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From Ruse to Farce

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Hegel remarks somewhere that all great world-historic facts and personages appear, so to speak, twice. He forgot to add: the first time as tragedy, the second time as farce. (Marx, 1963 [1852]: Ch. 1)

More than two decades ago, philosopher of biology Michael Ruse testified as an expert witness for the plaintiffs in the Federal District Court case, *McLean v. Arkansas Board of Education* (529 F. Supp. ED Ark. 1982). The plaintiffs in that case challenged the constitutionality of an Arkansas law that had recently been passed by the state legislature. The law mandated that public (taxpayer-funded) schools that taught Darwin's theory of evolution would also be required to teach 'creation science' (a thinly secularized version of Fundamentalist Christian interpretations of Biblical Genesis). In his ruling against the defendants, Judge Overton relied heavily on Ruse's testimony when concluding that 'creation science' fell short of the following 'essential characteristics of science':

1. It is guided by natural law;
2. It has to be explanatory by reference to natural law;
3. It is testable against the empirical world;
4. Its conclusions are tentative, i.e. are not necessarily the final word; and
5. It is falsifiable. (Memorandum of Opinion, IV C)

Though Ruse was pleased with the success of his effort to convey demarcation criteria to the court, he was strongly criticized by other philosophers for having put forward a picture of science that had gone out of favor in science studies.¹

In 2005, another philosopher (or, rather, a social epistemologist) appeared as an expert witness in another trial about the teaching of evolution, *Kitzmiller et al. v. Dover Area School District* (U.S. Dist. LEXIS 22647, 2005). In this case, however, the philosopher Steve Fuller appeared

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as expert witness for the *defendants*: a local school board in Dover, Pennsylvania, which had mandated that public schools in the district must inform ninth-grade biology students that evolution through natural selection is a *theory*, not a *fact*, and that students can explore an alternative theory – Intelligent Design – by reading the book *Of Pandas and People* (Davis & Kenyon, 1993), supplied in the school library. It remains to be seen how much controversy Fuller's testimony will generate among his academic colleagues. The defendants lost their case, and gathering from the judge's ruling, they lost resoundingly.² Fuller's testimony apparently left the plaintiff's arguments unscathed; indeed, Judge John E. Jones III almost turned Fuller into a witness for the plaintiffs by repeatedly quoting statements from his testimony that seemed to support the adversary case (see Edmond & Mercer, 2006). Some of the more notable press accounts of the trial also treated Fuller's testimony as a farcical sideshow to the main event (for example, Talbot, 2005: 77). Though some of us in science studies may hope that this episode will be forgotten before it motivates our detractors to renew the hostility and ridicule directed our way during the 'science wars' of the 1990s,³ in my view it raises serious issues that are worthy of sustained attention.

As I noted in my editorial in the December 2005 issue of *Social Studies of Science* (35[6]: 835–36), Fuller's appearance in the Dover case dramatizes dilemmas similar to those that Simon Cole and I discussed in relation to Cole's appearance as a defense witness in trials involving fingerprint evidence (Lynch & Cole, 2005). The dilemmas arise from efforts to follow through on proposals to use science and technology studies as a basis for engaging in public controversies. I believe that it is fair to say that there is a strong trend in S&TS circles toward advocating some sort of normative engagement in techno-scientific politics. It has gotten to the point that anyone who expresses skepticism about that trend risks being consigned to quietism or, worse, mere academic professionalism.⁴ Nevertheless, I think it is worth pointing out that calls for engagement face a difficulty with reconciling symmetry and/or impartiality – often held to be principled cornerstones of a constructionist stance toward science – with the unqualified advocacy often demanded of participants in public controversies and tribunals. One can, of course, reject symmetry and straightforwardly advocate one side or the other in a controversy, but one does so at the risk of reverting (or, at least, *seeming* to revert) to formulaic versions of the sociology and philosophy of science that supposedly were left behind with the rise of SSK in the 1970s.⁵ An appearance as an expert witness in a trial or pre-trial hearing in an adversary system exacerbates those difficulties, because of the common expectation that such a witness should put forward testimony supporting one side or the other in a dispute. A possible way out of the dilemma is to suppose that an expert can intervene in hopes of *restoring* a modicum of symmetry in an asymmetric dispute between powerful claimants of scientific truth and opponents who are charged with holding pseudoscientific, magical, or merely commonsense beliefs.

Those of us who are familiar with Steve Fuller's voluminous body of writings will know that he has long advocated an activist stance toward the natural sciences. His participation in *Kitzmiller* as a defense witness is

consistent with that stance, though in a disconcerting way. As he states in his comment in this issue, Fuller (2006) views his invitation to appear as an expert witness as an opportunity to criticize what he sees to be a dubious philosophy of science put forward by the authoritative science organizations that weighed in on the side of the plaintiffs. Though he testifies for the other side, Fuller argues that Ruse's appearance as an expert meta-scientist in *McLean* set the stage for his own appearance.⁶

The Science Question

For Fuller, Ruse's appearance in *McLean* was an important precedent, but less for what his testimony conveyed to the court than for what it exemplified. The important issue for Fuller is that Judge Overton heard (and, indeed, cited) the testimony of an outsider – someone independent of the specific field, or fields, in question. Fuller's situation also was somewhat akin to Simon Cole's. Cole appeared as an expert witness for the defense in *New York v. Hyatt* (Supreme Court of NY, Kings Co., 4 October 2001), and several other cases in which the defense challenged the prosecution's fingerprint evidence.⁷ Cole was prepared to testify about the history of the fingerprint profession, its claims to scientific certainty, and the social and organizational grounds of its credibility. He was not, and did not pretend to be, a competent fingerprint examiner who would evaluate the particular evidence submitted by the prosecution. Instead, in Risinger's (2000: 515) terms, he provided 'academic summarization expertise': scholarly descriptions and evaluations of the history and current practice of latent fingerprint examination (Cole, 2001). Academic study in philosophy and history of science or science and technology studies can, and sometimes does, count as relevant qualification for testifying as an expert (see Gorman's [2006] comment for further examples). However, Cole and Fuller both experienced formidable resistance when their testimony clashed with judicial views of the professions they characterized and of the nature of science in general.⁸

An unusual feature of both cases was the prominence of the question 'Is X a science?' As Fuller presents the matter, the primary issue in *Kitzmilller* was to determine the scientific status of ID.⁹ Support for his view is that Judge Jones devoted a major section of his lengthy ruling to the science question about ID. Similarly, in his testimony in *Hyatt*, Cole addressed questions about whether the training and practices of latent fingerprint examination met scientific standards. However, in both cases, the relevant 'scientific standards' were those that are recognized in law, and articulated in cases such as *McLean* (see above) or *Daubert v. Merrell Dow Pharmaceuticals Inc.* (113 S. Ct. 2786, 1993). Expressing no single, coherent philosophy of science, the standards mix naturalism, empiricism, and falsificationism. In *Kitzmilller*, the plaintiff's experts advocated something they called 'methodological naturalism'. Cole and Fuller could have tried to persuade the court that the picture of science accepted by the courts is out of line with current opinion in science studies, and to some extent Fuller attempted to do that. Cole more completely accommodated his testimony to the discursive context by reverting to Mertonian and

Popperian formulations when testifying about the epistemic status of latent fingerprint examination.

One could argue that Fuller's and Cole's lack of persuasive success in the particular cases had little to do with the worthiness of the larger cause – which was to persuade an important social institution to adopt a general conception of science that would be more in line with contemporary academic thinking. However, in both cases, the question of what is or is not a science has become secondary, almost a distraction from the more important legal issues. In other words, not only were Cole and Fuller fighting losing battles, the campaign was being settled in another theater. In the case of fingerprint evidence, the court in a defining case *US v. Mitchell* (365 F. 3d 215, 3d. Cir., 2004) disavowed the whole question of whether fingerprint examination is 'scientific' in favor of deciding (according to legal criteria) whether or not it is 'reliable'.¹⁰ In *Kitzmiller*, the most important constitutional issue was not whether ID is 'scientific', but whether it is 'religious'. One could argue that the science question still lurks in the background, but the courts in both cases made strident efforts to reduce its salience.

The Religion Question

Kitzmiller v. Dover Area School District was the latest in a series of trials in the US concerning the teaching of Darwin's theory of the evolution through natural selection in public schools. The first in the series was the 1925 'trial of the century' (one of several trials so dubbed during the 20th century) in which John Scopes, a high-school teacher in Tennessee was charged with violating a newly enacted state law that prohibited the teaching of evolution. Scopes was convicted, but at the cost of drawing ridicule from more urbane sectors of the US population (immortalized in the 1955 play and 1960 film *Inherit the Wind*). However, not until the late 1960s were state laws that prohibited the teaching of evolution in public schools taken off the books. The Supreme Court in *Epperson v. Arkansas* (393 US 97, 1968) ruled that such laws violated the Establishment Clause in the First Amendment of the US Constitution, which states that:

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the government for a redress of grievances.

In 1927, when the Tennessee State Supreme Court reviewed Scopes' appeal of his guilty verdict, the court made a narrow interpretation of a similar clause in the state constitution, arguing that it prohibited the establishment of a state religion but was not relevant to such matters as school curricula. As Fuller (2006) points out, starting in the mid-20th century the Federal courts gradually gave more expansive interpretations of the clause, arguing that it protected the freedom to practice *no* religion, and prohibited governments at all levels from using public funds for religious activities and expressions of religious belief. Thomas Jefferson's statement that there should be a 'wall of separation between church and

state', frequently was cited as grounds for ascribing a broad intention to the Establishment Clause, but the specific articulation was provided by the Supreme Court's decision in *Lemon v. Kurtzman* (403 US 602, 1971), commonly known as the 'Lemon test' consisting of three 'prongs':

1. The legislature must have adopted the law with a secular purpose.
2. The statute's principal or primary effect must be one that neither advances nor inhibits religion.
3. The statute must not result in an excessive entanglement of government with religion.

In 1987, the US Supreme Court ruled against another 'equal time' law in Louisiana (*Edwards v. Aguillard*, 393 US 573), but it is notable that the dissenting opinion written by Justice Scalia strongly opposed the interpretation of the first prong of the Lemon test. He objected that if, on the face of it, the legislation in question mandated the teaching of an alternative scientific 'theory', and made no mention of religion, then it was irrelevant to explore the historical context of the legislation or the religious motives of the individuals and groups that lobbied for and drafted the legislation. Fuller's comment about his participation in *Kitzmiller* makes only passing mention of the Lemon test, and of the crucial importance of Judge Jones' ruling that the Dover School Board's policy was unconstitutional because it violated the Establishment Clause (as interpreted via the Lemon Test). Though the question of whether ID is a science is more interesting for a social epistemologist, it is secondary, and arguably irrelevant, to the constitutional question.¹¹

Judge Jones' application of the Lemon Test focused on explicitly religious statements allegedly made by particular school board members during meetings when the policy was proposed and discussed. He also identified specific religious activists and fundamentalist organizations that lobbied the school board. In brief, Judge Jones delved into the context of the policy when determining that it expressed a religious purpose. As Fuller mentions, the judge also agreed with the plaintiff's argument that the systematic substitution of the words 'intelligent design' for 'creation' in a revised version of *Of Pandas and People* indicated that ID was a transparent version of creationism. Jones also decided that a 'reasonable, objective observer' would perceive that the apparently secular language of the school board's policy was actually promoting religious doctrines.

It is, of course, possible to challenge the plaintiffs' peculiar philosophy of 'methodological naturalism' or Judge Jones' interpretative construction of an 'objective observer', but to do so would be to miss the point. The science question was less germane to the issue than the religious question. The court was engaged in legal boundary work, and (social) epistemological argument was secondary if not entirely irrelevant to the political and legal task at hand (Fuller glosses over the difference between the analytical value of the notion of 'boundary work' and a normative conception of demarcation). Moreover, even if the science question had been central, it is unclear that our community (however we define or delimit it) offers an agreed-to conception of science that would be of much assistance

to the court, or to one or the other party in the adversary argument (also see Edmond & Mercer [2006] on this point).

It is understandable that members of the STS field would want to draw upon their meta-knowledge about science in order to participate effectively in contemporary political controversies about science and technology. However, it is not always obvious which 'side' of a controversy to join. As Cole has pointed out (Lynch & Cole, 2005: 273; Cole, 2006), it would be quite easy to cite existing STS scholarship to support the fingerprint examiner community's claims to authentic expertise. Despite the fact that few members of that community have PhDs, a proponent of STS could easily endorse fingerprinting as a practical art that relies upon the unacknowledged skills of technicians, and the crucial role of tacit knowledge. In addition, it would be easy to point out the inadequacy of judicial standards for evaluating the reliability of expert evidence. Indeed, one could argue that it is more consistent with STS orthodoxy to take the fingerprint examiners' side rather than to support the side that Cole takes. Moreover, one could argue that his testimony (whether effective or not) draws upon heterogeneous sources of information and argument, some of which have little relation to STS and even conflict with widespread tendencies in the field. In his case, however, his political alignment has a principled basis (he is on the side of civil liberties; of combating the State's power to enlist 'science' as a prosecutorial tool). Though Fuller also articulates a principled basis for his intervention (to oppose dubious pronouncements about science made by powerful advisory bodies enlisted by the plaintiffs), I would argue that he ignores what is stunningly obvious about the political alliance he joined. I say this not out of any conviction *derived* from 'science studies' or 'STS', but from non-specialized (arguably educated) opinions about the current US political landscape and about the constituencies that lined up around the Dover trial.

Fuller explains why he took the school board's side in *Kitzmiller*, and while I have no reason to doubt his sincerity, his reasons seem narrowly cast and politically naive. Without suggesting that all of the leading proponents of ID are in league with fundamentalist Christians who are pressing a reactionary political agenda, it seems clear (to me at least, and apparently to Judge Jones as well) that a major source of support for the Dover initiative (and many similar initiatives throughout the USA) is an alliance between political activists and fundamentalist Christians. With his contextual and motivational analysis of the school board's policy, Judge Jones linked ID to creationism and then to fundamentalist Christianity, thus staving off the latest in a series of efforts to insinuate religious doctrines into the science classroom. Of course we can criticize his arguments, but I would argue that such criticisms are unlikely to encourage US Federal courts to adopt a picture of science more consistent with current STS thinking. My basis for concluding this is not 'grounded in STS'. I do not mean to suggest that 'STS' should be politically neutral, or that it will always be irrelevant to major political conflicts, but that our normative predispositions and, more importantly, the historical contexts in which we would express them in action, largely derive from other life-sources. Moreover, the articulation of available (and effective) positions in

political or legal disputes does not easily mesh with the characteristic orientations and lines of debate in our field. I am not counseling against public engagement, but instead suggesting that when we wade into the fray, 'STS' or 'social epistemology' may offer, at best, a deceptive source of epistemic authority, and, at worse, a farcical expertise.

Notes

1. For criticisms and exchanges about Ruse's expert testimony, see Ruse (1982, 1986), Laudan (1982), and Quinn (1984). It is notable that none of the parties to this academic disagreement gave the slightest support for the claims of the defendants – the proponents of 'creation science'. See Kevin Lambert's (2006) discussion of ID-proponent Philip Johnson's criticisms of Judge Overton's criteria.
2. The judicial ruling, transcripts of testimony, and many of the briefs filed in the case are available on a number of websites, including < www.talkorigins.org/faqs/dover/html > .
3. Edmond & Mercer (2006) document some links that critics have drawn between Fuller's testimony and the 'science wars'.
4. For a respecification of the terms of debate, in a subtle and thought-provoking rebuttal to the 'quietism' charge, see Smith (1994).
5. For an earlier round of argument on the Politics of SSK, see the special issue of *Social Studies of Science* guest edited by Evelleen Richards and Malcolm Ashmore (1996: 26[2]).
6. The equivalence between the parties in the two cases – and, specifically, the equivalence between the positions advocated by the defendants ('creation science' in 1982, and ID in 2005) – was contested within the dispute. The plaintiffs in *Kitzmiller* argued that ID was creationism in disguise, while the defendants argued that ID was an independent, secular theory. The position Fuller put forward in his testimony was ambivalent about this point, and the judicial ruling (which accepted the argument for equivalence) even quoted his deposition to argue that ID was a creationist doctrine: 'Moreover and as previously stated, there is hardly better evidence of ID's relationship with creationism than an explicit statement by defense expert Fuller that ID is a form of creationism. (Fuller Dep. At 67, 21 June 2005) (indicated that ID is a modern view of creationism)' (*Kitzmiller v. Dover Area School District*, 2005: 35).
7. *Hyatt* is but one of dozens of recent cases in which fingerprint evidence was challenged, and it was by no means the most significant. Among other things, it was a state, rather than federal case, and the state involved (New York) continues to use a variant of the 'general acceptance' standard for admissibility, which in federal courts is superseded by the Federal Rules of Evidence. The case is prominent in this discussion because a transcript of Cole's testimony was available, and the dialogues in the transcript raised issues discussed in Lynch & Cole (2005).
8. As Edmond & Mercer (2006) point out, however, Fuller was allowed to testify as an expert witness, whereas the admissibility of Cole's testimony was challenged.
9. Unlike Fuller, Michael Ruse more explicitly recognized that the 'science question' was subordinate to a legal judgment about the religious origins of the 'science' in question. In his response to Laudan's (1982) criticisms, Ruse (1982: 19) points out that '... proof that something is not science is not the same as proof that it is religion.' I'm grateful to Simon Cole for reminding me of this point.
10. The *Kumho Tire* decision is now widely understood to have emphasized 'reliability' rather than accord with a definition of 'science' as the key issue for admissibility decisions in federal courts. In his more recent court appearances, Cole challenges the 'reliability' of fingerprinting, and does not delve into the science question, as in *Hyatt* (which was held under the 'general acceptance' standard). However, one can argue that the *Daubert/Kumho* standard of 'reliability' derives from a judicial (mis)conception of science which has been generalized to cover all forms of expert evidence (see Edmond, 2002).

11. John West (2005) posted a comment on the Discovery Institute website criticizing Judge Jones as an 'activist' judge whose ruling ventured into the question of whether ID is scientific, thus going beyond what was necessary to demonstrate that the Dover policy was unconstitutional.

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