John Henry Wigmore and Arthur Allan Thomas: An example of Wigmorian analysis

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This article examines a system devised by Dean Wigmore for analysing a complex case involving mixed masses of evidence. The advantages and limitations of the system for case analysis and the light cast on theoretical evidential issues are considered and its use as a teaching aid is demonstrated. Finally the author considers current academic work aimed at improving the system as an aid both to fact analysis and to the consideration of theoretical issues.

I WIGMORE'S SCIENCE OF PROOF

A Evidence and Proof

John Henry Wigmore is chiefly remembered among evidence scholars as the author of the monumental *Treatise on the Anglo-American System of Evidence in Trials at Common Law*, commonly known as *Wigmore on Evidence*. This work now consists of 13 volumes revised by a variety of successors and cites some 40,000 cases from every jurisdiction in the USA and Canada and several Commonwealth countries.

Wigmore himself produced two further editions of this work incorporating criticisms made of the earlier editions and his responses to them. The work is notable not just for its meticulous and arguably over-inclusive detailed examination of the Rules of Evidence but also for its attention to theory and rationale. For the next generation, evidence scholarship consisted largely of nit-picking over Wigmore, explaining, challenging and out-Wigmoring Wigmore. Wigmore had set the agenda.

Wigmore's incredible publication record included not only the three editions of this work, which alone would have been enough for many, but also *The Principles* (later *The Science*) *of Judicial Proof*.[1] In this work he announced his theory of

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1 *The Science of Judicial Proof as Given by Logic, Psychology, and General Experience and Illustrated in Judicial Trials* (3rd ed 1937) previously published as *The Principles of Judicial Proof as Given by Logic, Psychology, and General Experience and Illustrated in*

proof and predicted that the study of proof would one day dominate the field of evidence. He introduces his ideas in paragraph one:

> The study of the principles of Evidence, for a lawyer, falls into two distinct parts. One is Proof in the general sense, - the part concerned with the ratiocinative process of contentious persuasion, - mind to mind, counsel to juror, each partisan seeking to move the mind of the tribunal. The other part is Admissibility, - the procedural rules devised by law, and based on litigious experience and tradition, to guard the tribunal (particularly the jury) against erroneous persuasion. Hitherto, the latter has loomed largest in our formal studies, - has, in fact, monopolised them; while the former, virtually ignored, has been left to the chances of later acquisition, casual and emphatic, in the course of practice. Here we have been wrong; and in two ways:
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> 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 and should be studied. This science, to be sure, may as yet be imperfectly formulated or even incapable of formulation. But all the more need is there to begin in earnest to investigate and develop it. Furthermore, this process of Proof is the more important of the two, - indeed, is the ultimate purpose in every judicial investigation. The procedural rules for Admissibility are merely a preliminary aid to the main activity, viz the persuasion of the jury's mind to a correct conclusion by safe materials. This main process is that for which the jury are there, and on which the counsel's duty is focused. Vital as it is, its principles surely demand study.
>
> And, for another thing, the judicial rules of Admissibility are destined to lessen in relative importance during the next generation or later. Proof will assume the important place: and we must therefore prepare ourselves for this shifting of emphasis.

Wigmore went on to acknowledge the debt owed to Bentham but it will be noticed that there is some ambivalence in his attitude to the rules of admissibility. Belief that they will lessen in importance presumably indicates belief that the steady movement in a Benthamite direction away from a "technical" and towards a "natural" system of proof would and should continue. Nonetheless Wigmore was willing to accept the rules as the product of "litigious experience" devised "to guard the tribunal...against erroneous persuasion." The existence of the rules was not attributed to the sinister interests of "Judge and Co" in complicating and mystifying litigation. Unlike Bentham, Wigmore was essentially a defender of the legal system and was concerned to show that the system itself was developing in the desired direction. It has been argued that this concern was to distort his whole approach. For example, in order to defend the right of the judge to exclude irrelevant material Wigmore had to postulate a distinction between relevance and weight. This distinction, which he never abandoned, affected his theories both of evidence and proof.[2] This will be discussed below.

Judicial Trials (1st ed 1913, 2nd ed 1931, Little, Brown & Co, Boston). The argument is also contained in John H Wigmore "The Problem of Proof" (1913) 8 Ill LR 77.

2 P Tillers and D Schum "Charting New Territory in Judicial Proof: Beyond Wigmore" (1988) 9 Cardozo L Rev 907, 916 ff.

The *Principles of Judicial Proof* introduced to the world Wigmore's "chart system" of analysing evidence. This involved representing the structure of argument in a case diagrammatically and writing a key-list of propositions represented by the symbols on the chart. A complex vocabulary of symbols was drawn up and detailed instructions given even as to the colour of pencils to be used. Two charts were published, based upon *Umilian*[3] and *Hatchett*.[4] Throughout the three editions both the vocabulary and the published charts remained unchanged.

The object "of course, is to determine rationally the net persuasive effect of a mixed mass of evidence." The mind, said Wigmore, can only assimilate a limited amount of material at one time. It is necessary therefore to reduce an argument to its constituent parts in order that the parts may be juxtaposed appropriately and the mind enabled to assimilate them step by step "until the mind can consciously juxtapose them with due attention to each, so as to produce its single final idea."

The chart was designed to show the relation of ideas one to another and to show the drawer's state of belief. The formation of this belief would be assisted by the careful analysis of facts and inferences but the chart would not tell the drawer what his belief ought to be. This was because '[t]here are no known rules available to test the correctness of the infinite variety of inferences presentable in judicial trials." So those who are reading this article in the hope of discovering an objectively correct answer to the conundra in the Arthur Allan Thomas case will, it is regretted, be disappointed. The Wigmore Chart "is more like a map of the mind than a map of the world ."[5]

This is the way Wigmore intended it. Nonetheless it is not clear whether the chart system is really only descriptive of the processes of the mind as Wigmore believed, or whether it has at least some normative element. Most students of Wigmorian method report changes in their patterns of thought and this will be discussed in the conclusions. Of course if a scheme is normative it implies that what went before was in some way defective. At a personal level the identification of what was previously defective is a matter of self-analysis but at an institutional level it may be that Wigmorian method will reveal defects in the courts' decision making structure that must be examined.

In particular it is frequently claimed that a particular rule of evidence either hinders or helps the process of proof. Indeed Wigmore made a general claim of this nature in the passage quoted above. In order to test this sort of claim one has to set up the decision making process absent the rule and see whether one is more or less likely to reach a satisfactory conclusion. (Unfortunately one cannot say a "correct result" as it is axiomatic that there is no objective method of determining what happened on a past occasion or, therefore, of objectively determining the accuracy of a court decision.) In order to do this one must be familiar with a rigorous method

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3 *Commonwealth* v *Umilian* (1901) 177 Mass 582 (Supreme Court of Massachusetts).
4 *Hatchett* v *Commonwealth* (1882) 76 Va 1026 (Court of Appeals of Virginia).
5 P Tillers and D Schum above n 2, 911.

of thinking through an evidential problem. The chart system is not therefore simply a technique for analysing a particular case but also potentially a vehicle for reflection upon the judicial process.

B The Lead Balloon

Unlike the *Treatise* the *Science of Judicial Proof* disappeared into obscurity. It went down, in the words of William Twining, "like a lead balloon."[6] Lawyers were put off by the complex vocabulary of symbols and perhaps by the appearance the chart gives of trying too hard to objectivise a process which is far more complex than a mere objective search for the truth.

This makes it all the more unfortunate that Wigmore did not develop his system over his lifetime. Further work might both have simplified the symbology and made clear Wigmore's own realisation of the limited objectives of the system. Wigmore's original vocabulary resembles the 'primitive' vocabulary of computer symbols. As experience was gained with computers it was realised that this vocabulary was too complex and a much smaller number of symbols are now used. If Wigmore had done further work there is every possibility that he would have simplified his vocabulary.

Wigmore himself said that the purpose of the symbols was to aid the drawer of the chart in his mental processes. Choice of symbols and the allocation of meaning to them is therefore entirely a matter for the individual, though if the chart is to be seen by others some conformity as to the basic symbols is desirable. Comparison of the vocabulary used in analysing the Thomas case below with Wigmore's own will reveal that this author has substantially simplified the symbols.

The chart system also involved teachers and students in what has not traditionally been seen as the domain of the law school, namely the examination of facts. There has been sporadic protest at this tradition. Frank went so far as to argue that all cases hinged upon the facts not law.[7] The Realists argued that what mattered was not what the appellate courts said but what the lower courts did. In both cases a valid point was undermined by the extreme nature of its presentation. The rulings of appeal courts continue to be the bread and butter of the law student despite the fact that at District Court level many of these rulings count for little - and in no field is this more the case than in evidence itself.

Some attempt was also made to make students realise the fallibility of the trial process and in particular of witness evidence. As Twining records however there was no organised progress in this area and much of what was done was trite.[8] The teaching of evidence reached a stage where the fact that the purpose of the enterprise was to set up a system reliably to establish what happened in the past was lost sight

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6 W Twining "Taking Facts Seriously " (1984) 34 J Leg Ed 22.

7 See J Frank *Courts on Trial* (1 ed, 1949, 2 ed, 1970, ed Kahn).

8 Above n 6.

of. The rules of evidence have become formalised and rigid and are seen as ends in themselves rather than as means to an end - as the uproar caused by any attempt to reform the rule against hearsay shows. The inferential process, examination of which casts much light on the rules of admissibility, was not seen as an appropriate area for study by lawyers.

Thus Wigmore's system disappeared from view in the legal world. The flame was however tended in other intellectual communities, including the intelligence community, until the time was ripe for it once more to lighten the legal world.

C The Revival

The revival of interest in Wigmore's charts is owed to the congruence of a number of factors. One is the dedication of a few teachers who have rediscovered the *Science of Judicial Proof* and realised its worth.[9] Another is the creation of new technologies and fields of study, such as computer language and decision analysis. Yet another is the fact that gradually Wigmore's own prediction is coming true. The rules of admissibility are being simplified and are lessening in importance. Furthermore from an academic point of view most of principle that there is to say about them has been said. The scope and focus of the study of evidence is poised to change in just the way Wigmore predicted 77 years ago. Wigmore was cursed with foresight.

Fact analysis in one systemised form or another is now taught at many institutions at undergraduate, postgraduate and professional levels. Even evidence courses retaining a traditional structure are becoming infected with the realisation of the importance of study of the inferential process. Law journals publish articles with diagrams and even equations in them. It is remarkable that it has taken the legal professions in England and New Zealand so long to include fact analysis in their formal training but as argued above it is not simply a valuable professional skill, it is also an avenue for giving new insight into the law and the practice of the courts. Fact analysis is a device well deserving inclusion in the academic lawyer's intellectual tool-kit.

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9 See especially T Anderson and W Twining *Analysis of Evidence,* (forthcoming, Little, Brown and Co, Boston, 1990); W Twining, above n 6; W Twining *Theories of Evidence: Bentham and Wigmore* (Weidenfeld and Nicholson, London, 1985); P Tillers and D Schum, above n 2.

II ANALYSING A CASE - ARTHUR ALLAN THOMAS

A The Story

On Monday 22 June 1970 Constable Wyllie of the New Zealand Police walked into one of the greatest mysteries of the country's recent history. Alerted by a telephone call from a farmer named Owen Priest he went to a farm near Pukekawa, which belonged to a wealthy farming couple, Jeannette and Harvey Crewe. What he found, when he had cleared away the local people who were already trampling over the scene, was a bloodstained house and 18 month old baby Rochelle, who was alive and fairly well. Of her parents there was no sign.

It was quickly established from blood and brain tissue left on a chair that Harvey Crewe had met a violent death. Detective Inspector Hutton was put in charge of the investigation and the largest search in New Zealand's modern history got under way with the help of the Army, RNZN and civilian volunteers. It was established that no one had seen or heard of the Crewes since the evening of Wednesday 17 June, but as they were not a very sociable couple this had not caused any remark over the week-end.

The time scale raised a question that captured the public imagination. If the Crewes had been murdered on the Wednesday, how had little Rochelle survived the intervening five days? Who if anyone had looked after her? The newspapers ran reports of sightings with another woman, claims by mediums to know where the bodies were and stories that Rochelle was being taught to speak so that she could tell what had occurred.

Initially the police concentrated their enquiry on Lenard Demler. He was Jeannette's father and lived on the neighbouring farm. By August the enquiry was coming to a standstill and outside officers were brought in to review the procedures. They advised that too much effort was being expended in the one direction. At the same time Jeannette's body was at last found in the Waikato River. She had been killed by a single .22 bullet wound to the head. The Crewe farm was searched again and 64 .22 rifles were taken up from the surrounding area and from people who knew the Crewes.

One such person was Arthur Allan Thomas. He was a somewhat poorer farmer with a small farm at the other end of Pukekawa. Thomas's rifle was one of only two that could not be excluded from having fired the fatal bullets and the police were already aware that he had courted Jeannette Demler in his youth.

Several attempts were made to obtain direct evidence from Thomas. He cooperated throughout and even declined to follow advice from friends that he get a lawyer as the police were, he told them, merely trying to eliminate him from the enquiry.

During September Harvey's body was found, also in the Waikato. The bullet in his head was even less helpful to the investigators than Jeannette's but his body was apparently weighted with an axle. It was established that an axle of similar type had been used to make a trailer which had eventually been purchased by Allan Thomas senior who had used it on the farm now leased from him by his son Arthur.

Thomas now became the centre of the enquiry and his farm was searched and his rifle again removed for examination. In October the Crewe farm was again searched and on this occasion a .22 cartridge case was found in a flower bed. This case had undoubtedly been fired from Thomas's rifle. Thomas was arrested and charged with the two murders.

It will be noticed that the above is the story of the investigation and not of the events leading up to the deaths. Thomas denied any involvement in the killings and consistently maintained that stance. He denied having anything to do with the Crewes once they were married. They were of different social class, lived in a different area and their lives had no point of conflict. Unlike other *causes célèbres* therefore there is no story of passion, conflict or politics in this case. In fact there is no defence story at all, simply the question of the coherence of the prosecution case.

Thomas was convicted by a jury and the conviction affirmed by the Court of Appeal. One Graham Hewson, a friend of the Crewes who had managed their farm after their deaths, then read a press review of the case. This indicated that a key exhibit, exhibit 350, the cartridge case found in the Crewes' garden in October, had been found in a flower bed he had helped to search in June. He came forward and as a result of further investigations a referral was made to the Court of Appeal. A new trial was ordered.

The second trial differed markedly from the first. The defence obtained the services of a scientist, Dr Sprott, who right up until the last minute was constructing a theory which divided the cartridge cases produced by ICI Melbourne into categories. A case of the type of exhibit 350 could not, he maintained, have contained either of the fatal bullets. The prosecution case was also subtly different. At the first trial it had been the prosecution case that Rochelle had been looked after for the five lost days with a hint that Thomas's wife, Vivien, was involved. In the intervening two years Vivien had not been charged with any offence in relation to the murders and it now became the prosecution case that Rochelle might not have been looked after.

Thomas was again convicted and the conviction affirmed by the Court of Appeal. The campaign on behalf of Thomas continued. Dr Sprott became so involved that he advertised for .22 rifle bullets to be sent to him and he took apart some 26,000. The Minister of Justice asked to see the two vital exhibits and became "deeply troubled" when told that they had been destroyed. He instituted a new referral to the Court of Appeal asking "Has the petitioner established that neither of the bullets...could have been assembled with...exhibit 350?" The Court of Appeal answered the question by saying that the petitioner (ie the defendant) had failed to

exclude a reasonable doubt that the prosecution might be right. Thomas remained in jail.

This did not bring the campaign to an end however, and in 1979 after a change of government the new Minister of Justice commissioned an enquiry by Mr Adams-Smith QC. His report was private but following it Thomas was pardoned and released. A Royal Commission was set up to investigate the police investigation. As a result of its recommendation Thomas was paid over $1,000,000 compensation. No one else has been charged with the murders.

B First Steps

1 Standpoint

It is vital in conducting an analysis of this sort to determine precisely one's standpoint and the question one is asking. Wigmore designed his system for the advocate preparing for trial. The historical investigator looking back at a decided case is in a very different position. An advocate must be in a position to prove by testimonial evidence every single proposition on which he will rely. The historian can take much as not requiring proof.[10] Likewise whether a piece of evidence is produced by the prosecution or the defence is of little consequence to the historian.

The precise form of the ultimate *factum probandum* will also affect the whole enquiry. It is quite easy to slide from one question to another if care is not exercised. For example, in the November 1979 New Zealand edition of *Reader's Digest* Maurice Shadbolt published a feature length article entitled "Who Killed the Crewes?". On the label highlighting the article appears the question: "Did Arthur Allan Thomas really kill the Crewes?" These are, of course, different questions which might take the Wigmorian investigator in different directions.

Defining the ultimate *factum probandum* is probably easier in this case than in a case where the mental element of an offence is in dispute. In cases such as Bodkin Adams, the Scarsdale Diet murder or the Bywaters and Thompson case there might be greater difficulty. In this study the proposition "It was Arthur Allan Thomas who murdered the Crewes" is taken as the ultimate *probandum.* Attention was paid to other theories only to the extent necessary to raise a doubt as to the identity of the killer.

2 Sources

A factor which will naturally shape the investigation is the source of information. Any secondary source will have a standpoint of its own and there is no substitute for a transcript of the court hearings. A transcript on the other hand may

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10 Incidentally Wigmore seems to have erred here. He had a symbol for real evidence - or 'autoptic proferrance' which includes real evidence, and allowed that to appear at the bottom of a chain of inference. The trial lawyer must not forget that every piece of real evidence must be produced by a witness.

be enormously lengthy and the weeding process may become an overwhelming task in itself. If secondary sources are to be found they should be taken advantage of and their disadvantages compensated for by using more than one. To an extent the accuracy or otherwise of the secondary sources is irrelevant if what one is interested in is testing Wigmore's system rather than examining a particular case. The information to hand can be charted for the purpose of testing the system as adequately as the whole case and the process will throw light on the standard of reasoning of the authors of the secondary sources - which in many cases is revealed to be seriously defective.

The sources from which the study here has been made are:

Report of the Royal Commission to Inquire into the Circumstances of the Convictions of Arthur Allan Thomas for the Murders of David Harvey Crewe and Jeannette Lenore Crewe (Government Printer, Wellington, 1980);

David A Yallop *Beyond Reasonable Doubt?* (Hodder and Stoughton, Auckland 1978);

Maurice Shadbolt "Who Killed the Crewes?" November 1979 *Reader's Digest (NZ).*

This paper should strictly be regarded as an analysis of those sources rather than of the case itself.

3 Vocabulary

As noted above the difference in standpoint from that envisaged by Wigmore necessitates variation in the symbology. Further simplification was achieved by eliminating the distinction between positive and negative assertions. Every assertion assumes the negative of its converse and propositions frequently have to be framed arbitrarily simply to suit the structure of the argument.

Wigmore used a sign for matters of which judicial notice would be taken. This was a marker next to the appropriate symbol. These matters are subsumed in the present enquiry in the category of uncontroversial matter. Wigmore did not have a symbol for the generalisations and assumptions used in the reasoning process. This is a curious omission since, as argued below, one of the principal values of the system lies in the way it forces such generalisations to the surface. Some of these generalisations might themselves have to be proved by evidence. Others might be within judicial notice or the everyday experience of the juror. These distinctions will be of significance to the trial lawyer but not to the historian. For present purposes it is the role these generalisations play in the reasoning process that is of importance and not the way in which they are proved.

The vocabulary eventually adopted was as below:


An inference

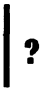

Testimonial evidence


A proposition which in this case is uncontroversial

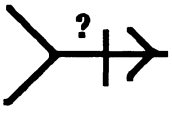

A generalisation or assumption


The item below tends to prove the item above


The item below tends to disprove the item above



The probative value or relevance of the item below to the item above is doubtful



The item to the left (in this instance) strengthens, weakens or is of uncertain effect upon the item to the right


An inference believed


disbelieved

doubted

4 Selectivity

Wigmore instructed that *all* the evidence in a case must be charted. Of course if one is a trial lawyer preparing for a case this is good advice. In other circumstances it may be a counsel of perfection. Both the system and the case concerned can usually adequately be examined by preparing a macroanalysis and some microanalysis.

In a macroanalysis the structure of the whole case is explained and charted. It may be objected of course that one cannot come to a state of belief about any one major part of the case unless one has charted all the evidence. Nonetheless the structure of argument relied upon to reach the ultimate *probandum* can be charted. Into this structure will fit certain microanalyses of particular parts of the case. One can then legitimately express a view as to the truth or otherwise of the parts of the macroanalysis which have been comprehensively examined in this way. As to the other parts one can either express a more or less intuitive opinion or express no opinion.

Naturally both in determining what are the major factors worthy of inclusion in the macroanalysis and what facts are significant enough to justify intensive microanalysis reasonable people may differ. This is just one of several ways in which a chart drawn up of the same case by different people will differ. Wigmorian analysis is at root judgmental and not technical.

C The Macroanalysis

This can be approached in a number of ways. The structure will often depend upon the selected ultimate *probandum*. It may be necessary to frame an ultimate *probandum* which expresses all the legal ingredients of the offence. In that case the penultimate *probanda* will be the individual ingredients expressed as simple propositions. It will then be seen that it may not be necessary to chart the entire case in detail for if one is not convinced of any one ingredient then the verdict is 'not guilty'.

In the Thomas case however the whole debate has been conducted on the basis that the question is as to the identity of the killer, there being no real doubt that Jeannette at least was murdered. It would be possible to examine whether in other circumstances all the ingredients had been proved. If it were the case for example that Harvey Crewe first killed his wife and then himself the question of his mens rea would have to be examined. In this study this alternative theory is proffered simply to see if it raises a reasonable doubt as to whether Thomas carried out the crime. The criminal responsibility or otherwise of Harvey Crewe is therefore irrelevant.

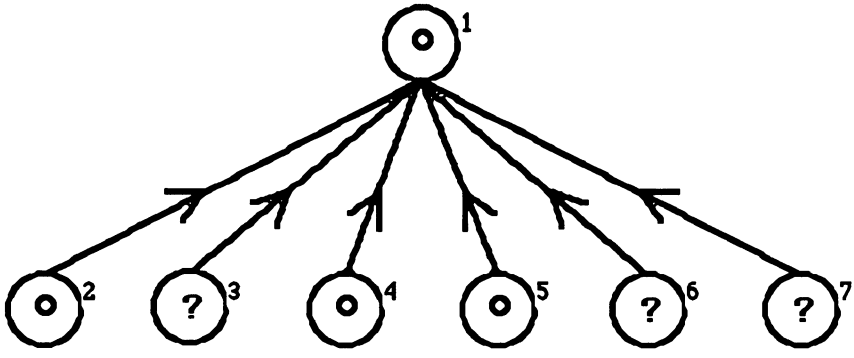
Furthermore division into legal ingredients will often not be helpful in that the facts which prove the actus reus are in the vast majority of cases the same facts which prove the mens rea. Thus penultimate *probanda* proving the existence of actus reus and mens rea will not be helpful until and unless the defence discharge the tactical burden of putting mens rea genuinely in issue. The defence argument can then be charted.

In this study the penultimate *probanda* were taken as the investigator's classic trio of motive, means and opportunity, the proposition that forensic scientific evidence linked Thomas to the crime and the existence of alternative theories.

Thus the first seven propositions were as follows:

1 It was Arthur Allan Thomas who murdered the Crewes.
2 Thomas had the opportunity to murder the Crewes.
3 Thomas had a motive to kill the Crewes.
4 Thomas had the means to murder the Crewes.
5 Scientific evidence linked Thomas to the murders.
6 Demler killed the Crewes.
7 Harvey killed Jeannette and then himself.

Propositions two to seven were regarded as leading directly to the ultimate *probandum* so that the finished chart looked like this:



Each of these penultimate *probanda* is then supported (or undermined) by further propositions. The analyst must turn to the evidence and reduce it to simple propositions of fact and then build chains of inference. An example of a chain of reasoning built up from a fact of which evidence is given is on the next page.

It is immediately apparent that from proposition 58 upwards the propositions charted are not the only relevant propositions. Not merely at the top of the chart but at each level each chain of reasoning represents just one cord of which the rope which supports the burden of proof is composed.[11] Once the other propositions are charted complexity begins to set in. Since it is the binding together of the cords and the relationships between inferences which is interesting most of the examples below will omit the primary facts on which the inferences depend. Naturally they must be identified before the upwards process can begin.[12]

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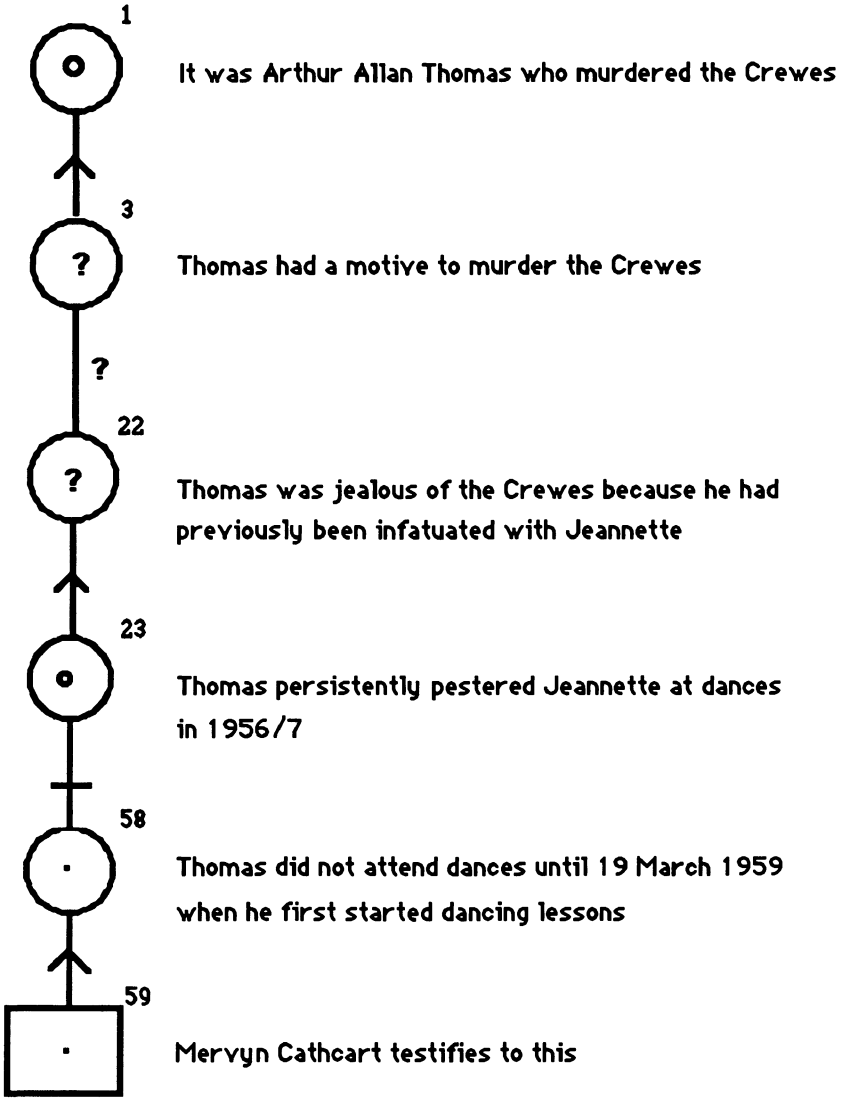
11 *R* v *Thomas* [1972] NZLR 34, 41, per Turner J.

12 And perhaps established to some level of proof. In *R* v *Chamberlain* (1984) 51 ALR 225 the majority held that primary facts must be proved beyond reasonable doubt before the inferences are made. Deane J was content with proof on balance of probabilities. In *Thomas* the Court of Appeal referred to facts "clearly proved": [1972] NZLR 34, 40.

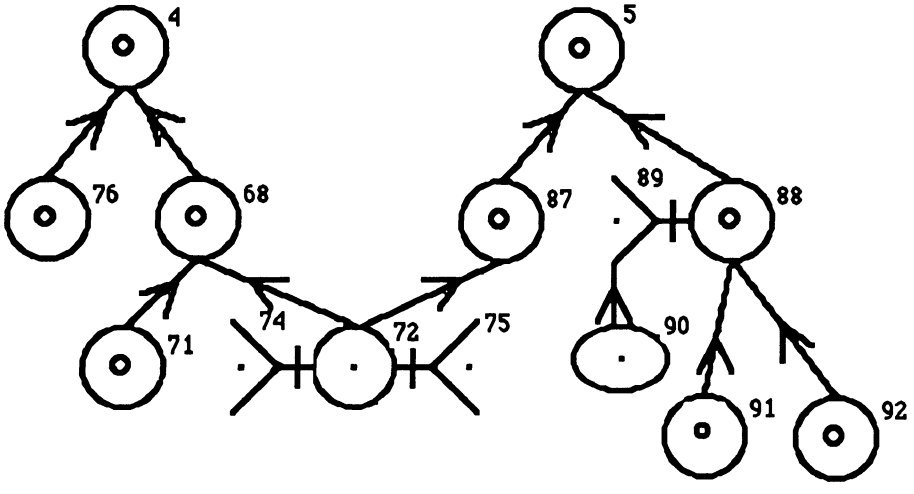


To test the value and limitations of Wigmorian analysis it is useful to examine evidence which lends itself readily to rational analysis and also evidence which does not.

Into the latter category comes motive. Even if the facts on which a supposed motive is based can be proved one is still left with the task of determining whether

it would be sufficient to drive a person, or a particular person, to murder. This is not a matter susceptible to rational analysis. In a case, as here, where it is identity which is in doubt the value of motive lies presumably in a generalisation such as "murders are likely to be carried out by someone with a motive". This tells us that our culprit will likely have a motive, it does not tell us the likelihood that a particular person with a motive is the murderer since there may be other people with motives. If the generalisation is framed as "a person with a motive is more likely to be the murderer than someone without" we still face the problem of assessing the probative value of the evidence of motive which in turn hinges upon accurate assessment of how many people may have had a motive. This all begs the question of what constitutes a motive.

Into the former category comes scientific forensic evidence. In this case such evidence related to the rifle and ammunition, the axle apparently used to weight Harvey Crewe's body and the wire apparently used to attach the two together. The rifle is also central to the issue of means, proposition 4, so that at the next level down, the chart in this area looks like this:



68 Thomas had a .22 rifle which could have been the murder weapon.
71 Both fatal bullets were fired from Thomas's rifle.
72 Exhibit 350, a cartridge case found in the Crewes' garden, had certainly been fired from Thomas's rifle.
74 Exhibit 350 cannot have contained either of the fatal bullets.
75 Exhibit 350 was planted by the police.
76 Thomas owned the same sort of ammunition as the fatal bullets.
87 There is scientific evidence to link Thomas with the scene.
88 There is scientific evidence to link Thomas with the bodies.
89 Others could have taken the materials concerned from Thomas's farm.
90 The wire and tip on Thomas's farm were not secured.

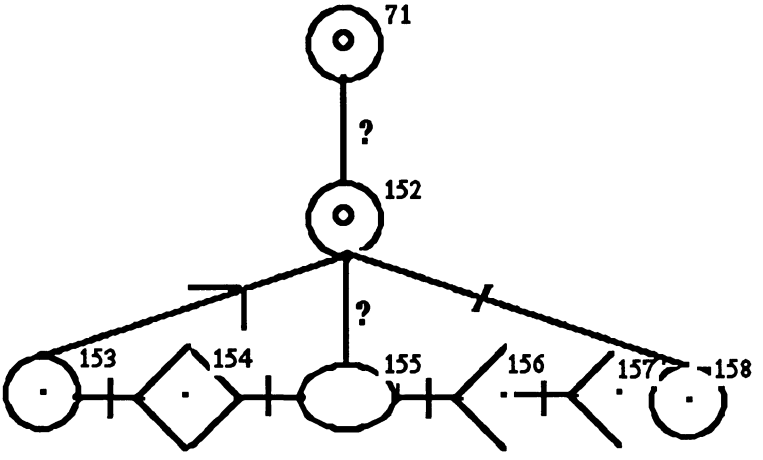
91 The axle used to weight Harvey Crewe's body came from Thomas's farm.
92 The wire used to bind Harvey Crewe's body to the axle came from Thomas's farm.

Under the various propositions in the macroanalysis will be a greater or lesser number of supporting propositions. These may be dealt with in microanalyses in which case the macro-chart merely contains a direction to turn to the appropriate micro-chart. Thus proposition 74 in this study was supported by 75 propositions and proposition 75 was supported by 150. The production of a single chart showing all these would be a practical impossibility.

D The Microanalysis

1 Barrel/Ammunition

One of the key questions in the case is whether or not the fatal bullets passed down the barrel of Thomas's rifle. This is proposition 71 in the macro-chart above and was supported by some 45 further propositions. The top of the micro-chart appears thus:

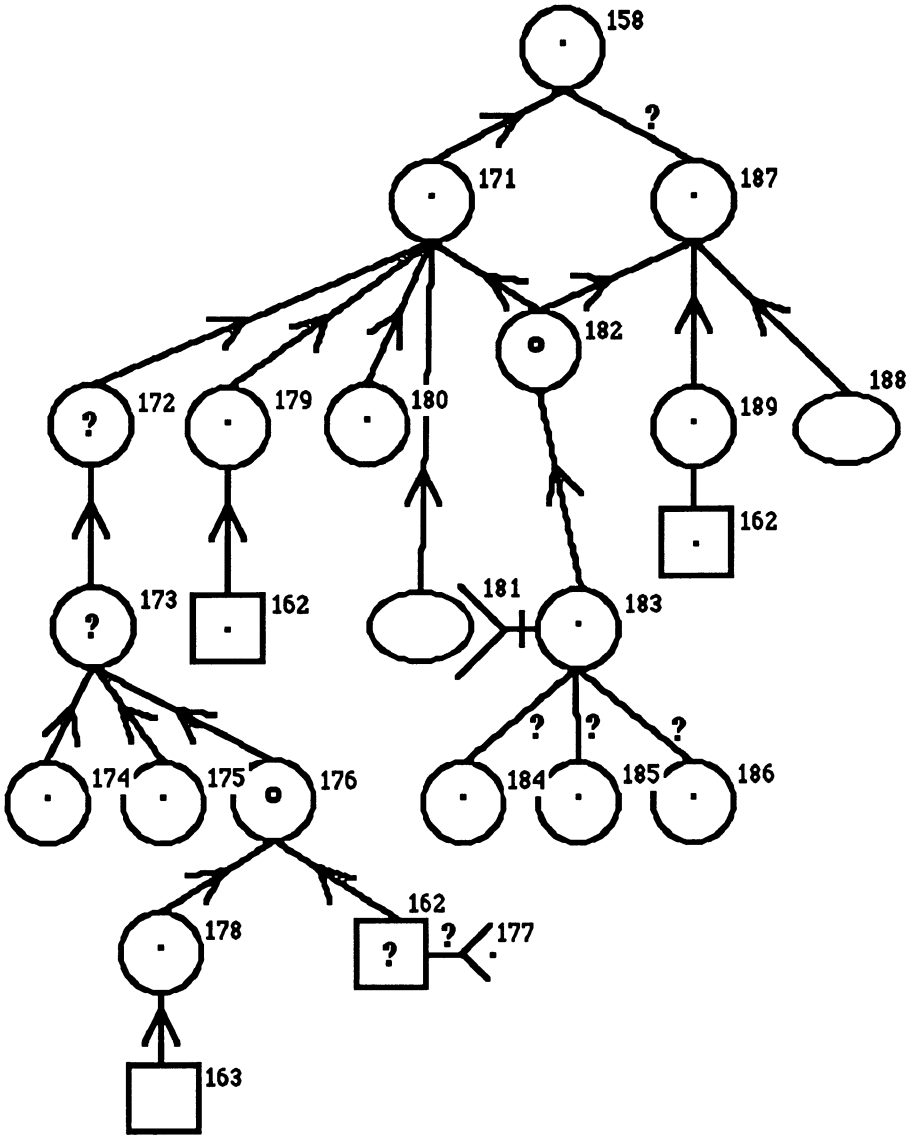


152 Both fatal bullets could have been fired from Thomas's rifle.
153 Each fatal bullet could have been fired from Thomas's rifle.
154 The marks do not *establish* that the fatal bullets came from Thomas's rifle.
155 Thomas's rifle was the only one examined which was not eventually excluded.
156 Had the sample been bigger more rifles may have been found which could not have been excluded.

157 The sample was not taken up at random but from people for whom there was some prior probability of guilt.

158 Neither bullet came from Thomas's rifle.

Proposition 158 in turn rests upon an interesting combination of scientifically verifiable evidence and unverifiable assumption:

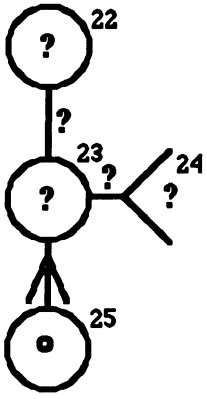


158 Neither bullet came from Thomas's rifle.
162 Dr Nelson testifies to this.
163 The Home Office experts testify to this.
171 Thomas's rifle cannot have fired both fatal bullets.
172 Jeannette's bullet, Harvey's bullet and test bullet F cannot all have come from the same rifle.
173 Test bullet F can only have come from the same rifle as Jeannette's bullet if the land on F with a heavy score mark corresponds to the missing land on Jeannette's bullet.
174 There was a heavy score mark on one land of test bullet F.
175 There was no corresponding heavy score mark on Jeannette's bullet.
176 The score mark on F was a rifling characteristic.
177 Dr Nelson's evidence is equivocal as to whether he observed this mark on other test bullets.
178 This mark was not observed on other bullets test-fired by the Home Office.
179 Test bullet F was fired through Thomas's rifle.
180 The score mark on F does not appear on the fragment of Harvey's bullet.
181 The Home Office did not comment on Harvey's bullet nor on any comparison between it and Jeannette's.
182 The likelihood that both bullets came from the same rifle is low.
183 The two bullets can only have come from the same rifle if the marked land on Harvey's bullet corresponds with the missing land on Jeannette's bullet.
184 Jeannette's bullet is only partly complete, showing only five out of six lands.
185 Harvey's bullet is only fragmentary showing only one complete land and parts of the two adjoining lands.
186 There are two marks on the complete land of Harvey's bullet which do not appear on Jeannette's bullet.
187 Both bullets came from the same rifle.
188 There is no evidence that more than one person was directly involved in the killings.
189 Both bullets exhibited the same rifling characteristics.

2 *Motive*

The motives posited for Thomas were financial and sexual jealousy. These were interlinked. The argument was that Thomas had wanted to go out with Jeannette in his youth, that Jeannette was the wealthy partner in the Crewe marriage and therefore not only was Thomas's love unrequited but also had he married Jeannette he would have become a wealthy man.

Even supposing that the facts on which Thomas's supposed infatuation for Jeannette were proved - and that is far from the case - the argument rests on crucial assumptions. Even the single straight line reasoning process from alleged fact to conclusion is riddled with mystery:



22 Thomas was jealous of Jeannette's marriage

23 Thomas was infatuated with Jeannette as a youth

24 A generalisation

25 Thomas pestered Jeannette at dances as a youth

It is obvious that the strength of the reasoning here depends crucially upon the generalisation at 24. What is it to be? Since a gap of some eight years is involved between the last time Thomas spoke to Jeannette and the murders it must be postulated that at least some infatuations are sufficiently strong to give rise to such long-lasting and overwhelming jealousy. The question then arises whether such an infatuation would be considered normal or abnormal and whether Thomas exhibited the characteristics of a person who might suffer from such an obsession. Again there is no rational way of conclusively determining this question. The defence did however try to introduce psychiatric evidence to show that Thomas was not an obsessive personality. This evidence was excluded at the trial and the exclusion upheld on appeal on the ground that the jury do not need to be told about the reactions of normal people.[13] The factor revealed by the analysis here and ignored in the case is that if it is accepted that normal people do not suffer from this sort of obsession surely the prosecution should have been required to prove that Thomas was abnormal?

In one sense therefore Wigmore fails us at this point. We are not able to subject the reasoning in this instance to detailed rational analysis in such a way as to assist us in coming to a conclusion. On the other hand the chart has performed the valuable services of making us realise just how difficult it is to frame a convincing generalisation to get us from 23 to 22 and that evidence of Thomas's mental state was probably relevant whatever the Court of Appeal may have thought.

Likewise the prosecution tried to put forward the view that the murders were carried out by someone with a long-standing grudge against the Crewes. In support of this contention was advanced the fact that the Crewes had been the victims of a series of strange events. The reasoning appears to be this:

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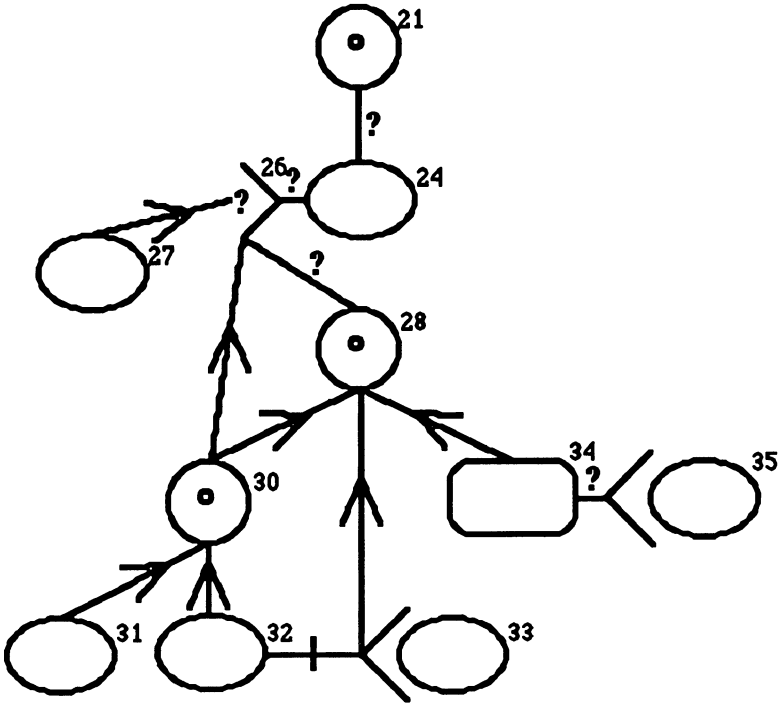
13 *R* v *Thomas* [1972] NZLR 34.



21 The murders were carried out by someone with a long standing grudge against the Crewes.

24 There was a series of occurrences at the Crewe farm, a burglary on 29 July 1967, a fire in the house on 7 December 1968 and a fire in a hay barn in June 1969.

26 These events are relevant to the murders.

27 There is no direct evidence linking these events with each other or with Thomas.

28 These events suggest a regular course of conduct in each year of the Crewe marriage by a local person with a continuing grudge against either or both Crewes, of a personal nature as there was evidently no monetary motive, even for the burglary, a person with particular interest in the brush and comb set and not acting on impulse.

30 Thomas can be linked with the burglary.

31 One of the items stolen was a brush and comb set which Thomas might have stolen to make her use the set he had given her.

32 Other valuable and accessible items were not taken.

33 The brush and comb stolen were of sterling silver and other valuable items were also taken.

34 The likelihood of a burglary, two fires and a double murder happening to one couple in four years without there being any connection is low.

35 No evidence is offered for this proposition.

It will immediately be noticed that most of the propositions in this series are uncontroversial in themselves. The crucial question is whether the conclusions advanced are supportable. This in essence is a matter of judgment with which rational analysis cannot help. It will also be noticed that a key role is played by the generalisation 34. Since there is no direct evidence of any connection between these events their relevance hinges upon the supposed statistical unlikelihood of one household falling victim to such a series of events. If that generalisation is not valid then the whole argument falls apart. The Royal Commission called proposition 28 evidence of the desperation of the police to defend themselves, but would not an investigator who ignored such a series of previous events be acting negligently?

The Thomas case is an interesting one for subjecting Wigmorian analysis to scrutiny. It involves different *kinds* of evidence from the highly scientific to conjecture about motivation and evidence of differing *weight* ranging from the inconclusive findings about the wire to the potentially damning finding of exhibit 350. The uses of the system are demonstrated in the picking apart of the complicated structure of the arguments about the ammunition and its limitations in its inability to cast much light on whether his alleged jealousy was sufficient motive for murder on Thomas's part or whether, as the defence alleged, the family's financial affairs provided sufficient motive for Lenard Demler to murder his adult daughter. Since in either case the perpetrator would presumably have been acting under extreme stress an analysis of his supposed actions based upon rational assumptions may be useless.

V BEYOND WIGMORE

Since Wigmore developed his work so little it was inevitable that once others started in this field progress would rapidly occur. Two developments will be looked at briefly: the work of Tillers and Schum, and the fact analysis training in the revitalised New Zealand professional course.

A The New Zealand Professional Legal Studies Course

In 1988 the system of training for lawyers in New Zealand was altered following the "Gold Report". This was prepared by Professor Neil Gold of the University of Windsor (Ontario). Professor Gold recommended that the emphasis in the post-graduate professional training should be switched from the imparting of information to the inculcation of skills. Fact analysis was identified as one of the key skills to be dealt with and a "Five Level Fact Analysis Model" devised, based upon Wigmore's own work. "The purpose of the model is to assist students to arrange facts in an orderly manner for the purposes of making proof within the evidential rules of admissibility."[14]

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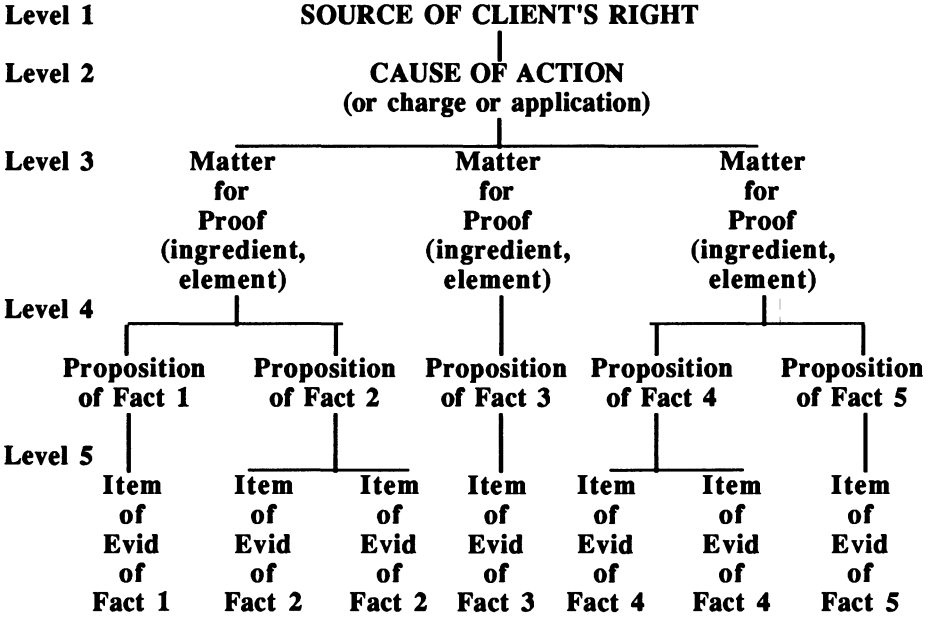
14 R Scragg and C Cull "The Introduction of the Professional Legal Studies Course in New Zealand" (1988) 6 J Prof Leg Ed 117.

Although Wigmore thought primarily from the standpoint of a lawyer preparing for trial he failed to address some of the trial lawyer's concerns. An attempt to correct this is made by the upper levels of "five level analysis".[15] The model is based upon the diagram below.

At level 1 the lawyer must "research the law thoroughly to ascertain with precision the place(s) in the body of law where the 'source' of the client's right(s) is contained". Level 2 consists of the cause of action, the jurisdiction and the parties, or in criminal cases the charge. At level 3 will appear the matters to be proved which in a criminal case will be the ingredients of the charge. In a civil case these matters cannot be determined before a case theory has been decided upon. The lawyer then descends to level 5, the items of evidence and reasons his way back up to level 3 via level 4 which consists of the facts and inferences.



This model has the virtues and defects of simplicity. As can be seen, it is, like Wigmore's original charts, severely vertical in structure. The analysis of the Thomas case has demonstrated that the lines of reasoning do not merely ascend. There are interconnections between inferences and one fact may serve more than one purpose. The latter can be accommodated in the five level analysis merely by repeating an item of evidence at level five, so that for example, Item of Evidence 5

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15 For a fuller exposition of the system, see, N Carter *Winning Your Case - Structuring Proof and Closing Evidentiary Loopholes,* (1988) NZ Law Society. The author is also indebted to Neville Carter for taking time to discuss the model.

might be Item of Evidence 2 repeated. In terms of simplicity of presentation this is probably an improvement upon Wigmore. Difficulty may be experienced however at level 4 when it is desired to show that an inference is supported not only by the fact below but also by other facts and inferences.

The second internal problem is that the model does not accommodate items of evidence and inferences which are not themselves directly relevant to a fact in issue but are relevant to the credibility of a witness. These are the sorts of items which in a Wigmore chart impact horizontally upon a proposition. Obvious examples are a witness's interest in the proceedings and the facts which go to prove it. It may also be necessary to prove certain other matters not logically relevant to the issue but required by the law of evidence, eg that lost documents have been searched for or that a confession was voluntary. These matters are not at present catered for by the scheme.

The five level analysis also fails to address the major defect of Wigmorian analysis. This is that the case theory must be selected before the analysis can be attempted. The scheme does not itself assist the lawyer in generating either case theories or factual hypotheses. Clients do not in general present lawyers with case theories but with stories. One of the lawyer's most important tasks is identifying the most appropriate case theory before he can even embark upon the task at level 1. It may be questionable for example whether a particular set of facts gives rise to an action in tort or contract or to a charge of common assault or assault with intent to injure. Neither Wigmore nor the five level scheme offer any assistance with this decision.

In fact five level analysis comes into its own as a tool for checking that the correct charge or cause of action has been selected. By constructing the chart downwards any gaps in the evidence will be revealed as will any unused evidence. Gaps may indicate either that the wrong charge has been selected or that particular further enquiries need to be made. Unused evidence may indicate that the wrong charge has been selected. For example, when a common assault charge is analysed there is an unused proposition that the victim's nose was broken. This may indicate that a more serious charge is in order. It is in this context that the system is taught at the Royal New Zealand Police College to police prosecutors. Police prosecutors are presented with a file on which someone else has already made the decisions but they must take the case into court. It is therefore necessary to ensure both that the charge can be supported by the evidence presented and that the most appropriate charge has been preferred.

B Tillers and Schum

It is in an attempt to tackle these defects that Tillers and Schum[16] offer different species of analysis to be conducted in conjunction with Wigmorian inferential analysis.

Wigmore, they argue, assumed that the advocate had already decided upon his case theory and furthermore lived in a more or less stationary world. These assumptions are in fact more appropriate to the historian examining the decided case than to the lawyer preparing for trial. The latter must extract a case theory from the material he is given and furthermore must be prepared to adapt or even abandon his theory in favour of another as a result of what he learns during the discovery process. At an early stage he may in fact have several case theories in mind.

Each of these case theories will assist in directing the discovery process and therefore, since the information obtained is dependent upon the questions asked, will actually shape it. The discovery process and the case theory are therefore interactive. Each will shape the other. Likewise the lawyer will wish to identify likely case theories to be used by his opponent.

A common-sense mechanism for generating hypotheses is offered by the authors.[17] This is "temporal analysis". This form of analysis recognises the importance of time as a factor. A horizontal line is drawn representing time running from left to right. The "Moment of Substantive Importance" (MSI) (ie the event giving rise to the litigation)[18] is plotted and then the prospectant, concomitant and retrospectant evidence plotted. Each proposition plotted on the line may be supported by a Wigmorian analysis if necessary.

The efficacy of this simple move is shown by examination of the events surrounding the finding of exhibit 350 in the Crewes' garden. Wigmorian analysis picks apart the arguments involved very effectively (this author devoted some 150 propositions to this aspect). The one thing Wigmorian analysis will not do is suggest the idea in the first place. If the events are plotted on a time line and those relevant to the cartridge case highlighted the result is as shown overleaf. Immediately a question mark rises over the finding of the cartridge case and further investigation is prompted.

It will be noted that the events charted in this example are stages in the investigation and not in the life of the perpetrator. This indicates yet another aspect of the importance of time which is not emphasised by Tillers and Schum in "Beyond Wigmore." This is that an investigator or a trial lawyer acquires his information

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16 David Schum, Professor of Information Technology and Engineering, George Mason University.

17 P Tillers and D Schum, above n 2, 946.

18 D Binder and P Bergman *Fact Investigation: From Hypothesis to Proof* (West Publ Co, St Paul, Minn, 1984).

over time. Since at every stage he is constructing case theories new information is fitted into the pattern already forming. This demonstrates the importance of keeping an open mind and being prepared to scrap the whole jig-saw if one piece does not fit in rather than trying to force it into an available hole. It is inevitable however that the order in which facts are obtained will affect the investigator's or lawyer's view of the case. This is a matter Wigmore completely failed to address. Tillers and Schum have constructed an extended simulated investigation in order to examine precisely this point.[19]

C *Influence Diagrams*

Influence diagrams are a newly emerging decision-plotting technique in the world of operations research.[20] They enable assessed probabilities to be plotted and combined along with the structure of the argument. They offer an obvious line of development for Wigmorian analysis. This is being examined by Professor Ward Edwards of the University of Southern California and by the present author under the guidance of Professor GA Vignaux. Their use will be explored in an LL M course at Victoria University to be taught jointly by the author and Professor Vignaux.

VI WIGMORIAN ANALYSIS AS A TEACHING AID

Wigmorian analysis may also be of use as a teaching aid in teasing out the structure of arguments. This author has found Wigmorian analysis helpful in examining the concept of relevance and related evidential subjects such as similar fact evidence and the previous sexual history of complainants in sexual violation cases. The diagrammatic form also vividly illustrates certain arguments in other areas of the law of evidence. Two examples are given below.

A *McGreevy* and *Pereira:*

In *McGreevy* v *DPP*[21] the House of Lords held that there was no rule of law requiring a special direction to a jury when a case depends upon circumstantial evidence. In *Police* v *Pereira* Mahon J criticised this decision saying:[22]

> in a case involving a combination of direct and circumstantial evidence...the only intended function of the circumstantial evidence is to aid the acceptance of the direct evidence. In a criminal case where the issue is identity ...the surrounding circumstances reinforce, weaken or leave unimpaired the direct identifying testimony on which the Crown primarily depends.

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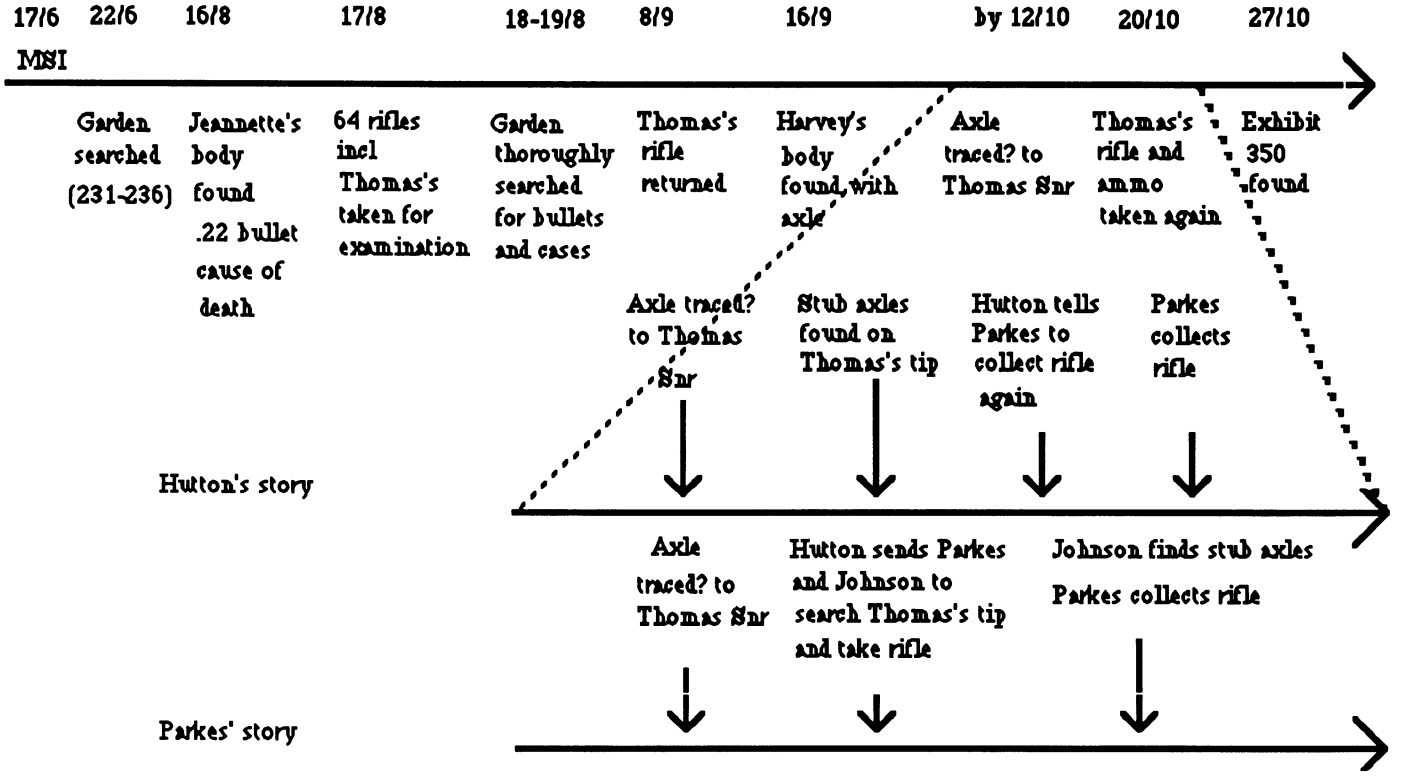
19 P Tillers and D Schum *Marshalling Evidence throughout the Process of Fact-Finding* (unpublished). A seminar on it was held on 25 January 1990, Cardozo School of Law.

20 R D Shacter "Probabilistic Inference and Influence Diagrams" (1988) 36 Operations Research 589.

21 [1973] 1 WLR 276, [1973] 1 All ER 503.

22 [1977] 1 NZLR 547, 554.

TILLERS-SCHUM 'TEMPORAL ANALYSIS' OF FACTS RELATING TO THE PLANTING OF EXHIBIT 350



The two figures below lay out the argument in diagrammatic form. Figure 1 shows a proposition which is supported by two pieces of circumstantial evidence and undermined by a third. What Mahon J seems to be saying is that if a piece of identification evidence is injected the structure suddenly becomes as in figure 2 and that the circumstantial evidence is of no direct relevance to the ultimate *probandum*. It is submitted that this cannot be the case. Suppose, for example, the jury decide that the circumstances of the identification make it so unreliable that they put it to one side, nevertheless they could still convict on the basis of the circumstantial evidence. It is submitted that the correct structure is as shown in figure 3 and that the reasoning in *McGreevy* is to be preferred. Furthermore it is only true to say that the circumstantial evidence supports the direct evidence in so far as it is true to say that any two pieces of evidence which lead to the same conclusion support each other.

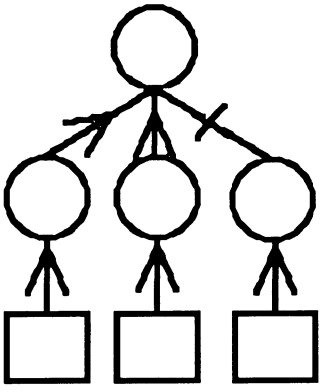


Figure 1

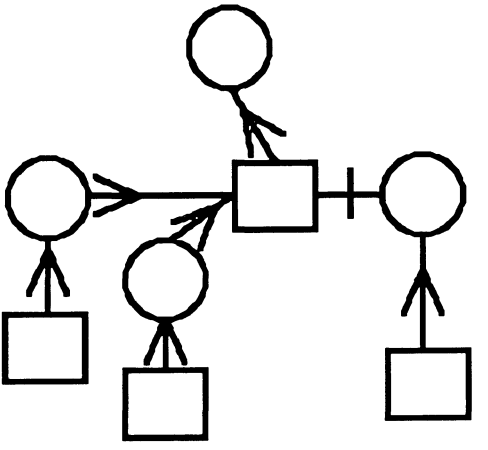


Figure 2

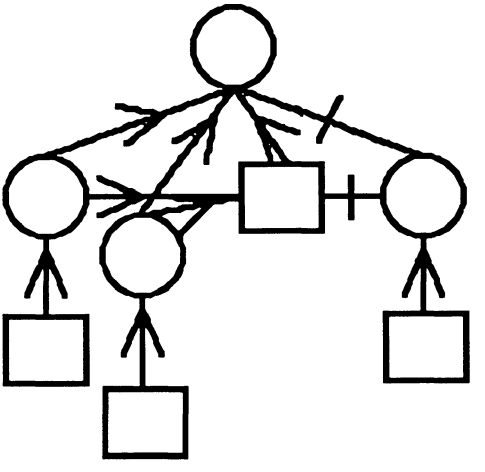


Figure 3

B Howe v Malkin:[23]

In this case the court held that a statement that a tree was being planted on the boundary of some property was not admissible under the hearsay exception relating to contemporaneous statements explaining the nature of an act. A statement that the actor was planting a tree would presumably have been admissible had that been in dispute. The case is easier to grasp when laid out in diagrammatic form:

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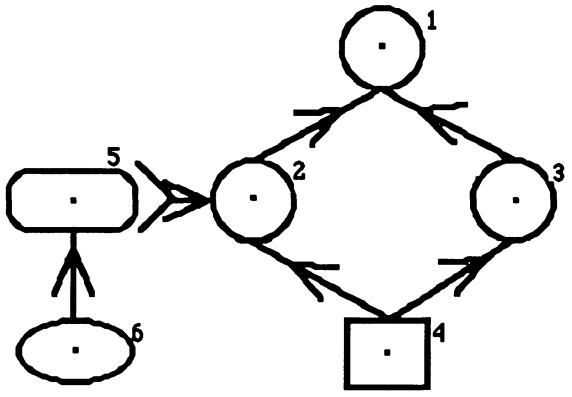
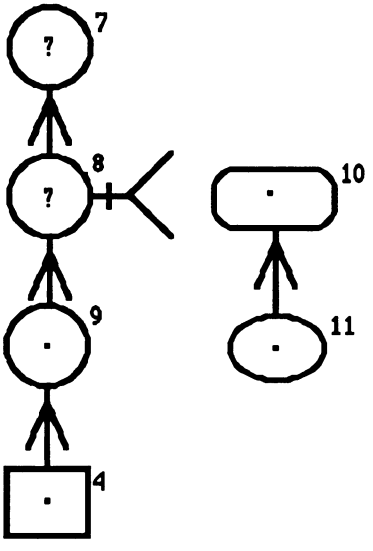
23 (1878) 40 LT 196.





The propositions are as follows:

1 The speaker was planting a tree.
2 The speaker said he was planting a tree.
3 The speaker's actions were consistent with planting a tree.
4 Witness whose evidence is being considered.
5 This statement is likely to be true.
6 This statement was readily verifiable subsequently.
7 The tree marked the speaker's boundary.
8 The speaker believed the tree marked his boundary.
9 The speaker said that the tree marked his boundary.
10 This statement is unreliable.
11 It was in the speaker's interests to induce this belief.

It will be seen that the second diagram not only involves a longer chain of reasoning but involves an inference which may suffer from all the testimonial infirmities, it may have been insincere, ambiguous, mistaken or the product of defective memory. In the first diagram the speaker's statement cannot be the last, is unlikely to be mistaken, appears clear and is readily verifiable. The diagram helps to make clear the distinction between explaining the nature of an act and the reason for it.

VII CONCLUSION

A Generalisations and Assumptions

It has been shown above that at various stages of the argument in the Thomas case assumptions and generalisations played a vital role. Some of these required formally to be proved while others were considered to be judicially noticed. All forensic scientific evidence, for example, rests upon an assumption known as Locard's principle, namely that whenever two objects come into contact they affect one another in some way. This law is not generally explained to courts as a prelude to the giving of scientific evidence. It was necessary to prove in the Thomas case however, that when an engraver engraves a hob from a drawing the result will never be the same in any two instances unless the same engraver makes the two engravings at the same time from the same drawing. On this assumption rested much of the value of the evidence concerning the manufacture of the cartridge cases.

It is a criticism of Wigmore that he failed to realise one of the key features of his system, namely that it isolates these generalisations. Likewise in his *Treatise* it has been pointed out that in rejecting a syllogistic approach to evidential questions Wigmore failed to grasp the significance of exposing the generalisations required to construct the major premise of a syllogism.[24] Twining and Anderson believe that herein lies one of the greatest uses of Wigmorian analysis to the trial lawyer. If the generalisations and assumptions on which one's opponent's case rests can be exposed to the harsh light of day they may be revealed to be the most fruitful targets for attack.[25]

B Is it All Worthwhile?

The most obvious limitation of Wigmorian analysis is its cost in time and effort. The production of a key list and chart of the size of the one completed in this study is a considerable feat of organisation which can easily become an end in itself. If the key list is to read logically it needs to be endlessly reorganised and if the chart is to be clear it needs to be carefully planned and drawn and redrawn. Since there is so much of a judgmental nature involved, the process of revision carries risks since each

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24 G James "Relevancy, Probability and the Law" (1941) 29 Calif L R 689.
25 Above n 9, 51.

time material is gone over new relationships are seen and new decisions taken. The process is thus potentially endless and can become a form of compulsive behaviour.

Two related problems are relevance and complexity. Wigmore proceeded on the assumption that relevance and weight were distinct concepts. This does not seem to accord with experience which suggests that relevance is a matter of degree. What appears to be a legal decision on relevance is often in fact a decision on probative value, or weight, ie a decision that the relevance of a piece of evidence is not sufficient to make up for the costs of introducing it - whether these are measured in Benthamite terms such as vexation, cost and delay,[26] or in terms of concepts such as prejudicial effect.

In a particular case much of the evidence will be interrelated, even if only to the extent that each piece of convergent evidence increases the likelihood of the truth of the other such pieces. If one test of an inference is that the thesis with which it is consistent is, on holistic analysis, credible, then the whole case can be turned inside out and the truth of each piece of evidence comes to depend upon the credibility of the ultimate *probandum* rather than vice versa. In the Thomas case the Royal Commission specifically found that the weakness of all the remaining evidence was relevant to the proposition that exhibit 350 was planted since it reflected on the probability that Thomas was present at the scene at the required time.

If all such arguments were to be charted the result would be an incomprehensible mess which would serve no purpose. On the other hand if they are not charted the result is not a true representation of the reasoning process. This may simply teach us that the inferential process is an extremely complicated one and that some compromises have to be made in setting it out on paper. In the setting out of mathematical proofs it is proper to omit steps which are by consensus both obvious and correct. This technique could help simplify a chart. Great care must be exercised however as, as argued above, one of the values of the system is that it exposes as weak the assumptions underlying intuitively acceptable steps in reasoning. On the other hand the problem may be that intuition and holistic analysis play such a large part in human decision making that the chart system cannot as a matter of general principle accurately portray the workings of the mind - though it may still have some normative value.

This leads to the second important line of attack on Wigmore which would be to allege that this is just not how triers of fact make their decisions. Judges and juries simply do not break arguments down into minute pieces and then reconstruct them assessing the weight of each part. It might be said that perhaps they ought to, but in the meantime this technique will not help a lawyer win a case. Conversely it is argued that the concept of "pure" holistic analysis is meaningless. The process of examination of a case *must* involve some degree of reduction. "[I]t is hard to imagine

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26 *Hollingham* v *Head* (1858) 27 LJCP 241 and arguably *R* v *Blastland* [1986] 1 AC 41.

how we can imbibe the evidence we 'see' without performing *some* sort of mental analysis, which by definition seems to involve some sort of dissection."[27]

Research into how juries make their decisions is limited outside the United States. There the research of Hastie and others[28] appears to show that jurors like to compare stories. In other words they engage in a holistic analysis of the evidence and not a particularistic analysis. This finding makes especially significant the words of David Yallop about the prosecution's closing address in the second Thomas trial: "As a short story it is brilliant. It grips. It is atmospheric. On initial reading or hearing, powerfully convincing. In terms of obtaining a conviction it is in my view only bettered by the judge's summing up in the first trial."[29]

The position that the defence found themselves in was therefore an awkward one. Since Thomas's defence was that he simply had nothing to do with the events in question he was not in a position to put forward a rival story. All the defence could do was to pick the prosecution case apart. This episode may support the contention that juries like a good story, but on the other hand the defence in Thomas's case were forced back on a rational analysis of the prosecution case. There was no alternative course.

There are other factors embedded in the folklore of the legal profession which Wigmore fails to take into account. Books of technique by experienced trial lawyers tend to emphasise the non-rational factors involved in the trial process. To take a simple example, if one's client's previous convictions are going to come out it might be best to extract them in a sympathetic and down-beat manner during examination in chief rather than leave it to the prosecution to produce with a flourish.[30] Now Wigmore would surely assume that the witness's previous convictions reflect to a given extent on his evidence independently of how the fact comes to light. Levy assumes that the manner of presentation is all important. If Levy is right then a major defect in Wigmorian analysis, from the point of view of the trial lawyer, is revealed. The discussion also prompts us however to ask who is right? Wigmore the rational optimist with his belief in universal cognitive competence? Or the experienced lawyer who has nonetheless never actually sat on a jury? Wigmorian analysis cannot cater for the effect of an abrasive witness or, to take *R* v *Chamberlain*[31] as an example, a mother who has lost a child in tragic circumstances and yet appears cool and collected in the witness box. In order to assess the

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27 P Tillers "A New Science of Evidence" (1989) 87 Mich LR 1225, 1252.

28 R Hastie, S Penrod and S Pennington *Inside the Jury* (Harvard UP, Cambridge, Mass, 1983).

29 D Yallop *Beyond Reasonable Doubt?* (Hodder and Stoughton, Auckland, 1976), 267. For more on the role of stories in legal reasoning see W Twining "Lawyers' Stories" in *Rethinking Evidence* (Basil Blackwell, Oxford, 1990).

30 The example is from E Levy *Examination of Witnesses in Criminal Cases* (Carswell, Toronto, 1987) 2.

31 (1984) 51 ALR 325 - 'The Dingo Baby Case'.

importance of these factors however, we surely need to know far more than we do about how jurors make decisions.

Should one therefore despair? Since perfection cannot be attained and we do not know whether the process reflects jurors' thought-processes, is there any point in embarking upon it at all? This author does not despair. For one thing, it is clear that all lawyers, indeed all decision makers, do structure their thoughts in some way. Whenever a lawyer introduces a piece of evidence he does so for some purpose and if he has to justify himself he will do so in rational terms, demonstrating what he believes the evidence proves - even if that is not the real reason for introducing it. Lawyers should therefore benefit from having a technique available which enables them to structure their arguments rigorously and also to analyse their opponent's arguments to reveal weaknesses. The technique is on this argument descriptive. By simply making overt what is going on inside the skull the student of analysis is enabled to make more consistent and effective use of his own mental skills.

Furthermore, while it is obviously not a practical proposition for a lawyer to subject the whole of every case dealt with to this sort of analysis there may be parts of an argument which can helpfully be reduced to their constituents in this way. This author found the analysis of the arguments surrounding the manufacture of the case of exhibit 350 particularly helpful. The story was just too complex to be grasped in the narrative form in which it was set out by the Royal Commission.

Thirdly, there is a normative purpose. The student is given a piece of equipment with which to analyse argument on the assumption that we wish to maximise the rationality of decision making. To this extent it does not matter that the chart cannot show every aspect of the thought process. If we can simply show that decisions have been taken which do not stand up in some respect to rational analysis then we can give the decision maker valuable feedback which may enable an improvement in performance in future. The question of *whether* we wish to make decisions, or legal decisions, in a rational fashion is not one that can be attempted here.

Finally, it may be that all that can be deduced from the foregoing is that the production of a comprehensive meaningful chart "is a task which, if it lies within the reach of human faculties, must at any rate be reserved, I think, for the improved powers of some maturer age."[32] This is surely how Wigmore, the rational optimist, would have answered these criticisms. The organised, published study of these methods is relatively young, yet already substantial progress has been achieved. We are embarked on a journey from which we must not be deterred just by the difficulty of the terrain.

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32 Jeremy Bentham in a rare moment of doubt as to the generality of his "anti-nomian" thesis; see *Rationale of Judicial Evidence* (Garland Pub, New York, 1978) vol 1 p 44.