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COMMENT

THE COSTS OF ACCEPTABILITY: BLUE BUSES, AGENT ORANGE, AND AVERSION TO STATISTICAL EVIDENCE†

NEIL B. COHEN*

In his article on the acceptability of verdicts,¹ Professor Charles Nesson sets forth a controversial² rationale for devaluing overtly probabilistic methods of proof. He posits that probabilistic "proof" typically presents information not about the *event* at issue in the trial,³ but rather about the *evidence* presented at the trial.⁴ To illustrate this distinction he describes a scenario in which an unknown card is drawn at random from a deck of playing cards:

Suppose someone flashes . . . [the] card, and we get a quick glimpse of . . . [it]. On the basis of this glimpse, we form a belief that the card is not a picture card. *The subject matter of our belief is the card*, and we make a statement about what happened. "The card that was flashed was not a picture card." . . . The statement equivocates by describing a state of mind, but the state of mind being described is a belief about the card. If the card in fact turned out to be a king, we would admit that we had been wrong. But suppose we blindly draw a playing card from a well-shuffled deck. Before seeing the card, we would agree that the card is probably not a king. *Our statement would express a belief about the evidence that the card is not a king*, a belief based on our knowledge about the make-up of the deck, the fairness of the draw, and the laws of probability—not the unseen card. If the card turned out to be a king, we would not say that we had erred in assessing the probabilities: the discovery is not inconsistent with what we initially believed to be true. We would simply say that on this occasion a relatively improbable event had occurred.

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¹ Nesson, *The Evidence or the Event? On Judicial Proof and the Acceptability of Verdicts*, 98 HARV. L. REV. 1357 (1985).

² See, e.g., Allen, *Rationality, Mythology, and the "Acceptability of Verdicts" Thesis*, 66 B.U.L. REV. 541 (1986); letter from Hon. Jack B. Weinstein to Charles Nesson (Oct. 21, 1985).

³ Nesson, *supra* note 1 at 1360-63.

⁴ *Id.*

The statement about the probability of drawing a king from a shuffled deck is a statement of belief about the card itself.⁵

Professor Nesson argues that a verdict is more powerful if it can be seen as a statement about the event rather than merely a statement about the evidence:

If a person views the verdict as a determination of what actually happened, he can assimilate the applicable legal rule and absorb its behavioral message. If he regards the verdict as merely a statement about the evidence, he will assimilate only the proof rule, whose deterrent effect is far less pronounced.⁶

He argues, therefore, that findings supported only by probabilistic evidence—or, as many would describe it, “naked statistical evidence”⁷—are to be disfavored. As an example, he points to that favorite bedeviling hypothetical problem of evidence professors—the blue bus case. Based loosely on the facts of *Smith v. Rapid Transit Inc.*,⁸ this problem has many variations. As related by Nesson, the hypothetical involves a plaintiff who has been run off the road by a bus. There were no witnesses other than the plaintiff, and the plaintiff noticed only that the vehicle that forced him off the road was a bus; he did not notice any identifying features. The defendant Blue Bus Company operates 80% of the buses that run on the road where the accident occurred.⁹ If no other facts are introduced, should the plaintiff prevail in a lawsuit against the defendant Blue Bus Company?

Professor Nesson, like many other commentators,¹⁰ contends that the plaintiff, having presented only the minimal facts described here, should lose the case.¹¹ Indeed, Professor Nesson argues that the case should not even reach the jury; it should be disposed of by a directed verdict:

[T]he factfinder cannot, and the public knows it cannot, make anything other than a bet on the evidence. Because the judicial system strives to project an acceptable account about what happened, then, the plaintiff's evidence is insufficient, notwithstanding the high probability of its accuracy.¹²

In his paper for this symposium,¹³ Professor Nesson applies his thesis in

⁵ *Id.* at 1361 (emphasis added).

⁶ *Id.*

⁷ See, e.g., Kaye, Book Review, 89 YALE L.J. 601 (1980).

⁸ 317 Mass. 469, 58 N.E.2d 754 (1945).

⁹ Nesson, *supra* note 1, at 1379.

¹⁰ See, e.g., Tribe, *Trial by Mathematics: Precision and Ritual in the Legal Process*, 84 HARV. L. REV. 1329, 1349 (1971); Williams, *The Mathematics of Proof*, 1979 CRIM. L. REV. 297, 304-05.

¹¹ Nesson, *supra* note 1, at 1379.

¹² *Id.*

¹³ Nesson, *Agent Orange Meets the Blue Bus: Factfinding at the Frontiers of Knowledge*, 66 B.U.L. REV. 521 (1986).

the context of toxic torts. As a paradigm, he examines the case of John Lilley.¹⁴ Lilley's widow, a plaintiff who opted out of the class in the famous Agent Orange litigation, claimed that her husband had died as a result of the effects of exposure to dioxin, a substance contained in Agent Orange. Federal District Court Judge Jack B. Weinstein granted the defendants' summary judgment motion, relying largely on epidemiological studies that failed to demonstrate that dioxin causes leukemia—Lilley's primary malady. Professor Nesson argues that the judge's decision was incorrect, particularly in his deference to the statistical studies suggesting no causation and his lack of deference to "particularistic" evidence presented by the plaintiff. As he argues with respect to the blue bus case, Professor Nesson would rule against the party proffering statistical or probabilistic evidence. In the blue bus hypothetical, Professor Nesson argues that the plaintiff who demonstrated that 80% of the buses belonged to the defendant cannot even get to the jury. In *Lilley*, on the other hand, he contends that even powerful and uncontroverted statistical evidence cannot form the basis for summary judgment in the face of particularistic evidence proffered by the plaintiff. Apparently, although the statistical information tells us quite a bit about the evidence, it does not tell us enough about the event.

Professor Nesson's thesis is intuitively appealing, yet many of its underlying assumptions are easy to attack. As Professor Allen has argued, to the extent that Nesson's thesis depends on public awareness of the fact-finding aspects of trials, the thesis is on shaky ground.¹⁵ As Allen points out, most trials are sparsely attended,¹⁶ and only extraordinary trials are covered by the media.¹⁷ He observes:

I have sat at length in courtrooms in numerous jurisdictions. My experience has been that in the great majority of cases I was the only one in the room other than the actors in Professor Nesson's drama. In addition, I have searched for some evidence—anecdotal or otherwise—that my experience is abnormal. I have found none, and Professor Nesson provides none. This is striking because Nesson is making an empirical rather than an analytical claim, and no basis for it appears to exist.¹⁸

Reading Professor Allen's criticism, though, one is left with the impression that very few laypersons have even the remotest conception (accurate or inaccurate) of the fact-finding process at trial. This impression, of course, is false. I suspect that most Americans over the age of eight have a precise idea of how trials work. This idea may be inaccurate or distorted, but it is

¹⁴ *In re "Agent Orange" Prod. Liab. Litig.*, 611 F. Supp. 1267 (E.D.N.Y. 1985) [hereinafter *Lilley*].

¹⁵ Allen, *supra* note 2, at 544-46.

¹⁶ *Id.* at 544.

¹⁷ *Id.* at 544-45.

¹⁸ *Id.* at 544.

present nonetheless. Professor Allen gives too little weight, if any at all, to secondary sources of information about trials. For example, courtroom drama is one of the staples of modern entertainment. From television's *Perry Mason* to the film *The Verdict*, we have all been continually educated about the fact-finding process. That education may be distorted in many respects, but most often it clearly presents trials as forums in which verdicts are statements about *events*. Thus, although only a small percentage of the public may even have witnessed the fact-finding process, the vast majority is presented with information from which it forms impressions of the process. I am not convinced that this indirect route by which the public develops its perceptions of the fact-finding process lessens the validity of Nesson's thesis.

A more substantial argument against Professor Nesson's theory involves questioning his distinction between statements about evidence and statements about the event. This distinction appears to have at least two problems. First, the analogy of the playing card selected from the deck is inapposite. In a trial, after all, the jury itself does not catch a glimpse of the card in question; rather, a witness testifies that he or she caught a glimpse of the card. If the question before the jury is whether the card was a face card, the jury will consider a number of facts. In this simplified situation, for example, the jury must consider the likelihood that the card was a face card, given that a witness with no apparent motive to lie, and with visual acuity not known to be different from average, has testified that the card was not a face card. If the jury, based on these factors, finds that the card was not a face card, isn't this—in Nesson's terminology—a statement about the *evidence*, not about the *event*? Take, for example, the veracity of the witness. We might assess the probability that a witness with no apparent motive to lie would lie nonetheless at, say, two percent. Thus, even assuming the witness has perfect eyesight, we might say in this case that the chances are 98% that the card was not a face card. Yet, we have no way of telling which two witnesses out of 100 are the liars. To paraphrase Nesson, if the witness turned out to be a liar, we would not say that we had erred in assessing the probabilities: the discovery is not inconsistent with what we initially believed to be true. We would simply say that on this occasion a relatively improbable event had occurred.¹⁹ Jurors are not witnesses to the events in question.²⁰ Because jurors must rely on statements witnesses make, their verdicts can only be statements about the evidence presented, not statements about the underlying event.

Second, as Judge Weinstein has argued, there are some doubts about the underlying assumption that people believe verdicts are statements about events: "I rather doubt, for example, that the public at large thinks that a verdict or judgment of a court is based on confidence in truth rather than

¹⁹ See Nesson, *supra* note 1, at 1361.

²⁰ Indeed, a juror with independent knowledge of the facts of a case is usually disqualified.

upon some probability of accuracy."²¹ If, in fact, the public either does not distinguish between the evidence and the event or accepts verdicts as statements about the evidence, Professor Nesson's thesis loses its descriptive basis. If the distinction does not describe actual perceptions, is there justification for proof rules embodying it?

Perhaps Nesson's distinction between the evidence and the event and his disfavoring of a verdict based on conclusions about only the former is another way of phrasing the argument put forth by Professor Adrian Zuckerman in his paper for this symposium.²² Professor Zuckerman argues that the rationale for denying recovery to the plaintiff in the blue bus type of hypothetical is societal resistance to the concept of "corporate liability"—i.e., holding "an entire social group responsible for the transgressions of its individual members."²³ According to Zuckerman, society resists corporate liability for failing to treat the individual as entitled to be judged on his own actions.²⁴ It appears that, as a practical matter, both Nesson's principle and Zuckerman's principle suggest identical results in most, if not all, cases. An advantage of Zuckerman's formulation is that it is stated as a moral rather than utilitarian principle. As such, it is not sensitive to errors in empirical assumptions that underlie utilitarian principles like Nesson's.

Despite the arguments against Nesson's thesis, however, it has undeniable intuitive appeal. Indeed, I believe it explains our reluctance to give verdicts based on "naked statistical evidence" more convincingly than do the theories advanced by Professors Tribe²⁵ and Kaye.²⁶ As I have argued elsewhere,²⁷ those arguments suffer from internal inconsistencies. Nesson's thesis, on the other hand, seems closer to the mark. Although the reason is difficult to articulate, and may not be entirely rational, it may in fact be more comforting to feel that we have knowledge, however imperfect, about what happened, than merely to assess odds. Perhaps this discomfort with odds-making reflects an implicit aversion to applying the concept of subjective probabilities. If so, it has profound implications for most probabilistic models of proof. Alternatively, I suggest, the discomfort springs from an unwill-

²¹ Letter, *supra* note 2. Judge Weinstein does point out, however, that his perception "of jurors may be quite wrong, especially since it is limited to Brooklyn jurors (who are well known for figuring the odds on horse races as well as the probability of arriving home safely after entering the subway system)." *Id.*

²² Zuckerman, *Law, Fact or Justice*, 66 B.U.L. REV. 487 (1986).

²³ *Id.* at 499. Professor Zuckerman's paradigm, however, is not the blue bus case, but rather, L. Jonathan Cohen's rodeo gatecrasher hypothetical. See L. COHEN, *THE PROBABLE AND THE PROVABLE* 7 (1977).

²⁴ Zuckerman, *supra* note 22, at 499.

²⁵ See Tribe, *supra* note 10.

²⁶ See Kaye, *supra* note 7.

²⁷ Cohen, *Confidence in Probability: Burdens of Persuasion in a World of Imperfect Knowledge*, 60 N.Y.U. L. REV. 385, 396-97 (1985).

ingness to convert one's calculation of the probability of the facts supporting plaintiff's case given the evidence adduced at trial, to a general belief about the probability of the facts supporting the plaintiff's case.²⁸

Rather than continue to debate the existence of a distinction between the evidence and the event, or the relative value of verdicts as statements about one or the other, let us assume for the moment that there is a distinction between statements about the evidence and statements about the event and that there is a societal advantage to verdicts that can be perceived as statements about the latter. The final problem with this hypothesis that I would like to address is cost. Nothing in life is free. Assuming that "event-verdicts" are benefits, what do they cost, and who pays that cost?

If we deny verdicts to plaintiffs in blue bus cases (because, Nesson argues, verdicts for plaintiffs would only be statements about the evidence), we must recognize that we are increasing the number of factually incorrect verdicts. Assume, for example, that ten blue bus cases are litigated and our decision rule (unlike Nesson's) gives a verdict to the plaintiff in each of them. If the facts are consistent with our understanding that the probability that the blue bus belonged to the defendant is 0.8, we can expect that eight verdicts will be "correct" in that the defendant did in fact operate the offending bus, while two will be "incorrect" in that some other company operated the bus. In such a small experiment, the result, even in those two "incorrect" cases, is that the wrong is one-sided: the winning plaintiff deserves recovery, but gets it from the wrong party. Thus, the Blue Bus Company suffers an improper loss while the true culprit goes free. If, on the other hand, our decision rule (like Nesson's) gives a verdict to the defendant Blue Bus Company in each case, only two verdicts will be factually correct (in that the bus did not belong to the defendant), while eight will be incorrect (because the bus did belong to the defendant). Furthermore, in the eight incorrect cases the wrong is two-sided: the losing plaintiff ought to have recovered and the winning defendant ought to have paid. Moreover, even the two correct verdicts are asymmetrical: although the prevailing defendant ought not to have been liable to anyone, the losing plaintiff was entitled to recovery from *someone*, just not from the defendant. Thus, the preference for event-verdicts and against evidence-verdicts moves us from eight correct verdicts (and two "one-sided" incorrect verdicts) to eight incorrect verdicts (and two "one-sided" correct verdicts).²⁹

²⁸ Using symbols commonly employed in this area, I suggest that in the case of "statements about the evidence," factfinders are not necessarily convinced that $P_{pc}|E = P_{pc}$ (where P_{pc} is the probability of plaintiff's case, and E is the evidence presented). See N. Cohen, *Probability, Proof, and the Weight of the Evidence* (work in progress).

²⁹ More particularly, if ten blue bus cases are litigated, there are a total of twenty parties, ten plaintiffs and ten defendants. If we give verdicts to the plaintiffs, eighteen of the twenty parties will be put into the same position an omniscient legal authority would have put them into—eight plaintiffs would recover from eight of the defen-

Increasing the number of factually incorrect verdicts is, I assert, a societal detriment, but does the benefit flowing from discouraging "evidence-verdicts" and encouraging "event-verdicts" outweigh the detriment? Perhaps it depends on the case. If, for example, only 51% of the blue buses were owned by the defendant, the societal advantages of event-verdicts might well outweigh the slight increase in incorrect verdicts (from 49% to 51%) that would result from applying the Nesson principles rather than a strict probabilistic preponderance model. If, on the other hand, 99% of the buses were owned by the defendant, a verdict for the defendant would be factually incorrect 99% of the time—99 times as often as a verdict for the plaintiff would be. An increase in error of this magnitude is obviously much harder to outweigh.

Professor Nesson has innovatively described a benefit flowing from aversion to probabilistic verdicts. While we may be willing to accept his thesis that the principle is beneficial, its cost must be examined. Only if the benefit exceeds the cost should the principle be adopted. The cost is easily quantifiable; the benefit, however, is not. How many additional factually incorrect verdicts are the advantages of event-verdicts worth? Five percent? Fifty percent? Whatever the answer, society should purchase the benefit only if it is a good bargain in relation to its cost.

I should note that the costs associated with Nesson's thesis are not unique. Indeed, any decision-making model that denies a verdict to the plaintiff when the factfinder's best assessment of the relevant probability is higher than 0.5 has similar costs. I also have posited such a model,³⁰ arguing that probabilities determined in a legal context are only estimates and, accordingly, are accompanied by a degree of uncertainty as to their ultimate accuracy. In statistical terms, the probability assessments are "point estimates" that are surrounded by "confidence intervals." The preponderance burden is satisfied, according to that model, only when the entire confidence interval, rather than merely the point estimate, exceeds 0.5.³¹ To the extent that application of this model would increase the number of factually incorrect verdicts by denying verdicts to plaintiffs when the point estimate (but not the entire confidence interval) exceeds 0.5, this model also ought to be subjected to this sort of cost-benefit analysis before it is accepted.

Returning to our cost-benefit analysis of Nesson's thesis, a second question must be addressed: who pays? Assuming the societal benefits of policies favoring event-verdicts exceed the societal costs of those policies, how should those costs be allocated? Under Nesson's thesis, the cost is borne entirely by plaintiffs who have good cases but are incorrectly denied recov-

dants, and two plaintiffs would recover from nonparties. If we give verdicts to the defendants, on the other hand, only two of the twenty parties (the two "innocent" defendants) would be placed in the same position as they would have been by the omniscient authority. The omniscient authority would find the other eight defendants liable to eight of the plaintiffs, and two nonparties liable to the other two plaintiffs.

³⁰ Cohen, *supra* note 27.

³¹ *Id.*

ery. In the blue bus cases, for example, Nesson's thesis creates a group of eight plaintiffs (out of ten) who were injured by defendant's bus but cannot recover. I do not understand why these unfortunates should pay the entire cost of the presumed societal benefits of event-verdicts. To add insult to injury, the incorrectly exculpated defendants not only share in the societal benefits of event-verdicts, but they also get the windfall of their false vindication!

The benefit is shared by society. Why should the cost be borne only by a few, especially without an ascertainable normative reason? If the cost is not, or cannot be, socialized, isn't the unfair allocation of the societal cost itself an additional societal cost? If so, this additional cost must be factored into the cost-benefit analysis.

I find these questions about cost-benefit ratios and cost-allocation troubling. I do not mean to imply that Nesson's thesis should be rejected. I suggest only that the analysis of its value ought to be broader. We should not debate merely whether event-verdicts ought to be encouraged over evidence-verdicts; rather, we should also examine the costs of that encouragement. Only after we know the cost—and who must bear it—can we make an intelligent decision about purchasing the benefit.