

The Role of Stories in Forensic Reasoning

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Introduction

The New Evidence Scholarship

According to one School of Thought, forensic reasoning is primarily about rules: “the pattern, or essence, of law is to be located in its distinctive structure of rules [1].”

“The process of applying rules is central to legal activity, and studying theralational structure of this process is central for explaining the character of legal reasoning as a branch of practical reasoning [2].”

Notwithstanding the fact thatscholars such and William Twining [3], Peter Tiller [4], David Schum [5], Mike Redmayne [6], John Jackson [7], Kólá Abimbólá [8], and many others, who fall roughly within “the New Evidence Scholarship” School [9] now focus on proof, not enough has been done on the nature of forensic inference itself. In particular, the manner in which different inferences combine to facilitate the process of reasoning in forensic contexts is often left out.

This paper gives a catalogue of the types of inferences there are in forensic science, and then illustrates with examples how they mutually reinforce each other in inferential tasks. Focusing exclusively on one type of inference or the other will never give a good picture of what forensic inference involves. As such, what is needed is a comprehensive theory that incorporates all the varieties of inferences into the same rubric.

The Nature of Forensic Inference

There are at least three basic Types of processes of thought that the human mind engages in when it reaches conclusions on the basis of evidence and reasoning. Let us call these: Type 1, Type 2 and Type 3 inferences. Each Type is made-up of different forms of reasoning processes.

Type 1 Inferences: Deduction, Induction and Abduction

Logicians identify three basic types of human inferences (reasoning or arguments): deductive, inductive and abductive inferences. Deductive inferences are those in which the truth of the premises guarantees the truth of the conclusion, inductive inferences are about probabilities, and abductive inferences make use of induction, deduction and other background assumptions in identifying the best explanation for phenomena.

The object of Type 1 inferences is the transference of truth (or possible truth) from premises to conclusion, and as such the most basic ingredients of reasoning in Type 1 inferences are propositions, claims, and statements-declarative assertions that can be true or false.

Here are examples of each type of reasoning:

Deductive Inference

1. Jingo is a dog.
 2. Jingo has a tail.
- ∴ Jingo’s tail is the tail of a dog.

In this reasoning, if we accept the premises as true, denying the conclusion would be a self-contradiction.

Inductive Argument

1. Jane is 80 years old.
 2. Usain Bolt is 31 years old.
 3. Usain Bolt has won 19 Olympics gold medals
 4. Jane and Usain Bolt will run a 100-yard race tomorrow.
- ∴ Usain Bolt will win the race.

In this reasoning, the conclusion follows only probabilistically - we can never be certain. After all, this race might be a charity fundraiser in which Usain Bolt will deliberately run slower than Jane.

Abductive Inference

Unlike deduction and induction where the object of explanation is “truth” or “probability,” the focus of abduction is “explanation.” We have here before us facts A, B, C, D, what is the best explanation of these data? Here is an example:

Abraham Lincoln and the Case Against Grayson

Grayson was on trial for the murder of Lockwood. Sovine, the prosecution’s key witness, testified that he saw Grayson shoot Lockwood. Lincoln cross-examined Sovine as follows [10]:

- LINCOLN: And you were with Lockwood just before and saw the shooting?
- WITNESS: Yes.
- LINCOLN: And you stood very near to them?
- WITNESS: No, about twenty feet away.
- LINCOLN: May it not have been ten feet?
- WITNESS: No, it was twenty feet or more.
- LINCOLN: In the open field?
- WITNESS: No, in the timber.
- LINCOLN: What kind of timber?
- WITNESS: Beech timber.

LINCOLN: Leaves on it are rather thick in August?
 WITNESS: Rather.
 LINCOLN: And you think this pistol was the one used?
 WITNESS: It looks like it.
 LINCOLN: You could see the defendant shoot -see how the barrel hung, and all about it?
 WITNESS: Yes.
 LINCOLN: How near was this to the meeting place?
 WITNESS: Three-quarters of a mile away.
 LINCOLN: Where were the lights?
 WITNESS: Up by the minister's stand.
 LINCOLN: Three-quarters of a mile away?
 WITNESS: Yes,-I answered ye twiste.
 LINCOLN: Did you not see a candle there, with Lockwood or Grayson?
 WITNESS: No! What would we want a candle for?
 LINCOLN: How, then, did you see the shooting?
 WITNESS: By moonlight! (defiantly).
 LINCOLN: You saw this shooting at ten at night-in beech timber, three- quarters of a mile from the light-saw the pistol barrel-saw the man fire-saw it twenty feet away-saw it all by moonlight? Saw it nearly a mile from the camp lights?
 WITNESS: Yes, I told you so before [10].

The interest was now so intense that men leaned forward to catch the smallest syllable. The lawyer drew out a covered almanac from his side pocket-opened it slowly-offered it in evidence-showed it to the jury and the court-read from a page with careful deliberation that the moon that night was unseen and only arose at the next morning". The Art of Cross-Examination. Macmillan: USA [10].

Deduction, induction and abduction are three broad methods of reasoning that are universally acknowledges as indispensable to forensic inference.

TYPE 2 Inferences: single-stage and multi-stage reasoning

The object of Type 2 Inferences is not statements per se, but rather the arrangement of the statements used in Type 1 inferences into a chain that lead to new "claims." Type 2 inferences will, therefore, always start off with a given set of propositions (i.e. the objects of Type 1 inferences) and then arrange them into a link. In this link, the mind infers (conjecture or extrapolates) into other "claims." The new other "facts" (or "claims") of Type 2 Inferences are radically different from the claims of Type 1 inferences. Type 1 claims have reality in the external world, but Type 2 claims only exist in our minds; Type 1 claims are objective, but Type 2 claims are subjective because they will always only exist in our minds (and not in the real world as concrete things). However, even though Type 1 and Type 2 claims are radically different, in Forensic reasoning, the two come as a packaged deal. Whenever you are using Type 1 inferences, Type 2 inferences are involved; and you require Type 1 Inferences to be able to use Type 2 inferences. What I call Type 2 inferences are typically referred to as cascade, catenated or multi-stage reasoning.

David Schum [5,11,12,] approach to explaining the nature of what I call Type 2 inferences is particularly useful. According to David Schum, in forensic reasoning, it is prudent to distinguish E (an event) from E*

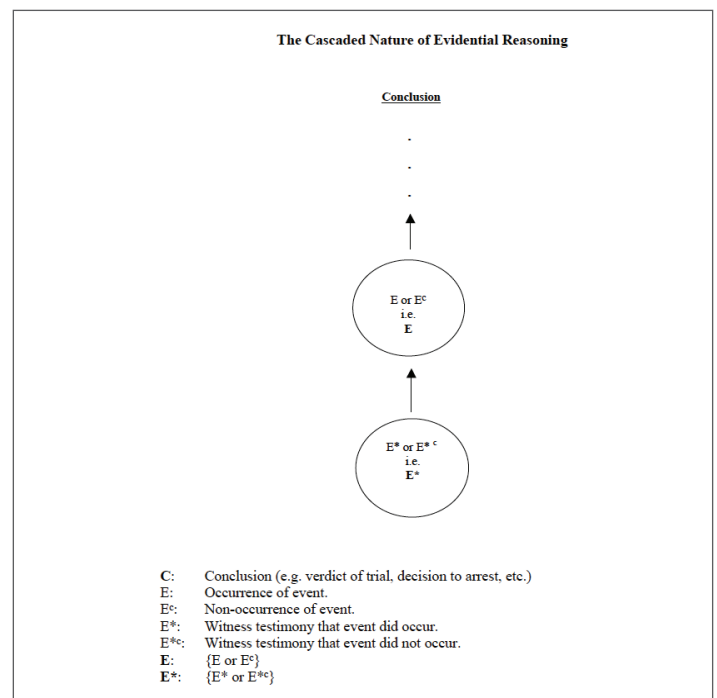
(someone's testimony that the event occurred). Imagine a situation where Jane testifies to the event that she saw Peter stab Mike. There are at least two separate things we need to distinguish between here: E the event itself (i.e., the occurrence of a series of actions, events, inactions, emotions, etc. that culminated in a situation where Peter stabbed Mike). But we also have E* (that is, Jane's claim that: "I saw Perter stab Mike"). E* is not, cannot, and will never be the same as event E itself. Janemay be mistaken in her identification of Peter as the assailant; Jane may be lying about what she saw; and even if we are all sure that Jane is describing exactly what she saw, Jane's testimony E* is a radically different event from E.E* is, and always will be an object of the human mind. E itself is (was) a series of events that are now in the past (and are such are gone and unrepeatable); whereas Jane can still offer her testimony over and over. The implication of this is that whenever we infer conclusions from the evidence presented to us, there will always be an unbridgeable gap between the testimony and the event itself [8].

The image of forensic inferences we should have, therefore, is:

If we focus exclusively on Type 1 inferences and eschew the complex networks of chains of reasoning connections (Type 2 inferences) from our analysis, our understanding of what forensic reasoning is would be seriously lacking in breadth, depth and explanatory power. Scholars such as John Henry Wigmore [13,14,15], William Twining [3,16], Terry Anderson [17], John Jackson [7, 18, 19], and Kóla Abimbóla [8] have emphasized the significance of cascaded reasoning in forensic thinking.

TYPE 3 inferences: nomological structures

There is yet another class of "inferences" that, has, unfortunately, been understudied in the literature. As already indicated, the usefulness of Type 1 inferences is dependent upon the availability of Type 2 inferences. Differently put, in forensic reasoning, we need to go beyond observable facts to arrive at mental states in which we believe that some conclusion follows (with certainty or with probability) from the evidence. This we cannot do without multi-stage (Type 2) reasoning. But by what mechanism do we form chains of reasoning connections? How are we "connect the dots" between different items of information in forensic environments? The answer to these questions, I believe, is nomological structures [8].



Nomological structures provide “warrant” or “backing” in our mind when we extrapolate from concrete observable facts in chains of reasoning [8]. Why should we believe Jane’s testimony? Our mind will rely on its contents to enable us form chains of reasoning. These contents will include: beliefs and assumptions like:

- Jane is a White middle-aged woman. I believe her testimony.
- Jane is a professor at Oxford University, she is unlikely to lie.
- Jane is a mother of three young children who does not know neither the victim nor the accused, she is unlike to be lying.

Assumptions and beliefs of these types often function tacitly (or explicitly) as inferential warrants, in the minds of fact finders, thereby legitimating (in minds) the move from one stage of reasoning to another. I call these background assumptions nomological structures because they are habits or customs of the mind that are required for reasoning by the very nature of the human mind itself. That is to say, like it or not, want it or not, use them consciously or not; whenever we reason from fact and evidence to conclusion, these nomological structures perform the role of convincing our mind that our inferential moves are correct.

In sum, nomological structures are properties or attributes of the human thinking processes that enable us to think inferentially about evidence. Although I maintain that there are four essential nomological structure (generalization, stories, practical belief-logics, and the interrogative nomological structure), I focus on just stories in this paper.

What Are Stories?

Following Twining [20] I will adopt Ricoeur’s [20] definition that a story is “a narrative of particular events arranged in a time sequence and forming a meaningful totality” [20]. It is only when all the italicized parts of this definition are present that we have a “story.” Thus: “Mike was stabbed and Peter was arrested” is a chronology and not a story. “Mike was stabbed and Peter was arrested because Jane testified that she saw him stab Mike”, is a story because the chronology now has one coherent meaning.

The Function of Stories

Stories perform two related but distinguishable functions. One is communicative, the other is quasi-logical. Starting with the communicative function, authors like Bennett and Feldman [21] and B. Jackson [7] stress the communicative function of stories because they maintain that triers of fact make their decisions by assessing the plausibility of the competing stories of the prosecution and the defense. And if neither of these two competing stories is acceptable, the trier of fact will reconstruct her own version of events from the evidence presented, and make a judgement on the basis of the plausibility of her reconstruction. The communicative function of stories stresses the point that, in order to make an adjudicative decision, human beings need to understand the totality of events that are claimed to have occurred over time. The communicative function of stories is therefore a psychological thesis about how humans make sense of the world.

But a distinction can be made between persuasive argumentation and valid argumentation. Persuasion is about inducement; it is about convincing others to accept one’s viewpoint or opinion. Validity is about logic. It is about good or bad reasoning irrespective of whether that piece of reasoning is convincing. Persuasiveness and validity are, of course, not mutually exclusive. A persuasive argument could also be valid, just as a valid argument could be persuasive. Indeed, we can define persuasiveness in terms of validity (but not vice versa) such that only valid arguments are regarded as persuasive. But obviously, not all persuasive arguments are valid! A skillful advocate could succeed in winning others over with invalid arguments.

Writers like Snedaker [22], B. Jackson [23], Bennett and Feldman [21] view the significance of stories in terms of persuasiveness. As Snedaker puts it:

“Persuasion is the goal of the courtroom advocate. The opening statement is the first opportunity for an advocate to persuade his audience. He can focus the attention of the jurors on lines of reasoning he hopes the panel will adopt for the entire trial. Identifying why one opening statement is more effective than another is critically important. The story form is identified as the communication strategy underlying successful opening statements” [22].

Legal theorists like Twining, Tillers, and Allen, however, emphasize the role of stories in rational argument. Thus, Twining evaluates the “legitimate functions of narratives in rational argument by advocates on disputed questions of law and disputed questions of fact” [3]

Consider the following argument by Lord Denning in *Miller v. Jackson*, et al. [18] 3 All ER 340: “In summer time village cricket is the delight of everyone. Nearly every village has its own cricket field where the young men play and the old men watch. In the village of Lintz in County Durham they have their own ground, where they have played these last 70 years. They tend it well. The wicket area is well rolled and mown. The outfield is kept short. It has a good club-house for the players and seats for the onlookers. The village team plays there on Saturdays and Sundays. They belong to a league, competing with the neighboring villages. On other evenings after work they practice while light lasts. Yet now after these 70 years a judge of the High Court has ordered that they must not play there anymore. He has issued an injunction to stop them. He has done it at the instance of a newcomer who is no lover of cricket. This newcomer has built, or has had built for him, a house on the edge of the cricket ground which four years ago was a field where cattle grazed. The animals did not mind the cricket. But now this adjoining field has been turned into a housing estate. The new comer bought one of the houses on the edge of the cricket ground. No doubt the open space was a selling point. Now he complains that, when a batsman hits a six, the ball has been known to land on his garden or on or near his house. His wife has got so upset about it that they always go out at weekends. They do not go into the garden when cricket is being played. They say that this is intolerable. So, they asked the judge to stop the cricket being played. And the judge, much against his will, has felt that he must order the cricket to be stopped; with the consequences, I suppose, that the Lintz cricket Club will disappear. The cricket ground will be turned to some other use. I expect for more houses or factories. The young men will turn to other things instead of cricket. The whole village will be much the poorer. And all this because of a newcomer who has just bought a house there next to the cricket ground.” [24].

This argument illustrates the contrast between the role of stories in argumentation techniques, and stories in logical appraisal of arguments. The statement of the facts in this case is used (or manipulated) by Denning in such a way that if we accept the narrative the way he tells it, the case is nothing more than one of a clash between private and public interests:

“The public interest lies in protecting the environment by preserving our playing fields in the face of mounting development, and by enabling our youth with all the benefit of outdoor games, such as cricket and football. The private interest lies in securing the privacy of his home and garden without intrusion or interference by anyone” [24].

But the plaintiff had bought the trouble on his own head by buying a house so close to the grounds. The private interests of the newcomer, according to Denning, should not prevail.

There is no doubt that Denning’s argument is very entertaining-and some would no doubt find it persuasive. But even if Denning’s argument is psychologically persuasive, it is logically invalid. For if we shift attention away from persuasiveness to the role of stories in valid arguments, logical errors begin to surface.

Denning commits statistical errors. At one point in his judgement, Denning states that: “In 1975 there were 120 six hits on all sides of the ground. Of these only six went over the high protective fence and into the housing estate. In 1976 there were 160 six hits. Of these only nine went over the high protective fence and into this housing estate.” On the basis of these figures, Lord Denning goes one to claim that a house owner “could not complain if a batman hit a six out of the ground and by a million to one chance” [24].

In short, in Lord Denning’s statistics, 15 balls out of 280 six hits translates into “a million to one”! Denning is also guilty of making hasty generalizations. He claims for instance that: “In the summer time, village cricket is the delight of everyone” [24]. He then goes on to give a robust narrative of the benefit of the cricket club in which the villain is “this newcomer” who has applied for injunction. But surely unless one ignores the misery of this newcomer, Denning’s generalizations are prejudiced and unjustified. For all we know, this newcomer could be a great lover of cricket. Nonetheless, he still wants to live in peace and without fear of injury in his house. Moreover, as the judgement of the other judges in this case makes clear, the Millers are not the only ones adversely affected by the cricket. Geoffrey Lane LJ for instance points out that:

“The plaintiffs were not the only people in Brackenridge who suffered in this way. The Craigs moved to the next-door house a number of balls come into their garden. One of them went through a glass pane and into the dining-room. That ball went over Mr. Craig’s head as he was picking raspberries in his garden. His wife was in the house. Broken glass landed all around her. The Milners live at no 24. They have only had two balls come into their garden.” [20].

Denning is also guilty of the logical error of argumentum ad misericordiam (appeal to pity). This fallacy is committed when, in a question of fact as opposed to sentiments, one appeals to pity just for the sake of drawing an unwarranted conclusion. Thus, in the long excerpt above, when Denning runs out of real facts, he takes refuge in counterfactuals and conjecture: “I suppose that the Lintz cricket Club will disappear. The cricket ground will be turned to some other use. I expect for more houses or factories. The young men will turn to other things instead of cricket. The whole village will be much the poorer. And all this because of a newcomer who has just bought a house there next to the cricket ground” [24].

If one rejects Denning’s statement of the facts in this case, and one gives a different narrative in which the rights of the plaintiffs are incorporated, the poverty of Denning’s argument becomes apparent. The role of this story in Denning’s overall argument is therefore of the utmost importance. Setting up the case as a clash between private and public interests, and between an intolerant newcomer and a local tradition, makes it easier for Denning to draw the conclusions he wants. The acceptance of his verdict is affected by the story he tells.

The foregoing discussion of Denning’s argument encapsulates the logical function of stories. For although a skillful advocate could succeed in winning others over by telling a persuasive story, we can also analyze that story to exhibit any logical danger it might have. The logical dangers include: reliance on irrelevant fact, using emotion and not logic to secure conviction, and the tacit reliance on stereotypes [17].

Recognizing that stories can lead to irrational and defective argumentation implies that they provide the interpretative matrix for assessing the validity of arguments. For on top of the psychological point that fact investigators rely on stories in making sense of legal arguments, stories also provide the analyst with a framework for analyzing investigators’ arguments. Just as I evaluated Denning’s argument, we can examine the prosecutor or defense’s stories to assess the strength and validity of their arguments. Simply put, stories supply one avenue for

examining the validity of arguments. For in examining the stories put forward by advocates, we need not concentrate only on whether the story is persuasive, or coherent, or true. We can also evaluate the connection between the propositions contained within the story. This is what I mean by the claim that stories provide the interpretative framework for evaluating evidence. To evaluate the uses we make of the evidence and the conclusions we draw from the evidence, we need to assess the value of the arguments advanced. The story is not the argument. Rather stories form part of the argument as a whole by supplying the contextual meaning for the evidence.

Since the reasoning of judges (in the form of judgements) is more readily available than those of other fact investigators, there is a natural inclination to make use of these published judgements. Nonetheless, the reasoning processes of other fact investigators can also be evaluated by looking at examples of it given by others. One crucial class of fact investigators is the police. To use examples of actual police decision-making in illustrating the role of stories is problematic for the very simple reason that it is virtually impossible to lay hands on confidential records such as police officers notebooks and taped interviews.

Another example that illustrates the use of stories as frameworks for the analysis of arguments is given by RG Collingwood in *The Idea of History* [25]. This example is particularly important because, unlike the Elliot illustration, this example focuses on the role of stories in the police’s own frame of reference. In this example, the police were investigating John Doe’s murder:

“When John Doe was found, early one Sunday morning, lying across his desk with a dagger through his back, no one expected that the question who did it would be settled by means of testimony. It was not likely that anyone saw the murder being done. It was even less likely that someone in the murderer’s confidence would give him away. It was least likely of all that the murderer would walk into the village police-station and denounce himself. In spite of this, the public demanded that he should be brought to justice, and the police had hopes of doing it; though the only clue was a little fresh green paint on the handle of the dagger, like the fresh green paint on the iron gate between John Doe’s garden and the rector’s” [25].

Several individuals were considered as suspects. First there was the “elderly neighboring spinster asserting that she killed John Doe with her own hand because he had made a dastardly attempt upon her virtue” [25]. The police regarded this story as incredible and they “advised her to go home and have some aspirin” [24].

There was also “the rector’s daughter [who], in a state of agitation, rushed in and said she had done it herself; the only effect of which was to make the village constable ring up the local Inspector and remind him that the girl’s young man, Richard Roe, was a medical student, and presumably knew where to find a man’s heart; and that he had spent Saturday night at the rectory, within a stone’s throw of the dead man’s house” [24].

Following up on Richard Roe as a likely suspect, the police built up a narrative of events which supplied an interpretative matrix for assessing the likelihood that Richard Roe was the murderer. This they did on the basis of the following: First, they recalled that “there had been a thunderstorm that night, with heavy rain, between twelve and one; and the inspector, when he questioned the rectory parlour-maid was told that Mr. Roe’s shoes had been very wet in the morning. Questioned, Richard admitted having gone out in the middle of the night, but refused to say where or why” [24].

Further investigation, however, revealed that: “John Doe was a blackmailer. For years he had been blackmailing the rector, threatening to publish the facts about a certain youthful escapade of his dead wife. Of this escapade the rector’s supposed daughter, born six months after marriage,

was the fruit; and John Doe had letters in his possession that proved it. By now he had absorbed the whole of the rector's private fortune, and on the morning of the fatal Saturday he demanded an installment of his wife's, which she had left to him in trust for her child. The rector made up his mind to end it. He knew that John Doe sat at his desk late into the night; he knew that behind him, as he sat, there was a French window on the left and a trophy of Eastern weapons on the right; and that on hot nights the window was left open until he went to bed. At midnight, wearing gloves, he slipped out; but Richard, who had noticed his state of mind and was troubled about it, happened to be leaning out of his window and saw the rector cross the garden. He hurried into his clothes and followed; but by the time he reached the garden the rector was gone. At this moment, the thunderstorm broke. Meanwhile the rector's plan succeeded perfectly. John Doe was asleep, his head fallen forward on a pile of old letters. Only after the dagger had reached his heart did the rector look at them, and see his wife's handwriting. The envelopes were addressed "John Doe, Esq." Until that moment, he had never known who his wife's seducer had been" [24].

All these facts were reconstructed and teased out of narratives given by the trio: the rector, his daughter, and Richard Roe. Detective-Inspector Jenkins of Scotland Yard was able to discover numerous items of evidence (such as: ashes of written paper in the rector's dustbin; ashes of leather-probably a pair of gloves; "metal buttons bearing the name of a famous glove-maker in Oxford Street whom the rector always patronized"; etc.).

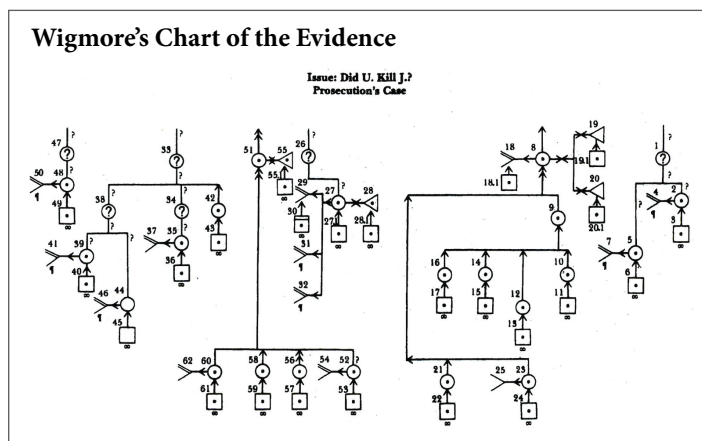
Commonwealth V. Umilian, 177 Mass. 582 (Mass. 1901)

Casimir Jedrusik disappeared on Sunday, December 31, 1899, and on April 10, 1900, his body was found wrapped in a bran sack in an unused well on the farm where Jedrusik and Umilian both worked. Jedrusik's body had been mutilated, his head cut off, and suspicion fell on Umilian because when the narration of particular events about Umilian's behavior were arranged in a time sequence, they meaningfully added up to the belief that he is the most likely person to have unlawfully killed Jedrusik, and that the murder was pre-meditated. In particular, Jedrusik had tried to prevent the marriage of Umilian to someone by sending an anonymous letter to the priest. The letter had stated that Umilian was already legally married in their "old country." Below is Wigmore breakdown to the facts of this case in what Wigmore's the Key List of propositions for the case [13].

Analysis: Wigmore Key List of Commonwealth V. Umilian

Having adopted Knowlton J's narrative as the receptor of interpretation in his analysis of the Umilian evidence, Wigmore constructed the following map of the evidence

Wigmore's Chart of Commonwealth V Umilian 1901 [13].



This mind map can be broken down into six segments, and each segment illustrates the interconnectivity of the three Types of inferences in forensic science. More specifically, we are able to identify propositions and facts only if we already have our story in place. This illustrates the point that stories serve as the magnet for attracting the facts, information and evidence that we will use in our deductive, inductive and abductive inference. But since forensic inference is multi-staged, whenever we deduce a new (or old) fact; induce a new (or old) fact; and whenever we infer the best explanation of a phenomenon, all the three Types of inferences function together in a packaged deal -reinforcing each other and justify the move from one level of the chain of inferences to another. Below is a step-by-step analysis of the six parts of Wigmore's chart and how they interconnect.

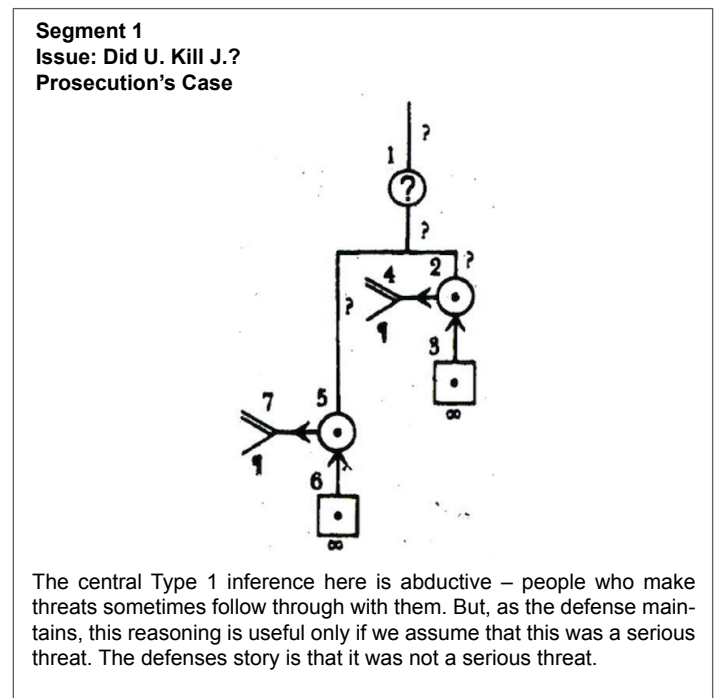
Key List and Chart of Segment 1

1. Design to kill J.
2. Threats of unstated tenor, made on discovery of J's interference in prevention of marriage.
3. Anon. Witnesses thereto.
4. Threats might have meant merely some lesser harm.
5. Threats of revenge at later time.
6. Anon. Witness thereto.
7. Threats might have meant merely some lesser harm."

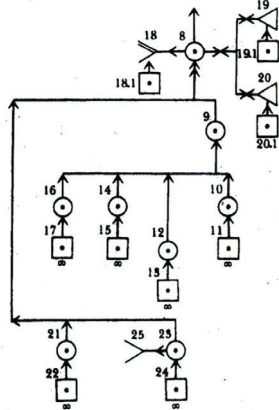
Key list quoted from Wigmore, et al. [13].

Key List and Chart of Segment 2

8. Revengeful murderous emotion towards J.
9. J. had falsely charged him with intended bigamy Nov. 18, and had tried thereby to prevent his marriage; thus, tending to stir up such an emotion.
10. Letter received by priest, stating that U. already had family in old country.
11. Anon. witnesses to this.
12. J. was author of letter, though it was in a fictitious name.



Segment 2
Issue: Did U. Kill J.?
Prosecution's Case



Here we have a mixture of induction, deduction (inferences drawn from the content of the letter itself) and abductive reasoning – all of which are arranged into a chain; but the chain itself requires the acceptance the prosecution's story.

13. Anon. witnesses to this.
14. Letter communicated by priest to U., with refusal to perform marriage; refusal later withdrawn.
15. Anon. witnesses to this.
16. Letter's statements were untrue.
17. Anon. witnesses to this.
18. U's marriage being finally performed, U. would not have had a strong feeling of revenge.
19. J. remaining in daily contact, wound must have rankled.
19. 1. Witness to daily contact.
20. Wife remaining there; jealousy between U. and J. probably continued.
20. 1. Witness to wife remaining there.
21. U. uttered threats and other hostile expressions between Nov. 18 and Dec. 31.
22. Anon. witnesses to this.
23. U, on Dec. 31, charged J to K with stealing K's goods.
24. Anon. witnesses to this.
25. Does not appear that these charges were false, hence not malicious.

Key list quoted from Wigmore, et al. [13].

Key List and Chart of Segment 3

26. U's opportunity in time and place was almost exclusive.
 27. On Dec. 31 U was on premises.
 - 27.1. Witnesses to this.
 28. U was only man so seen.
 - 28.1. Anon. witnesses to this.
 29. U's wife and a woman visitor were there.
 30. Anon. witnesses to this.
 31. Passing tramp-villain might have been there.
 32. In time between Dec. 31 and April others had access to J, if alive still.
- Key list quoted from Wigmore, et al. [13].

Key List and Chart of Segment 4

33. U had uneasy consciousness of guilt about J's disappearance.
34. U lied about J's going to Granby.
35. U said J had gone there, though J was then dead.
36. Anon. witnesses to this.
37. J might really have gone there, not being killed till later.
38. U was conscious that the well was a place where damaging things would be discovered.
39. He watched those who searched there.
40. Anon. witnesses to this.
41. That might have been due to natural curiosity of a farm hand at strange doings.
42. U lied about the reason for Olds and K searching the well.
43. Anon. witnesses to this.
44. U did not go to the well to see the body when found.
45. Anon. witnesses to this.
46. Several other reasons would explain this."

Key list quoted from Wigmore, et al. [13].

Key List and Chart of Segment 5

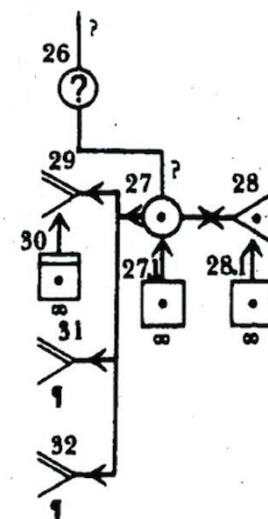
47. U knew that J was dead, though others did not.
48. He gave away J's boots and said that J would not come back; this was about the middle of January.
49. Anon. witnesses thereto.
50. Like others, U may merely have believed that J had given up work at the farm."

Key list quoted from Wigmore, et al. [13].

Key List and Chart of Segment 6

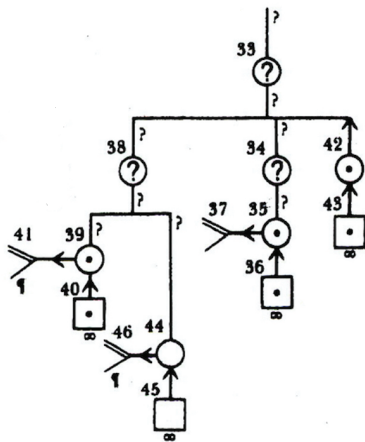
51. Data of slayer on J's body were of a person having free and intimate access to horse barn of K.

Segment 3
Issue: Did U. Kill J.?
Prosecution's Case

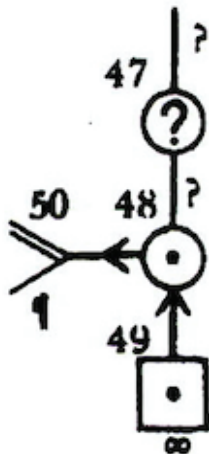


The reasoning here is a mixture or inductive and abductive reasoning.

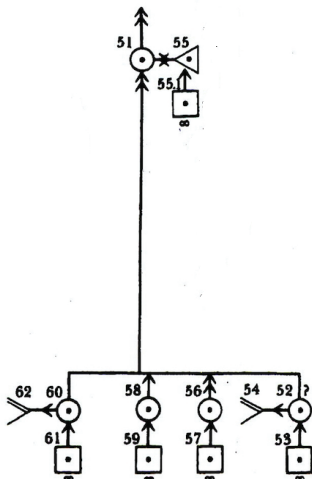
Segment 4
Issue: Did U. Kill J.?
Prosecution's Case



Segment 5
Issue: Did U. Kill J.?
Prosecution's Case



Segment 6
Issue: Did U. Kill J.?
Prosecution's Case



52. Wound-marks were those of a corn cutter from barn.
53. Anon. witnesses thereto.
54. Precise correspondence not stated; might have been a different weapon.
55. No other person but U had at that time such access.
- 55.1. Anon. witnesses to 55; and see 26.
56. Sacks holding body and clothes came from horse barn.
57. Anon. witnesses thereto.
58. Stone in sack fitted wall near well.
59. Anon. witnesses thereto.
60. Clothing in sack had marks of mud from barn cellar.
61. Anon. witnesses thereto.
62. Mud not specifically identified."

Key list quoted from Wigmore, et al. [13].

In all segments of this case, it is clear that without the "story" that explains why Umilian had a murderous intention to kill Jedrusik, it would be impossible to identify the propositions and facts on the basis of which our deductions, inductions and abductions should operate. Even though forensic inference is about the establishment of the truth of fact(s)-in-issue the principles of deductive, inductive and abductive logic are not sufficient enough to assist us in the generation and evaluation of Type 2 and Type 3 inferences. In particular, when dealing with Type 1 inferences, the object of evaluation and assessment are propositions - items of facts that are in some relative sense objective, observable and malleable to examination on the basis of the basic principles of logic.

Stories (and the other nomological structures), however, require a different type of evaluation, and there is no single right way to assess a story. We need to pay attention to the host culture, to the plot, the themes, the essential characters, and to the point of views the narrators.

Conclusion

In this paper, I have used a variety of real and imagined examples (including examples previously used by others in other contexts) to illustrate the point that stories, just like cascaded inferences, and, deduction, induction and abduction, are a requirement of human evidential thinking. Reasoning from fact to proof requires a conceptual organization of events into the narrative form. Whether we consider the role of stories in argumentation techniques, or whether we consider their role in the rational evaluation of arguments, our conclusion remains unchanged: stories provide a temporal interpretative matrix for the analysis of evidence; they enable us to better perform our inferential tasks. It is in this sense that they operate as inferential warrants. Arranging events chronologically to form a meaningful totality enables us to see the connection between various items of evidence. They therefore function as inferential warrants enabling fact investigators to link different items of evidence to form a meaningful totality.

Evidential inference is not just about the relationship between propositions. It has a psychologicistic dimension that is often left out of traditional theories of forensic reasoning which focus almost exclusively on Type 1 (and sometimes Type 2) inferences. A comprehensive approach to forensic reasoning should include Type 3 inferences such as Stories.

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