The Argument from Silence

Introduction

In one of Sir Arthur Conan Doyle's classic stories, Sherlock Holmes draws Inspector Gregory's attention to "the curious incident of the dog in the night-time." The lesser detective is baffled by the remark: "The dog," he points out, "did nothing in the night-time." "That," Holmes replies, "was the curious incident."[1]

Writing a work of fiction, Conan Doyle has no difficulty in constructing a plausible chain of events in which Holmes's observation proves to be the key to the crime. But in real life, applications of the argument from silence have provoked wildly varying assessments from historians. One learned nineteenth century German author declares the *argumentum ex silentio* to be "nothing more or less than the universally valid method of historical investigation" [2]—a description perhaps prompted by the fact that such arguments form the underpinning of most of

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[1] Sir Arthur Conan-Doyle, "Silver Blaze," in *The Complete Sherlock Holmes* (New York: Doubleday & Co., 1988), p. 347. That someone had entered the stables at night and abducted the race horse Silver Blaze is already established; the dog, although trained to guard the stables, gave no alarm. Holmes employs the argument from silence to narrow the field of possible suspects to people familiar to the dog—hence its silence in the night. This incident has proved suggestive for several different philosophical explorations: it is used as an illustration of the interrogative method of scientific inquiry in Hintikka and Hintikka, "Sherlock Holmes confronts modern logic: toward a theory of information-seeking through questioning," in E. M. Barth and J. L. Martens, eds., *Argumentation: Approaches to Theory Formation* (Amsterdam: John Benjamins, 1982), pp. 55-76, whereas Peter Lipton, *Inference to the Best Explanation*, 2nd ed. (New York: Routledge, 2004), p. 116, construes it as an inference to the best explanation, as do Walter Sinnott-Armstrong and Robert Fogelin in *Understanding Arguments: An Introduction to Informal Logic*, 8th ed. (Belmont, CA: Wadsworth Cengage Learning, 2010), pp. 259-60.

[2] Julius Wellhausen, *Prolegomena to the History of Israel* (Edinburgh: Adam & Charles Black, 1885), p. 365.

the work for which he was famous. Another author describes an argument from silence as "exceedingly strong."[3] Other historians, however, have expressed the opinion that "the argument *ex silentio* is weak at best,"[4] and some have gone so far as to describe it as "that most treacherous and worthless of all arguments—the *argumentum ex silentio*."[5] Even some of those who make use of the argument from silence often do so apologetically, acknowledging that it is "rather precarious."[6]

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[3] Walter Leaf, "Reichel on the Homeric Armour," *The Classical Review* 9 (London: David Nutt, 1895), p. 55.

[4] Mabel Gude, *A History of Olynthus* (Baltimore: Johns Hopkins Press, 1933), p. 19. Gude's comment here is prompted by the omission of any mention of the Chalcidian League in the work of Thucydides. Similar deprecatory assessments of the form of the argument might be quoted almost *ad infinitum*, e.g. William Thomas Arnold, *Studies of Roman Imperialism* (Manchester: University Press, 1906), p. 89, note 1; Rachel Robertson Reid, *The King's Council in the North* (London: Longmans, Green & Co., 1921), p. 73; Richard D. Mohr, *The Platonic Cosmology* (Leiden: Brill Academic Publishers, 1985), pp. 159-60; David R. Hall, *The Unity of the Corinthian Correspondence* (New York: T. & T. Clark, 2003), p. 64.

[5] George Edmundson, *The Church in Rome in the First Century* (London: Longmans, Green and Co., 1913), pp. 62-63. Similarly strong language regarding the argument from silence crops up in many historical works, e.g. Edward Moore, *Studies in Dante*, third series (Oxford: Clarendon Press, 1903), p. 131; W. A. Goligher, "Studies in Attic Law," *Hermathena* 14 (Dublin: Hodges, Figgis, & Co., 1907), p. 515.

[6] J. B. Lightfoot, *Essays on the Work Entitled* Supernatural Religion (London: Macmillan and Co., 1889), p. 84; Hugo Radau, *Letters to Cassite Kings from the Temple Archives of Nippur* (Philadelphia: Department of Archaeology, University of Pennsylvania, 1908), p. 23; cf. George W. Elderkin, "The Fountain of Glauce at Corinth," *American Journal of Archaeology* 14 (New York: Macmillan, 1910), p. 43; Peter R. Ackroyd and Christopher Francis Evans, *The Cambridge History of the Bible: From the Beginnings to Jerome* (Cambridge: Cambridge University Press, 1975), p. 123; Nicholas Cahill, *Household and City Organization at Olynthus* (New Haven: Yale University Press, 2001), p. 187; Peter Jackson, "Marco Polo and his 'Travels'," in Gerald R. Hawting, ed., *Muslims, Mongols, and Crusaders* (New York: Routledge, 2005), p. 278.

Where opinions vary so widely, we might certainly hope to find some serious philosophical analysis and exposition. Yet there has been relatively little philosophical exploration of the argument from silence, and deductive reconstructions, when they have been tried at all, are generally acknowledged to be of little or no practical use.[7]

The first section of this paper gives some illustrations of the argument from silence, explains the formal structure of arguments from silence in terms of basic probability theory, and isolates a key component of that formalization that is particularly vulnerable to known human cognitive biases. The second part explores some of the evidence for the weakness of the argument as applied to the study of ancient history, emphasizing how frequently our naive expectations are at variance with the actual evidence and suggesting that we should, in the light of this evidence, recalibrate our expectations. The third part draws some morals for the application of the argument from silence both in its own right and when (as generally happens) it is employed in conjunction with or in opposition to other considerations.

The argument from silence and its rational reconstruction

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[7] The principal sources that treat the argument from silence in some detail, though with very uneven levels of formal and philosophical sophistication, are C. A. Briggs, "The Argument *E Silentio*: With Special Relation to the Religion of Israel," *Journal of the Society of Biblical Literature and Exegesis* 3 (1883), pp. 3-21; Andrew Constantinides Zenos, *The Elements of the Higher Criticism* (New York: Funk & Wagnalls, 1895), pp. 74-94; Charles de Smedt, S. J., *Principes de la critique historique* (Paris: Librarie de la Societe Bibliographique, 1883), chapters 13 and 14; Charles Victor Langlois and Charles Seignobos, *Introduction to the Study of History*, trans. G. G. Berry (New York: Henry Holt and Co., 1904), chapter 3; John Lange, "The Argument from Silence," *History and Theory* 5 (1966), pp. 288-301; David P. Henige, *Historical Evidence and Argument* (Madison: University of Wisconsin Press, 2005), chapter 16; and Elliott Sober, "Absence of Evidence and Evidence of Absence: Evidential Transitivity in Connection with Fossils, Fishing, Fine-tuning, and Firing Squads," *Philosophical Studies* 143 (2009), pp. 63-90.

"The logic of the argument from silence," one philosopher notes, "is relatively complex, no matter how straightforward it may appear on the surface."[8] And so it is. At the outset, we may set aside any attempt to assimilate it to Ockham's Razor as hopeless. No extant source states that Julius Caesar sneezed during the year 50 BC, but the intrinsic plausibility of the event would surely preclude our drawing a negative conclusion on this point. On the other hand, no source states that he converted to Judaism, but no historian worth the name would entertain the suggestion. Ockham's Razor is too blunt an instrument, as it is insensitive to the question of whether the missing evidence should have been expected.

Issues of testimony are more closely bound up with the argument from silence. But it is all too easy to slip into errors here unless we make our assumptions explicit. It is common, for example, in the analysis of testimony to restrict the possible outcomes to two: the witness gives testimony that H (which we can abbreviate as "tH"), or he gives testimony that ~H (abbreviated "t~H"). But neither of these formulations represents silence; it would be a scope error to assume that $P(t\sim H|\sim H) = P(\sim tH|\sim H)$, as the two probabilities will not coincide except under most unusual circumstances.[9] This point will arise again when we come to the consideration of negative testimonial evidence in law.

In some respects, arguments from silence resemble certain forms of reasoning sometimes classified as arguments from ignorance. It is difficult to answer the question of whether arguments from silence should be considered to be a special case of arguments from ignorance, partly because there is no general agreement on the proper analysis of arguments for ignorance.

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[8] Lange (1966), p. 298.

[9] See the discussion in Timothy and Lydia McGrew, "The Reliability of Witnesses and Testimony to the Miraculous." With Lydia McGrew. In Jake Chandler and Victoria Harrison, eds., *Probability in the Philosophy of Religion* (Oxford: Oxford University Press, 2012), pp. 46-63.

Some logic textbooks classify all arguments from ignorance as fallacies; if an argument is not fallacious, it is not an argument from ignorance.[10] Other textbooks more cautiously state that arguments from ignorance are fallacious under some circumstances but not under others.[11] In his painstaking study of arguments from ignorance, Douglas Walton suggests that the argument from silence should be classified as a species of the argument from ignorance.[12] There are, as we shall see below, some formal similarities between the two sorts of inference. But what makes arguments from silence distinctive is that there is typically a source (or set of sources) from which the evidence is (rightly or wrongly) expected. It is the absence of evidence from that source that is supposed to drive the argument, and arguments from silence are sometimes pressed even in contexts where there is also positive evidence from some source ranged against the silence from another.

　　We will make no progress by working with mere generalities; we must look at actual cases. The following examples illustrate the argument from silence at work in the study of history:

(1) The extant writings of Greek historians of the fifth century BC make no reference to the city or people of Rome. Therefore, probably, Rome did not exist in the fifth century BC.

(2) Extant sources make no reference to the *Donation of Constantine* until several centuries after Constantine's death. Therefore, probably, the *Donation of Constantine* is a forgery.

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[10] See the references in Douglas Walton, *Arguments from Ignorance* (University Park, PA: Pennsylvania State University Press, 1996), pp. 2-5 and 25-28; but note the reservation expressed by Copi, cited in Walton pp. 34-35.

[11] *Ibid.*, pp. 28-36.

[12] *Ibid.*, p. 67.

(3) In his *Germania*, Tacitus set himself the task of enumerating the peoples of Germany. Therefore, the absence of a certain Germanic people from the *Germania* proves (or at least makes it very probable) that it did not exist at the end of the first century AD.

(4) The *Notitia Dignitatum* mentions all the provinces of the Empire; therefore, the absence from these lists of a people or a province proves (or at least makes it very probable) that it did not then exist.[13]

(5) There is no explicit mention in the *Odyssey* of a breastplate as a piece of armor. Therefore, apparent references to a breastplate in the *Iliad* (such as 4.136, 11.19, 11.373-74) may be dismissed either as not referring to a breastplate or as later interpolations.[14]

(6) Throughout the New Testament and the Christian literature of the first and second centuries, there is no indication, direct or indirect, that Jesus of Nazareth was married. Therefore, we may ignore as unhistorical a conjectural interpretation of a third century gnostic text insinuating that Jesus was married.

The examples diverge strikingly. The conclusion of (1) is obviously false, while the conclusion of (2) is notoriously true. In evaluating (3), a non-specialist might well hesitate, asking how

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[13] See Langlois and Seignobos (1904), p. 256, who seem to be offering (3) and (4) as instances in which the argument from silence is conclusive.

[14] See Leaf (1895), p. 56.

complete our text of the *Germania* is and wondering about the sources at Tacitus's disposal; something similar goes for (4). In (5) and (6), the argument is given as a reason for dismissing or reinterpreting *prima facie* evidence to the contrary, but in (5) the evidence is contemporaneous and strong, whereas in (6) the "evidence" is already severely weakened by being late, uncorroborated, and conjectural.

But despite this diversity, these cases have several noteworthy features in common. First, in each instance, the silence of some source—its failure to mention some specific fact or event—is being used as an argument, categorically or defeasibly, for drawing some conclusion. Second, in each case, the argument is enthymematic; for a deductive reconstruction, it would appear that a conditional of some form is missing.

As a first attempt at reconstruction, we could try filling out a typical argument from silence with a subjunctive conditional:

1. If the *Donation of Constantine* were not a forgery, historians today would be aware of some reference to it closer to the putative time of writing than the mid 700s.

2. Historians today are not aware of any reference to it prior to the mid 700s.[15]

Therefore,

3. The *Donation of Constantine* is a forgery.

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[15] The earliest known probable reference is in a document written by Pope Adrian I, who died in 795.

According to this reconstruction, the contrast between a strong and a weak argument from silence could be parsed out largely in terms of our grounds for accepting premise 1; if it were practically certain, then (assuming that 2 is uncontroversial) we should be nearly certain of 3, whereas if it were dubious, the argument may do little to warrant belief in the conclusion. So, according to this reconstruction, the force of the argument is a function of our justifiable confidence in the first premise.

This sort of reconstruction is nearly identical to the general scheme of arguments from ignorance that Walton advocates. When an investigator looks for a such-and-such a thing and does not find it, he may reason:

If it were there, I would find it.

But I didn't find it.

Therefore, it is not there.[16]

It is with something like this reconstruction in view that earlier authors have laid down several rules for the application of the argument from silence. Formulations vary, but following de Smedt we can cast them as conditionals required for a rigorous statement of an argument from silence regarding an event:

(R$_1$)   If the disputed event had actually transpired, then the author whose silence is being invoked could not have been ignorant of it.

(R$_2$)   If the author had not been ignorant of the event, he could not have failed to mention it.[17]

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[16] Walton (1996), p. 252.

[17] De Smedt (1883), p. 227; cf. Langlois and Seignobos (1898), p. 256; Lange (1966), pp. 290-93. Unlike the earlier authors, Lange recognizes the problems with such analyses.

Some care is needed in interpreting the term "mention" in R_2. An author who does not expressly state that the event has transpired or that the fact in question is the case may still reveal his awareness of it, for example, by presupposing it in something else he says. Clearly, an argument from silence cannot be made from a given author's work unless all such indications are absent. But the question of whether a given passage presupposes something that it does not explicitly state is often difficult to resolve.

To these sensible-sounding conditions we might well add a third that cannot be taken for granted, particularly in the study of ancient history, where fragile documents are at the mercy of many factors that do not take the importance of the material to later generations into account:

(R_3)　　If the author had mentioned it, we would be aware of that today.[18]

One can find here and there unguarded statements affirming R_3 in sweeping terms. Clemens Reichel has gone on record as saying that it is

> probably safe to say that every historical event leaves some traces in the material record. Miniscule as these traces may be, they can often be recognized by careful observation and a good amount of detective work.[19]

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[18] This qualification is suggested by an observation made by Lange (1966), p. 294, though in a slightly different context.

[19] Clemens Reichel, "A Modern Crime and a Ancient Mystery: the seal of Bilalama," in Gebhard Selz, ed., *Alter Orient und Altes Testament 274* (2003) p. 355.

But here surely David Henige's stricture is correct:

> [M]uch of the record of the past is suffused with impenetrable silence, and the bulk of
> historians' interest is inevitably directed toward the sounds. . . . the past has not been
> benevolent in preserving itself for the present.[20]

As Henige elsewhere explains,

> [a] past event has to be witnessed, then the observations recorded, the record preserved for
> varying periods of time, then found, and finally understood. . . . the degree of disappearance
> has been phenomenally high.[21]

In the work of Langlois and Seignobos, such rules are expressly presented as necessary conditions for drawing a conclusion from silence. But as John Lange points out, we could seldom be confident that we had met these conditions, and so, on the basis of the argument from silence alone, we could seldom draw a negative conclusion with confidence. This analysis, then, would seem to confirm the broadly negative assessment of arguments from silence in historical study.

Yet this reconstruction will not do. Even in cases where the probability of the conditional is quite high, the argument may be weak because rival explanations account for the absence of evidence even better than the desired conclusion does. Thus, consider the standard statistical

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[20] Henige (2005), p. 175. Henige castigates Reichel's view as "prodigiously nonsensical—and technically indefensible."

[21] Henige (2005), p. 174.

scenario with two outwardly indistinguishable urns: one (which we will unimaginatively label 'A') contains 990 black balls and 10 white ones, while the other ('B') contains 999 black balls and 1 white one. A ball is drawn from one of the urns—we have no antecedent information telling us from which—and proves to be white. The deductive reconstruction would run thus:

    1*.   If the ball were drawn from urn A, it would be black.

    2*.   The ball was not black.

Therefore,

    3*.   The ball was not drawn from urn A.

No very great acumen in probability theory is required to detect the problem with this reasoning: under the given conditions, the hypothesis that the ball was drawn from urn A is clearly rationally preferable, as that urn is ten times as likely to produce the observed outcome as urn B. To put the point another way, we could simply substitute B for A in 1* and 3*, and the argument would yield an incompatible conclusion from premises that are equally or more probable. The problem with a deductive reconstruction is that we are, in fact, comparing conditional probabilities, not merely proceeding by some probabilistic analogue of *modus tollens*.[22]

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[22] That is to say, from "If P, then very probably Q" and "Not Q," we cannot legitimately infer "Not P," since (by contrast with the deductive case of *modus tollens*) we need additional information about how probable Q would be if P were false before we are entitled to draw a conclusion, even probabilistically. This is a point correctly stressed by Elliott Sober in *Evidence and Evolution: the Logic behind the Science* (Cambridge: Cambridge University Press, 2008), pp. 48-57 and 353-54.

Retrenching, we can cast the argument in a more explicitly probabilistic form. In the subsequent discussion, we will refer to the terms of the odds form of Bayes's Theorem for evidence ~E, which is $P(\sim H|\sim E)/P(H|\sim E) = P(\sim H)/P(H) \times P(\sim E|\sim H)/P(\sim E|H)$. The underlying structure of the argument is irreducibly mathematical, but the rationale for this reconstruction can be communicated to some extent in informal terms. First, the argument has an important (if often tacit) *ceteris paribus* clause: it indicates what it is reasonable to believe, all else being equal. A strong antecedent presumption in favor of an event or fact H may be able to withstand the force of even a fairly strong argument from silence. The degree of resilience, be it great or small, is encoded in the ratio of the prior probabilities, $P(\sim H)/P(H)$.[23]

Second, the argument from silence, like all probabilistic arguments, is essentially *contrastive*: its force depends on the contrast between the expectation of the absence of the evidence (~E) if the event in question had not occurred (~H) and the expectation of the absence of the evidence if the event had occurred (H). This feature is encoded in the two conditional probabilities known as the likelihoods, $P(\sim E|\sim H)$ and $P(\sim E|H)$.

Third, the strength of an argument from silence can be measured in terms of the *ratio* of these likelihoods, $P(\sim E|\sim H)/P(\sim E|H)$. This mathematical fact has three consequences: (a) there is no upper limit on the strength of arguments from silence, since that ratio approaches infinity with a positive numerator as the denominator shrinks toward zero; (b) when the two likelihoods are equal—that is to say, when we expect ~E equally strongly whether or not H is true—the argument is completely forceless; and (c) when there is not a very high expectation of the evidence on the assumption that the event had occurred, that is, when $P(E|H)$ is rather small, say less than 0.5, the denominator of the likelihood ratio, which is equal by definition to $1 - P(E|H)$,

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[23] That is to say, the ratio $P(\sim H)/P(H)$.

will be rather large, in this case greater than 0.5; and as the numerator can be no greater than 1, the argument from silence will have very little force.

It matters quite a bit, therefore, whether E would be very probable if H were true. Using the intuitions behind $R_1 - R_3$ as a guide, and making a few reasonable simplifying assumptions, we can resolve the question into three others:

(1) If H (the event or fact in question) were true, how probable is it that *the author in question would have noticed it* (N)?

(2)   If H were true and the author had noticed it, how probable is it that *he would record it* (R)?

(3) If H were true, and the author had both noticed and recorded it, how probable is it that *this record would have survived and that contemporary historians would be aware of it* (S)?

In more formal terms, these three questions amount to a request for three numbers: P(N|H), P(R|H & N), and P(S|H & N & R).[24] Since (N & R & S) entails E, we can approximate the critical value P(E|H) by the product

$$P(N|H) \times P(R|H \ \& \ N) \times P(S|H \ \& \ N \ \& \ R)$$

noting that this is equivalent to P(N & R & S|H), which in turn must be less than or equal to P(E|H).

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[24] By the Theorem on Total Probability, P(E|H) = P(N & R & S|H) × P(E|N & R & S & H) + P(~N ∨ ~R ∨ ~S|H) × P(E|(~N ∨ ~R ∨ ~S) & H). Since *ex hypothesi* (N & R & S) entails E, P(E|N & R & S & H) = 1; we can therefore simplify the algebraic expression for P(E|H) by dropping that term, yielding P(E|H) = P(N & R & S|H) + [P(~N ∨ ~R ∨ ~S|H) × P(E|(~N ∨ ~R ∨ ~S) & H)]. Expanding P(N & R & S|H) into a series of simpler conditional probabilities by successive applications of the conjunction rule yields P(N|H) × P(R|H & N) × P(S|H & N & R). By substitution, we arrive at P(E|H) = [P(N|H) × P(R|N & H) × P(S|R & N & H)] + [P(~N ∨ ~R ∨ ~S|H) × P(E|H & (~N ∨ ~R ∨ ~S))].

Each term in the product corresponds to one of the rules $R_1 - R_3$. If *any* of these terms is low, the product will be low; if several of them are low, the product will be *very* low. And a very low value for P(E|H) means a value for P(~E|H) that is close to 1, which in turn entails that the critical ratio

P(~E|~H)/P(~E|H)

cannot be much greater than 1, and the argument from silence will have negligible traction.

We can make this abstract discussion more vivid by considering the effect on the argument of a modest level of uncertainty in the three critical terms. If just two of them have a probability of .7 apiece, and the third is granted as certain, the total force of the argument from silence would be not quite enough to move a rational agent, by conditionalization, from a probability for ~H of .5 to a probability of .67—a change from even odds to 2 to 1 odds. If each of the three terms has a probability of .8, the result is similar. If each has a probability of .9, the argument would shift the probability of ~H from .5 to about .79. Giving each term a probability of .67 would yield an argument so weak that conditionalizing on this evidence would not, by itself, shift the probabilities of a rational agent from 0.5 to 0.6.[25]

What sort of information, then, is necessary for us to get a grip on the relevant probabilities? In the case of historical inferences in which arguments from silence are commonly employed, we may often safely assume that P(~E|~H) is quite close to 1—a best-case scenario for an argument from silence. The requisite conditions are honesty and knowledge on the part of the writer of a historical narrative, since one or the other of these must fail for him to describe as actual something that did not happen at least broadly as described. We feel confident, for

[25] In all of these scenarios, we are assuming that the extra term [P(~N ∨ ~R ∨ ~S|H) × P(E|H & (~N ∨ ~R ∨ ~S))] is zero. Any positive value of that term will in most circumstances be so small as to have a negligible effect on the force of the argument from silence.

example, that Pliny the Younger would *not* have written about the destruction of the town of Herculaneum by the eruption of Mt. Vesuvius if Vesuvius had *not* erupted and buried it.

And what should we expect him to have written if it *had* erupted and buried the town? Here, the Bayesian formalism gives us no general answer, for the numerator and denominator of the critical ratio are independent quantities. Nor are the two conditions mentioned sufficient to ground a judgment about the case. Allowing that Pliny was both honest and fully informed, nevertheless there are many possible reasons for his not having mentioned the sudden destruction of Herculaneum. He *might* simply have forgotten to mention it; he *might* have considered the matter incidental to what he was writing; he *might* have been saving that fact for a subsequent epistle; he *might* have discussed it already (perhaps in some document now lost) and have been disinclined to repeat himself; he *might* have considered it indelicate to mention the fact in a particular context or to a particular audience. And he *might* have had some other reason that we, separated from him in culture, language, time, and space, cannot easily imagine.

This lack of symmetry between reasons for mentioning an event and reasons for omitting it brings us close to the heart of the difficulty with arguments from silence. For there are indefinitely many reasons that an honest and well-informed writer might omit to mention some fact that, from our perspective, would have been most natural for him to include; and unless we are justified in ruling out all, we are not in a position to rest significant weight on the omission. In probabilistic terms, when we are not justified in evaluating $P(\sim E|H)$ at something fairly low, we are not justified in taking $P(\sim E|\sim H)/P(\sim E|H)$ to have a value substantially greater than 1. Therein lies the key problem in arguments from silence.

There is an instructive analogy between arguments from silence and the category of negative evidence in law. According to a longstanding canon of evidence, negative

evidence—testimony from a witness saying that he did not see or hear a certain thing—is considered to be weaker than positive testimony from another equally credible witness that he *did* see or hear it.[26] Adapting the abbreviations discussed earlier, the legal presumption is that t_1H outweighs $t_2\sim H$, so that $P(H|t_1H \; \& \; t_2\sim H) > P(H)$. This presumption of superiority is defeasible. If the fact positively attested is such that the negative testifier *could not have failed* to observe it, had it occurred, then negative and positive testimony may be considered to be of equivalent weight, though the mere word of the negative testifier that he could not have failed to see it will not by itself suffice to raise his testimony to the standard of positive evidence.[27] But unless that strong condition (reminiscent of R_1) is met, the same asymmetry obtains between positive and negative evidence as between arguments from testimony and arguments from silence.

And in the case of the argument from silence, the case is even worse than that of negative testimony, in two ways. First, here we have, not the distinct assertion of some ancient writer that an event did not occur or a work did not exist, but rather merely the *omission* of any reference to it: $\sim tH$ is even weaker evidence than $t\sim H$. Second, recalling R_3, all that we are entitled to say is that there is no reference to it in any of that writer's *surviving* works. Both factors tend to weaken the argument from silence; and the more of a writer's works we know or can reasonably suppose

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[26] See Edgar Whittlesey Camp and John Finley Crowe, eds., *The Encyclopedia of Evidence*, vol. 9 (Los Angeles: L. D. Powell Co., 1906), pp. 867-68, in particular the cases cited in notes 10-13.

[27] "To entitle the testimony of a witness that he did not see or hear a certain thing occur at a particular time and place, to the same weight upon the question of whether it did occur or not, as that of an equally credible witness that he saw or heard the occurrence in question, it must appear that the opportunities of the former were at least equal to those of the latter, and that his attention was specially directed to the matter; and whether this was so or not is to be determined, not merely from his own opinion or statement that the occurrence could not have taken place without his seeing or hearing it, but from all the evidence bearing on the subject." Killian *v.* Georgia R. & B. Co., 97 Ga 727, 25 S. E. 384. Quoted in Camp and Crowe, *The Encyclopedia of Evidence*, vol. 9, p. 870, note 19.

to have been lost to us, the less weight we are entitled to place on mere omission in the remainder.

Calibration

Where a formal analysis proves insufficient to guide our reasoning, we can try to get a rough estimate of how well we do when shooting from the hip. How good a guide is our untutored intuition regarding the key question of whether a given writer would mention a certain fact or event that did, in fact, transpire?

There is no obvious way to measure this quantitatively. But we may get some sense that we are prone to overestimate it by considering situations in which the event in question undoubtedly did transpire but we have, in the extant writings of a contemporary witness or witnesses, no mention of it. Our surprise at their omissions is admittedly only a qualitative measure of our tendency to overestimate the conditional probability in question. But if that surprise is very great, it may serve a legitimate role in helping us to calibrate our expectations.

In some ways, the best sort of evidence for calibrating our expectations would be arguments from silence that have been advanced and then had their conclusions proved false. But examples of this sort in historical work are somewhat rare, in part because the proponents of arguments from silence are not often prepared to abandon their position in the face of positive evidence. Still, there are some cases where the scholarly consensus is solidly on the side of the actuality of the event. In each of the following cases, we have other sources of information about the event or fact in question; that is inevitable, since we cannot make use of such instances for calibration unless we know that an argument from silence drawn from a more limited set of data

would be in error. And of course the survey here is unsystematic. But I do not see any obvious way in which this can be helped. If our question is how much to infer from silence, we must look at instances of silence; if we are wondering how often it *might* mislead us, we need to test our intuitions in cases where we know, on independent grounds, that it *would*.

One interesting case pits archaeological evidence against an argument from silence. As Henige explains,

Several separate digs in and around Bergen, Norway turned up indications of a major conflagration there ca. 1225-30, but the relevant annals record no fires between 1198 and 1248. Archeologists have considered, and rejected, the hypothesis that a number of coeval small fires—each too small to make the annals—account for the available archaeological evidence, leaving it a straight contest between the two forms of evidence.[28]

Which consideration should take precedence, the archaeological evidence of a large-scale conflagration, or the omission of any mention of it in annals that contain descriptions of numerous other fires? An archaeologist and a historian, working in collaboration, determined that the archaeological evidence carries the case.[29] A key point in their analysis is that sagas and annals of the time record fires selectively—to advance a plot, secure royal favor, or tell of the demise of notable persons. Since it met none of these criteria, the Bergen fire was passed over in silence. Henige draws a cautionary moral:

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[28] Henige (2005), p. 75.

[29] Rory Dunlop and Jón Vidar Sigurdsson, "An Interdisciplinary Investigation of Bergen's Forgotten Fire: Confrontation and Reconciliation," *Norwegian Archaeological Review* 28 (1995), pp. 73-92.

If true, this episode should encourage those using the medieval written records to be more careful about arguments from silence than they might have been in the past. While no one thought of these sources as comprehensive, it had seemed reasonable to assume that, if they recorded as many fires as they did, then they probably attempted to record all major fires. That they apparently did not do this after all throws unwelcome light on both their completeness and their objectivity.[30]

But a wider set of examples is desirable for any meaningful calibration of our expectations. Here we may take guidance from the optimistic claim of Langlois and Seignobos: "That which is conclusive is not the absence of any document on a given fact, but silence as to the fact in a document in which it would naturally be mentioned."[31] If it turns out that our judgments as to what "would naturally be mentioned" are frequently and systematically mistaken—specifically, if we are prone to assume that some undoubtedly real fact or event would be mentioned by a particular author or authors who do *not* mention it—then we ought to temper our expectations. Here, then, are some examples of unexpected silence from the annals of history.

The principal historians of ancient Greece, Herodotus and Thucydides, make no mention of Rome or the Romans, nor do any of their contemporaries whose writings have survived—a curious omission noted by Josephus in his work *Against Apion* 1.12 (Loeb #66). Though Rome was not yet the world power it would in due course become, the Republic was already established by the beginning of the fifth century BC, and the volatile military situation in the

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[30] Henige (2005), p. 75.

[31] Langlois and Seignobos (1904), p. 256.

Italian peninsula might have been expected to draw at least some notice from contemporary historians.

Nor is this the only omission in works from that era. Thucydides's *History* makes no mention of Socrates, whom we would now be inclined to view as one of the most important and interesting characters in Athens in the twenty years covered in that work. The works of Thucydides themselves go unmentioned in the surviving works of Aristotle and Xenophon; we must, in fact, wait two and a half centuries, until Polybius, to find a historian who takes notice of Thucydides.

Roman authors are also strangely silent about events that we can scarcely imagine passing over in silence ourselves. To recur to an example used earlier: in two long letters to the historian Tacitus, Pliny the Younger gives a detailed account of the eruption of Mt. Vesuvius—yet strange to relate, the governor of Bithynia never mentions the destruction either of the wealthy town of Herculaneum or of the more heavily populated Pompeii. Hadrian's secretary Suetonius also discusses the eruption of Vesuvius; but he, too, neglects to tell of the destruction of these towns. They are first named about a century after Pliny by Dio Cassius (*Roman History* 66), who not only could not have been an eyewitness but in all probability never spoke to one. Dio's florid description of the eruption, overflowing with fantastical and pointless embellishments, is hardly worthy to be mentioned in comparison with Pliny's sober firsthand account, and his claim that the inhabitants were overwhelmed while sitting in the theater is demonstrably false. Yet for all that, an inference drawn from the silence of Pliny and Suetonius would mislead us, for archaeology has long since unearthed these ruined cities.

The same phenomenon can be found in Christian authors of late antiquity. Eusebius wrote a detailed biography of the Emperor Constantine, yet he does not mention the deaths of

Constantine's son Crispus or his wife Fausta. Here, at least, we may hazard a guess as to a motive for the omission; it would be difficult for a Christian writer to rationalize either the murders or the methods used. But if we were not informed in advance of the omission, we might well open the work with some curiosity as to how Eusebius would handle the whole affair. Hindsight alters our expectations.

The advent of printing in the west drastically altered the rate at which information proliferated and the proportion of it that was preserved. Nevertheless, English writers in the era of the Scientific Revolution also afford instances of our theme. Francis Bacon and William Shakespeare were nearly exact contemporaries, each with a large literary output, yet neither mentions the other. John Milton and Jeremy Taylor also fail to take notice of each other. Henry Oldenburg, secretary of the Royal Society, stayed in London with his family during the devastating plague of 1665-66 and kept up his voluminous correspondence throughout the period, yet he mentions the plague only once, in passing, as an explanation to Spinoza for why a book had been delayed in the mails.[32]

It would be both easy and (for the reader) tedious to go on. Anyone who is not impressed with these striking examples of unexpected silence is unlikely to be convinced by the further multiplication of examples. But granting that our expectations of silence are often out of line with the historical facts, it is worth inquiring how we might explain the magnitude of the mismatch. How might we come to be simultaneously so confident and so frequently wrong?

Here, cognitive psychology offers us a clue. It is well known that humans are prone to overestimate the probability of a conjunction *vis a vis* the probability of the conjuncts, essentially

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[32] Frederick Pollock, "Benedict de Spinoza," *The Nineteenth Century* 3 (London: C. Kegan Paul & Co., 1878), pp. 338-39.

underestimating the rate at which the multiplication of probabilities reduces a number.[33] In the case of arguments from silence, the reconstruction offered in this paper features just such a conjunction: $P(N|H) \times P(R|N \& H) \times P(S|R \& N \& H)$.[34] There is, then, a mechanism at hand to account for overconfidence with respect to inferences from silence: the critical term in a Bayesian reconstruction of the argument is just the sort of thing we are apt to misevaluate in the direction that would lead to overconfidence.

The limits of silence

In historical inquiry, we must make do with the evidence we have, for we cannot generate new data by experimentation. To be sure, an Egyptologist may look forward eagerly to the news from the latest archaeological dig at Thebes, but no one can guarantee that it will disclose fresh

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[33] On this point see J. Cohen, E. I. Chesnick, and D. A. Haran, "Evaluation of Compound Probabilities in Sequential Choice," *Nature* 232 (1971), pp. 414-16, and "A Confirmation of the Inertial-ψ Effect in Sequential Choice and Decision," *British Journal of Psychology* 63 (1972), pp. 41-46, M. Bar-Hillel, "On the Subjective Probability of Compound Events," *Organizational Behavior and Human Performance* 9 (1973), pp. 396-406, and Raymond S. Nickerson, *Cognition and Chance: The Psychology of Probabilistic Reasoning* (Mahwah, NJ: Lawrence Earlbaum Associates, 2004), pp. 290 and 342-43.

[34] Some research (e.g. Kahneman and Tversky, "On the Study of Statistical Intuitions," in *Judgment Under Uncertainty* (New York: Cambridge University Press, 1982), pp. 493-508) suggests that a bias in favor of representativeness will frequently lead reasoners to make incoherent probability judgments regarding $P(A\&B)$ and $P(B)$. Recent attempts to reproduce this result seem to indicate that it is less robust than Kahneman and Tversky originally thought. But in the case at hand, the effect of conjunction need not be so radical as to introduce this sort of incoherence; it suffices that our unreflective judgment of $P(N\&R\&S|H)$ tends to be significantly greater than that of the equivalent product $P(N|H) \times P(R|N \& H) \times P(S|R \& N \& H)$.

information about Thutmose I. Under such conditions, it would be a hard thing to suggest that we ought not make use of every scrap of evidence we do possess, however feeble. Even small evidential presumptions may make their contribution to a cumulative case that deserves respect. Yet as we have seen, the argument from silence often *is* feeble. With all due allowance for the widely divergent situations in which one might be tempted to employ the argument, it seems reasonable to draw a cautionary moral or two.

It will help if we return for a moment to some of the examples considered at the outset. In the case of the *Donation of Constantine*, one might argue that the absence of references in extant sources for several centuries after Constantine's death creates some presumption against the authenticity of the document. Allowing this to be so, however, the principal reason for dismissing the *Donation* as a forgery is the presence in the document itself of numerous incontestable anachronisms. Philology, not silence, was the decisive weapon wielded by the fifteenth century scholars Lorenzo Valla and Reginald Peacocke in their demonstration of the forgery. The contribution of silence to their argument is slight indeed.

Even that slight presumption owes whatever force it has to the complete silence of contemporary sources regarding the *Donation*. The case of silence regarding breastplates in the *Odyssey* is quite different, since they are mentioned repeatedly in our extant manuscripts of a work of equal antiquity—and one, moreover, in which the descriptions of battles and armor might more naturally be expected. It may be doubted whether the silence even of several documents regarding a single contemporary event or fact is ever, by itself, sufficient to overturn the positive assertion or manifest presupposition of that event or fact in a document of comparable antiquity and credentials.

We do, of course, often disbelieve things claimed in ancient documents, sometimes when they are the only sources to make the claims. But when we do, the weight of the argument almost never rests on the silence of other sources alone; it rests on other factors such as the antecedent incredibility of the claim or direct and explicit contradiction of the claim by some comparable authority. Omission alone does not have the evidential force of an explicit negative claim. The reasonableness of the conclusion should not be confounded with the strength of silence as a consideration in its favor.

It undoubtedly strengthens an argument from silence when there are multiple independent sources, close in time to the ostensible event, varied in authorship and genre, all of which betray no sign of the fact or event in question, particularly when the matter seems obviously to lie within the scope and purpose of those sources. But the examples of the silence regarding Rome and the Romans in Greek sources, the effects of the eruption of Vesuvius, and the Bergen fire should temper our enthusiasm for the argument from silence even in these most favorable cases. Where significant historical issues hang in the balance, even fairly extensive silence in the existing ancient documents may, by itself, be insufficient to persuade cautious scholars. And if, in addition, the argument asks us to sweep out of view some positive evidence of comparable antiquity, we may expect reasonable scholarly judgments to reflect, to a very considerable extent, the relevance of other considerations and prior commitments. At the very least, anyone who proposes to advance an argument against such a direct assertion on the sole basis of silence cannot reasonably expect it to pass unchallenged.

I will close with a modest proposal. Anyone who puts forward an argument from silence in historical inquiry should offer explicit arguments for each of the three claims corresponding to the three terms in the critical product—should offer, that is to say, separate arguments that (1) the

event or fact would almost certainly have come to the notice of the author or authors in question ($P(N|H) \approx 1$), (2) the author or authors would have recorded or in some other clear fashion given evidence of the fact, had they noticed it ($P(R|N \text{ \& } H) \approx 1$), and (3) the work or works in which this was done would have survived to the present era and come to the notice of contemporary scholars ($P(S|R \text{ \& } N \text{ \& } H) \approx 1$). Exact numbers are, of course, unnecessary, but as we have seen, the standard to which such arguments must be held is very high. For if at any of these three points a cogent argument cannot be made, the argument from silence, whatever its superficial attractions, will be weaker than almost any other kind of historical evidence.

Endnotes