

Getting from Here to There:
The Contingency of Historical Evidence and
The Value of Speculation

Abstract-

Here I look to some work in the historical sciences in order to draw out some of the epistemic benefits of “speculative narratives,” which bears on some more general epistemic benefits of speculative reasoning. Due to the contingent nature of much historical evidence, some degree of speculative reasoning is necessary to get the epistemological ball rolling in the historical sciences, and I argue that speculative narratives provide the necessary sort of frameworking apparatus for doing precisely this. I use contemporary work on the first peopling of the Americas (the “Clovis First Debate”) for illustration.

1. Introduction

Here’s a phrase that one might hear applied to certain theoretical discussions about various topics in the natural and human sciences: “Yes, that’s all lovely, but it’s ultimately quite speculative.” We hear certain kinds of physicists say things like this, perhaps, when discussing the credentials of string theory, or perhaps biologists and biophysicists when discussing the plausibility of “hypercycles” as integral to the generation of the first living cells. In a recent conversation with a colleague (Bruce Glymour) about a recent paleobiological debate concerning sexual selection as a driver for lineage extinction in the fossil record, he entered the following (paraphrased) objection to any substantive conclusion in the controversy: “The only available inference methods here would involve speculative reasoning from analogy, which is just unreliable.”¹ The worry undoubtedly makes sense. The reliability of inference methods is a central methodological

¹ Bruce Glymour, in correspondence, approves the inclusion of these paraphrased remarks.

concern in the sciences, and if various modes of speculation tend toward unreliability, then we need to be able to say some substantive things about when it's warranted, and what proper constraints on speculative modes of inference might look like. Bruce admits that his views are tendentious, but in any case, what do we mean when we say that a hypothesis or theory is “speculative”?

I suspect there's no single answer to this question. Perhaps one unifying theme is that speculative hypotheses are deployed in situations where evidence is either inaccessible or in some sense “indirect,” although the sense in which this is true can vary quite a bit from case to case, and the differences are not inconsequential (see Turner 2007; Schum 1994). So, rather than tackling the topic of speculative reasoning in general, I will narrow my focus and discuss its applications in the context of *historical* inference—more specifically, within the context of archaeology and anthropology. The value of speculative reasoning in such contexts is, I'll argue, tied to a specific kind of contingency that prevails within historical science.

To that end, I aim to examine a source of contingency in historical science that we may call *contingency of evidence*. That is, in the historical sciences, the evidence that we have at our disposal is itself very much a contingent matter (see Chapman and Wylie 2015, chapter 1). This is true in several senses: first, the evidential material we have to work with is just what the world conspires to deliver. The world, for the most part, deals the cards independently of what we may desire in terms of building a strong hand.² Further, the relative quality of the evidence where we happen to find it is essentially a contingent fact.³ So what is ultimately delivered to us and in

² Currie (2018) mentions various ways in which scientists “manufacture” evidence, but it strikes me that even here the reliability of such evidence is going to rely on a number of contingently discovered physical evidence.

³ A reviewer has pointed out that Adrian Currie (2018) has arguments that countervail here. I don't think that's quite right. I take Currie's point that historical scientists make use of an “omnivorous” set of evidence streams, and that “traces” are not the only kind of evidence that historical scientists make use of. Traces are, however, central, and provide a starting point for research in the historical sciences. Much

what manner is subject to the whims of nature. Finally, that we are in a position to uncover and analyze the relevant evidence is contingent.

This turns out to generate a number of interesting epistemological problems for historical science. First, it means that we have to construct the past from incomplete (and often severely impoverished) stores of supporting evidence (this is famously pointed out by Darwin (1859) as he puzzles over how to reconstruct the “book of nature” from incomplete evidence). Further, it may turn out that future, equally contingent evidential finds will complicate the kinds of explanatory inferences we may have made at some earlier stage of research (see Currie (2018) and the discussion of his “ripple model” of historical evidence). Further yet, there may be many sources of evidence that bear epistemic relevance to the contingent evidence of focus, but we may not know how to properly fit these other evidence streams into our broader picture of the problem landscape; that is, some stream of evidence may clearly seem relevant, but (at first glance) incompatible with other evidence streams that we think relevant to some epistemic puzzle about the past. So, the speculative process iterates.

I will argue that one way in which historical scientists navigate this tricky set of problems is by deploying *speculative narratives* that serve as epistemic frameworks for their respective problem spaces. Speculative narratives are narrative explanations advanced by a scientist or scientific community that may well be pretty flatly false, and are (usually severely) underdetermined by available evidence. To outline the use of speculative narratives, how they operate, and why they’re useful, I’ll look at the development of speculative narratives that aim to explain the first peopling of the Americas (often referred to as the “Clovis First Debate”). What this case study shows is that these speculative narratives perform many positive functions, some

of the ancillary evidence that Currie points to, I would argue, can be conceptualized within the ambit of “speculative narratives” as laid out in this article.

epistemic, some non-epistemic. The main epistemic function of these speculative narratives involves the coordination of evidence. That is, many types of evidence are typically relevant to the problem space for research in this area: physical evidence (archaeological sites, etc.), population modeling, genetic data, and much more besides (see Fiedel (2017)). The construction of speculative narratives concerning the overall dynamics of population spread during the first peopling of the Americas helps us get some positive grip on how these diverse evidence strands should be coordinated to aid us in solving the problems of interest.

I'll also argue that speculative narratives involve a kind of non-epistemic value in that they are in some sense *simplicity-promoting*. This, I argue, is part of the reason that the Clovis First hypothesis has enjoyed so much support over the history of the debate. That is, the Clovis First hypothesis is quite simple and elegant (as research in this area goes, anyway), and as such, has been thought to be of great explanatory power (see Friedman 1974), rendering complications from later (likewise contingent) evidence sometimes unwelcome, or else discredited as inauthentic (see Gibbons 1996). I think that this simplicity-promoting aspect of speculative narratives is good, but only insofar as it takes the epistemic value of evidence coordination as a limiting factor. So, perhaps better to say that “simplicity promotion” is not *exactly* epistemic. It does not get us to truth as such, but may serve indirectly as a kind of handmaiden to truth.

2. Characterizing and motivating speculative reasoning

Reasoning, scientific or otherwise, has to begin from somewhere. As it turns out, certain kinds of puzzles arrive to us with quite a bit more in terms of beneficial furnishings than others, evidential or otherwise. Where such resources are sparse, some degree of speculation is necessary. We find this sentiment echoed in the rightly famous *Major Transitions in Evolution* by Maynard Smith

and Szathmary. In the opening sentences of the preface, they write, “This is a book about the origin of life, of the genetic code, of cells, of sex, of multicellular organisms, of societies, and of language. Such a book is inevitably speculative, because it is an account of a series of unique events that happened a long time ago. But these are matters on which we must speculate. Why else would we study evolution? [...] We want to know where we came from” (1998). The gauntlet, then, has been thrown: if you want to have any chance at all of having knowledge of certain kinds of phenomena (in this case, biological phenomena in the deep past), you must be prepared to speculate.

So far as historical knowledge goes, however, it is not only knowledge of the *deep* past that requires some speculation. Even events much less historically remote may require speculation. Some have argued, for instance, that “counterfactual history” is a necessary part of the generation of historical knowledge, especially in cases where we want to understand the significance of particular historical events, entities, or persons (Sunstein 2016). This is the approach taken by Peter Bowler in *Darwin Deleted: Imagining a World Without Darwin* (2013). That is, he generates a speculative history of the development of evolutionary theory in the absence of Darwin’s influence. The details of this speculative history are neither here nor there, but it is important to understand that according to Bowler (and others), Darwin’s influence *made a difference* to how evolutionary theory developed historically, and therefore how we understand it today.⁴

It may be objected here that counterfactual reasoning in history (or this historical sciences more broadly) is in some sense *more speculative* than the kind of speculative reasoning that motivates certain kinds of explanatory schemas in evolutionary biology. I don’t see the

⁴ This as opposed to the “in the air” conception of evolutionary theory, which has it that if Darwin hadn’t hit upon the theory of evolution by natural selection, someone else would have, because “all of the pieces were there” to be cobbled together (see Himmelfarb 1996; Radick 2009).

motivation for this claim. There is, in my estimation, a deep symmetry here. In any case, whether we're talking about the major transitions in evolutionary history, or the causal trajectories that lead to certain population impulses in the peopling of the Americas (and much more besides), we are appealing to structural features of the world that make certain kinds of speculations warranted, and therefore, potentially fruitful. Speculative reasoning, properly deployed, can give us information about difference makers (even if the information is imperfect).

2.1 Speculative reasoning and reasonable constraints

It seems likely that a key point of resistance as regards speculative reasoning is the notion that insofar as we're engaged in speculation, anything goes (we want to avoid, in the words of Gould and Lewontin (1979), the spinning of "just so" stories). Or, if, for instance, Professor Glymour is right, there is something objectionable because speculative reasoning doesn't give us a good ground for reliable inference. Perhaps these fears can be assuaged in the pages below, but some brief comments are in order if we are to properly motivate the use of speculative reasoning to begin with.

In the sentences just following those quoted from *Major Transitions* (1998), we receive the following constraints: "First, each event must be explained in a way that is consistent with a general theory of evolutionary change, the theory of evolution by natural selection. Second, an adequate account of the origin of any system must explain the peculiarities of that system as it exists today: for example, a theory of the origin of the code must explain why it is a triplet code, why it is redundant, why similar codons specify chemically similar amino acids, and so on. In other words, theories about origins can be tested by looking at the present."

Similarly, Peter Bowler's counterfactual narrative does not float free of constraints. While he does not state them quite so explicitly, it is quite clear from context that he takes textual evidence from the time period under question, as well as recent trends in evolutionary theory, as strong constraints on any purportedly explanatory story we may want to glean from the counterfactual history that doesn't include Darwin.⁵

It is not the case, then, that speculative reasoning is epistemologically retrograde. It is well-motivated within certain contexts, and can be reasonably constrained in such a way as to not be an "anything goes" sort of endeavor. This motivational framework can work well both for friends of speculative reasoning, and as a way to mount an account that responds to the skeptic.

For the friend of speculative reasoning, we are presenting the groundwork for a clearer *explication* of the epistemic function of speculative reasoning. Even if we can agree that it's valuable, it's nice to reason through why that's the case and what gives us reason to think we're right in saying so. As a response to the skeptic, reasoning through examples of epistemic successes in the use of speculative reasoning, and pointing to some generalizable features of such reasoning styles, may allow us to cast things in such a way as to allay various epistemic fears that may attach to the subject.

2.2 Speculation, minimally characterized

Speculation, I take it, involves the deployment of generalized, scaffolded conceptual schema, where those schema are strongly underdetermined by any available evidence. These conceptual schema are generalized in the sense that they are (and must be) broad enough in scope to be able

⁵ As a quick example, he connects the influence of figures like Haeckel and the now more prevalent trend of work in areas like "evo-devo" to the inference that absent Darwin, developmental biology would have been in the driver's seat earlier on in the development of evolutionary theory, with contributions from areas like theoretical population genetics arriving only later. This difference in order, he argues, leads to difference in emphasis, and therefore differences in the ways in which we might think about the nature of evolutionary theory (Bowler 2013, ch. 3).

to capture a wide range of phenomena. In theorizing about the origins of “simple” lifeforms, for instance, we need a conceptual apparatus that can cover catalysis, autocatalysis, membrane formation, differential selection, metabolism, inheritance, and so on (Conway Morris 2003; Penny 2005; Maynard Smith and Szathmary 1998). In the more recent historical case where we’re trying to explain the (potentially) unique influence of Darwin on the shape of evolutionary theory, we must consider multiple interacting networks of scholars, non-scientific trends that might have influenced scientific epistemology at the time, and also public sentiment as it stood in relation to the reception of such ideas as evolutionary trends explaining the emergence of biological forms (see Rupke 2009).

Further, speculation is scaffolded in the sense that what we are able to infer in a given epistemic context is dependent on the generalized conceptual schemes we deploy, as described above. This is not a unique insight, but it does merit mentioning. Scaffolded reasoning has been recognized in physics (Walsh 2019), evolutionary biology (Wimsatt 2007), archaeology (Chapman and Wylie 2015), and history (Roth 2020). In order to begin the task of inference (scientific, historical, etc.), we often need some conceptual bootstrapping—we have to manufacture a starting point that can give us some minimal purchase on where to begin the task of solving the epistemic puzzles at hand. The sense in which this is the case may vary quite a bit between contexts. Indeed, it may vary quite a bit even within the context of the “historical sciences.” As Adrian Currie (2018) has argued, historical scientists are “methodologically omnivorous.” This implies, I take it, that the degree of bootstrapping (i.e. scaffolding) necessary for a task is going to be task *specific*. In some cases we may begin with some highly scaffolded hypothesis, and then direct and ancillary evidence may subsequently turn out to be so highly confirmatory that we can kick some of the scaffolding away. In other cases, we may need to

continue to retain conceptual scaffolding in order to keep research going (I will have more to say about this with the central case study of this article).

2.3 *Moving forward*

So, what is the peculiar epistemic problem at hand? It is just that the historical sciences are perspicuously vulnerable to problems of underdetermination. This, of course, is not a point that's unique to the historical sciences: underdetermination of theory by evidence is everywhere in the sciences. But the historical nature of certain kinds of sciences and the fact that their explanatory accuracy relies on certain kinds of evidential traces means that this issue is more pressing here than it might be in other scientific contexts.

This, in large part, is why historical science is *necessarily* speculative, at least in some limited sense. We need estimations of the available evidence that can send us down fruitful paths. Obviously these estimations can't float free of constraints—but even so, in order to properly coordinate the evidence in the first place, we must craft speculative narratives. This is where I'll now turn my attention.

3. Speculative narratives

Speculative narratives tell stories. Or, perhaps better, they provide the conceptual frameworks that allow us to tell stories. There are many good reasons for telling stories, scientific, historical, or otherwise (Currie and Sterelny 2017). The uses of such narratives (that is, scientific, historical, or fictional, etc.) may or may not be very distinct from one another (Swaim 2021). In any case, it is certainly true that the construction of time-sequenced event structures (i.e. narratives) serves as a central function for certain kinds of epistemic tasks (Gallison 1997; Morgan 2017; Roth 2017).

There is much to be discussed as pertains to the specific nature of narratives and narrative explanation, but for the purposes of this article, let us just assume that there is some sense in which explanation in the form of narrative is epistemically indispensable. That is, certain forms of explanation must be given in terms of time-sequenced structures that have something like the form of a *story*: that is, they involve a *central subject* (Hull 1975) (something which the story is *about*) and a narrative *structure*; that is, a beginning, middle, and end, along with some compulsive force that drives the narrative from the beginning to the end.⁶

Speculative narratives, however, have some distinctive features over and above the notion of a narrative *simpliciter*. First, they are *frameworking* tools. That is, they frame the epistemic tasks of and for the individuals that deploy them, in the sense described in the previous section. Further, they provide for the possibility of bootstrapping inferences described under the broader banner of speculative inference. As frameworking devices, then, speculative narratives provide a coordinating function over the available evidence: speculative narratives subsume and connect what evidence there is under an overarching structure, but are also constrained by the available evidence and the theoretical spaces to which they're attached.

Here is another way of expressing essentially the same thing as outlined above. Speculative narratives are *indirectly about* a central subject, whereas narratives *simpliciter* are *directly about* a central subject. A speculative narrative coordinates a conceptual space of problems, through some conceptual scaffolding over (probably contingent) evidence, which further directs epistemic efforts in the craft of narratives *simpliciter*.

It's worth noting here that there is some overlap between what I'm up to here, and the work of, for instance, Currie (2018) and Currie and Sterelny (2017) (and surely others). Two

⁶ The notion of "narrative" and a *fortiori* narrative *explanation* can be cashed out in rather deflationary terms (Swaim 2019), and also in rather robust terms (Ricoeur 1983). For the purposes of this article it makes little difference where one stands on this issue.

points are worth mentioning. First, it is not necessarily a major goal of this work to advance an entirely novel account of speculative reasoning as such. Rather, it is of some interest, in my estimation, to give a high-level recounting of the development of a subject in the historical sciences that illustrates the sense in which speculative reasoning shows up in ways that drive a research program forward. Second, what is novel is that the features outlined here show this process to be one of iterative bootstrapping and scaffolding. As I'll argue, the inferential machinery has a scaffolded structure, and sometimes some bits of that structure get kicked away, but this doesn't result in a non-scaffolded inferential structure. Perhaps instead we might say that (at least hopefully) less secure materials get replaced with more secure ones. But in any case, I take it that this is an open-ended process of narrative re-craft.⁷ In this context we are, as it were, on Neurath's Raft, reassembling the floor beneath us one piece at a time, hopefully in ways that generally improve the structural integrity, as we (hopefully) navigate toward shore.

4. The Clovis First Hypothesis (and its detractors)

The Clovis First Hypothesis (CFH) has enjoyed a great deal of support over its tenure (defended recently even by Fiedel (2017)). Its roots lie in the discovery of human artifacts in the area of modern day New Mexico in the first part of the twentieth century. Most prevalent among these artifacts are "clovis points," interpreted as sharpened stone tips for projectile weapons, presumably used for hunting game (Marshall 2001). Similar archaeological finds proliferated over the coming decades, and then, in the 1950s, with the advent of radiocarbon dating, researchers were finally in a position to put dates to materials. These clovis points, spanning

⁷ This could be read as implying a kind of antirealism (e.g. Roth 2020). I mean no such implication to be read here.

from the upper reaches of North America all the way to Tierra Del Fuego, were estimated to be about 11,500 years old.

So, a speculative narrative developed around this evidence, now with concrete evidence to support dates. The story goes like this: sometime between 11,500 and 13,000 years ago, there was a population impulse from the east Asian steppe, over the Bering Strait, and into the upper regions of North America. This coincides, roughly, with the latter portion of the last glacial maximum, and as such, these bands of people would have been afforded the ability to cross the strait overland, to later settle into pockets of the northern parts of modern day Alaska and Canada. Physical evidence, in the form of artifacts, suggests that population movements then proceeded quite swiftly, with the Clovis people coming to inhabit virtually all parts of the Americas within just a few hundred years (see Callaway 2018). According to CFH, this swift population spread is partially explained by hypothesizing that the Clovis culture was primarily a hunting culture: that is, they tracked animal populations throughout the Americas as their primary means for sustenance (nutritional and material) (Marshall 2001). This, it is supposed, also explains, for instance, the extinction of charismatic megafauna in the Americas in the post-glacial period (Moreno-Mayar et. al. 2018).

Stated more explicitly: the first humans entered the Americas no earlier than 13,000 years ago. They tended to establish settlement sites that could be moved rather quickly, because they depended on the hunting of large game for food and important materials. This rapid movement (as seemingly established by the widespread deposition of Clovis materials in the archaeological record) made things such that the Clovis people populated nearly all parts of the American continents within a relatively short period of time, which then led to the long-term settlement of peoples and the development of various cultures at subsequent times. This is the fundamental

speculative narrative constituting CFH. Let's turn to some specific features of CFH as a speculative narrative, and then look at some of the complications that have cropped up in more recent work in order to see what they might have to tell us about the nature of speculative narratives.

4.1 CFH as a speculative narrative

Material objects often need sense-making structures. Like it or not, researchers (such as archaeologists and philosophers) are compulsive sense-makers. In the case at hand, there were objects in the ground, contingently placed (in the sense outlined above), that seemed to be the handiwork of humans. So, the speculative wheels start churning.

It is, then, the contingent evidence itself that drives the need for the development of some speculative apparatus around it. That speculative apparatus, as a framework, allows us to bootstrap some conceptual scaffolding that can afford for some limited inferences. In the context of early twentieth century archaeology, this meant explaining the presence and distribution of the evidence in hand in terms of population impulses of some kind; but what sort of population impulse, and why? Well, given the geographical distribution of the materials, it makes sense to speculate that we could be witnessing a contingent remnant of the first peopling of the Americas. Then, in the 1950s with radiocarbon dating, researchers could finally attach some hard figures to the speculative narrative, and seemingly kick away some of that proverbial scaffolding. Perhaps, one may have thought, this speculative narrative is not *exactly* right, but it coordinates the evidence (geographical distribution, rate of distribution, animal extinctions, geological events, etc.) in the right sort of way, and as such warrants something like our assent, if not outright belief. With a framework (in the form of a speculative narrative) in hand, evidence could be

coordinated under a framework for the purposes of scaffolded inference, with some of that scaffolding seeming to be kicked away with what appeared to be confirmatory evidence.

4.2 Challenges to CFH: the plot thickens

CFH is, seemingly, about as elegant an explanatory narrative as one might hope to find in the realm of archaeology and anthropology. These are, after all, notoriously messy fields, both in terms of the kinds of evidence we have to work with, and the theories at our disposal for making sense of such evidence (Chapman and Wylie 2015). So it is perhaps not surprising that one would want such an elegant explanatory narrative to turn out to be true, at least to some decent level of approximation. As it turns out, subsequent work has cast a great deal of doubt on CFH. First, let's look at what (some of) these complications are, and then think about how to contextualize them within an account of speculative narratives.

4.2.1 Pre-Clovis sites

Here's something that would obviously *not* be predicted by the CFH model, and if found, would constitute a major challenge to its validity: artifacts, found in the Americas, which predate the hypothesized initial population impulse of the Clovis culture from Beringia, into North and (eventually) South America. Recall that the upper limit on the date for the first round of humans populating the American continents is supposed to be something like 13,000 years. If you were to find human artifacts that seemingly predate this upper limit, that would be a hard fact for CFH to grapple with.

As it turns out, there are many such examples. It is worth noting, however, that these are matters of ongoing scientific controversy. I take none of these to constitute defeaters of CFH, but

rather as examples of how the process of negotiating scaffolded evidence proceeds in contexts where speculative narratives must be deployed and (perhaps) corrected.

Here's one example (perhaps the first) of an archaeological find that put CFH on its heels: Jacques Cinq-Mars' excavation of the "Bluefish Caves" in Canada. The process of excavating the site took about a decade, all told (1977 through 1987). Briefly characterized, Cinq-Mars, over many years of scrupulous labor, uncovered multiple deposits of animal bones in the northern reaches of Canada that seemed to bear the distinctive marks of human tooling. This, by itself, is unremarkable. However, radiocarbon dating placed these deposits at around 24,000 years in age, preempting CFH by over 10,000 years (Marshall 2001; Cinq-Mars 2001).

These findings, naturally, were not met without controversy (Gibbons 1996). The Bluefish Caves, along with many other archaeological discoveries, have been challenged by some as "inauthentic" (Bourgeon et. al. 2017). Such challenges can proceed in several ways. In some cases, pre-Clovis findings are challenged on the basis of their depositional environment. Radiocarbon dating is known to have a rather broad error range, and as such, archaeologists are careful to take radiocarbon dates as merely *one* part of the evidential picture (Rose 2017). Depositional *context* is also important: do the depositional layers in which objects are found align with what we think of various dating techniques using isotopes? Are the objects found in a particular depositional context consistent with what we think of the age of *other* objects potentially found in or around those objects? These are important questions.

Critics of Cinq-Mars (and others purporting to have found pre-Clovis artifacts) raise just these questions. They claim, for instance, that the radiocarbon dating of animal bones (like the "Yukon Horse" jaw bone that the Bluefish site is most famous for) is insufficient for establishing a substantive objection to CFH (Bourgeon et. al. 2017). Further, it is claimed, the depositional

environments tend to be “mixed.” That is, there are objects in the depositional environment of pre-Clovis sites inclusive of Bluefish) that appear consistent with the dating of CFH. This, it is argued, provides reason to retain CFH as a default narrative model (Saint Pierre 2017). Below I will return to the topic of pre-Clovis archaeological finds when I discuss speculative narratives designed to correct CFH. For now, it is enough to note that these discoveries exist and are in the scientific literature, however controversial they might be.

4.2.2 Pre-Clovis DNA

There’s nothing quite like DNA to untidy an otherwise tidy scientific narrative, and CFH proves no exception to this rule. If CFH were true, you could reasonably predict the following: biological remains of Clovis-era individuals should be relatively genetically homogenous. Specifically, you ought to be able to predict that genetic patterns would reflect an ancestry originating in the Asian steppe, without much variation, given that the population impulse from north to south, according to CFH, took place quite quickly as analyzed in terms of generational scales.

As it turns out, quite like the case of pre-Clovis archaeological sites, there exists genetic material that CFH has a difficult time explaining. One such example (from Saint Pierre 2017) involves mitochondrial DNA uncovered in South America. Here we have an interesting example of confluence of evidence: archaeologists (around 2012) found what looked like human artifacts in modern day Chile that dated (both depositionally and in terms of radiocarbon dating) to around 19,000 to 24,000 years ago (Saccone 2020). This is perhaps even more significant than the findings of Cinq-Mars (1979), given that this doesn’t just predate CFH, but puts humans in

South America at a time that predates what is supposed to have been the date of the first human entering *North America*.

Dating of mtDNA from the relevant populations seems to corroborate the findings from these South American archaeological sites—that is, the mtDNA found in the relevant samples seems to suggest that there were humans in South America much earlier than would have been predicted by CFH. This is not the only case of confounding genetic material from South America, as regards CFH. There is also evidence of (what we would call) aboriginal DNA from modern-day Australia present in biological samples that seem to be inconsistent with CFH (see Whitley and Dorn 1993). These complications, some have argued, generate a demand for alternative models that better accommodate them. I won't try to adjudicate them, but rather give a high-level characterization of them that is intended to illustrate how such speculative narratives are developed, and toward what end.

5. CFH and potentially corrective narratives

Before moving on to some brief characterizations of speculative narratives meant to correct perceived errors in the CFH account of the first peopling of the Americas, it might be helpful to summarize where we are at this point.

I've argued that speculative narratives are central to the work done by researchers in certain scientific fields. This is certainly true, I think, in the case of the historical sciences, for reasons pointed out by Derek Turner (2007), among others: nature destroys much of what we want preserved, and this forces us to reason somewhat speculatively about the nature of the past. This is especially so when confronted with contingent evidence: we often accidentally come upon things (in the physical sense of *things*) that cry out for explanation, but this requires that we

build frameworks that allow for the possibility of explanatory inference and the like. This frameworking role, as I have repeatedly harped, is the function of speculative narratives. Such narratives (e.g. CFH) can be confounded, however, by *further* discoveries of equally contingent evidence, as seemingly implied by the ripple model of evidence supplied by Currie (2018): evidential traces have a reverberating influence through and over time, which seemingly implies that even our most cherished of explanatory narratives can be disrupted by novel information, as seems to be the case with CFH. So the process of speculative coordination via narrative iterates. Now to some of the speculative narratives that are supposed to correct CFH.

5.1 A minimal corrective: Beringian Standstill

A minimally corrective model to CFH is the “Beringian Standstill Model” (BSM). According to BSM, much of CFH is true. The main thing that it gets wrong is just the timing of the *first* humans crossing into North America from the Asian Steppe (Whitley and Dorn 1993).

Here is the fundamental idea: sometime during the last glacial maximum, a small group of individuals successfully moved across the Bering Strait from the Asian steppe into the very upper reaches of North America. However, this event took place much earlier than estimated by CFH—perhaps 10,000 years earlier, or more. However, population impulses into the lower reaches of North America and later into South America did not occur until around 13,000 years ago (the CFH timeline). So, humans, according to BSM, managed to find their way into North America earlier (perhaps much earlier) than assumed under CFH, but then things proceed basically under the presumed population mechanics of CFH once the last glacial maximum finally ends. The findings of Cinq-Mars (1979) have largely been interpreted as friendly to this model (see Marshall 2001). So here, as discussed, we have a clear case of further contingencies

(the findings in the Bluefish Caves, etc.) requiring some reconsideration of “established” narrative.

5.2 A slightly more drastic corrective: multiple population impulses

The BSM is a somewhat minimal corrective narrative with respect to CFH. A slightly more drastic corrective of CFH is the following: BSM is effectively true, which is to say, we ought to give our assent to the claim that humans crossed into North America from the Asian steppe at a date significantly earlier than the one proffered by CFH. However, further than this, it is also the case that there were multiple crossings, at different historical times, utilizing different methods as the primary means of transporting human populations to various geographic locations within the Americas (Skoglund and Reich 2016). For the sake of bookkeeping, let’s call this the “Multiple Methods Model” (MMM).

There are many versions of MMM, and there’s no settled view in the literature as to which (if any) of the speculative narratives deployed to explain anomalous data in terms of an MMM type model is the correct one. While disagreements abound, MMM models share at least one thing in common: the desire to account for genetic data that CFH (and BSM) can’t explain (e.g. the various anomalies outlined in 4.2.2). What, then, are the supposed advantages of MMM type narratives, as regards genetic data? Perhaps more than anything, they provide a plausible mechanism for otherwise unexpected genetic *diversity*. That is, on both CFH and BSM, you would predict a high degree of homogeneity with respect to genetic data from the relevant evidence (although BSM might account for some of the diversity, depending on migration trends into Asia during standstill periods), as the population founders are supposed to have been small in number, closely related, and then quickly proliferating (Callaway 2018). But in fact we find a great deal of genetic diversity around the time of (and even pre-dating) CFH and related

narrative models, distributed over time periods and geological ranges that CFH struggles to handle (Whitley and Dorn 1993).⁸ The following, then, can stand in as a summary of the many particular speculative narratives that might fall under the category of MMM.

Given that we have (contingently) found genomic data that cannot be accounted for given other speculative frameworks, we must develop new ones. According to such frameworks, we can account for such surprising data by complicating our narrative picture of American (in the broad sense) archaeology and anthropology in the following ways: First, there was not one population impulse into the Americas, but many. Some of these may have occurred during or even before the last glacial maximum, extending the timeline of population impulses into the rather distant past (Skoglund and Reich 2016). Many others would have followed, especially after the glacial maximum period. Second, the methods of human travel in the peopling of America were multifarious, including overland and sea travel (probably broken into several relatively short voyages staying pretty close to the coastline) (Raff and Bolnick 2014). Why correct the narrative in these ways? Because doing so accounts for two puzzles.

First, MMM type narratives account for genetic diversity by allowing for a longer period of human migration prior to and during post glacial impulses into the Americas. That means it allows for the possibility of a larger number of genetically disparate groups arriving at Beringia at various historical times, widening the range of possible combinations of genomic data to be later discovered by various kinds of historical scientists. It also accounts for the geographical range covered by these contingent evidence sets. It is puzzling, as an historical scientist, taking CFH (or some variant of it) as your scaffolded framework, how to make sense of genomic data

⁸ Here Whitley and Dorn offer a relatively simple model of population dynamics that puts some pressure on the plausibility of CFH. Given some parameters for how much ground primitive humans could have covered in a day's time, the amount of nutrition necessary to do so, plus some assumptions concerning reproduction rates and resources required for population support in the familial setting, it seems unlikely (according to their model) that the hypothesized Clovis culture (on CFH) could have populated the Americas in anything like the amount of time given on CFH.

found in Brazil that seems to contradict everything you think you know about the pace and timing of the first peopling of the Americas (see Rose 2017). But, with more time and a wider range of possible humans, these puzzles appear potentially resolved (or at least *dissolved*).

5.3 A yet more drastic alternative: the Solutrean Hypothesis

The final alternative narrative I'll point to is the "Solutrean Hypothesis" (SH). SH shares many properties with all the variants of MMM: it aims to account for issues concerning discrepancies in genetic data, timing, and population dynamics (i.e. rate of population spread) that MMM narratives aim to deal with. But, it adds another mechanism into the picture: specifically, humans crossing the Atlantic from Europe as part of the picture of how humans came to inhabit and spread throughout the Americas (Oppenheimer et. al. 2014).

What is this speculative narrative supposed to explain? Like MMM, it is mainly purported to explain genomic data that seems otherwise inexplicable. In this case, there appear to be mtDNA markers in Columbian pre-Clovis materials that imply ancestry from southwest Europe (Oppenheimer et. al. 2014). How to explain this? Well, one way is to propose some route by which humans may have traveled from southwest Europe, to North America, and then finally into Columbia and elsewhere. The obvious choice here would be some route involving water travel.

SH is not widely accepted as credible. I'll say some more about this in the next section, but most within the field think that less extreme models (in line with what I'm calling MMM) have the explanatory resources to cover the puzzles that SH takes itself to be uniquely positioned to solve.

6. Taking stock of things

What has been established up to this point? I take it that we have established the following: speculation is necessary in certain epistemic scenarios. Among such scenarios are the kinds that historical scientists are confronted with when they encounter contingent evidential traces. In order to make sense of such things, speculative narratives are constructed in order to bootstrap the process of explanatory inference: frameworks are necessary in order to reason inferentially, because inferences don't float free from context (see Garfinkel 1984; Potochnik 2011). So, inferential processes are scaffolded in terms of these speculative frameworks, and point research in the direction of further (contingent) evidence that may bolster the epistemic credentials of a speculative narrative. By obtaining such evidence, we can sometimes kick away part of our scaffolding (or at least secure our footing). It seems that this was thought to be the case, I argued above, in the case of the radiocarbon dating of Clovis spear tips and CFH.

But as is implied, I take it, by Currie's (2018) ripple model of evidence, further contingencies lurk around every corner, which can alter our position with respect to the data. New kinds of evidence must be accounted for, and this means that the narrative structures that serve as side constraints on our speculative reasoning also shift in character. The case of CFH and its downstream permutations and corrections is exemplary of this process of speculation, scaffolding, reworking, further speculation, and alteration of scaffolding that I take to be characteristic of a wide range of work in historical science. The contingency of evidence demands this of us if we are to get from here (ignorance) to there (knowledge). Is it perfect knowledge? Hardly. But speculative knowledge is still knowledge. But what else can be said about speculative knowledge?

6.1 *The epistemic dimension of speculative narratives*

I stated at the outset that speculative narratives have a positive epistemic quality: they perform an evidence-coordinating function. I think that the above case study (or case studies) make it clear how this is so. By having a speculative narrative in hand, we can put the various kinds of evidence streams we have to some essential work. In using an MMM narrative, for instance, we are able to develop models that coordinate anomalous genomic data, population trends, physical archaeological finds, and much more besides. The framework provided by the speculative narrative provides for ways of seeing how all these evidence sets “hang together” as a unified picture. But the evidence itself is also a point of resistance—that is, the concrete materials that historical scientists work with in these contexts provide constraints on what kinds of narratives can be considered plausible or respectable (see Swaim 2021). This is the reason, for instance, that SH is not considered a plausible contender by most.

There just isn't any evidence, for instance, that humans, in the relevant historical context, had the necessary skills or technology for the kind of seafaring voyage required by SH. This is by no means the only evidential failing of SH, but it is a rather devastating one. If we are to keep speculative reasoning in its proper place, then it must be the case that the stories we tell for the coordination of the relevant evidence also have *some basis* in the available evidence itself. In many cases, SH simply fails this test. It puts forward some bits of evidence that are claimed to call out for an explanation that is not ready to hand, but the speculative narrative proposed is pure speculation, not *restricted* speculation; it answers for lack of evidence with a hypothesis that itself has no grounding in the available evidence. Our speculative conceptual scaffolding (narrative or otherwise) needs to have a firm grounding in the evidence that it is ultimately supposed to account for (as alluded to in section 2.1); evidence and speculative scaffolding

should, we might say, sit in “reflective equilibrium” with one another, or some such. SH just fails here—the speculative narrative far exceeds the epistemic demands placed upon it by the material evidence. Something like MMM, however, respects the material constraints of the evidence in the iterative craftwork of speculative narration. This constitutes one of the reasons to prefer it (or something rather like it).

6.2 The non-epistemic dimension of speculative narratives

Rounding out our discussion of speculative narratives, it is worth pointing back to previous comments on the *simplicity-promoting* character of these explanatory schemata. The notion of “simplicity” is not easy to nail down. Peter Lipton (2002) struggled to make much sense of it, while still holding that it has some central role to our inferential practices. Elliott Sober (2016) devoted an entire monograph to exploring its many potential dimensions, with mixed results. Because of constraints on space, it is hard to say much about this particular dimension of speculative narratives that’s especially philosophically satisfying, but reflection on our case study might prove somewhat illuminating.

There’s a sociological element to the development of the speculative narratives covered here that is really only hinted at. It is the following: pre-Clovis (which is to say, non CFH or, rather, MMM models) had to “fight for acceptance,” in the words of Marshall (2001). There are surely many reasons for this. Some probably have to do with the internal politics of archaeology and anthropology, and others may have to do with the fact that senior researchers are simply “set in their ways,” etc. But I think it’s also relatively clear that it was preferred on the basis of its *simplicity*. A single ancestral group migrates and populates new territory, eventually coming to spread over two continents, and the rest, as they say, is history. A simple story involving simple,

relatively unified mechanisms, and which seemingly explains all of the important facts (Gibbons 1996). What could be better?

I suppose there is room to think that simplicity, and therefore the simplicity-promoting function of speculative narratives, tracks truth (at least in the good cases), and we should therefore understand simplicity as an epistemic good. Perhaps, for instance, simplicity can be linked to “loveliness” in some way, where loveliness of a theory, explanation, narrative, model, etc. is somehow “symptomatic” of truth (e.g. Lipton 2002). It’s hard to see how to make this point sufficiently general. The value of simplicity, such as it is, seems highly variable across domains. A brief survey of the kinds of cases covered Chapman and Wylie (2015), Bechtel and Richardson (2010), or Wimsatt (2007) should be enough to convince you that the very messy and decidedly unsimple aspects of the natural world are sometimes our center of epistemic focus; that is, the aim is not to idealize to a general model that is sufficiently simple for the purpose of unifying the messy details, but rather making sense of the messy details *as they’re found*.

So whatever value attends to this simplicity-promoting function is, it seems, at least not *directly* epistemic in character. Here’s a way that we might make sense of the non-epistemic (or, at least, *indirectly* epistemic) benefits of simplicity:

Simplicity, even though it does not track the truth, may serve as a guide for the development of methodological heuristics that turn out to be fruitful in the context of scientific discovery.

In some sense this tracks what Ernan McMullin (1984) has to say about fruitfulness and the like. The theory of continental drift was clearly false, but the metaphorical content (assuming that’s the right way to think about the contents of the theory) provided for the possibility of developing more fruitful ways of thinking about the macrostructure of historical geology such that the discipline could begin to converge (we think) on the truth.

In the present case (and surely others of a similarly historical character) we have a highly bootstrapped theoretical framework. The discovery of clovis points is a contingent event, and the fact that clovis points just were the physical materials we had in hand to reason with in the first place, and that they had the particular spatial distribution they in fact had, etc., are likewise contingent facts. The details are messy, our knowledge is sparse, and we stand in need of some way to coordinate our very limited knowledge of the situation, so researchers do the best they can.

CFH, arguably, was too simple to have ever really been trusted as something that could have been veridical, at least in all of the details. The trouble for this narrative model came early and often (see Cinq-Mars 1979; Whitley and Dorn 1993). It could have turned out that the dates were correct (or roughly so), but even so, the story was bound to become much more complicated than the one involving such simple population impulse mechanisms as proposed under CFH. Even though the simplicity of CFH was not itself a key to truth, it did serve to establish a set of heuristics for researchers to follow such that they could be in a position to iteratively re-craft the sets of narratives that coordinate the material universe of early-American archaeology and anthropology. Now, whether the researchers *themselves* take this to be what's happening in their disciplinary development I cannot say. But looking at the historical development of the debate and the iterativity of narrative re-crafting seems to suggest that something like this is the case.

Concluding remarks-

Some, like Bruce, may be uncomfortable with epistemic methods that rely heavily on speculation. These concerns are not exactly misplaced (or at least not entirely). Speculation can

clearly go wrong, as surely witnessed by conspiracy theorizing, creation science, and much that we would consider “crackpot science.”⁹ There are intermediate cases, to be sure, that justifiably involve speculative reasoning, but which demand a great deal of care in its use, given that we wish to avoid various epistemic extravagances and the like. So we must be careful, but to declare speculation as off limits because of the degrees of vagueness and slippage sometimes involved would be to foreclose upon any number of potentially fruitful research programs.

Here we have a case that bears this out. The unearthing of materials (Clovis points) gives us some reason to try to coordinate the discovery with other forms of evidence. This requires a scaffolded structure that can do the coordinating work. As the evidence becomes better coordinated through archaeological, geological, anthropological, and other kinds of scientific refinements, the speculative narratives become increasingly *actual*. We seem to learn more precisely what these narrative structures are (at least potentially) *about*. But the process can iterate.

CFH seemed to make sense given what we knew: the dating of Clovis points, the timing of the last glacial maximum, constraints on population impulse timing seemingly imposed by the last glacial maximum, megafauna extinctions, and so on. CFH came to constitute received wisdom, and so research continued as a mechanism for filling out the relevant details. But nature doesn't respect conventions, and subsequent discoveries forced our hand with respect to narrative recraft. Archaeological sites, ancestral genetic materials, and otherwise implausible population ranges forced researchers to expand and recraft (if not overturn) CFH with new speculative narratives to be explored, theorized, filled out, and so on. It seems plausible to think that this will happen again (and again). Creative (and responsible) uses of speculative reasoning give scientific fields new epistemic resources for developing a more secure foundation on Neurath's Raft.

⁹ See, for instance, Sheldrake's “Morphic Resonance Theory” (2009).

Whatever else may be true concerning speculative reasoning in science, I think this is a case where we can see that it has been (and continues to be) useful, and we're able to get a sense of why. CFH may be false, and perhaps as much should have always been suspected. But this is perhaps less interesting than the fact that it was importantly fruitful, and provided the ground for moving forward toward reworked speculative narratives that could inch us closer, if asymptotically, toward truth.

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