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Evidence as a multi-disciplinary subject

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The subject of Evidence deserves to be a sustained focus of multi-disciplinary attention. Recent events have combined to give it a higher public profile. It is inferential reasoning that gives the subject its coherence.

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1. Introduction: A high-profile subject

In December, 1995 I was invited to give a plenary address at the STAR conference on Criminal Investigation and Evidence in Amsterdam. I wrote a paper entitled *Recent Trends in Evidence Scholarship*, but I fell ill and failed to deliver it. Alas, I did not follow Max Gluckman's advice to the young academic: 'Never publish your party piece' and it was printed as part of the conference proceedings.[1] So I am estopped from presenting it today.

However, I shall use it as a starting-point to consider briefly some significant developments and some continuities regarding evidence as a multi-disciplinary subject from the point of view of a legal theorist who has a special interest in evidence in law. On that basis I shall argue that this is a particularly promising time to make evidence the subject of sustained inter-disciplinary attention, which can be given coherence by adopting what David Schum has called a 'substance-blind approach'.[2]

In my 1995 address I highlighted several salient themes of the previous decade: It is hardly surprising that Rick Lempert's phrase 'the new evidence scholarship' should have been mainly associated with the debates and developments about probabilities in law. But in 1995 I argued for a much wider conception of recent developments affecting the subject of evidence in law, to including interest in witness psychology, advances in forensic science (e.g. DNA and footprint analysis), issues about the relationship between narrative and argument, holism, post-modernism and pragmatism. From this ferment, I selected four themes for more detailed development: (i) the place of the Law of Evidence within the broad field of Evidence in Law and, in particular, the problems of constructing a coherent conception of both the field and of evidence doctrine; (ii) the integration or re-integration of Evidence and Procedure—with particular reference to developments in England with regard to criminal evidence and how this related to the treatment of procedure in the Continental European tradition; (iii) the internationalisation of evidence

[1] Twining (1997).
[2] Schum (1994).

scholarship, through the work of scholars as different as Mirjan Damaska, Hans Nijboer, Hans Crombag and Willem Wagenaar; and, finally, (iv) the multi-disciplinary nature of evidence scholarship and the emergence of Evidence as a cross-disciplinary field in its own right.

All of the topics that I have mentioned—and many others—are alive today. Some new ones have come on the intellectual scene.[3] But rather than merely update my address of seven years ago or, more ambitiously, attempt to survey the current complex scene, I wish to focus on the last point and to suggest that some recent developments have greatly strengthened the case for making Evidence a multi-disciplinary field in its own right.[4]

The idea is not new. Bentham wrote: 'The field of evidence is no other than the field of knowledge'.[5] He devoted his longest work to one part of that field, Judicial Evidence. There is now a massive philosophical and theoretical literature that transcends disciplines. What is new is that the study of evidence is rapidly gaining a very high profile in several quite different quarters. For example, in popular fiction lawyer novelists have sometimes outsold writers of traditional detective and spy fiction. On television as well as in bookstores forensic scientists have joined the ranks of detectives and spies through Patricia Cornwell and programmes such as Crime Scene Investigation. In recent years international criminal tribunals and Truth and Reconciliation Commissions have proliferated, raising some new problems about evidence and story telling. Events in Eastern Europe, Rwanda, South Africa and Latin America have stimulated an enormous interest in 'Memory', especially among historians.[6] DNA regularly hits the headlines. In England several police authorities have been won over to FLINTS (Forensic Led Intelligence System), a computer programme developed by Richard Leary. This is a powerful tool for investigating multiple crimes, and making links between crimes that were not previously thought to be connected. It is based in part on ideas developed by Wigmore and Schum. Its proper operation requires that police investigators should be trained in basic skills of inferential reasoning and analysis.[7]

Perhaps the most obvious example has been the post-mortems on the tragedy of Sept 11th 2001: one standard line goes that the intelligence services had enough information to predict the event, but lacked the skills to analyse it. They did not have the capacity to 'join the dots' or methods for identifying as significant a few 'trifles' from the masses of data that flow into different agencies from a variety of sources. Evidence has been a primary focus of attention in news about Iraq: the weapons inspections, Colin Powell's presentation to the Security Council, the question of links with Al Qaeda and the search for 'weapons of mass destruction'.

An article in *The New Yorker* in Feb. 2003 reports interviews with leading figures in the CIA and the Pentagon who were concerned with improving intelligence analysis in the

[3] E.g. the debate about evidence and economic analysis of law (Posner, 1999; Lempert, 2001; Park, 2001) and the theoretical work of Ronald J. Allen (e.g. Allen, 1991, 1994; Allen and Leiter, 2001).

[4] In this context 'Evidence' is preferable to 'Evidence Science', for the latter might carry some association with the dubious idea of disciplinary 'autonomy' and might suggest that the subject belongs to the 'hard' more than the 'soft' disciplines, rather than at their interface.

[5] Bentham (1810, p. 2.)

[6] E.g. Nino (1996), Krog (1999), Amadiume and Na'im (2000).

[7] Leary (2003); see also Laycock (2000).

aftermath of Sept. 11th.[8] They included Donald Rumsfeld, George Tenet and Robert Gates. The starting-point was a judgement that 'American intelligence agencies did not possess the analytic depth or the right methods of analysis accurately to assess [possible threat].'[9] The diagnosis and the prescriptions were expressed largely in terms that are familiar to students of evidence and inference: the dangers of hypothesis-driven inquiries; the need to distinguish between constructing a hypothesis and testing it against the available data; the different problems that arise from a surfeit of information and absence of evidence; the difference between ambiguity and incompleteness; the value of alternative interpretations of ambiguous evidence; the dangers of 'mirror imaging', that is 'projecting of American values and beliefs onto America's adversaries and rivals'; a tendency to confuse the unfamiliar with the improbable; the relationship between calculus of risk and thresholds of credibility; the likelihood of political bias entering into judgements where the situation is uncertain. Though the vocabulary is sometimes different, all of these ideas should be familiar to students of evidence and inference; some of them seem to be derived, directly or indirectly, from Wigmore and Schum. Evidence scholars need to be alert to the ways in which these ideas are used in practice in intelligence analysis.

Symptomatic of this increased interest in evidence is the fact that in September 2002 one of the largest private foundations in Britain, the Leverhulme Trust, invited applications for what by their standards was a major programme in two fields: (1) the changing character of war and (2) the nature of evidence. This juxtaposition may not be a coincidence. The announcement read:

> Evidence has an essential place in debates that form the heart of human enquiry. Its character is, however, remarkably varied according to the discipline or state of development of that discipline. 'Admissible evidence' has been the cornerstone of the *legal system* for a millennium. Its nature has graduated from assertion and *ex cathedra* statement to 'objective' observation, nowadays supported by forensic science. In such disciplines as *history*, *social sciences* or *economics*, there is an analogous trend towards the quantitative. The aspirations of 'evidence-based' policy are one sign of this trend. Evidence accepted in *scientific debate* is characterized by measurement or observation; the boundaries of uncertainty are capable of being established and reduced by improved or new techniques. Accidental or deliberate instances of error suggest that subjective aspects nonetheless remain. Even in those disciplines such as *mathematics* or *logic*, which depend on argument served by well-defined rules, the issue of evidence holds a place. The social/political/psychological aspects of evidence then necessarily become central to an evaluation of its validity.

I shall not comment on the substance of this statement, about which I have some intellectual reservations, but rather on two aspects of the reactions that it stimulated. First, it generated enormous interest in British academic circles. It attracted a large number of bids from different universities. In my own institution, University College London, individuals from

[8] Jeffrey Goldberg, The Unknown: The CIA and the Pentagon take on Al Qaeda and Iraq, *The New Yorker*, Feb. 10, 2003, 40–47.

[9] *Id.*

almost 40 departments responded to an e-mail circular inviting expressions of interest. Second, in discussions stimulated by the project, I was reminded that the label 'evidence' carried different associations in different quarters. This is the subject of the next section.

2. Different conceptions of 'evidence'

The label 'evidence' has a number of different associations, depending on context. When it is suggested that the common element in a multidisciplinary focus on evidence is inferential reasoning, some agree, but others have expressed scepticism or surprise. For example, a historian might think that it is artificially narrow to separate inferential reasoning from broader concerns about narrative and truth; for some the main interest lies in particular kinds of data, such as archaeological remains, DNA or psychological findings about memory or bias. Some are interested in particular problems of collecting evidence, or preserving it, or assessing its credibility. Most of these concerns and problems are real enough, but they sometimes lead to a narrow or even a distorted view of Evidence as a subject. I think that it is relatively easy to demonstrate that the common element is the idea of the evidential role of linking data to hypotheses or probanda through inferential reasoning.

Some of these different perceptions of the field of Evidence have roots in intellectual history. Ian Hacking has suggested that the development of the theory of inductive reasoning was held up for several centuries, because before the seventeenth century the concept of evidence was restricted to the testimony of witnesses or the authority of man-made records and excluded the idea of making inferences from material objects or things.[10] However, this thesis has been questioned. In the past, in law for example, different taxonomies have related to sources (e.g. witness testimony, documentary evidence, real evidence) or to types of data frequently used as evidence (e.g. fingerprints, polygraphs, confessions). In the nineteenth century some legal treatises were organized around the tasks of proving particular kinds of probanda—for example, how to prove debt, the causes of railway accidents, or particular crimes.[11] Treatises on the Law of Evidence have also struggled to construct a coherent framework for evidence doctrine, especially those that have ignored Thayer's thesis that the Law of Evidence is no more than a series of disparate exceptions to a principle of free proof, i.e. ordinary common sense reasoning.[12] Without understanding the nature of the principle, and the accompanying insight that rules of evidence need to be located in a framework of argumentation, it is hardly surprising that many students of the Law of Evidence find it a confusing hotchpotch with no apparent organizing principles.

However, some other associations with the label 'evidence' are quite firmly entrenched. Let me take two examples, one from medicine and one from law.

First, medicine. The Leverhulme announcement specifically mentions 'evidence-based policy', which has been a fashionable term in government circles in the UK in recent years.

[10] Hacking (1975, pp. 31–48). This thesis has been questioned by Mirjan Damaška, who argues that there was a greater continuity in conceptions of evidence.

[11] E.g. Roscoe (1827, 1st edn), Phillipps (1814, 1st edn), Moore (1908). Greenleaf (1842, 1st edn), and Taylor (1848, 1st edn) are examples of works which tried to introduce general concepts and principles, but which still were largely organized in terms of different kinds of probanda. See Twining (1994, Chapter 3, pp. 33–52).

[12] Thayer (1898), Twining (1994, Chapter 6). On other meanings of 'free proof' see Twining (1997a).

It has been particularly salient in clinical medicine. The story goes something like this. For a relatively brief period starting in the late 1980s there developed a strong movement in favour of 'evidence-based medicine' (EBM) and more broadly of 'evidence-based' policy making. This went beyond the banal idea that practical decision-making in politics, medicine or elsewhere should as far as feasible be based on reliable empirical data. Rather it proposed that certain kinds of general scientific data should be accorded priority over 'softer' particular inputs, even in making decisions about particular cases or events, such as diagnosing and deciding on treatment of an individual patient. As my colleague, Patricia Greenalgh (a Primary Care specialist) put it:

> The so-called 'philosophy' of the EBM movement was a strictly empirical approach, based on largely randomized controlled clinical trials of interventions, could—and crucially SHOULD—provide all the information that doctors needed for clinical decision making. A perfect clinical decision was one that was made on the basis of a thorough assessment of all the relevant research literature (where 'research' was judged in a strict hierarchy with randomized controlled trials at the top and expert opinion at the bottom). EBM in its pure form was thus seen as antithetical to intuitive judgment, expertise or experience. Later developments in EBM allow that clinical experience and intuition, and the patient's idiosyncratic preferences, CAN play important roles alongside evidence from trials. But many unanswered questions remain ::: '[13]

The relationship between scientific generalizations and local or case-specific knowledge in particular cases is a familiar theme in history, law, medicine, and many other disciplines, as Jonathan Cohen and others have made clear.[14] What is interesting here in the phrase 'evidence-based' is that only certain kinds of scientific findings count as 'evidence' in contrast with what is referred to as 'intuitive judgement, expertise or experience ::: and the patient's idiosyncratic preferences'. This usage of 'evidence' excludes most of what counts as evidence in law, history, and most other disciplines, especially in the humanities. It does not seem to allow for the idea of 'mixed masses of evidence'.[15] Furthermore, in law or medical diagnosis or historical inquiry, in considering a particular case calling for judgment about a particular event or situation, insofar as the issue is susceptible to rational argument, the main distinction is not between scientific and intuitive (or subjective) judgement. Rather it is between different kinds of generalization (scientific, common sense, case-specific)[16] and particular items of information all of which have evidential functions in the context of an argument and all of which are subject to critical appraisal in respect of their evidentiary credentials—viz. relevance, credibility and probative force.[17] In arguing from particular (evidentiary) proposition to particular (interim or ultimate) probandum the warrant for each inferential step typically takes the form of ancillary evidence and one or more background generalizations.[18]

[13] Greenalgh (2003).

[14] Cohen (1977, 1980, 1983).

[15] Wigmore (1937).

[16] Anderson and Twining (1998, pp. 367—84).

[17] Schum (1994).

[18] 'While we can say that generalizations and ancillary evidence help us to defend the strength of links in

Of course, many practical decisions are not arrived at or justified by open, articulated reasoning. So one could allow for a distinction between overt evidence-based decision-making and intuitive judgement, but the meaning of 'evidence' would be different from that attributed to 'evidence-based medicine'—in most contexts, 'evidence' cannot be restricted to 'hard' scientific data.

Another entrenched usage of the term 'evidence' is as a shorthand way of referring to the Law of Evidence. As I have argued elsewhere, this is based on the false, and pernicious, assumption that the law of evidence is co-extensive with the subject of evidence in law—which includes the logic of proof and much else besides.[19] This argument seems to have fallen on deaf ears. A recent American law school textbook entitled *Evidence* illustrates the tendency. The Preface begins:

> Evidence law is about the limits we place on the information juries hear.[20]

I find this disappointing for two main reasons: first, this statement mis-describes the scope and functions of the Law of Evidence by confining it to exclusionary rules in contested jury trials. The Law of Evidence applies to [nearly] all trials (and in modified form to most adjudicative tribunals) and to many other contexts within legal processes. Second, by equating 'evidence law' with 'evidence' (note the elision from the title to the Preface) this statement by implication excludes or downgrades all the many lines of inquiry that can be subsumed under 'the New Evidence Scholarship' and undermines a coherent conception of the subject of Evidence in law.

The broader conception of the subject includes inferential reasoning, probabilities, narrative, and the practical and theoretical implications of developments in forensic science, forensic psychology, and information technology. Insofar as such topics find a modest place in some orthodox courses on the Law of Evidence, the focus is distorted, the intellectual framework is incoherent, and many important aspects are marginalized, especially when the contested jury trial is treated as the prototypical arena in which such topics are important.

My criticism is not directed at this particular book, which is merely conforming to a market in which the overwhelming demand is for courses on the Federal Rules of Evidence as part of preparation for bar examinations. It is ironic that the Federal Rules are themselves based on Thayerite assumptions that provide the basis for a coherent conception of the field. The argument is worth repeating: the Law of Evidence consists of a series of disparate exceptions to a principle of free proof; the subject is given coherence by the principle; 'free proof' involves the application of ordinary 'common sense' practical reasoning within the competence of most citizens; the 'logic of proof' provides a systematic account of this kind of reasoning on the basis of evidence.[21]

This same elision of the Law of Evidence and Evidence has also been a common feature

chains of reasoning we construct, we can also say that generalizations and ancillary evidence represent the 'glue' that holds our arguments together' Schum (1994, p. 82.)

[19] Twining (1994, Chapters 2 and 6); see, however, Murphy (2001).

[20] Fisher (2002, Preface).

[21] 'The logic of proof' was Wigmore's term. It includes induction, analogy, and now abduction, as well as deduction. 'Logic' is used in a wider sense than is accepted by some logicians. It does, however, conform to Skryms' well-known definition: 'Logic is the study of the strength of the evidential link between premises and conclusions of arguments' (Skryms, 1986, p. 4).

of police attitudes and training. At least until recently, in England training of detectives and other investigators has focused on the rules of evidence without any reference to skills in inferential reasoning.

The point is that, at its core, evidence as a multi-disciplinary subject is about inferential reasoning. The common ground is some general philosophical issues about logic, probability, truth and knowledge. 'Evidence' is a word of relation used in the context of argumentation. (A is evidence of B) In that context information has a potential role as relevant evidence if it tends to support or tends to negate, directly or indirectly, a hypothesis or probandum.[22] One draws inferences from evidence in order to prove or disprove a hypothesis or probandum. The framework is argument, the process is proof, the engine is inferential reasoning from information.

3. A substance-blind approach to inferential reasoning

David Schum has argued that many characteristics, credentials and principles of evidence are 'substance blind', that is to say they transcend the differences between types of evidentiary data such as traces, handwriting and witness testimony.[23] For example we can make general statements about relevance, credibility, authenticity, and probative force without reference to any particular kind of data. I would go one stage further and suggest that the core concepts of evidence as a subject are also blind to typologies of sources and matters to be proved. The main general characteristics of the subject of Evidence are substance blind, source blind, and hypothesis blind. In other words the subject of Evidence at its core transcends disciplinary cultures, the objects of inquiry, and the peculiar methods and traditions of particular specialisms. Of course, there are special problems with DNA, polygraphs, witness psychology and so on. But the core of the subject is inferential reasoning.

In answer to the question, why do you think Evidence has special claims to be a good focus of attention, my argument is largely pragmatic: all disciplines that have important empirical elements are connected to a shared family of problems about evidence and inference. Apart from its theoretical interest (as a contribution to human understanding) evidence is of great practical importance in many spheres of practical decision-making and risk management. In particular, multidisciplinary study of evidence focuses attention on such questions as: (i) What features of evidence are common across disciplines and what features are special? (ii) What concepts, methods and insights developed in one discipline are transferable to others? (iii) What concepts are not transferable? Why? (iv) Can we develop general concepts, methods and insights that apply to evidence in all or nearly all contexts?

Such questions were the starting-point for an unusual project that has recently culminated in a book on *Evidence and Inference in History and Law*.[24] In 1994 Terry Anderson and I were part of a group of lawyers studying 'forensic expertise' at the Netherlands Institute for Advanced Study (NIAS), the Dutch equivalent of the Stanford Centre for Advanced Study in the Behavioral Sciences (CASBS). As Fellows of the NIAS

22 On 'relevant evidence' cf. Federal Rules of Evidence Rule 401.

23 Schum (1994).

24 Twining and Hampsher-Monk (2003).

we were expected to interact with our colleagues in other specialist theme groups. The other projects were: (a) history of Dutch political concepts; (b) theatre iconography—that is the use of works of art as evidence in theatre history; (c) magic and religion in ancient Assyria; (d) social dilemmas. In addition, there were a number of fellows working on individual projects. At first sight these seemed rather esoteric and diverse. But on reflection it seemed to me that most of the Fellows of NIAS in that year could fairly be said to have shared methodological problems about evidence and inference. So Anderson and I decided to throw down a challenge to our colleagues to run a joint seminar on these problems. The starting-point was what came to be known as 'Twining's hypothesis':

> Notwithstanding differences in (i) the objectives of our particular enquiries; (ii) the nature and extent of the available source material; (iii) the culture of our respective disciplines (including its history, conventions, state of development etc.); (iv) national backgrounds; (v) other contextual factors, all of our projects involve, as part of the enterprise, drawing inferences from evidence to test hypotheses and justify conclusions and that the logic of this kind of enquiry is governed by the same principles.[25]

This was framed in deliberately provocative terms and I expected it to be challenged, subverted or modified in the course of discussion. However, rather than a general analysis of methodological issues the seminar resulted in a series of case studies dealing with a somewhat bizarre range of topics: a lawyer and an assyriologist debated the evidence relating to the date of the death of the Sumerian language; a Shakespeare scholar and a jurist explored the differences in their approaches to a body of love letters that were the main evidence in a *cause celebre*; a political theorist, an economic historian, a theatre iconographer and a musicologist contributed individual case studies in their particular fields in the light of our discussions. David Schum then contributed a general introduction drawing out some common themes.

No attempt was made to build a grand theory of evidence and inference—indeed the orientation of this group was strikingly particularistic. But the main concluding observations are worth noting:

> First, there was no serious disagreement that we had overlapping problems of evidence and inference and that we could usefully discuss these across disciplines. Second, the members of the group were all drawn from the humanities and the social sciences and all agreed that problems of evidence and inference could not be kept separate from questions about interpretation and narrative. Third, if representatives of the physical sciences, both pure and applied, and of cognate disciplines such as astronomy and mathematics had been represented, there would probably have been little difficulty accommodating them within the group—although there might have been more emphasis on probabilities and statistics and sharper disagreements on these issues. Difficult questions were raised about the relationship between fundamental problems of evidence and inference and the specific contexts and objectives of projects situated in different disciplinary cultures, but overall we had few serious problems of communication. (Introduction, p. 7)

[25] *Id.* p. 4.

This exercise was very much an experimental first step in treating Evidence as a multi-disciplinary subject in its own right.

4. Inference, culture, common sense and narrative

The theme of this conference is 'inference, culture and ordinary thinking'. If we treat Evidence as a subject that deserves to be a special focus of attention that transcends disciplines and if we treat the core as being inferential reasoning that has concepts and methods that are substance-blind, source-blind and task-blind, what is the connection with culture and ordinary thinking and, I would add, with ideas about common sense and narrative?

Within the study of evidence in law there is, I think, an identifiable set of answers to these questions within the Rationalist Tradition.[26] What we might call the Wigmorean view can be restated as follows: in the context of an argument about a question of fact every inferential step from evidence to interim proposition to ultimate probandum or hypothesis requires a warrant. Such warrants typically take the form of 'background generalizations'. A background generalization can be case-specific (e.g. based on local knowledge or some general aspect(s) of the particular case, like the habits or character of the accused)[27] or it may be derived from 'the stock of knowledge' that is more or less shared in the relevant society or community.[28] The stock of knowledge may vary in respect of perceived reliability from scientifically established laws through experience-based generalizations to sheer speculation or prejudice, from beliefs deeply rooted in religion to ideas or impressions casually acquired which, may also be casually discarded. Reliability can be roughly represented by a continuum of common sense, horse sense, specialist expertise, and scientific knowledge, all of which belong to a shared stock of beliefs. In the common law tradition there is thus an explicit recognition of the link between warrants of inferential reasoning and the stock of knowledge or beliefs that are an important part of shared culture.[29] This link was recognized in common law theories of evidence through the idea of 'general experience'; for example, Wigmore's book *The Principles/Science of Judicial Proof* was sub-titled '*as given in logic, psychology, and general experience*'.[30] Common law rules about expert evidence and judicial notice fit within this conceptual framework.

The Wigmorean view also accommodates ordinary reasoning. As Jonathan Cohen put it, adult members of society can be assumed to have a 'general cognitive competence' that enables them to participate in adjudication as jurors, lay judges and witnesses.[31]

26 'The Rationalist Tradition of Evidence Scholarship' in law is based on a series of assumptions that can be succinctly summarized as follows: fact-determination in adjudication involves the just implementation of law through the pursuit of truth by the method of reason. This set of assumptions, as an ideal type, has both prescriptive and descriptive aspects many of which have been challenged by a variety of 'strategies of scepticism'. (Twining, 1994).

27 Anderson and Twining (1998, pp. 368–369).

28 Cohen (1977) cf. Twining (2002, Chapter 15).

29 I prefer 'stock of beliefs' as what passes for 'knowledge' in a given society varies over time. To acknowledge this is not to commit what Susan Haack has labelled 'the passes for fallacy'. (Haack, 1998, 93–94, 117–119). In this context, the idea of 'stock of knowledge/beliefs' is collective; for example, a good deal of scientific and expert knowledge is 'counter-intuitive', i.e. contrary to common sense.

30 Wigmore (1937).

31 Cohen (1977, 1983).

This consists of two elements: first, existing knowledge of or ability to understand the main components of the social stock of beliefs; and, second, an ability to apply ordinary principles of inferential reasoning to disputed questions of fact in adjudication. Lay participation in the administration of justice is regularly challenged on one of two grounds: incapacity to understand complex evidence, as in fraud trials or white collar cases involving complex accounting evidence; or an incapacity to use correct reasoning.[32] Such challenges also go to the root of democracy—the idea that a deliberative democracy requires citizens who are cognitively competent to participate. Conversely defenders of general cognitive competence challenge the idea that computer programmes can be developed to make judgements that are as good as or better than the best judgements of ordinary citizens.

Today we would perhaps add some glosses to the orthodox Wigmorean view. First, we recognize that the idea of a cognitive consensus involving a common stock of knowledge or beliefs is highly problematic. This recognition extends beyond the idea of a plural or a multi-cultural society to the point that we can no longer treat societies, countries or nations as self-contained units with clear and stable boundaries. Rawls usefully introduced the idea of an overlapping consensus in another context.[33] It can be used to curb tendencies to exaggerate the extent to which stocks of belief in fact vary across 'cultures'—how many people, in the USA or the world in general, actually believe that buses have square wheels, or witches fly on broomsticks, or that Coca Cola is a motor fuel? Recent work on criminal justice in the Netherlands suggests that some generalizations about police behaviour travel well across cultures and legal cultures.[34]

A second gloss on the simple Wigmorean account relates to form. Standard versions of inferential reasoning, whether Baconian or Pascalian, are species of propositional logic. One infers conclusions from premises that are expressed as propositions. When we talk of 'background generalizations' as the warrants or the glue in this kind of argument, there is a tendency to assume that we draw these from our stock of knowledge as ready-made propositions. But this is psychologically implausible. As I have argued elsewhere, an individual's stock of beliefs is unlikely to be stored in the form of a neatly categorized code or data base:

> A 'stock of knowledge' does not consist of individual, empirically tested, and readily articulated propositions: rather, both individually and collectively, we have ill defined agglomerations of beliefs that typically consist of a complex soup of more or less well-grounded information, sophisticated models, anecdotal memories, impressions, stories, myths, proverbs, wishes, stereotypes, speculations and prejudices. Fact and value are not sharply differentiated. Nor are fact, fantasy and fiction. Nor can one take for granted either consistency or coherence within an individual's or a society's 'stock of knowledge'.[35]

[32] The controversial Adams cases in England (*R v Adams* [1996] 2 Cr App T 467, CA; *R v Doheny and Adams* [1997] 1 Cr App R 369, CA; *R v Adams* (No. 2) [1998] 1 Cr App R 377, CA), which ruled out the explicit use of Bayes' Theorem in court were based not on any theoretical position about its applicability or otherwise in the circumstances of that case, but on the pragmatic policy reason that the mode of discourse in courts should be framed in terms that the decision makers can understand.

[33] Rawls (2001).

[34] Wagenaar *et al.* (1993), Anderson (1999).

[35] Twining (2002, 456, see also 451).

Third, insofar as an individual's or a group's stock of beliefs is like a bouillabaisse, it does not seem like an environment conducive to maintaining clear distinctions between is and ought, fact and value. Stereotypes, proverbs and stories typically have an evaluative element—that is often their main point.[36] One of the main claims of Wigmorean analysis is transparency: by forcing the analyst to articulate exactly what is being argued, including the inferential warrants, each important step in an argument is laid open to critical scrutiny—a useful way of bringing to light speculation, exaggeration, prejudice or bias. But there remain some difficult questions as to how a form of allegedly empirical argumentation can remain empirical when at every step the main source of glue is an undifferentiated bouillabaisse of unpositivised beliefs.[37]

Stories form part of our stock of beliefs. There are important difficulties in extracting generalizations from particular narratives. These are analogous to the difficulties of determining the *ratio decidendi* or holding of a judicial precedent or of divining 'the moral' of a parable.[38] There is also a major issue concerning the relationship between narrative and argument in litigation and adjudication and, more generally, in reasoning about particular past events. Wigmore treated 'the narrative method' as an inferior substitute for his more rigorous chart method.[39] Anderson and Twining, among others, treat narrative and argument as complementary both in respect of arguing towards a decisio and in *ex post facto* justification.[40] Modern psychological research, especially that of Pennington and Hastie (1991) and Hasties (1993), shows that the actual decision-making processes of American jurors approximate more closely to a holistic 'story model' than to an atomistic 'rationalist model'. At first sight, this suggests that there is a large gap between psychological accounts about how adjudicators, especially jurors, actually think and decide (the psychology of decision) and what constitutes a valid, cogent, and appropriate method of reasoning about facts in adjudication (the logic of proof).

The most sustained theoretical attempt to resolve this seeming paradox has been by Ronald Allen.[41] The central point of his complex thesis is that the logic of proof does not and cannot resolve the problem of conjunction of multiple elements (material facts) so as to provide a criterion for assessing the weight of the evidence in a case as a whole.[42] Stories provide a coherent structure of proof—a framework for considering the case as a whole. In common law adjudication jurors assess the relative strength of competing stories in terms of their coherence (consistency, plausibility and completeness), coverage and uniqueness.[43] 'Atomistic' analysis plays a role both in evaluating stories on the basis

36 *Id.* Chapter 16.

37 In law, the issue is made more complex by the point that 'issues of fact' and facts to be proved often contain a discretionary evaluative element and more fundamentally every judgement of guilt or liability is itself evaluative. Zuckerman (1989)

38 On the analogy between parables and legal precedents, see Twining (2002, Chapter 16).

39 (Wigmore, 1937, s. 36), reproduced in Anderson and Twining (1998, pp. 155–8).

40 Anderson and Twining (1998, pp. 155–165.)

41 Especially Allen (1991, 1994) and Allen and Leiter (2001).

42 The *locus classicus* on 'the problem of conjunction' is Cohen (1977).

43 Pennington and Hastie (1991). Allen usefully links these tests to Nicholas Rescher's 'demands of rationality': consistency, uniformity, coherence, simplicity and economy (Allen, 1994, p. 628, citing N. Rescher, *Rationality*, 1988. pp. 16–18).

of evidence produced at trial, the background knowledge of the triers of fact and their skills in dealing with evidentiary problems and confirming and disconfirming them.

It is not possible to do justice to Allen's argument here. Although we may differ on some details, and on the relative emphasis we place on the importance of analysis in constructing as well as well as evaluating stories, I accept that this is a good theoretical basis for treating narrative and argument as complementary in the context of adjudication.[44]

There appears to be very wide agreement among scholars and practitioners that narrative is of central importance in fact-determination.[45] However, story-telling is seductive and I think that there has been a tendency on the part of lawyers to romanticize it. In a series of essays I have elaborated on the theme that stories are 'necessary but dangerous'.[46] Stories help us to make sense of events, to structure an argument, and to provide coherence. But, in legal practice they are also wonderful vehicles for 'cheating'.[47] For instance, they make it easy to sneak in irrelevant or unsupported facts, to appeal to hidden prejudices or stereotypes, and to fill in gaps in the evidence. 'Good' stories tend to push out true stories—and so on.[48] It is clear that narrative plays a central part in many disciplines,[49] but there are still many unanswered questions about the exact nature of their role: for example, how exactly does narrative help us to 'make sense' of an event? How far is the use of narrative in practice 'legitimate'? In what respects are the roles of narrative in adjudication, historiography and police investigation different? And so on. There is plenty of scope for more research.

5. Limitations of law

Many non-lawyers interested in inferential reasoning and argumentation have recognized that law provides a rich source of concrete, real-life, examples that illustrate facets of evidence, inference and proof. Toulmin, Perelman, Gaskins, the Amsterdam School of Argumentation and above all Schum are some modern examples. Schum even goes so far as to suggest that legal scholarship on evidence 'forms the major source of inspiration for anyone interested in a general study of the general properties and uses of evidence'.[50]

As I am something of a legal nationalist, I am usually delighted when I find my territory is thought to be interesting by colleagues from other disciplines. However, it is important

[44] 'We thus see the convergence of the structural theory of proof and the theory of evidence. The structure of proof requires selection over the stories advanced at trial, and for data to be coherent to be embedded, or be able to be embedded, in stories highly analogous if not identical to the stories being advanced by the parties as their claims about what happened.' (Allen, 1994, p. 630)

[45] However, 'narrative' is sometimes used loosely to include scenarios, scenes, situations (see Twining, 2002, pp. 12, 385–88). Compare the careful exploration of 'evidentially-supported scenarios' in Tillers and Schum (1991).

[46] Now collected in Twining (2002, Chapters 12–16).

[47] 'Cheating' here means violating legal conventions of a given legal system: for example, in England, conventional precepts such as 'judge the act, not the actor', 'decide on the basis of the evidence presented', 'keep separate questions of fact and questions of law', 'decide impartially, discounting bias and prejudice'. Of course, such conventional principles are themselves subject to critical appraisal from a number of standpoints.

[48] See especially *id.*, Chapter 14.

[49] Nash (1986).

[50] Schum (1994, p. 6). This theme is developed in *id*, Chapter 2.

to recognize the limitations of standard legal examples. In considering problems of evidence and inference three distinctions are crucial: the difference between past-directed and future-directed inquiries; the distinction between particular and general inquiries; and the distinction between hypothesis formation and hypothesis testing. For various reasons, including the tendency to equate Evidence in law with the Law of Evidence, the contested trial is widely perceived to be the main arena in which evidentiary issues arise. Adjudication of issues of fact in contested trials is typically past-directed, particular, and hypothesis testing—it only exceptionally deals with predicting the future, proving general empirical propositions, or hypothesis formation. These characteristics of standard legal examples may limit their significance in many other contexts.

Of course, the prototype of the contested trial, especially in common law adversarial proceedings, has certain features that do indeed make it a rich source of material for study: typically the proceedings are public, the conflict is overt, the issues are sharply defined, and evidence is presented, questioned and argued about, and the legal record makes for neat packaging of complex material. Often the record contains a great deal of detail, the data and arguments are complex, and there is a mixed mass of evidence of different kinds. Above all, trials deal with 'real life' problems rather than hypothetical or fictitious examples. For the student of inference there may be 'noise' factors that have to be filtered out such as technicalities of procedure, lawyers' tactics, artificial rules of evidence, and blurred lines between rational argument and effective persuasion. But trial records can provide a wealth of examples that illustrate different attributes and credentials of evidence, the structure of complex arguments, problems of combining mixed masses of evidence, and common fallacies in inferential reasoning.

Disputed trials are typically concerned with inquiries into particular past events in which the hypotheses are defined in advance by law—what lawyers call 'materiality'. Moreover, cases are artificially constructed units extracted from more complex and diffuse contexts. For example, a criminal trial may be just one event in a long-drawn out feud or other conflict. These elements—particularity, pastness, materiality and individuation of cases—differentiate this kind of legal material from many other inquiries in which inferential reasoning is involved.

In adjudication, there is a further factor, the duty of the adjudicator to come to a firm decision. Judges decide, historians and scientists conclude, but they do not have to. This pressure for decision has led the law to develop important ideas about presumptions, burdens of proof and standards of proof as aids to decision. These can can be quite suggestive in other decision contexts.

Thus historians share with lawyers a concern with particular past events, but historians lack the concept of materiality that identifies in advance the hypotheses to be proved or negated and that helps to formulate and anchor disputed issues of fact in advance with precision and specificity. Historians are often involved not only in establishing what happened but also explaining why it happened—often a more difficult and more interesting problem.[51] Furthermore, historians are typically interested in questions that go beyond

[51] In practice, fact-finders want to 'make sense' of a case by understanding not only what occurred, but why it occurred. For example, proving motive may not be a formal requirement or an evidentiary need in proving a criminal case, but it is often a practical necessity for police, attorneys and fact-finders. This is one of the main functions of story telling in advocacy.

establishing and explaining a particular event. For example, a great deal of the vast literature about the Sacco-Vanzetti case treats as straightforward or assumes the question of their innocence in order to explore wide ranging questions about the political, social and legal context of the time.[52]

Detectives, like adjudicators, are typically also concerned with particular past events—'whodunit', Sherlock Holmes' kinds of questions—and their enquiries may be guided by legal categories such as murder, manslaughter and accident. But like historians, scientists and many other enquirers, they have to construct hypotheses as well as test them. The typical decided case is not a good vehicle for learning about or developing skill in abduction and imaginative reasoning as part of the process of investigation.

Intelligence analysts, now much in the news, are often involved with predicting future possibilities and probabilities in a changing context with the continuing prospect of further information. Sometimes they are asked to predict precise probabilities—what is the likelihood of an attack on a particular target in a particular time period?—but they are also often concerned with more open-ended possibilities based on judgements about capabilities and intentions. Moreover, they are also concerned with building up general intelligence pictures of networks, scenarios and so on. As the post-Sept 11th post-mortems have made clear, it is usually much easier after an event to identify bits of information that would have been useful had they been spotted and selected as significant.

The prototypical inquiry in 'pure science' is concerned with the formulation and testing of *general* hypotheses, which *inter alia* form a solid basis for prediction. The classic 'problem of induction' concerns the difficulty of justifying an inferential step from a series of particulars to a general conclusion. In this context, the establishment and interpretation of particulars is often treated as unproblematic.[53] The paradigmatic adjudicative inquiry is concerned with establishing particulars—often the most simple part of a general scientific inquiry. Of course, where *application* of general scientific principles to particular instances is involved, for example in medical diagnosis or forensic pathology, the analogy to fact-finding in adjudication is somewhat closer.

It would, of course, be rash to say that lawyers have it easy in respect of evidence and inference, just because particular inquiries may often be easier than general ones, and because of aids to decision such as materiality, burdens of proof, and presumptions. Disputed trials are often disputed because the evidence is especially problematic—otherwise there would be a guilty plea or a settlement. *Causes celebres* are often celebrated because there is an unsolved mystery. More important, the contested trial is only one legal context among many. Problems of evidence and inference arise in many other legal contexts—including investigation, negotiation, mediation, anticipating future contingencies (as in drafting contracts) and law-making, where some of the elements of materiality, predictability, pastness and individuation of cases are absent.

Non-lawyers may be justified in treating the contested trial as a paradigmatic in law just because the secondary legal literature often makes this assumption and is accordingly more developed and sophisticated in respect of this arena. For this same reason, academic

[52] See the literature discussed in Felix (1965). Of course, this is not true of Kadane and Schum (1996).

[53] Cf. Allen (1994, p. 624): 'In science, unlike the law, the data are virtually never problematic. What actually happened is typically the uncontroversial starting point for attempting to explain what happened ::: . In the law, exactly the opposite obtains ::: Controversy virtually always settles on what happened.'

lawyers tend to treat Evidence as a technical subject for specialists in the law of evidence and accordingly to overlook the centrality of inferential reasoning about questions of fact in other legal contexts, such as investigation, negotiation, mediation, law-making and so on. Similarly, the law and literature movement has tended to neglect the problematic relationship between narrative and inferential reasoning; jurists continue to confine the topic of 'legal reasoning' to reasoning about questions of law; and only recently have those interested in economic analysis, post-modernism and critical legal studies directed their attention to issues of evidence.[54]

Peter Tillers expressed the hope that 'the general subject-matter of this conference is [should be] the relationship between (i) reasoning about evidence and (ii) matters such as received belief, intuition, personal judgment, personal or selective experience, subjective belief, inherited belief and personal preference.' (E-mail to conferees 5 December 2001.) The agenda has evolved since then, but this remains the core. The topic could hardly be more timely. The focus is on law, but the perspective is interdisciplinary, and this conference promises to add much to the enterprise.

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[54] E.g. Nicolson (1994), Siegel (1994), Pardo (2000). On economic analysis, see above n. 3.

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