Isaac Ray at 200: Phrenology and Expert Testimony

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In honor of Isaac Ray's 200th birthday, the author examines his early career for an example of critical thinking about expert testimony. Ray, a scientist from the outset, expressed interest in phrenology, a contemporary science of the mind. This paper explores a criminal case from Maine in which phrenological testimony was proffered and which Ray critiqued. The author then examines Ray's standards of practice in relation to present concepts of admissibility of expert testimony. He concludes that Ray's quality standards remain evident in contemporary efforts to apply evidence-based science to legal matters.

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As we mark the 200th birthday of Isaac Ray, founder of forensic psychiatry in America and one of the "Original Thirteen" members of the Association of Medical Superintendents of Institutions for the Insane (AMSII, the original name of the American Psychiatric Association) organized in 1844,[1] it is worthwhile to glance back at his early interest in expert testimony. Ray (Fig. 1), born January 16, 1807, was a vocal, tenacious, and lifelong supporter of the role of psychiatric expert witnesses in the adjudication of matters of mental state and the law. Ray believed strongly that physicians, not just judges, should have decision-making authority in matters of civil commitment, and he advocated broader definitions of insanity *vis-à-vis* criminal responsibility. As Quen[2] observed, "Ray was intensely concerned with improving the quality of medical testimony in the courts" (Ref. 2, p xxvii). One cannot fail to admire Ray's steadfast support of professional self-reflection and concern for psychiatric patients[3] in an era in which the focus was on humane care, but effective therapeutics were lacking.[4]

The 19th century witnessed many important developments in American forensic medicine, including education in medical jurisprudence, an appreciation of cause and effect in pathophysiology, and the professionalization of expert witnesses, especially in toxicology and surgery.[5] At the time Ray practiced, what we now call psychiatrists were generally referred to as asylum doctors,[6] and serious mental illness affecting one's capacity was described as insanity.[7]

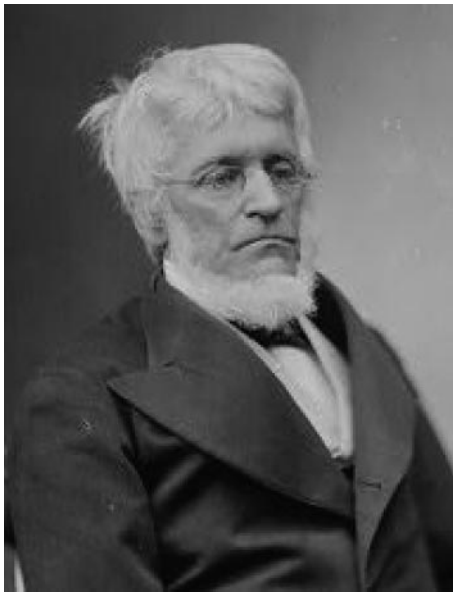

Figure 1. Isaac Ray (Source: Library of Congress, Brady-Handy Collection, 1865–1880).

Reforming and modernizing mental health-related law was a constant struggle between the evolving morality of the young United States and the conservative tug of English legal traditions. Accordingly, amid the chaos of new sciences and progressing standards and morality of care, Ray's steady focus on quality in medicolegal matters is remarkable. In his career development, Ray needed to confront some of

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the prevailing theories of mind, such as phrenology, and concepts of criminal responsibility, such as "moral insanity" while establishing forensic practice standards. In the following case, published several years before his celebrated *Treatise on the Medical Jurisprudence of Insanity*,[8] we see an early example of Ray's ability to analyze a legal matter and to understand the role of expert witnesses.

Phrenology on Trial: The Case of Major Mitchell

In 1834, Major Mitchell, a nine-year-old boy from Durham, Maine, was tried for the beating and mutilation of another boy. The publicized case caught the attention of John Neal, a literary critic and lawyer from Portland, who voluntarily participated in the defense. Neal reported his exploits in the *New England Galaxy*, a phrenology-friendly periodical that he edited.[9] Isaac Ray, who had examined the boy for Mr. Neal, excerpted Neal's account and added commentary in the *Annals of Phrenology* in 1835.[10] Others have commented on the Major Mitchell case in connection with Ray's career development.[11,12] Walsh[13] studied the case in detail and tracked the boy's outcome. The case represents a snapshot of lawyers, doctors, and a judge struggling with admissibility thresholds for medical testimony and Ray's quality concerns about what kinds of testimony would be helpful to the trier of fact. The considerations illustrated in this drama have an eerie freshness when we consider late 20th-century discussions of admissibility, reliability, and helpfulness of scientific evidence in legal matters. In the following factual account of the case, I will be using Ray's and Neal's accounts; afterward, I will add Ray's critical commentary.

The Crime and Confession

Major Mitchell was arrested for violent misconduct and confessed to the beating and partial castration of an 8-year-old schoolmate, David Crawford. The case was widely publicized,[13] carrying headlines such as "Juvenile Depravity,"[14] "Extraordinary Case of Cruelty,"[15] and "Maiming."[16] Because the confession to the jail physician appeared incompetent and rehearsed, the boy was befriended by lawyer and phrenologist Neal, and examined by Neal, Ray, and others who took measurements of Mitchell's head. Ray introduces an excerpt from Neal's account by saying the case "adds another to the mass of evidence that is daily accumulating in favor of our science [phrenology]" (Ref. 10, p 303). Thus, it is clear from the outset that Neal had high hopes that phrenology could play a credible role in the adjudication of legal matters. Ray, as we shall see, was more circumspect.

Before Neal met him, the boy gave statements to Dr. Jesse W. Mighles and others while in the Portland jail (Ref. 10, pp 304–5): On a Monday when there was no school, "[Major] persuaded David to go into a pasture near, where he intended to whip and kill him—on what account he cannot tell." Major "vexed" David, who called him names such as "a hog, a fool, and a stealer." The boy confessed that he began to beat David with his fists and would have killed him, but for a neighbor who broke them up. Later, Major overtook David on the road and coerced him to go into the woods. He confessed to Mighles: "I put him into the water with his clothes on, and kept him there ten minutes, trying to drown him." The boy then lists a series of atrocities perpetrated on the victim, for example: filling David's mouth with leafy material; pulling off all his clothes; tying up his hands and feet; beating him with sticks for five hours, striking him 500 times, drawing blood; holding him face down in ankle-deep water for eight minutes; and building a dam to deepen the water. He let the victim go, fearing he would be caught by the man who had broken them up before.

Mighles then inquired further on some of the facts Major reported. For example, hearing that Major delivered 500 blows to David's naked body, the doctor asked how many sticks he used. He answered 500. Similarly, when asked how many blows he inflicted with each stick, he replied 500. Indeed, Major kept saying 500 no matter how the doctor rephrased the question. Ray commented later, "His idea of five hundred was probably as definite as that of five million, for it appears from the evidence, that he could not count beyond thirty-eight. . . . By five hundred, it is obvious he meant only an indefinite number, beyond his power of counting" (Ref. 10, p 305). Mighles also determined that Major's sense of time was as flawed as his concept of quantity. Hearing the confession repeated, Neal was impressed by its rote quality and the boy's detached affect. He considered the statement unreliable and began to search for physical reasons for the boy's behavior, such as a blow to the head. Speaking with Major's mother, Nancy Plummer, Neal learned that, at about one week of age, Major injured his head during a fall from a high

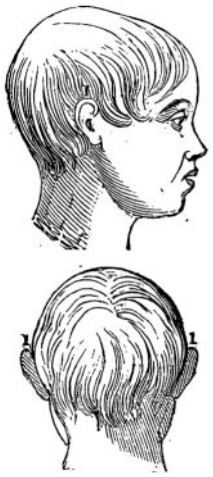

Figure 2. Phrenological sketches of Major Mitchell.[9,10] Neal[9] notes: "For the reference of the uninitiated, we have caused the spot upon the head where [the Organ of] Destructiveness is placed to be marked by a figure."

chest. The child's head swelled, and the attending physician gave him a poor prognosis. His wild behavior afterward was usually attributed to the injury.[13]

Send in the Phrenologists

Seeking a "medical" basis for the boy's apparent deficits, Neal brought in experts before the plea hearing. There were phrenological examinations and measurements of the juvenile by Neal, "a lecturer on phrenology" (referred to as "Mr. Jones" in the *Galaxy* articles), and Ray. A cast of the boy's head was made, as well as one of his mother's.[13] There were significant disparities between the others' and Ray's examinations in the interpretation of the prominence of several of the boy's brain "organs" (for example, Benevolence, Conscientiousness, Approbativeness, Firmness, Cautiousness, and Secretiveness). A sketch of Mitchell's head, reproduced both in Neal's account and Ray's article, highlights the Organ of Destructiveness, just above the ears (Fig. 2). Supposedly, this abnormality created the causal link in the formulation of the boy's violence.

The lecturer and Neal gave their impressions based on the cast and Neal's own measurements. Neal reported in the January 24, 1835, issue of the *Galaxy* that a few days after the cast of Major's head was taken, Ray and others listened as the boy repeated his story. Neal was convinced that there were questions to be raised about the boy's deficits, but was not sure whether to bring them out through medical or phrenological testimony. On the one hand, there may have been a credible history of infantile traumatic brain injury, whereas on the other, the prominence of Destructiveness could persuade a jury that the boy was damaged and therefore not responsible for his acts.

Phrenology in the Courtroom . . . or Not

Though counseled by Neal not to do so, the boy pleaded guilty at the arraignment and then Neal:

> . . . interfered [by interposing himself as defense counsel], and the plea of not guilty was received. . . . At once therefore, I determined to go to trial, and rely upon extracting the groundwork of a defense from the government-witnesses. If I could show the injury to the head, no matter how, I was prepared with Medical *or* Phrenological testimony, as the nature of the case might require [Ref. 9, January 31, 1835; emphasis in the original].

Neal had hoped that his mother or stepfather would testify about Major's infantile head injury, but neither was willing to do so.[13] Nevertheless, he proceeded to proffer expert testimony in what we might consider a haphazard fashion, given that the doctors were government witnesses and none had any credible expertise in phrenology.

Armed with potential expert witnesses (though Ray was not among them), Neal tells of his idea to introduce medical and phrenological testimony into the Major Mitchell case:

> Believing now, that there was a good foundation to proceed upon, I determined to introduce a new question of Medical jurisprudence; and being satisfied that if I could *prove* the injury to the child's head, or render it *probable* by the testimony of medical men, that *it had sustained an injury*; or that there was a *malformation* of the head; or that the remarkable *want of symmetry*, (one ear being higher than the other, and the developments of [the organs of] Destructiveness and Secretiveness considerably larger on that side) indicated something *doubtful* as to the healthy condition of the brain—being satisfied, I say, that if I could do any one of these *four* things, I should be able to introduce Phrenology, for the first time, into a Court of Justice, and obtain the responses of her priesthood upon oath, I prepared for trial with these three leading objects in view—The Discovery of Truth—The promotion of Justice—and the enlargement of Legal Science. Not that I would be understood as having *postponed the cause of Justice*, even to the *Discovery of Truth*; but simply that my first object was to obtain the truth, the whole truth, and nothing but the truth, as preliminary to a yet higher object, the promotion of Justice. But supposing all the other facts of the case proved, still there might be a question for the jury—there certainly was one in my own mind—whether the boy was capable of crime, or in the language of the law, *doli capax*. This would, or rather might, open a passage for the introduction of Phrenological testimony, and thereby enlarge the boundaries of legal science [Ref. 9, January 31, 1835; emphasis in the original].

Expert Testimony

At trial, Neal made a feeble attempt to introduce medical testimony via a Dr. Barrett, who stated:

> "I am not a Phrenologist—I know but little about Phrenology. *So far as I do know any thing about it, I am a believer.* Spurzheim on Insanity and Combe on Phrenology are standard works. I have examined the prisoner's head. The idea of injury might or might not have occurred to me, had I been led to examine it elsewhere. I should think there was an unusual depression here (about the junction of the parietal and frontal bones.)" [The witness was] *cross-examined* only as to the effect [on the victim] of immersion in cold water, and the probability of hemorrhage from a lacerated wound [Ref. 9, February 7, 1835; emphasis in the original].

Clearly, Neal was more interested in demonstrating something about Mitchell's head than he was in parsing the differences between phrenologically and brain injury-based pathophysiology, though either one could be used to support today's definition of developmental disability or mental defect. For his part, Dr. Barrett went along with the head injury idea, though there had been no testimony documenting the injury.

Mighles, who examined the boy and heard his confession, also testified:

> *I am a believer in Phrenology, as a science*. Great changes have taken place in the treatment of insanity, as well as the mode of dissecting the brain, since that work appeared I have examined the prisoner's head—there is something remarkable in that—a very unusual *depression*—I presume it is congenital. All heads are more or less deficient in symmetry, but the want of symmetry *here*, is quite remarkable. I have examined it repeatedly before, and had come to the conclusion long ago, and before I was called, that some injury had probably happened to it. The right ear is lower than the left, and there is a considerable protuberance on that side—an injury to the muscle of that ear, caused by a fall or blow to the head, might naturally produce these appearances. Certain functions of the brain may cause in consequence of a blow—the functional power may be destroyed—while the rest continue undisturbed. Such is the doctrine of the books, and I believe it. [Cross-examination:] I do not speak of this destruction of the functional power of the brain in part, while other parts continue uninjured, from experience. Change of intellectual or moral character might appear a twelvemonth after the injury, from irritation or inflammation [Ref. 9, February 7, 1835; emphasis in the original].

Although Mighles' testimony lacked cogency, at least he had a working hypothesis that a blow to the head could cause brain disturbance. Unfortunately, he could not opine whether the defect was congenital or acquired; nor whether this boy had sustained a head injury.

Phrenological Testimony: Admissibility Threshold

Arguing to the court, Neal then proposed the acceptance of phrenological testimony, which was objected to by the Attorney General, ". . . opposing the introduction of such testimony upon two grounds—1st, that it had never been heard of before; and 2ndly that neither he, nor the jury, nor perhaps the court would be prepared for understanding the subject" (Ref. 9, February 7, 1835). Neal responded that chemistry was also a comparatively new science, yet courts permitted testimony in that area. Second, he said it was not necessary for the court, the attorney general or the jury to be acquainted with phrenology, because Mighles was an expert "whose opinions, founded on acquaintance with the subject, by reading and observation, were to be judged of by the jury, as any other matters of fact—as opinions to chemistry, surgery, bookkeeping, astronomy, or navigation, for example" (Ref. 9, February 7, 1835).

The judge suggested Mighles testify as a medical man, but this did not satisfy Neal. He argued that even if phrenology were of no consequence in this client's case, it might be to others, and he again urged the court to have the witness qualified in the area of phrenology. Neal recalled:

> At this moment however, the Court interposed and asked a question, which resulted in a declaration by the witness, that he could not of his own knowledge, say that such or such enlargement of the given organ would produce a correspondent change of character. To be sure, he believed, though he did not know, of his own knowledge, that a blow on the head might change the character of the individual in some particulars, though it left him unaltered—undisturbed in others. Of course there was nothing more to be said. One of my chief purposes however, was accomplished. Phrenology had been mentioned seriously in a Court of Justice, without provoking laughter [Ref. 9, February 7, 1835; emphasis in the original].

On cross-examination Mighles said modestly,

> I never knew an injury to vary the conduct of an individual. I could conceive a change of intellectual character, a year or two after the injury *as a consequence*. Inflammation might follow, and the functions of a part of the brain, might be disturbed though the rest were to continue healthy [Ref. 9, February 7, 1835, emphasis in the original].

And on redirect, he speculated, "I do not know, *as a surgeon*, what would be the effect of an enlargement over the ear in that particular region. *It would, if phrenology is true*, *be likely to exasperate* [sic] *the feeling of destructiveness*" (Ref. 9, February 7, 1835; emphasis in the original).

The Court Rules

After hearing arguments of counsel and the Attorney General, Judge Emery, noting that prisoners between the ages of 7 and 12 were presumed to have the capacity to commit crimes, commented as follows:

> But it is said, that the head has a large peculiar formation called the organ of *destructiveness*. There is no disposition to keep out of Courts of Justice *true* science, but on the contrary to pay a marked deference. If a question were raised here, as to a fact committed in the East Indies, and by two persons it should be said to have been full moon at the time; and *Astronomers* should be called, who should demonstrate from calculations, that there could not have been full moon at the time, it would be proper evidence for a jury. So if *dyers* be called, as to the effects of chemical combinations upon colors; or if *Physicians* be called to show the effects of poison upon the human frame, such is competent testimony. But, what it shall have been demonstrated by proof like this, that a bump here or a bump there shall affect the mind, either to destroy the powers of mind, or decidedly to alter its character, then, and not till then, will such become proper evidence to be submitted to a jury. Where people do not speak from *knowledge*, we cannot suffer a *mere theory* to go as evidence to a jury; especially where one says he is a believer in the system, and has no personal knowledge upon the subject. Our decisions are made in the daylight, and the jury are judges, of law as well as of facts [Ref. 9, February 14, 1835].

Compare this language from *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923), to that in the *Mitchell* decision:

> [Quoting from the defendant's brief] The rule is that the opinions of experts or skilled witnesses are admissible in evidence in those cases in which the matter of inquiry is such that inexperienced persons are unlikely to prove capable of forming a correct judgment upon it, for the reason that the subject-matter so far partakes of a science, art, or trade as to require a previous habit or experience or study in it, in order to acquire a knowledge of it. When the question involved does not lie within the range of common experience or common knowledge, but requires special experience or special knowledge, then the opinions of witnesses skilled in that particular science, art, or trade to which the question relates are admissible in evidence.
>
> [The court continued] Numerous cases are cited in support of this rule. Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.
>
> We think the systolic blood pressure deception test has not yet gained such standing and scientific recognition among physiological and psychological authorities as would justify the courts in admitting expert testimony deduced from the discovery, development, and experiments thus far made [Ref. 17, p 1014].

The judge in *Mitchell* instructed the jury to disregard any considerations of a phrenological nature. Instead, he charged them with determining whether, at the time of the incident, the boy could distinguish right from wrong. Walsh has accused Judge Emery of bias against the defendant: "Justice Emery's summation as it has been recorded appears to this writer as one which left the jury with essentially no decision to make at all" (Ref. 13, p 7). Mitchell was convicted and sentenced to nine years at hard labor in the prison at Thomaston, Maine. He survived his ordeal and resurfaced in Durham, Maine, in 1870, where he was married and worked as a farm laborer.[13] Walsh notes that the Major Mitchell trial was the first time psychiatric testimony was used (by way of phrenology) in an American court.[13]

Discussion

Though standards for testimony were largely established in the 19th century,[5] forensic psychiatry is only now countenancing the need to apply evidence-based concepts to experts' opinions.[18] Judge Emery's ruling in the *Mitchell* case is eerily familiar, when one considers the standards set forth in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*[19] more than 150 years later. In effect, Judge Emery said that the scientific basis of phrenology was not reliable, and though it might be relevant to the question of brain functioning, the doctors failed to make the connection meaningful. Thus, the phrenological testimony was not helpful to the trier of fact. Similarly, phrenological testimony would not have passed the *Frye*[17] "general acceptance" test, a point not lost on Judge Emery nearly a century earlier.

Ray Weighs In

Isaac Ray did not participate directly in Major Mitchell's trial, though he volunteered to assist his friend John Neal. In a 30-year retrospective account of the case,[20] Neal recalled, "I had already secured Dr. Ray, who has since written so much and so well upon that subject [phrenology]" (Ref. 20, p 106), lamenting that Ray and the other doctors would not appear as phrenologists. Though we do not know if Ray was asked to testify as a physician, it is reassuring to see that he stayed out of the case. Thus, a basic piece of advice can be inferred from Ray's demurral: when in doubt about the appropriateness of testifying, the better decision is to stand aside.

Ray, however, formed clinical opinions about the defendant, some unfavorable. In his retrospective analysis, Ray makes a definite phrenologically based statement about Major Mitchell's acts, after taking into account his imperfect education and the possibility of provocation: "[I]t was still a most cruel, heart-sickening act, and was of that wanton, cold-blooded, motiveless kind that springs only from a large development of Destructiveness" (Ref. 10, p 306). Besides Ray's visceral reaction to the boy's alleged acts, he was apparently unable to think outside the box of faculty psychology. Despite his harsh words and hyperbole, Ray was most likely making the point that there was scientific evidence to explain, if not to excuse, the behavior. Perhaps his testimony could have been used in mitigation of sentence.

Never one simply to go along with the crowd, Ray was not satisfied with the quality of the previous cranioscopic (bump-reading) measurements:

> We saw Mitchell in the Portland jail a few months before his trial, and then, certainly, his organ of Benevolence struck us as far from being "*remarkably deficient*." Neither did any of the intellectual organs appear to us "astonishingly developed," as both the Lecturer and Neal represent, though they were, indeed, well developed. . . . Mitchell, certainly, presented the most striking instance of the catlike pathognomy that we ever met with. . . . From such an organization, it needs no uncommon experience in Phrenology to infer the character of a cowardly, bloody-minded, able villain, distinguished by superior tact and shrewdness [Ref. 10, p 307].

Ray illustrates various "faculties" by examples of Mitchell's behavior and statements. It appears that he considered phrenological assessments valid and reliable—but only in the right hands. This is another take-home point from Ray: testimony on medical tests is only as good as the evaluator. In any event, one would have to regard Ray's position as forensically neutral, as either the defense or prosecution could have capitalized on his findings.

In his published analysis, Ray admits that this was not the ideal case to introduce phrenology "into the dark passages of our Criminal Law" (Ref. 10, p 308). He notes that one ground of the defense was that the boy received a head injury from a fall,

> . . . whereby the portion of the brain, called, by Phrenologists, the organ of Destructiveness, was preternaturally enlarged and a destructive disposition excited. It will be readily seen—and, probably, Mr. Neal did so see it—that the question of such an effect was one entirely of fact, and independent of phrenology. It was necessary for him to establish, that falls on that part of the head were in the habit of producing a corresponding change on the character, which he not only could not do of course, but was unable to show the occurrence of any such change. He was anxious to ask one of the witnesses, whether, as a phrenologist, he considered that such an enlargement would be followed by the change in question, while the Court permitted his opinion to be asked only as a medical man. With this, Mr. N. declares he was not satisfied, because, "though he was questioned as a *medical* man, the moment he was called upon for his *reasons,* they would turn out to *be phrenological reasons.*" His reasons, or, more properly speaking, grounds of this opinion, must have been *certain facts,* without which, his evidence would have been utterly valueless, and we apprehend that the facts would have been received as sufficient authority for the opinion, whether related in the character of a physician, or a phrenologist. We could have wished that the first case for the introduction of phrenology into a court of justice, might be a strong one and prove successful; then would have been afforded an opportunity for a triumphant vindication of its utility, amid an augury of its future stupendous influence. In justice to Mr. N., however, it should be added, that he considered one of his chief purposes accomplished. ". . .Two most respectable physicians have acknowledged their belief in phrenology, as a science, *upon oath;* and there were many others here ready, whenever a case might require their help, to submit themselves to further interrogation" [Ref. 10, pp 308–9].

This is an important passage, because it highlights Ray's parallel interests in evidence-based forensic testimony and phrenology. That is, he sensed the importance of an underlying pathophysiology in making cause-and-effect statements in a legal matter. Readers interested in Ray's career development and phrenology are directed to a recent review.[21] As it turns out, shortly after the publication of his *Treatise*,[8] Ray stopped beating the drum for phrenology, though he fondly recalled it as a developmental milestone in his career.[21]

Returning to the theme of Ray's quality standards in the *Mitchell* case, we see several prominent themes in his commentary: first, he appears hopeful that, given the right case, phrenology might inform triers of fact about the connections between brain and behavior; alas, Major Mitchell's case was not it. Second, Ray was careful not to allow his enthusiasm for phrenology to cloud his judgment as it had Neal's in his "shotgun approach" to the boy's defense. In his critique of Neal's approach, he felt Neal was forcing the issue of phrenological testimony where it did not fit; or, at minimum, phrenology needn't have been invoked if a medical formulation would have sufficed. Third, Ray shows us a degree of clarity of thought and adherence to logic that retains a freshness applicable to contemporary standards of peer review. Despite the terrible things he said about the defendant, he clearly observed facts as distinguished from speculation. This feature of Ray's considerable ability was

present, as Quen[12] notes, from the time he wrote his medical school dissertation at age 20. Today's forensic psychiatrists would be well advised to take note of Ray's approach before venturing into the courtroom.

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