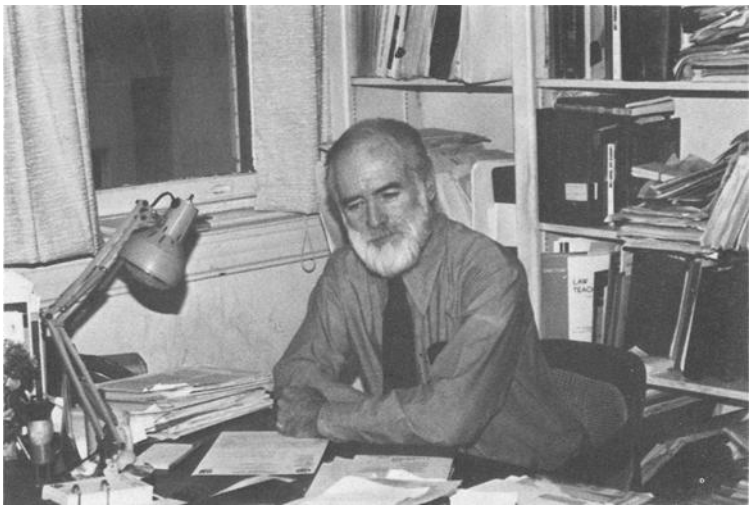
GUEST EDITORIAL



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In the Land of Agog: An Allegory for the Expert Witness

ABSTRACT: Taking its cue from Paul Bunyon's allegory, *The Pilgrim's Progress*, and the various recastings of the Arthurian legend, this paper presents a not altogether mythical allegory on the foibles of some expert witnesses and the ineffective response of the judicial system to them. In its first part, the paper recounts the fictional plight of the King of Agog, mysteriously striken with a crippling illness, whose last recourse for recovery seems to lie in the magic of three wizards. Each of these wizards, Lord Willifred Panbred, Lord Manny Quarryful, and Lady Prunella Prudence, is fashioned after the model of some experts who have ministered as witnesses in the judicial system. Each wizard bears his or her own bag of tricks, none of which give the King any but temporary relief from his affliction. In a second part, the paper dispenses with fiction and engages in a detailed, factual, case-by-case analysis of the ways in which these wizards from a fictional past and their stock of wizardry are paradigms for the conduct of some expert witnesses today. Prescriptions for a cure more permanent than the hocus-pocus the wizards offer the King are stated.

The Legend

Once upon a time, in the mythical land of Agog, when flummery was but a nascent flower, there reigned a King named Guppa-Nemmer the First, called Gn[1] by his friends and confidants. The Kingdom of Agog was a remarkably serene and beatific place, where everything was simplicity itself. Everyone, no matter what his rank or occupation, understood the other. Language was a medium of communication, not a witch's brew of doubt and derision. Fair was fair and foul was foul with nary a word to the contrary. Trust walked the lanes of the land, secure in its welcome and its relevance. The polemic arts were disfavored as were wiles and strategems. Dissension and dispute were unknown. In truth, the natives of Agog, called Agogians, were living lapped by a constant and mighty wave of contentment.

But then came the wizards. No one, at this late date, really knows whether the wizards were first on the scene or whether they were preceded by the King's distress. It is not necessary to this recital to know the proper order of their arrival. We do know they complemented each other, such as they were.

One brightly overcast a.m., King Guppa-Nemmer awoke with a ghastly start. Something he knew was amiss. The morning doves were cackling with jarring crow-like disharmony. The wind had altered its course to a vertical direction and the trees were struggling to adjust. Babble was abroad in the land. So the King put his pillow over his head and prepared to remain abed until the ferment passed.

But rest was not to be his refuge. As Guppa-Nemmer sought to blot out his transmogrified world, he sensed a numbness in his legs, a numbness which prevented his walking. Unaccountably, from a lifetime of strength and vigor, the King had been transformed into a cripple, dependent upon constant care and the incantations of the wizards. True, his metamorphosis was neither as complete nor as monstrous as that which afflicted Kafka's traveling salesman, Gregor Samsa, but the King was, as a King, unaccustomed to even minor inconveniences, much less a crippling blow.

But the King, you see, was not a quitter, even though he had never previously been so much as distressed by acid indigestion. The word, therefore, was proclaimed far and wide throughout the Kingdom of Agog that King Guppa-Nemmer would be beholden to anyone who could cure his malady. They came by ones and they came by twos and they came in droves, for no other reason than that they loved their King. But the King was not relieved. Their arts, their magic, their prayers were of no avail and the King languished abed. And then came the wizards, quietly but with untrammeled conviction in their ability to give him succor.

Unobtrusive as was the wizards' crossing into the land of Agog, the King's sentinels soon espied them and crowds upon crowds of the curious and the disabled and the King's loyal subjects assembled in multitudes in their train. Forward went the word that three wise wizards from the west were on their way. The King received the news upon awakening and instantly assumed a most sanguinary humor for these wizards were acclaimed to have demonstrated the power to cure every illness from ague to phlogosis. More, as accoutrements of their office as genuine wizards and as testimony to their prowess, they bore titles befitting their occupation. There were two lords and a lady among them.

The First Wizard: Lord Willifred Panbred

The first of the wizards to be brought into the King's sickroom was Lord Willifred Panbred. Lord Willifred very nearly did not enter at all for he insisted on carrying a 4.6-m (15-ft) long quintain with a paddle affixed to its crosspiece. Aside from this cumbersome and wondrous quintain, Lord Willifred was distinquished by the proustite-colored gown he wore, from which emanated beams nearly too blinding to behold. Almost as if to distract his onlookers from his radiant apparel, the wizard held in his left hand (his quintain he insisted on

hoisting in his right hand) a bag containing a noisy collection of the bones of animals who had died for want of his magical ministrations. Lord Willifred, you see, was what might be termed in another society, a veterinarian. His forte, for which he held plaudits aplenty, was the curing of lameness in animals.

At first the King was skeptical. Would a measure good for animals have sufficient thaumaturgic quality to cure his lameness? Lord Willifred Panbred was a most persuasive wizard, however, who would brook no doubts. What is good for animals is good for humans, he repeated with such gusto and bravado that the King, out of the slough of his desperation, agreed to be put to the test.

The procedure was a simple one, so promised Lord Willifred. All the King need do was to submit to being bladed. Blading, well-known among wizards, involved bending the subject over the carcass of a beast slain in a hunt, and the subject's being smacked five sharp blows on the natch with the flat side of a wooden paddle.

The King, seeing no harm in this, agreed to the cure, if such it was to be. A hunt was organized for the first light of the very next morning in the King's forest. In the land of Agog, hunting, it needs to be told, was, by edict, only a forenoon sport. In due course, a feral beast was trapped and slain. Whereupon the King's stretcher bearers conveyed him to the scene, laid him over the beast and the King, with eyes chastely averted, was promptly given five vigorous smacks across his natch with Lord Willifred's paddle.

But nothing happened, save for a howl of pain from the sorely bruised King.

As the King's pain from the paddling diminished, and the failure of the cure became certain, the King's anger quickened. Lord Willifred was taken captive and was unceremoniously sent from thither riding on the crest of his outstretched quintain.

The Second Wizard; Lord Manny Quarryful

Undismayed by the ignominy of Lord Willifred Panbred, the King summoned the second wizard. Lord Manny Quarryful made a most dignified and impressive entry. He come with a shock of curly white hair and a beard to match. From his incanous face, two eyes pierced the gloom of the King's sickroom as much as to say that there was no wisdom in the land beyond his lined forehead. Lord Manny spoke in a language of well-schooled refinement, liberally interspersed with Latinate words and phrases. Bonus, bona, bonum punctuated all of his comments, at least those in which hic, haec, hoc did not make an appearance. The impression was one of awesome erudition. To complete this tableau of august wizardry, Lord Manny sported, if such a word of plebian import can be tolerated, a pointed hat upon which were painted a number of triangles with staring eyes which seemed about to blink.

Lord Manny found instant favor with the King, especially when he explained that the King's disability was caused, not by a flaw in the King's physiology, but by an exterior force, known as the Questing Beast. The remedy for the King's lameness lay only in snaring the Questing Beast, a task made more difficult, it appeared, by the protection afforded the Questing Beast by Galapas, a giant of unfathomable magnitude. The King, at first optimistic, despaired upon hearing of Galapas.

But, undaunted, Lord Manny had all the answers. He presented the King with a nacarat as an amulet to ward off the powers of Galapas. He responded to the King's "but had this ever been done before?" with a brusque "there's always a first time" and, more tellingly, "precedent's only fodder for the law." To the King's "but is it possible?," Lord Manny riposted with the firmness of one disciplining a child, "anything is possible to a wizard." The King was captivated, one might almost say, taken in.

And so the hunt for the Questing Beast began. And King Guppa-Nemmer's stalwarts sallied forth bespeckled with rosy optimism and glowing enthusiasm. But as the weeks became months and the months turned into years with neither sight nor sound of the Questing Beast, the King became, at first, disconsolate, then irate. At long last Lord Manny was

relieved of his luxurious appointments in the King's palace and peremptorily dismissed from the land of Agog. Lord Quarryful, when last seen, was trussed hand and foot and, looking most sorrowful, was being dragged along at the end of a nacarat towards the border of Agog.

The Third Wizard: Lady Prunella Prudence

The appearance of the third of the wizards was more than a change of pace. Lady Prunella Prudence, who had been named by her parents after the plant with almost miraculous healing properties, lacked much of the ostentatious, overbearing panache of Lords Willifred and Manny. But, of necessity, she came attired in the raiment of a wizard—in her case, a full-length gown with five tippets and festooned with embroidery of cabalistic designs. Then too, she did have in hand a magic wand carved of lignum vitae. But she did not flaunt an arrogance, a haughty facade of pomp and pretense. She was different. Anyone could see that.

Lady Prunella's stock-in-trade was carried not in her bearing or in an imperious manner but in a portfolio under her arm. To the surprise of King Guppa-Nemmer she deposited this portfolio at the foot of his bed and withdrew from it any number of pages of foolscap. In a polite but authoritative way and without so much as a by-your-leave, she passed these materials to the King for his inspection.

It became apparent that the King had in hand a dossier of scholarly articles authored by Lady Prunella which had been published in all the most renowned journals of wizardry. "Prudence on Mandrake Soup as a Poultice for Red Rimming" was the impressive and trenchant title of the first of these papers. Needless to say the article, which was three printed pages in length had been coauthored by four other wizards, of similar scholarly attainments to Lady Prunella. The King, being well on in years by this date, was particularly attracted to one article which he was seen to hide under his pillow for later reading. At that moment, Lady Prunella had been momentarily distracted. This secreted paper was suggestively titled "Prudence on Preparing the Morwong as an Aphrodisiac for Septuagenarians."

King Guppa-Nemmer, regardless of any reservations he might have had, had no alternative but to hear out Lady Prunella. "What seems to be the trouble?" said the wizard to the King. "I have this total and unceasing numbness in my legs," said the King. "Ah," signed the wizard, signifying volumes of comprehension that only a wizard could possess. "I have just the remedy for that numbness," she announced to the King's immediate relief. "but you must abide by my prescription to the letter," she insisted, "otherwise I will not be answerable for the consequences." Upon the King's acquiescence, she rifled among the papers of her dossier and, having found the one that suited her, emitted another loud "Ah," this time signalling how pleased she was with herself.

Lady Prunella's panacea was too complex, too tedious, and too exacting to be explainable in detail here, but, in short compass, it involved a concoction of equal parts of the roots and flowering parts of the thapsia plant mixed with a two-to-one proportion of cider and metheglin to be drunk only in a well-chilled pewter mug. Lady Prunella called this remedy her "thanathapsia nectar," since, as she put it, it kept the devil from death's door. The King was to drink this brew a mouthful at a time once each day in the a.m. until it was exhausted.

The King sprang to the task with more alacrity than might be expected of a cripple. A royal command was issued for the necessary ingredients; a pewter mug was newly minted; and a suitable vessel was obtained for the mixing. The King waited and watched the proceedings in eager anticipation.

With his first gulp of the magic brew, the King felt instant surcease from the numbness in his legs. As the days advanced, his draughts became sweeter for the numbness was not only relieved but evaporated entirely. Wonder upon wonder, Lady Prunella's wizardry had succeeded. Or had it?

The King had been cured of the numbeness that had engulfed his limbs. But he still could not walk. His lame and numb legs were no longer numb, but they were still lame. A much harried King Guppa-Nemmer summoned Lady Prunella to his chambers.

But, said Lady Prunella Prudence, upon entertaining the King's lament, "you only asked me to cure the numbness in your legs. And have I not done so?" "Of course," moaned the King, in a rising fury, "but could you not also have returned to me the power to walk?" "Indeed I could," the wizard answered almost cheerily. "Then, why, in the name of all that is wizardry, did you not do so," said the King in exasperation. "Because," said Lady Prudence almost nonchalantly, "you never asked for that relief."

With that, the King's vexation knew no bounds. Lady Prunella Prudence was banished from the land of Agog. When last seen she was being escorted along a laneway of the Kingdom with quill in hand shedding page upon page of crumpled foolscap all commencing "Prudence on the Infecundity of Importunate Prudence Towards the Disadvantaged."

L"Envoi"

It is not known whether King Guppa-Nemmer ever recovered the use of his legs, but it is understood that wizardry is in decline in the land of Agog. The people of Agog, when asked to explain this phenomenon, have been heard to murmur "there is more to being Agog than wizardry."

Sir Willifred Panbred and the Shoemaker's Last

The expert witness who is all too lickerish to pontificate on any and all subjects with confidence and certainty in his ability and his opinions has forgotten the maxim of Pliny the Elder. *Ne supra crepidam sutor judicaret* is its phrasing in the Latin text. [*1*]. As loosely translated, it is an exhortation that the shoemaker should stick to his last. According to Wittgenstein [*2*] in a variation on the same theme, "whereof one cannot speak, thereof one must be silent."

Experiential Qualifications

As applied to the expert witness, this maxim addresses the need for the expert to be qualified in two respects. The first is the obvious prerequisite of "experiential qualifications" [*3*] by which only those experts "sufficiently experienced for the matter in hand" [*4*] may testify. An expert should give his opinion only within the limits of his own field of established expertise. Apart from other more compelling reasons of professional conscience for this command, the expert who ventures beyond his own pale chances being hoisted, at least during cross-examination, by the inadequacies of his background for the opinion he has expressed. Every expert should be mindful, with President Calvin Coolidge, that "I have noticed that nothing I never said ever did me any harm" [*5*].

Of course, the scope of each expert's field of expertise is not neatly packaged and readily on display. Some cases are easy. A person who was a member of a city's fire department for 20 years cannot, without more, qualify as an expert in arson detection [*6*]. Others are not so easy. May an expert in hair analysis and comparisons testify to match a fragment of fingernail to its author? A Michigan trial court found no obstacle in the way of such testimony, although on review the trial court was reversed, on other grounds [*7*]. In one sense the Michigan trial court was correct for hair comparisons generally are accomplished microscopically. So too is fingernail matching. But there the resemblance ceases, for the structure of hairs is not the structure of fingernails. A skilled microscopist as to one is not, a fortiorari, a skilled microscopist as to the other.

Other situations are even more problematic. Should a forensic odontologist be permitted to express an opinion identifying the origin of a fingernail scratch mark on human skin? A Pennsylvania appellate court gave the nod to such testimony [*8*], but one wonders. Admittedly, odontologists have developed techniques for the identification of the teeth that implanted a bitemark in human skin. Are those techniques transferable without modification

to fingernail scratch marks? But more to the point, does a knowledge of the structure and function of teeth equate with such learning as to fingernails?

Certainly scientific fields are not discrete, tight little islands unto themselves. The pathologist, along the way in conducting necropsies, is infused with more than a smidgen of insight about firearms identification. The odontologist becomes even more than an amateur microscopist in the course of his duties. The crossover among the various scientific disciplines, however, often provides only an aura, a fragment of experiential qualifications in a cognate, but separate, field—a fragment insufficient to appear in court and to expatiate on one's opinions in that other discipline.

The courts have constantly been confronted with the challenge to keep the expert's opinion within the confines of his own field of endeavor. Defining that field of endeavor has often been the sticking place in a court's quest in a particular case. The decisions are illustrative and bountiful, but not nearly reconcilable according to any litmus paper test.

A pathologist for the defense in the trial of Jean Harris for the murder of Scarsdale diet doctor Tarnower was permitted to suggest that Harris' supply of ammunition was filled with "duds" since "ladies often keep ammunition for years" [*9*]. A "qualified ballistics expert" was allowed to speculate that a red mark on the accused's shoulder "could have been caused by the recoil of firing" a shotgun [*10*]. But one "qualifying as a practical ballistician" (sic) was not allowed, without proof of his psychological training, to state that there is "an involuntary firing reaction—that a person firing a weapon tends to keep on firing (even after ammunition is exhausted)" [*11*]. But, in that same case, the trial judge indicated a willingness to hear from a medical examiner whether "the delivery of a bullet to the victim's forehead from the front could have spun him around so that he could receive the fatal bullet from the rear" [*12*].

If a grieving grandmother can be permitted to identify a mass of bones as belonging to her two missing grandchildren without any indications of her having special training in physical anthropology [*13*], then eyebrows should not be raised when a toxicologist, lacking the same special learning, determines the height of the deceased crime victim and states that the skeletonized remains are those of a young person [*14*].

More recently, in a Texas case, an "opthamologist" (sic) was heard, without judicial complaint, to say that a wound was consistent with having been caused by a .223 bullet and that its trajectory followed an upward path implying it was fired from a prone position [*15*]. But a pathologist "with impressive credentials" who stated that injuries inflicted on the children of single mothers are "most likely" to be caused by live-in or baby-sitting boyfriends was criticized by a Washington state appellate court which reversed a murder conviction for that unsubstantiated and "highly prejudicial" testimony [*16*].

An Oklahoma appeals court was more kindly disposed toward a medical examiner's book learning which, he maintained, enabled him to give his opinion that "marks in the mud around the body could have been made by a person with an artificial limb," such as that worn by the accused [*17*]. The doctor's study of the subject was said to suffice to qualify him to state his opinion on the characteristics of imprints left in mud by prosthetic devices.

The list of such instances of real and imagined excesses in the testimony of persons expert in one field but. ostensibly, not in another could be catalogued mercilessly and nearly endlessly. The Kirschke case [*18*] is a convenient, if not a fitting, summing up on this matter for it is a particularly alarming and indisputable example of an expert witness' kicking over the traces in the courtroom.

Jack Kirschke, a deputy District Attorney in Los Angeles, CA, had visions of grandeur, if a judicial appointment can be so described. But Kierschke's wife, so he though, was an obstacle in his path. Her notorious philandering would not commend him for a judgeship. What to do? Kirschke caught his wife and her paramour *in flagrante delicto* in a bed at the Kireschke's home. Kireschke then killed them both with a .38 caliber revolver he had kept at bedside, after having it released to him after he had prosecuted a person who used it in a crime.

Kirschke was tried and convicted on two counts of murder in the first degree. His defense was that most abused defense, an alibi. Pitted against Kirschke's alibi was the testimony of the state's expert, De Wayne Wolfer, a criminalist with the Los Angeles Police Department. Wolfer first qualified as a ballistics expert and testified that the bullets taken from the victims had been fired from Kirschke's .38 caliber revolver "and no other in the world" [*19*]. Wolfer used photomicrographs to illustrate the points of identification between the evidence and test bullets. So far the progress of the case was humdrum and unexceptional.

But then "a sideshow developed at trial" [*19*]. The male victim's body was shown to have been found face down on the floor beside the bed with postmortem lividity fixed in the wrong location, on the victim's back. Apparently someone or somehow the male victim had rolled off the bed some time after his death.

Further, neighbors testified to having heard loud noises in the Kirschke home in the early morning hours on the day of the killings, which would have been some time after the victims were said to have died. These puzzling facts the prosecution sought to explain by recalling Wolfer to the witness stand. Wolfer was qualified as an expert in acoustics (the appellate court opinion gave no particulars of his credentials in acoustics) and in anatomy, based on an undergraduate college course in which he is said to have "dissected a cadaver from top to bottom" [*19*].

After these preliminaries were concluded, Wolfer was allowed to theorize that the actual killings could have been accomplished while the revolver was "silenced with a towel or a lawn mower muffler" [*19*]. Then the noise reported by the neighbors some hours later needed explication. Wolfer was up to the task.

The noise must have been that of the male victim's falling out of the bed onto the floor. But what might have brought about that reaction? "Wolfer expressed his opinion that a shift of body fluids after death could have so altered the center of gravity of the lady as to cause it to roll from the bed" [*19*].

To support this absolutely insupportable flummery, the round murder bed was put on display in the courtroom in the presence of the jury. Not yet finished with the circus atmosphere, a reenactment of the crime, according to the gospel of Wolfer, was conducted. Two police officers, a male and a female, played the roles of the victims while the path of the murder bullets was traced. The male officer, apparently without first waiting a sufficient time for postmortem lividity to become fixed, rolled off the bed and landed "face downward beside it" [*19*].

After his convictions, Kirschke made a number of startling discoveries concerning Wolfer's testimony. Wolfer's photomicrographs of the bullets which purported to show that they were fired from the same gun, did not do so. Wolfer, when asked to explain this discrepancy, contended that the mistake was an accident resulting from the bullets having been moved while he was momentarily interrupted in his work [*20*]. A reviewing court termed this error "not deliberate" [*20*]. But Wolfer's statements on his qualifications in acoustics and anatomy bordered on "perjury" and were "given with a reckless disregard for the truth" [21]. None of these matters were deemed sufficient by the California appeals court to necessitate a retrial for Jack Kirschke.

Methodological Quicksands

Even the ablest expert witness will falter in the absence of a tried technique grounded in a proven principle. The legal standards of acceptability are not those of science and they may be more demanding than those of the expert's discipline itself. Conclusions drawn from the polygraph test, hypnosis sessions, a potpourri of newly struck syndromes from the rape trauma syndrome to the battered wife syndrome and, latterly, the psychology of eyewitness identifications all bear witness to the fact that the law has a finely calibrated weather eye out for the fair and the foul among newfound principles and novel applications of accepted ones. Most regularly, the issue before the courts is whether to accept or to reject the findings of a

principle or a technique which has not previously found judicial favor. The voice spectrograph and an electrophoretic determination of the types of genetic markers in blood are either-or propositions in the juridical order. Either they are accepted or they are not—en toto. And once admitted they are accepted for all purposes and all applications so long as no substantial alterations in their structure or operations are forthcoming.

But other methods are of a different cast. To say that Super Glue[4] is effective in the repair of domestic crockery is not a testimonial to its ability to reveal latent fingerprints. That the laser can revolutionize the practice of surgery is not to affirm that it can detect fingerprints on skin [*22*].

Take neutron activation analysis as another example. Neutron activation analysis, at least until the advent of the less costly and more expeditions atomic absorption spectrometry (usually of the flameless type) was a well-accepted method of determining the existence of primer residues in firearms cases [*23*]. It had even been expanded to the elemental analysis of hair fragments [*24*]. But when it was applied to the analysis of blood, one court called a halt.

In *State v. Stout* [*25*], the Missouri Supreme Court held that the so-called Leddicotte technique for the analysis of blood by neutron activation analysis did not meet the standards of *Frye v. United States* [*26*]. Even though the results of neutron activation testing of hair had previously been approved by that court [*27*] it perceived that the analysis of blood using neutron activation analysis presented "a unique challenge" because of "the large amounts of sodium and chlorine in blood." The problems inherent in the presence of sodium and chlorine had not been obviated by the Leddicotte technique, according to the Missouri court, and thus the application of neutron activation analysis to blood analysis was deemed legally unacceptable.

Anodic stripping voltammetry (ASV) is another illustration of a technique of proven value in one field which has been expanded to other uses quite possibly before the time was propitious to do so. Two decisions [*28*] from two different appellate courts in Missouri in 1983 focus on this problem.

Both involved charges of homicide in the use of a firearm. Both witnessed a state's crime laboratory's testing swabs from the hands of the accused and others to determine the presence and the quantum of primer residues on them. And both involved laboratory conclusions drawn from analysis by ASV which were highly incriminating to the defendents. Both saw ASV challenged on the appeals from the convictions as not based on a "scientific principle generally accepted as reliable" [*28*]. Neither witnessed the presentation at the trial of direct testimony from experts for the defense critical of the application of ASV to primer residue determinations. Neither saw the appellate challenge to ASV succeed since the settled use of ASV in environmental industries in ascertaining the level of pollutants in air and water justified its acceptance in primer residue analysis.

Prima facie, the conclusions drawn by these two Missouri appellate courts, no further elaboration having been offered by them, constitute egregious non sequiturs. Blading, one is forced to remind Lord Willifred, which is effective for curing lameness in animals is not logically the cure for the same condition among humans.

That there is a reasonably large literature attesting to the value of ASV in environmental uses is indisputable [*29*]. That the literature commending its use in primer residue decision-making is increasing, mainly through the writings of two of its most confident exponents, is accepted [*30*]. But ASV, as it is presently used, has one still more intractable drawback. It cannot detect the presence of barium, an element put into primer compounds as an oxidizing agent.

The major constituents of primer compounds, which have forensic science significance, are lead, antimony, and barium [*31*]. The hands of a person who discharges a weapon, at least one using centerfire ammunition, are likely to show evidence of concentrations of lead, antimony, and barium as well as copper, which is the major component of cartridge cases and appears in the jackets of coated bullets as well. But lead and copper, particularly lead,

are so ubiquitous in ordinary, nonfirearm settings that to find lead and copper on a person's hands is of little or no importance as more than a mere presumptive indication that that person discharged (as opposed to handled, and so forth) a weapon.

The two elements then that are genuine markers of primer residues are barium and antimony. But, as said previously, ASV is disabled from detecting barium. Consequently, the linchpin upon which ASV's legal acceptability must rest is whether the scientific community generally will rely upon a finding of antimony alone to justify a laboratory report that a person has fired a weapon.

The answer is, most resoundingly and emphatically, in the negative [*32*]. Consequently, for these two Missouri appellate courts to find that ASV's general acceptance among scientists warrants the admissibility of its primer residue test results is more than a logical fallacy. It is a rejection of the Missouri Supreme Court's soundly based opinion in *State v. Stout* [*25*], a failure to recognize the state of the art among scientists conducting primer residue testing and an opening wedge for even more absurd daredeviltry by expert witnesses.

Observe, in the latter connection, that the expert in *State v. Williams* [*28*] not only said that his tests were consistent with Williams having discharged a weapon, but that they were consistent with his having fired a ".45 caliber weapon." Now that is an opinion which would find favor only among ASV's most die-hard true believers. To pinpoint the caliber of the weapon from levels of antimony, lead, and copper on a person's hands requires a tinker-toy analysis of many variables. It does not suffice to assert that larger caliber bullets leave more primer residues. Whether the weapon is a revolver or a pistol is also important. Whether the shooting occurs indoors or out is relevant. The condition and the age of the weapon and how it is held are also factors that make caliber determinations, certainly in the absence of barium, tricky business of the most Hohfeldian sort. The goose does not hang high in the presence of scientific propositions of the most unscientific, even dégagé, variety.

What's To Do?

First, the quick fix! Presumptively, expert witnesses know their own experiential qualifications and can, therefore, simply avoid the siren call to exceed them. Professor Keith Simpson, esteemed pathologist [*33*], has reported that he was once asked whether "the flow of the tide comes very heavily at this point." He replied, "I have no knowledge of that," which is an answer that might, quite irrationally, perturb other expert witnesses who operate on the premise that once an expert witness on one matter, always an expert witness on all matters. For the faint of heart, it is suggested that what was good enough for Mrs. Sparsit should certainly be apt for the expert witness.

As Dickens tells us, Mrs. Sparsit declared, "I do not pretend to understand these things . . . my lot having been signally cast in a widely different sphere" [*34*]. Ignorance, where knowledge is not reasonably expected, is no cause to blush nor to balk at its admission.

But the more ineffable case is that of the expert witness who is rooted in the unshakeable conviction that either he is qualified to state an opinion or that any uncertainty in that regard can merely be screened out by couching his opinion in words of equivocation, such as appeared, or seemed, or consistent with. Such words are to the expert witness what the unbaited hook is to the fisherman—that which portends no contest.

In such a situation it is to the court to which we must look for direction. Yet, in most instances, the court is not equal to the task, either because it lacks the necessary knowledge or the incentive to intervene. More exacting and more widely promulgated standards for qualifying expert witnesses must be drafted. A clash of experts must be seen to be the norm rather than the exception. What courts will not do for themselves, the testimony of experts at loggerheads must remedy. And finally, the old, the shopworn, the moldering shibboleth of the court appointed expert acting as an impartial arbiter must once more be given serious

consideration. What experts will not do to discipline themselves, other experts must be called to do for them.

Lord Manny Quarryful and the Quest for the N-Rays

Expert witnesses sometimes are so expert that they could even square a circle, resolve Bishop Berkeleys's philosophical puzzle, find the elusive N-rays or perform other prodigiously impossible tasks utilizing the results of their irreproducible research. Scientists, like anyone else, can be bilked into believing the impossible is attainable. The N-rays fiasco that occurred in turn-of-the-century France [*35*] was a particularly horrid example of deceit by and upon scientists.

In experimenting with the newly discovered X-rays, the acclaimed French physicist Rene Blondlot proclaimed his discovery of a new light wave which he termed the N-ray after the University of Nancy where he worked. Shortly, other qualified scientists claimed to have observed the same phenomenon under a variety of disparate circumstances. Some 300 papers by 100 scientists and medical doctors were published analyzing these new rays. Blondlot was chosen by the French Academy of Sciences over Nobel prize winner Pierre Curie for the highly valued Lecomte prize.

But "N-rays do not exist" [*36*]. The scandal, once unmasked, became a nightmare of charge and countercharge within the French scientific community. Some dismissed the whole thing as a pathological aberration of limited consequence. Others saw it as symptomatic of scientists' self-delusion when their observations lead them "to see what they expect to see" [*36*]. This human factor was thought by some to be an ineradicable mark on the scientific process.

Expert witnesses, too, have done more than dream the impossible dream. They have also been revealed in the bright light of their own N-rays. And the foibles of human observers may be responsible for the appearance of this aberration in expert witnesses as it is in other spheres. Indeed, the judicial machinery may bear its share of the blame for this state of affairs.

Bullet Wounds and Bullet Caliber

All too often expert witnesses are asked to state the size of an unrecovered bullet that has left a penetrating hole in skin, bone, or fabric. The literature indicates a constant admonition to experts to exhibit a fixed aversion to overtures to testify to the caliber of the bullet which caused a puncture in skin, bone, or fabric. One pathologist has defined the "attempt to predict the caliber of the bullet from the size of the entrance wound" as the seventh among many pitfalls for forensic pathologists [*37*].

That a bullet caliber determination under these circumstances is "risky" business [*38*] is amply supported. The elastic nature of skin and fabric make such decisions rife with the probability of error [*39*]. But not only the elasticity and the resilience of skin tissue or a garment are cause for caution. It may also happen that the bullet upon striking the subject is deformed or is tumbling erratically after having ricocheted off another object [*40*]. The hole size, in that event, will be a false barometer of the caliber of the bullet.

Even in the case of bone penetrated by a bullet, one chances error in estimating the bullet size from the diameter of the entrance hole. If a contact wound were the precipitating cause of the injury or death, the entrance wound, and the bone, certainly in the case of a head wound, would be larger than normal as a result of the location's taking "the entire blast of expanding gas" [*41*].

Confronted with these uncertainties and imponderables, expert witnesses have been cautioned that not even "valid estimates" of the "exact bullet calibers" can be made "solely from the dimensions of the entrance skin defects" [*42*]. But the practice in the testimony of

expert witnesses in the courts has been too often to disregard this sound advice [*43*]. And the courts have consistently accepted such evidence [*44*]. "Opinion evidence may be admissible as to what caliber of bullet ... inflicted the wound or wounds in question," says one respected legal encyclopedia [*44*].

In spite of judicial approval of such testimony, some experts have exercised a self-imposed caution. Rather than declaring the exact bullet caliber from the measurements of the hole it produces, the bullet is said to be a "small caliber one" [*45*] or one larger than a stated caliber [*46*]. Other experts have had recourse to that traducious obscurity, the phrase "consistent with," in the apparent expectation that such language is but innocuous mugwumping [*47*].

In one case [*48*], the common misapprehension in the presence of "consistent with" became rankly evident in a dissenting judge's opinion. A pathologist was reported by the majority opinion of the Texas appellate court to have testified that "one-half inch diameter measurements of five of the wounds (to the deceased Greer) would be consistent with those made by a .45 caliber bullet" and that the other wound measuring one-quarter of an inch was "consistent with being made by a .32 caliber" [*48*]. The dissenting judge, however, said the pathologist's testimony had identified the wounds as caused by ".32 and .45 caliber bullets" [*48*]. Maybe not, but that is the way "consistent with" is often misunderstood by the nonlinguistic experts who sit on juries or who render appellate court opinions.

Sinister Connotations

The pressures upon the expert to give the prosecutor or the defense attorney what they want for an expert opinion is sometimes overpowering, even when to do so will convey the misleading notion that the impossible is, in fact, possible. The jury, and often the judge as well, will not know the difference because the presence and the jargon of the scientist have a spellbinding tendency to overawe the laity. Quite conceivably something on this order explains the "weapons expert's "storybook testimony in *State v. Aubert* [*49*].

Jean Aubert, the shooting victim's wife, was right-handed, but when she entered a neighbor's home on New Year's Eve 1978, she was carrying a .38 caliber revolver in her left hand. Her husband, Armand, had earlier gone to this house to join in the New Year's Eve festivities. Jean went up to her husband, pointed the gun at him and asked "Do you want it now?" Mr. Aubert instantly grabbed his wife by the hair and the gun by the barrel. In the struggle between them, a bullet was discharged from the gun striking Armand in the face.

On a trial in a New Hampshire state court for attempted murder in the first degree, Jean Aubert was convicted over her claim that the .38 had discharged accidentally. On appeal to the New Hampshire Supreme Court in 1980 the conviction was reversed [*49*]. The trial court had refused to charge the jury to return a verdict of not quilty if they decided the shooting was accidental.

Apparently, the trial court was of the opinion that the facts did not sufficiently support an accidental shooting instruction. The New Hampshire high court disagreed noting that a "weapons expert" had testified that a right-handed person who intends to fire a gun will carry it in his right hand. This evidence, together with other proof for the defendant, sufficed to warrant the jury's concluding that Jean Aubert did not intend to kill her husband when she pointed the revolver at him with her left hand and inquired "Do you want it now?"

The first, spontaneous reaction to this opinion is to take refuge in a clerihew, which might be formulated as follows:

The New Hampshire high court
Found firearms not its forte.
So to a weapons expert it turned
Who, for better or worse, it should have spurned.

Other jurisdictions, without the benefit of similar expert testimony, have concluded that an intent to kill can be reasonably inferred from a close-range shooting to the head of the victim [*50*]. The heavy reliance placed by the New Hampshire Supreme Court on the weapon's expert's novel testimony so perplexed this author that a copy of the transcript of the expert's testimony was secured and reviewed.

The expert, the transcript reveals, was a retired 23-year veteran of the F.B.I. who was knowledgeable in general criminal investigations. Aside from his "having been trained in the use of firearms" [*51*], no qualifications were stated to support his ability to testify as a firearms expert. The pertinent testimony appeared in the following exchange on his direct examination by the defense attorney [*51*].

> Q. . . . What is the significance to you of the fact that a woman who was right-handed had that pistol in her left hand upon entering into that residence?
> A. Well, it would appear to me that she did not intend to fire the weapon. I would draw the conclusion that she wanted to show the weapon.

On cross-examination [*52*], this weapons' expert stuck to his guns.

> Q. Have you ever been involved in a situation in which a firearm was used where a right-handed person fired a gun with the left hand?
> A. No.
> Q. Never?
> A. No. . . . I have never seen anyone use the opposite hand in a normal situation.

The expert made no reference to any literature, scientific or otherwise, to bolster his opinion. Well he might have done so, however, since the question of whether a person will necessarily fire a weapon in his "strong" hand has been a recurring theme in determining whether a gunshot wound to the head is suicidal or not. It has been suggested that the left to right bullet wound in Adolph Hitler's head was not self-inflicted since Hilter was known to be right-handed [*53*].

On the contrary, Petty [*54*] classifies the right-hander axiomatically committing suicide "with the muzzle in contact with or close to the right temple" as a common misconception. "Many individuals are not familiar with firearms" [*55*]. For such persons, a class of which Mrs. Aubert might have been a member, there is no "expected, normal or proper fashion" [*55*]. Fatteh [*56*], however, disagrees. His study of 844 suicides prompted him to conclude that the right temple is the favorite point of firing for right-handed suicides whereas the left temple was the choice of left-handed suicides.

It appears that, at least as to suicides, the matter is in doubt. But Mrs. Aubert was not charged with suicide, nor was the defense's expert seen to have a portmanteau filled with data or experience on the question. Experts who are untutored neophytes do seem to find the impossible more penetrable than do experts who are seasoned veterans. But even old hands need be on their guard against the excesses to which their discipline may be heir.

The Pink Teeth Phenomenon

That forensic odontologists have a responsible and important role in the prosecution of criminal matters cannot be gainsaid. That their participation is of inestimable value in rape cases involving what appear to be bite marks on the victims [*57*] is well-established. And the courts have been quick to support this relatively new scientific discipline. But odontologists have been called to the mat on other cases that are not exclusively of dental cognizance. One of such situations pertains to proving the cause of death where the deceased is discovered with teeth bearing a distinct pinkish hue.

At least since the discovery, in 1953, that Mrs. Beryl Evans, one of the eight victims in the Christie murders [*58*], was found upon exhumation to have noticeably pink teeth, there has

been occasional scientific scurrying to pinpoint the cause of this phenomenon. Camps [*59*] speculated that the root cause of the pinkish coloration of the teeth was hemoglobin or a heme derivative in the dentinal tubules. Since it was known that Mrs. Evans had been strangled, Camps postulated that strangulation might force hemoglobin into the teeth "by rupture of the vessels of the dental pulp during a period of raised intracapillary pressure from the venous obstruction" [*60*].

Later studies [*61*] have suggested that pinkness in postmortem teeth is a natural postmortem phenomenon [*61*]. Beeley and Harvey [*62*] found a multitude of potential causative factors, including carbon monoxide, strangulation, and drowning. In Kirkham et al's [*63*] formidable paper "decomposition in a moist environment" was seen as a frequent feature of possible causative influence. Kirkham et al [*63*] question whether strangulation can result in hemorrhage into the dentinal vessels sufficient to cause the teeth to become pink. It is concluded that "it is not sufficiently clear that strangulation or hanging can cause hemorrhage into the pulp of sufficient proportions to cause the teeth to become pink in a short time" [*63*]. Climatological conditions, such as freezing, were observed to "predispose" to pink teeth. These studies, in sum, although not totally discounting strangulation as a crucial factor in the postmortem pink teeth phenomenon, minimize its overall importance. Then along came Leamon Jordan [*64*].

Leamon Jordan was convicted of murder, felony murder, and kidnapping in the death of 17-year-old Kathleen Jennings in Will County, IL and sentenced to concurrent 14- to 60-year terms. The circumstances of the crime and its aftermath made it, in the language of the Illinois trial court, an "absolutely gross example of one person's inhumanity to another person." From the viewpoint of forensic science, the case was extremely unusual for it involved the testimony of forensic odontologists concerning the cause of death, determined from the pink color of the victim's teeth.

Although the victim disappeared in December 1979, the various parts of her dismembered body were not discovered until late February 1980. Her head was found in a dog house in March 1980. Not until about one year later was the defendant, Jordan, arrested for the crimes.

In the interim, various scientific analyses were performed on the victim's remains, including her clothing. Toxicological studies were conducted and forensic odontologists either viewed her teeth or color photographs of her teeth. The coroner released the remains to the victim's father who then had them cremated.

Jordan's involvement in the murder of Ms. Jennings was proved by his two extrajudicial confessions which were corroborated by scientific and other evidence. Apparently Jordan's first confession resulted from his response to a $50 000 reward posted by the victim's father. This confession, described as a "story or fable" by the defendant, involved a role-playing recital in which police officers were given the fictitious identity of Jordan's two accomplices. According to this recital, Ms. Jennings had been suspected of stealing an ounce of cocaine from one Siciliano. Siciliano, in retaliation, tricked Ms. Jennings into leaving a bar and forced her into his automobile.

The victim was taken to a house (or trailer) where Siciliano choked her until she showed no vital signs. Thereafter, still in the presence of Jordan, Siciliano asked who would kill her? Cartalino, the third party in the group, then came to the fore and stabbed Ms. Jennings in the abdomen, using Jordan's knife. The disposal of the body through dismemberment was seemingly arranged through the interposition of Siciliano's father.

Four forensic odontologists testified at the trial, two for the prosecution and two for the defense. The purpose of the state's introduction of such evidence was to corroborate the tale told by Jordan in his confessions. The principal points in issue were whether Ms. Jennings had been strangled and stabbed as described by Jordan.

Of the state's dental experts, only Dr. George Morgan had examined the victim's teeth before cremation. The other expert, Dr. Lester Luntz, had made his analysis based on color

photographs of the teeth, taken after the disarticulated head was discovered. On the basis of the pinkish color detected in the victim's teeth and on other scientific tests, these experts concluded that Ms. Jennings had indeed been strangled as Jordan had recounted.

Jordan argued, on appeal, that the dental experts testimony was defective in that:

(1) it relied on color photos that lacked a color chart or color patch;

(2) it was based on an assessment of teeth that had been destroyed by cremation, thereby denying Jordan an opportunity to refute it by his own expert's scrutiny of the teeth;

(3) odontologists, not being medical doctors, cannot properly be allowed to make medical determinations, such as that pink teeth signify strangulation as the cause of death; and

(4) the evidence for the state was insufficient to establish that the cause of the pink teeth was strangulation rather than some other factor.

With respect to the photographs of the teeth, the Illinois Appellate Court admitted that there was considerable dispute among the experts over the quality of the photographs to illustrate the actual color of the teeth at the time of photographing. Although a color chart or a color patch might have been of assistance, particularly since a copy of the Chicago Tribune on which the jaw had been placed while being photographed also appeared pink, the appeals court deferred to the trial court's decision that the photographs accurately portrayed the color of the teeth.

The appellate court saw no due process infraction in the failure of the state to preserve the victim's jaw and teeth for later examination by the accused. The court found the record totally "devoid of any indication that such would have resulted in evidence favorable to defendant" [*64*].

Concerning the claim that dentists cannot testify on matters of a physiological nature that are more appropriately within the ken of medical doctors, the court asked, rhetorically, can a dentist then not testify to the existence of an abscess? Indeed the court noted, briefly, that the theory of dentists' determining the cause of death from the pinkish color of teeth must be, at least implicitly, generally accepted within the community of such experts since none of the dental experts who testified at trial, either for the defense or the prosecution, disagreed with that view "in theory."

Finally, the possibility that some cause other than strangualtion might account for the pink teeth of Ms. Jennings was considered. Eleven competing alternative theories were stated and discounted as not being sufficiently based on the scientific evidence or as having been expressly excluded by it. They were: carbon monoxide; cyanide poisoning; a direct blow to the head; drug use or abuse; climatological causes, such as rapid heat decomposition or rapid freezing of the body; drowning; and extrinsic staining by tetrocycline or internal absorption (or resorption) through cellular destruction.

All the other evidence having been considered and all the other claimed errors having been found meritless, the conviction and sentences were in all respects affirmed [*64*].

If scientific conclusions can derive from legal decisions, this case would leave the troubling impression that the pinkish color in Ms. Jennings' teeth, discovered in the dead of a central Illinois winter, was occasioned by her being strangled, as Jordan had confessed she had been. Yet, in the present state of the art on this recondite phenomenon, such a finding could, most generously, only be construed to be a flight of scientific fancy propelled by a judicial decision.

The End of the Quest

Science has its limits and, occasionally, it is a foredoomed quest that seeks to exceed those bounds. The forensic pathologist who stated that the knife wounds found on the victim's body were inflicted by a woman [*65*] just did not have the scientific backing for this assertion so as to save a murder conviction resulting from his testimony from reversal on appeal. But

the Georgia Supreme Court discerned no error in the testimony of the state's fingerprint expert that he found no fingerprints in a house because the 26.7°C (80°F) temperature "dried out in a matter of hours the moisture required to hold prints" [66]. Not all courts are perspicacious enough to see the scientific flummery flaunted in its presence.

These are only a few of the fables of forensic science that are being acted and reenacted on a regular basis in the courts. Some day we may expect to find, with Thomas Harris [*67*], that fingerprints may be lifted from one's eyeballs or, with Inspector McGarr [*68*], that fingerprints may be sex-typed or, with Sherlock Holmes [*69*], that a document can be detected to have been written on a commuter railway, but at present these are unattainable goals for forensic science. The courts stand as a giant in the way of forensic science's steady progress in quarrying new scientific achievements when exacting scientific standards to guarantee the accuracy and reliability of scientific results are left vacuously at the courthouse door. The courts must bear the brunt of the responsibility for these deviations from scientific truth, which is, after all, the ultimate quest both in law and in forensic science.

Lady Prunella Prudence and the Conviction of the Innocent

That the innocent are sometimes convicted is a most alarming fact of life in the operation of the criminal justice system. For the incredulous, this tragic state of affairs has been documented in book-length collections, such as *Convicting the Innocent* [*70*] and *Not Guilty* [*71*], books that should be mandatory reading for all persons involved in the very competitive enterprise of criminal law enforcement. The names of certain innocent persons, victimized by fatal flaws in the criminal justice machinery, are etched forever in the public's consciousness. James Whitmore, unjustly convicted for the Hoffert and Wylie murders, is one of those foul weather cases that betokened the dire need for radical criminal law reform. But there are others of less notoriety that have not been so widely disseminated but which, being of particular concern to expert witnesses, deserve the thoughtful appraisal of all fair-minded persons in regular contact with the forensic sciences. Such a case was that of Francis P. Hemauer.

Some of the deficiencies in the criminal law applications of forensic science, being of human and not scientific origin, are readily detectable and equally readily remediable. To learn that Lloyd Prevost was, in 1920, wrongly convicted of murder, in large part upon the testimony of a firearms expert who had manually forced, not fired, through a revolver the test bullets he compared with the evidence bullets is simply to be informed that forensic science's growing pains have sometimes been inflicted on innocent persons [*70*, p. 201].

Or to hear that in 1891 three responsible medical doctors provided the necessary link erroneously establishing the guilt of Ameer Ben Ali (nicknamed Frenchy) for murder upon their affirming that the stain on French's socks constituted "intestinal contents of food elements, all in the same degree of digestion—all exactly identical" to that in the intestines of the deceased victim is but to realize that the practitioners of forensic science sometimes have greater faith in their "scientific" findings than is justly deserved [*70*, p.201]. The case of Francis P. Hemauer lacked the glaring overindulgence in "scientific" learning which precipitated the unjust convictions of Lloyd Prevost and Ameer Ben Ali, but its not being a limelight case should not detract from the desirability of exploring its failures [*72*].

On 4 June 1974 Francis P. Hemauer's lot must have appeared bleak and even totally forlorn. On that date Hemauer's convictions for the abduction, rape, and attempted murder of a 15-year old Milwaukee girl were affirmed by the Wisconsin Supreme Court. His sentence to a 60-year jail term then seemed fixed and immutable.

But Hemauer, his friends, relatives, and some lawyers never relinquished their faith in his innocence. Then, on 8 April 1981, almost nine years after his conviction, Hemauer was freed by a Milwaukee, WI Circuit Court judge who acted on the joint motions of both the prosecution and the defense. The simple fact of the matter was that Hemauer was innocent of the

charges for which he had been convicted and the irrefutable evidence of that fact was at long last forthcoming. Retesting of the seminal stains detected on the panties and the jeans of he victim had now been conducted for the purpose of blood typing them. The stains were found to by type B; the victim was type O and Hemauer was neither of those, but type A. Absorption inhibition saved the day. But how did Hemauer ever get to the desperate plight that had beset him?

The tale seemingly began on Saturday afternoon, 12 Oct. 1968 when a 15-year-old girl, called B. L. S. by the Wisconsin Supreme Court, was asked to assist a man with apparent car trouble who was parked in a Milwaukee shopping center. B. L. S. naively entered the man's car and attempted to start the motor while the man worked with the engine. Shortly, the man closed the car's hood, entered the car, forced B. L. S. to the floor on the passenger's side of the front seat and drove for 10 to 15 min to another location where they exited the car. The man compelled B. L. S. to accompany him to a remote, wooded location where he forced her to remove her panties and pants and then he raped her. Thereafter, he stabbed B. L. S. 20 to 30 times in her upper back and another 15 to 17 times in her upper chest. Not satisfied she was dead, her assailant attempted to suffocate B. L. S., but she feigned death and he left. Immediately B. L. S. went for aid and, miraculously, survived the ferocious attack.

Not until almost three years later was Hemauer implicated as a possible suspect. Sometime in 1971, another 15-year-old girl, Terre Lee Erdman by name, was stabbed to death after being sexually assaulted in Milwaukee. Hemauer was questioned, photographed, and released. In view of the similarity of the two crimes, B. L. S. was shown the photograph of Hemauer which the police had obtained during the investigation of the Erdman killing. Hemauer's photo was one of a group of four displayed to B. L. S. Even though the victim thought the photo of Hemauer could have been that of her attacker, she did not then positively identify Hemauer.

A lineup was conducted, in which the then 48-year-old defendent was grouped with three police officers, aged 30, 32, and 33, respectively. Only after Hemauer was required to put on dark rimmed glasses and was viewed alone by the victim in a hall did she positively identify him as her attacker. The Wisconsin Supreme Court, after viewing color photos of this lineup, termed it "not unnecessarily suggestive" as well as "constitutionally antiseptic" [*73*].

The victim's pinpointing Hemauer as the wrongdoer would have sufficed for a conviction without further evidence. But there was more, much more. Hemauer was interrogated by the police and made most damningly incriminating statements, such as (I) "probably raped B. L. S. but cannot remember." Hemauer later sought to explain this statement as having referred to the memory lapses he suffered when he drank heavily.

In addition, B. L. S. identified Hemauer's car at a lot where some 230 cars had been impounded from the Milwaukee city streets. Her recognition of the car was based upon distinctive exterior and interior features of it. Further, a third person, after first misidentifying Hemauer at a lineup (because of her fear of him, as she said) later picked him out as the man with the pretended car trouble in the shopping center on the date of B. L. S.'s abduction. This witness had observed B. L. S.'s good samaritanism as she wheeled her child across the parking lot of the shopping center. She, like B. L. S., also selected Hemauer's car from the 230 in the impounded car lot as the car she had seen in the shopping center parking lot.

Against this seeming mountain of evidence of his guilt, what could Hemauer say in his own behalf? He presented an alibi (that least credible of all defenses) to the effect that he was duck hunting with a friend early on Saturday, 12 Oct. 1968 and that later, in the afternoon, he left town for Fond du Lac, WI. Two persons, tenants of an apartment house managed by Hemauer, testified to having seen him driving in Fond du Lac at the times he said he was there. Hemauer's former wife said the 1960 Mercury identified by B. L. S. and the other witness was, in reality, in Stockbridge, WI on the date of the crime. Hemauer claimed to be driving a 1967 Pontiac on that date, which assertion alibi witnesses verified. Further, Hemauer had led a life unblemished by a criminal record.

In this state of the evidence and without the blood typing which was later accomplished,

the Wisconsin high court found the disputes in the evidence created a factual question that had "properly (been) determined by the jury."

Almost nine years later and after the expense of some $12 000 in personal costs, paid from his and his family's funds, Hemauer's innocence has been conclusively established. But what went awry? It was a concatenation of accidents, coincidences, and omissions which conspired to convict an innocent man. The F.B.I. in 1968 had tested B. L. S.'s clothing and found seminal stains, but they did not go further to blood group it.

The explanation for this omission lies in an understanding of F.B.I. laboratory practices in 1968. Apparently, the F.B.I. would test physical evidence according to the nature of the request received from the local law enforcement agency that had submitted the evidence. If, as one can fairly hypothesize occurred in the submission concerning B. L. S.'s panties and jeans, a specific request is made for a determination of the existence of seminal stains, then the analysis would be limited to that evaluation and would not go beyond it to, say, blood group the stain, once found to be seminal in nature. The advantages of this self-imposed administrative policy in 1968 which put a lid on imaginative laboratory energies and put a premium on the scientific savoir faire of local law enforcement personnel, might well be debated, but it is clear that its existence was one of many accidental circumstances that pyramided Hemauer into jail. And it is equally clear that that straight jacketing policy no longer controls in the serology branch of the F. B. I. laboratory [*74*].

Of course, no one could be faulted for neglecting to blood group the seminal stain on B. L. S.'s panties and jeans if no testing method existed for that purpose in 1968. Yet among the vast literature in forensic serology that was readily available in 1968, much material was devoted to a discussion of the application of absorption inhibition to the blood typing of nonblood bodily fluids, such as seminal stains. Indeed, as early as 1926, Landsteiner, yes the same Landsteiner who first developed the ABO blood grouping system, and Levine had penned an article directly on point entitled "Group Specific Substances in Spermatazoa" [*75*]. The abundant scholarly literature in 1968 attests to the existence of absorption inhibition as a reliable and well-recognized means of blood typing seminal stains [*76*]. The same can be said of the state of the art in 1972 when Hemauer came to trial.

Whether the defense at the 1972 trial sought to minimize the impact of the F.B.I.'s finding of seminal stains, by noting the failure of the prosecution to more specifically pinpoint its donor by blood typing, is not known. Clearly, any properly briefed and responsible defense attorney should have done so. Such a defense obligation exists even if absorption inhibition testing had not yet met the measure of judicial acceptability in 1972. Later judicial decisions have found no evidentiary impediment to the admissibility of blood grouping of nonblood stains through absorption inhibition, even in those more questionable situations of mixed vaginal and seminal stains [*77*].

It was Hemauer's good fortune that the victim's stained jeans and panties were preserved in a "police locker" free from the possibility of bacterial contamination, in view of the dry atmosphere and controlled temperature of the place, for an eight-year period, which must seem excessive to most investigating agencies. Reanalysis was Hemauer's key to the jailhouse door.

Release from prison gave Hemauer, as he said, the opportunity to touch a tree which he had not been privileged to do for so many years. It also provided him with the motivation to sue his former attorneys for five million dollars in damages for their purported malpractice in representing him. On 10 Sept. 1983, the Milwaukee newspapers reported that the malpractice insurers for the attorney defendants had agreed to settle Hemauer's claim out of court for one-half million dollars. Now Hemauer had more than a tree to touch.

The Hemauer case reveals chinks in the armor of nearly every functionary in the criminal justice process. Police, prosecution, defense attorney and the crime laboratory are all, to some extent, implicated in this miscarriage of justice. From the perspective of the expert witness, what is to be done to thwart a recurrence of such an injustice? In a word, interaction.

The expert witness must communicate to the prosecution and to the police, whichever may be the agency that forwards physical evidence to the crime laboratory for analysis, the capabilities of the laboratory in the testing of the evidence submitted. Needless to say, no recommendation is tendered to create a cadre of police para-experts, although serious thought might be given in that direction.

And police investigative agencies must keep the laboratory informed of their needs which are essential to a complete and impartial investigation of a crime. Admittedly, this last caution broaches issues of wide and ultra sensitivity, particularly with respect to the expert witness's practicing in an atmosphere of objectivity where the chips must be allowed to fall where they may, regardless of police disenchantment with the results.

The onus to protect the Hemauers of our society is in the first instance on the police and prosecution and those allied to them, such as the expert witness when in the crime laboratory. The defense attorney is most often only a gadfly, albeit a vital one, in keeping the balance true. It is unfortunate when the die of injustice is cast before trial leaving to the trial advocacy of the defense attorney the necessity to ferret the truth out of a calamitous situation provoked by a failure to ask specifically for a cure for lameness rather than numbness.

The Passe Partout

King Guppa-Nemmer prefigures the law which is like an empty tent whose magnificence waits upon its being outfitted by those who serve it well. The wizards, like the expeert witnesses they represent, came to serve the King in his hour of trial. That they gave no more than minimal relief is a sad reflection on the way the law has responded to the overtures of expert witnesses as well as on the failure of some expert witnesses whose frailties have lamed them as much as the King's affliction had crippled him.

The King's lameness, of course, signals the state of conflict which is the lot of the law and which it is destined to confront in its courts and beyond. But this lameness might also spring from the law's infrequent exposure to a besotted expert witness. The descriptions of the wizards and their titles and credentials are intended as gentle ribbing, through obvious hyperbole, of the trappings and posturings of some expert witnesses with whom the courts are far from adorned.

The King's greedy acquiescence in the wizards' purported cures signifies the law's faith in the magic of expert witnesses. That this faith may, on occasion, be blind or misguided is not to suggest that it be discarded. Rather the King must rule by reason, not by the pathos which his affliction bears down upon him.

Assuming there is no panacea for a necromancer's follies, which assumption is not misplaced in the case of some expert witnesses, is there at the very least a palliative? Suggestions on that order have been insinuated throughout the legend and the lore of this paper. Sweeping and drastic remedies are not propounded. Blading is definitely out as is the need to capture the Questing Beast or even to immobilize Galapas, the giant who protects his lair. All-encompassing remedies can cut out anything—even the lifeblood of the expert witness with the cut. That is not part of the King's prescription for good health.

In the wave of time, King Guppa-Nemmer is confident that a cure will be forthcoming for

The blood is strong; the heart is intact
And we in deeds must uphold that fact.

Notes

[1] *Natural History*, Book XXXV, sec. 84
[2] Wittgenstein, L., *Tractatus Logito—Philosophicus*, sec. 7, 1921.
[3] Wigmore, H., *Evidence in Trials at Common Law*, Little Brown & Co., Boston, rev. ed., 1961, sec. 555-556.

[4] Id. at pp. 750-751.
[5] 91 Cong. Rec. 2627 (3/22/45).
[6] *State v. Williams*, 654 S.W. 2d. 292 (Mo. App. 1983).
[7] *People v. Wesley*, 303 N.W. 2d. 194 (Mich. App. 1981).
[8] *Comm. v. Graves*, 456 A. 2d. 561 (Pa. Super. Ct. 1983).
[9] *Washington Post*, A2, 1/20/81.
[10] *People v. Lauro*, 398 N.Y.S. 2d. 503, 504 (N.Y.S.Ct., West. Cty. 1977).
[11] *Comm. v. Seit*, 364 N.E. 2d. 1243, 1248 (Mass. 1977).
[12] Id. at 1247.
[13] *Sprouse v. Comm.*, 116 S.W. 344 (Ky. 1909).
[14] *Desilvey v. State*, 16 So. 2d. 183 (Ala. 1944).
[15] *Wilburn v. State*, 636 S.W. 2d. 771, 775 (Tex. App. 1982).
[16] *State v. Steward*, 660 P. 2d. 278 (Wash. App. 1983).
[17] *Jones v. State*, 660 P. 2d. 634, 641 (Okl. Cr. 1983).
[18] *In Re Kirschke*, 125 Cal. Rptr. 680 (Cal. App. 2d. 1975).
[19] Id. at 683.
[20] Id. at 684.
[21] Id. at 685.
[22] Menzel. E. R., "Laser Detection of Latent Fingerprints on Skin," *Journal of Forensic Sciences*, Vol. 27, No. 4, Oct. 1982, pp. 918-922.
[23] *State v. Ross*, 523, S.W. 2d. 841 (Mo. App. 1975).
[24] *State v. Coolidge*, 260 A. 2d. 547 (N.H. 1969).
[25] *State v. Stout*, 478 S.W. 2d. 368 (Mo. 1972).
[26] *Frye v. United States*, 293 F. 1013 (D.C. App. 1923).
[27] *State v. Stevens*, 467 S.W. 2d. 10 (Mo. 1971).
[28] *State v. Walker*, 654 S.W. 2d. 129 (Mo. App. 1983); *State v. Williams*, 659 S.W. 2d. 309 (Mo. App. 1983).
[29] Ferren, W. P., "Analysis of Environmental Samples by Means of Anodic Stripping Voltammetry," *American Laboratory*, Vol. 10, 1978, pp. 52-58. See, in general, Vydra, F., Stulik, K. and Julakova, E., *Electrochemical Stripping Analysis*, Halsted Press, New York, 1976.
[30] Chouchoiiy, S. and Briner, R. C., "An Inexpensive Approach to Inorganic Gunshot Residue Analysis Using Anodic Stripping Voltammetry," *Current Separations*, Vol. 4, 1982, pp. 20-22; Liu, J. H., Lin, W.-F., and Taylor, L., "The Application of Anodic Stripping Voltammetry to Forensic Science, I. The Construction of a Low-Cost Polarograph," *Forensic Science International*, Vol. 16, 1980, pp. 43-52; Liu, J. H., Lin, W.-F., and Nicol J. D., "The Application of Anodic Stripping Voltammetry to Forensic Science, II. Anodic Stripping Voltammetric Analysis of Gunshot Residues," *Forensic Science International*, Vol. 16, 1980, pp. 53-62.
[31] Green, A. L. and Sauve, J. P., "The Analysis of Gunshot Residue by Atomic Absorption Spectrophotometry," *Atomic Absorption Newsletter*, Vol. 11, No. 5, 1972, pp. 93-95.
[32] Telephone conversation with Charles Midkiff, chief chemist, Alcohol, Tobacco and Firearms Bureau, Department of the Treasury on 30 July 1984; Krishnan, S. S., "Detection of Gunshot Residues: Present Status", in *Forensic Science Handbook*, R. Saferstein, Prentice-Hall, Inc., Englewood Cliffs, NJ, 1982, pp. 572-591.
[33] Simpson, K., *Forty Years of Murder*, Granada, London, 1980, p. 43.
[34] Dickens, C., *Hard Times*, Book 2nd., Chap. I.
[35] Broad, W. and Wads, N., *Betrayers of the Truth*, Simon & Schuster, New York, 1982, pp. 112-114.
[36] Id. at p. 113.
[37] Cleveland, F. P., "Characteristics of Wounds Produced by Handguns and Rifles" in *Forensic Pathology: A Handbook for Pathologists*, R. S. Fisher and C. S. Petty, Eds., Government Printing Office, Washington, DC, 1977, pp. 136-143.
[38] Adelson, L., *The Pathology of Homicide*, Charles C Thomas, Springfield, IL, 1974, p. 211; Adelson, L., "Medical Evidence in Fatal Gunshot Injuries," *American Journal of Clinical Pathology*, Vol. 23, 1953, pp. 758-767.
[39] Walker, J. T., "Bullet Holes and Chemical Residues in Shooting Cases," *Journal of American Institute of Criminal Law and Criminology*, Vol. 31, May-June 1940, pp. 497-521; Spitz, W. U. and Fisher, R. S., *Medicolegal Investigation of Death*, Charles C Thomas, Springfield, IL, 2nd. ed., 1980, p. 249.
[40] Shafer, N., Wilkenfeld, M., and Shafer, R., "Gunshot Wounds," in *Legal Medicine*, C. Wecht, Ed., W. B. Saunders Co., Philadelphia, 1982, pp. 1-20.
[41] Moritz, A. R. and Dutra, F. R., "Scientific Evidence in Cases of Injury by Gunfire," *American Medical Association Archives of Pathology*, Vol. 37, 1944, pp. 340-346.
[42] Adelson, L., *The Pathology of Homicide*, Charles C Thomas, Springfield, II, 1974, p. 211.
[43] *State v. Truster*, 334 S.W. 2d. 104 (Mo. 1960); *Miller v. State*, 276 S.E. 2d. 417 (N.C. 1981);

Comm. v. Kivlin, 406 A. 2d. 799 (Pa. 1979); *Pilot Life Ins. Co. v. Boone*, 236 F. 2d. 457 (5th Cir. 1956); *Lee v. State*, 661 P. 2d. 1345 (Okla. Cr. App. 1981).

[44] *Corpus Juris Secundum*, Vol. 23, sec. 868, p. 428.

[45] *State v. Madden and Keeten*, 232 S.E. 2d. 656 (N.C. 1977); *Hartman v. State*, 507 S.W. 2d. 553 (Tex. Cr. App. 1974).

[46] *Willis v. State*, 290 S.E. 2d. 87 (Ga. 1982).

[47] *Ethridge v. State*, 418 So. 2d. 798 (Miss. 1982).

[48] *Granger v. State*, 605 S.W. 2d. 602 (Tex. Cr. App. 1980).

[49] *State v. Aubert*, 421 A. 2d. 124 (N.H. 1980).

[50] *State v. Boyer*, 406 So. 2d. 143, 150 (La. 1981).

[51] Transcript, p. 247.

[52] Transcript p. 261.

[53] Waite, R. G. L., *The Psychopathic God: Adolph Hitler*, Basic Books, Inc., New York, 1977, p. 421.

[54] Curran, W. J., McGarry, A. L., and Petty, C. S., *Modern Legal Medicine, Psychiatry and Forensic Science*, F. A. Davis Co., Philadelphia, 1980, pp. 471-472.

[55] Id. at p. 472.

[56] Fatteh, A., *Handbook of Forensic Pathology*, Lippincott, Philadelphia, 1973, p. 113.

[57] Holley, M. C., "Forensic Odontology: Investigating Bite Marks," *Forensic Science Digest*, Vol. 2, No. 10, 1976, pp. 214-227; Dinkel, E. H., "The Use of Bite Mark Evidence as an Investigative Aid," *Journal of Forensic Sciences*, Vol. 19, No. 3, July 1974, pp. 535-547.

[58] *People v. Marx*, 126 Cal. Rptr. 350 (Cal. App. 1975); Anno., "Identification of Accused by Bite Marks," 77 A.L.R. 3d. 1122 (1977).

[59] Camps, F. E., *Medical and Scientific Investigations in the Christie Case*, Medical Publications Ltd., London, 1953.

[60] Id. at p. 150.

[61] Miles, A. E. W. and Fearnhead, R. W., "Post-Mortem Changes in Teeth," *Journal of Dental Research*, Vol. 33, 1954, p. 735 abstract.

[62] Beeley, J. A. and Harvey, W., "Pink Teeth Appearing as a Post-Mortem Phenomenon," *Journal of Forensic Science Society*, Vol. 13, No. 4, 1973, pp. 297-305.

[63] Kirkham, W. R., Andrews, E. E., Snow, C. C., Grape, P. M., and Snyder, L. "Postmortem Pink Teeth," *Journal of Forensic Sciences*, Vol. 22, No. 1, Jan. 1977, pp. 119-131.

[64] The factual details of the following rendition are drawn from *People v. Jordan*, 448 N.E. 2d. 237 (Ill. App. 1983). Jordan was affirmed by the Illinois Supreme Court on 20 Sept. 1984, too late for inclusion in this article. The Illinois Supreme Court, however, merely tracked the views of the intermediate appellate court.

[65] *Fisher v. State*, 361 So. 2d. 203 (Fla. 1978).

[66] *Bowden v. State*, 238 S.E. 2d. 905, 909 (Ga. 1977).

[67] Harris, T., *Red Dragon*, G.P. Putnam's Sons, New York, 1981.

[68] Gill, B., *McGarr at the Dublin Horse Show*, Penguin, New York, 1981. A foremost fingerprint expert has said "it is almost impossible to determine sex from a latent fingerprint." Moenssens, A., *Fingerprint Techniques*, Chilton Book Co., Philadelphia, 1971, p. 103.

[69] As Sherlock Holmes said "it was written in a train. The good writing represents stations, the bad writing movement, and the very bad writing passing over points. A scientific expert would pronounce at once that this was drawn up on a suburban line." Doyle, A. C., "The Adventure of the Norwood Builder," in *The Complete Sherlock Holmes*, Doubleday & Company, Inc., New York, 1930, pp. 496-510.

[70] Borchard, E., *Convicting the Innocent*, Archon Books, Hamden, CT, 1961.

[71] Frank, J. and Frank, B., *Not Guilty*, Doubleday & Son, Garden City, NY, 1957.

[72] The facts of Hemauer's ordeal are an amalgam of reports on Nexis from the Associated Press and United Press International dated 7, 8, 9 April 1981, 23 Feb. 1982, and 1 Oct. 1983 as well as the Wisconsin Supreme Court's opinion in *Hemauer v. State*, 218 N.W. 2d. 342 (Wis. 1974).

[73] *Hemauer v. State*, 218 N.W. 2d. 342, 344 (Wis. 1974).

[74] Telephone conversation with James Kearney, Serology Branch, F.B.I. on 25 July 1984 which indicated that the standard protocol now calls for semen testing and then, if positive, for blood grouping as well.

[75] *Journal of Immunology*, Vol. 12, 1926, p. 415.

[76] Weiner, A. S. and Helpern, M., "Grouping of Semen in Cases of Rape" in *Fertility and Sterility*, New York, 1966, pp. 6, 12, 551; Yamakami, K., "The Individuality of Semen with Reference to its Property of Inhibiting Specifically Isohemagglutination," *Journal of Immunology*, Vol. 12, 1926, p. 185; Camps, F. E., Ed., *Gradwohl's Legal Medicine*, The Williams and Wilkins Co., Baltimore, 1968.

[77] *People v. McGee*, 410 N.E. 2d. 641 (Ill. App. 1980); *State v. Gray*, 233 S.E. 2d. 905 (N.C. 1977); *Comm. v. Chapman*, 386 A. 2d. 994 (Pa. 1978).