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 Inferential Reasoning and Proof in International Criminal Trials

 The Potentials of Wigmorean Analysis

 Yvonne McDermott[[1]](#footnote-1)\*

**Abstract**

This article discusses the challenges posed by the scope and volume of the evidential record to fact-finding and the presentation of cases in international criminal trials. To this end, it introduces a modified version of a technique first developed by John Henry Wigmore at the start of the 20th century, which provides a device for mapping complex arguments based on mixed masses of evidence. The potential benefits of the method to both lawyers and judges are illustrated with examples from international criminal trials. This discussion is timely, given a recent debate that has arisen in international criminal law on the analysis of evidence in general, and the standard of proof to be applied to individual facts in particular. The article concludes by offering some observations on that debate and arguing in favour of a method that might be seen as excessively fragmentary to some, but ultimately enables a rigorous analysis of the arguments that support or weaken conclusions on the guilt or innocence of the accused.

**1. Introduction**

International criminal trials incorporate vast and overwhelming quantities of evidence, ranging from direct testimony on the acts or conduct of the accused, to documentary evidence on the geography of the affected region, to evidence on the credibility of a given witness, and a great deal in between. To give a recent example illustrating the volume of evidence at trial, the *Prlić et al.* case, which tried six individuals for war crimes and crimes against humanity committed against Bosnian Muslims and other non-Croats in the Bosnian Croat wartime entity of Herceg-Bosna between 1992 and 1994, heard 207 witnesses and admitted almost 10,000 items of documentary evidence (constituting over 1,000,000 pages of evidence) over the course of 465 trial days.[[2]](#footnote-2) The trial of Thomas Lubanga Dyilo, a single accused facing a single charge, heard 67 witnesses and admitted 1,373 items of documentary evidence over 204 days of hearings,[[3]](#footnote-3) whilst the *Katanga* trial heard 54 witnesses across 265 trial days and admitted a total of 643 pieces of documentary evidence, with the documentary evidence constituting tens of thousands of pages in each trial. *Popović et al.*, a case involving seven co-accused, admitted 87,392 pages of evidence and heard from 315 witnesses, constituting close to 34,915 transcript pages, over 1,121 trial days.[[4]](#footnote-4) On a generous estimate of 320 pages per day, it would take an individual 382 working days, or approximately 18 months, to read each page of the evidential record in *Popović* just once.

Through this fog of ‘evidential debris’,[[5]](#footnote-5) lawyers strive to present a coherent narrative and judges must satisfy themselves, beyond reasonable doubt if they are to convict an accused, of the veracity of their findings. To consider, synthesise, analyse, and give appropriate weight to each piece of the evidential puzzle presents an enormous — and some might say, superhuman[[6]](#footnote-6) — challenge to the fact-finder in an international trial. Nevertheless, one of the most frequent statements found in trial judgments is that findings are based on the totality of the evidential record,[[7]](#footnote-7) and that each piece of evidence has been duly analysed and given weight in accordance with the other evidence on record.[[8]](#footnote-8) Judgments assure us that even if a relevant piece of evidence has not been explicitly cited in making a finding, it will have been considered as part of the examination of the totality of the evidence.[[9]](#footnote-9)

This paper introduces a modified version of a technique first developed by John Henry Wigmore for the graphical representation of facts, evidence, and inter-relationships among pieces of evidence, and considers its applicability to international criminal trials. Wigmore’s chart method (otherwise known as ‘Wigmorean analysis’) assists one in organising the logical structure of an argument and linking it to the available evidence in a case, thereby breaking down the reasoning process into sequential steps. Following a brief introduction to the method in Part 2, I will argue in Part 3 that Wigmorean analysis might prove useful to international criminal lawyers as a trial preparation tool, in developing their arguments and identifying the evidence to support hypotheses to be presented at trial, and to judges in facilitating the reasoning process required to draw conclusions on evidential propositions presented in court. I argue that, with some modification, existing technology such as CaseMap™ could be used for the purposes of Wigmorean analysis. Part 4 will contextualize this discussion in light of a debate on the evaluation of evidence that has recently arisen before the ICC.

It is important to be clear at the outset that Wigmorean analysis does *not* act as replacement to human reasoning. In other words, a Wigmorean chart will not tell a judge or lawyer whether an accused is guilty or not, and nor should it.[[10]](#footnote-10) The method has a rather more modest aim of helping the chart-maker to identify the inferences that can or can not be drawn to support a conclusion, and to marshal evidential propositions, as well as the generalizations that might lead him or her to conclude that the evidence alters the probability of an inferred proposition, into a logical framework for evaluation. The method thereby elevates the complex task of inductive reasoning based on a mixed mass of evidence from an intuitive or impressionistic exercise to something more concrete.

**2. Wigmorean Analysis: A Brief Introduction**

Evidence law can be broadly divided into two constituent parts — that relating to the admissibility of evidence and that relating to proof, or the ‘natural process of mind which all men would use in weighing the evidence that has already been admitted’.[[11]](#footnote-11) For many years now, a small but committed number of scholars have argued that evidence literature places too great an emphasis on the former, at the expense of the latter.[[12]](#footnote-12) It is true that the vast majority of evidence textbooks, university courses and scholarship tend to be dominated by a discussion of rules of admissibility, with questions of proof generally being treated as an aside. This, for Twining, is ‘rather like treating England as a suburb of London’.[[13]](#footnote-13)

The reason for this apparent neglect of the proof side of evidence may be down to the perception of issues of credibility and sufficiency of evidence as being better left to the internal convictions of the decision-maker. Bacon, writing in the early 17th century, noted that such matters were left ‘to the juries’ consciences and understandings’.[[14]](#footnote-14) The belief at the time – and one that largely persists – was that questions of proof were intangible, and that in coming to conclusions on the truth of a matter, decision makers should be left to follow their own instinct. The argument was that the complex mental processes used in drawing conclusions could not be cogently classified or fully elaborated, even by the decision-maker him or herself.[[15]](#footnote-15) This changed somewhat with the emergence of the ‘new evidence scholarship’[[16]](#footnote-16) in the 1970s, when an extensive academic debate raged as to whether reasoning on probabilities in criminal trials was mathematical in nature.[[17]](#footnote-17)

Wigmore, for his part, believed that there was something more tangible about the proof element in evidence law. His words are stirring in their conviction on this point:

For one thing, there is, and there *must* be, a probative science — the principles of proof — independent of the artificial rules of procedure; hence it can be and should be studied. This science, to be sure, may as yet be imperfectly formulated … But all the more need is there to begin in earnest to investigate and develop it.[[18]](#footnote-18)

To this end, Wigmore developed a technique, known as the ‘chart method’ for the construction and evaluation of inferential arguments.[[19]](#footnote-19) Using a complex set of symbols, Wigmore’s chart method starts with an ‘ultimate probandum’ — that is, the matter that ultimately needs to be proven — and breaks it down into ‘penultimate probanda’, or the elements that constitute the ultimate probandum. To give a simple example, in a murder case, the ultimate probandum would be that X murdered Y. In order to prove this, the prosecution will have to prove each of the following penultimate probanda: (a) that Y is dead; (b) that X was responsible for Y’s death; (c) that X killed Y intentionally; (d) that Y’s death was unlawful; and (e) that X had no valid defence for the killing of Y.[[20]](#footnote-20) Wigmore’s method mandates, first, the construction of a ‘key list’ of all the relevant propositions to an argument, including the evidence that could be put forward to support those propositions, and second, the linking of all relevant propositions and evidence to the ultimate probandum in a single chart. Wigmore believed that his method would:

[E]nable us to lift into consciousness and to state in words the reasons why a total mass of evidence does or should persuade us to a given conclusion, and why our conclusion would or should have been different or identical if some part of that total mass of evidence had been different.[[21]](#footnote-21)

Wigmore posited that rules of admissibility would become of lesser importance over the course of the 20th century, and that courts would move towards a more ‘free proof’ approach.[[22]](#footnote-22) By today, common law jurisdictions have certainly moved towards a more flexible approach to admissibility,[[23]](#footnote-23) and this is a trend that is also reflected in the practice of the international criminal tribunals.[[24]](#footnote-24) However, Wigmore’s method was seen as little more than a curiosity in his lifetime,[[25]](#footnote-25) presumably owing in large part to the complexity of the text and the method. Wigmore does not even get to the business of charting until page 750 of *The Science of Judicial Proof*, with much of what precedes it a panoply of case excerpts and large sections from other authors’ work,[[26]](#footnote-26) and he uses a number of complex neologisms, such as ‘autoptic proference’ (a term given to direct evidence before the court). The method, too, uses an abundance of symbols, likely to confuse the reader and discourage him or her from attempting their own chart.

Thus, Wigmore’s method was broadly unused and unknown until the 1990s, when it was significantly simplified and elegantly updated by Anderson and Twining in their *Analysis of Evidence*.[[27]](#footnote-27) A new and long-overdue interest in some key components of Wigmore’s thesis emerged, as ‘neo-Wigmorean’ scholars such as Twining, Anderson, Schum and Tillers, developed theories of inference and legal reasoning.[[28]](#footnote-28) *Analysis of Evidence* remains the key guide to Wigmorean analysis, and a number of university courses have been developed with a view to teaching the method to the lawyers of the future.[[29]](#footnote-29) In the words of Twining and Anderson:

In our view, a method that employs symbols and charting is certainly the most efficient and perhaps the only method that makes it possible to present all the arguments in a case in a form and format that enhances clarity and understanding and makes rigorous appraisal and critique feasible.[[30]](#footnote-30)

Anderson and Twining have identified two key benefits to Wigmorean analysis. First, it helps users to ‘marshal evidence’ and manage facts in complex cases. By starting at the top (ultimate probandum) and working down (a process Wigmore called ‘deductive inferential reasoning’), a macroscopic approach to charting can help identify the components of what must be proven, and in turn, we can identify where certain facts fit within the argument, and where there are gaps in an argument.[[31]](#footnote-31) The charting method is particularly suited to criminal trials, because the penultimate probanda are pre-established in the elements of crimes; to prove a charge of rape as a crime against humanity, for example, we know that we need to prove that there was an attack; that it was widespread or systematic; that it was directed against the civilian population; that the accused had knowledge of the attack; that the perpetrator invaded any part of the body of the victim with a sexual organ, or the anal or genital opening of the victim with any object or body part; and that there was a threat or use of force or coercion. Each of these elements, along with the mode or modes of liability charged, could then be subjected to its own chart to enable rigorous analysis.

Inferential reasoning can be one of the simplest forms of human thinking in daily life — I observe that the grass in my garden is wet, so I infer that it has been raining.[[32]](#footnote-32) However, when it involves drawing inferences from an enormous mass of evidence, such as in international criminal trials where thousands of pages of evidence and hundreds of witnesses are often presented at different stages over the course of a trial spanning a number of years, the task becomes exceptionally complex, if not impossible. For that reason, Roberts has likened trying to draw reliable inferences in such situations without a tool like the charting method as being akin to trying to do long division mentally.[[33]](#footnote-33) As Schum has stated:

Often, many sources of doubt lurk between our evidence and our hypothesis and arguments become more complex, especially where a mass of evidence exists ... [Wigmore’s method helps us to] identify those sources of doubt, lest somebody else identify them for us.[[34]](#footnote-34)

This leads us to the second advantage, which is that in its microscopic form the chart method can be used as ‘an analytical tool for identifying crucial or important phases in a complex argument and subjecting selected phases to rigorous detailed analysis.’[[35]](#footnote-35) For trial lawyers, for example, it can help identify the key weak area of the opponent’s case, and build upon that weakness to their advantage – a technique Anderson and Twining refer to as ‘going for the jugular’.[[36]](#footnote-36) The chart allows its drafter to conduct a microscopic analysis of one crucial element of the case, and unpack the elements of the argument, linking it to supporting evidence. Thus, the method does not mean that the whole case needs to be charted in detail (although of course it can, should the chart-maker deem this desirable) — instead, the macroscopic, or ‘top-down’, approach can be used to identify those jugular propositions on which the case turns, and microscopic analysis can then subject these jugular propositions to rigorous scrutiny. For example, the jugular fact in an international trial might be the date when the accused took control over an organisation or armed group, or whether he or she was present at a meeting when genocide was planned. In this respect, while some initial investment of time is required to become familiar with the method, Wigmorean analysis can be less time-consuming than it might appear on first glance.

**3. Potential Uses of Wigmorean Analysis in International Criminal Trials**

***A. As a Trial Preparation Tool for Lawyers***

Lawyers may use any one of a number of methods, or a combination of several methods, to organise data in preparing for trial. These may include ‘analysis charts’, as exemplified in a Pre-Trial Chamber decision in *Bemba*, where the elements of the crimes, as well as their contextual elements, were broken down into their constituent parts, and the prosecution was asked to match those parts to corresponding pieces of evidence.[[37]](#footnote-37) Other teams might use narratives, chronologies,[[38]](#footnote-38) and/or contemporary technology for indexing and organising information, such as the quite ubiquitous CaseMap™,[[39]](#footnote-39) a piece of software that enables users to organise data in complex cases. With CaseMap, issues are hyperlinked to pieces of evidence, thereby facilitating the user to search for relevant evidence and link evidence to facts and issues in a case.[[40]](#footnote-40) Some have suggested that the prosecution’s CaseMap file should be submitted with final trial briefs,[[41]](#footnote-41) whereas the ECCC has held that the Office of Co-Investigating Judges’ CaseMap does not form part of the Case File, and thus parties have no right of access to it.[[42]](#footnote-42) Contrary to Nice and Valliéres-Roland’s position that one party’s CaseMap might provide a useful illustration to judges of where the facts were supported by evidence, the ECCC’s decision stressed the individualised nature of creating a CaseMap, and noted that there was ‘no barrier to individual Defence teams also creating their own internal CaseMap databases based on this information, should they choose’.[[43]](#footnote-43)

 Wigmorean analysis differs from CaseMap and other means of organising evidence in that it operates in a framework of argument.[[44]](#footnote-44) The method should be seen as complementary to pre-existing means of organising data and preparing for trial, rather than a rival. Where the ‘fill box’ or CaseMap approach breaks down the elements of the crime and slots pieces of evidential data into that framework, Wigmorean analysis goes further by allowing the chart-maker to articulate every step in an argument, breaking complex arguments down into simple propositions, and charting the relationships between those propositions. It also includes generalisations that might be drawn in supporting or denying an inferential conclusion.

To give an example of the differences between the two approaches, we can take an illustration from the *Gatete* trial before the ICTR. Gatete was charged with genocide or alternatively complicity in genocide, as well as conspiracy to commit genocide and the crimes against humanity of murder, rape and extermination.[[45]](#footnote-45) To take just one of these crimes, we can note that Gatete was found to have participated in killings in Rwankuba sector, at Kiziguro parish, and at Mukarange parish as part of a joint criminal enterprise to kill Tutsis in these areas, and that all participants in the joint criminal enterprise possessed the intent to destroy in whole or in part the Tutsi ethnic group.[[46]](#footnote-46) A ‘fill box’ approach to the evidence on the Rwankuba sector might look something like this, with software potentially hyperlinking the evidence to these elements, allowing for further examination:

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| --- | --- | --- |
| **Elements** | **Incriminating evidence**  | **Exonerating evidence** |
| Persons were killed in April 1994 in the Rwankuba sector. | Witnesss BBR; AIZ; LA41; LA43; Mutimura; LA16. |   |
| These persons were members of the Tutsi racial or ethnical group. | Witnesss BBR; AIZ; LA41; LA43; Mutimura; LA16. |  |
| Gatete intended to destroy the Tutsi racial or ethnical group in whole or in part. | Witnesses BBJ, BBR, AIZ. | Witnesses LA40, LA41, LA43; evidence of appointment of Tutsis to positions of authority. |
| Alternatively, Gatete knew that other persons intended to destroy the Tutsi group in whole or in part and planned, instigated, ordered, committed or otherwise aided and abetted those other people in the planning, preparation, or execution of killing or causing serious bodily or mental harm to members of the Tutsi group.  |  Witnesses BBR, AIZ. | Witnesses LA40, LA41, LA43. |
| A common plan was in existence for the destruction of the Tutsi group. |  Witness BBR. | Witnesses LA40, LA41, LA43. |
| A plurality of persons existed for the purposes of establishing a joint criminal enterprise. |  Witnesses BBR, AIZ. | Witnesses LA40, LA41, LA43. |
| There existed a common plan to commit genocide against the Tutsi in the Rwankuba sector. |  Witnesses BBR, AIZ. | Witnesses LA40, LA41, LA43. |
| Gatete participated in the common plan. |  Witnesses BBR, AIZ. | Witnesses LA40, LA41, LA43. |

Wigmorean analysis goes one step further than this by fully constructing arguments, extracting every relevant proposition that tends to support or negate the ultimate probandum, or final conclusion. In a dialectical manner, drafting the chart allows the chart-maker to construct the most coherent arguments for and against this ultimate proposition, and to relate all of the arguments within a single coherent structure. The key list for the same point in *Gatete* would follow the lines below:

**Key list for JCE**

1. **Ultimate Probandum:** Gatete was responsible for the killings of Tutsis in Rwankuba sector, Murambi commune, on 7 April 1994.
2. Gatete participated in a joint criminal enterprise to conduct killings on 7 April 1994.
3. A plurality of persons participated in the joint criminal enterprise.
4. A meeting took place on 7 April 1994 in the Rwankuba sector office courtyard.
5. BBR testified to 4.
6. AIZ testified to 4.
7. About 40 *Interahamwe* gathered at the Rwankuba sector office courtyard on 7 April 1994.
8. BBR testified to 7.
9. AIZ testified to 7.
10. Conseiller Bizimungu attended the meeting on 7 April 1994.
11. BBR testified to 10.
12. AIZ testified to 10.
13. Bourgmestre Mwange attended the meeting on 7 April 1994.
14. BBR testified to 13.
15. No meeting took place in the sector office on 7 April 1994.
16. LA41 testified to 15.
17. LA43 testified to 15.
18. LA40 testified to 15.
19. Gatete was not in Rwankuba sector in April 1994.
20. LA41 testified to 19.
21. LA43 testified to 19.
22. LA40 testified to 19.
23. At least 25 to 30 Tutsis were killed at Rwankuba sector on 7 April 1994.
24. BBR testified to 23.
25. LA41 testified to 23.
26. AIZ testified to 23.
27. A Tutsi named Macari, the *responsable* of Nyagasambu *cellule*, was killed on 7 April 1994.
28. Mutimara testified to 27.
29. The number of victims indicates that there was prior planning and co-ordination.
30. A common plan was in existence to kill Tutsis at Rwankuba sector.
31. The gathering in the sector office could not have taken place without the prior agreement of those involved.
32. Gatete made a significant contribution to the achievement of the common plan.
33. Gatete ordered the Interhamwe at the meeting on 7 April 1994 to ‘work relentlessly’.
34. BBR testified to 33.
35. Gatete told those present to ‘sensitise’ others to the killings.
36. AIZ testified to 35.
37. Gatete distributed weapons at the meeting on 7 April 1994.
38. LA41 could not see the sector office at all times on 7 April 1994.
39. LA41 testified to 39.
40. LA43 could not see the sector office at all times on 7 April 1994.
41. LA43 testified to 41.
42. LA40 could not see the sector office at all times on 7 April 1994.
43. LA40 testified to 43.
44. There are doubts as to the reliability of the key prosecution witnesses – BBR and AIZ.
45. Witnesses BBR and AIZ may have colluded in their evidence.
46. Witnesses BBR and AIZ stayed in the same safe house prior to giving testimony.
47. Witnesses staying in the same safe house will have an opportunity to discuss their evidence with each other.
48. Witnesses BBR and AIZ testified on the same day.
49. There is less scope for witnesses who testify on the same day to collude on their evidence.

**Chart for JCE**

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**Symbol Guide**

= Direct evidence before the court

= Tends to disprove

= Tends to prove

= Inferential proposition

G = Generalisation

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It is obvious from the above that the charting method allows the chart-maker to unpack the relevant evidence in more detail than a straightforward categorisation exercise, whilst also incorporating generalisations that might be referred to in building the argument. In this manner, Wigmorean analysis is a profoundly individualised exercise – it is a picture of the *chart-maker’s beliefs* as to what constitutes the strongest argument, and as such, has been described as ‘more like a map of the mind than a map of the world’.[[47]](#footnote-47) Thus, Anderson, Schum and Twining recommend that before charting commences, the chart-maker should ask themselves: ‘Who am I?’; ‘At what stage of the process am I?’, ‘What materials are available for analysis?’ and lastly, ‘What am I trying to prove?’.[[48]](#footnote-48) Following this methodology allows the lawyer to rigorously deconstruct, analyse, and reconstruct his or her arguments on a particular point.

In this manner, Wigmorean analysis is arguably more beneficial as a trial preparation tool than a system of information management, where members of a team sporadically classify evidence as being pertinent to a particular point without further unpacking of the arguments that might arise from that evidence.[[49]](#footnote-49) While technology such as CaseMap may well be very useful in drawing up the chart itself, the creation of the accompanying key list and deciding what is to go into the chart involves judgment, skill, analytical capacity, and selection technique and, as such, is a profoundly human enterprise, which cannot be replaced by technology. As Anderson and Twining have stated, ‘The chart method is an aid to thinking, it should not be envisaged as a substitute for thinking.’[[50]](#footnote-50) This does not mean that the method falls outside of the reach of international criminal lawyers, who form part of a large team on any given case. Rather, the macroscopic form of Wigmorean analysis, or breaking the case down into elements that need to be proven, can be carried out as a group exercise, and an individual team member or members may then be assigned parts of the case to undergo rigorous microscopic analysis. Given the limited resources of international criminal prosecutors, this microscopic analysis may well be applied only to ‘jugular facts’ on which the case hinges, such as whether an accused was present at a given meeting on a given date, or on key lines of argument, or possibly just on lines of argumentation that are proving difficult or perplexing.

 It cannot be emphasised strongly enough that Wigmorean analysis does *not* encourage head-counting exercises. Just because the prosecution’s chart indicates that they have ten witnesses to testify to a given fact while the defence has one witness to counter that testimony, this does not mean that the prosecution case is stronger than the defence case. The ten witnesses may be lacking in reliability or credibility; their accounts might be incomplete; there might be questions as to the consistency of their accounts, or some other reason that the Trial Chamber decides that the one defence witness provides a more credible account of the fact at hand. While Wigmorean charts facilitate the lawyer in structuring his or her argument, they give no indication as to the weight to be attributed to pieces of evidence or the overall strength of that argument.

A chart might, however, highlight areas where a link between the evidence and a proposition could be made more explicit, or where the inferential proposition is simply unsupported by the evidence at hand. In the above chart, for example, we can see that point 37 — that Gatete distributed weapons — appears to be unsupported by the prosecution evidence; this was the Trial Chamber’s ultimate conclusion.[[51]](#footnote-51) Had the prosecution charted this element of the case as above, it might have been aware in advance of trial that this proposition was unsupported, and it may have either introduced more evidence, explicitly linked the evidence at hand to that proposition, or sought to amend the indictment to remove the claim that could not be proven. Equally, the defence might have used the charting method to discover whether certain inferences could not logically have been drawn from the evidence at hand, and whether certain lines of defence argument might have been further bolstered with additional material.

***B. As an Aid to Judicial Reasoning***

In the same way that the charting method as elucidated above can help the lawyer preparing for trial to structure and evaluate the strength of their argument, it might also be a means for judges (and lawyers serving in Chambers) to organise the vast quantities of materials admitted over the course of a trial and to assess the strengths of the arguments presented before the court.

As mentioned at the outset of this paper, there is a tendency in international criminal law to treat fact-finding as an intuitive exercise, where the judges, having listened to all of the evidence, come to their conclusions based on the totality of that evidence.[[52]](#footnote-52) However, given the huge volumes of evidence at play in international criminal trials, this is immensely challenging, even where summaries of the evidence are created as the trial goes along. By subjecting individual propositions to intense scrutiny and analysis, the charting method allows the judge to further elucidate the basis for their intuition on a certain point. This will in turn assist in the judgment drafting process, by making the assumptions and factual findings underlying certain findings explicit.

This is not to say that an adoption of Wigmorean analysis will make judgments more accurate than they are at present, or that judges who have utilised the charting method will be entirely certain of the truth of their findings. Proof beyond reasonable doubt does not require 100% certainty in the conclusions reached, as most recently pointed out in the *Chui* Appeals judgment.[[53]](#footnote-53) Indeed, certainty beyond any doubt is impossible where, despite its volume, the evidential record simply cannot reflect the entirety of information available on a given incident.[[54]](#footnote-54) However, the judge does have to satisfy him or herself on the reasonableness of the conclusions reached, even if another fact-finder might have reached a different conclusion. As Judge Shahabuddeen has pointed out, ‘different minds, equally competent, may and often do arrive at different and equally reasonable results’.[[55]](#footnote-55) In this manner, offering a full exposition of the process through which conclusions were reached shields those findings of fact from appeal, where the standard is whether the finding is one that ‘no reasonable trier of fact’ could have reached.[[56]](#footnote-56)

Indeed, Wigmorean analysis could have particular applicability at the appeal stage when an error of fact has been alleged, because a microscopic analysis of the Trial Chamber’s reasoning on that particular fact can be undertaken to determine whether the alleged error meets the very high standard of review for alleged errors of fact. We might illustrate this with reference to the Appeal Judgment in *Krnojelac.*[[57]](#footnote-57)

Milorad Krnojelac was convicted of persecution and cruel treatment as an individual, along with cruel treatment and inhumane acts as a superior, on 15 March 2002 and was sentenced to seven and a half years imprisonment.[[58]](#footnote-58) The defence submitted six grounds of appeal, five of which were on questions of fact.[[59]](#footnote-59) The prosecution lodged seven grounds of appeal; two of these were alleged errors of law, and five were alleged errors of fact.[[60]](#footnote-60) In its judgment of 17 September 2003, the Appeals Chamber clearly stated its position of deference to the Trial Chamber on findings of fact, stating that:

The Appeals Chamber considers that almost all of the Defence’s sub-grounds and grounds of appeal based on errors of fact in this case are invalid ... . It seems that the Defence is only challenging the Trial Chamber’s findings and suggesting an alternative assessment of the evidence.[[61]](#footnote-61)

One alleged error of fact put forward by the prosecution was the Trial Chamber’s finding that Krnojelac could not have been aware of the murder of detainees by his subordinates in the KP Dom detention facility, of which he was the commander.[[62]](#footnote-62) The Trial Chamber had accepted that the accused had knowledge of two deaths, one of which was possibly a suicide, and that he had also been informed of the beatings and disappearances of detainees, but it was not convinced ‘that this was sufficient information in the possession of the Accused to put him on notice that his subordinates were involved in the murder of detainees.’[[63]](#footnote-63) The Appeals Chamber, in upholding the Prosecutor’s appeal and thus increasing the sentence of the accused as a consequence, disagreed. Without any footnotes, the following statement was made in its judgment:

The Appeals Chamber is of the opinion that Krnojelac was in a position to see the blood stains spattered along the corridors of the KP Dom and the bullet holes in the walls of the entrance to the administration building. As the Trial Chamber stated, the Accused went to the KP Dom almost every day of the working week. While there he would go to the canteen, the prison yard or elsewhere inside the compound, all places where he had ample opportunity to notice the physical condition of the non-Serb detainees. There can therefore be no doubt that he was also in a position to see the blood stains and bullet holes marking the walls.[[64]](#footnote-64)

On first glance, it might appear that the Appeals Chamber here had undertaken its own evaluation of the evidence. However, a Wigmorean chart of this particular aspect of the case reveals that this was not so.

The starting point of any Wigmorean chart is to frame the ultimate and penultimate probanda. In this instance, these elements would be as follows:

U

P3

P2

P4

P5

P1

In this preliminary chart:

U is the **Ultimate Probandum**. The Ultimate Probandum here is, ‘Krnojelac is responsible as a superior for the murder of detainees in KP Dom detention facility in June 1992.’

P1 = **Penultimate Probandum 1**: 26 detainees died while in custody in KP Dom during June 1992.

P2 = **Penultimate Probandum 2**: Deaths were caused by the act(s) of one or more subordinates of Krnojelac.

P3 = **Penultimate Probandum 3**: Those acts were made with the intent to commit murder.

P4 = **Penultimate Probandum 4**: Krnojelac knew or had reason to know about the murderous acts of his subordinates.

P5= **Penultimate Probandum 5**: Krnojelac failed to take reasonable and necessary measures to prevent these acts or omissions or punish those perpetrators.

Penultimate probandum 4 was the key factual issue at appeal on this point – that is, whether the accused knew or had reason to know about the murderous acts of his subordinates. Below are the key list and chart for P4.

**Key List for P4**

**P4. Krnojelac knew or had reason to know about the murderous acts of his subordinates.**

1. Krnojelac knew of murders that were committed by his subordinates in KP Dom.
2. Krnojelac knew of the murder of Halim Konjo by KP Dom guards.
3. Halim Konjo was murdered by KP Dom guards.
4. Halim Konjo was taken away by KP Dom guards on 12 June 1992 and was never seen again.
5. Testimony of FWS-69; RJ; FWS-139; FWS-54 to 4.
6. Halim Konjo succumbed to a beating and died.
7. Testimony of FWS-69; RJ; FWS-139; FWS-54 to 6.
8. Halim Konjo died of a heart attack or stroke.
9. Hearsay testimony of Muhamed Lisica to 8.
10. Krnojelac knew that Halim Konjo was dead.
11. Testimony of Krnojelac and RJ to 10
12. Krnojelac knew of the murder of Juso Dzamalija.
13. Krnojelac knew of death of Juso Dzamalija.
14. Testimony of Krnojelac to 13.
15. Juso Dzamalija committed suicide.
16. Testimony of FWS-66; FWS-111; FWS-215; FWS-54; Ekrem Zekovic;  Dr Amir Berberkic; FWS-69; FWS-250 to 15.
17. Krnojelac had reason to know about the murders committed by subordinates in KP Dom.
18. Murders were committed by KP Dom guards in June 1992.
19. See chart to P1 (26 detainees died while in custody in KP Dom during June 1992).
20. Krnojelac would have seen and heard evidence of the murders in the administration building.
21. There were bullet holes in the walls of the administration building.
22. Testimony of FWS-249 to 21.
23. Blood and bloodied instruments could be seen in the rooms where the beatings took place.
24. Testimony of FWS-71 and Muhamed Lisica to 23.
25. During and after the beatings, KP Dom guards could be seen carrying bodies out of the administration building in blankets.
26. Testimony of Muhamed Lisical FWS-54; FWS-71; Ekrem Zekovic to 25.
27. Screaming, pleas and shouting could be heard during the time of the beatings.
28. Testimony of FWS-69; FWS-172; RJ; Ekrem Zekovic; FWS-86; Rasim Taranin; FWS-109; FWS-144; FWS-71; Dževad Lojo; FWS-215; Safet Avdic; FWS-198; FWS-66; Ahmet Hadžimusic; Amir Berberkic; Muhamed Lisica; FWS-73; FWS-142; FWS-104; FWS-03; FWS-250; FWS-162; Ekrem Zekovic to 27.
29. A vehicle belonging to KP Dom with a faulty exhaust pipe was used to carry bodies from the camp.
30. Traces of blood were seen on the vehicle.
31. Testimony of Muhamed Lisica; Ekrem Zekovic; FWS-109; FWS-142; FWS-138 ; FWS-109; FWS-249 to 30.
32. The vehicle was heard leaving the compound soon after shots were fired.
33. Testimony of FWS-138; FWS-69; FWS-71; FWS-109; FWS-66; Ekrem Zekovic; FWS-142; FWS-58; FWS-86; Dr Amir Berberkic; FWS-172; FWS-71; Muhamed Lisica; FWS-144 to 32.
34. The vehicle was used to transport raw fish and meat, and had stains as a result.
35. Testimony of Lazar Divljan to 34.
36. Krnojelac had been asked about the suspicious disappearance of detainees.
37. RJ asked Krnojelac about the disappearance of detainees.
38. RJ testimony to 37.
39. RJ never asked Krnojelac about the disappearance of detainees.
40. Krnojelac testimony to 39.
41. As prison warden, Krnojelac held the highest position of authority in KP Dom.
42. Krnojelac was the prison warden of KP Dom from April 1992 to July 1993.
43. Testimony of Krnojelac; Exhibit D30 to 42.
44. The prison warden held the highest responsibility in KP Dom.
45. Testimony of FWS-139; Zoran Mijovic; FWS-138; Divljan Lazar to 44.
46. As prison warden, Krnojelac was only responsible for the maintenance of the property.
47. Evidence to 46: Letter from Ministry of Defence tendered through Milenko Dundjer.
48. Evidence contradicting 47: Letter appointing Krnojelac, which makes no mention of limited role.
49. Krnojelac would have seen the detainees being brought to the administration building for beatings.
50. Krnojelac’s office was located in the administration building, overlooking the prison yard.
51. Testimony of Krnojelac to 50.
52. The beatings took place in the administration building.
53. Testimony of Dževad S Lojo; FWS-66; FWS-144; FWS-109; FWS-71; Ahmet Hadžimusic; FWS-54; FWS-162; FWS-172; Safet Avdic to 52.
54. Detainees crossed the yard from their rooms to the administration centre, where they would line up outside prior to being taken into a room inside the centre to be beaten.
55. Testimony of Dževad Lojo; FWS-66; FWS-71; FWS-172; Safet Avdic; FWS-54; FWS-73; FWS-71; FWS-86; FWS-198; FWS-182; FWS-119; FWS-138; FWS-109; Ekrem Zekovic; RJ; FWS-69; FWS-58 to 54.
56. Krnojelac would have noticed diminishing numbers of detainees.
57. Daily roll calls were taken in the prison yard, in view of Krnojelac’s office.
58. Testimony of FWS-109; FWS-250; FWS-172; FWS-137; FWS-111; FWS-85; FWS-86; FWS-119; Rasim Taranin; FWS-144 to 57.
59. There would have been fewer detainees in the roll call in the days after murders took place.

**Chart for P4**

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Penultimate probandum 4 was the key factual issue at appeal on this point – that is, whether the accused knew or had reason to know about the murderous acts of his subordinates. Penultimate probandum 4 can in turn be divided into two propositions — the first, whether the accused knew of such acts, and the second, whether he had reason to know about those acts. These propositions are represented by the numbers 1 and 17, respectively, in the above chart. We can see from the chart spanning from number 1, that is, that Krnojelac knew about the murders in KP Dom by his subordinates, that the evidence is relatively weak on this point. We can see that the accused knew of the death of two individuals, but there are evidential gaps linking him to knowledge of murder, and with one of the victims, there was evidence to suggest that the cause of death was suicide.[[65]](#footnote-65)

The chart to point 17 (that the accused had reason to know about the murders) is notably more detailed. A number of evidential propositions might be relied upon in order to reach this penultimate probandum. These are:

1. Murders were committed by KP Dom guards in June 1992 (point 18 on the chart);
2. Krnojelac would have seen and heard evidence of the murders in the administration building (point 20 on the chart);
3. Krnojelac had been asked about the suspicious disappearance of detainees (point 36 on the chart);
4. As prison warden, Krnojelac held the highest position of authority in KP Dom (point 41 on the chart);
5. Krnojelac would have seen the detainees being brought to the administration building for beatings (point 49 on the chart); and
6. Krnojelac would have noticed diminishing numbers of detainees (point 56 on the chart).

We can see from the chart that there is not a great deal of evidence on the fourth interim probandum — one witness testified that he asked the accused about the suspicious disappearance of detainees; the accused testified that he had not. It is in the hands of the fact finder to determine whether this resolving this disputed fact (that the accused was asked about the disappearances) is imperative for drawing an inference on the penultimate probandum (that he should have known of the murders). Yet, this was not a crucial point in the Trial Chamber’s acquittal on this point; indeed, it actually accepted that he was informed of the disappearances,[[66]](#footnote-66) although this is arguably the weakest interim inference in the chain leading to point 17. The other evidential links leading to points 18, 20, 36, 49 and 56 on the chart were accepted by the Trial Chamber, but at other stages in the judgment, such as the factual circumstances surrounding the case. Here, it was accepted that the accused did in fact hold the highest position of authority in the KP Dom.[[67]](#footnote-67) The Trial Chamber had also accepted that a total of 26 murders were committed by the KP Dom guards under the accused’s control.[[68]](#footnote-68) While the Trial Chamber did not explicitly find that Krnojelac would have seen or heard evidence of murders in KP Dom, it did make positive findings on the vast majority of the interim inferences that would lead one to that conclusion,[[69]](#footnote-69) such as the fact that Krnojelac’s office was located in the administrative building; that the screams of victims could be heard coming from the administrative building, and that evidence such as bloody implements and bullet holes and traces of blood on the walls was clearly visible throughout the KP Dom.[[70]](#footnote-70)

The chart, then, illustrates the Trial Chamber’s error — while these findings of fact were conclusively reached, there was a failure to link them to the ultimate probandum. Thus, the Appeals Chamber’s conclusion that no reasonable trier of fact, on the totality of the evidence on front of it, could have found that the accused could not have had reason to know of the murders in KP Dom, is sound. What appears, on a textual analysis of the Appeals Judgment, to be a replacement of the Trial Chamber’s evaluation of the evidence with the Appeals Chamber’s own evaluation, is revealed through Wigmorean analysis to be an exercise of judgment offering deference to the Trial Chamber’s findings, but finding an error insofar as all of the inferences from the evidence and factual findings were not drawn.

**4. Limitations of the Method and Criticism of the ‘Fragmentary Approach’**

Three potential criticisms to judges adopting Wigmorean analysis might be envisioned at this stage. The first is that the exercise is excessively time-consuming, especially given the volume of evidential material involved in international criminal trials. However, the complexity of the cases and the volume of evidentiary material provide the very reason why charting is a suitable exercise for the international criminal judge. Recalling the ‘long division in one’s head’ analogy raised earlier in this article, I would argue that the exercise of classifying evidentiary material and linking it to propositions and their ultimate probandum in a written chart is a far less taxing mental exercise than keeping hundreds of thousands of pages of evidential material in mind when reaching a conclusion. Further, as set out earlier, Wigmorean analysis in its microscopic form can focus on a certain key aspect or aspects of the case — it does not insist that every single evidentiary proposition is charted and scrutinised, although of course it can be. Lastly, as mentioned above, existing software might be used for drawing the chart, although the decision as to the structure of the chart, what to include, and the relationships between propositions is an exercise for the chart-maker.

 The second potential criticism might point to the exceptionally lengthy nature of judgments at present, and argue that the adoption of Wigmorean analysis would lead judgments to be even more cumbersome. Further, it might be argued that drilling down into each evidential proposition may lead judges to lose sight of their overall intuition on the culpability of the accused, thus rendering them unable to see the wood for the trees, so to speak. To this criticism, I would point out that the use of Wigmorean analysis in the judicial decision-making process does not make it inevitable that judgments will be necessarily longer than they would otherwise have been, and even if they are longer as a result, no-one would argue that clarity of reasoning and depth of analysis should be sacrificed for the sake of brevity. The point of detracting from the initial intuition of the judge cannot stand as a relevant argument in a system where the standard of proof is not *l'intime conviction du juge*, but beyond reasonable doubt. If a judge had previously been convinced by the narrative presented by the prosecution on the accused’s role but a rigorous analysis of the arguments raise some reasonable doubt as to the guilt of the accused, that can only be a positive thing.[[71]](#footnote-71)

 Lastly, given that Wigmorean analysis tells the decision-maker nothing about the weight that should be attributed to particular pieces of evidence, the judge might wonder why the method is any more valuable to him or her than, say, a list linking evidence to the elements of the crimes charged. As hopefully illustrated by the *Gatete* example above, Wigmorean analysis allows a more thorough unpacking of the arguments, and helps the chart-maker to articulate his or her thinking, thereby elevating the decision-making process from a matter of pure intuition to one that is based on rigorous assessment of the facts and evidence.

 While probabilistic methods of reasoning and related tools such as Bayesian networks, which graph probabilistic relationships between variables,[[72]](#footnote-72) fall outside the scope of this article, the question of weight highlights a pertinent issue that has recently arisen in the ICC. In their Concurring Opinion to the *Katanga* judgment, Judges Diarra and Cotte argued against ‘the approach whereby the probative value of each piece of evidence is evaluated in a fragmentary manner or one which would lead to the application of the beyond reasonable doubt standard to all the facts in the case.’[[73]](#footnote-73) The key point at issue here was whether the evidence was sufficient to establish that there was a group acting with a common purpose, for the purposes of establishing liability under Article 25(3)(d) of the Statute, or an organisation that could adopt a policy to commit crimes against humanity, as required for liability under Article 7. Judge van den Wyngaert, in her Minority Opinion, concluded that the militia of Walendu-Bindi were nothing more ‘than a loose coalition of largely autonomous units’,[[74]](#footnote-74) while the Trial Chamber’s judgment found that the evidence established that there was an organisation with a command structure, acting with a common purpose to attack the Hema civilian population.[[75]](#footnote-75)

Judges Diarra and Cotte’s quote above, a sentiment reiterated by Judges Trendafilova and Tarfusser in their Joint Dissenting Opinion to the *Ngudjolo* Appeals Chamber judgment,[[76]](#footnote-76) raises two questions — first, should each piece of evidence be evaluated in a fragmentary manner? Second, should the beyond reasonable doubt standard be applied to facts in the case?

On the first point, it is clear that each piece of evidence should be evaluated on its own merits, in light of the other evidence on the record, to determine whether a point has been proven beyond reasonable doubt.[[77]](#footnote-77) However, there is no reason to believe that the minority in *Katanga* or the majority in *Ngudjolo* went beyond this approach. Judges Trendafilova and Tarfusser’s dissent in *Ngudjolo* is more instructive than the concurring opinion in *Katanga* as to why they believed that the Trial Chamber took an excessively fragmentary approach to the evidence, giving three specific illustrations. First, the Trial Chamber considered one witness’s evidence and determined (correctly, as confirmed by the dissenting judges)[[78]](#footnote-78) that the evidence was of a general nature and did not provide specific information as to the role and status of the accused in the Bedu-Ezekere *groupement*.[[79]](#footnote-79) The dissenting judges expressed distaste at the Trial Chamber’s approach, stating that it should have considered ‘the accumulation of all the evidence in the case’ before discussing whether the witness’s testimony sufficed to prove the role and status of the accused.[[80]](#footnote-80) Similarly, the dissenting judges criticised the Trial Chamber’s note that another witness did not provide sufficient detail on the status of the accused, noting that, ‘In so doing, the Trial Chamber effectively dismissed relevant evidence that, if relied upon *together* with other evidence in the record, might have sufficed for the Trial Chamber to establish Mr Ngudjolo’s control over the Lendu militia of the Bedu-Ezekere *groupement* at the relevant time.’[[81]](#footnote-81) Lastly, the dissenting judges felt that the combined effects of these two witnesses’ accounts with the hearsay and inconsistent evidence that the Trial Chamber had treated with circumspection was not given sufficient attention.[[82]](#footnote-82)

With respect, the dissenting judges’ approach appears to be misplaced for a number of reasons. First, it is common practice for judgments to consider the weaknesses, such as gaps, inconsistencies or credibility issues, inherent in a particular witness’s account as it recalls their testimony in the final judgment.[[83]](#footnote-83) This does not mean that the totality of the evidence has not been considered; instead, it indicates that due consideration will be given to the weaknesses in the witness’s account along with its strengths in basing a finding on the evidence as a whole.

Second, the dissenting opinion comes dangerously close to suggesting an alternative reading of the evidence, whereas the standard of appeal for alleged errors of fact is whether the Trial Chamber ‘committed a clear error, namely, misappreciated the facts, took into account irrelevant facts, or failed to take into account relevant facts.’[[84]](#footnote-84) The Appeals Chamber has noted that, on ‘misappreciation of the facts’, it ‘will not disturb a Pre-Trial or Trial Chamber’s evaluation of the facts just because the Appeals Chamber might have come to a different conclusion. It will interfere only in the case where it cannot discern how the Chamber’s conclusion could have reasonably been reached from the evidence before it’.[[85]](#footnote-85) The dissenting judges’ remarks that a more inclusive reading of the evidence as a whole ‘might have sufficed’[[86]](#footnote-86) to support a conviction is rather unconvincing in this light and fails to demonstrate that the Chamber’s conclusion could not reasonably have been reached on the basis of the evidence before it. The fact remains that the Trial Chamber considered that the evidence did not suffice to make a finding, and it is categorically the Trial Chamber’s place to make that decision. It is settled jurisprudence that a large degree of deference must be shown to the Trial Chamber in any given case, given that it was the judicial bench that heard all of the evidence on which those findings of fact were based.[[87]](#footnote-87)

Third, the dissenting opinion’s caricature of the Trial Chamber’s evaluation of the evidence ‘as if it existed in a hermetically sealed compartment’[[88]](#footnote-88) is unfounded, given that the Chamber’s evaluation of the evidence came in the judgment, at the end of the trial. Such an accusation might have been justified if, after hearing each witness, the Trial Chamber had noted insufficiencies in the testimonial account and concluded that it would not have any weight. This was clearly not the case, given that the Trial Chamber explicitly noted the strengths as well as weaknesses in the particular witnesses’ accounts, but ultimately concluded that ‘it cannot rule out the possibility that [the accused] led the Lendu combatants from Bedu-Ezekere during the Bunia operation, but is nonetheless unable to so determine beyond reasonable doubt.’[[89]](#footnote-89)

Fourth, the dissenting opinion appears to urge against pointing out weaknesses inherent in witnesses’ accounts or pieces of evidence when discussing those items in the Trial Judgment, apparently preferring a description of the contents of the testimony or statement, followed by what might be seen as a Sherlock Holmes-style conclusion where the Trial Chamber concludes that, on the basis of all that has gone before it, it is either convinced or not convinced beyond reasonable doubt as to the truth of an assertion. Such an approach would clearly be detrimental to the parties in attempting to decipher the basis for the judgment, and it can only be hoped that future Trial Chambers are not discouraged by these concurring and dissenting opinions from fully elucidating their reasoning on the weight of individual pieces of evidence.

The second question raised by this recent trend in the ICC’s jurisprudence on fact-finding is whether the beyond reasonable doubt standard should be applied to all of the facts in the case. It goes without saying that not all facts need to be proven beyond reasonable doubt. However, a fundamental rule of probability theory is the so-called ‘conjunction fallacy’, the rule that the probability of two events occurring together is always less than or equal to the probability of one occurring alone.[[90]](#footnote-90) So, to take the fact at issue in the *Ngudjolo* dissenting opinion, let us imagine that the credible but overly general evidence of Witness P-317 taken alone creates a 0.2 probability that the accused was indeed in charge of Lendu militias in the Bedu-Ezekere *groupement*;[[91]](#footnote-91) let us assume, for the sake of argument, that the additional witness testimony, which the Trial Chamber felt lacked sufficient detail on the status of the accused, and the hearsay and inconsistent testimony treated with circumspection by the Trial Chamber, all taken together, raise this probability to 0.7. It would still be a fallacy to conclude that the accused was criminally liable under the mode of liability charged, indirect co-perpetration (or acting, together with another, through other persons), for the acts of those militia, because control over the perpetrators is a pre-requisite for being able to act through those perpetrators. Therefore, control would have had to be established to a probability of 0.9 or above before an accused could be convicted beyond reasonable doubt.[[92]](#footnote-92)

This is not to say that 0.7 was the correct probability to attach to the relevant fact — this is a decision to be made by the fact-finder, and the application of tools such as Bayes’ Theorem encourages them to interrogate the strength of their own confidence in the truth of a proposition. Nor does this suggest that the dissenting judges were incorrect in finding that not every factual finding needs to be proven beyond reasonable doubt. However it does make the point that a fact-finder simply cannot be satisfied beyond reasonable doubt of the truth of an inference drawn from facts, where they doubt the existence of those facts.[[93]](#footnote-93) Equally, it would be incorrect to conclude that the probability that an accused gave an order is 0.8, where the probability of her having been commander at the time is 0.7, as being the commander is a pre-requisite for the ability to give orders.[[94]](#footnote-94) Judge Orie has eloquently stated the problems of assuming that where a fact-finder is not entirely convinced on a number of pertinent facts, he or she might be able to make a finding beyond reasonable doubt on the sum of those facts: ‘Mathematically speaking, if on five different occasions I was each time 70 per cent convinced that the Accused shared the necessary intent, this would not necessarily result in me being 100 per cent convinced, let alone 350 per cent.’[[95]](#footnote-95)

**5. Conclusion**

This article provided a brief introduction to the method of charting inferential relationships between elements of complex arguments based on a mixed mass of evidence known as Wigmorean analysis. I posited that both the macroscopic (or top-down) and microscopic approaches to Wigmorean analysis might serve as useful trial preparation tools for the parties, in constructing their arguments and developing links between pieces of evidence and hypotheses that support those arguments. Defence teams might use the method to reconstruct the prosecution’s arguments and thereby identify weak points in those arguments. I noted that, while existing technology might make the process of drawing up a chart more economical, the process of developing a key list of arguments and constructing inferential links is an exercise for the chart-maker, thereby enabling them to rigorously analyse the bases for those arguments in a microscopic manner.

 I also discussed the potentials of applying Wigmorean analysis as a tool to assist in judicial decision-making. Given the enormous quantities of evidence presented at trial, the method would enable judges to analyse the logical consequences of inferences that can be drawn from the evidence at hand, and to fully interrogate various evidential propositions. To this end, I provided an example of the method’s particular potential usefulness where an error of fact has been alleged on appeal, insofar as a charting approach may lead the Appeals Chamber to analyse the basis for a Trial Chamber’s finding of fact, and to assess whether this was indeed a finding that no reasonable trier of fact could have reached.

 This discussion is timely, given an apparent divergence of opinion that has recently arisen between some members of the international criminal judiciary on the degree of certainty that should be attached to findings of fact, and whether evidence should be subjected to a fragmentary or a holistic analysis. I emphasised the applicability of the conjunction fallacy in probability theory in this context — while the fact-finder does not need to be satisfied beyond reasonable doubt on every finding of fact, basic logic precludes the drawing of a conclusion beyond reasonable doubt on the basis of a factual finding of which they are less certain. This recent debate, and other pertinent issues raised in the present symposium and beyond, highlight the fact that there remains much scope for further analysis of issues of fact-finding and proof before international criminal trials. By drawing on a rich body of evidence scholarship, itself influenced by studies of logic, probability, psychology and law, international criminal law scholars and practitioners can continue to strive to enhance their discipline.

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2. Judgment, *Prlić et al.* (IT-04-74-T), Trial Chamber III, 29 May 2013, Annex 2, ‘Procedural History’ (‘*Prlić* judgment’). [↑](#footnote-ref-2)
3. Judgment pursuant to Article 74 of the Statute, *Lubanga* (ICC-01/04-01/06-2842), Trial Chamber I, 14 March 2012 (‘*Lubanga* judgment’), § 11. [↑](#footnote-ref-3)
4. Judgment, *Popović et al.* (IT-05-88-T), Trial Chamber II, 10 June 2010, § 5. [↑](#footnote-ref-4)
5. P. Murphy, ‘No Free Lunch, No Free Proof’, 8 *Journal of International Criminal Justice* (2010) 539, 543. [↑](#footnote-ref-5)
6. Craig Callen has pointed out that humans’ cognitive capacities are inherently weak: C.R. Callen, ‘Human Deliberation in Fact-Finding and Human Rights in the Law of Evidence’, in P. Roberts and J. Hunter, *Criminal Evidence and Human Rights* (Hart, 2012) 309, at 310. [↑](#footnote-ref-6)
7. Amongst many others, examples include *Lubanga* judgment, *supra* note 2, § 94; Judgment on the Appeal of Mr. Thomas Lubanga Dyilo against his Conviction, *Lubanga* (ICC-01/04-01/06-3121), Appeals Chamber, 1 December 2014, § 22; Judgment, *Taylor* (SCSL-03-01-T), Trial Chamber II, 18 May 2012, § 160; Judgment, *Muvunyi* (ICTR-00-55A-T), Trial Chamber III, 11 February 2010, §§ 5, 29; Judgment, *Limaj et al.* (IT-03-66-T), Trial Chamber II, 30 November 2005, § 10. [↑](#footnote-ref-7)
8. *Prlić* judgment, *supra* note 1, § 282; Judgment and Sentence, *Musema* (ICTR-96-13-A), Trial Chamber I, 27 January 2000, § 41; Decision on Motion for Acquittal, *Kunarac et al.* (IT-96-23-T), Trial Chamber II, 3 July 2000, § 4. [↑](#footnote-ref-8)
9. E.g. Judgment, *Stanišić and Simatović* (IT-03-69), Trial Chamber I, 30 May 2013, § 34. [↑](#footnote-ref-9)
10. As Roberts and Aitken have noted, ‘The Chart Method is sometimes measured, and predictably found wanting, against excessively inflated expectations, when all that is really required to vindicate its usefulness is some improvement in the direction of logical analysis over exclusively narrative methods or impressionistic intuitions.’ P. Roberts and C. Aitken, *The Logic of Forensic Proof: Inferential Reasoning in Criminal Evidence and Forensic Science Guidance for Judges, Lawyers, Forensic Scientists and Expert Witnesses*, Royal Statistical Society’s Working Group on Statistics and the Law, Practitioner Guide No. 3 (2014), available online at <http://www.maths.ed.ac.uk/~cgga/Guide-3-WEB.pdf> (visited 3 May 2015), at 68. [↑](#footnote-ref-10)
11. J.H. Wigmore, *The Principles of Judicial Proof as given by Logic, Psychology, and General Experience, and Illustrated in Judicial Trials* (Little Brown & Co., 1913), at13–14. [↑](#footnote-ref-11)
12. See e.g. W. Twining, ‘Taking Facts Seriously’, 34 *Journal of Legal Education* (1984) 22; W. Twining, *Theories of Evidence: Bentham and Wigmore* (Stanford University Press, 1985), at iv; W. Twining, ‘Rethinking Evidence’ in *Rethinking Evidence* (2nd edn., Cambridge University Press, 2006), at 237; Y. McDermott, ‘The Admissibility and Weight of Written Witness Testimony: A Socio-Legal Analysis’, 27 *Leiden Journal of International Law* (2013)971; P. Roberts, ‘Groundwork for a Jurisprudence of Criminal Procedure’, in R.A. Duff and S.P. Green (eds), *Philosophical Foundations of Criminal Law* (Oxford University Press, 2011), 379, at 385–386. [↑](#footnote-ref-12)
13. Twining, *Theories of Evidence* *ibid.*,164. [↑](#footnote-ref-13)
14. F. Bacon, ‘Proclamation Concerning Jurors (1607)’, in J. Spedding (ed.), *The Letters and the Life of Francis Bacon*,Vol. 3(Longmans, Green Reader and Dyer, 1868) 390. [↑](#footnote-ref-14)
15. P. Tillers, ‘Modern Theories of Relevancy, 1931-1981’, in P. Tillers (rev.) *Wigmore on Evidence* (1983), available online at <http://tillers.net/ModernTheories.pdf> (visited 3 May 2015), at 140–141. [↑](#footnote-ref-15)
16. See further, R. Lempert, ‘The New Evidence Scholarship: Analysing the Process of Proof’, 66 *Boston University Law Review* (1986)439; J.D. Jackson, ‘Analyzing the New Evidence Scholarship: Towards a New Conception of the Law of Evidence’, 16 *Oxford Journal of Legal Studies* (1996) 309. [↑](#footnote-ref-16)
17. These Baconian (non-mathematical) vs. Pascalian (mathematical) approaches are probably best exemplified by L.J. Cohen, *The Probable and the Provable* (Oxford University Press, 1977) and the critique of Cohen’s work in G. Williams, ‘The Mathematics of Proof – I’ and ‘The Mathematics of Proof – II’ (*Criminal Law Review* [1979] 279; 340). See further, Twining, *Theories of Evidence*, *supra* note 11, at 13–15; L.H. Tribe, ‘Trial by Mathematics: Precision and Ritual in the Legal Process’, 84 *Harvard Law Review* (1971) 1329; B.J. Shapiro, ‘Beyond Reasonable Doubt and Probable Cause: Historical Perspectives on the Anglo-American Law of Evidence’, in P. Murphy (ed.), *Evidence, Proof and Facts – A Book of Sources* (Oxford University Press, 2003) 327. For greater detail on the two sides’ approaches to these questions, see Mark Klamberg’s contribution in this issue of the *Journal*. [↑](#footnote-ref-17)
18. Wigmore, *supra* note 10, at 1. [↑](#footnote-ref-18)
19. *Ibid.* [↑](#footnote-ref-19)
20. Roberts and Aitken, *supra* note 9, at 40. [↑](#footnote-ref-20)
21. Wigmore, *supra* note 10, 4. [↑](#footnote-ref-21)
22. *Ibid*., 1–2. [↑](#footnote-ref-22)
23. P. Roberts and A. Zuckerman, *Criminal Evidence* (Oxford University Press, 2010) 676–684 (on ‘forensic reasoning rules’); M. Damaška, *Evidence Law Adrift* (Yale University Press, 1997) discusses the reasons behind those rules. [↑](#footnote-ref-23)
24. See e.g. Rule 89(C) ICTY and ICTR RPEs: ‘A Chamber may admit any relevant evidence which it deems to have probative value’. See McDermott, *supra* note 11 for a detailed analysis. [↑](#footnote-ref-24)
25. Twining, *Theories of Evidence*, *supra* note 11, at 173. [↑](#footnote-ref-25)
26. Some of these excerpts, such as those on the reliability or lack thereof of certain races as witnesses, reflect some of the more odious prejudices of the day, e.g. Wigmore, *supra* note 10, 313–317. [↑](#footnote-ref-26)
27. T. Anderson and W. Twining, *Analysis of Evidence* (Northwestern University Press, 1998); A second edition of *Analysis of Evidence* (Cambridge University Press) was published, with David Schum as a co-author in 2005. Twining had earlier discussed Wigmore’s place in the ‘rationalist tradition of evidence scholarship in *Theories of Evidence*, *supra* note 11. [↑](#footnote-ref-27)
28. In addition to those works cited above, the following works are key contributions to the neo-Wigmorean movement: D. Schum, *Evidential Foundations of Probabilistic Reasoning* (Wiley & Sons, 1994); T.J. Anderson, ‘Refocusing the New Evidence Scholarship’, 13 *Cardozo Law Review* (1991) 783; W. Twining, ‘Taking Facts Seriously’, 34 *Journal of Legal Education* (1984) 22; P. Tillers, ‘The Value of Evidence in Law’ 39 *Northern Ireland Legal Quarterly* (1988) 167. [↑](#footnote-ref-28)
29. Roberts and Aitken, *supra* note 19, 65. [↑](#footnote-ref-29)
30. Anderson and Twining, *Analysis of Evidence* (1998), *supra* note 26, 144. [↑](#footnote-ref-30)
31. T. Anderson and W. Twining, ‘Law and Archaeology: Modified Wigmorean Analysis’ (2014) (on file with author). [↑](#footnote-ref-31)
32. This simple inference may not be well-held; perhaps my neighbour decided to water my garden for me in a period of unseasonable drought, or perhaps the dew has fallen. This illustrates the role of generalizations in drawing inferences — Wigmore’s method encourages the chart-maker to explicitly identify those generalisations. [↑](#footnote-ref-32)
33. P. Roberts, ‘The Priority of Procedure and the Neglect of Evidence and Proof: Facing Facts in International Criminal Law’,in this issue of the *Journal*, 31. [↑](#footnote-ref-33)
34. D. Schum, ‘Evidence and Inferences about Past Events: An Overview of Six Case Studies’, in W. Twining and I. Hampsher-Monk (eds), *Evidence and Inference in History and Law* (Northwestern University Press, 2003), 9, at 12. [↑](#footnote-ref-34)
35. Anderson and Twining, *supra* note 30, at 6. [↑](#footnote-ref-35)
36. Anderson and Twining, *ibid*. [↑](#footnote-ref-36)
37. Decision on the Submission of an Updated, Consolidated Version of the In-depth Analysis Chart of Incriminatory Evidence, *Bemba* (ICC-01/05-01/08-232), Pre-Trial Chamber III, 10 November 2008, § 6. [↑](#footnote-ref-37)
38. T. Anderson, W. Twining and D. Schum, *Analysis of Evidence* (Cambridge University Press, 2005) at 151–153. [↑](#footnote-ref-38)
39. This should not be seen as an endorsement of the particular software — other programmes are available for case organization. [↑](#footnote-ref-39)
40. Ieng Sary’s Motion to Add the OCIJ’s Casemap to the Case File, *IENG Sary* (002/19-09-2007-ECCC/TC), 3 June 2011, §§ 1–2. [↑](#footnote-ref-40)
41. G. Nice and P. Vallières-Roland, ‘Procedural Innovations in War Crimes Trials’, in H. Abtahi and G. Boas (eds), *The Dynamics of International Criminal Justice: Essays in Honour of Sir Richard May* (Nijhoff, 2006) 141,at 161–165. [↑](#footnote-ref-41)
42. Decision on Ieng Sary Motion to add the Office of the Co-Investigator’s CaseMap to the Case File, *IENG Sary* (002/19-09-2007-ECCC/TC), Trial Chamber, 28 July 2011, 1. [↑](#footnote-ref-42)
43. *Ibid.* [↑](#footnote-ref-43)
44. Anderson and Twining, *supra* note 30, at 5. [↑](#footnote-ref-44)
45. Amended Indictment, *Gatete* (ICTR-2000-61-I), 10 May 2005. [↑](#footnote-ref-45)
46. Judgment and Sentence, *Gatete* (ICTR-2000-61-T), Trial Chamber III, 31 March 2011, §§ 585–608 (‘*Gatete* Trial Judgment’). [↑](#footnote-ref-46)
47. P. Tillers and D. Schum, ‘Charting New Territory in Juridical Proof: Beyond Wigmore’, 9 *Cardozo Law Review* (1988) 907, 911. [↑](#footnote-ref-47)
48. Anderson, Twining and Schum, *supra* note 37, at 124. [↑](#footnote-ref-48)
49. Some prosecution and defence teams may have a CaseMap manager, whose primary role is to manage the CaseMap file (see e.g. Transcript, *Orić* (IT-03-68-T), Trial Chamber II, 22 August 2005, where the defence team included a CaseMap Manager), which may alleviate any issues of incorrectly classified information, but this is relatively rare. [↑](#footnote-ref-49)
50. Anderson and Twining, *supra* note 31, 7. [↑](#footnote-ref-50)
51. *Gatete* Trial Judgment, *supra* note 45, § 126. [↑](#footnote-ref-51)
52. See the references at *supra* note 6. [↑](#footnote-ref-52)
53. Judgment on the Prosecutor’s Appeal against the Decision of Trial Chamber II entitled ‘Judgment Pursuant to Article 74 of the Statute’, *Chui* (ICC-01/04-02/12-271), Appeals Chamber, 7 April 2015, §§ 42–63. [↑](#footnote-ref-53)
54. S. de Smet, ‘Are International Crimes Justiciable? Some Thoughts on the Volume of Evidence and the Criminal Standard of Proof’, paper delivered at Bangor University, *Proof in International Criminal Trials*,28 June 2014. [↑](#footnote-ref-54)
55. Separate Opinion of Judge Shahabuddeen, Judgment, *Tadić* (IT-94-1-A), Appeals Chamber, 15 July 1999, § 30, citing H. Lauterpacht and C.H.M. Waldock (eds), *The Basis of Obligation in International Law and Other Papers by the Late James Leslie Brierly* (Clarendon Press, 1958), at 98. [↑](#footnote-ref-55)
56. Art. 25(1) ICTYSt; Art. 24 ICTRSt.; Art. 20 SCSLSt.; Art. 81 ICCSt.; *Lubanga* AppealsJudgment, *supra* note 2, § 21. [↑](#footnote-ref-56)
57. Judgment, *Krnojelac* (IT-97-25-A), Appeals Chamber, 17 September 2003 (‘*Krnojelac* Appeal Judgment’). [↑](#footnote-ref-57)
58. Judgment, *Krnojelac* (IT-97-25-T), Trial Chamber, 15 March 2002 (hereinafter, ‘*Krnojelac* Trial Judgment’). [↑](#footnote-ref-58)
59. *Krnojelac* Appeal Judgment, § 2. [↑](#footnote-ref-59)
60. *Ibid.*, § 3. [↑](#footnote-ref-60)
61. *Ibid.*, § 20. [↑](#footnote-ref-61)
62. *Ibid.*, § 173. [↑](#footnote-ref-62)
63. *Krnojelac* Trial Judgment, § 348. [↑](#footnote-ref-63)
64. *Krnojelac* Appeal Judgment, § 178. [↑](#footnote-ref-64)
65. See point 16 on the chart above. [↑](#footnote-ref-65)
66. *Krnojelac* Trial Judgment, § 348 (‘The Trial Chamber accepts that the Accused had knowledge of two deaths, the suicide of Juso Džamalija, and the suspicious death of Halim Konjo. The Trial Chamber is also satisfied that the Accused had been told by RJ about beatings and disappearances which were occurring in the month of June 1992. However the Trial Chamber is not satisfied that this was sufficient information in the possession of the Accused to put him on notice that his subordinates were involved in the murder of detainees.’) [↑](#footnote-ref-66)
67. *Krnojelac* Trial Judgment, §§ 97–107. [↑](#footnote-ref-67)
68. *Ibid.*, § 339. [↑](#footnote-ref-68)
69. These are included in points 21, 23, 25, 27, 29 and 50 of the chart. [↑](#footnote-ref-69)
70. *Krnojelac* Trial Judgment, §§ 45; 335–338. The Trial Chamber was not convinced of the evidence on point 29 in the chart — that a van belonging to the KP Dom facility was used to transport bodies from the camp (§ 334). [↑](#footnote-ref-70)
71. The literature on Wigmorean analysis discusses a number of *causes célèbres* where individuals were convicted following a particularly strong narrative or theory of the case that ultimately do not stand up to rigorous scrutiny — e.g. Twining, *Theories of Evidence*, *supra* note 11, at 143–152 (discussing the case of *Bywaters and Thompson*) and J.B. Kadane and D. Schum, *A Probabilistic Analysis of the Sacco and Vanzetti Evidence* (Wiley, 1996) (analysing the *Sacco and Vanzetti* case). Psychology literature reveals that human reasoning is heavily influenced by stories or narratives: N. Penningtom and R. Hastie, ‘The Story Model for Juror Decision Making’, in R. Hastie (ed.), *Inside the Juror: The Psychology of Juror Decision Making* (Cambridge: University Press, 1993). [↑](#footnote-ref-71)
72. Bayesian networks take their name from Bayes’ theorem, which tells us that the posterior probability of the hypothesis of guilt or innocence is calculated by multiplying the prior probability of that hypothesis by the likelihood ratio of the evidence given the hypothesis. In Bayesian networks, each evidential or hypothesis variable is represented by a node, and a probability value for each node is calculated; by today, a number of software programmes are available to assist the decision maker in constructing Bayesian networks. See further, S. De Smet, ‘Justified Belief in the Unbelievable’ in M. Bergsmo (ed.), *Quality Control in Fact-Finding* (Torkel Opsahl Academic EPublisher), 73, at 87; Roberts and Aitken, *supra* note 9, at 103–143, and F. Taroni et al*.*, *Bayesian Networks for Probabilistic Inference and Decision Analysis in Forensic Science* (2nd edn., Wiley, 2014) for an analysis of Bayesian networks. For a very clear exposition of Bayes’ Theorem, see G. Williams, ‘The Mathematics of Proof – II’, *Criminal Law Review* (1979) 340, at 347 *et seq.* [↑](#footnote-ref-72)
73. Concurring opinion of Judges Fatoumata Diarra and Bruno Cotte, Jugement rendu en application de l’article 74 du Statut, *Katanga* (ICC-01/04-01/07-3436-AnxII-tENG), Trial Chamber II, 7 March 2014, § 4. [↑](#footnote-ref-73)
74. Minority Opinion of Judge Christine Van Den Wyngaert, Jugement rendu en application de l’article 74 du Statut, *Katanga* (ICC-01/04-01/07-3436-AnxI), Trial Chamber II, 7 March 2014, § 206. [↑](#footnote-ref-74)
75. Jugement rendu en application de l’article 74 du Statut, *Katanga* (ICC-01/04-01/07-3436), Trial Chamber II, 7 March 2014, § 1127. [↑](#footnote-ref-75)
76. Joint Dissenting Opinion of Judge Ekaterina Trendafilova and Judge Cuno Tarfusser, Judgment on the Prosecutor’s Appeal against the Decision of Trial Chamber II entitled ‘Judgment Pursuant to Article 74 of the Statute’, *Chui* (ICC-01/04-02/12-271-AnxA), Appeals Chamber, 7 April 2015. [↑](#footnote-ref-76)
77. Judgment and Sentence, *Musema* (ICTR-96-13-A), Trial Chamber I, 27 January 2000, § 41; Judgment, *Limaj et al.* (IT-03-66-T), Trial Chamber, 30 November 2005, § 20; *Lubanga* Appeals Judgment, *supra* note 2, § 22. [↑](#footnote-ref-77)
78. Joint Dissenting Opinion of Judges Trendafilova and Tarfusser, *supra* note 75, § 44. [↑](#footnote-ref-78)
79. Judgment Pursuant to Article 74 of the Statute, *Chui* (ICC-01/04-02/12-3), Trial Chamber II, 12 April 2013 ('*Chui* judgment'), § 434. [↑](#footnote-ref-79)
80. Joint Dissenting Opinion of Judges Trendafilova and Tarfusser, *supra* note 75, § 44. [↑](#footnote-ref-80)
81. Joint Dissenting Opinion of Judges Trendafilova and Tarfusser, *supra* note 75, § 46. [↑](#footnote-ref-81)
82. *Ibid*., §§ 47–51. [↑](#footnote-ref-82)
83. See, for example, *Lubanga* judgment, *supra* note 2, §§ 206–502; 632–731. [↑](#footnote-ref-83)
84. *Lubanga* Appeals Judgment, *supra* note 2, § 21. [↑](#footnote-ref-84)
85. Judgment on the appeal of the Republic of Kenya against the decision of Pre-Trial Chamber II of 30 May 2011 entitled "Decision on the Application by the Government of Kenya Challenging the Admissibility of the Case Pursuant to Article 19(2)(b) of the Statute, *Ruto et al.* (ICC-01/09-01/11-307), Appeals Chamber, 30 August 2011, § 56. [↑](#footnote-ref-85)
86. Joint Dissenting Opinion of Judges Trendafilova and Tarfusser, *supra* note 75, § 46. [↑](#footnote-ref-86)
87. Judgment, *Tadić* (IT-94-1-A), Appeals Chamber, 15 July 1999, § 64; Judgment, *Blaškić* (IT-95-14-A), Appeals Chamber, 29 July 2004, §§ 17–19; Judgment, *Kupreškić* (IT-95-16-A), Appeals Chamber, 23 October 2001, §§ 28–41. [↑](#footnote-ref-87)
88. Joint Dissenting Opinion of Judges Trendafilova and Tarfusser, *supra* note 75, § 46. [↑](#footnote-ref-88)
89. *Chui* judgment, *supra* note 78, § 456. [↑](#footnote-ref-89)
90. A. Tversky and D. Kahneman, ‘Extensional Versus Intuitive Reasoning: The Conjunction Fallacy in Probability Judgment’, 90 *Psychological Review* (1983) 293. [↑](#footnote-ref-90)
91. This is not to suggest that this is the proper probability to assign to the hypothesis given the evidence at hand; the probability of a hypothesis given the particular evidence is an assessment for the decision-maker alone to decide upon. Bayes’ Theorem, discussed *supra* note 71, encourage the decision maker to reflect on the strength of their confidence in the probability of a given inference. [↑](#footnote-ref-91)
92. The criminal standard for proof beyond reasonable doubt is normally placed at between 0.9 and 0.99 (i.e. the fact-finder is 90-99% satisfied of the guilt of the accused): see P. Roberts and A. Zuckerman, *Criminal Evidence* (2nd edn, Oxford University Press, 2010), at 157. [↑](#footnote-ref-92)
93. *R v. Van Beelen* (1973) 4 S.A.S.R. 353, at 379. [↑](#footnote-ref-93)
94. De Smet, *supra* note 71, at 81. [↑](#footnote-ref-94)
95. Separate Opinion of Judge Alphons Orie, *Stanišić and Simatović* Judgment, *supra* note 8, § 2418. [↑](#footnote-ref-95)