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The Acquisition Of Scientific Evidence Between Frye And Daubert. From *Ad Hominem* Arguments To Cross-Examination Among Experts

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Abstract: The Frye and Daubert rulings give us two very different ways to intend the relation between law and science. Through the contributions of Wellman and Walton, we will see how the main method to question the expert's testimony before a judge deferent to science is to question her personal integrity by using *ad hominem* arguments. Otherwise, using Alvin Goldman's novice/expert problem, we will investigate if other manners of argumentative cross-examinations are possible.

Keywords: *Ad hominem*, cross-examination, evidence, expert testimony, law and science, legal argumentation, legal evidence, trial

1. Introduction

With this paper, we aim to add a small piece to the wider and much discussed topic of the relationship between science and law. We will pursue this target with a specific regard to the argumentative profiles that it poses. Thus, our chosen perspective to explore this vast field of studies is, on the one hand, related to the evolution of the relationship between science and trial, and on the other hand, related to the argumentative techniques for acquiring scientific evidence during this evolution.

As far as the first aspect is concerned – taking into account the limited space and knowledge – we obviously will not be able to deal with the entire history, which had science and law as protagonists. Therefore, in the first paragraph we will focus exclusively on the two main stages, which helped to highlight the relationship between science and law in a trial during the twentieth century.¹ We will examine two famous *leading cases* – the Frye ruling in 1923 and the Daubert ruling in 1993 – which from their original American context have had effects on the Italian system as well.² The Frye ruling, will give us the image of a judge subordinated to science, while the Daubert ruling will give us the image of a judge ‘in dialogue’ with the scientific theories proposed by experts. In fact, the judge is called to express her opinion on the validity of the scientific theories within the juridical context of the particular decision, redeeming the epistemological tools of the trial and underlining the crisis of the universal idea of science, which was typical during the modernity.

In the second paragraph, stemming from examples offered by Francis L. Wellman in *The art of cross-examination* and using Douglas Walton's reconstructions of *legal argumentation*, we will see how the use of *ad hominem* arguments is the main tool that juridical actors have to cross-examine experts, as long as the trial is subordinated to science. Lastly, keeping in mind

¹ We will mostly refer to the *penal* trial context. In fact, in civil literature, especially in the Italian context, the scientific evidence topic had so far received sporadic attention and the non-frequent jurisprudence, has been limited to generic and rather questionable statements (Taruffo, p. 219; Puppo, 2004, p. 355).

² As an example, throughout this contribution the 2010 Cazzini ruling of the Italian Corte di Cassazione will be referred to as a clone of the American Daubert ruling in 1993, according to many interpreters. In order to understand better the ongoing Italian debate on the substantial and procedural concept of scientific evidence, it is important to refer to the American experience, where confrontation on the scientific nature of evidence has been going on for years (Bertolino, p. 3).

the new role entrusted to the judge by the ‘Daubert turn’, in the third paragraph we will use the strategies suggested by Alvin Goldman in his *novice/expert problem* to understand what the new perspectives of a trial are where an effective dialogue with experts’ theories is present.

2. The expert testimony and the different evaluation standards of scientific proof

In assessing the way which science and law intertwine inside courtrooms, it is possible to identify essentially two main trends that affect, in some aspects, the different legal systems. First of all one can talk about a *general* perspective – which we will not deal with directly – which is the *policies* one (in the mutual influence of social needs and sciences) and, secondly, one can talk about a *particular* perspective, which is going to be the main topic of this paper, concerning the way in which scientific outcomes interfere with judicial decisions.

In order to understand how this latter relationship between science and law takes place, it is necessary to examine the figure of the expert testimony, which is the main means of proof by which science has access to a trial. In fact, thanks to a growing complexity of society, the number of experts requested by parties and judges is countless, as well as their disciplines of provenance (Haack, p. 114). For our purposes, it is important to focus on the main and well-known difference between *lay* testimony and *expert* testimony³. While the former can report only on what is directly known, generally because she assisted personally to it⁴, expert testimony is allowed to reach her personal conclusions stemming from data, which is submitted to her during the trial⁵. The expert, indeed, can reach conclusions that are not strictly linked to her personal perception but, differently, that can be based on her technical skills (Haack, p. 211).⁶ In other words, the expert witness can identify scientific-technical laws valid for inferring one fact from another and can make this inference available to the reasoning of the parties and the judge; she can reach this inference on the basis of factual data which have already been introduced during the trial by other means of proof; she can carry out the same inference from factual data not constituting already an evidence, but only postulated (the so called, *hypothetical question*) (Dominioni, p. 40)⁷.

³ We decided to use the American wording; but it is not correct when referring to the Italian context. In fact in Italy during a penal trial, the distinction is between testimonies on one side (the subjects who have been called to refer on facts known not by virtue of her specific competences, art. 194 of the Italian procedural penal code [c.p.p.]), and *periti* or technical consultants, on the other. The *perito* is directly appointed by the judge, in accordance with art. 220 c.p.p.; while technical consultants, are experts appointed by the prosecutor or by the other parties, in accordance with artt. 225 and 230 c.p.p..

⁴ In the American context, the Federal Rule of Evidence (FRE) 602, in terms of *lay* testimonies, reports: «A witness may not testify to a matter unless evidence is introduced sufficient to support a finding that the witness has personal knowledge of the matter». However, in the Italian context, art. 194 c.p.p., states: «The testimony is examined on facts which are object of proof», where ‘object of proof’ indicates «a life episode or judicial fact that must be proven whether it happened or not» [definition given by *Codice di procedura penale spiegato*, 2015, Napoli, Ed. Giur. Simone, *our translation*].

⁵ In the American context, FRE 701 claims that a *lay* testimony, as opposed to an *expert* one, is authorized to bring her opinions or inference only in two cases. Firstly, when the opinion or inference is «rationally based on the perception of the witness» and secondly, when the opinion or inference is «helpful to a clear understanding of the witness’ testimony or the determination of a fact in issue».

⁶ In the Italian context, the rule which extends the expert’s faculty during her testimony is art. 220 c.p.p., in the section that authorizes her to «investigate, acquire data or make evaluations that require specific technical, scientific or artistic competences». Instead, in the American context, it is especially FRE 702 (combined with 703) which sanctions a difference between the lay testimony and the expert one: «A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion [...]».

⁷ Wellman, in the text that we will analyze in the next paragraph (*The art of cross-examination*), expresses some considerations – very skeptical – on the approach of hypothetical questions and answers (Wellman, p. 164).

This possibility of exposing her inferences on the facts to the court, which both Italian and American judicial systems grant to those who give their depositions as *experts*, will be the center of the investigation that will take place in the third paragraph of this paper. In fact, according to us, this peculiarity can have precise repercussions on the modality in which the examination, and specifically, the cross-examination of the expert takes place. After all, these are moments when in a rhetorical-dialectical way – that is, through questions of prosecutors and lawyers, and the expert witnesses' answers – the persuasive effectiveness of science is explained towards judges, and thus towards the law (Manzin, p. 258).

Before reaching such considerations, it is important to focus on the background where the expert's testimony takes place. In other words, in order to reason on the importance of scientific evidence during the process and its acquisition methods, it is primarily important to understand the relationship between science and law.

As already mentioned in the introduction, this complex relationship has a long history and we certainly cannot fully analyze it. We intend to use the last century as a reference and isolate the two main stages that have defined two different ways of interpreting such relationship. We refer to two extremely renowned leading cases, even though both coming from an American context, they are able to reflect perfectly the evolution of the balances in question⁸.

While the first paradigmatic ruling, the so-called *Frye*, gives an image of a judge subordinated to the results of science, which is intended statically (Dominioni, p. 193), the second ruling, the so-called *Daubert*, gives an image of a judge who is 'in dialogue' with the different scientific theories proposed. Indeed, the judge actively must choose the one that better suits the concrete decision, rather than others according to a dynamic perspective. In order words, with the necessary epistemological authority, the judge is allowed to assess independently the range of the scientific theories that access the trial.

Proceeding in order, the two decisions are analyzed more in detail below.

In 1923, during the famous ruling *Frye v. United States*, the Circuit Court of District of Columbia was faced with the question of whether or not admitting a truth machine in the trial. Thus, the famous criterion called *general acceptance test* (or, *Frye standard*) was elaborated.

According to this criterion – which met its great fortune in courts because used for many decades with undisputed adhesion (Carlizzi, p. 118) – in order to establish the reliability of a scientific theory in a trial, the judge must refer to the opinion generally accepted by the scientific community of reference (Carlizzi, p. 84). For our purposes, it is sufficient to underline two important repercussions, closely related to each other, connected to the explicit reference that the theory suggested by the *expert* has to be previously accepted by the scientific community. First, this implies that many 'intermediate' theories between exact science and pseudoscience (or so-called junk science), despite being effective in explaining the connection between elements of the trial, are unable to access the trial (Carlizzi, p. 85). Secondly, this implies that the judge must have a 'deferent' attitude towards official science. In fact, wherever there is a theory that has already been discussed and recognized by the scientific community, the judge can only recognize its access in court and, on the contrary, in case of no recognition by the official science, she will have to deny the possibility of the theory being effective in accounting for the case facts. This deference – as we will return to say – on the one hand, implies that a neutral scientific community (with claims of universality) actually exists; on the

⁸ As we will see, we refer to the famous ruling of *Frye* in 1923 and *Daubert* in 1993. As regards to the *Frye standard*, one cannot talk about a real effect of this ruling outside American borders, but that this decision represented the sentiment of deference that the entire Western juridical world, not only American, felt towards science during the first half of the twentieth century. While, regarding the effect that the *Daubert* ruling had in Italy, many commentators consider the Cozzini ruling, declared by the Corte di cassazione in 2010, a sort of clone of the *Daubert* one (Carlizzi, p. 99).

other hand, that the juridical context is expressly subordinated to this scientific community and therefore, without epistemological tools to question its results (Tallacchini, p. VII).

It is by this alleged subordination of the law to science that, during the second half of the last century, it was being recorded as the *general acceptance* criterion [the *Frye standard*] was precluding actual analysis of reliability and validity of the inferred evidence, delegating judicial decisions to scientists (Dominioni, p. 119).

As well as this “intolerance” of the courts, the idea of a neutral, concordant and objective *science* that, far from judgment, was able to offer universally valid theories became more and more scarce. In other words, from the last-century Sixties, the awareness of the fact that there are no rules to determine when a scientific topic is guaranteed enough from evidence in order to be accepted or sufficiently weakened by the evidence to be rejected, started to grow (Haack, p. 221).

It is clear that, in the face of this epistemic change, the concept of a very deferential judge towards the scientific community could no longer be considered satisfying, at the cost of leaving judicial decisions at the mercy of the impossibility of scientific knowledge to provide incontrovertible certainties (Dominioni, p. 125).

Also by virtue of such motivations, in 1993, another leading case was decided. It marked a division between the previous image of a “deferent judge” and what will be discussed in the third paragraph, the so-called *gatekeeper* judge who is able to evaluate scientific theories. We are referring to the *Daubert v. Merrel-Dow Pharmaceutical, Inc.* case, where the Supreme Federal Court took the opportunity to mark a drastic turning point in the admittance of evidence. Putting aside the factual details of the decision, the main landfall was that the judge, exercising a so-called function of *gatekeeper*, evaluated the scientific evidence not by referring anymore to the *ipse dixit* of the scientific community. However, taking into account the reconstructions that emerged during the trial, the judge exercised a direct control over the reliability of the technical proposed theory in a non-absolute way (Puppo, 2004, p. 358). This conferral of greater responsibilities to the judge in analyzing the merit of scientific theory, led to two further consequences which for our purposes, we have defined *subjective* (of the judge) and *objective* (of the trial). A direct consequence connected to the *subjective* component is that the judge having to exercise her direct control must also have the necessary knowledge. Thus, it opened the doors to an always greater frequency, in the American juridical literature (and not only), of studies which illustrate the problems of the scientific method and its possible relevance for the judicial evaluation of evidence (Dominioni, p. 145). Connected to the one that we defined the *objective* consequence, in order for the judge to fulfill his role as an evaluator of the scientific results during the trial, she must be able to count on wise procedural devices that guarantee the correct assumption of the expert testimony. We will return to these two elements – the *subjective* and the *objective* ones – in the third paragraph.

3. The ‘deferent judge’ facing scientific evidences: The use of *ad hominem* arguments

To continue our analysis of the role of scientific evidence in a trial, in this paragraph we will examine two well-known texts.

The first one is *The Art of cross-examination* where the famous American prosecutor (and later lawyer), Francis L. Wellman, gave some useful advice to colleagues who at the beginning

of the twentieth century, had to cross-examine the testimonies. Then, we will examine Douglas Walton's *Legal argumentation and evidence*, and we will compare the reconstruction that he makes of argumentative techniques during the acquisition of testimonies with the examples offered by Wellman.

Let us proceed with order. In the first pages of the chapter on cross-examination of the expert testimony, Wellman clarifies immediately what he will reiterate several times through examples: as a general rule, it is not prudent for the *cross-examiner* to try to keep up with the specialist regarding topics concerning its specific subject. Long cross-examinations concerning the expert's theory, exposed during the direct examination, usually result in disaster. They constitute a hazard, which must rarely be used (Wellman, p. 130). Therefore, what emerges is the idea that a trial is not the right place to test the goodness of a scientific theory given by the expert and if it has passed the critical examination of the scientific community, it enters the trail with unassailable strength. In fact, after a few lines, Wellman reveals the risks that a lawyer incurs disregarding the above-mentioned advice, during the cross-examination of a doctor. By doing so,

she ends up offering the opportunity to further spread on the deposition which he has already given to the doctor, thus allowing him to clarify to the jury what, instead, it may not have been understood or completely ignored. (Wellman, p. 131, *our translation*)

Therefore, the main strategy given by Wellman to cross-examine an expert testimony would consist in attacking his personal credibility, leaving aside completely the technical content of the testimony. The author provides many examples about this. Only some are reported below:

- The entire effect of an expert's deposition can sometimes be nullified by submitting the testimony to a sudden and unexpected verification of his experience, ability and judgment. If the expert fails the test, *he may be ridiculed in front of the jury*. In this way, the laughter aroused will make the jurors forget everything that he has declared against the reasons supported by the *cross-examiner* (Wellman, p. 138, *our translation, our cursive*);
- QUESTION: "Doctor, you declare currently practicing as such. Have you been doing it for long in the city of Chicago?" ANSWER: "Yes, I have been practicing here in Chicago for almost forty years now" Q: "Well doctor, during this time, I assume you have had the chance to treat some of our most eminent citizens. Am I right?" A: "Yes, I think so" Q: "Any chance, doctor, that you have ever been called as a family doctor, to visit old Mr. Marshall Field?" A: "Yes, I was his doctor for several years" Q: "By the way, I haven't heard of him recently. Where is he now?" A: "He is dead" Q: "Oh, I'm sorry to hear that. Were you ever old Mr. Cormick's doctor?" A: "Yes, for many years" Q: "Could I ask where he is now?" A: "He is dead" Q: "Oh, I am sorry". He continued in the same way, to ask information about eight or ten of the most important citizens of Chicago who he knew had been his friend's [the testimony] patients and who were all deceased. Once the list was over, he calmly sat down while the jury giggled and commented: "I do not think it is

necessary to ask further questions. Have a seat.” (Wellman, pp. 157-58, *our translation*)⁹

Therefore, in Wellman’s text, one can notice a general attitude towards the expert testimonies, which, twenty years later, will find its expression in the *Frye standard*. There is the conception that scientific knowledge, which has developed and tested outside courthouses, technically cannot be questioned during the trial because – according to its epistemological inferiority – it is only the place to test personal reliability of testimonies (Wellman, p. 130).¹⁰ To the point that the objective repeatedly stated by Wellman is to arouse laughter in the listeners.

As already mentioned in the beginning, when we talk about scientific evidence within the trial, one usually refers to the testimony of an expert (Walton, 2002, pp. 236-37). In fact, even though scientific evidence can initially be under the form of documentation or judicial experiment, interpretative activity of an expert who can explain the results of specific means of proof and links them in a significant way to the case in question during the judicial dialectic is often necessary (which always happens in a rhetorical and dialectical manner). As pointed out by Douglas Walton, the ability of scientific evidence to explain the facts of the cause is largely connected to the reliability of the *expert* testimony who offers interpretation, which emerges during long examinations and cross-examinations (Walton, 2002, p. 237). Therefore, since the entire scientific debate cannot be reproduced within the trial, the Author defines the arguments used by prosecutors, lawyers and judges, which follow the expert’s reports, as *appeal to expert opinion*.

What tools do trial parties – as said, lawyers, prosecutors and judges (or jurors) – have in order to examine different opinions of conflicting experts?

Undoubtedly, in the first half of the twentieth century – the period of Wellman and the *Frye standard* – the distrust of epistemological tools of the trial leads to believe that only the *expert’s* personal reliability can be examined and not the technicality of the theory which she brings to court.

In his reconstruction of the typical characteristics of *legal argumentation*, Douglas Walton provides us with proof on how this type of attitude towards experts, is still extremely actual. In fact, according to the Author, cross-examination of the expert testimony consists in: *i*) an *exetastic* dialogue between the expert and his *counter-examiner* (e.g., the defense lawyer if expert is in the prosecution), *ii*) during which questions which criticize conclusions of the counterparty that base their acceptability on the *appeal to expert opinion* (e.g., on what is claimed by the expert who is being cross-examined) are reasonable (therefore, legitimate) (Walton, 2002, p. 241). We can see these two points briefly.

From the interpretation in a later work that Walton himself provides of the so-called *exetastic* dialogues, these are distinguished by the fact that who asks the questions tries to lead the other party to a sort of *personal inconsistency*, which is then used to attack the technical-scientific arguments. In fact, the *exetastic* type of argument corresponds quite well to the descriptions of the circumstantial *ad hominem* argument given in modern logic textbooks (Walton, 2007, p. 64).

However, while *ad hominem* arguments are generally considered invalid because misleading from the focus of the dialogue (D’Agostini, pp. 109-10), in his theory of argumentation, Walton reaffirms the legitimacy of it in the context of the trial, especially if

⁹ Even in this case, one must highlight how the examination does not relate at all to the circumstances of the testimony deposited, but only discredit the expert witness.

¹⁰ It is interesting to underline how the idea – typically modern and which will suffer a crisis only during the second half of the twentieth century – of the existence of an actual objective and neutral science which law cannot criticize, emerges throughout Wellman’s text.

moved forward against the expert testimony during the cross-examination. In fact – as one can remember – scientific evidence which is often useful to define the fact, does not have legal value itself, but only after having found a place – generally through the expert’s testimony – within the rhetorical-dialectical activity of the parties in court (Puppo, 2015, p. 219). In this context, dominated by subjects without actual ‘scientific’ qualifications (the public prosecutor, the lawyer, the judge, the jurors), the most accessible method to compare the contrasting *experts’* thesis, is to in fact discuss their reliability or personal credibility, in terms which are understandable also outside the specific scientific sphere, rather than reasoning on technical details of their thesis (Walton, 2002, p. 243).

Therefore, the ways to carry out cross-examination of the expert testimony – thus, acquiring scientific evidence – suggested by Wellman, as well as being confirmed in Walton’s *legal argumentation*, appear to be the only possible ones as long as there is a model of ‘deferent’ trial towards science, represented by the *Frye standard*. In fact, by limiting the epistemological possibilities of judgment, the use of *ad hominem* arguments is the main method, which parties have to test the reliability of the expert.

4. Perspectives of expert testimony after the ‘Daubert turn’

As we saw, with contributing factors such as epistemological crisis of science and the authority claim of the courts, in 1993, with the Daubert case, there was a change of perspective. In that context, the Court introduced the principle according to which general acceptance of the scientific community as well as *peer review*, are only a part of the elements that judges have to determine what is, in a specific case, valid science (Tallacchini, p. XVI).

This new role conferred to courts, entails greater responsibilities in particular when taking on scientific evidence, during which judges (or the jury) must evaluate technical merit of the proposed theory and therefore, long cross-examinations that focus on expert’s credibility, could no longer be sufficient.

As one might remember, at the end of the first paragraph we referred to two orders of consequences strictly linked to the ‘Daubert turn’, a subjective one (of the judge) and an objective one (of the trial).

In relation to the subjective element, we have already referred to the increasing literature that aims to educate legal operators on peculiarities of the scientific method.¹¹ However, it is evident that given the variety and complexity of the issues that reach the courts, it is unthinkable that prosecutors, lawyers, judges and jurors become connoisseurs of every discipline in order to confront the experts and evaluate their theories. Hence, the relationship between the expert and the juridical actors resembles the existing one between the *expert* and the *novice* who is studying the former’s words, within the scientific field. This type of comparison reminds us the Alvin Goldman’s *novice/expert problem*, where the Author wonders what the real possibilities for a novice to identify the best theory among a dispute between experts, are. According to Goldman, if a *non-expert* finds herself in such a situation – extremely common in trial, suffice to think of the experts of respective parties who offer opposite interpretations on the same phenomena – she would have five different possible strategies to establish the actual competence of the interlocutors and the best available theory (Goldman, p. 93; see also Zuolo, pp. 21-23):

¹¹ For example, Jasanoff (2005) or Haack (2015). The latter, especially, allows for further consideration on the investigation regarding which is the scientific method confirmed by the Daubert ruling (Haack, pp. 157-206).

- I) Discuss the actual goodness of the arguments presented by the experts to support their position;
- II) Compare the experts to each other;
- III) Consult a meta-expert;
- IV) Check for any conflicts of interest or prejudice of the experts;
- V) Verify previous successes obtained by experts in applying their theories.
- VI)

As already mentioned, we are aware that the scientific and legal spheres of research are completely different and that for the latter, the discovery of the best scientific thesis among the proposed ones is only one of the useful aims in decision making, but not the most important one (Haack, p. 226). However, taking into account the role of assessing science given to the judges by the Daubert decision, let us try to consider briefly, whether and in what ways these five strategies can be used within Italian and American penal trials, in order to evaluate their epistemological tools before science.

Out of the five proposed steps to evaluate scientific theories that enter a trial, probably the last two correspond to what has already been analyzed in the previous paragraphs; the second and the third one are strictly connected to decisions of procedural policy made by each judicial system; while the former, corresponds to a further epistemological effort that the ‘Daubert turn’ requires from the courts.

As far as point IV) is concerned – the presence of conflicts of interests or prejudice of the expert’s testimony – we believe that this step is potentially satisfied by *exetastic* dialogue seen in the previous paragraph. In fact, the *ad hominem* arguments used by cross-examiners are aimed to attack personal characteristics of the expert, such as alleged partisanship or lack of clarity of her skills.

Point V) – the evaluation of previous successes obtained by the expert’s theory within the scientific community – instead appears to retrace what was expected by the *Frye standard* regarding admission of scientific evidence in court. This criterion did not disappear after the Daubert ruling, but simply constitutes one of the elements of scientific evidence assessment and not the decisive one (Dominioni, p. 147).¹²

As mentioned, the actualization of points II) and III) is linked to the assumption of certain penal procedural policies by the various legal systems – especially the implementation of pure or spurious accusatory system or, otherwise, investigatory systems – which do not represent the main object of this paper.¹³ Just to give some examples, in the early 2000s the Italian Corte di Cassazione¹⁴ expressed itself regarding the opportunity for experts to compare among themselves (point number two). This decision n. 35187 of 2002, restated that in accordance to art. 501 of the Italian procedural penal code (hereinafter “c.p.p”), a comparison among experts is possible only according to art. 212 c.p.p. during the trial, but in no way can expert witnesses *cross-examine* each other.¹⁵ In this context, we cannot analyze in depth the details of the art. 212 c.p.p., but for our purposes it is sufficient to underline that through this method of comparison experts cannot ask each other direct questions (authority which is solely reserved to the judge, at this stage) but at most, express concerns about the colleague’s thesis. However,

¹² As far as the Italian legal system is concerned, remembering what has been said previously, the Cozzini ruling is considered a clone of the Daubert one by many interpreters, see notes n. 2 and 8.

¹³ For further information on epistemological competence of the accusatory trial, see Haack, pp. 39-67.

¹⁴ It represents the third and last degree of judgment in Italy.

¹⁵ «Technical consultants are not given the right to cross-examine the experts, since art. 501, comma 1, of the c.p.p., on the subject of experts and technical consultants’ examination, refers to the norms of the testimonies’ examination if applicable. These norms on the testimonies’ examination do not consider any cross-examination of testimonies between each other (and the consultant is compared to the testimony), but only the possibility to be confronted and questioned by the prosecutor, as well as the defender of the parties» [Cass. pen., sez. I, sent. n. 35187 of October 21, 2002, *our translation*].

as far as point *III*) is concerned – the possibility of consulting a meta-expert – the difference between the American and Italian procedural system strongly emerges. While in the first, because it is purely accusatory, there is no possibility for the judge to *interfere* with his own expert in the dispute between parties (Tonini, p. 2); in the second, the figure of the meta-expert can be represented by a consultant appointed by the judge *ex artt. 220 c.p.p. and ff.* (the so called *perito*).¹⁶

Now, let us see the first strategy that Goldman suggests to a *novice* who would like to understand which expert to trust. As we have already said, briefly, it seems an expression of what was required in the Daubert ruling, namely that judges evaluate the actual extent of the experts' arguments. It is interesting to report some of the Author's reflections because they allow us to understand how the transfer of information from expert to novice, occurs. This, for our purpose, contributes to the composition of the famous paradox, which distinguishes experts' testimony: «science which confesses its uncertainty urges a judge's intervention; but the judge is not able to make an informed decision if he cannot understand what science has to offer him» (Tuzet, p. 206).¹⁷ In the following analysis, we will see a comeback of what we defined, in the first paragraph, as objective consequences of the 'Daubert turn': the need of procedural devices suitable for the new epistemological role recognized to the judges.

As you will remember, the main characteristic that distinguishes the *expert* testimony from a *lay* one is that the first one is authorized to formulate inferences based on her specialized experience stemming from facts that emerged during the trial. Goldman, evoking a contribution of John Hardwig, in identifying the main differences between a *novice* and an *expert*, refers precisely to the different ability of the two subjects to draw conclusions within a specific context (Hardwig, pp. 336-39). In fact the novice:

- a) Does not possess any or some of the premises from which the expert draws her conclusions;
- b) Is in a condition of epistemological inferiority which does not allow her to evaluate the relationship that the expert has placed between the premises and the conclusion;
- c) Does not know any or some of the possible conditions that would make defeasible the transitions from premises to conclusion of the expert.
- d)

In reference to point *a*), the Author devotes his attention in distinguishing, among the statements pronounced by the expert, between the so-called *esoteric* ones and the so-called *exoteric* ones (Goldman, p. 94). While for the latter, the novice is able to establish their *truth-value* because they are not related to the expert's specific area of expertise, the former – due to their high technical component – are more difficult to understand, to the point that the novice is not able to establish their *truth-value*. Goldman, then, makes a further distinction among *esoteric* statements, dividing them into ones that owe their complexity to semantic reasons – therefore, their complexity can be *easily* overcome by paraphrases or reformulations (D'Agostini, pp. 41-68) – and ones which owe it to epistemic reasons.

Considering that no statement is *esoteric* in itself, but is always in relation to the epistemological condition of the subject which is addressed to (Goldman, p. 106), it seems appropriate that every *novice* called to evaluate the experts' thesis (in our case, judges and

¹⁶ The *perito* is not appointed by the judge with the direct purpose of offering her opinion on the dispute between the consultants of the parties, but with the aim of facilitating the judge in carrying out investigations or evaluations that require specific technical skills. In light of the proposed reconstruction, it is clear that its report can serve as a meta-report with reference to the thesis of the consultants of the parties (Dominioni, pp. 340-44).

¹⁷ Wellman already pointed out that few shows, if we want to call them that, can be more absurd and incongruous than a jury composed by twelve people who, without any prior study or scientific training, are suddenly called to judge controversies where the most distinguished luminaries strongly contradict their respective claims (Wellman, p. 171).

jurors) can at least ask questions to solve semantic doubts. In regards to procedural devices which allow the motion of such questions in the Italian context, this authority is undoubtedly recognized to the judge by art. 505, comma 2, c.p.p.¹⁸ While in the American context, given the aforementioned eminent accusatory nature of this system, such authority is not generally expected, but one must underline the constant evolution towards such opening, to the point that the states of Arizona, Colorado and Indiana have already explicitly granted to their jurors the authority to ask the experts questions (Montaldo, p. 1).

The above-mentioned points *b*) and *c*), refer more properly to the epistemological differences between expert and novice in evaluating the inferential connection between premises and conclusion. It results more complex to fill such a *void* in the short time of the trial, because the novice does not have the necessary specialized competence. Thus, referring to justifications that each expert offers to support its inferences during a dispute, Goldman introduces the distinction between *direct* and *indirect* argumentative justification (Goldman, pp. 94-96). With the former, the expert *E1* aims to offer to the novice-listener good reasons that directly support *E1*'s conclusions. However, considering that expert *E2* will try to do the same, for the novice it will be very complex to understand which of the two justifications has a higher *truth-value*.

Hence, the novice will often 'have to settle' with relying on *indirect* argumentative justifications, that is to say dialectical superiority of one of the experts, rather than the greater smoothness with which one of the experts was able to face the examination and cross-examination. It is clear that they are not conclusive factors for evaluating the reliability of a thesis but, in any case, can serve as indicators of greater epistemic validity of one of the discussed thesis (Goldman, p. 95). In conclusion, we believe that a tool to increase reliability of *indirect* argumentative justification in the legal field, could be to make the expert's examination and cross-examination more complex from a technical-scientific point of view; for example, allowing experts to examine each other.

In fact, recalling that both in the Italian and American system this method is precluded, we would like to report the critical view offered by Oreste Dominioni:

the need to give effectiveness to the critical examination of the expert's deposition can recommend experts and technical consultants to participate actively in the examination with their own questions. It has been said that this would exacerbate "the consultant's position as 'technical defender', rather than as means of proof" and therefore, should not be allowed. However, it is not clear how this effect can be produced: the questions-among-experts method projects dialectical research, which is used in the field of study, onto the juridical scene, and asking questions to the counter-expert has an internal gnoseological function in creating scientific-technical evidence (Dominioni, p. 270).

2. Conclusion

In the first paragraph, we highlighted how the figure of the judge who faces science has changed, in light of the Frye and Daubert rulings. We started from the idea of a 'deferent judge', in front of whom prosecutors and lawyers' main strategy to challenge the expert's inferences lies in *exetastic* examinations and use of *ad hominem* arguments. Reaffirmed the actuality of

¹⁸ «The president [of the panel of judges], even upon request of another member of the college, can ask questions to testimonies, experts, technical consultants, people indicated in article 210 and the already examined parties, only after examination and cross-examination».

these strategies – in line with Douglas Walton’s studies –, we asked ourselves what new prospects for the experts’ cross-examination could there be after the ‘Daubert turn’.

Therefore, stemming from the need that judges and jurors must establish an actual dialogue with scientific theories – which are the content of the expert’s testimony – we compared the position of those juridical subjects to a *novice* who faces a dispute among experts and must understand which position has the greatest *truth-value*.

By following the five strategies proposed by Alvin Goldman, we asked ourselves whether the current procedural devices – both Italian and American – live up to the role given to the judge by the Daubert ruling. The answer was not unique. In fact, in some cases, we observed an ongoing evolution (such as jurors who ask direct questions to experts); while in other cases, we hoped for a legislator’s intervention, for example, suggesting the possibility – now, precluded in both legal systems covered in our paper – also to involve experts in the reciprocal cross-examination. Embracing the critical position of Oreste Dominioni, we underlined how cross-examinations could reach the technical-scientific complexity necessary to confer to the *indirect* argumentative justification a persuasive effect, which is epistemologically grounded.

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