PYENSON, 2002). In the case of Fossils

and Reputations, by tracking down the communication between two individuals, one at the periphery, one at the centre, Corsi compared several elements that distinguished scientific practices in both regions. Although disciplinary boundaries were fluid, they remained stable enough to compare localised uses of concepts, descriptions, and geological periods (CORSI, 2008: 10-28).

Analytical Cohesion

Corsi's narrative approach addressed many of the problems and shortcomings of traditional centre/periphery models highlighted by Chambers and Gillespie 2000. Therefore, it is possible to investigate the structure of the narrative about Italian geologists from the perspective of how analytical frameworks, based on problems with traditional models, fit into ironical emplotments. Chambers and Gillespie argued, for example, that the analysis of centre/periphery interactions should allow the 'examination of both local and global contingencies of knowledge production' (CHAMBERS and GILLESPIE, 2000: 227). Corsi accomplished this whilst simultaneously presenting the developments on geology in Italy in comparison with Germany, England and France, where the main institutions, publications and specialists in geology were located or circulated. At the same time, he focused on the local practices in Italy, which consisted of the study of a diverse 'population of naturalists' (CORSI, 2008: 8). Although Corsi used categories such as academic and amateur, he made it clear that such terms were not adequate to capture the subtle constitutions of all the groups related to the production of geological knowledge. Throughout the narrative, the profane, the hallmark of the ironical narrative, is depicted by focusing on the diverse motivations of a population formed by 'producers, buyers and sellers of natural knowledge', which included, but was not limited to, wealthy amateurs, doctors, pharmacists, chemists, botanists, physicists, part-time merchants of natural history specimens, parish priests, quarry workmen, artillery officers, land owners, and mining engineers among others. A review of Corsi's work has correctly noted that he managed to put together short biographies of no less than 220 characters providing evidence of no a priori category of exclusion (CIANCIO, 2010). As a result, the local contingencies and the profane motivations of this diverse population are captured by a historiographical approach that allows and invites the consideration of diverse social figures from different 'intellectual, institutional and social worlds' (CORSI, 2008). Pulled together, such an approach accomplishes the task of uncovering

the production of scientific knowledge in the periphery that eventually had to be legitimised in the centre

A further necessity that Chambers and Gillespie declared vital is a framework that is at the same time ‘nonlinear, non-staged and non-prescriptive’, but capable of having some parameters that allow ‘systematic comparison of the different independent local histories of knowledge’ (CHAMBERS and GILLESPIE, 2000: 227). This is essentially what has already been described above as plot disintegration, an intrinsic feature of ironical narratives. Corsi achieves this aim by exploring the fluid borders of the geological discipline. Geology is portrayed in Europe as a battlefield where characters fight for their reputations in a constantly volatile environment. The narrative about Italian geologists reveals that the demarcation of the discipline was a subject of intense dispute and that the label ‘community’ when applied to these individuals, in fact, hid ferocious competition (CORSI, 2008: 8-24). In addition, it is in the bulk of the discipline that Corsi reveals contentions, interactions, and exchanges that shed light on the contingent factors affecting the accumulation of knowledge in the periphery. For example, in Italy, Meneghini was aware that Parisian experts had not observed some fossils that were familiar to him, but they were still deemed experts on those fossils for being located at the “centre”.

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As noted above, Chambers and Gillespie insisted on the necessity of paying attention to ‘vectors of communication, exchange and control’ (CHAMBERS and GILLESPIE, 2000: 227). Ironical emplotments allow this attention through the analysis of contradictions between discourses and motivations. In the case of Italian geology, Corsi undertook this analysis by focusing on the extent to which reputations among peers was a driving force behind communication channels, exchange practices and power relations between centres and peripheries. For example, Meneghini in Italy, offered fossil samples to Charles Lyell in England, who was an anti-directionalist; and also sent samples to Constant Prévost in France, who was a directionalist. The Italian geologist was aware that he was providing evidence to researchers who held completely different theoretical positions; however, his motivation to interact with prominent researchers was to gain access to central institutions that could legitimise his own work. The opportunistic character of this alliance sheds light on the nature of exchanges in which personal benefits were as important as theoretical positions. Eventually, Lyell altered his *Elements of Geology* based on the observations that Meneghini had made in Italy. To the Italian, this was a great achievement given the resulting publicity of his

own work. Attempts were made to translate Lyell's works into Italy by Meneghini after he found a publishing space in London. Not surprisingly, soon after British public support for his work, the Italian geologist withdrew his support to Constant Prévost in Paris. In other words, the scientist at the periphery had to carefully craft his alliances because his access to centres, where he could legitimise his work, was extremely difficult.

Moreover, the focus on discourses and their underlying motivations has revealed peculiar elements of power structures within the discipline of geology. For instance, holding a prominent position in a central institution did not necessarily equate to having a distinguished reputation among the scientific community. The case of the Parisian geologist, Alcide d'Orbigny, who occupied a central position but was plagued by a dubious reputation, is illustrative in this case. Although d'Orbigny was essentially forced to occupy a Chair of Palaeontology especially created for him at the Natural History Museum in Paris, he faced, nonetheless, fierce opposition from his peers (CORSI, 2008). This, of course, affected not only the personal career of d'Orbigny, but also contributed negatively to the field he wished to promote. This example suggests that the focus on motivations reveals localised cultural and local rules present in central regions; the same must then also be investigated in the periphery. For instance, Meneghini, in Italy, abhorred the idea of publishing his biography in the Bulletin of the French Geological Society because it might be considered an explicit search for publicity, which would be unacceptable for a person of his status. But this was common practice within the Parisian scientific community and, as result, affected the image of the peripheral scientist without any specific relationship to his cognitive skills.

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It could always be otherwise

Without a doubt some criticisms of the use of ironical emplotments in centre/periphery studies can be anticipated. First of all, the treatment of narrative categorisation provided in this chapter might be interpreted as an attempt to transform historical studies into simple literary analysis. This could not be further from the goal of this essay, which has drawn attention to the importance of ironical emplotments and their usefulness in providing practical and straightforward guidelines for historians and social scientists to explore primary sources and organise their narratives. While debates about the philosophical merits of such an approach have been exhaustively carried out (as indicated in the bibliography of

this chapter) the argument put forward here is much simpler. Ironic emplotments are traditionally used to ‘disrupt established, intolerant narratives of power’, and thus can assist those trying to avoid or to discuss previously traditional models (JACOBS and SMITH, 1997). This may be accomplished without necessarily entering into the debate about what ironical narratives might offer in terms of causality. In fact, according to Gregory Currie, ironic emplotments ‘target the defects in points of view, generally without any assertion of a contrary stance’, as ironical narratives have a general tendency of avoiding ‘manifest commitment to theories or principles’ (CURRIE, 2010). The use of comparative methodology is particularly pertinent in this case. Peter Baldwin argues that comparative history has become increasingly concerned with complexity rather than with causality, especially through the lens of cultural history; whereas Stone suggests that the central focus of historiographical narrative is on individuals not circumstances, and that their will is as important as impersonal forces (STONE, 1979; BALDWIN, 2004).

A second line of criticism that can be anticipated is regarding inflexibility in narrative emplotments used in history of science (LAW, 1991). Although this may apply for some categories, it is hard to see how this can fit into ironical emplotments. As shown above, ironical narratives are usually the result of attempts to address shortcomings in accepted views. In Corsi’s case study, for example, the existence of a methodological scepticism underlying the whole narrative is clear from the start. By analysing the Parisian scene from the perspective of an outsider, Corsi put into question established knowledge about the French geology scene. For instance, identifying where the centre and periphery are located is made by historical actors, not the historian. This is a distinctive feature between the formulaic nature of models, that establish aprioristic categories for identification of centres and peripheries, and the narrative Corsi puts forth. Geologists knew where the centre of their discipline was. Their criterion included the concentration of libraries, collections and societies. In addition, it was in the centre where researchers had to validate the data and research carried out by individuals back in Italy, who, nevertheless, were fully aware of the quality of their work (CORSI, 2008: 10-32). Although most of these elements coincide with traditional model’s predictions, bringing the historical actor to the foreground first and foremost reveals a theoretical stance that the narrative could have had a completely different formulation if a different character or group was the focus of attention. The historical actor in this sense becomes the most reliable source to indicate the evolution of his or her own field

and, more importantly, to identify shifts in the axis of power of scientific centres. This interpretive flexibility is similar to the ‘uncertainty trough’ put forward by Donald MacKenzie (PINCH, 1996). According to MacKenzie, the closer one gets to scientific research, the greater the uncertainty about the experimental data it yields becomes. In narrative terms this translates into the existence of different perspectives that vary according to the individuals investigated, and which implies a sceptical stance towards any of the actors’ interpretations. Stone called this variability in narrative resolution as the ‘principle of indeterminacy’, which, in face of the evidence presented so far, could be perfectly expected in ironical emplotments (RESTIVO, 2005: 391). In addition, scepticism can also be assumed from Corsi’s use of sources. The amassing of letters that constituted the bulk of his book demanded years of research and almost a decade to transcribe the letters. It is noteworthy that this was correspondence between two marginal figures, from a peripheral part of a small scientific community. The choices guiding Corsi’s empirical practice therefore reveal a methodological scepticism in which nothing can be aprioristically excluded.

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I opened up this paper answering the invitation for the dialogue between history of science and STS, and I would like to close it pointing out areas where this might actually take place based on the possibilities highlighted above. The role of motivations explored in this chapter resembles the ‘interests approach’ put forward by STS scholars in the early 1980s (WEBSTER, 1991: 16). Further studies may define more specifically the ways in which narratives written from historical and sociological perspectives have incorporated motivations and interests into narratives, and how they could learn from each other. The question of symmetry is another area that might be extremely useful to narratives of centre/periphery interactions. A concept that has been important in STS could be also useful to imagine more symmetrical narratives of interactions, and historians might benefit immensely from the familiarity of STS scholars with this concept (SISMONDO, 2010). This chapter has also suggested that this dialogue is possible in the form of narrative categorisation as ironical emplotments are suited to incorporate methodological and analytical requirements that amend problems identified in previous centre/periphery models. The several elements of ironical narratives in Corsi’s work indicates that this category enables historians and social scientists to deal with the main limitations of centre/periphery models by placing individual agency at centre stage and, at the same time, displaying an admittedly tentative nature. In this sense, ironically, the category of irony has always been there, we

just need to rediscover its potential.

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