SCIENTIFIC EVIDENCE IN COURTS-MARTIAL: FROM THE GENERAL ACCEPTANCE STANDARD TO THE RELEVANCY APPROACH

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I. INTRODUCTION

In courts-martial today, the use of a wide variety of scientific evidence has become routine. Counsel for either side may offer fingerprint or blood type evidence to indicate identity. Trial counsel use chemical analysis of blood or urine to prove recent drug use or intoxication. Behavioral analysis of victims is presented routinely as evidence of rape trauma or battered child syndrome. Truthfulness, or the lack thereof, theoretically can be demonstrated by polygraph examinations.


-United States v. Ford, 16 C.M.R. 185 (C.M.A. 1954). Analysis of blood and urine only detects recent drug abuse because chemical evidence of drugs and alcohol in bodily fluids dissipates rather rapidly depending on the drug, the amount used, and the metabolism of the individual.


-See, e.g., United States v. Gipson, 24 M.J. 246 (C.M.A. 1987); United States v. Abeyta, 26 M.J. 97 (1987). Assuming the polygraph examination was administered by a Department of Defense or similarly-certified polygrapher, the questions asked at the examination were relevant, and the subject of the test testifies at trial, theoretically no barrier should exist to the admissibility of the polygrapher’s testimony.
The use of other newer types of scientific evidence someday may become just as routine.\(^4\) Apparently, scientists can now prove identity to nearly a mathematical certainty using DNA analysis.\(^5\) The use of radioimmunoassay analysis of hair suggests that drug usage can be detected for months, even years, after ingestion.\(^6\) As science advances, ever more creative means of producing evidence undoubtedly will be developed.

In recent years the standard for the admissibility of scientific evidence in courts-martial has undergone significant change. This change can be described as the replacement of the general acceptance standard with the relevancy approach. The purpose of this article is to examine the development and acceptance of the relevancy approach in the federal and military courts, analyze its meaning, and attempt to provide a working model for its application in courts-martial. However, before turning to that approach, an understanding of its predecessor, the general acceptance standard, is necessary. The underlying rationale for the general acceptance theory remains a consideration under the relevancy approach.

II. THE GENERAL ACCEPTANCE TEST

Since 1923, the admissibility of novel scientific evidence in federal, state, and military courts has been governed almost exclusively by the rule articulated in *Frye v. United States*.\(^7\) In that case, the Federal District Court for the District of Columbia considered the admissibility of evidence derived from a crude forerunner of the polygraph. Whereas the modern polygraph measures several different physiological

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\(^4\) Evidence derived from scientific techniques that are neither judicially noticed as a matter of course nor rejected out of hand as unreliable, are deemed "novel."


\(^6\) Much of the substance of the instant piece results from research and writing accomplished while producing that article. For an interesting article arguing that DNA profiling is currently scientifically unreliable, see Hoefle, *The Dark Side of DNA Profiling: Unreliable Scientific Evidence Meets the Criminal Defendant*, 42 Stan. L. Rev. 465 (1990).

\(^7\) Drug analysis of hair has been used in the following cases: *People v. Robert Kornier*, No. 154558, Santa Barbara Superior Court, 1985, and *People v. Mart Mejia*, No. 804003, Los Angeles Superior Court, 1985. The authors are unaware of any appellate case that has reviewed this type of evidence. The technique used in the analysis of hair-radioimmunoassay—is nearly identical to the technique used in urinalysis. The underlying theory is that as the blood circulates through the body the metabolites, or by-products created when the body breaks down a particular drug, are stored in the hairs of the body. As the hair grows, the chemical evidence remains within. Thus, depending on the length of the hair being analyzed, a record of drug ingestion may be determined that covers several months or even longer.

\(^{293}\) F. 1018 (D.C. Cir. 1923).
cal responses of the subject being tested, the device under scrutiny in *Frye* was a "monograph," which measured only blood pressure. Finding the test to be a novel scientific technique, the court enunciated a standard of admissibility in a brief, two-page opinion that would provide a basic framework for the analysis of scientific evidence in the courts of the United States for the next sixty years. That standard was announced as follows:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in the twilight zone, the evidential force of the principle must be recognized and while the 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 to which it belongs.8

The court then held that the evidence in question was inadmissible because the "lie detector" that was employed had "not yet gained such standing and scientific recognition among physiological and psychological authorities."9 The *Frye* court did not cite authority for the general acceptance standard, nor did the court set forth a rationale for it. Despite that fact, it was accepted initially without question. Only years later, when the standard was questioned, did courts begin to defend its application in any comprehensive manner.10

Several arguments in support of general acceptance were offered repeatedly. The most common basis for the test was the need to ensure the reliability of evidence upon which a jury based its decision. The issue of reliability was, and still is, seen as especially important in the area of scientific evidence. Although the judge or jury may have some innate ability to evaluate the testimony of lay witnesses, they probably do not have commensurate ability with regard to the complexities of science. This relative inability to assess critically scientific evidence is compounded by a concern that science in the twentieth century, albeit ever more incomprehensible to the layman, has taken on an aura of "mystic infallibility."11

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8Id. at 1014 (emphasis added).
9Id.
11In the words of the D.C. Circuit, "scientific proof may in some instances assume a posture of mystic infallibility in the eyes of a jury of layman...." Id. at 744. This paternalistic attitude toward the jury is an aspect of the *Frye* test that has been attacked by opponents. See infra note 81.
Thus, the primary reason for requiring general acceptance by experts in the particular field to which the evidence belongs is to address the potential for confusion in the face of seemingly infallible scientific evidence and to provide a method for determining its reliability. What the general acceptance standard does is supplant judges and lay juries with a “scientific jury” when issues of scientific reliability arise. This approach is premised on the view that scientists are best able to assess science. Assuming the particular evidence passes muster in the scientific community, the fact finder need only determine the appropriate weight to give the evidence. Weight issues fall within the natural purview of the fact finder because they center on concepts as credibility, and they depend—as do most factual matters—on the effectiveness of litigators. Thus, asking jurors to handle such issues is consistent with all the other tasks the judicial system demands of them. Additional justifications for the Frye test include ensuring the existence of a “reserve of experts . . . who can critically examine the validity of a scientific determination in a particular case” and promoting “uniformity of decision.”

The Frye standard received almost universal acceptance, although application of the standard is not without problems. For instance, some scientific evidence cannot be ascribed conveniently to a particular field of study to determine acceptance because the evidence may be the product of an interdisciplinary approach. Must such evidence be accepted generally by all scientific fields that contributed to its existence?

Perhaps an even more troubling issue raised by the general acceptance approach is whether it is the principle or the technique

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2^Despite concerns about the “mystic infallibility” of scientific evidence, the jury is free to assign whatever weight it feels is appropriate to any piece of evidence. Indeed, the jury is even free to disregard it completely. That scientific evidence often is disregarded, or at least not completely relied upon, should be clear to any counsel who has participated in a criminal case that resulted in acquittal. Arguably, “mystic infallibility” could pose a greater danger in the military because of the educational background of the court members. In that virtually all officers have college degrees, court members are likely to have been exposed to the “potential of science.” Thus, though science will not seem as mystic, it may seem more infallible. The contrary might be true of individuals who lack the education of the average military court member.
3^Addison, 498 F.2d at 744.
5^One court using the Frye standard to analyze voiceprint evidence noted that “[c]ommunication by speech does not fall within any one established category of science. Its understanding requires a knowledge of anatomy, physiology, physics, psychology, and linguistics.” People v. King, 266 Cal. App. 437, 456, 72 Cal. Rptr. 478, 490 (1968).
employed in the creation of the scientific evidence that must be accepted generally. A review of the *Frye* decision reveals that the court was concerned almost exclusively with the principle involved. Specifically, it found no generally accepted nexus between variations in blood pressure and deception. In subsequent years, however, many courts deviated from the precise holding in *Frye* and required general acceptance of the technique employing the principle. Other controversies arising as a result of the failure of the *Frye* court to provide a comprehensive analytical framework include the definition of the term "acceptance," how narrowly or broadly the relevant field from which general acceptance is sought is to be defined, what is necessary to qualify as an expert, and how general acceptance is to be proven.

### III. FRYE RECONSIDERED

As previously noted, *Frye* was accepted initially without question. As time passed, however, the general acceptance standard came

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1. The term "principle" applies to the scientific rules or theories relied upon by scientists in developing the evidence. The term "technique" refers to the means by which the principle is applied. For instance, polygraphy is based on the principle that conscious deception causes physiological stress that can be measured. The actual measurement of the physiological changes by the polygraph itself, and the formulation of an opinion by the examiner, is the technique by which the principle is applied.

2. *See generally Frye,* 293 F. 1013. Of course, this point begs the question of whether the court would have inquired subsequently into the reliability of the technique if the principle involved had been deemed generally accepted.

3. Seattle v. Peterson, 39 Wash. App. 524, 693 P.2d 757 (1985). In this case the court specifically noted that the principle underlying the Doppler radar speed detector was not at issue. Instead, the issue was whether the machine itself and the results it produced were reliable.


5. In considering scientific evidence using the *Frye* test, this issue is critical. Defining the field too narrowly could result in an insufficient number of experts to convince a court that general acceptance existed. For example, in assessing DNA evidence, should the field be defined as genetics, population genetics, or forensic DNA analysis?

6. A major issue is whether technicians should be able to testify as well as scientists. Some courts recognize that technicians may be in the best position to determine the reliability of the technique involved in the creation of scientific evidence while other courts have taken a more restrictive view. *Compare People v. Young,* 391 N.W.2d 270 (Mich. 1986) with People v. Reilly, 98 Cal. App. 3d 1127 (1979).

under greater scrutiny. In part, this was attributable to the increasingly important role that scientific evidence assumed in recent years. As the raw number of cases involving such evidence grew, it was inevitable that pitfalls in the standard would become more apparent. Nevertheless, despite a trend towards rejecting the seeming "mystic infallibility" of Frye itself, the general acceptance standard remains the standard of admissibility in a majority of jurisdictions.

An opportunity to reassess the standard presented itself in the guise of the Federal Rules of Evidence, signed by President Ford on January 2, 1975. Specifically, Federal Rule of Evidence 702 (Testimony by Experts) was to open the door to a new approach. Though the general acceptance standard had been dogma for fifty-two years, inclusion of the standard or any clearly analogous counterpart was conspicuous by its absence. Indeed, despite the established position of Frye as the lead case in the area of novel scientific evidence, it was not mentioned at all in the analysis of the rule.

24 The emergence of scientific evidence in criminal trials has been, according to some, the indirect result of cases like United States v. Wade, 388 U.S. 218 (1967), and Miranda v. Arizona, 384 U.S. 436 (1966). Those cases restricted the methods that police traditionally used to obtain evidence, such as interrogations and line-ups. Giannelli, supra note 23, at 1199. These judicially-created restrictions on police activity forced law enforcement officials to seek out new means of establishing guilt. Scientific evidence became popular because it generally can be obtained with far less intrusion on personal privacy than those methods found unconstitutional by the Supreme Court.

25 There are numerous federal cases adhering to the Frye standard. See, e.g., Barrel of Fun, Inc. v. State Farm and Fire Casualty Co., 739 F.2d 1028 (5th Cir. 1984); United States v. Dutler, 671 F.2d 954 (6th Cir.), cert. denied, 454 U.S. 827 (1981); United States v. Tranowski, 659 F.2d 750 (7th Cir. 1981); United States v. McDaniel, 538 F.2d 406 (D.C. Cir. 1976). In United States v. McBride, 756 F.2d 45 (2d Cir. 1985), the Frye standard was used to overturn a lower court's ruling that had excluded scientific evidence. In that case, the trial judge did not allow psychiatric testimony that, due to a brain injury, the defendant could not have formed the requisite specific intent to commit the crime. Apparently, the trial judge determined that the type of evidence proffered had not gained general acceptance; he noted that "psychiatry was still in its infancy." McBride, 756 F.2d at 50. The appellate court disagreed and overturned the decision. This case raises the issue of whether an appellate court should overturn a trial court's decision on general acceptance when, as a result of further testing and experience, scientific evidence actually does become generally accepted in the interval between the decisions of the trial court and the appellate court. Because a district court judge has broad discretion with regard to the admissibility of expert testimony, an appellate court presumably would base its decision only on the degree of acceptance that existed at the time of the trial judge's decision, even if the scientific evidence had gained more acceptance by the time it made its decision. If law is a search for truth, this is probably an unacceptable result.

27 Fed. R. Evid. 702: "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training or education, may testify thereto in the form of an opinion or otherwise."
28 Drafters' Analysis, Fed. R. Evid.
To compound this lack of guidance, the Advisory Committee’s Notes did not address the issue of whether the general acceptance standard survived promulgation of the rules. The significance of these omissions would soon become apparent to scholars and practitioners alike. Was the standard so accepted as to be assumed part and parcel of Federal Rule of Evidence 702, or did the omission indicate that the judicial standard set forth had been overruled legislatively? The foundation was laid for a schism in evidentiary law that continues today.

In light of the theoretical and practical problems that had plagued the general acceptance standard, a number of jurisdictions chose to
reject it in favor of a less demanding approach.\textsuperscript{32} That approach has come to be known as the "relevancy test." In essence, the test does away with the treatment of novel scientific evidence as a separate evidential category by treating it in much the same fashion as other expert testimony.\textsuperscript{33} Therefore, the emergence of the relevancy standard marked a retreat to the pre-Frye era of admissibility. Relevancy was a return to basics—arguably, a return of fact-finding to the fact finder.\textsuperscript{34} Core evidentiary concepts such as probative value, prejudicial effect, and reliability\textsuperscript{35} would now serve to shape the admissibility inquiry.\textsuperscript{36} This is not to suggest that these concepts played no role in the general acceptance analysis. However, they were now to emerge from the background to supplant the nonlegalistic inquiries of the "scientific jury."\textsuperscript{37}

\textsuperscript{32} Though the relevancy standard is less demanding in terms of admissibility, it is certainly more demanding in terms of litigation. General acceptance requires little more than determining the make-up of your scientific jury and then polling it. Relevancy, as we shall see, involves the complex task of litigating the synergistic effect of multiple rules.

\textsuperscript{33} For example, consider the Fourth Circuit’s approval of admission of spectrographic voice analysis evidence in United States v. Baker, 519 F.2d 463 (4th Cir.), cert. denied, 423 U.S. 1019 (1975). Addressing the standard of admissibility, the Fourth Circuit held that “[u]nless an exaggerated popular opinion of the accuracy of a particular technique makes its use prejudicial or likely to mislead the jury, it is better to admit relevant scientific evidence in the same manner as other expert testimony and allow its weight to be attacked by cross-examination and refutation." Id. at 469.

\textsuperscript{34} General acceptance allows the scientific community to determine reliability and thereby keep unreliable evidence from the jury. In contrast, the relevancy approach, with its lower standard of admissibility, permits the jury to hear evidence that the general acceptance standard would preclude and to make its own determination concerning reliability. This broadening of jury responsibility arguably results in a corresponding return of law to the "law finder": that is, the judge. The judge now is deemed responsible for making the sort of relevancy decisions familiar to him beyond the realm of novel scientific evidence. The sophisticated use counting called for under the general acceptance standard becomes only a peripheral activity for the judiciary.

\textsuperscript{35} These and other questions are the basis of the relevancy rules of evidence, Federal and Military Rules of Evidence 401-403. Such questions are also the basis of the "helpfulness standard" found in the expert testimony rule, Fed. R. Evid 702 and Mill. R. Evid. 702. For a decision focusing on the degree of "help" evidence offers the fact finder, see United States v. Gwaltney, 790 F.2d 1378 (9th Cir. 1986). The court held that the seminal issue was whether the jury could receive "appreciable help" from the evidence. Id. at 1381.

\textsuperscript{36} In United States v. Williams, 583 F.2d 1194 (2d Cir. 1978), cert. denied, 439 U.S. 1117 (1980), the court noted that "[p]robative value, materiality, and reliability of the evidence on one side, and any tendency to mislead, prejudice, or confuse the jury on the other, must be the focal points of inquiry." Id. at 1198. Spectrographic evidence was held to have been admitted properly.

\textsuperscript{37} The Second Circuit succinctly noted the shift in approach: "In testing for admissibility of a particular type of scientific evidence, whatever the scientific "noting" pattern may be, the courts cannot . . . surrender to the scientists the responsibility for determining the reliability of that evidence." Id.
United States v. Downing\textsuperscript{58} would quickly become the lead case cited by relevancy advocates. The fact pattern of Downing is fascinating. At issue in this fraud case was whether the defendant was a con man who had called himself "Reverend Claymore." Twelve eyewitnesses testified that the defendant and Reverend Claymore were one and the same. The defense called an expert witness on the unreliability of eyewitness testimony. Relying on the "helpfulness" standard of Federal Rule of Evidence 702,\textsuperscript{38} the Third Circuit refused to permit the defense expert to take the stand.

A review of Downing indicates that the court was primed to reject Frye by relying on the text of the Federal Rules. As the Downing court recognized, the eight years since the promulgation of those rules had witnessed a plethora of suggestions on how novel scientific evidence should be treated. Among the possible approaches circulating at the time were the following: reasonable scientific acceptance;\textsuperscript{40} a preponderance standard for criminal defendants with a beyond a reasonableness standard for prosecutors;\textsuperscript{41} established and recognized accuracy and reliability;\textsuperscript{42} and a relevancy prejudice approach that shifts the inquiry to weight once relevancy is established.\textsuperscript{43} Rather than adopting one of the new approaches that had become the focus of attention, however, the court chose to fashion its own analysis of the rules.\textsuperscript{44} This is not to suggest that the court rejected the various alternatives out of hand. Instead, it noted the underlying considerations of those approaches and then looked to the Federal Rules of Evidence for resolution of the dispute. Indeed, even the Frye standard played some role in the court's new approach.

For the Third Circuit, the derivation of an appropriate standard necessarily was rooted in the breadth of the relevancy rules—Federal Rules of Evidence 401-403. Under the rules, essentially all evidence is admissible unless it is irrelevant, unduly prejudicial, or

\textsuperscript{58}753 F.2d 1224 (3d Cir. 1985).
\textsuperscript{59}Id. at 1226.
\textsuperscript{60}S. Saltzburg and K. Redden, Federal Rules of Evidence Manual 452 (3d ed. 1982).
\textsuperscript{61}Giannelli, supra note 23, at 1249-50.
\textsuperscript{63}United States v. Williams, 583 F.2d 1194 (2d Cir 1978), cert. denied, 439 U.S. 1117 (1979); State v. Hall, 297 N.W.2d 60 (Iowa 1980).
\textsuperscript{64}Downing, 753 F.2d at 1232-35.
otherwise specifically excluded. By contrast, evidence evaluated using the Frye standard could be excluded even if it was both relevant and not prejudicial. This would occur in situations in which the scientific community had not yet passed collective judgement on the process involved. Reduced to basics, the two approaches represent an inherent conflict between the search for truth and the goal of fairness in our legal system. If the goal is truth, then evidence having any bearing on the fact in issue should be admissible, so long as it is not so unreliable as to grossly mislead the factfinders. The broadness of the relevancy rules clearly fosters this goal. Justice is safeguarded through litigation as to the appropriate weight to be given the evidence. On the other hand, the Frye approach searches for fairness. Using the Frye approach, courts are willing to sacrifice evidence that might be dispositive so as to preclude any possibility that unfair—i.e., scientifically unreliable—evidence might come before the factfinders. The safeguard is to be found in science, not law. As a result, the scientific jury takes center stage, and litigation focuses on admissibility. Thus, a natural conflict exists between the central premise of the relevancy rules and that of Frye.

Interestingly, the court could have avoided the apparent conflict between relevancy and Frye simply by holding that, given the failure of the Federal Rule of Evidence drafters to "overrule" specifically the general acceptance standard, Federal Rule of Evidence 702 incorporated Frye. Again, this would have been inconsistent with the

43Fed. R. Evid. 401: "Relevant evidence means any evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence."
Fed. R. Evid. 402: "All relevant evidence is admissible, except as otherwise provided by the Constitution of the United States, by Act of Congress, by these rules, or by other rules prescribed by the Supreme Court pursuant to statutory authority."
Fed. R. Evid. 403: "Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence."

44The fairness/truth distinction is characterized best by differences between the common law (e.g., United States, Great Britain and Australia) and the civil law (e.g., continental Europe) systems. The common law system, often deemed accusatorial in nature, places a great deal of emphasis on procedural and evidentiary law. By contrast, in civil law countries the judge, rather than the attorney, guides the inquiry and does so unhindered by complex rules of evidence or procedure. Thus, the system often is labeled inquisitorial. The distinction might best be illustrated by the comment "He got a fair trial." Such a comment, commonplace in the United States, would seem out of place in France or Germany. For the French or Germans, a fair trial is simply one in which guilty defendants are convicted and innocent ones are acquitted. This attitude also is reflected in the nature of appeals. In common law countries, appeals generally are limited to issues of law. Civil law jurisdictions generally permit at least one appeal on factual findings.
broad nature of Federal Rules of Evidence 401-403. However, the
drafters arguably contemplated this inconsistency by noting that
evidence admissible under the relevancy rules nevertheless may be
excluded by the terms of other rules of evidence. In light of the
asserted dangers of "mystic infallibility" posed by novel scientific
evidence, a detour from the principle favoring admissibility might
have been justified. After all, truth is most often the victim of un-
fairness. Thus, the broadness of relevancy logically did not demand
the death of Frye.

Rather than arguing that Frye had been rejected outright, the
Downing court took a unique approach by concluding that, although
the codification of evidence rules "may counsel in favor of a reex-
amination of the general acceptance standard," Federal Rule of
Evidence 702 neither incorporated nor repudiated Frye. This very
unusual analysis was based on the theory that because the drafters
must have been aware that Frye was a judicial creation, the failure
to condemn "such interstitial judicial rule-making" in the rules was
to be read as a mere invitation to reconsider the standard. In other
words, the Third Circuit was suggesting that drafters intended the
courts to address the issue in a case-by-case fashion. The flaw in this
analysis lies in the nature of the drafters' task. If they had been in
the process of drafting nonbinding rules, deferring decision on par-
ticular issues to the courts of differing jurisdictions might have made
more sense. However, the drafters were developing binding rules for
an integrated system of courts. Nevertheless, the Downing court
seemed to be suggesting that the drafters of the Federal Rules of
Evidence were willing to countenance splits among federal courts
in their approaches to novel scientific evidence. If the development
of rules of evidence was to be left to the judiciary, one must wonder
why the drafters bothered to take on their task in the first place.
Was piecemeal uniformity satisfactory to them? Surely, this would
represent an unusual method of codification. Arguably, the Downing
court was inviting reconsideration—not the drafters. Neverthe-
less, given the court's interpretation of the omissions, the issue of
Frye's survival entered the realm of judicial policymaking.

With policy concerns now the focus of attention, the court began
its inquiry into the relative merits of maintaining the Frye standard.

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4Fed. R. Evid. 402; see supra note 45.
5768 F.2d at 1235.
6Id.
7Id. For a discussion of the background underlying the effort to produce a uniform
set of evidentiary guidelines, see S. Salkzberg and K. Redden, supra note 30, §§ 1-6.
On the positive side, Frye provides a methodology by which novel scientific evidence may be assessed; that is, "the scientific jury." Theoretically, this method would result in like decisions in like cases and therefore serve the goal of uniformity of judgment. At the same time, general acceptance also protects criminal defendants from unreliable evidence presented by the prosecution to a jury potentially in awe of science.51

Counterbalancing these advantages are two significant potential dangers. The first is "vagueness." As the court pointed out, the general acceptance standard is vague because the terms "scientific community" and "general acceptance" are ill-defined.52 Even if the courts could reach a consensus as to the composition of the "relevant community" regarding a particular form of scientific evidence, the lengthy and divisive process of reaching consensus would be revisited each time a new scientific process was developed. At the same time, the subjectivity inherent in the term 'general acceptance' precludes any quantification of the standard.

The second danger cited by the court is "conservatism." As the court perceptively pointed out, the standard is conservative in the sense that it might preclude the admission of probative and reliable evidence.53 Because of the lag time between the development of a new type of scientific evidence and its general acceptance by the scientific community, Frye clearly has the potential of excluding evidence that subsequently is determined to be completely reliable. Arguably, this is a neutral flaw; that is, one that might assist the guilty defendant to keep inculpatory evidence out and assist the government to exclude evidence of an exculpatory nature.54 Neutral or not, however, if trials are forums in which truth is sought, that purpose

51 Downing, 753 F.2d at 1235. One of Professor Imwinkelried's arguments against the Frye standard concerned this paternalistic attitude toward the jury. Imwinkelried, supra note 20, at 113. He concludes that the assumption that jurors are unable to assign appropriate weight to scientific evidence, one of the primary rationales for the existence of the Frye standard, simply is unwarranted. He cites studies conducted in civilian forums that establish just the opposite—that lay jurors are able to evaluate critically scientific evidence. Finally, he mentions that his conclusion has special significance for courts-martial because jurors there are generally more sophisticated and better educated than their civilian counterparts. If civilian jurors can handle scientific evidence, surely military jurors can. Id. at 117. But see supra note 13.
52 753 F.2d at 1236. See supra text accompanying notes 20-22.
53 753 F.2d at 1236.
54 This argument is unsatisfactory because it fails to recognize that the goal of a judicial system is not a balance between the government and the defense; it is rather fairness in a particular trial. The exclusion of reliable but not generally accepted exculpatory evidence in a particular trial is hardly a neutral flaw for the now-convicted defendant.
will be hindered. These two concerns—vagueness and conservatism—led the court to reject *Frye* as "an independent controlling standard of admissibility." Instead, general acceptance was viewed as but one of potentially many indicators of reliability.

In what has become the accepted approach by courts rejecting *Frye*, including the military courts, the Third Circuit set forth its method of determining whether evidence is admissible under Federal Rule of Evidence 702. The key was the term "helpfulness" in the rule. For the court, an assessment of whether novel scientific evidence is helpful depends on three factors: 1) the soundness and reliability of the process or technique used in generating the evidence; 2) the possibility that admitting the evidence would overwhelm, confuse, or mislead the jury; and 3) the proffered connection between the scientific research or test result to be presented, and the particular disputed factual issues in the case.

The similarity between this three-tiered query and the relevancy rules leaves one with the impression that the court has done more than reject *Frye*. Arguably, the court has defined Federal Rule of Evidence 702 as a restatement of the relevancy rules. For example, with regard to the first component of the test, would evidence resulting from an unreliable or unsound technique or process make a fact in issue more or less probable under Federal Rule of Evidence 401? Clearly, it would not. One possible resolution of this quandary is an argument that the question in Federal Rule of Evidence 401 is not whether the process or technique is unreliable, but simply whether the result that is generated makes the fact in issue more or less probable. In other words, accurate, albeit unreliable, evidence that makes a fact in issue more or less likely is admissible under Federal Rule of Evidence 401—period (unless outweighed by Federal Rule of Evidence 403 concerns). Absent Federal Rule of Evidence 702, reliability of the process or technique then would become only

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55 See *Downing*, 753 F.2d at 1235-37. The court cites United States v. Sample, 378 F. Supp. 44 (E.D. Pa. 1974), as an example of a case in which a court expresses concern over the exclusion of relevant evidence. United States v. Addison, 488 F.2d 741 (D.C. Cir. 1974), is cited as representing the opposite view. 56 *Id.*

57 "[G]eneral acceptance in the particular field...should be rejected as an independent controlling standard of admissibility. Accordingly, we hold that a particular degree of acceptance of a scientific technique within the scientific community is neither a necessary nor a sufficient condition for admissibility; it is, however, one factor that a district court normally should consider in deciding whether to admit evidence based on the technique." *Id.*

58 *Id.*
an issue of weight, not admissibility. If this were the approach taken, Federal Rule of Evidence 702 would have meaning independent of Federal Rule of Evidence 401. The Downing court itself, however, defeats this argument by noting that the "logical relevance" of Federal Rules of Evidence 401-403 does, in fact, involve reliability.59

Any number of additional examples could be cited in the characterization of Federal Rule of Evidence 702 as a relevancy restatement. For example, would not unreliability under Federal Rule of Evidence 702 also necessarily serve to confuse or to mislead the jury under Federal Rule of Evidence 403? Similarly, the second component of the Downing helpfulness test is, arguably, nothing more than Federal Rule of Evidence 403 revisited. Indeed, the textual similarities would suggest Federal Rule of Evidence 403 served as the model in drafting the decision. Finally, the third component essentially poses the question of whether the evidence in issue is relevant, i.e., it is a Federal Rule of Evidence 401 inquiry.

The Third Circuit clearly was sensitive to the possibility that its interpretation of Federal Rule of Evidence 702 was illogical in light of the Federal Rules of Evidence 401-403 relevancy standards. It therefore went to some effort to distinguish the Federal Rule of Evidence 702 requirements. The court started by construing the term "helpfulness" (Federal Rule of Evidence 702 standard) as necessarily implying a quantum of reliability "beyond that required to meet a standard of bare logical relevance (Federal Rule of Evidence 401)."60 Unfortunately, in the absence of quantification or examples, this clarification does little other than muddy the water. Indeed, it smacks of meaningless judicial draftsmanship.61 In a like manner, the court acknowledged that the Federal Rule of Evidence 702 concern about confusing, misleading, or overwhelming evidence might mirror Federal Rule of Evidence 403 to some extent. The court posits evidence, however, that could meet the Federal Rule of Evidence 702 requirements, but fail under a balancing test pursuant to Federal Rule of Evidence 403. As an example, the court suggests that a Federal Rule of Evidence 403 prohibition on waste of time or confusion of the issues might operate to exclude evidence admissible under Federal Rule of Evidence 702 if additional evidence of guilt existed.62

59Id. at 1235.
60Id.
61There is a notable absence of effort to make the distinction in subsequent cases. Because the Rule 702 standard is theoretically higher, courts can be expected generally to base their opinions on that rule using language that will sound identical to a Rule 401 ruling. See, e.g., United States v. Howard, 24 M.J. 897 (C.G.C.M.R. 1987).
62753 F.2d at 1242-43.
The problem with this analysis is that the real question is whether evidence that passed a Federal Rule of Evidence 403 review ever would fail a Federal Rule of Evidence 702 confusing, misleading, or overwhelming test—not vice versa. If so, that component of the Federal Rule of Evidence 702 test would have independent meaning. If not, it is nothing more than a Federal Rule of Evidence 403 retest. Most likely, the latter is the case, at least for practical purposes.

Whether the Downing court did anything beyond simply rejecting Frye and requiring that novel scientific evidence meet the basic standards set forth in Federal Rules of Evidence 401 through 403 remains unclear; as a result the case is intellectually troubling. Nevertheless, the Downing case has come to represent an approach that increasingly is being adopted by jurisdictions throughout the United States. On this tenth anniversary of the Military Rules of Evidence, we turn to one of those jurisdictions—the military justice system.

IV. EVOLUTION OF THE MILITARY APPROACH TO NOVEL SCIENTIFIC EVIDENCE

Despite adoption of the Military Rules of Evidence on 12 March 1980, the military courts continued to employ the Frye test in generally the same manner as their civilian counterparts. As the Federal Rules of Evidence did in federal courts, however, the Military Rules of Evidence eventually would provide the impetus for a complete revision in the admissibility standards applicable to novel scientific evidence. This should not be surprising, given the clear goal of the drafters of the military rules to mirror the federal rules to the extent possible. As a result of that intent, the rules relevant to this

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64See e.g., United States v. Hulen, 3 M.J. 275 (C.M.A. 1977). United States v. Ford, 16 C.M.R. 185 (C.M.A. 1964). The Ford case, which involved urinalysis, was the first military case to endorse the general acceptance standard. In 1967, in United States v. Wright, 37 C.M.R. 447 (C.M.A. 1967), the Court of Military Appeals became the first appellate tribunal to uphold the admissibility of voiceprint evidence despite the fact that research had not established general acceptance of the technique. According to Judge Ferguson, who dissented, this signified an abandonment of the general acceptance standard and adoption of much more lenient standards against which even polygraph evidence would be admissible. Id. at 454 (Ferguson, J., dissenting). This was not to be because ten years later the Hulen case firmly reconfirmed the general acceptance standard first announced in Ford, 3 M.J. at 275-77.
inquiry. Military Rules of Evidence 401-403 and 702, are nearly identical to their federal rules counterparts.\(^6\)

The possibility that *Frye* had not survived the promulgation of the rules was not considered in earnest until the Army Court of Military Review’s decision in *United States v. Bothwell*.\(^7\) *Bothwell* involved the attempted admission of a psychological stress evaluation (PSE). The examination, designed to assess veracity, is based on the theory that deception causes psychological effects, which in turn result in variations in voice modulation.\(^8\) The court began, in much the same fashion as the *Downing* court would two years later, by taking note of the dispute over the continued viability of the *Frye* standard, specifically in the federal circuits. It accurately attributed this dispute to the failure of the draftsmen to include any mention of the general acceptance standard in the Federal Rules.\(^9\) Because the military had adopted the Federal Rules almost verbatim, the debate was particularly relevant to military practice. Nevertheless, the court stated

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\(^6\)Military Rules of Evidence 401, 403, and 702 are identical to their federal counterparts. See supra notes 27, 45. Military Rule of Evidence 402 is identical to Federal Rule of Evidence 402 in intent and effect, but includes as limitations sources of law unique to the military. "All relevant evidence is admissible, except as otherwise provided by the Constitution of the United States as applied to members of the armed forces, the code, these rules, this Manual or any Act of Congress applicable to members of the armed forces. Evidence which is not relevant is not admissible." Mil. R. Evid. 402.

\(^7\)17 M.J. 684 (A.C.M.R. 1983). Prior to *Bothwell*, there existed some inkling of the debate that would emerge in the military courts. In United States v. Martin, 13 M.J. 66, 68 n.4 (C.M.A. 1982), the Court of Military Appeals noted that Military Rule of Evidence 702 might broaden *Frye*. It did not have to address the issue, however, because Military Rule of Evidence 702 was not in effect at the time of trial. Additionally, the evidence was found to be generally accepted and, thus, would have passed muster even under the forthcoming relevancy test. *Id.* at 67-68. Later, Judge Everett, in dicta, found in his dissenting opinion in *United States v. Moore*, 15 M.J. 354, 372 (C.M.A. 1983) (Everett, J., dissenting), that "the *Frye* test still has vitality." This was not an issue, however, because, as with *Martin*, the trial predated the rules.

\(^8\)*Though not directly relevant to this discussion, the ultimate decision of the court is interesting. The trial judge refused to permit the defense to lay a foundation for the PSE. In other words, he did not permit testimony on the reliability or general acceptance of the test. On appeal, this was found to be error. Rather than remanding, however, the court looked at state and federal cases, as well as several articles, and concluded that it was "unable to imagine anything which [the expert] could have said that might have led the military judge to conclude that PSE enjoys general acceptance in the scientific community." Thus, the error was harmless. 17 M.J. at 688. Two problems with this result exist. If it was so clear that the proffered evidence was unreliable that the appellate court could reject it out of hand, then why was the trial court wrong to do likewise? Certainly, not all evidence merits an admissibility hearing. Evidence based on astrology or voodoo probably could be rejected without a hearing. Additionally, the court claimed PSE was in the "experimental rather than the demonstrable stage." *Id.* at 688. To support this claim, it cited cases, House Committee hearings, and articles as aged as nine years old. *Id.* Though it very well may be the case that PSE was still in the experimental stage in 1983, to cite nine-year-old scientific support is questionable.

\(^9\)*Id.* at 686-87.
that "in the absence of any definitive authority to the contrary, [it was] unwilling to abandon a rule that has been applied in the military for almost thirty years." Presumably, the appropriate authority would be a decision by the Court of Military Appeals.

The Bothwell court was obviously uncomfortable with the "it's always been done that way" justification it had enunciated. In an effort to bolster its holding, the court turned to the "mystic infallibility" rationale set forth nine years earlier by the D.C. Circuit Court in United States v. Addison. In other words, the Bothwell court was expressing concern that lay members very well might be overwhelmed by the scientific nature of the evidence and that unfairness would result. At the same time, the court very perceptively realized that critics might allege that the danger of misleading or overwhelming the jury already was taken care of by the Military Rule of Evidence 403 balancing test. Therefore, its interpretation of Military Rule of Evidence 702 as incorporating Frye to avoid such dangers would clearly be subject to attack. To preempt that criticism, the court declared the Frye protection to be greater than that of Military Rule of Evidence 403 and based its argument on the words "substantially outweighed" in the rule. Clearly, in retrospect the apparent hidden agenda of the Bothwell court was to invite others to join the affray. Until that occurred, however, the Bothwell court was unwilling to explore new ground. Thus, Frye would remain the accepted standard.

That was soon to change as military courts began to question the survival of Frye and rule in favor of an expansive view of Military Rule of Evidence 702. In United States v. Snipes the Court of Military Appeals held that the intent of Military Rule of Evidence 702 was to "broaden the admissibility of expert testimony." Upholding the

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admission of rebuttal evidence by a child psychiatrist concerning sexual abuse, the court noted the existence of "a sufficient body of specialized knowledge" as to the typical behavior of sexually abused children and their families to permit certain conclusions to be drawn by an expert." Though such verbiage resembles general acceptance, that standard was not discussed by the court. This fact, combined with the earlier comment on admissibility, indicated the court was moving slowly in the direction of the relevancy approach.

Not long after Snipes, the Court of Military Appeals moved even closer to adoption of the relevancy approach in United States v. Mustafa. Mustafa was a rape-murder case in which the government called an Army Criminal Investigation Command (CID) agent to testify concerning blood flight analysis. The defense objected on the grounds that blood flight analysis was not generally accepted. Without addressing the issue directly, the court found the existence of "a body of specialized knowledge which would permit a properly trained person to draw conclusions as to the source of the blood." The court, discussing the effect on Frye and the general acceptance standard only peripherally, found that the existence of this body of specialized knowledge meant the evidence was "helpful, i.e., relevant." Thus, it was admissible. Though certiorari was denied on

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76 Id. at 179.
78 Id. at 187. A second objection was that the CID agent was not a qualified expert.
This issue is related to the general acceptance issue because it likewise turns on a determination of how broad Military Rule of Evidence 702 was meant to be. The CID agent had attended a five-day course by one of the preeminent practitioners in the field and received other unspecified training, but was not a chemist, nor had he written on the subject. Additionally this was only his second course involving the technique. The court found that he was an expert. Id. at 168. In a beautiful piece of judicial craftsmanship, it noted that "[g]iven the broad language of Military Rule of Evidence 702 we have no doubt that Sherlock Holmes could be eminently qualified as an expert in this field." Id. at 168 n.6. This decision is indicative of the court's new approach to admissibility and previewed how the broader approach would affect the Frye standard.
79 Id. at 188. The court did not address the term "general acceptance." Instead, its finding that a body of "specialized knowledge" existed was based on three factors: 1) state courts had accepted similar evidence; 2) the technique was based on established laws of physics and common sense; and 3) the process was capable of quantification. Id. Clearly, the court was looking to the issue of reliability, but not depending on a "scientific vote" in doing so.
80 Id.

By labeling the expert testimony "helpful, i.e., relevant", it is unclear whether the court is using Military Rule of Evidence 702 or Military Rules of Evidence 401 and 402 as the standard. Rule 702 deals with helpfulness whereas Rules 401 and 402 involve relevancy. The wording of the decision would suggest the terms are synonymous. Further, the decision mentions all three rules without ever clearly distinguishing among them. This type of imprecision reappears in subsequent decisions such as United States v. Gipson, 24 M.J. 248 (C.M.A. 1987). The result is that it becomes extremely difficult for trial practitioners to deal with novel scientific evidence in a systematic way.
appeal to the Supreme Court, Justices White and Brennan would have granted it to resolve the issue of whether the rules incorporated the *Frye* standard.81

Though *Mustafa* was clearly a rejection of the stringent standards of the general acceptance test, it failed to replace that test with any definitive analytical framework for use in evaluating the admissibility of novel scientific evidence. Nevertheless, the Court of Military Appeals clearly was moving in the direction of relevancy. Emphasis on terms like "helpful and relevant," in light of the debate then occurring in the federal circuits, could mean nothing else. The chronology of the cases cited makes clear where the court was going: *Bothwell*,62 December 1983; *Snipes*,85 July 1984; *Mustafa*,64 June 1986; *Mustafa*, certiorari denied, November 1986.65 After Justice White argued that resolution of the conflict was required, the military's adoption of relevancy seemed inevitable. It also should have been apparent that the military would adopt the *Downing* approach, given Justice White's selection of a single case to cite as representative of the "flexible standard of admissibility."--*Downing*.86 Just over eight months later, the court would do exactly that in *United States v. Gipson*.87

In *Gipson* the appellant had made a motion in limine to admit evidence of an exculpatory polygraph.88 Refusing to allow a defense

8193 L. Ed. 2d at 390 (White, J., and Brennan, J., dissenting). Such a ruling, whether finding incorporation or not, obviously would have had enormous impact in the federal courts, as well as the military courts.
8217 M.J. 684.
8316 M.J. 172.
8422 M.J. 165.
8593 L. Ed. 2d at 392.
86Id. at 393.
8724 M.J. 246 (C.M.A. 1987). Interestingly, *Gipson* generally is characterized as an important case because of the issue of polygraph admissibility. Actually, that is not the reason *Gipson* is a seminal case for the military practitioner. Instead, its importance lies in the fact that it overruled prior military case law that employed the *Frye* standard in assessing novel scientific evidence. The case could have involved any novel scientific technique or process and would have had precisely the same effect on the admissibility of polygraphs.
88A motion in limine would be an appropriate way to raise the issue of the admissibility of novel scientific evidence. In making the tactical choice of when and whether to make the motion, litigators should remember that the burden of persuasion is generally on the party making the motion or raising the objection. See MCM, 1984, Rules for Courts-Martial 801(e)(4), (5) and 801(g) [hereinafter R.C.M.]. Additionally, if the motion has resulted in the preclusion of novel scientific evidence, the proponent should ensure the trial judge's essential findings (R.C.M. 908(d)) are as complete as possible. At minimum, the proponent should address all components of both the relevancy rules and Military Rule of Evidence 702. To the extent the findings on the record are incomplete, the judge should be asked to fill in the gaps. Similarly, if the proponent senses that the trial judge misunderstands the legal standard, he or she should ensure the misunderstanding is placed on the record. Doing so not only will preserve the issue for appeal, but also will give appellate litigators the material they
attempt to lay a foundation for admissibility, the trial judge ruled that polygraphy was not "accepted that well in the scientific community or the judicial community..." At the appellate level, therefore, the granted issue was the appropriateness of that refusal. To assess whether the defense should have been granted the opportunity to lay a foundation, the requisite foundation had to be ascertained. This question opened the door to relevancy in the military courts.

The court relied heavily on the reasoning of the Third Circuit in Downing. Indeed, the published opinion is very much the Downing decision reissued in the military context. As a prelude to its adoption of relevancy, the court first discussed the pros and cons of the Frye standard, as well as the dispute then occurring in the federal system over continued adherence to the standard in light of the Federal Rules. The chief concern expressed by the court was "that too much good evidence went by the boards during the 'lag time' inherent in the scientific 'nose-counting' process."

The groundwork laid, the court went on to analyze the Military Rules of Evidence. Given the near verbatim adoption of the Federal Rules by the military, that the court's analysis tracked Downing precisely is not surprising. Additionally, the court completely adopted the Downing understanding of Federal Rule of Evidence 702 in its own analysis of Military Rule of Evidence 702. Henceforth, Military Rule of Evidence 702 would require an inquiry into the three Downing standards:

- The government had to demonstrate that the evidence was reliable.
- The government had to demonstrate that the evidence was relevant.
- The government had to demonstrate that the evidence was admissible.

need to work with. This is particularly important with regard to novel scientific evidence because, as advances in forensic science are made, the ability of appellate level courts to declare "harmless error" will diminish. For a brief, but extremely helpful guide to motion practice in the military, see American Bar Association, Military Motions: A Handbook for Lawyers (1986).

24 M.J. at 247. An interesting question is why the defense was not permitted to attempt to lay a foundation even if the general acceptance standard was being used by the judge. Essentially, the judge was holding that the evidence was not generally accepted without taking evidence on that issue. This is similar to what happened in Bothwell, 17 M.J. at 684. If the procedure was followed regularly, one must query how a technique or process that at one time might have been unreliable, but which subsequently was improved, ever would get into court. The trial judge in Gibson did note that the government was offering a potentially inculpatory polygraph. 24 M.J. at 247. Presumably, two different results was an indication of the general unreliability of polygraphs. Without taking evidence, however, how could the judge possibly have known whether the difference was the result of factors that would relate to admissibility or only of factors concerned with the appropriate weight to be afforded the seemingly divergent results?

753 F.2d 224 (3d Cir. 1985).
24 M.J. at 250.
3 Id.
4 Id.
5 Id. at 250-51.
tung criteria: 1) soundness and reliability of the process or technique; 2) the possibility of overwhelming, confusing, or misleading the jury; and 3) the proffered connection with the disputed factual issue.66

In its adoption of the Downing approach to relevancy, the court considered two additional factors unique to military consideration of Rule 702. First, the drafters of the military rules had noted in their analysis that Military Rule of Evidence 702 might "be broader and [might] supersede Frye."67 Thus, their rejection of Frye was technically on firmer ground than that of the Third Circuit. In addition, the 1969 Manual for Courts-Martial had stated that polygraph results were inadmissible.68 In the Military Rules of Evidence, however, this evidentiary exclusion had been omitted.69 Arguably, both of these were factors indicating the drafters intended to expand the standards for admissibility beyond the narrow confines of Frye. Indeed, how could the specific mention of Frye be read as anything other than an invitation for the courts to reject this judicially created norm?70 Similarly, to the extent that polygraphs no longer were singled out for exclusion, in the absence of new information on their reliability, the standard must have changed.71 Therefore, the court, relying on the Downing rationale combined with a focus on the text of the new rules and their analysis, found Frye to have been superseded by the relevancy approach.72

66Id. at 251; see supra text accompanying note 58.
6724 M.J. at 251.
69Gipson, 24 M.J. at 250.
70It could be read as an indication that the drafters, who were writing the new rules as the Federal Rule of Evidence 702 debate was occurring, were unsure of what standard to adopt and, therefore, were leaving it up to the courts. Arguably, the use of the word "may" was an indication that the military drafters felt it appropriate to retain Frye, but, given the current debate, were unwilling to do so until the issue was resolved as to Federal Rule of Evidence 702.
71See Gipson, 24 M.J. at 250-51. With regard to the failure to mention polygraphs, the drafters may have felt that it was poor draftsmanship to single out any one form of novel scientific evidence. Additionally, the omission may have been an indication of their belief that it would be inappropriate to exclude a category of evidence that might, over time and with advances in science, become generally accepted. This is of course speculation, but probably no more so than the court's own analysis of the deletion. The Drafters' Analysis sheds no light on this specific issue.
72Though concurring, Judge Everett seemed to have mixed emotions. He noted that "at the very least, the expert witness should be able to relate his theories to scientific principles having a substantial body of adherents." Id. at 255 (Everett, J., concurring).
V. THE RELEVANCY APPROACH UNDER GIPSON

Based upon the holding in Gipson, military courts currently consider four evidentiary rules prior to admission of novel scientific evidence—Military Rules of Evidence 401, 402, 403, and 702. Based upon the holding in Gipson, military courts currently consider four evidentiary rules prior to admission of novel scientific evidence—Military Rules of Evidence 401, 402, 403, and 702.102

Basically, three broad requirements exist: 1) the evidence is relevant and admissible under 401 and 402; 2) the evidence is helpful to the fact finders under 402; and 3) the probative value outweighs any dangers posed by the evidence under 403.103

Though the Court of Military Appeals did not label their new approach to novel scientific evidence, the requirements listed above are nearly identical to those set forth by commentators and courts advocating what has become known as the "relevancy" test.104 In its pure form, the relevancy approach treats novel scientific evidence as any other type of evidence by asking whether the evidence is probative and, if so, whether its probative value outweighs the dangers posed by admission.105 Arguably, both Downing and Gipson require further evaluation of the evidence using the expert testimony rule, Federal Rule of Evidence 702, or Military Rule of Evidence 702. As discussed earlier,106 some question exists as to whether those rules are simply restatements of the relevancy rules or whether they are qualitatively different. Regardless of the academic exercise of dif-

102 Id. at 261-52.
103 See Gipson, 24 M.J. 246, see also United States v. Abeyta, 25 M.J. 97 (C.M.A. 1987); United States v. Dozier, 25 M.J. 530, 531 (A.C.M.R. 1989); Abeyta excluded polygraph evidence on the grounds that the accused did not testify, and therefore, it was not relevant. 25 M.J. at 98. Dozier held the trial court's exclusion of a speech pathologist's testimony to be error. 28 M.J. at 552. The pathologist would have testified that the accused did not make certain phone calls based on a phonetic transcription of the his voice. Dozier is an important case because the court noted that the technique offered would have met the Frye test. Id. This illustrates that the test still may be used to meet the requirements of Gipson. As the Gipson court noted, in evaluating probativeness and helpfulness, "one of the most useful tools is that very degree of acceptance in the scientific community we just rejected as the be-all-end-all standard." 24 M.J. at 252.
104 For an excellent discussion of the "relevancy test," see F. Gianelli & E. Imwinkelried, Scientific Evidence (1986). They note that the relevancy test has three steps: 1) identify the probative value of the evidence; 2) identify any countervailing dangers or considerations inherent in admission; and 3) balance the probative value against the dangers posed. In terms of probative value, when dealing with scientific evidence the focus should be on the reliability factor. F. Gianelli & E. Imwinkelried, Scientific Evidence §§ 1-6 (A)-(C). Cases discussing the probative value issue include United States v. DeBetham, 348 F. Supp. 1377 (S.D. Cal 1972), aff'd, 470 F.2d 1387 (9th Cir. 1972), cert. denied, 412 U.S. 707 (1973), and United States v. Ridling, 350 F. Supp. 90 (E.D. Mich. 1972). On the other hand, one of the major countervailing dangers is that of "mystic infallibility." See supra note 11 and accompanying text.
105 See supra notes 35-38 and accompanying text.
106 See supra notes 59-61 and accompanying text.
differentiating between the relevancy and expert testimony rules, however, both the Downing and Gipson courts treated them as different. Therefore, any proposal of practical use will do likewise.107

With the adoption of the relevancy approach by the military courts, practitioners now are faced with a significantly different mode of analysis when determining the potential admissibility of scientific evidence. This article will propose an analytical framework to use with regard to that evidence. First, however, one must clearly understand the rules used in the analysis: Military Rules of Evidence 401, 402, 403, and 702.

VI. MILITARY RULES OF EVIDENCE 401 AND 402

Federal Rule of Evidence 402 provides that all relevant evidence is admissible unless otherwise provided by the Constitution, the Manual for Courts-Martial, or Acts of Congress.108 Therefore, one must turn to the definition of relevant evidence under Military Rule of Evidence 401 to ascertain admissibility. Basically, relevant evidence is that which has any tendency to make a fact in issue more or less probable.109 Evidence that does so is deemed logically relevant. Determining whether or not the evidence is logically relevant is essentially a tiered inquiry consisting of materiality and probativeness. To be material, the evidence must bear on an issue in the case. If it does not, it is inmaterial and, thus, cannot be relevant. Assuming the evidence in question is material, an inquiry into whether it actually makes the issue more or less probable is required. If the evidence makes the issue more probable, it is probative and the evidence is

107 Remember that the standard for appellate review of admissibility in the area of novel scientific evidence is “abuse of discretion.” See P. Giannelli and E. Imwinkelried, supra note 104, § 16(c); United States v. Williams, 583 F.2d at 1194; 1200 (2d Cir. 1978); United States v. Baller, 519 F.2d 468, 467 (4th Cir. 1975). For error to be found, the ruling must have materially prejudiced a substantial right of a party. Mil. R. Evid. 103(a). In order for the error to be preserved, an objection must be made in a timely fashion “stating the specific ground of objection, if the specific ground was not apparent from the context.” Mil. R. Evid. 103(a)(1). Additionally, in cases excluding evidence, an offer of proof as to the excluded evidence must have been made unless contextually clear. Mil. R. Evid. 103(a)(2). Defense counsel should not rely on the plain error doctrine. Mil. R. Evid. 103(d). Particularly in the area of novel scientific evidence, plain error will be difficult to demonstrate if for no other reason than the novelty of the process. A full-blown hearing on a motion in limine should meet most of these requirements and is the recommended method for litigating the admissibility of scientific evidence. Obviously, in most cases the defense will want to address this issue prior to entering pleas, particularly if the evidence is inculpatory.

108 Mil. R. Evid. 402; see supra notes 45 and 66.

109 Mil. R. Evid. 401; see supra notes 45 and 66.
now relevant.\textsuperscript{10} Ascertaining materiality with regard to novel scientific evidence presents no apparent problems beyond those of other forms of evidence. Decisions involving the admission of scientific evidence, however, do tend to pay more attention to the second part of the inquiry—the issue of probativeness.

This issue of probativeness generally is framed in terms of reliability.\textsuperscript{11} Logic dictates that if evidence is unreliable, or more precisely if it lacks reliability, then it does not make any fact in issue more or less probable. This approach has become part and parcel of the military courts' Military Rule of Evidence 401 analysis, and, as a result, a prerequisite to the admission of novel scientific evidence.\textsuperscript{12} The problem with the military's use of a "reliability" standard as part of a Military Rule of Evidence 401 analysis is that the term is ill-defined in military case law. Gipson, which expressly makes reliability under Military Rule of Evidence 401 applicable, said little to quantify reliability beyond stating that Military Rule of Evidence 702 would require a "greater quantum" of reliability than that required by the dictate of logical relevancy.\textsuperscript{13} How much greater is not clear. At the same time, Gipson failed to set forth what is supposed to be reliable.\textsuperscript{14} As a result, weight admissibility distinctions remain blurred.

In fairness, the Gipson court did provide some assistance to those who would apply its new standard, although ironically in the form of Frye. Despite Frye's rejection as the "be-all-end-all standard," the Court of Military Appeals held that general acceptance remained a factor for consideration by courts, both as to the issue of probativeness (Rule 401) and that of helpfulness (Rule 702).\textsuperscript{15} Therefore, if evidence passes muster under the old Frye standard, it should generally survive a Gipson review.\textsuperscript{16}

Ironically, additional assistance in defining the relevancy approach as adopted by the military was provided by the Army Court of

\textsuperscript{10} See generally McCormick on Evidence 605-09 (3d ed. 1984).
\textsuperscript{12} Id. at 251.
\textsuperscript{13} Id.
\textsuperscript{14} See id.
\textsuperscript{15} Id. at 252.
\textsuperscript{16} The one problem may be the Military Rule of Evidence 702 focus on overwhelming, misleading, or confusing. As discussed earlier, if Federal Rule of Evidence and Military Rule of Evidence 702 are to have meaning beyond their 403 counterparts, they must be more restrictive. See supra note 62 and accompanying text. If this is so, then evidence that survived a Frye and a Rule 403 analysis might not survive a Gipson Downfall 702 analysis.
Military Review in *Bothwell*.\(^{117}\) Though that court retained *Frye*, it set forth the areas of reliability it felt Military Rule of Evidence 401 affected. In determining reliability of scientific evidence, the court suggested an inquiry into three factors: 1) the validity of the principle underlying the technique used; 2) the validity of the technique itself; and 3) the proper application of the technique on the particular occasion that resulted in generation of the evidence.\(^{118}\) As in *Gipson*, the lack of quantification is one problem posed by the suggested methodology. Additionally, remember that *Bothwell* is technically nothing more than persuasive authority. Nevertheless, the case does provide some semblance of methodological order for courts struggling through the imprecision of *Gipson*.

The case also can serve as a framework for developing an argument on the issue of admissibility versus weight. In that *Bothwell* calls for a review of the entire scientific process, from principle to application, one can argue that the admissibility/weight distinction is one of degree, not of subject matter, when considering novel scientific evidence. For example, the question is not whether concerns about a principle will fall within the purview of the judge as the finder of the law or the members as the finder of the fact. Instead, the issue is whether the concerns have reached a level at which the judge, as a matter of law, will refuse to allow the jury to consider the evidence.

The process of defining reliability in a usable way is difficult. In the effort to determine the limits of inquiry, even reliance on the well-reasoned *Bothwell* decision leaves one foundering, for subjectivity pervades the entire process. Though law is certainly no stranger to subjectivity, that which exists in making reliability determinations poses particular difficulty. The standard does exist, however, and the three *Bothwell* inquiries will assist litigators and the judiciary to address the issue with a semblance of coherence.

**VII. MILITARY RULE OF EVIDENCE 702**

Assuming scientific evidence meets the requirements of Military Rules of Evidence 401 and 402, it then must be analyzed against Military Rule of Evidence 702. Reliability, as with Military Rule of Evidence 401, is the key to Military Rule of Evidence 702.\(^{119}\) With regard to Rule 702 reliability, however, the *Gipson* court provided

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\(^{117}\)M.J. 684 (A.C.M.R. 1983).
\(^{118}\)Id. at 686.
\(^{119}\)Gipson, 24 M.J. at 251.
a much greater indication of what it meant by the term than it had when discussing Military Rule of Evidence 401. Basically, the test is "helpfulness" to the fact finder; that is, an indication that the court logically concluded that unreliable evidence is unhelpful. This assumption led to the court's articulation of three factors that must be balanced when determining helpfulness.

As noted earlier, in Gipson the Court of Military Appeals adopted the Downing court's analysis of helpfulness. Military courts now will be required to evaluate the soundness and reliability of the process or technique; the possibility of misleading, overwhelming, or confusing the jury; and the extent of the connection between the evidence and the disputed factual issue. Obviously, these aspects again present the problem of quantification. In other words, the imprecision in distinguishing between admissibility and weight issues remains. Unfortunately, the court did little to resolve the issue beyond noting that a greater degree of reliability will be required than in a Military Rule of Evidence 401 inquiry. The weight versus admissibility issue is, therefore, both a Military Rule of Evidence 702 and a Rule 401 issue. Presumably, the trial judge will be able to decide when the controversy over reliability is severe enough to merit taking the issue from the jury entirely by ruling the evidence inadmissible.

In setting forth the first tier of a Military Rule of Evidence 702 inquiry, the Gipson court neglected to discuss what it meant by soundness and reliability of the technique or process. Though such an omission normally would be fatal in the attempt to develop an analytical methodology, the near total reliance of the court on the Downing

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120Id.
121This is not a necessary conclusion, however. Arguably, unreliable evidence may, in fact, be valid evidence. As an extreme example, consider the ancient proposition that the earth was flat. An assertion that the earth was round, prior to the 15th century, would have been rejected out of hand not only as unreliable, but also as contrary to the scientific principles then generally accepted. Albeit extreme, this example highlights the problem implicit in a new technique, particularly when that technique is based on truly novel scientific principles. To resolve this theoretical problem would require courts to forego admissibility analysis in favor of an almost exclusively weight evaluation by the fact finder. Obviously, for policy reasons, this will not be done.
122See supra text accompanying notes 94-95.
123Gipson, 24 M.J. at 251.
124See id.
125Of course, this is also what the trial judge did under the Frye standard. The judge now has much greater leeway because, under Frye, he or she was constrained by expert testimony on whether the procedure was generally accepted. Therefore, the relevancy approach enhances the role of the judge. The judge not only supplants Frye's "scientific jury," but also does so in the absence of clear guidelines on where to draw the line distinguishing admissibility versus weight.
decision can be used to flesh out the definition. Perceiving the problems courts might encounter in assessing reliability, the Third Circuit set forth a number of factors that might be considered. First and foremost is the degree of acceptance of the technique or process. In essence, this is a quasi-Frye analysis. Certainly, if a technique or process has gained general acceptance in the scientific community, it is probably reliable. On the other hand, the Downing court notes that "a known technique which has been able to attract only minimal support within the community is likely to be found unreliable." The grey area between "general acceptance" and "minimal support" requires further elucidation.

To flesh out the grey area, Downing suggests a number of tactics. Beyond acceptance, a court may consider the uniqueness or novelty of a technique or process. In other words, given a novel scientific technique, to what extent is it based on established and well-accepted principles? Similarly, the technique or process may have been critiqued in literature from the relevant field of study. In both these cases, the key is the extent to which the "scientific basis of the new technique has been subjected to critical scientific scrutiny." Other factors that might be addressed include the "qualifications and professional stature of the witnesses," the "non-judicial uses to which the scientific technique are put," "the frequency with which a technique leads to an erroneous results," and the "type of error" generated. Of course, a court always could choose to take judicial notice of testimony supporting or attacking the technique in prior cases.

The Gipson decision also provided little guidance on how to ascertain whether the evidence would overwhelm, confuse, or mislead

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126 Downing, 753 F.2d at 1238. The Gipson court similarly retains Frye in this manner. 24 M.J. at 252.
127 753 F.2d at 1238.
128 Id.
129 As a measure of reliability, the court suggested comparing the number of times a valid result occurs to the number of times the result is erroneous. Any time the technique is more likely to produce the erroneous result, it should be deemed unreliable. Id. at 1239.
130 Id.
131 Id. at 1238-39. The court based its discussion on the work of Judge Weinstein and Professor Berger, J. Weinstein and M. Berger, Weinstein's Evidence § 702 (1985). With regard to judicially noting testimony of experts in previous cases, care must be taken to ensure the state of the scientific technique has not changed. Advances in technology are inherent in novel scientific techniques because, at least until they become generally accepted, they continually are being tested and evaluated. Therefore, the procedure may have been improved or discredited because the testimony in a prior case was taken.
the members, particularly in light of the Military Rule of Evidence 403 limitations. Again by focusing on the Downing decision, however, one at least can sense the type of issues the courts would address. Obviously, one danger is the Addison "mystic infallibility" concern. In noting this problem, the Downing court clearly felt the need to address the concerns of those who opposed rejection of Frye. Frye was meant in great part to avoid the "mystic infallibility" of scientific evidence in the eyes of the layman. The Downing court's alteration of the standard of admissibility was no reason to assume this problem would vanish. Therefore, the relevancy test does tackle the problem through a tier of the newly articulated 702 inquiry. To the extent a piece of scientific evidence will generate undue credibility and be afforded undue weight by the fact finder simply because of its scientific nature, the evidence is more likely to be deemed inadmissible when the probative versus prejudicial balancing occurs.

The irony is that this approach simply restructures the Frye response to the problem. Under Frye, those best able to assess the evidence would pass judgment on its admissibility. If less than generally accepted evidence meets the first tier of the Rule 702 analysis under Downing/Gipson (soundness and reliability), however, the propensity to mislead or confuse is compounded by the "mystic infallibility" phenomena because the evidence is less reliable than it would have been under Frye. Logically, less reliable evidence poses greater dangers of misleading, confusing, or overwhelming the fact finder. The unanswered question is, of course, how the balance plays itself out. Would more evidence be inadmissible based on lack of general acceptance under Frye than would be if based on confusion under the relevancy test, given the lesser degree of acceptance that test requires? That remains to be seen.

Two additional potential scenarios are singled out in Downing as posing particular dangers. The greater danger involves the offer of conclusions by the expert witness without a critical assessment of the underlying data. In these cases, the expert serves as his own "scientific jury" and propounds his own evaluation of the accuracy of the evidence. This is problematic because, under the relevancy standard, the task of demonstrating reliability is less onerous. The

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134496 F.2d at 744; see supra note 11 and accompanying text.

135Downing, 753 F.2d. at 1239.

136Indeed, the absence of experts testifying that the technique is not generally accepted may exacerbate the perceived problem of "mystic infallibility."

137763 F.2d at 1239.
proponent no longer needs to present the "ruling" of the "scientific jury" prior to admission. Instead, he need only convince the judge, a layman in the field of science.

The second problem cited in *Downing* is that of subjectivity. As the court noted, scientific evidence often is generated in raw form by mechanical devices. Then the duty of the expert is to evaluate the evidence subjectively. The classic example, of course, is found in polygraphy. Again, subjectivity is a greater danger under the relevancy test than under *Frye* because the process by which the expert subjectively evaluates the data undergoes less scrutiny. Therefore, in the absence of strict scrutiny of the process, there exists a significant potential for subjectivity flaws in a relevancy approach to 702.

Once the court has considered the degree of reliability and the potential to confuse, mislead, or overwhelm, it must balance the two. In *Downing* the Third Circuit purposefully declined to enunciate the foundation for doing so. It reasoned that because a balancing test that had policy implications was being employed, imposing a standard as if the process involved only fact-finding would be inappropriate. Instead, it simply would use an abuse of discretion stan-

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136 This is a particular problem with regard to novel forensic scientific techniques. To the extent that a technique is unique to forensic science, the experts who have developed it and who will testify concerning its reliability very well may have a vested interest in its acceptance by the courts. Further, because it is a forensic technique, it may be some time before an unbiased scientific community, not involved with forensics, evaluates it.

137 763 F.2d at 1239. The problem of bias discussed earlier is present here as well. See supra note 136. To the extent a private laboratory is involved in forensics, it has a vested interest in being able to generate definitive results. The problem is not so much one of producing results that a client would want, as it is of reporting a result at all when the data may not be clear enough to support one. Concerns in this area are not limited to private firms. For example, although this writer found Air Force Office of Special Investigations (AFOSI) polygraphers to be extremely fair minded and objective, a common perception exists among military defense counsel that AFOSI polygraphs are unreliable and have an undue tendency to incriminate. As part of a team designed to "catch" criminals, the belief is that OSI polygraphers will want to prove guilt via the polygraph examination.

138 An example of the balancing is found in United States v. Mance, 26 M.J. 244 (C.M.A. 1988). The court refused to permit expert scientific testimony to the effect that melatonin—a substance responsible for skin pigmentation and found in urine—could result in a positive urinalysis for cannabis. The court noted that the expert involved was self-taught, had no formal forensic education, and had no lab. Additionally, no tests had been done to verify the theory, and the expert was unaware of any scientist other than himself who supported the theory. Therefore, the testimony would only serve to confuse and mislead the fact finders. Id. at 247.
dard to review the decisions of lower courts. In other words, the trial judge will have to ascertain when the balance, given the particular type of evidence involved and in light of other evidence adduced at trial, will tip in favor of admissibility or in favor of exclusion. Presumably, military courts will take the same approach.

If the reliability of the evidence outweighs the potential dangers, the court must consider the final factor implicit in Military Rule of Evidence 702—the proffered connection between the offered evidence and the fact in issue. This issue is reminiscent of the Military Rule of Evidence 401 requirement that the evidence render a fact of "consequence . . . more or less probable." Generally, articulating the connection will not be an overly demanding task for the practitioner. Further, because reliability already is described as a Rule 702 requirement, the issue actually will be one of materiality. Therefore, assuming the reliability of evidence outweighs its

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139 73 F.2d at 1240. There have been a number of military appellate cases upholding the judge’s discretionary powers. In United States v. Jensen, 25 M.J. 254, 260 (C.M.A. 1987), the Court of Military Appeals, citing Gibson, upheld the trial judge’s exclusion of an excorayatory polygraph. The great degree of discretion granted was indicated by the lack of discussion of the basis for exclusion and by the court’s statement that “this is not to say that the trial judge would have erred by admitting the evidence.” Id. An example of a case finding the trial judge to have abused his discretion is United States v. Rivero, 23 M.J. 638 (A.C.M.R. 1988). In Rivero the prosecution called an expert in psychology to testify about the “therapist-patient sex syndrome.” Citing Gibson and Sipes, the Rivero court acknowledged that the rules relating to novel scientific evidence had been relaxed. However, the court went on to point out that the expert in question and his associates were about the only people doing research in this area and that the syndrome was not recognized in the Diagnostic and Scientific Manual (DSM III). Rivero, 26 M.J. at 641. The court then ruled that the trial judge had abused his discretion by admitting the testimony because both the technique employed and its underlying principle were very much open to question. Additionally, there was concern about the aura of “scientific legitimacy.” Id. at 642. Rivero is a fascinating case because it reads very much like a case, particularly when the discussion turns to issues such as inclusion in DSM III and the number of researchers looking at the issue. Inclusion in DSM III is, in particular, a general acceptance issue. Of course, it retains value in light of Gibson, but only when it serves as a standard resulting in the admission of evidence. The absence of general acceptance under Gibson, however, should serve only to continue the inquiry.


141 Mil. R. Evid. 401; see supra notes 45 and 86.

142 The proponent of the evidence should make an on-the-record proffer of the relationship asserted. See United States v. Downing, 758 F.2d 1224, 1232 (3d Cir. 1985).

143 An example of a case rejecting evidence on this basis is United States v. Dobb, 26 M.J. 830 (A.C.M.R. 1988). In Dobb the defendant alleged that he was suffering from a transient mental disturbance caused by urea formaldehyde gas and, therefore, did not have the mens rea to establish the dishonorable nature of his acts; that is, issuing worthless checks. Id. at 831. The court rejected the evidence because the defendant made “no proffer that (he) presently suffered from such a mental disturbance, that the physiological condition caused a psychological reaction, or that the military environment in which the appellant lived and worked contained substances that would trigger the onset of the mental disturbance.” Id. at 832.
dangers, the proponent need show only that it will help the fact finder resolve a disputed issue.\textsuperscript{144}

\section*{VIII. MILITARY RULE OF EVIDENCE 403}

The last requirement under a \textit{Gipson} relevancy analysis is that the probative value not be "substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the members, or by undue delay, waste of time, or needless presentation of cumulative evidence."\textsuperscript{145} In assessing the balance, the presumption is in favor of admissibility. Furthermore, the judge will be granted a great deal of discretion in making this determination.\textsuperscript{146} Many of the issues discussed above with regard to the Military Rule of Evidence 702 focus on these dangers are also relevant here. As pointed out above, however, Federal Rule of Evidence 403 is considered, at least in the Third Circuit, to be a stricter standard than the Rule 702 standard,\textsuperscript{147} a precedent military courts probably will follow given the overall \textit{Gipson} reliance on \textit{Downing}. How and why the standard is different is not explained.\textsuperscript{148} This imprecision is illustrated in \textit{United States v. Howard}.\textsuperscript{149} In that case the Coast Guard Court of Military Review considered the exclusion of polygraph results by the trial judge because the questions posed were ambiguous. It based its decision

\begin{footnotes}
\footnote{One final consideration in a Military Rule of Evidence 702 analysis is whether the individual providing the testimony can be qualified as an expert. To be so qualified, the individual must have special knowledge, skill, experience, training, or education sufficient to make it reasonable to rely on his testimony assuming it passes muster as to the other facets of the rule. This is a very low threshold and the expert does not have to be an "outstanding practitioner" in the field. \textit{United States v. Barker}, 653 F.2d 1013, 1024 (6th Cir. 1981). An oft-cited military case is \textit{United States v. Garries}, 19 M.J. 845 (A.F.C.M.R 1985). In Garries a detective was called as a blood stain expert. He had attended a course at the University of Colorado taught by a nationally-recognized blood splatter expert and had been involved in 20-30 actual cases. The detective was held to have been qualified properly as an expert in the field. An example of a case rejecting an individual as an expert is \textit{United States v. Carter}, 26 M.J. 425 (C.M.A. 1988). In Carter admission of a CID agent's testimony that the victim exhibited responses similar to other rape victims was held to be error because he was not properly qualified in the field of rape trauma syndrome. In other words, mere familiarity is insufficient.}


\footnote{\textit{United States v. Downing}, 758 F.2d 1224, 1243 (3d Cir. 1985); see supra text accompanying note 62.}

\footnote{This is one excellent reason to seek special findings in all Military Rule of Evidence 403 rulings.}

\footnote{24 M.J. 897 (C.G.C.M.R. 1987).}
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on Military Rules of Evidence 403 and 702. Given the subjective nature of the standards, future military courts are likely to follow suit.

IX. AN ANALYTICAL FRAMEWORK

A Gipson analysis of novel scientific evidence clearly is fraught with pitfalls. The primary problem is the lack of quantification and definition of the standards. Beyond adoption of a different standard, little can be done to address this particular problem because the criteria chosen by the court inherently call for subjectivity. Therefore, practitioners must rely primarily on their advocacy skills during admissibility hearings and must trust that judges will exercise their broad discretion wisely.

A more approachable problem is that the standard fails to offer a point-by-point catalogue of the issues the court will address. In other words, issues tend to repeat themselves in the guise of criteria for varying rules of evidence. For example, reliability is the subject of inquiry in both a Military Rule of Evidence 401 and a Military Rule of Evidence 702 analysis. The same is true of the Military Rules of Evidence 403 and 702 confusing, misleading, or overwhelming dangers. Even accepting the court’s articulated distinctions, the

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189 Id. at 906.
190 Military Rule of Evidence 403 does include mention of delay, waste of time, and needless presentation of cumulative evidence. These issues of judicial economy are not unique to novel scientific evidence, however, and their handling will mirror that involved with non scientific evidence. Indeed, these provisions seldom are invoked in situations involving scientific evidence.
191 In the face of an assertion that whatever standards might be chosen would, nevertheless, be incapable of quantification, the authors would suggest consideration of admissibility standards that differ based upon whether the evidence is incriminatory or exculpatory. One such approach, which would employ a beyond a reasonable doubt standard for prosecution evidence and a preponderance standard for defense evidence, has been outlined by Professor Giannelli. Giannelli, supra note 33, at 1249-50. Another technique might be to apply the more stringent general acceptance test for incriminatory evidence and the relevance test for exculpatory evidence. Though such approaches would not solve the problem of lack of quantification, they would, to a much greater degree, place the risk where it should be—with the prosecution. Acceptance of differing standards, of course, tend to result in a greater number of acquittals than would be the case if both sides were subject to the same lower standard. As a policy matter, however, we should strive for a system in which the innocent defendant could present any evidence that might demonstrate his or her innocence. Similarly, we should create stringent safeguards against admission of evidence that might wrongly convict that same defendant. To argue that both sides have an inherent right to present evidence of the same quality is to reject the adage that we would rather have guilty defendants go free than convict one innocent one.
192 It is certainly open to question whether “abuse of discretion” is an appropriate standard to use when dealing with exculpatory evidence, particularly when the evidence is of a scientific nature, but has not yet been generally accepted.
substantive elements of these two examples remain constant from rule to rule. Those distinctions that do exist are merely ones of degree. Nevertheless, the similarities permit proposal of a cohesive methodology for the practitioner that combines components of the various rules. Of course, combining common elements of different rules of evidence will not be responsive to the differences of degree asserted by both Downing and Gipson. However, in the absence of clear guidance concerning what those differences are, this point is, in practical terms, irrelevant. Judges will base their decisions on their own estimation of whether the standards have been met, citing the more restrictive rule in close cases. Although this analysis may sound overly cynical, actually it is simply a recognition of the existence of judicial discretion.

In the aftermath of Downing and Gipson, certain areas of inquiry emerge that cut across the somewhat hazy process that would exist in a rule by rule analysis. The analytical framework set forth below is offered to help the practitioner organize an approach to novel scientific evidence. No relevancy analysis would be complete without considering each of the following points:

1) To what extent does the witness qualify as an expert by virtue of his or her knowledge, skill, experience, training, or education (Military Rule of Evidence 702)?

2) To what extent is the offered evidence connected or material to the fact in issue (Military Rules of Evidence 401 and 702)?

3) How valid are the principles underlying the technique used to generate the evidence (Military Rules of Evidence 401 and 702)?

4) How valid is the technique or process used to generate the evidence (Military Rules of Evidence 401 and 702)?

5) To what extent was the application of the process or technique as to this particular evidence and in this particular instance proper (Military Rules of Evidence 401 and 702)?

6) To what extent will admission of the evidence overwhelm, confuse, or mislead the jury, and what is the balance between these factors and the probative value of the evidence (Military Rules of Evidence 401, 403, and 702)?

*The term "probative" is purposefully used here in contrast to the term "material" in question two. This is to indicate that the probativeness of evidence is the combination of the response to all the inquiries set forth in the previous questions.*
7) To what extent do concerns of judicial economy affect the balance in question 6) (Military Rule of Evidence 403)?

8) Can the evidence be excluded on constitutional grounds due to the evidentiary rules, or because of other reasons?

With the exception of the final question, each inquiry requires an answer that must be placed along a continuum. This was done purposefully to emphasize the discretionary powers of the judiciary in this area. The practitioner also must realize that the answers to these questions probably will have a synergistic effect on the ultimate exercise of that discretion. Regardless of the way discretion plays itself out, however, a complete analysis of proffered novel scientific evidence must respond to each of these questions. Finally, the relevancy approach provides fertile ground for argument that any problems with scientific evidence identified by the above analytical framework should go to the weight of the evidence, not to its admissibility. As mentioned previously, the assumption that jurors cannot deal critically with scientific evidence may be unwarranted, especially in courts-martial. In fact, jurors in a court-martial actually may be better able than the judge to assess some types of scientific evidence. With this in mind, an advocate might argue that the relevancy approach, with its less restrictive posture towards scientific evidence, demands that the members be permitted to assign the appropriate weight to a piece of evidence, and that the judge should refuse to admit scientific evidence only under very rare circumstances.

X. CONCLUSION

From 1923 to the mid 1980's, the admissibility of scientific evidence in most courts of the United States, including courts-martial, was governed by the general acceptance standard. This standard required that the scientific principle and technique involved in the creation of a certain piece of evidence be accepted generally by the field to which the principle belonged. Recently, the relevancy approach, which appears to be far less restrictive, has been adopted by some federal courts and the military courts. Whether or not the relevancy approach actually will create a less restrictive atmosphere for the

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\(^{155}\) For example, a judge might admit evidence when the application is somewhat questionable, but not do so in the case of other evidence in which similar questions arise as to application, because of additional questions concerning technique and principle.

\(^{156}\) See supra note 51.
reception of scientific evidence in courts-martial remains to be seen. In adopting the relevancy approach, the Court of Military Appeals did not articulate clear, quantifiable standards for its application. Although a degree of uncertainty exists with regard to the application of the relevancy approach, as forensic science becomes increasingly more sophisticated, the standard certainly will receive further critical attention, and clearer standards necessarily will result.