



Narrative and causality

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Abstract

When discussing narrative in historical sciences, particular emphasis is often placed on causality. During the course of a story, events are linked in such a way that cause-and-effect relationships emerge, helping to explain the occurrence of past phenomena. Yet, the way in which these relationships are conceived may vary depending on the context and in relation to different formal features of the narrative. Sometimes it is enough for the narrative explanation to establish an analogy with a regularity for the phenomenon considered in the explanandum to be characterised in terms of sufficiency and necessity. Alternatively, we find more complex cases where narratives adopt a diffuse inferential form due to the number of causal terms involved. These cases will be studied as forms of contributory causation, which can be incorporated into the narrative in two ways: either as an account of the repercussion of an antecedent insufficient to produce the explanandum, but relevant to produce some of its properties; or as a set of causes that each alone is insufficient, but together become sufficient in explanatory terms. Moreover, there will be narratives in which the relationship between events is described as remote causes, which define an attribute of historicity specific to some narratives. Following their characterisation, a discussion on the explanatory relevance of remote causes will be raised on which a pragmatic approach will be adopted.

Keywords Causal narratives · Narrative explanation · Causality in history · Contributory causes · Remote causes

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1 Introduction: The causal structure of narratives

A central purpose of narratives is to elucidate how particular events are related. Causality is usually emphasized as one of the defining elements of narrative explanations. For example, in Currie (2018, 327) we find the following definition: ‘Narrative explanations account for some particular event using narrative form: They situate the explananda in terms of some particular causal history.’ Moreover, narrative form is closely linked to the type of causal relations addressed by the story, both in cases where causes and effects follow a certain linearity according to an underlying regularity (e.g. Paskins, 2022), and in more intricate stories where causes are defined after a retrospective analysis of the historical antecedents (Roth & Beatty, 2025).

The idea of narrative as a linear causal chain, where each event is explained by its predecessors in the same way that the product of a chemical reaction finds its explanans in all the previous steps leading to its synthesis, despite being important in certain fields, may be excessively rooted in experimental science and does not capture the degree of complexity observed in historical narratives. In causal sequences such as those seen in a chemical reaction, or those that capture explanatory mechanisms (Glennan, 2010), it is often sufficient to show by means of a regularity that A is the cause of B, B the cause of C, and so on. Hence, the narrative can be formalized as an inference (whether deductive or ampliative) and it can be replaced by other scientific explanations (mechanisms, D-N models...) that follow the same logical structure (Klauck, 2016).

Other conceptions account for the role of narratives in explaining contingent events (Beatty, 2016, 2017). In these cases, narrative explanations clarify how an event is related to its antecedents, even when there is no necessary connection between them, leading to a scenario diametrically opposed to causal mechanisms, where the convergence of the same elements always produce the same results. Ereshefsky and Turner (2020) have pointed out that, while assessing contingent relations of historical events, it is not the metaphysical problem (i.e., indeterminism) that is relevant, rather it is an epistemic issue: Whether an event is (ontologically) contingent upon its antecedents matters less than the uncertainty surrounding this relationship to define the causal structure. In their conception, the problem of causal narratives is focused on the lack of knowledge regarding the actual relations between historical events.

Narratives have also been defended as irreplaceable forms of explanation according to Roth’s (2017, 2020) concept of essentially narrative explanations. In contrast to the linear narratives, which can be formalized in a simple scheme, Roth’s narratives are logically formless since the ‘morass of details’ (2017, 47) and relations that they present cannot be structured in a straightforward inference. In this sense, essentially narrative explanations appear to be similar in their lack of logical form to Currie’s (2014) complex explanations, but they may not be totally equivalent in all circumstances: indeed, Currie defines the complexity on the basis of the plurality of causal terms interacting (as if they were too many to handle), but he says nothing about whether his narratives only *seem* irreducible to straightforward causal inferences from a researcher’s perspective. So in practice we can expect to find narratives built on epistemic grounds that are different in certain aspects to retrospective narratives.

Although Roth's (2017) first definition related retrospection to contingency, both in human history through Danto's (1962) narrative sentences and in natural history following Beatty and Carrera's (2011) discussion of Gould's (1990) thought experiment, in a recent publication, Roth and Beatty (2025, 468) have presented a 'fundamentally epistemic' notions of causes and narratives without metaphysical assumptions. These authors identify cases where the definition of a historical event as the cause of another is defined retrospectively, both in human history and historical biology. This means that event A cannot be defined as a cause of a future event B until the second one has taken place, usually because B *cannot be predicted* at the time of A.

Historical unpredictability has been considered in absolute terms (Roth, 2017, 2020), meaning that it can neither be achieved by an Ideal Chronicler with a complete description of the world at time A (Danto, 1962). In this sense, it is possible that their conception is not free from ontological assumptions: In human history is easy to accept that future events are unpredictable (at least for someone who does not uphold historical fatalism or some old-fashioned form of historicism), but in natural history it appears questionable whether we should invoke the Ideal Chronicler or rather the prediction-allowing Laplacian Demon. At least, we could ask ourselves: Why invoke one over the other? — And then get lost forever in the metaphysical discussion.

Despite this intuition, I do think that natural history is compatible with Roth and Beatty's notion of retrospective causality. Now, accounting for this compatibility can be achieved in two ways: The first one would be justifying the very notion of retrospection in the historical sciences by analysing unpredictability in these disciplines. This, I believe, leads to a more complicated discussion than the mere consideration of an Ideal Chronicler, a discussion that, taken to the field of epistemology, would consist in determining the absolute cognitive limits of research, like the ones posed by Turner (2005). In the end, we would have a justification for retrospective causality based on (absolute) unpredictability, following along the lines projected by Roth and Beatty.

This, although it could be interesting for future studies, is not what I intend here. Instead I will follow a second, more pragmatic option: to understand retrospective narratives as representatives of a form of remote causality in Sect. 4 (van Bouwel & Weber, 2002), whose consideration may or may not lie in metaphysical assumptions about indeterminism, but which, in any case, are relevant to explain issues of the object of study that cannot be understood using classical scientific approaches to causal explanation (Sect. 4.1).

This also allows us to distinguish Currie's complex narratives and the retrospective narratives. As I said, in both we can identify the same structure of contributory causality (sometimes similarly to Mackie's, 1974 INUS conditions; Carroll, 2001) reflected in the lack of logical form, as it will be defined in Sect. 3. While in Currie this complexity is eminently epistemic, the retrospective narratives, in contrast, appear as elaborated answers to questions regarding distant causal relations.

My approach will be pluralistic with respect to the narrative form: while admitting that there is a 'purely historical' narrative causal structure, it is impossible to deny the importance of other types of narratives, especially in the field of historical sciences, where mechanisms often appear in relation to narrative. I will therefore give special

relevance to the epistemic dimension in justifying when and how one or another causal structure emerges in the narrative. That is why I will begin by analysing causality in the most elemental regularity-grounded narratives in terms of necessity and sufficiency (Sect. 2), in order to contrast them with more complex and representative cases of the historical narrative. This pluralism will also allow us to consider the coexistence of different types of causal narratives to reconstruct the same historical phenomenon in later examples.

2 Regularities and necessary consequences

The existence of regularities in history (Jeffares, 2008) facilitates the clarification of many causal relations, without undermining the idiographic nature of historical research, that is, its tendency to describe the particular (Huss, 2022). In history, regularities can be identified that are captured by abstract processes or ‘event types’ (Graßhoff & May, 2001, pp. 85–86; Kranke, 2022). Sometimes, these processes are underpinned by more elementary physicochemical laws or mechanistic explanations (Glennan, 2010).

Graßhoff and May (*ibid.*, p. 86) state that ‘a regularity is a relation between event types’, which are abstractions of observable phenomena. This relationship forms the basis for regularity theories of causation, which argue that a singular event A is the cause of another singular event B, provided that this relationship can be subsumed under a regularity between event types that are representative of the particular case (*ibid.*). This conception, which dates back to Hume, has received particular attention in the philosophy of science over the past few decades (e.g., Baumgartner, 2006, 2013; Psillos, 2009) and is especially suitable to define causality in the field of experimental sciences, as these disciplines often work with abstractions of processes and frequently refer to general laws or principles. And this sufficiency strengthens the causal explanation.

Sometimes, in historical research, particular events will be reducible to more fundamental postulates underpinned by a regularity, as narratives frequently employ generalities to explain a specific event from the past. When applying a generality to a particular case, we are assuming that the subject of study behaves according to a given model, such that the combination of certain elements always leads to the same result, *caeteris paribus*. Therefore, the causal chain adopts the form of a succession of events in which each one is sufficient to produce the next.

This form of narrative is sustained by prior knowledge about type processes, which often comes, as Kranke (2022, 13) points out, from laboratory experimentation, although it can also derive from the direct observation of natural events in the present (like in Lyell’s actualist conception of geological history). In both cases, a causal relationship between abstract entities is typified (*ibid.*, 16) and then applied through analogical reasoning to the case of study for the purpose of explanation.

Knowledge about regularities will therefore condition the possibility of presenting this type of causal explanations in the narrative. If we consider that the variables relevant to the explanation that are at work in our object of study can be identified with those defined by the regularity, then the explanatory form of the narrative is provided

by this analogy. In cases where knowledge about how variables operate is limited—cases where, in general, there is no mechanism available to explain the passage from one event to another, or causes where we do not know if the variables that define the systems actually operate as stated by the regularity—the logical form of the narrative cannot be formalized following this linear scheme.

More simply, these narratives are *closed* in terms of causal sufficiency between explanans and explanandum: we do not need to invoke any causes other than the ones defined by the regularity to satisfy a criterion of sufficiency. In general, this is a hallmark of classical scientific explanations, which satisfies a methodological ideal in natural science. Yet it also undermines the historical character of the narrative explanation, which, as Kranke (2022) points out, focuses on the particular.

Mechanisms and laws *truncate* the past in their explanations. This idea, originally presented by Suppes (1986) in the field of the social sciences, can be recovered here to show how classical models of explanation limit their focus to the most proximate causes, those that operate to produce the phenomenon defined in the explanandum, while disregarding what may be causally relevant in the historical antecedents. These are cases where the relevant state-defining properties of a physical system can be explained by basic causal relationships, such as those we have seen, encompassed by a regularity.

When we deal with abstract entities, the sufficiency of the causes is maintained even when the past is truncated; or rather, *because* the past is truncated in such a way that the explanation discards all terms that are not part of the regularity, for they are considered irrelevant to the particular case at hand.

But when are the elements not covered by regularity considered *irrelevant*? — In part, the answer to this is not made concrete if not in practice: this relevance will depend on the questions that the research seeks to answer, something of particular interest in cases of remote causation, as I will discuss in Sect. 4.1.

Sometimes, however, a mechanism will be a sufficient explanation, as in the example of Currie (2014) on glaciations, where the narrative is replaceable by a general mechanistic model without losing explanatory content. Here, the causal explanation deals with variables like albedo, temperature, landmass clustering, etc.; all of them define an abstract process that would result in a global glaciation. These causes are presented isolated from a historical background for the purpose of explanation; and this is justified insofar as they are proved representative of the case study. Moreover, under normal conditions these causes would necessarily lead to the outcome in all similar cases and always as far as an analogy can be established between them. Yet, history has little respect for *normal* conditions. When we speak of historical explanations we are usually referring to one that is dependent on historical antecedents, where some causes are proved insufficient in the causal story.

3 Causality in idiographic narratives

Although narrative frequently includes references to regularities, it is characteristic of history (both human and natural) to present particular relationships of events which cannot be subsumed under laws, mechanisms, or other classical explanatory mod-

els. In this way, specific causal relationships are established between irreproducible events, which can be encompassed by the notion of ‘actual causality’. This includes causal relationships between particular events and, generally, has a retrospective character (Halpern, 2016, p. 2), which has also been noted in historical explanations (Roth & Beatty, 2025).

In contrast to processes subsumed under regularities, the relationships between particular events can be studied using counterfactual reasoning, which Beatty (2016, 2017) has already explored in historical sciences.

The definition of counterfactual causality by Halpern and Pearl (2005a, b) establishes that A is a cause of B if we consider that, had A not occurred, B could not have happened either. Like the regularity theories of causation, this notion has its roots in Hume (Halpern, 2016, p. 2). The central idea of this conception of causality, which is also identifiable in historical narratives, is that, to consider there to be a causal relationship between two events, there must be a dependence between them, such that A is necessary for B to occur.

Now, according to Beatty (2017), counterfactual reasoning is also used to show that an event is contingent upon its antecedents and, therefore, that it did not necessarily have to occur even if the first event took place. Essentially, Beatty’s counterfactual explanations aim to show that B does not necessarily have to happen just because A happens; conversely, it says nothing about the existence of a dependence of B on A, which is the central idea of the Halpern-Pearl definition.

Beatty’s approach is not exclusive of the classical definition of counterfactual causality, and the apparent divergence is based on an asymmetry in the notion of necessity. Thus, an event A may be necessary for B to occur, but it is not necessary that B follows A. In other words, it could be the case that whenever B occurs, the antecedent necessarily is A; but tracking these causes backwards as in Beatty’s analysis, we see that, even in these cases, the first event A can occur without B ever having occurred.

Beatty’s counterfactuals reveal an independence of the consequences from the causes in terms of necessity. This can be interpreted as an ontological issue related to indeterminism, but in our case we adopt an epistemic approach, i.e., I am concerned with indeterminacy regarding the relation between the two events. In the following, I will present a conception of the narrative where the causal explanation is analysed in terms of influence, instead of causal determination (Sect. 3.1). A more systematic development of this idea will characterize idiographic narratives by means of contributory causality (Sect. 3.2), which can give insight into the causal properties of narratives that are usually considered inferentially formless, either for epistemic or formal reasons.

3.1 Historical influence

We can say that historians and historical scientists often lack data to establish why events unfold the way they do, and narrative then comes into play as a tool for clarifying the relationship between each event and its antecedents. However, in this case, this does not occur in the same way as we saw earlier, where the historical process is subsumed under a regularity. Whether due to contingency (metaphysical) or indeterminacy (epistemic), a relationship cannot be established such that the first event

always leads to the second. Narrative, then, delves into the influence one event has over another, but assuming an inferential gap between them.

This approach is especially evident in human history, where social, volitional, or intentional factors accentuate indeterminacy. Roth (2017, p. 46), using a historical text by Raul Hilberg, presents an example in which the 1933 law in Nazi Germany that prevented Jews from holding public office was a precursor to the Holocaust a decade later. Undoubtedly, there is a relationship between the two events, as the 1933 law normalised racial discrimination at both a social and institutional level, setting a precedent for genocide. The first event influences the second; moreover, this second event cannot be fully understood without the first. However, the 1933 law is not a sufficient cause for the genocide; the latter does not necessarily follow from the former.

Let us examine another example from the history of music before comparing it to cases from the historical sciences. In this text, Daniel Barenboim reflects on the influence of Wagner's opera *Tristan and Isolde* on the subsequent development of twelve-tone technique:

In *Tristan und Isolde*, Wagner stretched chromaticism to the point at which the tonality of the music became obscure, even cryptic. [...] Schoenberg continued in this vein in his early works such as *Transfigured Night* or *Pelléas and Mélisande*, before totally obliterating the existence of harmony, giving each note in the twelve-tone scale equal importance. (Barenboim, 2009, pp. 28–29)

And when he takes up that idea again later on:

The influence of these two composers [Liszt and Berlioz] on Richard Wagner is impossible to overestimate and we know that without Wagner, there would have been no Bruckner, Strauss, Mahler or Schoenberg. (Ibid., p. 62)

Considering these excerpts, the overcoming of the tonal system and the development of twelve-tone technique by Schoenberg can be explained when we consider the influence that Wagner's work had on the composer. Schoenberg had a deep understanding of Wagner's use of chromaticism and how it suspends tonal functions, something evident in his early works, as Barenboim points out. Without this knowledge, it is impossible to understand Schoenberg's later interest in abolishing the tonal system on which classical harmony is based and developing the twelve-tone system.

Wagner's work is a precursor to Schoenberg's, it influences it, and to a large extent, explains it. Now, is Wagner's work the cause of twelve-tone music, in the same way, for instance, that an increase in the acidity of water is the cause of an increase in the solubility of calcite? – We cannot claim that the development of twelve-tone music necessarily follows from Wagner's work, but neither can we deny that it was an important historical precursor. Through counterfactual explanations (such as those of Beatty), we can suggest that Wagner could have written *Tristan und Isolde* without the twelve-tone system ever having developed; and conversely, it is not far-fetched to think that twelve-tone technique could have developed even if Wagner had never composed a single measure, for example, had Schoenberg (or anyone else) taken

Liszt as a reference, as Liszt also explored the limits of the tonal system in some of his pieces¹ (Baker, 1990).

Despite the above, there is no doubt that one event had an impact on the other, and we need to appeal to their relationship to understand how historical events took place. The term *cause* may seem somewhat pompous in this case, and even incorrect, since, as we have seen, the conditions of necessity and sufficiency, which define causality in science, are not met. What we recognise is more of an influence or contribution of the first event on the second. These relationships are not usually encapsulated in regularities, and narratives become valuable tools for characterising them.

I consider that event A influences event B when A helps us understand some of the relevant aspects of B or how B came to occur, but not all of them. In this definition, it is assumed that data are missing to fully understand why B occurs, but A is proposed as an important contribution to the explanation. Following the previous example, although we accept that Wagner (A) had a significant influence on Schoenberg in developing the twelve-tone system (B), there are also relevant historical factors, unrelated to A, that would contribute to explaining B, such as the concern among early 20th-century musicians about the expressive limitations of classical harmony.

While experimental science tends to favour a regularity approach to causation (Halpern, 2016), historical sciences are interested in elucidating particular causes, which cannot be subsumed under regularities. Therefore, it is common to find narratives that study relationships between events in the way the previous example does, and even more complex ones, in which a series of antecedents is presented to understand why a particular event takes place. Consider the following text about the extinction of archaeocyaths during the Cambrian:

The Gondwana margins (North Africa, South Europe, Middle East, Himalaya, Australia, Antarctica, South America) are reached by inputs of terrigenous discharge, replacing the previous carbonate deposits [...]. Carbonate platforms were sinking; there was an increasing turbidity of waters. All these phenomena were linked with the major paleotectonic events of the opening Iapetus Ocean. [...]

In Siberia, Kazakstan and North China, the carbonates persist, but their characteristics of deeper water deposits (shaly nodular and clayed limestones) made them unsuitable for archaeocyath development. In some other places, like South China for example, the tensional events may have induced uplifts reactions; in this case, there was a persistence of shallow water carbonates, but a change in

¹ However, this latter issue must be approached with caution: Indeed, there are cases where we can say that B could have occurred for a reason other than A; however, being strictly idiographic, this second event B would have occurred differently than it did if its antecedent had been another event distinct from A. The twelve-tone system, as an abstract idea, can have any antecedent that justifies it; however, the twelve-tone system as it was historically developed by Schoenberg is inextricably linked to Wagner. It is only in this latter sense that Halpern-Pearl's definition of counterfactual causality is applicable, but not as an abstraction.

latitude, inducing a climatic modification, made also the conditions unbearable for development of archaeocyaths.

So, at the end of Lower Cambrian [...] a generalized distension phase is observed, linked with the gradual opening of the Iapetus Ocean, expressed by pulsating subsidence, disturbing all the previous global paleogeographic and environmental conditions.

Bathymetry, turbidity and salinity changed. As filter feeders and representatives of the marine benthos, the archaeocyaths were particularly sensitive to even slight modifications. (Debrenne, 1991, pp. 102–103)

This text outlines the repercussions of a tectonic event (the opening of the Iapetus Ocean) on the environments where archaeocyaths developed, thus providing an explanation for the decline and eventual extinction of these organisms. Archaeocyaths were filter-feeding organisms that thrived in shallow carbonate platform environments with low turbidity and specific temperature and salinity conditions. They were sessile organisms of small size but capable of forming reefs. When the Iapetus Ocean began to open, several changes occurred in their ecosystem, such as the migration of continents to cooler latitudes, an increased supply of terrigenous material resulting in greater turbidity, the sinking of the carbonate platforms they inhabited, and the rise in water salinity.

Each of these factors has an impact on the extinction—there are how-questions here that could form part of the narrative explanation and highlight its idiographic nature, but here we will focus on the whys. Turbid water, for example, negatively influences the ability of archaeocyaths to obtain food through filtration, which explains, in part, a decline in the populations of these organisms. The cause defines a trend towards extinction, although it may not, on its own, be determinant of extinction.

Once again, counterfactual explanations prove very valuable, as they allow us to distinguish these cases from others where causality is grounded in regularities that impose necessity in the relationship between events. Thus, it could be argued that, despite the ecological changes resulting from the opening of the Iapetus Ocean, the archaeocyaths could have adapted to the new conditions in such a way that they would not have gone extinct. This form of reasoning in history highlights the causal indeterminacy regarding the causes in the transition from event A to event B: if the opening of the Iapetus Ocean had inevitably determined the extinction of the archaeocyaths, there would be no room for alternative histories.

So, either we lack the data to fully understand all the causes that led to the extinction of the archaeocyaths, or this extinction, even though it was influenced by the tectonic event, is contingent upon it.

A first matter here is to choose between a metaphysical or an epistemic approach to causality. Already in the introduction I pointed out that there are authors who choose to emphasise contingency (Beatty & Carrera, 2011; Beatty, 2017; Roth, 2017), while others prefer an epistemic approach, free of ontological commitments (Ereshefsky &

Turner, 2020; Roth & Beatty, 2025). In this aspect, I too prefer to suspend judgement on metaphysical questions and adopt an epistemic stance.

However, this choice is independent of a second issue, which is more important for the topic at hand, and which could be formulated as follows: Is the causal structure of the story defined on the basis of the epistemic limits of the research, or is it a question dependent on the narrative form?

In Roth and Beatty's retrospective narratives a formalist approach is taken to identify the causes of an event in its historical antecedents. Causes defined in retrospect are a particular hallmark of historicity, but they do not encompass all the narratives we encounter in practice.² I consider that there are narratives that are constructed within a particular epistemic framework, but that are equally lacking a logical form like that of retrospective narratives (Roth, 2017). In other words, my approach is pluralistic with respect to the question I posed in the previous paragraph, as it is rooted in the observation of practice.

Thus, the use of complex narratives in Currie's (2014, 1175) conceptual framework is prompted by the fact that "the explanandum is itself diffuse and complex". That is, such narratives as causal explanations respond to an interaction between the researcher and the world, to the way in which we engage with the object of study. There is not necessarily a retrospection, just an explanandum to which we respond with detailed causal information. And yet, because of that complexity, there is also a lack of logical form, as the causal inferences appear blurred by the amount of details.

I will argue below that both epistemically grounded and retrospective narratives adopt a contributory causal structure, so that the concept of influence that I put forward in that section will take on a more systematic treatment. This will define the general formlessness of both types of narratives, before discussing in Sect. 4 a criterion for separating retrospective narratives from strictly epistemic ones.

3.2 Contributory causes

A contributory cause A_1 of an event B is one among several causes that only when they coincide result in B . Thus, A_1 alone is not enough for B to occur, but the set of causes $A = \{A_1, A_2, \dots, A_n\}$ is sufficient. In some cases, contributory causes can be related to Mackie's (1974) INUS conditions, that is, the insufficient but necessary parts of a condition that is unnecessary but sufficient to produce the effects. Riegelman (1979, p. 177) refers to contributory causes as 'unnecessary and insufficient', using case studies from medicine. In fact, the definition of a contributory cause only requires insufficiency, while a relationship of necessity may or may not occur, depending on the case.

An example where this necessity is identified is the formation of silcrete or secondary silica: For silica to dissolve and then re-precipitate (B), water (A_1) and a warm or mild temperature (A_2) are required. If we have water but the ambient temperature is cold, the solubility of silica is low and silcrete will not form; conversely, if we

² Moreover, there is the problem I pointed out in the introduction, that perhaps the concept of retrospection is not entirely free of ontological commitment, especially in the natural sciences. But this, as I say, is outside the scope of the discussion.

have a favourable temperature but a dry climate, silica has no medium in which to dissolve, and again, silcrete will not form. When considered individually, neither A_1 nor A_2 is sufficient for B to occur (only the set $A = \{A_1, A_2\}$ is sufficient), but we see that both conditions are necessary; a necessity which, on the other hand, stems from a chemical regularity.

A different case, where both insufficiency and non-necessity apply, is the example of the archaeocyaths we saw earlier: The turbidity of the water (A_1), changes in bathymetry (A_2), the increase in salinity (A_3), cooling (A_4), etc., are some of the conditions that converge to cause the extinction of archaeocyaths (B). Considered individually, none of these factors is sufficient or necessary to produce the effect they had. The condition of insufficiency is clear: all these causes must converge with one another and with other additional factors to produce the extinction.

The non-necessity of each of them is highlighted when we realise that any of these conditions could be removed, but extinction could still have occurred by the simple convergence of the rest ones or due to other factors we are not considering. Again, the counterfactual reasoning exposes the epistemic limitations with respect to causal links, while defining the causal properties of the narrative as contributions, rather than deterministic relations.

Contributory causality is the most frequently found in historical narratives of particular events, such as in Debrenne's example, the case raised about the history of music, or Roth's example regarding the Holocaust mentioned earlier. Contributory causes summarise the more general (and less systematic) idea of influence we discussed earlier. All the cases of actual causality studied under this notion share the following in common:

- a) Event B does not necessarily follow from A^3 , and A alone is not sufficient to produce B.
- b) However, A has some impact on the occurrence of B in one of its relevant aspects.
- c) The relationship between A and B cannot be reduced to a regularity; it is studied as a particular historical case.
- d) As A does not fully determine B, counterfactual explanations can mediate between them, either emphasising the contingency of B with respect to A or the indeterminacy of the set of causes that would determine B.

While contributory causes capture the type of influence relationship between A and B, their general definition overlooks the particular nature of this link in historical cases (point c). The first example of silcrete defines a regularity, an abstract process controlled by deterministic physical variables. In contrast, in the example of the extinction of the archaeocyaths, the particular circumstances are analysed, although the way in which each event contributes to the outcome can be assessed according to contributory causality. In other words, when I say that contributory causes outline a characteristic form of narrative explanation, I am always referring to a form of actual causation, that is, idiographic narratives.

³ However, A may be necessary for B to occur, as we mentioned a few paragraphs ago. Here, we can observe the asymmetry in the notion of necessity that we were posing.

This definition is valid for epistemically complex narratives as well as for retrospectively defined causes insofar as they both display an intricacy in the causal structure of the narrative. The causal inference no longer takes a linear form, as in the narratives we saw in Sect. 2, but includes numerous causal terms that blur the general structure.

Moreover, from the definition of contributory causes alone we can derive two types of causal narratives: (i) those which relate one or several insufficient causes to the explanandum, but without considering the sufficient set of causes; (ii) those which bring together all the insufficient causes which constitute the sufficient set to derive the explanandum (i.e. narratives with a closed INUS structure; Carroll, 2001). This distinction is based on observation of practice: it is not intended to claim one as more explanatory than the other. Rather, I proceed from the idea that causal information depends on the issues the narrative is intended to address, as well as the questions it is expected to answer.

A narrative can be based on contributory causes without considering the whole set of causes necessary to produce the second event, which may be unknown to the researcher. As such can be found in some examples we have seen and referred to above. In Roth's historical example, the *Berufsbeamtengesetz* of 1933 is pointed to as a relevant cause in the causal explanation of the Holocaust, even if it alone may be an insufficient cause to produce the historical event. The same could be said of Wagner's influence on Schoenberg's theoretical developments, as we have already seen. In both cases, from the relationship between insufficient cause and explanandum proliferate a series of questions which, taken together, constitute the narrative explanation with its particular structure. And not because the stated cause is insufficient there is a deficiency in the explanation: here the focus is on a particular causal relationship that is developed in qualitative terms in the narrative—as I said, through how-questions, as well as descriptions and other narrative elements. The narrative is constructed as an insight into these issues, as a contribution to an overall explanation of the phenomenon, and not as *the* explanation.

On the contrary, in my example of the archaeocyaths on Debrenne's text, the insufficiency is observed in each of the particular causes mentioned, while the set of those causes can be considered sufficient, thus, partially satisfying an INUS condition: Turbidity, salinity, bathymetry and temperature are, each of them, insufficient parts of the conditional, although it can be discussed whether all of them are necessary; in any case, the set of these causes is unnecessary, because there can be other conditions that would cause the same effect (let us say, predation of other species and a change in water acidity), but at the same time sufficient.

Although what we have said so far about contributory causes captures the intricate form (or 'logical formlessness'; Roth, 2017) of the narratives, a trait that, as I said in the introduction, is shared by Currie's complex narratives and Roth's retrospective narratives, the retrospective definition of causality requires a closer analysis.

4 Remote causes and the pragmatics of causal narratives

In Sect. 2, I cited Suppes (1986), emphasizing his view that a proper historical explanation cannot afford to truncate the past, because the events described have properties whose causes need to be traced back to a distant time. I will therefore study the notion of remote causality to understand the role it plays in the narrative.

A remote cause is not simply understood as one that is distant in time from its consequence, for this concept is rather relative: on the human scale, a remote cause can be defined in a time interval of weeks or days, whereas on the geological time scale there may be millions of years between two events but the causal relation may be considered proximate. What defines remote causes is the existence of intermediate causal terms (known or unknown) between cause and effect, making it difficult to establish a direct relation.

This form of causality is not new in philosophical discussion, although little attention has been paid to it in the philosophy of science, especially because it is considered to lead to incomplete explanations (Elster, 1983). Ockham had already questioned whether remote causes were true causes: ‘A remote cause is not a cause because the effect does not attend its presence. Otherwise Adam could be said to be the cause of me—which is not true, since what is not a being cannot be a cause of being.’⁴

The view that remote causes are poor explanations is rooted in the idea that they are only invoked when there is a lack of knowledge regarding proximate causes, which, if this ignorance were to dissipate, could be expressed as mechanisms with greater explanatory relevance (Elster, 1983). Yet, the role of remote causes has been highlighted in the field of social sciences, and they have come to be considered in some cases better explanations than proximate causes by van Bouwel and Weber (2002).

Like these authors, I will argue that remote causes are relevant in causal accounts. In the case of historical narratives, they can be identified in those causes defined in retrospect and, to the extent that they answer different questions than proximate causes, they do not lose explanatory relevance in the presence of proximate causes: both coexist in the historical explanation.

As an example, let us contrast the explanation of the Cambrian Explosion (ca. 542 Ma) offered by Peters and Gaines (2012) with that proposed by Morris (2000). The former authors relate the process of formation of the Great Unconformity (formed by the end of the Neoproterozoic) to subsequent proliferation of life. The Great Unconformity is a stratigraphic limit, which also marks an important chemical and environmental change in the oceans, due to the enrichment in nutrients and dissolved salts. This is taken as a cause of the Cambrian Explosion, according to the counterfactual definition of causality (I refer here to that of Halpern-Pearl): without that environmental change, the proliferation of the biomineralizing life forms observed in the Cambrian would not have been possible.

Morris (2000, 4429), on the other hand, offers an explanation based on ecological interactions: ‘The motor of the Cambrian explosion was largely ecological, notably

⁴ I quote indirectly from Engelmann (2007).

with the rise of macroscopic predation (and defence) and effective filter-feeding on the seafloor and in the pelagic zone.’ In other words, the author points to adaptive and selection processes as causes of the development, speciation and diversification of biomineralizing organisms.

It is open to debate whether an explanation like Morris’ is mechanistic,⁵ but in any case, the author is looking for an explanation that elucidates how the variables most closely related to the occurrence of the event operate. This explanation is different from the one put forward by Peters and Gaines, who point to an event further in the past to explain the Cambrian explosion. First of all, we see that the two explanations are not mutually exclusive: one explains the antecedents that promoted the proliferation, the other the evolutionary processes operating towards the occurrence of this event.

Both are important for the explanation: In this aspect, the case I present is different from the one studied by van Bouwel and Weber (2002, 445), where proximate causes have little explanatory relevance compared to remote causes. In my case, both are part of the explanation, following a contributory structure like the one we saw in the previous section. Here, moreover, we can point out that these causes answer to different questions regarding the historical event they are explaining, although it is the same event for both.

Remote causes make it possible to establish a link between the event to be explained and the historical circumstances (the non-truncated past) that preceded it. In the case of Peters and Gaines, they answer questions such as: What factors promoted or allowed the Cambrian explosion, or what event occurred in the prelude to the Cambrian explosion, without which the latter would not have taken place? The answer is given by particular causes, linked to historical circumstances or antecedents, which also allow us to establish why the Cambrian explosion occurs at this moment in history, and not at any other. In other words, remote causes confer *historicity* to the explanation, as opposed to Morris’ approach, whose explanation seems to be based more on abstract entities and typified processes.

Perhaps in practice not all narratives constructed by the historian or the historical scientist contain remote causes, but we cannot fail to notice that cases that are analysed as retrospective narratives or essentially narrative explanations often raise this kind of causal relationship. The link between the *Berufsbeamtengesetz* of 1933 and the Holocaust is a case that illustrates this: genocide is not the direct consequence of a racial segregation law (there are other causes in-between), but the latter does explain the former in many respects, especially bureaucratically and institutionally. There are closer causes that could also provide an explanation of the Holocaust, for example, the *Erlösung* of 1942, which can be considered a more proximate cause of the genocide; however, if we start our account at that date and truncate all previous events, we are only giving a partial explanation. We need to go back further, to 1933, to understand the administrative projection of the causes of the Holocaust. And

⁵ There has been a debate in philosophy of biology concerning the possibility of reducing natural selection to explanatory mechanisms: While some authors, such as Skipper and Millstein (2005) or Havstad (2011), argue that such reduction is not possible, others, like Barros (2008), defend it. More extensive analyses, such as Fulda’s (2017), demonstrate the complexity of this issue.

we may even want to go back further, to the first post-war period, to understand the growth of anti-Semitism in German society, and so on.

The historian's explanation digs into the past to identify events that, despite apparently not determining subsequent events, have an important influence on their occurrence. Remote causes, we might say, generate a tendency or disposition⁶, which is identified in retrospective analysis, while proximate causes are usually determinative to a greater or lesser extent.

The presence of remote causal relations in the narratives is also what allows us to differentiate between Currie's (2014) complex narratives and the narratives posited by Roth. The structure of the explanation can be expressed as contributory causation in both cases, as we have seen in the previous section, but the latter, in addition to being contributory, have the attributes of remote causality, that is, it expresses tendency revealed in retrospective analysis.

That not all contributory causes are retrospective can be seen by comparing the examples I have used. If in the Cambrian explosion we find a clear case of remote causation in the explanation of Peters and Gaines, in the extinction of the archaeocyaths we may have more difficulty in characterising it in that way, although it is a good illustration of contributory causation. The insufficient parts of the causal explanation (turbidity, salinity, etc.) have a direct repercussion on the event they explain, and therefore, not because they are insufficient, these causes are remote: the latter is an additional attribute of certain types of historical narratives, or rather, of those in which the historical character is more accentuated.

4.1 Discussion: A pragmatic perspective on causal narratives

Another question is whether these remote causes are relevant to the explanation. And on this, I believe, the least problematic position is the pragmatic one: the pertinence of invoking them depends to a large extent on the objectives of the research, on the starting questions or the idea the researcher wishes to focus on. To illustrate this, let us consider this 'extremal' example taken from Gould (1990, 323): 'And so, if you wish to ask the question of the ages—why do humans exist?—a major part of the answer, touching those aspects of the issue that science can treat at all, must be: because *Pikaia* survived the Burgess decimation.' Here, it is emphasised that the existence of humans (B) relies on the survival of *Pikaia* (A), the oldest known ancestor of the chordates. Undoubtedly, there is causal dependency that follows the counterfactual definition of Halpern-Pearl: If this ancestor of the phylogenetic branch to which humans belong had gone extinct without diversifying, neither humans nor any other chordates (from ascidians to vertebrates) would exist today.

However, between the two events, there is a temporal gap that could be pointed out to question the relevance of highlighting this causal relationship. The fossils of *Pikaia* date from the Lower and Middle Cambrian, meaning they are around 510 million years old. The oldest *Homo sapiens* remains date from just 300,000 years ago: Does this temporal distance render redundant the consideration that *Pikaia*'s adaptive success is a cause of human existence? Over such a long period, many other events

⁶ In an epistemic sense, not in the realistic sense of *propensities*, although this could also be discussed.

could have conditioned the occurrence of the second event: the emergence of vertebrates from the water in the Devonian, the adaptive success of mammals in the Palaeogene, or the descent of a closer ancestor of the genus *Homo* from the trees during the Pleistocene. All these events can be considered causes of human existence, but whether they are invoked in the narrative depends on the context of inquiry.

The temporal distance between A and B does not make the first event a ‘weak’ or ‘less relevant’ cause of the second. It simply depicts a different question guiding the narrative’s argument. Gould’s text aims to emphasise the significance of the Burgess Shale fauna with regard to humans, opening a new perspective in the way we conceive the past. At least in the highlighted passage, the narrative is constructed around the author’s intention to relate humans to the most distant natural history, revealing that it is the result of a very particular evolutionary process. Furthermore, it shows that our existence depends on a series of contingencies in the history of life, such as the survival of *Pikaia* and its subsequent diversification. Therefore, for what the author intends to explain in his narrative excerpt, highlighting the causal relationship between these two events bringing up this relation is pertinent.

We thus observe that invoking whether one event is the cause of another within the framework of a narrative largely depends on the objectives of the narrative itself. By pointing out this dependency of the conception of causality on the researcher’s purposes, I do not intend to instrumentalise the narrative or relativize its representativeness of historical reality. I am simply pointing out that historical research allows for different levels of discussion, each of which raises different questions whose answers may highlight different causal relationships, with varying degrees of generality or specificity. In this sense only my approach can be considered pragmatic: it shifts the focus to the research practice and to the relationship between the researcher and the natural object, without isolating the latter.

When we talk about the history of the Earth or the history of life, processes unfold over very long periods of time. Some narratives will seek to explain the immediate causes of events (like in Morris’ ecological explanations). Others will cover broader spans of time and will causally link distant events, revealing relevant features of the consequence. These latter narratives also allow us to form an idea of continuity in history by showing how the consequences of one event can be traced up to millions of years later, as in Gould’s example or in Peter and Gaine’s explanation of the Cambrian Explosion. Thus, the explanation of the same event can be approached from a range of perspectives, using various temporal scales, which results in differing narratives that fulfil different aims and objectives.

5 Conclusions

My analysis and subsequent discussion have revealed the complexity and the nuances of considering the narrative as a causal story. I have followed a pluralistic approach, in which different causal conceptions are not mutually exclusive, and can coexist. Although the way in which this coexistence occurs would need further analysis, a taxonomy of the different forms of narratives as causal explanations can be presented:

- a) Narratives where events are causally linked by means of regularities.
- b) Idiographic narratives with the structure of contributory causality, either:
 - α) arguing about how one or more insufficient causes contribute to the explanation, without presenting the sufficient set of causes, but focusing on the individual influence; or:
 - β) constructing a set of causes that by themselves are insufficient, but their totality is sufficient to produce the effect (INUS or cuasi-INUS conditions).
- c) Idiographic narratives that invoke remote causes, also formally contributory, but with implications in the retrospective conception of causality.

We have seen that the construction of narratives of type a) depends on our knowledge of the regularities underlying the processes and the possibility of applying them to our specific case study. They are generally used when the features considered relevant to the explanation can be characterised as part of typified abstract processes, where the past appears truncated. These narratives would be important in disciplines such as tectonics which, although historical, gives considerable weight to explanatory mechanisms.

Narratives of type b), would characterise complex causal interactions that demonstrate a lack of logical form, either absolute (like in Roth) or apparent (more akin to Currie). Type c) would allow to distinguish between one and the other, showing that, in addition to the contributory structure, Roth's retrospective narratives employ references to events in a distant time which, while causally relevant, do not directly imply the consequences.

I have adopted a pragmatic approach throughout, close to that of van Bouwel and Weber. I have not sought to justify a narrative structure on any metaphysical assumptions, but rather, looking at the practice, I have limited myself to pointing out how certain causal conceptions in the narrative arise. At the same time, however, I leave important questions unanswered in this study that could be the subject of a more extensive analysis in the future. First, although I have discussed a pragmatic conception of narrative explanation, it would be necessary to offer a more systematic development of this problem within the general framework of the pragmatics of causal explanation, to highlight the differences it might present with respect to narrative constructivism, and to justify its advantage over other conceptions of narrative. Second, there is the problem mentioned in the introduction that the concept of retrospection in narrative is not obvious in the natural sciences, insofar as its classical definition is linked to Danto's experiment of the Ideal Chronicler, from which an indeterministic ontology emerges; but this could be contested with the concept of the Laplace's demon in natural science. I believe that an analysis of the sources of unpredictability in natural sciences adopting an epistemic approach would help to solve this issue and would contribute to ground the last of the conceptions of causal narrative that I have presented.

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