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Established Principles for (non) Admissibility of Scientific Expert Evidence and their application in Pakistan

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Abstract

The modern devices and techniques have underpinned the legal actors to work together with scientific and technological experts as the litigation of criminal activities no more depends on the traditional methods of production and presentation of evidence alone. The relevancy of scientific and technological expert evidence is even more challenging task than it has been ever. The professional career of lawyers and the judges involves as a routine to discuss the scientific and technological expert testimony in their respective roles. This article endorses the importance of scientific expert testimony and lays down the critical analysis of legal regime relating to scientific expert evidence in Pakistan. The discussion into established principles for the admissibility highlights the importance of role of judges in this realm and underscores the need to adopt best practices to evaluate the reliability and validity of scientific expert evidence.

Keywords: Adversarial system, scientific evidence, Expert evidence, Expert opinion, Adversarial expert testimony

Introduction

In adversarial system, the prosecution is supposed to prove their case beyond reasonable doubt, and defence are to choose their right of cross-examining every piece of evidence, testimony, or expert evidence, which goes into deciding probity of the evidence produced against defendant (Keith 1990). As to the nature of the expert evidence, it is presented either in the form of proof or disproof of a fact or it comes as an expert opinion as to a fact in issue (Freeman and Zeegers 2015). Generally, an expert testimony if it is scientific report, and is based on scientific

knowledge or expertise, in this sense it is considered as an expert testimony of a fact or list of facts such as physician's medical report (Roberts 2015).

However, non-scientific expert evidence may lie in the province of expert opinion that does not necessarily require scientific knowledge, but it is 'special knowledge' (Kovera and Austine 2015) in the non-scientific realm of expert evidence such as technical opinion and handwriting expert opinion and so on. These two kinds of experts and their evidence go into two different streams of rules of admissibility and standards as to evaluation of their probative values for adjudication, therefore, the judicial policy may differ for the assessment of weight assigned to these expert evidence during any particular case (Bross and Mnookin 2003). As it appears from practice and procedure of admission of scientific evidence, that the court must perform function of 'gatekeeper' (Hamer and Edmond 2019) that requires the court to do two-fold responsibility. Firstly, looking into relevance, and deciding the admissibility of scientific evidence then adjudicating for the weight of scientific evidence according to its probative value in the process of litigation (Etherton and Cook et al 2010). Keeping in view the focus of discussion under this article, the rules, principles, and standards governing relevancy, admissibility, validity, probity, and weight of scientific evidence are the main themes of this research.

This article firstly discusses the relevancy of scientific expert evidence and focuses on rules as laid down in legal framework of Pakistan. Thereafter in the later section, it underscores and highlights the established principles for the rules of admissibility of scientific evidence and underpins the scope and applicability of scientific expert evidence. In doing so, the article underlines the criteria of relevancy, general acceptance, reliability, and validity of the scientific expert evidence. Moreover, the discussion as to the challenges of adversarial system with reference to relevancy and admissibility of scientific expert evidence underscores considering different models from Australia and Canada, to practically overcome the challenges and get more benefit out of adversarial systems. The article ends with conclusion and recommendations as to possibility of adaptation of the judicial policy towards consideration and application of established principles of scientific expert evidence in civil as well as criminal disputes brought in the courtroom.

Literature Review

The legal regime in Pakistan for the relevancy and admissibility of Scientific expert evidence comprises Articles 59, 60, 65, 164 of Qanun-e Shahadat Order 1984 (hereinafter as QSO 1984), sections 510, 164-A, 164-B, and 53-A of Criminal Procedure Code 1898 (hereinafter as Cr.P.C 1898), and section 9(3) of Punjab Forensic Science Agency Act 2007 (hereinafter as PFSA 2007). Below is the brief overview and critical analysis of these provisions as to the mechanism that they provide for scientific expert evidence.

Under Article 59, opinions of experts are relevant for the purpose of admissibility when there is a need to present an opinion relating to a foreign law, or of science or art or identification of handwriting or finger impressions. The law mentions types of scientific and expert knowledge (Hamza and Kamil 2013) for instance, handwriting expert and finger print expert, likewise mention of scientific experts such as serologist, chemical examiner (Khalil Akhtar vs. Magistrate Ist Class District Mianwali 2021) (Zaka Ullah vs. State 2021) under section 510 of Criminal

Procedure Code 1898 (discussed in detail in this section) both laws have masked the position of scientific and technological nature of DNA fingerprinting.

Moreover, the illustrations to the Article 59 show the inclusion of Medical opinion, psychiatric expert opinion, and handwriting (Lal Din vs. Muhammad Saleem, 2019) expert opinion relevant to the fact in issue. This has further marked a debateable question (which will be discussed in this section) as to its relevancy of DNA fingerprinting under the Article 59 QSO 1984 (2021 PLD 362 Supreme-Court). This law; as it further provides for the rules of relevancy (Manzar Masood vs. Bank Islami Pakistan Limited 2017) of scientific evidence, lays down the competency of the expert as a person ‘especially skilled’ in Scientific field and the other fields mentioned under the Article 59 (QSO 1984). The manner of laying down the rule for competency when deciding relevancy for scientific expert evidence is not narrow under this provision, because it did not require qualification-based expertise as a criterion for relevancy. The special skill can be attained through practice and experience in that field. This is to note that in other jurisdictions such as in USA the law comprehensively provides for competency acquired through education, skills, or technical expertise (Vallas 2011) that also leads to a possibility that qualification standards include learning through practice and experience and not only by education (Kovera and Austine 2015).

Therefore, in Pakistan, the opinion of an especially skilled expert is relevant as to a fact in issue relating to scientific knowledge or information (Manzar Masood vs. Bank Islami Pakistan Limited 2017). In the same line, Article 60(QSO 1984) provides for relevancy of those facts, which are to ‘support or are inconsistent’ with opinions of experts when expert’s opinion is relevant under Article 59 (QSO 1984). That means any fact that challenges or is in contradiction to opinion of the expert may be relevant fact and the effect of the relevancy of these new facts will lead to exercise of court’s decision-making as to admissibility or exclusion of the expert evidence; which was found relevant under law, and now court is to decide the admissibility while taking into consideration the support or contradiction of the expert evidence in that particular field of knowledge and science (Etherton and Cook et al 2010).

Alternatively, where expert evidence has relied on some methodology or procedure, and court considers any fact showing that the methods or procedures adopted or relied upon by expert are not supported in that particular area of science, this can lead to adjudication as to non-admissibility of expert evidence (Perrin 2015). Moreover, any fact challenging or supporting the debate of distinction between novel but valid research methods or procedures, or generally accepted method but invalid procedure can also be the relevant fact, and this can support or weaken the expert evidence (Ward 2020). It is to note here that deciding about the admissibility of relevant expert evidence is the function of the court and court must decide the weight of such evidence (Bross and Mnookin 2003). This may be inferred that the law requires court’s proactive role not a passive role as to scientific evidence and this is how court plays their role of ‘gatekeeper’ (Hamer and Edmond 2019). Secondly, this also means that the adaptation of scientific knowledge into legal procedure (Roberts 2015) is also underlined in the language of the Article as court must decide for or against the reliability, and validity of the scientific expert evidence (Etherton and Cook et al 2010).

The Article 65 (QSO 1984) further lays down the criteria of admissibility of grounds of opinion when relevant in that when opinion of any expert is relevant then the grounds including scientific

procedure, experiment, method, or even readings from where such opinion was drawn are also relevant. Illustrations to Article 65 provide that the experiments as grounds of scientific expert presenting opinion in the court are relevant fact under Article 65. It is to note here that the expert evidence is not only the personal observation of the scientific expert instead expert has to clearly cite the grounds of their evidence and these grounds may be the opinion of others in the field of knowledge, resulting in acceptance of hearsay evidence to be relevant in relation to expert evidence (Ward 2020). This extension of relevancy of other's opinion or in other words the hearsay evidence makes it a cautious task and calls for urgency to follow established rules of admissibility of expert evidence, which will be discussed in the later part of this research.

In this regard, the Article 164 Qanun-e-Shahadat Order also lays down the permission to the parties to produce evidence available through 'modern devices or techniques' (QSO 1984), if the judge decides that it is appropriate to meet the ends of justice. This provision also points to the relevancy of the scientific and technological evidence (State vs. Ahmed Omar Sheikh, 2021). This can also be inferred here that the decision to evaluate for the admissibility and for weight of such evidence are two different matters (Perrin 2015) and the court shall consider the relevancy of such evidence as to the need of the case and it shall assess the competency of scientific expert under Article 59 for 'special skill' and considering the reliability and validity of the facts according to Articles 60 and 65 as mentioned in the discussion above (Mian Khalid Perviz vs. State, 2021). Under the Proviso 2 to Article 164, which has been added in the year 2017 after insertion of the proviso through Act 4 of 2017, the courts have interpreted that DNA analysis report is admissible under modern technique to identify the link between crime, and the accused or victim. This proviso also provides that conviction based on evidence from modern devices and techniques may be lawful (2021 PLD 362 Supreme-Court).

Moreover, the Criminal Procedure Code 1898 provides for per se relevancy and admissibility of scientific expert evidence under section 510 (Farani 2013). This provision lays down special categories of scientific experts including chemical examiner, or serologist, fingerprint expert or firearm expert rather than allowing any kind of scientific expert evidence in its plain language. This provision is important in this that it introduces government appointed or court appointed (Perrin 2015) impartial or in other words non-adversarial expert evidence (Kovera and Austine 2015) because these are not appointed by parties to the suit. The law describes that it is not necessary to cross-examine such expert unless court in its discretion calls for cross-examination of the expert under section 510 (Farani 2013).

It is noteworthy that the 'helpfulness' (Perrin 2015) can also be inferred from the language of this section in that the report should be helpful to the court for explaining the fact regarding any matter or thing submitted to him for analysis or examination. Moreover, for the admissibility of this per se expert evidence under section 510 (Cr.P.C 1898) mere an opinion or conclusion as to the material or anything sent for examination will not qualify as such per se evidence. It is important that scientific expert evidence under this section is presented, and prepared by the scientific expert where he has written the opinion, clearly mentioned the grounds of the reliance of his expert opinion, and report should be clear, complete in all respects including signatures and names of the examiner. It is because; the court should not need any explanation regarding the facts pinioned in the report (34 Cr.LJ 754 Gara Gajrani).

However, the discretion lies with the court if it thinks fit in the interest of justice; court may summon and examine the person who has prepared such report. The section 510 can also be seen and read with Punjab Forensic Science Agency Act 2007 (hereinafter as PFSAA 2007) as the PFSAA has more detailed and inclusive list of scientific experts beyond the experts which are mentioned in section 510, according to modern scientific and technological trends. Subsection (3) of S. 9 of the PFSAA 2007 also provides for the scientific, technological, and forensic expert evidence. Reading these laws together widens the scope of scientific expert and their evidence in Pakistan.

The analysis augments the PFSAA with provisions in Cr.P.C 1898, and QSO, 1984 in that the report prepared by expert in PFSAA is relevant in courtroom as an evidence under section 510 (Cr.P.C 1898) and 164 (QSO 1984). That means, firstly, the experts working with PFSAA can be adversarial experts or non-adversarial experts where the adversarial experts are those whose report is presented by the parties to the litigation (Kovera and Austine 2015) and the non-adversarial expert is who is appointed by the government (Perrin 2015) as an expert by special knowledge, and court calls for their reports as per se evidence under 510 (Cr.P.C 1898) or decides to call him for cross examination in the interest of justice. On the other hand, under Article 164(QSO 1984) court may accept expert from Forensic Agency (PFSAA 2007 section 9(3)) evidence as an adversarial scientific, technological, or forensic expert where in the interest of justice parties can cross-examine the expert evidence presented by the opposite party to the case.

This can be noted that court had observed that DNA report is not per se evidence under section 510 as there is no clear mention of DNA analyst among the experts under that law (2021 PLD 362 Supreme-Court). On the contrary, under new proviso 2 to Article 164, DNA report may be accepted as adversarial scientific or technical expert evidence which is to be cross examined under rules of Article 164 (QSO 1984). On the other hand, under section 9(3) of PFSAA, the DNA report of the expert is however, admissible as per se evidence under section 510 as well as admissible as adversarial expert evidence under both Article 164 and its proviso 2 (Tanvir vs. State (2020) PLD 774 Lahore High Court Lahore).

It is noteworthy that under criminal law amendment in 2016 the sections 164-A, 164-B, and 53-A also provide for relevancy of Scientific and technological evidence like DNA report in that where the commission of offences or attempt to commit the offence of rape (PPC 1860 section 336), unnatural offence (PPC 1860 section 337), or sexual abuse (PPC 1860 section 337-A) is under investigation (Cr.P.C 1898,164-A) or where an offence is committed or there was an attempt to commit the offences (Cr.P.C 1898, section164-B) as mentioned above, or where an accused is arrested for commission or attempt to commit any of the offences (Cr.P.C 1898,53-A) as mentioned above, the medical examiner may examine the victim under 164-B(2)(c)(Cr.P.C 1898), or medical examiner may use force or any way collect the material from accused for DNA analysis under 53-A(2)(d)(Cr.P.C 1898), and send the material to the PFSAA for analysis at the earliest. Therefore, the relevancy and admissibility of DNA evidence is provided in the legal framework ranging from criminal as well as to evidence law in Pakistan (Ali Haider Pappu vs. Jameel Hussain etc. (2021) SCMR, 2021 PLD 362 Supreme-Court).

However, discussion about rules for evaluation of reliability, validity, and weight of such scientific evidence must have a clear lay out (Etherton and Cook et al 2010) so that one can

benefit from the modern scientific, technological, and forensic evidence or opinion in the courtroom. To this end, this article now proceeds to lay out an overview of established principles and rules for the relevancy, admissibility, and probity of scientific expert evidence. It is to note that the case of non-scientific expert evidence will be discussed briefly in the last part of this research. The discussion below, however, engages in the analysis of operative legal framework for admissibility of scientific evidence and while doing so comparing the established principles from other jurisdictions that share the commonality of adversarial system of litigation.

Established Principles for Scientific Expert Testimony

Development of law on admissibility of scientific expert evidence illustrates the undeniable prospect that besides the change of law, court system also needs to engage into policy safeguards keeping in view the evaluation of the quality of scientific expert testimony or evidence (Etherton and Cook *et all* 2010). This section engages in and presents the overview of general principles established by courts when they considered care and caution to deal with the changing realm of science and technology in the courtroom. As discussed in the section above, under Article 59 (QSO 1984) ‘special skill’ is the standard for competency to bring specialized information in the judicial proceedings. In this regard, this can be related here that competency to become a scientific expert for the legal proceedings can be more comprehensively meaning to include a qualified person by education, or technical expertise gained through skill or experience. In USA by contrast the competency of the expert is mentioned liberally but comprehensively as ‘qualified by education, skill, or technical expertise’ (Vallas 2011) (Perrin 1995). It has been observed (Keith 1990) that this phrase gives twofold benefit to the court in assessing relevancy of the expert evidence that both scientific and non-scientific experts can be adjusted through judicial interpretation when court must check the first step of competency of expert evidence.

In this regard, the qualification by education goes to the scientific expert competency; however, the words ‘skill or technical expertise’ would be flexible to include other technical or non-scientific experts. Among such other experts may include bankers, economist, social scientists, handwriting experts, technicians and so on, who might be considered as competent when their skill and expertise is gained through their knowledge, and experience relevant to their field of practice (Kovera and Austine 2015). In case of Pakistan, the Article 59 (QSO 1984) does not specify qualification by education as a pre-requisite for being an expert, rather it goes to the broad and flexible statement of law for this purpose and provides that special skill is needed to consider the relevancy of the scientific expert evidence as well as for non-scientific experts alike. This may lead to the conclusion that special skill gained through intensive reading, learning, training, work experience can all be considered for both scientific and non-scientific expert evidence in Pakistan.

The law under Article 59(QSO 1984) also provides a limited conception as to non-scientific expert testimony as its names experts for which it has laid down the rules of relevancy and competency such as law, art, hand writing and fingerprints only. This expression has posed a challenge (Azeem Khan v. Mujahid Khan, 2016) to expand the application of law for the situations where other technical and specialised evidence such as bankers, social scientists, economists, accountants, DNA technicians, or analysts, forensic analysts may be involved. In this situation, the Article 164(QSO 1984) and its newly introduced proviso 2 is pertinent to mention which provides for the relevancy of evidence produced through modern devices and

techniques including DNA analyst's report. Interestingly, the Article 164 (QSO 1984) together with section 9(2) (FPSAA 2007) can be considered for ascertaining a possible and detailed list of scientific experts' evidence such as forensic biology, forensic chemistry, forensic toxicology, computer forensics, digital evidence (Farooq and Waheed 2013). The law in this sense displays broadest purview of conceivable categories of scientific experts under these two laws; QSO and FPSAA, that will be considered as relevant according to Article 59 (QSO 1984) on the touchstone of competency as special skill of the expert and it is a progressive approach of law towards the scientific expert evidence in Pakistan.

Having explored the competency requisite for relevancy of scientific expert evidence, there comes the 'helpfulness test' where court's 'need' to have expert evidence is the standard to consider by the courts. This purview of this test leads to the fact that the matters which are common-sense although scientific or technical, they will not be considered as relevant under expert evidence because they are of no special need or these will not pass the test of being 'helpful' (Perrin 2015) to the court's knowledge about the fact in dispute. In other words, the expert testimony, which is not helpful and does not increase the knowledge of the judge, will not be relevant under the law. This inference can be extended to a broader conclusion that the scientific expert evidence that will confuse, mislead, or unfairly bias the court will not be relevant from its outset in the courtroom (Kovera and Austine 2015).

Principles of Reliability and Validity

The discussion on standards and principles for the admissibility of scientific expert evidence will now include further toil into evaluation of the expert testimony itself (Yasir Ayyaz vs State 2019), which is challenging task for the court. These principles set out the admissibility reliant on the touchstone of reliability and validity of scientific expert evidence (Etherton and Cook et al 2010). This means that mere acceptance of some conclusions presented by scientific expert in his report is not all about presentation and admission of science in the courtroom, rather it goes into evaluation and assessment (Ward 2015) of the process which has lead the scientific expert to draw those conclusion which he thinks are helpful to the judicial decision-making process for a dispute. This is not a simple task as it underscores the judge's knowledge and competency to perform this evaluation and assessment task for the admission of scientific expert evidence (Etherton and Cook et al 2010). The legal framework in Pakistan in this respect finds its place into Article 60 (QSO 1984), that provides for the facts which support or contravene the opinions of the experts are also relevant which means that not only the grounds of opinion (QSO 1984 section 65), or grounds of the analysis of the scientific expert, are also relevant facts for the court to consider the admissibility of the expert evidence. This is observed that this peculiar situation arises with the need of testing reliability and validity of the scientific evidence by the court, that the hearsay evidence is acceptable (Ward 2020).

In this regard, it is suggested that special care and caution should be the guiding principles for the court while deciding admissibility of scientific expert evidence and courts should not neglect the reliability and validity test (Etherton and Cook et al 2010). It is pertinent to mention the Daubert case (Daubert v. Merrell Dow Pharmaceuticals, Inc., 1993) where the function of the court has been made somehow easy to follow four points of consideration which is list of non-exhaustive test including assessment of validity of data, as a first step in the list because the validity is actually a verification of science, which 'is to be found in the accuracy of its

predictions' (Perrin 2015). The Daubert case's list includes whether the data relied upon by the expert can be falsified? (Daubert v. Merrell Dow Pharmaceuticals, Inc., 1993), that means if the data is novel but valid and cannot be falsified it could be admissible as reliable and valid. If the data is generally accepted but invalid, then the decision may be admissibility of the expert evidence, but less weight will attach to this evidence and this can be a justified conclusion in the court (Perrin 2015).

Moreover, the Daubert test of reliability includes considering whether the data is 'subjected to peer review or publication' and thirdly, if 'known or potential error rates are available' or mentioned by the expert in the report, fourthly, general acceptance of findings in the relevant scientific community (Daubert v. Merrell Dow Pharmaceuticals, Inc., 1993). This discussion can be summed up in that the fact that any 'novel but valid' data if peer reviewed and published, and if it cannot be falsified, and if its error rates are known, then that expert evidence may be admissible in the court. It is to note that these tests are also emphasized to apply and follow for all types of scientific expert evidence either court or government appointed expert under section 510 (Cr.P.C. 1898) which may be called as non-adversarial experts. Likewise, same rules of testing reliability and validity of scientific expert evidence should be applied and followed for an expert evidence under FPSAA section 9(3) if called under 510 (Cr. P.C 1898). It is also to note that these tests as to competency and relevancy of expert evidence and the tests for evaluation of reliability and validity of expert evidence as discussed above are nonetheless critical to perform the court's function as 'gatekeeper'(Hamer and Edmond 2019) and to keep the distinction of true science from the false and junk science in the court room (Perrin 2015). Court will follow these established principles even in cases where expert evidence is presented under section 510 (CrPC 1898).

While confirming to the application of test of reliability and validity, court will not only consider the expert's own opinion and grounds of such opinion rather facts in support or contradiction to the opinion and ground of opinion may be considered (Etherton and Cook et al 2010), which may include other observations and conclusions drawn by other experts' in the relevant field of scientific knowledge. The court will investigate these grounds, to test reliability of the expert evidence (Ward 2015). In doing so, with a view to evaluate the support or contradiction as to the grounds of expert opinion, the court may consider the validity of methods and methodologies used in the process of analysis either conducted and developed by expert himself or relied upon by him for the purpose of the preparation of the expert evidence (Freeman and Zeegers 2015). The methods and tools established and accepted as valid in that field of knowledge can be considered for testing the reliability of the expert evidence for this purpose the peer review and publications of such methods and tools are reviewed (Ward 2020).

It is observed that peer review and publication will work as circumstantial evidence for checking the reliability and validity of expert opinion for which court can take judicial notice and check the validity of the methods and tools (Perrin 1995). This inference calls for cautious assessment of these peer review and publications because the scientific expert evidence cannot be excluded based on circumstantial evidence of peer review and publication alone (Bross and Mnookin 2003). It is suggested to use 'inference to the best explanation' as guiding principle for relying on peer review and publication standard for reliability test of scientific expert evidence (Ward 2020). Likewise, the facts which do not support the scientific expert evidence and prove inconsistency of evidence can also be considered to decide against its validity.

In addition, it is seen that the ‘novel but valid’ (Perrin 1995) methods and tools can also be considered valid and reliable if those novel tools for analysis do not contradict the established principles rather they find support as being novel, even if not widely in use but their results are considered valid among that particular community of skilled or educated persons (Ward 2020). In this regard it can be seen that the law under Article 60 (QSO 1984) goes beyond the ‘generally accepted’ methods test (Frye vs. United States, 1923) and enables the courts to look into the reliability of the expert opinion and to distinguish a ‘valid but novel’ method from ‘generally accepted but invalid’ method (Perrin 1995). These conclusion further points to the judge’s capability to evaluate the matter of support or inconsistency of expert opinion in the manner mentioned above. In order to evaluate the admissibility of scientific expert evidence through reliability test as mentioned above, the generally accepted criteria for expert evidence (Frye vs. United States 1923) was somehow easy which seems not to be the purpose of the Article 60 (QSO 1984).

The Article 60 (QSO 1984) which clearly lays down that facts are relevant if they support or are inconsistent to the opinion of expert, pointing at the court’s function as gatekeeper (Hamer and Edmond 2019) such that court is to accept the relevancy of the facts for further evaluation of the validity of the method and tools relied upon by the expert and to consider the rules of distinction of ‘novel but valid’ (Ward 2020) and ‘generally accepted but invalid’ test (Perrin 2015). This means that court must have been trained into basic information about the modern techniques and tools for the knowledge of scientific evidence. This conclusion also points to the required ability of judge to accept the importance of their gatekeeper’s function (Hamer and Edmond 2019) and to learn the adaptation of scientific knowledge into the legal process inside the court room (Roberts 2015). In the same line, the Article 65 (QSO 1984) provides for court’s function to accept relevancy of the grounds on which the expert based his opinion and it means that court will consider the validity and reliability of experimental methods and tools used in preparation of expert evidence.

Evaluation of Non-Scientific Expert Evidence

Ironically, the evaluation of non-scientific expert evidence is considered difficult in the situation where methods and tools are difficult to find or to prove nor a potential error rate is available to test Daubert’s reliability standard. Instead of practicing exclusion of the non-scientific evidence (Ward 2020) from any kind of rigorous evaluation for the reason mentioned above, or to accept the expert evidence as presented without testing reliability of the expert evidence or the grounds for such expert evidence, it is stated that (Kumho Tire Company v. Carmichael (1999)) the court’s gatekeeper work is actually calling for more rigorous and expanded responsibility to include evaluation of reliability of non-scientific expert evidence keeping in mind that the standard under Daubert (Bross and Mnookin 2003) is not an exhaustive list to evaluate the non-scientific expert evidence rather court will have abundant options to include in that kind of list.

This kind of an attempt to rigorously evaluate the non-scientific expert evidence which goes to bankers, economists, social scientist evaluation of empirical research to harbour construction information will evaluate the expert evidence based on their specialized and technical knowledge of their relevant field. This limitless discretion to adopt suitable test to check reliability of the technical and specialized expert evidence, the court has more discretion than in application of tests discussed under Daubert for scientific expert evidence (Bross and Mnookin 2003). Having

said this, the setting up of standards and principles for evaluation of reliability of scientific and non-scientific information, it is to note that judges have to have scientific training or specialized knowledge to do this important task so that they may differentiate true scientific or specialized knowledge from flawed evidence and avoiding the admission of unreliable expert evidence (Perrin 2015).

Similarly, the adversarial expert evidence under article 164 (QSO 1984) where the parties are free to introduce expert evidence available through modern technology and devices if court considers it appropriate and allow so. It is observed that in common law based adversarial systems, lawyers seek to present expert evidence and the experts are paid for that work (Keith 1990), the impartiality and non-biased character of expert evidence is compromised and the court can face an expert providing testimony as a representative of the party to suit (Perrin 1995) rather than representative of the general scientific community (Kovera and Austine 2015). In this situation the ‘gatekeeping’ role of the judge is to determine; whether the testimony is admissible as evidence and decide the weight of such evidence carefully. It is observed that judges do not only have to rely on scientific conclusions to check the reliability of the expert evidence (Ward 2020) rather they must do more according to Daubert standards to evaluate the scientific evidence (Bross and Mnookin 2003).

Alternative Methods for Evaluation of the Scientific Expert Evidence

This article now proceeds to discuss the procedural and standardised rules to address the challenges of adversarial expert evidence and its impartial and biasness towards the party who calls for the permission presenting expert evidence for their side of the case. Truly speaking, the rules of evidence in adversarial system; such as cross-examination, judicial instructions to allow or disallow any question or evidence irrelevant to the fact in issue and the right of opposing party to present their expert testimony (Perrin 1995), to refute the expert testimony presented by other party are proven inefficient to remove the disadvantage of the adversarial system. It is another challenge that these techniques do not help in revealing the truth rather these works to leave unattended, unexplained evidence as admission of the party who seems unable to attend a timely rebuttable evidence (Keith 1990). This situation has encouraged the courts to seek alternative methods of evaluating the expert evidence and to avoid the partiality; bias of expert and to counter expert’s support to other party. The technique is called as ‘concurrent expert testimony’ (Kovera and Austine 2015) and is practiced in Australian and Canadian courts.

Before going into overview of the concurrent expert testimony, it is important to note that there are other suggestions to deal with the problem of partiality and bias in adversarial system where a solution is presented to use only court appointed expert testimony only but this theory is largely rejected by practicing lawyers and judges already (Perrin 2015). The concurrent expert testimony is multi step process that includes first stage called pre-trial conference and second stage that has two parts collectively named as joint testimony sessions (Kovera and Austine 2015).

The first stage of pre-trial conference affords an opportunity to indicate jointly the strengths and weaknesses of both sides of expert evidence in adversarial expert testimony, in the absence of their respective advocates who have hired them for their parties. These experts engage in finding areas of agreements of their expert report before the trial starts. The joint report from both sides of experts proceeds after this pre-trial conference, where the experts from both sides prepare a

report stating their points of agreements and differences and the grounds for clearing their argument regarding agreements and differences and experts from both sides agree to this report endorsing it as such. The lawyers from both sides will not be welcomed in pre-trial conference and during the preparation of the concurrent report; which is an attempt to bring the experts in impartial phase of their opinion-making role in courtroom.

During the trial two stages are observed, and the testimony is presented in a way that in first part the experts from both sides give testimony individually with no one interrupting their discussion about their expert evidence. However, in the second part of concurrent testimony during trial, the adversarial system is observed (Kovera and Austine 2015) such that lawyers can cross-examine experts to check the veracity and probity of their evidence. These cross-examining questions can be directed to one or many experts from any side, moreover, one expert may comment on the comment of the other side of expert's statement to any question. It is noted that this process enhances neutrality of expert witnesses and reduces the factor of partiality and bias of adversarial experts. This concurrent expert testimony as experienced in Australia and Canada and it is seen to have enabled the trial court draw comprehension and application of the expert evidence more effectively to the facts of the case (Kovera and Austine 2015).

Conclusion

It is to conclude that in order to enable judges do their appreciated task of evaluation of expert evidence and to enable lawyers do their best in cross-examination of other party's expert testimony both legal actors should afford opportunity to have scientific training including judges and lawyers (Perrin 2015) and it is necessary to identify true science from the false.

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