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DO THE FALLACIES YOU FAVOUR RETARD THE GROWTH OF KNOWLEDGE?

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Abstract:

A simple way to approach fallacies is to ask, "Has reasoning-strategy X retarded or halted the growth of knowledge?" and seek uncontroversial historical events as empirical support for the fallacy moniker. Historical support also offers a means of retiring reasoning strategies heretofore thought fallacious—they are wrongly accused if they helped drive knowledge. Finally, this approach allows us to be more critical of our argumentative practices. Evidence is offered for an Intuitive Fallacy: In its extreme form it rules out the possibility of (contradicting) evidence; in its weaker form, it is a non-response to evidence that appears to be a response.

[Knowledge of fallacies is] ... useful in one's own personal researches; for the person who is easily committed to a fallacy by someone else and does not perceive it, is likely to incur this fate himself on many occasions.

(Aristotle, *Sophistical Refutations* 16 175a)

In a companion paper¹ to this one, I posited an imaginary woman who is trying to decide among the rich assortment of theories about argumentation, informal logic, and critical thinking. How should she choose? She could pick the view(s) most intuitively attractive to her, but (in my imagination in the last paper) she decided that she needed some sort of external support for her theory-choice. By "external support" I mean evidence as it is understood in the interfield sense. Unfortunately, in philosophy "evidence" has been distorted to include *claims* about the external world.² Part of my job in this paper will be to argue against this distortion.

In the previous paper I supplied my imaginary woman with some external support in the form of three of history's most epistemically successful arguments, that of Mill on the intellectual equality of women, Darwin on evolution, and Newton on motion.³ These arguments from disparate fields drove the growth of knowledge. They also share some surprising features. All three arguments were highly counterintuitive for their time and seemed unreasonable in light of the going alternatives, so much so that all three authors delayed publishing for years. Other features the arguments have in common is that all contain a great deal of external support although (another surprise), some of that external support turned out to be false. Finally, there is little or no appeal to like-minded authorities, which appeal I have called "moral support" to distinguish it from external support, the latter being events or objects outside of any person's mind. In the last paper I suggested that these powerfully epistemic benchmark arguments, which form major foundations in social studies, physics, and biology, suggest that "reasonableness," far from being a reliable standard, is a constantly-changing intuition.

I had hoped to convince my imaginary woman by this argument, but I now imagine that I have not. She is so

surprised by all of this that she resists. I will now argue that a lot turns on the way that she resists.

Resistance of the sort that helps to grow knowledge versus fallacious reasoning strategies

So much has been written about the fallacies that some people are now beginning their contributions by remarking on that fact! For the moment I am interested in picking up on only one thread in this thick skein, Aristotle's notion of a misrefutation (Soph. Ref. 167a 21-34), most helpfully laid out by Tindale,⁴ and consistent with the interpretations of Hamblin and Walton that a fallacy has a deceptive quality.⁵ Thus, misrefutation is generally thought to be resistance of a sort that appears to be a response, but is actually, unbeknownst to the arguer, not a response at all. I would extend this point to claim that a misrefutation is a non-response because it is not conducive to the growth of knowledge (yet appears to the arguer to be so), and is therefore fallacious for those reasons. This definition captures, I believe, the concern that Aristotle had to identify reasoning strategies which looked proper but which threw both arguer and respondent off their epistemic track.⁶ I will suggest that the way that some argumentation theorists handle their intuitions in the course of their arguments is one such mistake. First, I will distinguish between initial intuitive responses and those which act as final arbiter.

Initial intuitive resistance appears to be a very good thing; it's how one manages one's intuitions that is crucial.

Intuitive resistance to then—current reasonable views⁷ presaged the arguments of Darwin, Newton, and Mill—and their arguments eventually defeated those views. If my imaginary woman remembers this, she will have external support for her conclusion that intuition is an invaluable *starting point* in theory production and argumentation. And recalling the success that superior external support eventually brought to these three arguments, despite their flaws, the imaginary woman could go seek external support of some sort for her view(s) about argumentation. On the other hand, my imaginary woman may be too busy or just too lazy to go out and hunt down external support for her intuition(s). But as long as she *expects* external support of some sort to eventually settle her intuitive differences with an alternative theory about argumentation—expecting things to be settled on her side, of course!—then her reasoning strategy would appear to be congruent with that of Newton, Darwin, and Mill, even though she will hardly have been as active as they in driving knowledge. Or she might criticize the quality of the external support arrayed against her view, as did Darwin, Newton, and Mill. I will offer examples of this type of helpful negative criticism shortly.⁸

The Intuitive Fallacy lies in making intuition teleological

My imaginary woman thinks about my advice to trump intuition with (the expectation of) external support, but she is both cantankerous and observant. She looks through the literature on argumentation and informal logic and finds intuition frequently holding court as final arbiter, with argument bent to serve it. In one book alone, the recent *New Essays in Informal Logic*,⁹ that has contributions by some of the field's foremost theorists, she reads:

However we may clarify the concepts of premise acceptability, relevance, or weight, our intuitive

understanding of these concepts indicates that they are necessary conditions for any good, correct reasoning... . (Freeman 1994, p. 37)

She reads another contributor, who notes in passing without any apparent sense of oddity, that:

Anderson and Belnap have their critics, many of whom challenge the ability of their relevant logic to salvage our intuitions about validity. (Tindale 1994, p. 73)

Still another seems rather self-deprecating about his external support because it supports the general intuition of his audience:

Of course, this general positive conclusion ought to be no surprise to the informal logician: the most it may do is to give explicit articulation to his basic intuitions. (Finocchiaro 1994, p. 31)

Yet another theorist notes:

On the one hand, we can despair of (R), which runs uncomfortably against the nap of intuitiveness....," (Woods 1994, p. 85)

Further down that same page she finds:

The banishment of tautologies and contradictions from the domain and counter-domain of the relevance relation just seems wrong. Intuitively, [a certain logical formula] is relevant to P (or at least entails it)." (Woods 1994, p. 85)

In this last article, "intuition" and its cognates occur 15 times. When it is not invoked in support of a thesis, intuition becomes a lively force to be reckoned with. (Woods 1994, pp. 82-91)

For our imaginary woman, this is external support for her intuition that a very different reasoning strategy occurs in much theorizing in argumentation, informal logic, and critical thinking. "Reasonable," "plausible," "appropriate," also appear frequently, but without apparent external support,[10](#) with "reasonable" offered as a heuristic for deciding when a reasoning strategy of a particular sort (e.g., *argumentum ad misericordiam*) is fallacious and when it is not.[11](#)

My imaginary woman thinks again of the brilliant, unreasonable, counter-intuitive arguments of Mill, Newton, and Darwin, arguments full of external support. It's not as if the makers of these epistemically successful arguments tried to be unreasonable—surely they thought their ideas were more reasonable. The point is that the arguers relied on external support rather than well-argued intuitions that seemed reasonable.

My imaginary woman tries to reconcile this vastly different argumentative approach to intuition. First off, she tries out the idea that a diametrically opposite approach is called for in our case. To support this possibility, she tries out some unreasonable-sounding intuitions, such as that argumentation theorists are perhaps just better at examining their intuitions than are thinkers in biology, social studies, or physics. That does sound hubristic, although she can see from their writings that argumentation theorists are all very bright people. But then, Leibnitz too was very intelligent, so was Descartes, and they were brilliantly correct on some matters[12](#) yet they were certainly wrong in their intuitions about motion, even given the external support they brought to the table for their views.[13](#)

And then a more reasonable-sounding thought occurs to her. "Argumentation theorists aren't *supposed* to do what people in other fields are doing. Perhaps the point of argument is to arrive at consensus."¹⁴ That sounds pretty good until she thinks, "But aren't they trying to get epistemically better too, just like people in every other field, but in their case get epistemically better on the subject of good argumentation?" The imaginary woman might well, at this point, turn to us and ask, "What has caused you to assume that intuition and reasonableness are pole-stars to the truth?"

The Intuitive Fallacy may be a vestige of Foundationalism

Freeman has recently argued that the dialectical model of argumentation suggests an antifoundationalist view of knowledge. In making his case that the ideal of deduction takes pride of place in a Cartesian epistemology, he offers the following:

It would seem that the only basic premises an individual knower could take from someone else would be premises that would need no justification, that he could ultimately discover for himself, because they are *self-evident*. [italics his]. And what of the propositions an individual comes to believe of himself? It would seem necessary for knowledge here that these beliefs either be derived from what is known or wear their certainty on their sleeves. Again, the basic premises of knowledge must be self-evident.¹⁵

Along with the tendency to favour deductive reasoning, the self-evidently reasonable self-evidence of intuition in much theorizing about argumentation is a reasoning strategy that may also be a vestige of foundationalism. This connection between the teleological use of intuition and foundationalism has not, to my knowledge, been suggested until now.

The (inductive) argument that making intuition teleological is fallacious

"These intuitions of yours about foundationalism are all very interesting," my imaginary woman replies, "but where is your external support for the idea that intuition as an end-point is an inadvisable reasoning strategy, hence fallacious?"

Here is the argument. Much (though not all!) of what we consider to be knowledge in other fields was at first thought unreasonable or far-fetched by workers in those fields. The following theories beggared an intuitive common sense that had been built up by ordinary perception and the then-available external support: motion,¹⁶ the Bible in English,¹⁷ continental drift,¹⁸ zero population growth,¹⁹ gravity,²⁰ lending money for interest,²¹ light,²² germs,²³ the relationship between ourselves and animals,²⁴ meteoric impact on Earth,²⁵ clonal selection in immunology,²⁶ the idea of wearing seatbelts while travelling,²⁷ that the body's immune system wages a close war with the AIDS virus over years,²⁸ sexual reproduction in plants,²⁹ programmed cell death (apoptosis),³⁰ ozone depletion and the decline of frog populations,³¹ private property,³² black holes, an order of nuns serving the poorest poor,³³ that bed-wetting in children has a genetic cause, that a bacterium causes ulcers,³⁴ quantum mechanics,³⁵ the possibility of a quantum computer recently,³⁶ the navigational flight of birds,³⁷ that sugar turns to alcohol because yeast eat and excrete it,³⁸ even a strange but possible reason my imaginary woman would more readily accept my counter-intuitive view of argumentation if she were a younger sibling³⁹—all of these

views were thought peculiar, counter-intuitive when they were first raised. Yet they have formed our contemporary sensibility of "reasonable" because the external support for these views was eventually found to be superior to their alternatives.

Consider also the *retirement* of formerly reasonable ideas for want of external support:

the evil eye, phrenology⁴⁰, the divine right of kings⁴¹ that sugar causes hyperactivity in children⁴², that a poor woman nursing a queen's child would confer on the baby "peasantness."⁴³

Given all of these theories, which passed into or out of reasonableness and intuitive (un)likelihood by dint of external support or the lack thereof, what are the chances that we argumentation theorists will be able to carry off the foundationalist trick of driving knowledge by arguing solely from our intuitive certainties?

My Imaginary Woman protests that some common-sense intuitions are implicit in my argument. I agree, but argue that the most important one has considerable external support.

My imaginary woman notices that in compiling this long list of counter-intuitive theories, I am still relying on intuitions, e.g., about how best to present my case or about the intuition that the more theories I can find for this list the stronger my argument will be. In the latter case, there is good support for the widespread intuition that, as Jacob Bernoulli noted two hundred years ago, "a particular thing will occur or not occur in the future as many times as it has been observed, in similar circumstances, to have occurred or not occurred in the past." Bernoulli produced what has been termed a "pathbreaking analysis of the interpretation of numbers," crucial to the development of statistics and therefore to the notion of a multiplicity of external support. In a delightful aside in the *Ars Conjectandi*, Bernoulli noted:

For even the most stupid of men, by some instinct of nature, by himself and without any instruction (which is a remarkable thing), is convinced that the more observations have been made, the less danger there is of wandering from one's goal.⁴⁴

Applying this insight to argument theory, the more observations of salient arguments which drove the growth of knowledge, the less danger of wandering from the goal of discovering the difference between good argument and bad, no matter how counter-intuitive the result may at first seem.

My Imaginary Woman demands direct external support for the claim that Alternative Argumentation drives the growth of knowledge. I offer her evidence, using the interfield heuristic of interrupting a purported cause.

My imaginary woman knows that a number of theorists have claimed a crucial importance to alternative argumentation, or a dialectical approach in the areas of argumentation, informal logic, and critical thinking, although not everyone.⁴⁵ Yet if the "minority" arguments of Newton, Darwin, Mill, Galileo, and a host of other contributors to the growth of knowledge can tell us anything, it is that just because a majority of theorists hold to some claim at a given historical point, that fact is no guarantee of the correctness of the claim. Some external test of the claim is necessary. A common strategy in the social and natural sciences is to create or to find cases where one's purported cause has been removed, and to see if the effect still obtains. Here the effect, as I've construed

it, is the growth of knowledge, with the putative cause, alternative argumentation. What would happen under a reasoning strategy whereby alternative argumentation were prohibited? Might people still be able to accumulate more knowledge? As I work my way through this evidence, I will also show some helpful negative criticism. Later I will show examples of negative criticism which I believe to be fallacious.

Three historical cases of interrupting alternative argumentation: Lysenkoism in the USSR and China, and McCarthyism in the US

In the perhaps understandable desire to break ranks with everything Western that smacked of capitalism, Stalin embraced the "peasant-biologist" T. D. Lysenko's view that acquired characteristics were inherited, a view which provided a more reasonable fit with Marxism and dialectical materialism. Lysenko managed to have any Soviet biologists with other views arrested. Then for years Lysenko and his co-workers presented papers making claims, such as that plants consciously thin themselves out in a forest. Articles appeared which claimed transformations of wheat into rye, and barley into oats. Khrushchev also accepted Lysenkoism. During this period of 1937-1964, not one piece of useful knowledge was discovered, despite the fact that before this era Soviet biological studies were among the most productive in the world. This case is especially striking because physics, unencumbered by prohibitions against alternative argumentation, proceeded apace in the Soviet Union.[46](#)

In a most helpful criticism directed against this evidence, Jonathan Adler asked, "How can you separate the lack of alternatives as the causal factor from the fact that Lysenkoism was simply *wrong*? For example, what if the Soviet government had decided "It's Darwin and genes all the way"? This response seemed to me to be quite a serious blow to my evidence, but I stuck to my intuition that at some point I might find a way to answer Adler with evidence. The answer came in the form of finding that Darwin was, through no fault of his own, wrong about inheritance and the origin of variation, confused about varieties and species, and unable to elucidate the problem of the multiplication of species[47](#). So Bilibicizing the *Origin of Species* and enforcing it in the way of Lysenkoism would have meant that the 20th century had no science of genetics, nor of immunology.

But still, my imaginary woman, armed with Bernoulli now, might well criticize this evidence as simply an unlikely occurrence. Isn't it possible that the lack of new biological knowledge during Lysenkoism in the Soviet Union was a fluke? As it happens, we have an additional test case because Mao Tse Tung welcomed Lysenkoism into China. Supportive of the more communistic intuition that plants cooperate rather than compete for space and sunlight, Lysenko proposed high-density planting because, according to his "law of the life of species," individuals of the same species do not compete but help each other survive. Mao's belief in close planting led to this practice in nearly every commune in China with wheat, sorghum, cotton, millet, and every other important crop. The results were that the seedlings died. Like Darwin's theory, Lysenkoism took no account of the reality of the gene, nor the importance to heredity of the chromosome (Qingdao, Schneider). But Lysenkoism could not *grow out of its mistakes* in the way Darwinism did, because the mechanism of free-wheeling alternative argument was shut off.

The stakes in China were not only theoretical. Because Mao dealt harshly with those who argued against his clear intuitions that Lysenkoism would work, as many as 30 million peasants may have starved to death during the years 1960-1962.[48](#) Mao seems to have been so convinced of the rightness of Lysenkoism that when he was told that the peasants could not send the astronomical amounts of grain to the cities he had demanded, he assumed the peasants were hoarding all the excess for themselves. Ironically, five years earlier, during the

"hundred flowers" period of greater freedom of speech, Lysenkoism had been roundly criticized by China's premier bioscientists for failing to produce evidence of its transformist claims. Yet the plea for evidence fell on deaf political ears. The consensus among Chinese scientists and Western historians chronicling the phenomenon today is that "The general harm of Lysenkoism for China's bioscientists lay in the fact that it prevented or delayed for decades the realization of their great potential to develop science education and research, and to improve agricultural productivity."[49](#)

The fact that these two cases entail communist societies raises the helpful negative criticism that, rather than the lack of alternative argumentation, perhaps the *political arrangement per se* of communism retards the growth of knowledge. However, the case of McCarthyism in the US suggests otherwise. Rampant fear of communism during the 1940's and 1950's led even liberals to consider it reasonable to suppress arguments they considered dangerous to democracy. Instead of following the European model of permitting a communist party to form and to compete in the marketplace of ideas, under the leadership of Senator Joseph McCarthy and with the backing of the Federal Government, various people were accused in public hearings. By a conservative estimate, 10,000 people lost their jobs. In a chapter entitled "The Legacy of McCarthyism," historian Ellen Schreker notes that "McCarthyism's main impact may well have been in what did not happen rather than in what did—the social reforms that were never adopted, the diplomatic initiatives that were not pursued, the workers who were not organized into unions, the books that were not written, and the movies that were never filmed."[50](#) But she does note that "the most obvious casualty was the American left ... the network that had created a public space where serious alternatives to the status quo could be presented." With no movement on their left, moreover, moderate reformers were more exposed to right-wing attacks and rendered less effective (p. 93). Another clear result, according to Schreker, was that public criticism in America of her role in the world was nil from 1948 until the early 1960's (p. 93).

These cases are empirical support that violation of the Pragma-dialectical Rule #1 is fallacious

These historical cases suggest that alternative argumentation drives knowledge, given that the interruption of alternative argumentation has halted the growth of knowledge. Thus, Lysenkoism and McCarthyism offer external support that violation of Van Eemeren and Grootendorst's first pragma-dialectical rule is fallacious. That rule is: Parties must not prevent each other from advancing standpoints or casting doubt on standpoints.[51](#) While other reasons could be adduced for this rule, e.g., courtesy or a sense of fair play, this external support makes an arguably deeper case by providing an epistemic reason that goes to the heart of what argumentation is for, namely the growth of knowledge.

The outright ban on alternatives is, I would suggest, an extreme form of the Intuitive Fallacy, one in which dialogue is misperceived as unnecessary to the growth of knowledge. But intuitions of the teleological sort can creep into responses and throw a dialogue off track without appearing to.

Fallacious intuitive responses that bend the argument to the intuitive designs of the respondent rather than speak to the question of external support. "Scan-the-canon" and "Answer to my framework" are examples of these strategies.

Training in philosophy consists almost entirely of learning the canon of (Western) philosophical ideas and learning how to argue cogently as well as creatively within it. So it should not be surprising that, when faced with anomalous data, instead of directly addressing that data as Adler did with his Darwin-and-genes-all-the-way response, people usually try to figure out where the general lines of the argument fit in the philosophical canon. So, for example, instead of thinking "Gee, I wonder if biology dramatically improved again in Russia and China when Lysenkoism stopped," [it appears to have, by the way], thus trying to figure out how tight the aforementioned cause-and-effect evidence is, or wondering where they might find evidence *against* this evidence—instead of these thoughts and true to their training, people often try to figure out which philosopher or school of thought the argument falls under. So, for example, a person might think, "Gee, is this view Kuhnian? Or is this Feyerabend? Positivism, perhaps." (In fact, I take neither moral nor external support from any of these views).

The scan-the-canon response comes naturally to a philosopher, but it is an insidious response because on one level the response has relevance. If external support for a certain philosophical view does come along, that support is *relevant to the philosophical view*. Consider what the atomic theory did for Democritus (as opposed to Anaximenes). The problem is that the philosophical view is *not relevant to the quality of the external support* being offered in the argument! Thus, an innocent blunder is made by the respondent, who thinks she is responding to the argument at hand and driving knowledge when she is not.[52](#)

It may be easier to see the fallaciousness of this reasoning strategy when it is played out in another venue. For instance, Newton's theory of motion was especially counter-intuitive because it appeared to be a throwback to the old, discredited Aristotelian view.[53](#) But to respond to Newton's argument with "Your view sounds a lot like Aristotle's, but you never addressed Aristotle's view about motion in your argument; go back and do that"—this type of demand will not grow knowledge about whether Newton was right or wrong.[54](#) Similarly, likening Darwin's view to the emanationist theory of Plotinus would be barren on the epistemological status of Darwinism, though interesting from the standpoint of the history of ideas. To the ferocious criticism levelled against his views, some of which criticism that he was "unscientific" and "unchristian," Darwin responded with more evidence.[55](#)

"You must answer to my intuitively-preferable framework"

Another way the intuitive fallacy plays out is the strategy whereby the respondent insists that the arguer import fundamental aspects of the respondent's intuitively-attractive view into the arguer's theory. This might entail demands for distinctions that do not obtain in the arguer's theoretical framework. So, for example, a respondent to Mill might counter:

Your argument suffers because it runs together three quite distinct sorts of judgments about women, judgments about their intellect, judgments about their emotions, and judgments about their will. These are judgments which my theory of women's inferiority holds as central in deciding this question.

The hegemonic quality of this counter-argument—its intuitive certainty that Mill's view suffers for lack of consistency with features in its own!—is apparent to us who favour the intellectual equality of women. Surely we would protest that anybody can cook up distinctions, but the cook should serve them along with external support for concluding that they bear on the truth of the issue at hand.

This example that entails Mill would appear uncontroversial. But consider the same type of unsupported

distinction-raising invoked against a *counter-intuitive* argument, and the strategy appears reasonable:

Smith's argument suffers because it runs together three quite distinct sorts of judgments about reasonableness: a) judgments about the reasonableness of the conclusion of the view being argued for; b) judgments about the reasonableness of the premises appealed to in the arguments; and c) judgments about the reasonableness of the principles of inference employed.

It is when one's own distinctions appear intuitively self-evident that one is tempted to fall back on them as teleological, thus failing to respond to the argument without realizing it and at the same time demanding that the arguer import features of the respondent's view into the arguer's theory.

A variant of this reasoning strategy of "answer to my framework" involves criticizing another theory for failing to follow one's favoured heuristic, without sensing any need to offer support for the necessity of that heuristic. For instance, to accuse another view of failing to "analyze" its claims assumes that analysis *per se* will make a view epistemically better. That sounds reasonable to those who intuitively favour analysis, but the case needs to be made.

On the naturalistic argument, "Philosophers have never been required to gather empirical support for their views in the past, so they shouldn't have to produce external support for their views or ideals about argumentation now."

Never having found good external support for a naturalistic fallacy, I can hardly accuse this argument of such.[56](#) But it does seem to be a mistaken view, one which assumes that philosophizing cannot import evidentiary heuristics from other fields, get epistemically better, and remain philosophy. In the spirit of Mill, who in arguing for the equality of women to men could only offer the analog of growing equality among males, I can only offer the analog of the growth of evidentiary tools in other fields. Four hundred years ago physicists did not think that mathematics was important, but its significance eventually became apparent through its use as a tool which could exclude tricky variables and then bring them back into the theoretical equation one by one.[57](#) Similarly, in this century an evidentiary leap was made by anthropologists, who have grown used to employing the techniques of biochemistry and molecular biology, allowing them to look at genes and make inferences about the timing of the divergence of organisms.[58](#) The techniques of molecular biology have similarly affected physiology.

My imaginary woman protests, "Oh, but those are all examples out of science! Don't be silly, we're in the humanities, remember." In fact, a surprising development in the humanities has occurred in the area of Shakespeare scholarship, an evidentiary tool which has already proved its mettle outside of that field. Donald Foster and colleagues have worked out a computer program which is far more refined in determining authorship than its predecessor "stylometrics," the less rigorous pursuit of authorship through repetitions of words and phrases. About eight years ago, Foster used this computerized technique to argue the unreasonable-sounding idea that an elegy (not well written by Foster's own account) was none the less Shakespeare's.[59](#) In the recent kerfuffle over the authorship of *Primary Colors*, Foster was hired to use his technique to determine, among a field of over a dozen candidates, who the anonymous author was. Despite a considerable overlap in syntax and word-usage among the candidates, Foster was able to successfully predict, with unqualified confidence, that the author of *Primary Colors* was Joe Klein.[60](#) One can only wish on Foster the occasion of more anonymous writers on which to test his technique. This ratcheting up of an evidentiary tool in the humanities should be as exciting to us as the witnessing of the birth of a star is to astronomers.

The notion of evidentiary tools is helpful in distinguishing between the idea of a *field* getting epistemically better and the idea that the *intuition* of individuals practicing in that field should get epistemically better. This is, I believe, a confusion underlying the interpretation of the empirical work of Nisbett and Ross, as well as Kahneman, Slovic, and Tversky⁶¹ showing that people—even statisticians!—frequently reason with heuristics that lead to conclusions other than those reached if one were to submit the same question to statistical methods or confirmation theory. Stich, for instance, draws the conclusion that these data challenge in general the notion that human reasoning is veridical.⁶² But recall that the yardstick by which this lack of rationality is being judged is the evidentiary tool of statistics! If one separates the tool from native intuition, there is no need to make a radical break with the notion of epistemological growth. The results of Nisbett et al. are external support for concluding that intuition is a poor mechanism for teleological epistemic purposes. These results show that it's not as if, having done lots of statistics, one grows *intuitively* better at guessing where correlations will or will not lie. The epistemic power lies in the tool, and the tool has been honed (in the case of statistics) over centuries of alternative argument.⁶³

A growth-of-knowledge heuristic suggests retiring the post hoc and ad misericordiam from fallacy status

From an interfield perspective, it seems uncontroversial that statistical methods have driven the growth of knowledge. Like formal logic and all other fields, statistics has a history, a development, and Hamblin's account of the *post hoc* suggests that the inductive version we know today comes out of Aristotle's Rhetoric and pre-dates by fifteen hundred years the development of statistics.⁶⁴ One can only imagine how counter-intuitive it would be to Aristotle to try to explain statistical predictions based on thousands of post hoc inferences!

Certainty founded on one after-the-fact connection is as treacherous as certainty on the basis of (well-argued) intuitions. Yet unlike intuition, which must be trumped by external support, *post hoc* is itself a type of external support, *hence requires more of itself* on any particular issue (cf. Bernoulli, *infra*). For instance, to the observation (and consequent data on baseball players) that left-handers appeared to die an average of a decade earlier, the corrected view that there doesn't appear to be a correlation between left-handedness and earlier death—this corrected view came via more precise statistical methods. It would seem, then, that *post hoc* thinking should be retired from fallacy status, given its stellar performance as an evidentiary tool, driving knowledge on a massive scale across so many fields. One might rather assume that it should be encouraged, given this stellar performance, and given that so much *ad hoc* effort has to go into defending the *post hoc* as fallacious.⁶⁵

Another candidate for retirement might be the *ad misericordiam*. Appeals to pity for the plight of women, slaves, minorities, and in earlier centuries for serfs,⁶⁶ have driven the growth of knowledge about what constitutes just behaviour. Of course there are instances where this reasoning strategy has been abused,⁶⁷ but when it is used under truthful circumstances it would seem a straightforward enough strategy to evaluate in light of alternative considerations. Moreover, without this strategy the dead hand of the old reasonableness can choke. Consider the pitiless intuitive certainty of the 19th century American biologist Louis Agassiz, on the future of the Negro race in the United States:

There is no more one-sided doctrine concerning human nature than the idea that all men are equal, in the sense of being equally capable of fostering human progress and advancing civilization, especially in the various spheres of intellectual and moral activity—Social equality I deem at all times impracticable—a natural impossibility, from the very character of the Negro race ... ⁶⁸





Given the sheer amount of misery in the world, be it human or environmental, the greater worry might be that we meet fresh appeals to pity with numbness rather than epistemic success. My imaginary woman has fallen silent. I wonder if she agrees?


Summary


The foregoing argument and its external support suggest a simple way to approach fallacies, namely by asking "Has reasoning-strategy X retarded or halted the growth of knowledge?" and seeking uncontroversial historical events as empirical support for the fallacy moniker as it applies to strategy X. This paper has offered evidence for a new fallacy, the Intuitive Fallacy, so called because the arguer's intuition is unknowingly misused to retard the growth of knowledge. The historical episodes of Lysenkoism in the Soviet Union and in China, as well as McCarthyism in the United States, suggest that the interruption of alternative argument due to intuitive certainty stops the growth of knowledge. These data support the author's Alternative Argumentation Theory, as well as the claim that it is fallacious to violate Rule #1 of the Pragma-Dialectical Approach laid out by Van Eemeren and Grootendorst. A weaker form of the Intuitive Fallacy is to make intuition teleological rather than preliminary and advisory. It was speculated that this latter misuse of intuition may be a remnant of foundationalism. Two variants of this strategy are "scan the canon" and "answer to my theoretical framework."


The growth-of-knowledge heuristic and its concomitant emphasis on evidentiary tools solves the riddle posed by some cognitive psychologists about the supposed irrationality of human reasoning. This approach also offers a means of retiring reasoning strategies heretofore thought fallacious, and suggests that post hoc and ad misericordiam might be retired from fallacy status because much in intellectual history supports the conclusion that they have driven knowledge.


Notes

1. Missimer (1995a). 
2. Ibid., p. 209. Cf Dancy and Soza's *Blackwell's Companion to Epistemology*, "Evidence," p. 120. 
3. Cf. also Finocchiaro's *Galileo on the Two World Systems* (1997). Galileo's argument would surely also count as such a bench mark argument that drove the growth of knowledge. 
4. In Johnson and Blair (1994) p. 68. 
5. Cf. Douglas Walton (1995), p. 779, "According to longstanding tradition...a fallacy is not only a bad argument, but one that seems good." I break with the longstanding tradition that one can determine the fallaciousness of a reasoning strategy by analyzing its (lack of) reasonableness. This heuristic for determining fallacies also diverges from what Finocchiaro has termed "the semantic intuition that a fallacy is a certain type of logical error" ("Six types of Fallaciousness," in Hansen and Pinto, p. 124). By this heuristic a fallacy is an


epistemological error of a certain type. 


6. I do not mean a fallacy to have the devastatingly opprobrious connotation that Finocchiaro worries about in his "Six Types of Fallaciousness: Toward a Realistic Theory of Logical Criticism," in Hansen and Pinto (1995). Finocchiaro argues that "semantic intuition suggests that ... to characterize an argument as a fallacy is to devalue it to an especially low degree." He prefers the term "fallacious," because "... this term does not seem to possess the finality and annihilating connotation that the word "fallacy" does." (p. 124) I intend the term "fallacy" only as a warning, not an indictment. The goal is to discourage a certain use of intuition by giving it a name people can remember. 

7. The resistance was to the reasonable views as well as to the external support of those views. I do not mean to suggest that arguments for the inferiority of women, or for the impetus theory of motion, or of ideal types in biology did not have external support. 


8. I am grateful to Finocchiaro for pointing out the problem of negative vs. positive evaluation of arguments (cf his 1994a), and for offering external support from the history of formal logic that the actual arguments by which logicians decide on verdicts of formal validity proceed inductively (pp. 27, 31). 


9. Johnson and Blair (1994). 


10 Van Eemeren & Grootendoorst (1995), "The pragma-dialectical research program is based on the assumption that, on the one hand, a philosophical ideal of reasonableness must be developed and, starting from this ideal, a theoretical model for acceptable argumentative discourse." The authors continue in an interesting tension with this remark, "On the other hand, argumentative reality must be investigated empirically, so that it becomes clear how argumentative discourse is in fact conducted." (p. 131). Siegel (1997), "...our aim is to help students...to be *appropriately moved by reasons* (italics in original). Ennis (1994), that critical thinking is "reasonably deciding to believe or to do." 

11. Walton (1989). Cf also Harrie Mazeland (1995), who notes, in a review of Walton's *Question-Reply Argumentation*, that "It is Walton's goal to establish guidelines which would enable a critic to evaluate a question as reasonable or unreasonable in the given context, relative to the given information." 


12. Cf Butterfield (1957) p. 98, on the Cartesian synthesis of algebra and geometry. 


13. Missimer, 1995a p. 206. Pinto has helpfully pointed out that I might be giving some readers the impression that the alternative views to evolution, motion, and women's intellectual equality had no external support. This is not true. 


14. Again the Perelman and Olbrechts-Tyteca view. Cf also Gilbert's (1994) argument for coalescent argumentation. 


15. James Freeman (1994) p. 46. Freeman cites Perelman and Olbrechts-Tyteca as well as Govier as moral support in this view. 

16. Cf Finocchiaro's (1994) "Two Empirical approaches to the Study of Reasoning," on the question of


heavenly motions, which were thought not to exist, that "Galileo ... has to argue every inch of the way through all sorts of controversial issues in order to refute the premise." pp. 3-4. And McClosky, *The Impetus Theory of Motion* for an account of the way in which common sense about motion around us ("Intuitive Physics"). 

17. In the early 16th century a priest, William Tyndale, translated the Bible from the original Hebrew and Greek, on "the revolutionary idea that people should have access to information without mediation by the state," according to Gustav Neibuhr (1997). For this unreasonable view, Tyndale was arrested, publicly strangled and his body burned in October, 1536. 


18. Hallam (1973) reports that Wegener argued that the close fit between the east coastline of South America and the west coastline of Africa supported his theory of continental drift. However, for the most part this theory was dismissed as unreasonable, the supposed "fit" being simply chance. 


19. The late Kingsley Davis, a sociologist and demographics expert, who coined the term and "created a sensation when he... [argued in 1967] that merely distributing contraceptive devices in undeveloped societies would have a negligible effect on runaway population growth ... Although his ideas were disputed at the time, population specialists credit Dr. Davis's approach with increasing the use of contraceptives in developing nations to almost 50 percent today from less than 10 percent." *New York Times Obituaries*, March 5, 1997. 


20. Newton again. Recall that a number of his colleagues called him "unscientific." (Missimer 1995a). 

21. Hill (1975) notes: "The most obvious area in which there were rival concepts of 'reasonableness' [in the 17th century] is the economic. Richard Capel, writing in 1633, admitted that 'most men do think that they have reason to make the most of their money, and (as yet) will see no reason against it'. The individual businessman's conception of what was reasonable was here setting itself up against the preachers' condemnation of usury handed down from a pre-capitalist society." p. 106 "In the fifteenth century, R.H. Tawney observed, the practical man 'had practised extortion and been told that it was wrong; for it was contrary to the law of God.' In the seventeenth century 'he was to practice it and be told that it was right; for it was in accordance with the law of nature.'" p. 105. 

22. The counter-intuitive idea that an object absorbs every colour but the one that it reflects. 


23. The ridicule that met Semelweiss and his consequent mental breakdown are legendary. 


24. Darwin again. 

25. In 1980, Luis Alvarez and colleagues reported that the boundary between Cretaceous and Tertiary sediments contained an anomalously high amount of iridium, which could only have come from a meteor. They argued that a meteor or comet must have caused the mass extinctions at the end of the Cretaceous period. His conclusion was thought so bizarre that it was ignored at a later conference that Alvarez attended, during which mass extinctions were discussed. See Walter Alvarez (1988). Cf also Muller, 1988. 


26. Ada and Nossal (1987). 


27. Considered ludicrous as first. The late physicist, Henry L. Yeagley, suggested quick-release passenger straps


in the early 1930's, but they were rejected for decades as too costly or as something that people would not use. See Noble, 1997. 


28. David Ho reversed the reasonable thinking about the AIDS virus, that after the initial infection it lay dormant in the patient's system for years. "But Dr. Ho had believed, for years before he could actually produce any proof, that HIV didn't sit idle at all, instead ... reproducing itself in massive quantities almost immediately. This implied such a significant reversal in long-held precepts of AIDS research and treatment that, for several years, Dr. Ho couldn't raise federal grant money to explore his theory ...". See Waldholtz, 1996. 


29. Lenhoff and Lenhoff, 1988. 


30. Considered too strange. Ignored for seven years. cf. Duke, Ojcius, and Young, 1996. 


31. Andrew Blaustein and co-workers found this correlation, and it is a particularly interesting case because Blaustein himself reports that he thought his own hunch was unreasonable: "We were shocked...we didn't think we'd find anything. We said 'O yeah, sure, UV, ha ha ha.' When we got the results we still couldn't believe it so we replicated it and now we believe." *Science Times, New York Times*, June, 1995. Cf also Blaustein et al., "UV Repair and resistance to solar UVB in amphibian eggs: A link to population declines?" *Proceedings of the National Academy of Science* 91: 1791-1795. 


32. Again, passed from unreasonable to reasonable in 17th Century England (Hill, 1975). Cf. p. 106, on the enclosure of manorial property. 


33. Mother Teresa's "wild notion of founding an order devoted to the poorest of the poor was not at first welcomed in Rome nearly half a century ago." See Crossette, 1997. 

34. Supplanted the stress-acid theory, despite considerable initial skepticism (cf "The Bacteria Behind Ulcers," *Scientific American*, February 1996, pp. 104-107). Note that the author suggests that this new understanding of gastritis makes "it seem[s] reasonable, then, to suggest that persistent microbes may be involved in the etiology of other chronic inflammatory diseases of unknown origin ..." (p. 107). Thus do more likely-seeming ("reasonable") lines of inquiry succeed the unlikely discoveries. 

35. The counter-intuitive behaviour of sub-atomic particles is legendary. 


36. G. Johnson (1997) notes: "Until very recently, trying to compute by using quantum mechanics was an obscure and somewhat disreputable endeavour. One of the researchers noted that "It was dismissed as just a bunch of funny old guys in an office thinking about something with no practical application." The reasonable view for a long time had been that with quantum bits, error correction would be impossible. But that hurdle was recently overcome, at least theoretically, to the surprise of many in the field of sub-atomic physics." 


37. Henry L. Yeagley again, who developed a theory in 1942 that birds could sense both the force of Earth's magnetic field and the force of Earth's rotation. His experiments were dismissed at the time as far-fetched. But decades of research by others has indicated that "what he had was a wonderful thought, and in the fullness of time it is likely to bear fruit," according to a colleague who has shown the existence of an extraordinary sensory system in pigeons. See Noble (1997). 


38. During the same period the process of fermentation was recognized by Theodore Schwann as being of biological origin, Schwann clearly recognized yeast as a plant capable of converting sugar to alcohol and carbon dioxide. Many of the leading chemists of the day, including Berzelius, Wohler, and Liebig, considered yeast to be non-living and fermentation to be caused solely by oxygen. In an unfortunate attack on Schwann's classic findings, Liebig and Wohler attempted ridicule by suggesting that the yeast cells "had a suctorial snout with which they devoured sugar, a stream of alcohol issued from the anus at the same time that carbon dioxide bubbled forth from enormous genital organs." See Mahler Cordes (1966). 


39. Sulloway (1996). Offering a controversial theory of birth order and theory-acceptance, Sulloway notes, "When evidence in support of new theories is meager, people often make decisions about this information based on gut instinct. Birth order is typically a good predictor of such decisions, but it ceases to be predictive when evidence finally points, in a decisive fashion, toward one theory or the other. Galileo's scientific career witnessed just such a transformation in astronomical evidence and credibility. Between 1572 and 1610, the influence of birth order steadily diminishes. Too much astronomical evidence had begun to point in one direction. Firstborns, worn down by the empirical avalanche, softened their opposition to Copernican theory and finally abandoned the previously dominant system altogether." p. 339. For reviews of Sulloway see Gardner (1996) and Stipp (1994).





40. A theory developed in the late 1790's by Franz Joseph Gall, a German physician. He correctly deduced that there are specific locations in the brain for various functions; however, he wrongly thought that the shape of the cranium and its various bumps were predictors of behaviour and character. His views at first polarized the scientific community (according to Sulloway, largely along birth-order lines); but scientific supporters, such as Hewett Cottrell Watson who edited the phrenological Journal for three years, abandoned this pursuit within three years, skeptical that evidence could be found in support of phrenology (cf Sulloway, pp. 248,252). 

41. Hill (1975) reports that by 1725, the notion of the divine right of kings had disappeared in most spheres. For example, in 1741 the idea of a king as God's vice-regent on Earth was ludicrous. Yet Hill notes that "it had not been at all funny a century earlier." pp. 105-106. 

42. Wolraich et al. (1996). 


43. Yalom (1997), p. 85. 


44. Stigler (1986) pp. 224, 64, and 225. As with Darwin, Newton, and Mill, Bernoulli was wrong about central features of his case, which de Moivre and others corrected. 


45. Siegel (1993) argued that the alternative argument theory is either trivial or false. In response, I showed how easy it is to construct an argument that Newton's theory of motion *and* Siegel's own "appropriately moved by reasons" conception making these seem either trivial or false on intuitive grounds (Missimer 1995). But Siegel was not persuaded by this or the other evidence I offered (1997 note 21). Despite Siegel's rejection of my evidence, it would seem unwise to argue the triviality or falsity of a theory on intuitive grounds alone, as the numerous examples in this paper also attest. 

46. Medvedev (1969). 


47. Mayr (1964); cf also Missimer 1995a p. 208. 


48. Becker (1996), pp. xi and 270. 


49. Qingdao, viii; Bowers and Schneider. These writers do not appear to know about the horrendous famine; at least they do not mention it. 


50. Schreker (1994) pp. 92-93. It may be no accident that the most egregious cruelties have occurred under conditions in which alternatives were completely stifled, e.g., Nazism, recent Servian atrocities, and the public whipping with radio antennas of women who venture outside by the Taliban in Afghanistan, youths reportedly steeped only in one interpretation of the Koran. In a different train, another piece of historical evidence I am pursuing concerns the history of the mathematical concept, pi, progress on which appears to have been interrupted in the Middle Ages by a church proscription against work on this concept while churchmen themselves continued to work on the concept without apparent success. cf Petr Beckmann, *A History of PI*, pp. 78-82). 


51. Van Eemeren and Grootendorst (1995), p. 135. 


52. It would also prove a convenient way of "damning by association," were the audience to the debate to disapprove of the philosopher(s) the respondent has associated with the arguer's view. But my intuition is that this implies malice without there being any evidence for such a judgment. 

53. For more details, see my (1995a). 


54. Newton's paper on Optics was the first fully "scientific" paper in that it did not mention any philosophical arguments or explain itself philosophically. When Newton went to the Royal Society to deliver this paper, he was evidently savaged by Robert Hooke. I am interested in looking at Hooke's reply. 

55. Cf. the excellent reprise of this response in Campbell (1994). 


56. Siegel has gone so far as to *prohibit* the empirical as being beyond the pale of philosophy, in his (1997), p. 68, after having made several quasi-empirical claims about famous thinkers to the effect that if they did *not* display these traits in the act of critical thinking they would not be critical thinkers. I had showed in my (1995b) that Darwin and Newton fail four out of six of Siegel's intuitively attractive criteria. The irony is that by outlawing external support one is even more liable to fall into intuitively attractive, skillfully argued claims that have been pilloried as "weak-sense critical thinking." 

57. Butterfield (1957), pp. 98-103. 

58. Cf. Alan Wilson (1977) on the Evolutionary Clock hypothesis. 


59. Foster 1989, 1996a. 


60. For an exciting reprise of the way in which Foster built his case, cf. his (1996b) "Primary Culprit." Joe Klein


adamantly denied authorship for another six months, placing Foster's credibility in a precarious state. 


61. Nisbett and Ross (1980); Kahneman, Slovic, and Tversky (1982). 


62. Stich (1990). Cf. Miriam Solomon's (1994) review, p. 137. 


63. Stigler (1986), as well as the work of Porter (1986). 

64. Hamblin (1970) p. 79-80. Hamblin traces multiple sources of the notion of "non-cause as cause" in Aristotle's thought in the *Prior Analytics*, the *Posterior Analytics*, *Metaphysics*, concluding with the somewhat different account that Aristotle offers in the *Rhetoric*, "because B happens after A, it happens because of A." (1401b 30). It is this version I am addressing, "the account the modern books give," according to Hamblin (p. 80). 

65. I take moral support from Pinto's conclusion in his "Post Hoc Ergo Propter Hoc" (1995) "Can we devise a set of rules or guidelines such that, if they are not followed, post hoc reasoning is defective? I do not think so." (p. 310). 

66. A horrifying instance of the growth of sensibilities about animals is the fact that the King of France in the seventeenth century would regularly set a sack of cats on fire to celebrate the midsummer. 

67. Cf. Walton (1995), regarding a case study of manipulation of public opinion in the United States by accounts of atrocities to Kuwaiti babies which turned out to be false. I think this case is a difficult one, because the teller of the atrocities hid her identity as the Kuwaiti ambassador's daughter-moreover, she lied. If Walton could find a clear-cut case in which the claimant to *ad misericordiam* told the truth and yet the reasoning strategy retarded the growth of knowledge, that would be interesting evidence in favour of the *ad mis*. I will look for such a case as well. 

68. In Sulloway (1996), p. 24. 

References

Ada, Gordon L., and Nossal, Sir Gustav (1987) "The Clonal Selection Theory," *Scientific American* 257(2): 62-69.

Alvarez, Walter (1988) *T. Rex and the Crater of Doom*. Princeton, NJ: Princeton University Press.

Becker, Jasper (1996) *Hungry Ghosts: Mao's Secret Famine*. New York: The Free Press.

Beckman, Petr (1971) *A History of PI*. New York: Dorset Press. pp. 78-82.

Blaser, Martin J. (1996) "The Bacteria Behind Ulcers," *Scientific American* 274(2): 104-07.

Blaustein, A. R., P. D. Hoffman, D. G. Hokit, J. M. Kiesecker, S. C. Walls, and J. B. Hayes (1994) "UV

Repair and Resistance to Solar UV-B in Amphibian Eggs: A Link to Population Decline?" *Proceedings of the National Academy of Sciences* 91(5): 1791-5.

Blaustein, A. R., J. M. Kiesecker, D. P. Chivers, and R. G. Anthony, (1997) "Ambient UV-B Radiation Causes Deformities in Amphibian Embryos," *Proceedings of the National Academy of Sciences* 94(25): 13735-7.

Butterfield, Herbert (1957) *The Origins of Modern Science: 1300-1800*. New York: The Free Press.

Campbell, John Angus (1994) "Of Orchids, Insects, and Natural Theology: Timing, Tactics, and Cultural Critique in Darwin's Post-'Origin' Strategy," *Argumentation* 8: 63-80.

Crossette, Barbara (1997) "Pomp Bars Poor at Mother Teresa's Rites," *The New York Times*, September 14, p. A6.

Dancy, Jonathan, and Ernest Soza, eds. (1992) *Blackwell's Companion to Epistemology*. London: Basil Blackwell.

Duke, Richard C., David M. Ojcius, and John Ding-E Young (1996) "Cell Suicide in Health and Disease," *Scientific American*, 275(6): 80-88.

Ennis, Robert (1991) "Critical Thinking: A Streamlined Conception," *Teaching Philosophy* 14: 5-24.

Finocchiaro, Maurice A. (1997) *Galileo on the World Systems: A New Abridged Translation and Guide*. Berkeley: The University of California Press.

_____ (1995) "Six Types of Fallaciousness: Toward a Realistic Theory of Logical Criticism," in Hansen and Pinto, eds., *Fallacies*, pp. 120-29.

_____ (1994a) "The Positive versus Negative Evaluation of Arguments," in Johnson and Blair, eds., *New Essays in Informal Logic*, pp. 21-35.

_____ (1994b) "Two Empirical Approaches to the Study of Reasoning," in *Informal Logic*, 16: 1-21.

Foster, Donald W. (1989) *Elegy by W.S.: A Study in Attribution*. Newark: University of Delaware Press.

_____ (1996a) "A Funeral Elegy: W(illiam) S(hakespeare)'s 'Best Speaking Witnesses,'" *Publications of the Modern Language Association of America* 111(5): 1080-1105.

_____ (1996b) "Primary culprit," *New York* 29(8): 50-58.

Freeman, James (1994) "The Place of Informal Logic in Logic," in Johnson and Blair, eds., pp. 36-49.

Gardner, Howard (1996) "The Darwinian Family," *Nature* 384, November, p. 14.

Gilbert, Michael (1994) "Feminism, Argumentation and Coalescence," *Informal Logic* 16: 95-113.

Hallam, A. (1973) *A Revolution in the Earth Sciences: From Continental Drift to Plate Tectonics*. Oxford: Clarendon Press.

- Hamblin, C.L. (1970) *Fallacies*. Newport News, VA: Vale Press (this edition published in 1986).
- Hansen, Hans V., and Pinto, Robert C., eds. (1995) *Fallacies: Classical and Contemporary Readings*. University Park, PA: The Pennsylvania State University Press.
- Hexter, J.H. (1979) *On Historians: Reappraisals of Some of the Makers of Modern History*. Cambridge, MA: Harvard University Press.
- Hill, Christopher (1975) "Reason and Reasonableness" in *Change and Continuity in Seventeenth-Century England*. Cambridge, MA: Harvard University Press.
- Johnson, George (1997) "Quantum Theorists Trying to Surpass Digital Computing," *The New York Times, Science Times*, February 18, pp. B 9 & 13)
- Johnson, Ralph H., and J. Anthony Blair, eds. (1994) *New Essays in Informal Logic*: Windsor, ON: Published by Informal Logic.
- Kahneman, Daniel, Slovic, Paul, and Tversky, Amos (1982) *Judgment Under Uncertainty: Heuristics and Biases*. Cambridge: Cambridge University Press.
- Lenhoff, Howard and Sylvia Lenhoff (1988) "Trembly's polyps," *Scientific American*, 258(4): 108-113.
- Levi, Don S. (1994) "The Zen of Argument Analysis: Reflections on Informal Logic's Argument Evaluation Contest," *Informal Logic* 16: 87-94.
- Mahler, Henry and Eugene Cordes (1966) *Biological Chemistry*. New York: Harper and Row. pp. 2-3. [Quoted from *Annalen* 29: 100, 1839.]
- Mayr, Ernest (1964) Introduction in Darwin's *The Origin of Species*. Cambridge: Harvard University Press.
- Mazeland, Harrie (1995) "The Reasonableness of Fallacy," *Argumentation* 9: 423-432. [Review of D. N. Walton's *Question-Reply Argumentation*.]
- McClosky, Michael (1983) "Intuitive Physics," *Scientific American* 248(4): 122-30.
- Medvedev, Zhores A. (1969) *The Rise and Fall of T.D. Lysenko*. I. Michael Lerner tr. New York: Columbia University Press.
- Missimer, Connie (1995a) "The Case That Alternative Argumentation Drives the Growth of Knowledge-Some Preliminary Evidence," *Informal Logic* 17: 201-211.
- _____ (1995b) "Where's the Evidence?" *Inquiry*, 14: 1-18.
- _____ (1994) "Why Two Heads Are Better Than One: Philosophical and Pedagogical Implications of a Social View of Critical Thinking," (*Proceedings of the Philosophy of Education Society* 1988), reprinted in Walters 1994. pp. 119-33.
- Muller, Richard (1988) *Nemesis--the Death Star: The Story of a Scientific Revolution*. New York: Weidenfeld & Nicholson.

- Neibuhr, Gustav (1997) "Display of Two 1526 Bibles Celebrates Translator," *New York Times*, February 15.
- New York Times Obituaries* (March 5, 1997) "Kingsley Davis, 88, Who Told of Zero Population Growth". p. A 17.
- Nisbett, R.E., and Ross, L.(1980) *Human inference: Strategies and Shortcomings of Social Judgment*. Englewood Cliffs, N.J.: Prentice-Hall.
- Noble, Holcomb B. (1997) *New York Times*, January 4, 1997, p. A9.
- Perelman, Ch. & Olbrechts-Tyteca, L. (1969) *The New Rhetoric*. Notre Dame, IN: University of Notre Dame Press. [orig. Fr. 1958]
- Pinto, Robert C. "Post Hoc Ergo Propter Hoc," (1995) in Hansen and Pinto, eds., *Fallacies*, pp. 302-311.
- Porter, Theodore M. (1986) *The Rise of Statistical Thinking 1820-1900*. Princeton, NJ: Princeton University Press.
- Schreker, Ellen, (1994) *The Age of McCarthyism: A Brief History with Documents*. Boston: St. Martin's Press.
- Schneider, Laurence, ed. (1986) *Lysenkoism in China: Proceedings of the 1956 Qingdao Genetics Symposium*. New York: M.E. Sharpe, Inc. [A special issue of *Chinese Law and Government*.]
- _____ (1988) "Genetics in Republican China," in John Z. Bowers, J. William Hess and Nathan Sivin, eds., *Science and Medicine in Twentieth-Century China: Research and Education*. Ann Arbor: Center for Chinese Studies, The University of Michigan.
- Siegel, Harvey (1993) "Not by Skill Alone: The Centrality of Character to Critical Thinking," *Informal Logic* 15: 163-77.
- Siegel, Harvey (1997) *Rationality Redeemed?* New York: Routledge.
- Solomon, Miriam (1994) Review of Stich 1990. *Informal Logic* 16: 137-40.
- Stich, Stephen (1990) *The Fragmentation of Reason: Preface to a pragmatic theory of cognitive evaluation*. Cambridge: MIT Press.
- Stigler, Stephen M. (1986) *The History of Statistics: The Measurement of uncertainty before 1900*, Cambridge: Harvard University Press.
- Stipp, David (1994) Review of Sulloway in *The Wall Street Journal*, August 23, pp. A1, 5.
- Sulloway, Frank (1996) *Born to Rebel: Birth Order, Family Dynamics, and Creative Lives*. New York: Pantheon Books.
- Tindale, Christopher W. (1994) "Contextual Relevance in Argumentation," in Johnson and Blair, eds., *New Essays in Informal Logic*, pp. 67-81.

Van Eemeren, Frans, and Rob Grootendorst (1995) "The Pragma-Dialectical Approach to Fallacies," in Hansen and Pinto, eds., *Fallacies*, pp. 130-44.

Waldholtz, Michael (1996) "Dr. Ho's Next Step in AIDS Research Is A Remarkable Gamble," *The Wall Street Journal*, December 17, pp. A1, 6.

Walters, Kerry S., ed. (1994) *Re-Thinking Reason: New Perspectives in Critical Thinking*. Albany: State University of New York Press.

Walton, Douglas (1989). *Question-reply argumentation*. New York: Greenwood.

Walton, Douglas (1995) "Appeal to Pity: A Case Study of the Argumentum ad Misericordiam," in *Argumentation* 9: 769-784.

Wilson, Alan (1977) "Biochemical Evolution," *Annual Reviews of Biochemistry* 46: 573-639.

Wolraich, M. L., David B. Wilson and J. W. White (1995) "The Effect of Sugar on Behavior or Cognition in Children: A Meta-Analysis," *Journal of the American Medical Association* 274(20): 1617-1621.

Woods, John (1994), "Is the Theoretical Unity of the Fallacies Possible?" *Informal Logic*, 16: 77-85.

Yalom, Marilyn, (1997) *A History of the Breast*, New York, Alfred A. Knopf.

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