General Introduction

Legal Evidence and Proof: Past, Present, Future

Legal evidence has to do with facts (though even this basic stance has been questioned, in the already extensive literature on the subject). In fact, the law has to do with facts in so many more ways. Law itself consists of institutional facts. Facts determine the content of law: think of Hart's minimum content of natural law, based on elementary facts of human and social life. Law sets factual limits to human conduct, through threats of punishment and so much more, just as it creates possibilities for important kinds of conduct and its factual consequences, such as legislating and contracting. Lawful (and unlawful) conduct changes the facts of the world. So many more relationships of law and fact remain to be investigated.

Most important, of course, are facts determining the application of legal rules to parts of the living (and sometimes dead) world, or: the problem of legal evidence and proof. Establishment of such facts, needed in order to realize the law (and hopefully justice and right) may go without much further saying, in any case if all parties and others concerned reasonably agree on them. But more than a few legal and other conflicts on the application of rules are fought over disputed facts, rather than disputed law, in courts of law and in the real world. So methods and standards have to be devised to settle conflicts over facts in some or other authoritative or even rational manner. A rather ancient but still probably well-known example of this is to be found in the Code of Hammurabi:

> If a man charge a man with sorcery, but cannot convict him, he who is charged with sorcery shall go to the sacred river, and he shall throw himself in the sacred river; if the river overcome him, his prosecutor shall take to himself his house. If the river show the man to be innocent and he come forth unharmed, he that charged him with sorcery shall be put to death. He who threw himself into the river shall take to himself the house of his accuser.

A rather unconventional way to establish strange facts, one might say with the benefit of hindsight, though a later and probably still better-known issue of evidence and proof offers a comparable semblance of the complete disparity of methods of discovery and facts to be established. Here is the story of fact-finding by King Solomon, once again (1 Kings 3, verse 16, New King James translation):

> Now two women who were harlots came to the king, and stood before him. And one woman said, 'O my lord, this woman and I dwell in the same house; and I

gave birth while she was in the house. Then it happened, the third day after I had given birth, that this woman also gave birth. And we were together; no one was with us in the house, except the two of us in the house. And this woman's son died in the night, because she lay on him. So she arose in the middle of the night and took my son from my side, while your maidservant slept, and laid him in her bosom, and laid her dead child in my bosom. And when I rose in the morning to nurse my son, there he was, dead. But when I had examined him in the morning, indeed, he was not my son whom I had borne.'

Then the other woman said, 'No! But the living one is my son, and the dead one is your son.' And the first woman said, 'No! But the dead one is your son, and the living one is my son.' Thus they spoke before the king. And the king said, 'The one says, "This is my son, who lives, and your son is the dead one"; and the other says, "No! But your son is the dead one, and my son is the living one."' Then the king said, 'Bring me a sword.' So they brought a sword before the king. And the king said, 'Divide the living child in two, and give half to one, and half to the other.'

Then the woman whose son was living spoke to the king, for she yearned with compassion for her son; and she said, 'O my lord, give her the living child, and by no means kill him!' But the other said, 'Let him be neither mine nor yours, but divide him.' So the king answered and said, 'Give the first woman the living child, and by no means kill him; she is his mother.' And all Israel heard of the judgment which the king had rendered; and they feared the king, for they saw that the wisdom of God was in him to administer justice.

However, some progress seems to have been made. Reconstruction of King Solomon's argumentation, or better still, justification in terms of implicit premises brings to light a reasonably strong connection between testimonies cunningly elicited and the fact to be proven. Arguments referring to riverside experiments in order to determine sorcery seem all too enthymemetic to pass muster in terms of more modern standards of evidence and proof. King Solomon applied a method of investigation brilliantly devised to solve a seemingly intractable problem. That is, intractable in those days: today, a simple (or sometimes not so simple) DNA test would do the job just as well, according to the same high standards, albeit at the cost of rather reduced drama.

Progress in forensic sciences and technologies has been formidable indeed. But human wisdom did not always keep up with it, as is probably conclusively proven by recent and not so recent scandals involving sentencing or even killing the innocent in the name of criminal law. This (and more evidential mishaps in application of the law) still happens in the most civilized of jurisdictions. Why?

One major reason may be the deep-seated tendency of the judiciary to regard the handling of matters of evidence and proof as presupposing no special knowledge and skills, and acting on it. Of course things go wrong at times, it will be added, but then there is no perfect human practice anyway. Strange as this may sound, at least to evidence scholars, it is a deep-seated conviction, repeatedly expressed by

prominent court members who are probably not conversant with a rather extensive literature in the field of evidence and proof. Thus a prominent district court vice-president in The Netherlands, W.M. Van den Bergh, expressed his conviction on 'the simplicity of basic facts' as follows (as recently as 2008):

> In order to decide whether the criminal defendant did commit the crime no special professional judges' expertise is needed. No special knowledge or skills are needed in order to become convinced of a criminal defendant's guilt, or to have doubts about it.

Probably not much special knowledge nor many skills are needed to comprehend that this kind of conviction behind convictions may be rather dangerous for the innocent. This is amply demonstrated by so many death row inmates in the United States owing their lives and liberty to non-legal people applying special knowledge, skills and zeal to their wrongly decided cases. Just as more than a few victims of misadministration of criminal justice in Great Britain, The Netherlands and elsewhere were freed as a consequence of 'laypeople's' unrelenting zeal on behalf of their cases. (Derksen's scathing and, in the end, effective public criticism of courts' misuse of basic statistics in a nurse's conviction for infant killing is a case in point: see also his contribution to this book.)

In line with this is legal people's tendency to incorporate issues of fact into the law. Indeed one important feature of legal evidence and proof is the regulation of legal fact-finding. Rules of procedure govern police authorities in search and seizure, admissibility of evidence and of witnesses, distribution of burdens of proof, legal standards of proof, determination of proof by authoritative bodies and so much more of course. This may indeed lead to legalizing or better still, legally formalizing issues of evidence and proof. Or: as long as the rules are faithfully adhered to, the outcome of legal processing of evidence is taken to be equivalent to legally relevant certainty as to the facts of the case. A notorious expression of this legal attitude towards facts (or 'facts') is United States Supreme Court member Scalia's well-known dictum in *Herrera* v. *Collins* (506 US 390, 1993):

> Mere factual innocence is no reason not to carry out a death sentence properly reached.

Thus doubts about the redundancy of special expertise and skill in the determination of legal evidence and proof (is it really true that malice, negligence or innocence are plain to see?!) seem to be done away with by reference to the authority of legal procedure. (Scalia even seems to be in postmodern company, doubting the very concept of a fact independent from 'authoritative establishment'.)

Still this is not a generally accepted standpoint, outside or even inside judiciaries. To limit the discussion to criminal procedure: it may be true that the great majority of criminal cases relate to certainty (according to whatever standards) of offender identification. Even then, issues of malice and negligence may not always be

simple. Next, more than a few hard cases remain. There may be circumstantial evidence only, witnesses may appear not to be completely trustworthy, expert witnesses may contradict each other, and so on. It does not seem plausible or even viable to do away with such kinds of uncertainties by simply referring to standards of legal procedure, let alone by appealing to commonly available knowledge and skills as sufficient to solve such riddles.

Thus questions about rational standards of evidence and proof crop up, as distinct from rules of procedure determining issues such as the division of burdens of proof and admissibility of evidence. Obviously, availability of direct evidence in the sense of exhaustive demonstration of the facts of the case before adjudicators' eyes and ears is rather exceptional. It would be hard even to think of a convincing example of this. In a grimly captivating story of a lawyer, herself caught in the machinery or machinations of criminal justice, Janet Malcolm comments on this with the following fundamental remark (1999, 19):

> Historical reconstruction in all cases gives rise to structures that are more like ruins than proper buildings; there is never enough solid building material and always too much dust.

How to clear this dust away, to a sufficient extent? What counts as dust, what is a sufficient extent? (Scalia probably would not mind.) Probability considerations plaguing so many criminal and other issues of fact set in here already. Next, there is the different and more practical distinction between direct and circumstantial evidence. Such evidence may be available to adjudicators with or without the intervention of witnesses.

In any case, the absence of 'the facts of the case themselves' (if this is a sensible concept at all) raises questions on standards of evidence and rules (in a wide sense) governing relationships between 'available evidence' and 'the facts of the case'. This is related to the long-standing and recently revived discussion of the 'logic' of evidence and proof, dominated for so long by the towering figures of Bentham and Wigmore. To further introduce this discussion it seems apposite to quote Bentham at some length (1827, Book I, Part 1):

> By the term evidence, considered according to the most extended application that is ever given to it, may be, and seems in general to be, understood, any matter of fact, the effect, tendency, or design of which, when presented to the mind, is to produce a persuasion concerning the existence of some other matter of fact—a persuasion either affirmative or disaffirmative of its existence.
>
> Of the two facts thus connected with each other, the latter may, for the purpose of expressing the place it bears in its relation to the other, be distinguished by the appellation of the *principal* fact, or matter of fact: the other, by that of the *evidentiary* fact, or matter of fact.

Taking the word in this sense, questions of evidence are continually presenting themselves to every human being, every day, and almost every waking hour, of his life.

…

The impression, or something like an impression, I see in the grass—the marks of twisting, bending, breakage, I think I see in the leaves and branches of the shrubs—the smell that seems to present itself to my nostrils—do they afford sufficient evidence that the deer, that the enemy, I am in chase of, have passed this way? Not polished only, but even the most savage men—not human kind only, but even the brute creation, have their *rules*—I will not say, as Montesquieu would have said, their *laws*—of Evidence.

Just as so many issues of evidence and proof remain the same in human life, at least some issues of legal evidence and proof have, of course, changed since the days of Bentham. Still, miscarriages of justice continue to the present day. We may have come a long way since Hammurabi, but King Solomon seems less easily surpassed. One driving force, apart from intellectual zeal, behind the recent revival of research into evidence and proof is the hope that (still) more rational rules or even principles of fact-finding, evidence and proof may be discovered and/or devised. Two more introductory cautionary remarks are in order then.

First, and even if the issue is limited to facts relevant for application of the law, many different kinds of evidence may be relevant. This ranges from specific facts determining 'who did what, and why' or specific forensic facts like collar bone x-rays determining the legally relevant age of refugees, or specific facts determining damage to be established by comparing two complete future courses of events (with and without tort), to general facts like: what are customs in specific parts of society determining 'what may be reasonably expected in commercial dealings'. Studies in the logic of evidence and proof tend to concentrate on offender identification, probably the most important issue in this field indeed.

Second, this book does not aim to represent more than a small part of the current state of the art in studies of legal evidence and proof. Thus issues of witness reliability, and issues of psychology in general, however important, are generally left out of account. The focus is on reasoning, logic, in a very broad sense. This may be further detailed as follows.

Three Current Approaches to the Study of Logic and Argumentation in Legal Evidence and Proof

Studies of argumentation and logic in factual legal inference have broadly speaking been of three kinds: statistical, story-based, and argument-based. First, statistical approaches acknowledge that evidence cannot provide watertight support for a

factual claim but almost always leaves some uncertainty. They then apply the 'standard' theories for reasoning under uncertainty: statistics and probability theory. Much work in the statistical approach is not focused on general statistical models of legal fact-finding but instead criticizes particular uses of statistics in court cases (e.g. Dawid 2005). Those who do focus on general models sometimes advocate a Bayesian approach, according to which domain experts provide conditional probabilities on hypotheses given the available evidence, while the fact-finder estimates the prior probabilities on the hypotheses. The mathematics of Bayesian probability theory then allows the computation of the posterior probability of the hypotheses, given the evidence. If, for a certain hypothesis, this probability exceeds the proof standard, the hypothesis can be accepted. Probabilistic theories of evidential reasoning have been thoroughly studied by David Schum (e.g. 1994).

Statistical methods can be very useful for investigating the relevance of evidence, for instance, by performing so-called sensitivity analysis, i.e., testing how a change in the likelihood of a statement affects that of other statements (see, e.g., Kadane and Schum 1996). However, the statistical approach is by no means uncontroversial (a useful critical overview of the debate is Lempert 1986). One objection is that in legal cases the required numbers are usually not available, either because there are no reliable statistics, or because experts are unable or reluctant to provide reliable estimates of probabilities. Another objection is that statistics and probability theory impose a standard of rationality that cannot be attained in practice, so that their application would lead to more instead of fewer errors. To overcome these and other limitations of statistical models, other models have been proposed.

Second, the story-based approach was initially proposed by the psychologists Bennett and Feldman (1981). Their main claim was not normative but empirical, being that the way lawyers make factual judgements is not by statistical reasoning but by constructing and comparing stories about what might have happened. Wagenaar et al. (1993) go a step further, arguing that this is in fact the only way for fact-finders to reason about the facts of the case, given the cognitive limitations of humans. Their research then takes a normative twist, studying how story-based factual judgement may be more rational. An important point here is that specific stories must be 'anchored' in factual generalizations which may, however, be less than certain, so that their applicability to a case must be critically examined. The story-based approach has also been embraced by some artificial intelligence (AI) researchers, based on the idea that story-based reasoning is not unlike abductive reasoning and inference to the best explanation, for which elaborate AI models exist (Josephson 2001; Poole 2001; Keppens et al. 2005; Thagard 2005).

A third approach takes not stories, but arguments, as the main concept. Bentham looms large here as well. In contemporary theory, however, Wigmore's charting method of legal evidence is prominent. With this method alternative arguments from evidence to hypotheses can be graphically displayed and sources of doubt in these arguments can be revealed (e.g. Wigmore 1931). Generalizations are

important here as well, since they are the 'glue' that connects the evidence with the hypotheses, and since their general plausibility and possible exceptions are important sources of doubt. Wigmore's charting method has been extended and refined by the 'New Evidence Scholars' (e.g. Anderson et al. 2005). One study of legal evidential reasoning from the perspective of dialogical argumentation theory is Walton's (2002). In AI and Law the argument-based approach has been founded on so-called non-monotonic, or defeasible logics, which were developed in AI to formalize reasoning with uncertain and incomplete information in cases where uncertainty cannot be quantified. In AI and Law one type of non-monotonic logic is particularly popular: argument-based logic, modelling defeasible reasoning as the construction and comparison of arguments and counter-arguments (e.g. Verheij 2000; Bex et al. 2003; Prakken 2004).

Finally, some have studied combinations of approaches. For example, Keppens (e.g. Keppens et al. 2005) has studied combinations of probability theory and abduction in the context of investigation. Kadane and Schum (1996) and Schum (2001) have reinterpreted Wigmore charts as so-called Bayesian networks. Such networks, developed in AI, combine probability distributions with graphical models of probabilistic dependencies (which may be based on commonsense generalizations).

Although the three approaches are different in important respects, they also share an important feature. In all three approaches, defeasibility is prominent. For example, in probabilistic models new evidence may reduce the posterior probability of hypotheses, in story-based approaches new evidence may reduce the credibility of a story, and in argument-based logics new evidence may give rise to arguments that defeat a previously undefeated argument. In all these cases the deeper reason for this phenomenon is that evidence almost always leaves room for doubt: sources of evidence (such as witnesses) are fallible, and general world knowledge is uncertain and leaves room for exceptions.

Defeasibility of legal evidential reasoning is related to both investigative and procedural aspects of legal evidence and proof. Legal reasoning about the facts takes place in a variety of contexts, which may be broadly divided into contexts of investigation and contexts of judgment. This distinction is, of course, related to the well-known epistemological and methodological distinction between contexts of discovery and contexts of justification. It was long held that these contexts are completely separated: how a scientist came to a certain theory was regarded as irrelevant for the truth of the theory. Legal logicians have long had a similar attitude to the justification of legal judgments: the process by which a certain judgment was reached was regarded as irrelevant for the quality of the judgment. However, developments in philosophy and AI have softened the sharp distinction between the two contexts. For these reasons, this book takes a broad perspective, studying both the investigative and the judgment phase.

Relationships between phases of investigation and judgment raise interesting issues, such as whether both phases are governed by the same or by different models of inference. For instance, looking for hypotheses about the facts of a case,

as in the investigative phase, may require abductive models of reasoning with a relatively low proof standard, while deciding whether a hypothesis can be accepted as true involves critical adjudication with a high standard of proof. Another issue is to what extent the soundness of an inference in the judgment phase depends on the quality of the preceding investigation.

A further theme relevant for reasoning about the facts of a case is the relation between rationality requirements and legal constraints. At first sight, since this book's focus is on rational models of factual legal reasoning, it would seem that specific features of legal systems may be ignored. However, it will turn out that one stumbles quite quickly on the tension between a rational ideal and legal reality. The simplest example of this tension is the necessity to decide about a case even though perfect knowledge about what has happened is unattainable. Human imperfection in deciding cases necessarily implies that some offenders go free, while some innocent people are punished. Also, evidence on which a case is decided is not simply given but established by rules of procedure and admissibility of evidence. Moreover, the inferences that can be drawn from the admissible evidence are not only determined by rules of rational inference but also by legal procedural rules on, for instance, burdens of proof and presumption.

In conclusion, studies of legal evidence and logic should not just focus on models of inference but should embed such models in accounts of investigation and different kinds of procedure.

An Overview of the Book

This book aims to cover these different issues as follows. Chapter 1 offers brief discussion of why legal evidence and proof seems desirable at all, or even imperative. Chapters 2 and 3 represent statistical approaches in a broad sense. Story-based discussion is to be found in Chapters 4 to 6; Chapters 7 and 8 compare story-based with argument-based accounts. The remaining three chapters are firmly on argumentative grounds. Summaries of the chapters may clarify this:

1. *Hendrik Kaptein* (Leiden University) discusses the basic question why legal evidence and proof are needed at all. Reasons against singling out offenders are expounded. Also, practical obstacles to the reliable establishment of evidence and proof pass muster. This leads to questions concerning the very concept of proof, presumably linking present evidence with past (or future) events. Brief discussion of (Benthamite) ideals seems to lead inexorably to the conclusion that proof of past events is impossible in principle. Lawyers' standard answer to such theoretical scepticism refers to proceduralism: there need be no such thing as historical truth in adjudication and conflict resolution in general, as 'legal truth on the facts of the matter' is exhaustively determined by the outcome of reasonable legal procedures. This 'practical solution' is argued to be deeply implausible in principle, not just because it may lead to legal establishment of fact at odds with historical reality.

One suggestion would be to limit troublesome issues of evidence and proof to determination of harm done (in a wide sense), leaving issues of authorship alone. Thus problems of evidence and proof may be 'halved'. Against this is put forward that individual liability is a basic presupposition of personal identity and thus of meaningful human relationships. Or: it is argued that there can be no humanly feasible society without ascription of individual liability and its consequences. So it is contended that there still is an issue of evidence and proof concerning offenders, not just concerning harm done. Legal forms and limits of this are discussed, including implications for standards of evidence and proof.

2. *Ton Derksen* (University of Nijmegen) and *Monica Meijsing* (University of Tilburg) discuss a notorious criminal case from The Netherlands. Nurse Lucia de B. was convicted of seven murders and three attempted murders with the penalty of life imprisonment. Yet there was little evidence apart from the fact that at the hospital where it all started, quite a number of resuscitations happened during the nurse's shifts. Then, after one more resuscitation, it was felt that that all this could not be just a coincidence. Very early in the process a quantification was given to the uneasy feeling that proportionally there were too many resuscitations during the nurse's shifts. The probability that such a coincidence could have happened by mere accident was calculated by one expert as 1 in 342,000,000. With that number out in the open, the general notion was that what had happened could not be just an accident. The nurse definitely had to be a serial killer, even in the absence of any further evidence. It is argued that this idea was in fact the driving force in the whole judicial process. It coloured everybody's perception, including that of the prosecution and the courts. And it fabricated a whole series of incriminating facts which inexorably led to the completely unwarranted conclusion against Lucia de B. Important general lessons may be learned from this. Throughout the process three dangerous reasoning instincts may be seen at work: (1) the Small Chance Instinct (2) the No Smoke without Fire Instinct, and (3) human inclination to pay little attention to base rates (in non-everyday situations).

3. *Ton Broeders* (University of Maastricht and Leiden University) discusses rational and probabilistic models of forensic decision-making in individuation problems. In such problems a forensic scientist is confronted with a trace (for example, a fingerprint, some handwriting, a DNA sample, or a bullet) and has to determine its source (a specific person, a specific firearm). Traditional forensic approaches are criticized for requiring that identification and elimination should be categorical and that therefore the reasoning involved should be deductive. Against this it is claimed that this kind of reasoning has to be inductive, since, when determining the source of a trace, it is practically impossible to compare the source with the entire population of all potential sources. Therefore probabilistic assessments are inevitable. Accordingly, a Bayesian model of factual judgement is proposed: forensic experts should provide conditional probabilities on the relevance of evidence to certain hypotheses, while the fact-finder should estimate

the prior probabilities of these hypotheses and combine them with the expert's conditional ones to calculate the impact of new evidence on the hypotheses' posterior probability. It is also argued that in order to avoid misunderstandings it is essential that the expert report his findings to the adjudicator in a rationally correct format. Traditional conclusion formats are argued to be logically flawed and misleading. A more plausible conclusion format is suggested.

4. *Floris Bex* (University of Groningen) focuses on the story-based approach to reasoning about the facts of a case. After a discussion of previous work on the role of stories in legal evidential reasoning, the notion of story schemes as a tool to assess story plausibility is developed. Stories are argued to be plausible if their facts fit story schemes. A story scheme is a description of typical event structures, such as the typical facts of a robbery or, more generally, an intentional crime. It is noted that story schemes can be more or less abstract and he emphasizes that it is important to match a story with the most specific available story scheme. For instance, a robbery story's plausibility is best established using a story scheme for robberies, and less so by using a story scheme for intentional crimes. This account of story schemes is also used to explicate the role of causal generalizations that connect causally related facts in a story, and it is noted how story schemes have different uses, e.g., for story analysis (in decision-making), hypothesis generation (in investigation) and for building persuasive stories (in pleading).

5. *Marijke Malsch* (Netherlands Institute for the Study of Crime and Law Enforcement, NSCR) and *Ian Freckelton* (Monash University, Melbourne) discuss two broad types of evidence evaluation within criminal cases. One of them concerns a 'holistic' way of looking at the various items of evidence and coming to conclusions about how convincing they are in terms of their probative value. The use of stories, comparing different accounts of what happened, and looking at events as a whole, are central to this model. The other way in which evidence is evaluated is atomistic, whereby each item of evidence is weighed and scrutinized independently from the other evidence. It represents, in principle, a bottom-up way of coming to conclusions regarding what happened in a case. Advantages and disadvantages of each approach are discussed. Attention is paid to two archetypes of legal systems: the adversarial and the inquisitorial. Taking The Netherlands and Australia as examples of the two types of legal systems, this chapter examines those characteristics that can be expected to contribute to a preference for either a holistic way or an atomistic way of evaluating evidence. An answer is sought to the question, which type of legal system would prefer to use one of the modes of evidence evaluation over the other. Some legal systems may be more inclined to a holistic approach than others, and vice versa. Some cautious recommendations are made.

6. *Amalia Amaya* (formerly Harvard University, now National Autonomous University of Mexico) discusses the combination of story-based approaches

with AI and cognitive science models of inference to the best explanation. It is argued that most arguments about facts in law are instances of 'inference to the best explanation', that is, patterns of inference whereby explanatory hypotheses are formed and evaluated. A coherentist interpretation of inference to the best explanation is offered, according to which reasoning about facts in law involves first the generation of several plausible explanations of the evidence at trial and then the selection, from among them, of the one that is best according to a test of explanatory coherence. It is shown how the explanationist model of legal proof proposed would deal with the O.J. Simpson case. Next, there is discussion of a major criticism against a model of inference to the best explanation in law, namely, the objection from the bad lot, which says that the best available explanation might still be a bad one. Against this it is noted that the investigation phase in which the explanations are constructed is governed by principles of epistemic responsibility and that respecting these principles increases the chance that the best explanation available is rationally acceptable.

7. *Bart Verheij* and *Floris Bex* (University of Groningen) contribute one more piece of the puzzle as to how the story-based and argument-based approaches are related. The main result of this chapter is a set of argumentation schemes, reconstructing anchored narratives theory. Such schemes are kinds of semi-formal analogues of the rules of inference of logic. An argumentation scheme specifies conditions that can support a conclusion and possibly also exceptions that can apply and conditions of use for the scheme. The central argumentation scheme of the set makes explicit how a story can be accepted as true according to the anchored narratives theory: the story must be good and the story must be well anchored. An important exception to the rule that good, well anchored stories can be accepted as true is the availability of another good story, with equally good or perhaps even better anchoring. Thus the argumentation schemes developed in the chapter lead to some refinements and clarifications of the anchored narratives theory. In particular, it is explained how accepting a story about the facts of a crime can depend recursively on stories about pieces of evidence. It is proposed that the acceptance of the truth of a story about a piece of evidence should be treated in the same way as the acceptance of the truth of a story about the crime facts, but using different measures of the plausibility of such stories (in the form of different story structures).

8. *Hendrik Kaptein* discusses the often belittled but in fact fundamental conflict between anomism (evidence and proof are to be established by any means, as long as they conform to relevant facts) and proceduralism (legally relevant facts are to be established by authoritative procedure). Anomism is shown to be related to strict distinctions between contexts of discovery and contexts of justification, related in their turn to ideals of monotonic reasoning. Proceduralism, on the other hand, implies the dependence of justification on procedure, with the attendant relevance of defeasible reasoning. Several objections against anomism are discussed, ranging

from the problem of the *argumentum ad ignorantiam* and doubtful objectivist ontological and epistemological presuppositions to its practical impossibility. At first sight this would seem to reinstate proceduralism and its basic idea of constructed 'reality'. Still, such 'pure' proceduralism is shown to come down to giving up the idea of reasonable conflict resolution as such. What is left to be done, then, is the devising of rational procedures for unearthing the truth of the matter, or: proceduralism is one important (heuristic) tool in reconstructing reality.

9. *Henry Prakken* (University of Groningen and Utrecht University) and *Giovanni Sartor* (CIRSFID, University of Bologna and European University Institute, Florence) continue with the argumentation approach. The starting point is the claim that logics for defeasible argumentation provide the means to logically characterize the difference between several kinds of proof burdens, but only if they are embedded in a dynamic setting that captures the various stages of a legal proceeding. It is also argued that 'standard' argumentation logics for AI must be adapted in order to model shifts in burdens of proof. Thus this analysis illustrates in two ways that logics cannot be simply imposed on the law but that features of legal systems must be taken into account. First there is the claim that the burden of persuasion, which legally is the burden to prove a statement to a specified degree (the standard of proof), with the penalty of losing on the issue, can be verified by applying an argumentation logic to the evidence available at the final stage of a proceeding. Then a precise distinction is made between two burdens that are sometimes confused, namely the burden of production and the tactical burden. In this analysis, the tactical burden of proof is automatically induced by the defeasible nature of the reasoning. The burden of production, by contrast, concerns the legal question of whether an issue can be submitted to trial or must be decided as a matter of law against the one who fails to produce any evidence. Finally the issue is raised as to what extent this account can be generalized to statistical and story-based approaches.

10. *Burkhard Schafer* (University of Edinburgh School of Law, Joseph Bell Centre) aims at a tentative exploration of a legal theory of rational argumentation, that is a theory that takes the rules of legal procedure as a starting point and aims to describe the way in which they function in a legal argument. The relationship between rational and legal procedural principles of evidentiary reasoning is addressed, taking Kaptein's distinction between anomism and proceduralism (see Chapter 8) as a starting point. It is claimed that when these clash, it is not always the law that is at fault. Indeed it is argued that rational inquiry in the natural sciences may not be the paradigm of fact-finding in the law. Typically, legal rational values may be at least as important. Legal-procedural rules should not be seen as contingent extra-rational add-ons to rational models, merely meant to promote extra-rational legal values such as fairness and due process. Instead it is argued that several such constraints enhance rational truth seeking, since they restore the epistemic asymmetry that sets legal trial apart from scientific debate. The difference shows

itself most clearly in criminal trials, where the defendant has privileged access to the truth, while the prosecution has privileged access to the means of proof. Legal procedure aims at restoring the epistemic symmetry between the parties by, for instance, rules on burdens of proof and pre-trial disclosure rules. Because of the epistemic asymmetry of legal procedure, it is also argued that legal evidential reasoning is not about what is true but about what can be proven to be true. Against Prakken and Sartor, in this book and elsewhere, it is put forward that this can be modelled as deductive instead of defeasible inference since the question 'what has been proven' is not addressed until the end of a proceeding, at which point no new evidence can be introduced, which excludes any further defeat.

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