

**THE ACTUARY AS EXPERT WITNESS**

**CLAUDE Y. PAQUIN\***

**ABSTRACT**

This paper describes the legal setting within which the actuary may find himself when serving as a consultant or expert witness in a contested legal proceeding in the United States. Its purpose is to provide the actuary with what he (or she) ought to know to be an effective professional witness. (One should incidentally recognize that not all legal proceedings are adversarial, and that some of them take place before administrative agencies.)

---

**INTRODUCTION**

Perhaps one of the first things the actuary ought to know is whether he possesses those qualities that are the hallmark of a good witness. While competence and integrity are essential prerequisites to serving as an expert witness, other qualities are required as well: an objective attitude and those qualities that characterize a "good teacher," such as articulateness, patience, and the ability to convey information effectively. The professional witness must find it easy to express himself in simple terms, so the jurors may understand. He must be willing to repeat his testimony, sometimes so that the jurors may absorb it properly, sometimes because the opposing side may feign incredulity and decide to test the patience and consistency of the witness. The expert witness should be able to relate to people (such as his neighbors, the jurors) and to provide testimony that is interesting as well as technically competent.

It is helpful, too, if the witness has a good understanding of the legal process of which he becomes a part, and of the legal concepts that form the basis of the information that is sought to be extracted through his testimony. In simple terms, the actuary must understand lawyers, so he may be effective among them. This paper's purpose is to supply a good measure of that understanding.

\* Mr. Paquin, in addition to being a Fellow of the Society, is a member of the Georgia bar.

## OVERVIEW: WHY CALL IN AN EXPERT?

We live in a specialized world, and occasions often present themselves where a lawyer must be consulted. While the lawyer's training may enable him to analyze the legal aspects of his client's problems, sometimes the lawyer must associate other lawyers with him or refer his client to a legal specialist. The lawyer, specialist or not, must often go beyond the strictly legal aspects of the case and resort to specialists in nonlegal fields. In cases involving physical health, the services of physicians are commonly needed. In cases involving "life contingencies" (and other matters, to be sure), the services of actuaries may also be needed.

What the lawyer needs, on behalf of his client, is access to the specialized knowledge of the actuary. The lawyer may simply need advice on whether a case is financially worth pursuing, and an approximate assessment of the actuarial value of his client's claim may provide the answer he needs. The lawyer may need the actuary's skills in analyzing a "structured settlement" (complex life annuity with variable benefits) proposed to his client. He may wish to be informed of whether or not the figures or conclusions of another actuary can be confirmed and relied on. All of this relates to the lawyer's (and his client's) "need to know."

Sometimes the need to know spills over into the "need to show," as when opposing counsel must be shown that the claim made by the lawyer's client is indeed a reasonable amount, which opposing counsel ought to recommend as settlement figure to the latter's client. This can be done through a written report. Sometimes formal proof must be made, through an affidavit (written statement under oath), answers to interrogatories (written statements under oath in response to written questions), a deposition (oral statements under oath in response to questions), or testimony (oral statements under oath and in court, in response to oral questions). (An actuary may occasionally be called upon to show something negative, namely, that a given value is incorrect.)

The actuary thus may need different skills along the way. To analyze a problem and to sort out its actuarial implications is one thing; to construct a valid actuarial model, from the facts of the case and appropriate assumptions, and to derive a proper actuarial value is another thing; and to explain it all effectively to a jury, if it comes to that, is another thing still.

One must note, for now, that the possibility of escalation from a simple report to sworn testimony in court makes it imperative that the simple report be prepared carefully and competently.

## WHO CAN QUALIFY AS AN EXPERT?

The following United States Federal Rules of Evidence (applicable to federal proceedings) are helpful in determining the nature of expert testimony and, consequently, what makes one an expert (for the purpose of the proceeding at hand).

FED. R. EVID. 701. *Opinion Testimony by Lay Witnesses.* If the witness is not testifying as an expert, his testimony in the form of opinions or inferences is limited to those opinions or inferences which are (a) rationally based on the perception of the witness and (b) helpful to a clear understanding of his testimony or the determination of a fact in issue.

The gist of Rule 701 is, in effect, that witnesses may generally not state opinions or provide inferences, except in very limited circumstances. An inference, it should be noted, is a conclusion derived from reasoning. (For instance, without ever seeing a person actually walk on a sandy beach, one might infer from seeing footprints on that beach that somebody walked on that beach.)

FED. R. EVID. 702. *Testimony by Experts.* 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.

Rule 702 makes clear that an expert witness must be qualified, before giving an opinion, as an expert in the particular field of knowledge covered by his opinion. His expertise may be the result of experience or education (not necessarily both), including even self-education, but before his testimony may be considered he must have established (to the presiding judge's satisfaction) that he is indeed an expert in the subject as to which his opinion will be sought. There are degrees of expertise, and some experts may be more convincing than others, but there is a certain threshold of expertise the expert must first demonstrate, to the judge's satisfaction, before his testimony can even be received in evidence. The judge also must be satisfied that the expert is qualified in a subject appropriate to the case.

It should be noted that Rule 702 is concerned with admissibility, and not credibility. *Admissibility* is that which will allow the expert to be listened to. *Credibility* is that which will predispose the listeners to believe what the expert says. Thus, where two minor experts hold to one opinion and one outstanding expert has a contrary opinion, the trier of the facts

(the jury, or in a bench trial the judge) may well decide to believe the outstanding expert. Thus, that phase of the trial where an expert's qualifications are brought out can affect the credibility of his testimony. The party calling the witness normally will seek to dwell on its expert witness's qualifications, while the opposing party may seek (more or less diplomatically) to minimize them.

The rule with respect to expert testimony in the state courts is quite similar to that in the federal courts. Where the facts are such that inexperienced persons are likely to be unable to form a correct judgment without the assistance of a person who has special knowledge, then expert testimony is called for.

Note, however, that an expert's opinion cannot be received if it states a conclusion of law. For instance, an actuary may demonstrate that the actual effective annual rate of interest charged on a given loan was 25.6 percent, but he may not state that he therefore concludes that the loan was usurious. If state law provides, in this instance, that usury exists where the interest charged exceeds 24 percent per year, it is a matter of putting two plus two together to conclude that the loan with 25.6 percent interest is usurious, but that two-plus-two decision is not for the expert witness to make. (The expert witness may avoid an objection, or, worse, a rebuke from the court, by steering clear of conclusions of law.)

#### THE STATEMENT OF CREDENTIALS

Since the first step, in formal proceedings, is for the actuary to establish his qualifications, how should he go about it?

The contents of a good statement of credentials should include (1) education, including academic and professional degrees and honors, (2) experience in the field(s) of expertise of interest in the case and related fields, (3) professional writings, and (4) any teaching experience in the field of expertise. Merely stating that one is a Fellow of the Society of Actuaries, when the judge and some of the members of the jury may not know what that entails, is not sufficient. The actuarial expert should preferably describe the type of work customarily performed by actuaries, their educational background, the actuarial syllabus and examination requirements, the structure of the actuarial profession, and the legal standing of actuaries with respect to the certification of reserves to insurance departments or that of enrolled actuaries with respect to pension plan certifications and their limited right to practice before the Internal Revenue Service (under Treasury Department Circular No. 230, sec. 10.3(d)) and so on. This information must first be conveyed to the lawyer who is expected to "call" the expert to the witness stand, and it may take the

form of a special résumé that will both inform the lawyer and suggest to him the line of questioning he should use when adducing this information at trial.

Note also that merely proving that one is an actuary and that actuaries possess knowledge relevant to some phase of the case may get, for the witness, permission to testify as an expert—that is, his testimony will be admissible. But the witness needs to impress the judge and the jury with the extent and quality of his knowledge if he is to be believed: that is what will make the expert's testimony credible, in addition to being admissible. (Of course, there is more to credibility than credentials, but credentials constitute the first important step.)

#### CONSULTANT OR EXPERT WITNESS: THE INITIAL CLIENT CONTACT

A "consultant" advises. An "expert witness" testifies. There is a big difference, and it is important that the actuary realize it at the outset.

The difference is important because a consultant's advice to a lawyer may be confidential and may need to be kept confidential (in which case it is known as "privileged information"). The testimony of an expert witness, probably first expressed to the lawyer in a written report, is generally available to the other party on demand of the other party, that is, it is "discoverable," which makes it almost the opposite of confidential.

The Federal Rules of Civil Procedure cover that subject at least in part. (It should be noted that many states have adopted the Federal Rules of Civil Procedure as their own, often with minor modifications.)

FED. R. CIV. P. 26(b)(4). *Trial Preparation: Experts.* Discovery of facts known and opinions held by experts, otherwise discoverable under the provisions of subdivision (b)(1) of this rule and acquired or developed in anticipation of litigation or for trial, may be obtained only as follows:

(A) (i) A party may through interrogatories require any other party to identify each person whom the other party expects to call as an expert witness at trial, to state the subject matter on which the expert is expected to testify, and to state the substance of the facts and opinions to which the expert is expected to testify and a summary of the grounds for each opinion. (ii) Upon motion, the court may order further discovery by other means, subject to such restrictions as to scope and such provisions, pursuant to subdivision (b)(4)(C) of this rule, concerning fees and expenses as the court may deem appropriate.

(B) A party may discover facts known or opinions held by an expert who has been retained or specially employed by another party in anticipation of litigation or preparation for trial and who is not expected to be called as a witness at trial, only . . . upon a showing of exceptional circumstances under which it is impracticable for the party seeking discovery to obtain facts or opinions on the same subject by other means.

(C) Unless manifest injustice would result, (i) the court shall require that the party seeking discovery pay the expert a reasonable fee for time spent in responding to discovery under subdivisions (b)(4)(A)(ii) and (b)(4)(B) of this rule; and (ii) with respect to discovery obtained under subdivision (b)(4)(A)(ii) of this rule the court may require, and with respect to discovery obtained under subdivision (b)(4)(B) of this rule the court shall require, the party seeking discovery to pay the other party a fair portion of the fees and expenses reasonably incurred by the latter party in obtaining facts and opinions from the expert.

One can observe, from the wording of this rule, that an opposing party could obtain the identity of the expert (under Rule 26(b)(4)(A)(i)), and thereafter contact the expert directly for the purpose of making the expert disclose the information provided to the party who first retained the expert. Many potential difficult problems can be nipped in the bud, so to speak, by avoiding the premature preparation and release of written reports: an oral statement of the expert's assumptions, processes, and conclusions to the lawyer of the party who retained the expert's services should normally precede the preparation of a formal report, particularly if the lawyer is not yet sure whether or not the expert is to be called as an expert witness at the trial. (Needless to say, the expert may normally rely upon the advice or instructions of the lawyer for the party who retained his services, but there may be difficult situations where the expert will have to retain his own legal counsel.)

#### FACT GATHERING AS AFFECTED BY APPLICABLE LAW

Unlike, say, engineers who might be called upon to ascertain, from physical tests or otherwise, the causes of an airplane crash, the expert actuary is seldom called upon to make an independent investigation of the facts that are relevant to his work. In the usual "loss of earnings" case, he normally will request to be provided with the injured (or deceased) person's date of birth, date of injury, sex, marital status, education, past earnings, and future earnings prospects before the injury. In the case of a disabled person, he will also need information about the degree of disability or residual earning capacity of the injured and his prospects of recovery, and his estimated future medical expenses. In the case of a deceased person, he may request information on the personal consumption expenditures of that person. (In all cases, he will also have need for a *valuation date*, generally the estimated date of trial.)

These facts normally should be furnished by the lawyer who requested the actuary's services (and who will generally have interviewed members of the family and attending physicians long before he contacted the actuary). At the trial, family members and physicians will most commonly

have testified before the actuary and introduced these facts into evidence.

The actuary may need to resort to outside sources to construct a likely future *earnings stream*, with respect to the person injured. The *Handbook of Labor Statistics*, published annually by the Bureau of Labor Statistics of the United States Department of Labor, can be a fruitful source of earnings data for various occupations or persons with various educational backgrounds. Organized associations of persons engaged in a given occupation often collect or have access to statistics on the earnings of their members as a group, and it may be possible to derive from these statistics a reliable basis for developing career growth earnings forecasts.<sup>1</sup>

The actuary should normally request the attorney retaining his services to provide the actuary with a memorandum (or at least guidance) on the applicable law on the use of inflation rates, income taxes, personal consumption expenditures, the value of household and nonjob services, and statutory mortality tables and interest rates prescribed or permitted for computing discounted values ("present values"), and so forth.

What the actuary is generally technically asked to value is not "lost earnings," but rather the economic value of the *earning capacity* of a person. Earning capacity relates to the future, includes more than salary, and normally excludes the possibility of unemployment. Earning capacity generally takes into account future upward mobility (or career advancement) and future increased productivity. In disability cases, it is wise to keep separate "lost earnings," which are earnings that have been lost prior to the time of trial, and "loss of earning capacity," which relates to the future (and takes into account "residual earning capacity," if any). (While the distinction between pretrial lost earnings and posttrial lost earning capacity arguably could be maintained in death cases, it is generally not as clear.) Past medical expenses can be proved together with pretrial lost earnings (and most commonly not through the actuary's testimony), while the value of future medical expenses can be proved together with the value of the loss of earning capacity. It also may be of assistance to the jury, in determining any damages for pain and suffering, that the actuary provide the injured worker's life expectancy.

It has sometimes been asserted that, in wrongful death cases, the value of personal consumption expenditures should be deducted from the value

<sup>1</sup> With respect to the loss of household services, one might note the following references: K. E. Walker and W. H. Gauger, "Time and Its Dollar Value in Household Work," *Family Economics Review* (Fall 1973; published by Family Economics Research Group, United States Department of Agriculture, Agricultural Research Service, Federal Building Room 442A, Hyattsville, Md. 20782), and M. Martin Murphy, "The Value of Time Spent in Home Production," *American Journal of Economics and Sociology*, Vol. XXXV, No. 2 (April 1976) pp. 191-197.

of future earnings, while in disability cases it should not. Of course, that is not true in all jurisdictions; but it is clear that, in those states where this is the law, the "value" which is sought to be produced, in wrongful death cases, is the value to the survivors (presumably the decedent's dependents) of the decedent's earnings. The question one may ask oneself in computing the value of future earnings is, the *value to whom?* Clearly, a totally disabled worker loses more than his dependents do: he loses his entire earnings, while his dependents lose only what would be left after deducting the share of his earnings that would have been used for his personal consumption. (Conversely, why should the wrongdoer get off more cheaply if he kills, rather than just maims, a person? It is easy to see that different states may have different points of view on that, and that the points of view may change over time.)

One item which can often be overlooked, when an injured party is married, is that party's spouse's "loss of consortium." Loss of consortium is the loss of enjoyment of a spouse's companionship. While the value of that loss is not susceptible of precise actuarial valuation, the actuary could compute (for whatever guidance it offers to the jury) the joint life expectancy of the injured party and his spouse. Thus the actuary may wish to ascertain the injured party's spouse's date of birth as part of his preparatory work.

Even though the law of a state may permit the use of a mortality table such as the 1958 CSO Table, the actuary would be wise to remember that the Guides to Professional Conduct of his profession may require him to qualify his calculation if an unsuitable table is used, and to make a supplemental calculation which, in his best judgment, more aptly reflects the true actuarial value of the loss.

Finally, one might consider the special case where the tort-feasor has no assets other than an insurance policy with, say, a \$100,000 liability limit. If it clearly appears that nothing beyond \$100,000 can be recovered, the actuary would obviously be justified in avoiding extreme refinements in his calculations as soon as it becomes clear that the value he is calculating exceeds that \$100,000 maximum available by far. This is, of course, a matter that warrants a discussion with the party's lawyer.

When the actuary shall testify, the facts and assumptions upon which he shall have relied shall form the "foundation" for his opinion. That foundation must often be provided first. The actuary might take note here of Federal Rule of Evidence 705, which is probably typical of the rule that might also be followed in state courts (keeping in mind that each state is free, within the constitutional limits of due process, to adopt its own rules of evidence).

FED. R. EVID. 705. *Disclosure of Facts or Data Underlying Expert Opinion.* The expert may testify in terms of opinion or inference and give his reasons therefor without prior disclosure of the underlying facts or data, unless the court requires otherwise. The expert may in any event be required to disclose the underlying facts or data on cross-examination.

#### REPORTS: FORM AND CONTENTS

As discussed previously, the expert should make an oral report to the lawyer who retained his services before preparing and presenting a formal written report. This procedure can have many advantages: not only does it help protect the actuary's findings from discovery by the opposing party, but it affords the actuary an opportunity to verify that he is providing the lawyer who retained his services with all the information the lawyer wants and in the form in which it is needed. Not only is it a good public relations gesture conducive to a pleasant relationship with the lawyer, but this preliminary oral review could help the actuary avoid an inadvertent misstatement of the facts (assumptions) upon which his figures are based.

What should a written report contain? The actuary's report should recite the basic facts or information provided to him and upon which he relied. This should be followed by a recital of the assumptions made by the actuary and his reasons for selecting each one. A description of his methodology (that is, of the procedures he employed) should follow, with a statement of his concluding figures. The actuary may follow all of this by an opinion as to the reasonableness of the concluding figures.

Here is an example of what an acceptable short report might look like:

#### SAMPLE REPORT (Short Form)

April 1, 1983

Mr. John Q. Attorney, Atty. at Law  
2222 Consolidated Federal Building  
Atlanta, Georgia 303ZZ

Re: Value of Loss of Earnings in Wrongful Death Case; Mr. Victim

Dear Mr. Attorney:

You have requested that we calculate for you the life expectancy of Mr. Accident Victim and the actuarial value, at the time of his death, of his future earnings.

You have provided us information about Mr. Victim which, in substance, is as follows. Mr. Victim was born October 1, 1937. He enjoyed good, normal health until the time of his fatal accident, on October 2, 1982. He graduated from high school, and engaged in assorted clerical work. He was gradually promoted into the position of office manager at XYZ Corp., and he had held that position for some two years at the time of his death. His annual pay at the time was \$20,000.

He also participated in his employer's profit-sharing plan: over the last five years, he was credited with an average of 10 percent of his earnings each year, under that plan.

We calculate that, at the time of his death, the life expectancy of Mr. Victim was 30.57 years. On the basis of the facts presented to us, and on the basis of the assumptions stated in this report, our opinion is that the amount which best represents the value, at the time of his death, of Mr. Victim's future lifetime earnings is \$xxx,xxx.

In calculating this value, we did not make any deduction for income tax or personal consumption expenditures (as you requested). We assumed that Mr. Victim's earnings (including amounts received through profit-sharing) would increase 10 percent per year, during his working lifetime, and that these future earnings should be discounted at an annual rate of 8 percent (to reflect the average yield that a safe investment of a current lump sum might provide over the long term), two assumptions which we believe to be reasonable and consistent when used jointly. We also assumed that Mr. Victim would not receive earnings beyond age 70. We used the Annuity Mortality Table for 1949, Ultimate, in our calculations (as you indicated was permitted under Official Code of Georgia Sec. 24-4-45(a)(2)), which we believe to be a satisfactory table for this purpose.

Upon request, we shall be glad to provide any additional information we can upon the contents and conclusions of this report.

Sincerely,

JOHN Q. ACTUARY, F.S.A, M.A.A.A., E.A.  
*Consulting Actuary, ACTUARIES, INC.*

#### DISCOVERY AND DEPOSITION

Typically, cases go through a fairly lengthy period of "discovery" prior to trial, during which each side accumulates the information and items of proof that will ultimately, but after much sifting, be presented at the trial. All through that time, it is likely that the parties are also "talking settlement," as they discover the respective strengths and weaknesses of their side of the case. At this stage, between the preparation of a written report and the presentation of testimony in court, the actuary may be called upon to furnish certain documents to the opposing party, or to prepare an affidavit (which may be submitted in support of a motion for summary judgment or partial summary judgment, which is essentially a request to the court to reach a legal conclusion, or "judgment," on the basis of facts allegedly not in issue), or to answer interrogatories, or to submit to a deposition (oftentimes being requested to bring with him various documents, which are identified in the notice of taking of deposition or in a *subpoena duces tecum*).

Surviving all of this calls for no special actuarial skills, but it is good to be prepared. (Fairly often, the actuary's testimony is much less crucial than that of live witnesses to an accident, for instance, and those witnesses are much more liable to being "deposed.")

The actuary might note that, at the time his deposition is taken, he may be asked whether he "waives the signature." He normally would be better advised not to do so, unless his failure to waive the signature would work a substantial hardship on the attorneys (who may be about to try the case three days later and who may have agreed, for reasons of cost or convenience, to call the actuary in as a trial witness through his deposition rather than in person). During the deposition, the witness's testimony is taken down (by a court reporter using stenographic means of generally no concern to the witness), and it is later transcribed, that is, put down on paper. After this testimony is available in typewritten form, the witness generally has the right to review it (unless he waived the signature). If he agrees that what has been written down is correct, he signs the deposition. If he disagrees, he notes his corrections in writing before signing the deposition. (The witness may confer with the court reporter on how best to make corrections to the transcript.) This procedure is covered by Federal Rule of Civil Procedure 30(e), which reads as follows:

FED. R. CIV. P. 30(e). *Submission to Witness; Changes; Signing.* When the testimony is fully transcribed the deposition shall be submitted to the witness for examination and shall be read to or by him, unless such examination and reading are waived by the witness and by the parties. Any changes in form or substance which the witness desires to make shall be entered upon the deposition by the officer [court reporter before whom the deposition was taken] with a statement of the reasons given by the witness for making them. The deposition shall then be signed by the witness, unless the parties by stipulation waive the signing or the witness is ill or cannot be found or refuses to sign. If the deposition is not signed by the witness within 30 days of its submission to him, the officer shall sign it and state on the record the fact of the waiver or of the illness or absence of the witness or the fact of the refusal to sign together with the reason, if any, given therefor; and the deposition may then be used as fully as though signed unless on a motion to suppress under Rule 32(d)(4) the court holds that the reasons given for the refusal to sign require rejection of the deposition in whole or in part.

#### TRIAL PRELIMINARIES

Immediately prior to the trial, the actuary may be served with a subpoena for his appearance at the trial. (The validity of the subpoena may depend upon the tender of a statutory fee. See, for example, Fed. R. Civ.

P. 45(c) and 28 United States Code Sec. 1821.) The service of a subpoena is generally a precautionary move, on the part of the party calling the actuary to testify, so that if the actuary does not show up on time, that is, when called in open court, that party will not be legally at fault. (Though the actuary may find himself in contempt of court, his lateness will not ruin the case for the party calling him.)

The actuary should be aware of a few items that may arise at the beginning of the trial. Through preliminary motions (called "*motions in limine*"), the lawyers may obtain from the court a certain set of ground rules for the trial. These ground rules often affect the witnesses.

For instance, the "rule of sequestration of witnesses" (now codified as Federal Rule of Evidence 615 and in some places simply called "the rule") is fairly likely to be invoked. This rule prevents the witnesses from being present in court prior to giving their full testimony, so their testimony will not be affected by their hearing the testimony of the witnesses who appear before them. The actuary thus should avoid wandering casually into the courtroom midway through the trial to listen to anything interesting that may be going on, unless he has first ascertained that he may do so from the counsel for the party that requested him to testify. (If it can be arranged ahead of time, it might be a good idea for the actuary to obtain permission to listen to the testimony of witnesses who will describe the plaintiff's earning capacity before and after the accident, as the actuary's testimony needs to take this information into account.)

Another rule may prevent the counsels and the witnesses from mentioning certain matters. For instance, all suggestions that the defendant may have had insurance generally must be strictly avoided (so the jury will not feel more generous than it otherwise might). Likewise there can be no references during the trial to prior settlement offers or negotiations: public policy generally encourages settlement negotiations, but it is obvious that no meaningful negotiations would ever be engaged in if confidential statements made in the course of these negotiations could later be dredged out and brought up at the trial. Other special matters may be "taboo," and the actuary should endeavor to know of these forbidden subjects and, of course, to avoid them in his testimony.

The actuary should bring his notes with him and a pad of paper (as well as, perhaps, some chalk and a blackboard eraser, just in case). The pad of paper is to jot down questions that may be asked of him while he is on the stand. It would hardly be safe for most actuaries to try to memorize the exact figures which represent their calculated value of loss of earning capacity or other such items. Hence, the actuary should bring his notes with him (preferably in his own handwriting, as otherwise an inference

may arise that the actuary is reciting material prepared by someone else). He should be prepared to show these notes to counsel for either side, or the court, during the course of his testimony. It is very wise to make a photocopy of these notes beforehand, because one party or the other might take the notion to seek to introduce them into evidence, in which case they will become part of the record of the case (until it is finally disposed of, after what could be a long appeals period). The actuary/expert-witness should likewise not bring into court books or documents he is not ready to part with: to bring photocopies of relevant material is wiser.

Finally, if the actuary proposes to use bulky or unwieldy visual materials such as large charts or transparencies, he should avoid letting the jury see them before their use has been authorized by the judge, and he should have paper copies of these materials handy (so they may be offered for inclusion as part of the record of the case).

#### THE DIRECT EXAMINATION: CONTENTS AND TECHNIQUE

Live testimony can be provided either at trial or through a deposition. The deposition is a proceeding whereby a person may be examined under oath in practically the same manner as he could be at trial: while no judge is immediately available to pass upon objections, the testimony is recorded by a court reporter and generally transcribed later. (That testimony might possibly be videotaped.) If the witness is not available at the time of the trial, his deposition testimony generally can be tendered into evidence (by being read into the record made at the trial as if presented live). If the witness is available, he is called upon to present live testimony. The testimony at trial ought not to contradict that given at the taking of the witness's deposition, or else his credibility will be in for a severe challenge.

When first sworn in at the trial, the expert should take the oath by answering a firmly audible "I do" in answer to the question "Do you solemnly swear or affirm that the testimony which you will give in this case shall be the truth, the whole truth, and nothing but the truth?" (A "yes" answer to this question, which is often concluded by "so help you God," does not ring very professional.) The expert's credibility begins to be established by this very first response.

Conducting the direct examination of a witness is the responsibility of the party calling that witness to testify (through his lawyer). The questions must be direct and nonleading. A nonleading question is one which does not suggest the answer. For instance, "What college did you attend?" is a leading question suggesting that the witness has attended college. "Did you attend college, and, if so, which one?" is a nonleading question.

(When the opposing party's lawyer gets his turn to ask questions of the same witness, he will be permitted leading questions.) To avoid embarrassing questions and wasting the court's time, the lawyer and the expert should review the questions to be asked. For instance, if the actuary never did attend college, it will save time and embarrassment if the question "Did you attend college, and, if so, which one?" is not asked. The same idea applies if the actuary has never written a paper or taught an actuarial subject.

### A. *Contents*

The direct examination of the expert witness actuary will normally cover the following subjects, in order, and the witness should be prepared for this:

1. The actuary's credentials (including statements indicating that the fact-finders do indeed need the expertise of an actuary to assist them in determining one of the facts they are charged with determining, such as the value of the damages);
2. A description of the preparations he has made to reach his conclusion (such as ascertaining the date of birth of the victim, researching career earnings patterns for persons with a similar background, and so forth);
3. A description of the expertise involved (use of mortality tables to determine survival probability at each attained age, and of interest rate to discount to current value);
4. A statement of his opinion or conclusion (to a reasonable degree of actuarial certainty);
5. An explanation of the basis or reasons supporting his conclusion (review of the reasonableness of all the factors, consideration of range within which the calculated value falls).

In connection with the actuary's statement of his opinion or conclusion, one should note the distinction between the mathematical result of the actuary's computations (which should be 100 percent correct) and the result as an actuarial figure to be used to represent the value of future earnings or medical expenses (or other item). As a representation of the value of future earnings, is that figure definite "to a reasonable degree of certainty"? This may seem like a strange question, but one should remember the law's concern that speculation (or mere guesses) be excluded from the evidence. Hence, the actuary must "feel comfortable," in a professional sense, with his figure: he must be satisfied with it "to a reasonable degree of actuarial certainty." While not all lawyers may use that very term, the actuary-witness must understand its meaning and the law's intent to avoid "mere speculation." Hence, the actuary must understand why the opposing attorney might suggest that "really, you are just guessing, are you not, when you pretend that Mr. So-and-So would

have lived 37.73 years past the date of the accident?" Such a question probably calls for a patient re-explanation of the concept of life expectancy as part of the answer.

### B. *Technique*

There is a technique to testifying as an expert witness on direct examination. First of all, the witness must maintain an objective attitude, that is, one of nonbias. Second, the witness should make effective use of demonstrative evidence. Third, he should keep his testimony simple, so it can be effective. In addition, the witness should generally avoid levity, especially in cases where people have been hurt or killed.

Demonstrative evidence, for actuarial testimony, will generally consist of graphs or charts. This demonstrative evidence will generally be introduced by means of questions like the following:

Have you prepared any graphs or charts in connection with your testimony?

Are the graphs or charts fair and accurate representations of how you arrived at your opinion?

Would referring to the graphs or charts help you explain your opinion to the jury?

Being simple is often not as easy as it sounds. The actuary must be particularly wary of using actuarial jargon, such as "present value," which does not refer to the "present" but to a given date, or "probability," which to the layman means likelihood rather than merely possibility.

### CROSS-EXAMINATIONS: TYPES AND DEFENSES

The word "cross," in the expression cross-examination, means "adverse." It is designed to be unfriendly in the sense that it seeks to test the testimony elicited on direct examination. It is sometimes referred to as simply adverse examination. Generally, a party calling a witness vouches for that witness's credibility (though the rule is now different in federal court), unless he is "surprised" by totally unexpected testimony. (Hence, where a witness says in the lawyer's office that the traffic light was red and then says at the trial that it was green, the lawyer may have to show to the court that the witness misled the lawyer before the latter may begin disputing the testimony of the very witness he has called. The people who happen to be at the scene of an accident are not all alert young adults with 20/20 vision who sing in their church choir. On the other hand, with so many expert witnesses to choose from, the lawyer seldom should be surprised by a last-minute change of testimony on the part of his expert, particularly after a written report or deposition has been provided.) Leading questions are generally the rule rather than the exception in cross-

examination, and the cross-examiner often uses the process to advance his own theories by preceding them with the words "isn't it true that. . . ." A good cross-examiner knows in advance the answer to virtually every question he propounds.

### A. Types

Cross-examination has been described as being of three types: (1) destructive (that is, affecting credibility), (2) neutralizing, and (3) utilizing. The most common type of cross-examination is, by far, the destructive type.

#### 1. DESTRUCTIVE CROSS-EXAMINATION

A destructive type of cross-examination may seek to show

- a) *Personal bias on the part of the witness, for instance as a friend of the party or his lawyer, or as feeling antagonism toward the opposing party, individually or as a member of a class.*

A favorite way of attempting to show bias in an expert witness is to ask, "How much are you being paid for your testimony?" This does suggest that the witness is being paid for saying what he says, so that an answer providing a mere dollar figure can be damning. Hemming and hawing is equally damning. Saying that one charges nothing, if that is indeed the truth, indicates friendship and the bias that can go with it. The best answer, to a question of this type (essentially similar to "Have you stopped beating your wife?"), is to rephrase the question in some acceptable way while answering it candidly. Thus an answer of "My employer treats my coming into court as an expert witness as part of my regular work and pays me my regular salary. For my preparation work and time in court, my employer makes a charge of \$75 an hour," would probably be most appropriate. Assuming it reflects the truth in that particular case, it is responsive and not evasive, but at the same time it sets the record straight, which all answers ought to try to do.

- b) *That the reputation of the witness has been damaged, for instance by his having been the subject of prior or current professional disciplinary proceedings (needless to say, a criminal conviction is even worse).*
- c) *The expert's lack of general professional competence (insufficient experience or education).*

Note how this can be suggested by questions such as:

You are not a member of the Conference of Actuaries in Public Practice, are you, Mr. Smith? Or is it Dr. Smith?

The cross-examiner is likely to know by then that you are not a "doctor." He also knows that if you had been a member of the Conference you would have said so upon being qualified by the party that called you to the witness stand. If you are moderately tired, you are liable to say, "I am not Dr. Smith and I am not a member of the Conference of Actuaries in Public Practice." If you are alert, you might ignore the Dr. Smith part of the question, and reply, "No, I have never felt the need to apply for membership in the Conference of Actuaries in Public Practice, though I believe I would be eligible." If the Dr. Smith part of the question comes again, you can reply that "In the actuarial profession, as in the accounting, engineering, and even the legal profession, it is not customary to seek or use the title of 'doctor.' "

If your answer to the question about the Conference of Actuaries in Public Practice has pleased the cross-examiner, you might expect this additional one:

And I suppose, Mr. Smith, that you are not a member of the American Society of Pension Actuaries either, are you?

If he is doing exceedingly well, the cross-examiner might continue:

And it's the same thing with the Casualty Actuarial Society, you are not a Fellow of that society either, are you? In fact, you're not even an associate member, isn't that true?

It is conceivable that your record of passing actuarial exams might be explored, particularly if you became an F.S.A. at an age which suggests that the exams might have been a formidable challenge. Your employment record might also be reviewed, particularly if it suggests experience in areas not related to the subject of your testimony or frequent changes of employers.

By then, unless his disposition is extremely good (or else he does not have enough sense to realize what is going on), the witness is bound to be getting a little irritated. Obviously, he should not allow himself to be anything but calm and truthful. (If you have ever been fired by an employer because of incompatibility with your boss, admitting it candidly may bring you sympathetic understanding from the jury, as some of the jurors or members of their family may have suffered the same fate in the course of their career. A skilled approach to answering tendentious questions is to weave the explanation inextricably into the answer.)

*d) The expert's use of invalid assumptions.*

Actuarial calculations are based upon various assumptions, and they make use of tables which in turn are based on certain assumptions. It is

conceivable that a cross-examiner could have a field day with mortality tables which are based on age last birthday as opposed to age nearest birthday, or on insurance mortality rather than general population mortality, and so forth. In the end, the actuary could be pushed into admitting that mortality tables are derived from more or less reliable data, which are then massaged through graduation processes that are more or less arbitrary and fanciful, and are added to, or subtracted from, through pseudo-scientific margins. Or else the actuary can be forced into admitting that he no longer remembers how the mortality table he has used in his calculations was constructed, in which case he does not look very "learned." If, of course, the expert's assumptions are truly invalid, there might be little need to attack those assumptions that only seem invalid. In short, the actuary should be able to defend all his assumptions, and he should refresh his memory about the "sources and characteristics" of the mortality tables he uses.

*e) The expert's use of incorrect data, or his failure to use or consider all relevant material information or data.*

It is not unusual at this stage for the cross-examiner to suggest that the attorney who called the actuary to the stand provided the actuary with the wrong figures or incomplete information. The actuary should thus be sure that, at the outset of his engagement, he has asked the *right* questions and has asked *all* of them; he should also, by the time he testifies, have checked and rechecked all the data (including such matters as the injured party's date of birth) that entered into his calculations.

*f) A manifest error in the expert's computations.*

This should never happen. But if it does, the actuary should admit the error and ask the court for a recess so he may have the opportunity to correct the error. The point to keep foremost in mind is not the obvious embarrassment to the actuary but the court's need to receive the right answer so the ends of justice may be served. (An attempt to cover up may ruin your professional actuarial career forever. You are under oath, and doing justice is the foremost objective of the entire proceeding.)

*g) A prior inconsistent statement by the expert (in his professional writings, or at a previous trial, or in a previous deposition).*

## 2. NEUTRALIZING CROSS-EXAMINATION

A neutralizing cross-examination is typically calculated to bring out an answer which concedes an opponent's point.

Let us suppose that, after you brilliantly testified, in explaining why you do not hold a doctorate, that "it is not customary to seek or use the title of 'doctor' in the actuarial profession," it turns out that the attorney for the opposing party has called to the stand an actuary who is regularly called "Doctor" and is indeed a Ph.D. as well as an F.S.A. That may first come as a little bit of a shock to you and the attorney who called you to the stand. It creates at least a faint suggestion that you were wrong or untruthful. But if the attorney, when cross-examining the other actuary, asks:

Dr. Jones, it is true, is it not, that it is not customary for professional actuaries to have doctor's degrees?

So it is also true, is it not, that most actuaries would not be called "Doctor"?

And the doctor's degree that you yourself hold, you sought because you were interested in teaching, isn't that correct?

In fact the doctor's degree you hold is not specifically in actuarial science, is it?

This exchange (which could be continued to extend into the Ph.D.'s major and thesis, and their relative irrelevance to the testimony being provided) may serve as an example of "neutralizing" cross-examination. It takes a little of the luster away from the opposing witness's doctoral title and degree.

### 3. UTILIZING CROSS-EXAMINATION

A utilizing cross-examination is calculated to establish a point which the cross-examiner wishes to make. In effect, the cross-examiner "helps himself" by using his opponent's expert (for free).

#### B. *Defenses*

A cross-examination is not intended to be friendly, but, being essentially neutral, an expert witness should have no particular reason to be fearful. To remain effective, though, he might take note of the following advice.

1. Always be polite to opposing counsel;
2. Do not hedge your answers with needless qualifiers;
3. Avoid the appearance of bias and untrustworthiness;
4. Confine your answer to the question asked;
5. Do not answer a question with a question, unless a clarification is needed;
6. Do not overstate your opinion or be unduly defensive;
7. Break down and answer part by part any compound or vague questions (jotting down the parts of the question on a pad of paper during questioning will help);
8. Ask to explain any answer (such as "yes" or "no") that might otherwise be misleading;

9. Refuse to concede the accuracy or validity of data provided by the lawyer unless you have independent knowledge of its accuracy;
10. If your answer is cut off, request permission to finish it;
11. Pause before answering every question, and do not start to answer if you see the lawyer for the party who called you to the witness stand rise to state an objection.

#### THE RE-DIRECT EXAMINATION: TYING UP THE LOOSE ENDS

The re-direct examination provides an opportunity to the lawyer who first called the witness to seek to "undo the damage" that may have been done on cross-examination. For instance, if the actuary was asked if he ever was fired from one of his jobs and he answered "yes," with no opportunity to say why, the lawyer may this time ask why. Hopefully, the answer will dispel any suggestion or suspicion that the actuary may have been fired for dishonesty or incompetence. All items which received incomplete answers (for deliberate want of follow-up by the cross-examiner) should ideally be covered, though the expert witness is to some degree at the mercy of his examiner's skills.

The actuary should be aware that a basic principle of effective teaching is repetition. If the attorney who called the actuary to the witness stand knows that as well (and chances are that he does), that attorney may ask the actuary to repeat a large part of his earlier testimony (for the benefit of the jury, which generally retires to deliberate without any written notes). As witness, the actuary should handle this part of the assignment with patience and thoroughness.

The re-direct examination may be followed by a re-cross-examination, and the latter by a re-re-direct examination, and so forth, until both sides are satisfied that all their questions for the witness have been answered.

After all the plaintiff's witnesses have been heard and his evidence presented, the plaintiff will "rest his case." At that point, unless the plaintiff's case is so weak as to invite an immediate dismissal from the court, the defendant will put up his case (by the presentation of his evidence, using his witnesses). After the defense rests, the plaintiff may engage in the presentation of rebuttal evidence, including further testimony, generally limited to attempting to disprove matters brought up by the defendant and his witnesses. This may be followed by a surrebuttal, and so on. On a practical basis, this entire procedure should suggest to the actuary the possibility that he might be called to the witness stand more than once, to testify on controverted issues. Especially if he has been subpoenaed for his appearance at the trial, he is thus not free to go after providing his original testimony unless he has been formally "excused" by the court.

## SPECULATION AND CONJECTURE; INFLATION AND INCOME TAX

In a personal injury case wherein the value of the future earning capacity of a person is in question, should an actuary ever be permitted to testify that a person now earning \$10,000 a year could be earning \$452,593 forty years later, assuming an earnings inflation rate of 10 percent per year? Is that believable? Should the actuary also take income taxes into account in his valuation of future earnings? A legal controversy has been raging on these subjects, particularly in recent years and for obvious reasons, because "speculation" and its progeny are generally inadmissible in evidence.

*A. Inflation Assumptions as Speculation*

The effect of inflation upon calculations can be so mind-boggling that many judges cannot bring themselves to accept that a person earning \$10,000 a year in 1983 might be earning \$450,000 a year for performing the same job in 2023. Inflation has, indeed, proved a troublesome issue for the courts. Presently, three judicial approaches to the problem of inflation can be identified.

One approach, commonly termed the *Alaska rule*, or *total offset approach*, adopts the theory that the inflation rate roughly equals the prevailing interest rate so that the two offset each other: thus, under that approach, the inflation rate is assumed to equal the interest rate, which eliminates the discounting process (at least with respect to interest) when calculating the "present value." The rule derives its name from being first adopted by the Alaska Supreme Court, in 1967 (in *Beaulieu v. Elliott*, 434 P.2d 665). The Pennsylvania Supreme Court, for one, recently adopted the Alaska rule and now prohibits the use of projected inflation rates (*Kaczkowski v. Bolubasz*, 491 Pa. 561, 421 A.2d 1027 [1980]).

Another judicially recognized approach is the *Feldman approach*, named after the case of *Feldman v. Allegheny Airlines, Inc.*, 524 F.2d 384 (2 Cir. 1975, applying Connecticut law). This case approved the computation of the discount rate by offsetting the anticipated rate of earnings on a prudent unsophisticated investment (established at 4.14 percent by the expert testifying at that particular trial) by an inflation factor (established as 2.87 percent as an eighteen-year average by the same expert; the expert rounded up the 1.27 percent difference to 1.5 percent). This approach is based on the theory (supported by ample historical data) that the "real yield" of money is roughly 2 percent in any year, with inflation accounting for the difference between that and the actual yield.

The weakness perceived in the Feldman approach (and in the Alaska rule as well, one might add) is that it assumes that wage increases will

mirror inflation. It is well known that, especially in recent years, the average wage increases of many workers in the United States have not kept up consistently with inflation (and few people are believed to know this better than federal judges, when they reflect on their own pay). Conversely, wages in some occupations have risen at a greater rate than inflation. Thus, even though the Feldman approach is a more appealing one than the Alaska rule, which is seen, by and large, as unduly favoring plaintiffs, the Feldman approach should not foreclose the receipt of testimony indicating that a plaintiff's occupation may give rise to wages which do not keep up with inflation, or which exceed it.

One of the most recent, and interesting, cases involving consideration of inflation in determining the value of lost earnings in federal cases is *Culver v. Slater Boat Co.*, 688 F.2d 280 (5 Cir. 1982, *on rehearing en banc*), decided by a twenty-two-judge bench on September 22, 1982 (with seven dissents). By this decision, the United States Court of Appeals for the (old) Fifth Circuit overruled its previous *en banc* decision in *Johnson v. Penrod Drilling Co.*, 510 F.2d 234 (1975; a 12-3 decision), *cert. denied*, 423 U.S. 839, which prohibited the use of inflation rates in determining future earnings without allowing a commensurate adjustment in the discount rate. The *Culver* court went to great pains to review and outline various approaches which it considered proper, foremost among which (but not exclusively so) was the Feldman approach (so long as the defendant would be permitted to demonstrate that the plaintiff's wages had not kept up with inflation and the likelihood they were unlikely to do so). The *Culver* court also approved of projecting future wages with the benefit of increases due to merit, productivity, promotion or cost-of-living raises (but apparently only if based on pertinent statistical data), discounted to their "present value" on the basis of the yield on relatively safe investments. This latter approach might be considered as the third judicially identified approach: though it suggests that the expert has a certain amount of flexibility, it appears that he would be wise to identify explicitly the elements that enter into projected increases in earnings, and to keep track of them separately.

On the state level, one might find an illustration of the same judicial concern about the speculative nature of inflation projections through the Georgia case of *Woods v. Andersen*, 145 Ga. App. 492, 243 S.E.2d 748 (1978), which came within a whisker of ruling that inflation forecasts by experts were too speculative and remote as a matter of law. The vote in favor of allowing the use of inflation rates as part of the foundation for an expert opinion on the value of lost future earnings was five to four, with one judge from the majority stating "while philosophically I share the

dissent's concern over the use of expert testimony based on annual inflation factors, legal considerations compel me to join the majority." (The expert, a professor of finance at Georgia State University, had used an annual "wage increase factor" of 5 percent and an annual interest rate of 7 percent to discount future earnings.)

One of the Georgia Court of Appeals judges posited the existence of four classes of expert evidence. In class one he would put anything that technically or scientifically can be observed, demonstrated, and tested by experiment, that is, based on exact science. That is the only fully non-speculative evidence. In class two he would put "speculative" evidence given special recognition by statute or judicial precedent, such as blood, ballistics, or fingerprint evidence. In class three he would put speculative evidence that has not achieved special recognition but is at least not based on "sheer speculation." Class four evidence is that which is impossible and incredible or based on sheer speculation (for example, the testimony of a palm reader). Future inflation would be considered as falling into class three. In the court majority's view, class three evidence is at least good enough to present to the jury, and it is up to the jurors to decide what trust they will put in it. (The judge did not comment on the results of lie detector tests. Judicially considered unreliable, they are often put in class four, though by agreement of both parties they may be moved up to class three.)

### B. *The Income Tax Controversy*

Income taxes were at one time much lower than they are now. In the old days, they could probably safely be ignored, and in the interest of preventing juries from getting bogged down with inconsequential matters some courts established as a matter of precedent that income taxes should not be considered. All of this is now being reexamined, not only because income taxes can now matter a lot, but also because of the recent United States Supreme Court decision in the case of *Norfolk & Western Ry. v. Liepelt*, 444 U.S. 490 (1980). In that case, the court ruled that in cases involving federal law a judge should not prevent the jury from considering that the injured person would have paid income tax on his earnings, nor should the judge prevent the jury from learning that the award they could make would be free of income tax. Justice Stevens, who authored the court's opinion, also indicated that the jury might be told that the interest on the award (from which annuity benefits to the injured person might flow) would be taxable as income.

This decision can introduce a whole new range of answers that the expert witness actuary may be called upon to provide in his deposition

or court testimony. Above all, it indicates a current trend to "let it all hang out" before the jury and trust that they will not be unduly confused in the end.

#### FEEES

The subject of fees is a very difficult one. When a person has been hurt, in order to obtain a financial recovery through the judicial system he must prove (among other things) the financial value of his damages, such as his lost earnings in the future. The defendant need not prove anything (at least initially). Thus a plaintiff, or his lawyer, is more likely to seek out the services of an actuary to make that proof than is a defendant.

One common problem is that the plaintiff has little or no money. He generally has had and continues to have very high medical expenses, and no income. Of course, if he recovers a large sum through a lawsuit, he will have some money, but that is iffy and often long delayed.

The contingent fee system, in the United States, has developed from the realization that justice often would be denied to people with meritorious claims if they could not retain an attorney on a basis that made the attorney's fee contingent upon a financial recovery. Hence, the attorney often takes a chance, along with his client, that the lawsuit will yield a recovery out of which the lawyer may recover a fee that compensates him for his work (and to some degree for the risk assumed that his labors might be for naught). Since everyone understands that the lawyer is an advocate for his client, and since the lawyer does not personally testify, that system is deemed proper and acceptable (so long as the lawyer does not acquire a greater interest in the suit than his client: on a practical basis, the rule limits contingent fees to 50 percent of the recovery, although fees in the range of 25 percent to one-third of the recovery seem the most common).

Though the actual rules can vary somewhat from state to state, the current model rules of ethics of the legal profession provide that a lawyer may advance the expenses of litigation to his client, so long as the client remains ultimately responsible for these expenses. (A final draft of proposed Model Rules of Professional Conduct, published in the November 1982 issue of the *American Bar Association Journal*, and currently the subject of much debate in legal circles, would remove the clause "so long as the client remains ultimately responsible for these expenses.") Without advances of that sort, many suits could not be maintained. If the plaintiff is successful, the recovery will provide the funds with which to repay the lawyer's advances; if the plaintiff is not successful, the lawyer may end up writing off

the advances made for his client as uncollectible (and conducive to very adverse public relations, or avoidance through bankruptcy, if the client is pressed for collection).

The American Bar Association's Code of Professional Responsibility (adopted, with some variations, by the various states) currently provides this pertinent rule:

Disciplinary Rule 7-109(C). A lawyer shall not pay, offer to pay, or acquiesce in the payment of compensation to a witness contingent upon the content of his testimony or the outcome of the case. But a lawyer may advance, guarantee, or acquiesce in the payment of:

- (1) Expenses reasonably incurred by a witness in attending or testifying.
- (2) Reasonable compensation to a witness for his loss of time in attending or testifying.
- (3) A reasonable fee for the professional services of an expert witness.

While this rule does not expressly forbid the witness from entering into a contingent fee agreement directly with the party, it appears to virtually rule out the possibility of making the expert's fee contingent on the party's recovery, and reported cases have held such agreements void (and thus uncollectible) as contrary to public policy. In any event, the expert can see that his credibility could be severely questioned, and with good cause, if his fee were expressed as a percentage of the recovery. It is debatable whether the expert could agree to a fee fixed in amount (through an hourly rate formula or otherwise, so long as reasonable and not related to the amount recovered in the lawsuit) but not payable unless and until the plaintiff actually receives, as a result of his lawsuit, the funds with which to pay that fee. (It is probably not a very good idea, and the actuary might be wise to avoid being unwittingly drawn into a loose arrangement that turns out that way.)

What this points to, then, is the necessity of making a firm arrangement with the lawyer about who pays the actuary's fees and when. If the actuary is to learn that the collection of his fee is to await a recovery and come from the plaintiff himself, it is better for him to learn that before he undertakes to perform professional work. Asking for an immediate retainer (serving as minimum fee and to be applied to future work) is usually a sensible way to bring about the necessary, if slightly painful, fee negotiations that must take place at the outset.

There are four commonly used approaches toward fees: (1) a fixed fee (based on an estimate of both time and expenses), (2) a fixed fee (based on a time estimate) plus actual expenses, (3) a daily or hourly rate plus actual expenses, or (4) a contract with severable, multiple parts for each

phase of the work (such as technical advice, data gathering, preparation of reports, preparation of charts and exhibits, and deposition or trial testimony, the latter usually commanding a higher rate because it is stressful, it demands a great degree of concentration, and it can present serious timing problems for the expert). The fourth approach is considered the best, especially for substantial assignments.

The expert should note that once he has been retained and is in effect under contract, he may not be free to withdraw (unless, perhaps, the other party is in breach of contract, for instance, by failing to make a timely remittance of fees or expenses).

#### CONCLUSION

To be a good expert witness requires considerable knowledge and skill, somewhat beyond the ability to calculate actuarial values. Thus, an assignment that calls for providing expert testimony should not be accepted lightly. One must recognize that there is a genuine and legitimate public need—though it is limited—for the services of consultants and expert witnesses who can perform two fairly different tasks: (1) make sound scientific determinations about the actuarial value of future earnings, or future medical expenses, or other financial values dependent, for their valuation, upon the mathematics of life contingencies, and (2) express orally, and even defend, their conclusions, with persuasion and professional dignity, in the tense atmosphere of the courtroom. To the extent that the need is there, and actuaries can competently and adequately respond to that need, they should not shrink from the task. By familiarizing the actuary with the legal process of which the expert witness becomes a part, this paper aims to help its reader develop the competence and confidence to handle professional assignments as expert witness. If this goal is achieved, both the actuarial profession and justice will thus better be served.

## DISCUSSION OF PRECEDING PAPER

BARNET N. BERIN:

Work as an expert witness can be challenging, difficult and demanding. Ideally, an actuary doing this type of consulting for the first time should discuss the proposed assignment with someone experienced in this field. Here are some practical suggestions:

1. Find out if another office of your firm provides services to either party and decide if this prevents you from taking the assignment.
2. Review the material before taking the assignment. Do not take an assignment with which you are uncomfortable.
3. Work includes pretrial, trial and posttrial phases.
4. Be cooperative and helpful, but do not be an advocate.
5. Actuarial consulting work, as well as general employee benefit consulting work, may involve issues where there are no unique answers but a range of possible answers. Normally, the range is similarly defined by competent consultants. Be sure that the party you represent understands the significance of this issue and is fully informed of the range of, say, present values.
6. Expenses include regular rate per hour, travel, hotel, and personal meals. In other words, bill on the regular basis.

I would emphasize points number two and four. A professional should not be a "hired gun" ready to take either side of an assignment of this nature. Further, a professional should not act or function as a senior member of the company for which this assignment is undertaken.

Mr. Paquin has performed a useful service to the membership of the Society of Actuaries on this important but little written about aspect of our profession.

DANIEL J. MCCARTHY:

Mr. Paquin's paper is a welcome addition to the actuarial literature because, in addition to discussing specific issues relating to "loss of earning capacity" cases, he has painted a helpful and accurate picture of the environment in which an actuary operates when he testifies as an expert or assists counsel in trial preparation. My own experience in these capacities arises from corporate litigation rather than from "loss of earning capacity" cases. Assignments have included corporate bankruptcies, antitrust cases, and pol-

icyholder suits against insurers, among others. I have had to learn, through “trial and error,” some of the lessons Mr. Paquin sets forth. In the balance of this discussion, I will reflect upon some of the points Mr. Paquin makes in the light of my experience.

### *Consultant or Expert Witness*

1. The distinction is important, as is the caution to be guided by counsel in the timing of committing opinions to writing. In complex corporate cases, where the “consultant” role may precede the “expert witness” role by many years, attorneys typically avoid making a commitment to the use of a particular expert until some time close to trial (within the limits set by the rules) thereby enabling the use of the consultant without prematurely exposing his thinking to the opponent. (Sometimes the two sides will agree not to take depositions or seek other discovery of the opinions of experts until the trial date is close at hand). In any event the expert should, as Mr. Paquin suggests, be guided by counsel.
2. The counsel with whom you are dealing as consultant or expert is not *your* counsel. His primary concern is his client, not you. You may, as Mr. Paquin notes, require your own counsel in sticky situations. I have never retained counsel in an expert witness situation, but there have been a few times when I considered it. Once, for example, I was asked during a deposition a “background” question whose answer—had I given it fully—would have divulged some information which I considered to be both confidential and unrelated to the matter at hand (it related to the activities of another client of mine). I asked for a recess and explained to the “friendly” counsel that, if the question could not be withdrawn or modified, I would have to delay the deposition to seek counsel. To expedite the proceedings, he successfully negotiated a way around the impasse on my behalf.
3. In his role as consultant, an actuary can have a lot to offer. He will have a background the attorney lacks, and will be familiar with sources of data unknown to the attorney. He may be called upon, for example, to articulate insurance concepts in plain language rather than in jargon, to envision the use of familiar data sources in unfamiliar concepts, and generally to educate the attorneys (and, in the process, be educated himself).

### *Fact-Gathering*

1. In some cases, the actuary may indeed be involved in gathering facts, or something like that. In one instance, a coinsurer of some group insurance policies sued the direct writer of the policies for fraud. I was retained by the court-appointed receiver for the (insolvent) direct writer. Counsel did

not dispute the fraud (failure to remit premiums, charging excessive expenses against the policies, and so on) but sought to limit the damage by arguing that the reinsurer should have known at some point that something was wrong and could have taken action. I was asked to examine the experience reports provided by the direct writer to the reinsurer and, based on those reports and other data previously provided to the reinsurer, to infer the point in time at which it should have been clear to the reinsurer that something was amiss. This example is not unusual. In corporate cases in which the acts giving rise to the litigation are financial rather than physical, an actuary may often serve as an interpreter of facts.

2. Mr. Paquin refers to the word “foundation,” a legal concept important to the expert witness. Typically, counsel will take the expert’s opinion, examine the logical chain of reasoning and the derivation of results contained therein, and identify specific documents supporting each element of evidence or reasoning. He then will assure that these documents are available for admission as evidence and that the basis—the foundation—for their admission is clear (for example, that they are business records, or that they are authoritative sources normally consulted on the question at hand). Sometimes witnesses will have to be called to attest to the foundation of such documents. The actuarial expert, often accustomed to reaching conclusions from a store of knowledge which if often not fully articulated, will—when this first happens—scramble for documentation of things he has long taken for granted.

### *Discovery and Deposition*

My deposition has been taken fairly often, yet I have never signed one. (I *have* always insisted on getting a copy.) In reading depositions (including but not limited to my own), I have seen numerous transcription errors, some laughable and some potentially serious. Whether the nonsigning deponent should be held responsible for such errors is a point upon which Mr. Paquin may wish to expand.

### *Trial Preliminaries*

I have been instructed on occasion in jury trials to step out of the courtroom during the testimony of an expert representing the opposing side (I’ve never understood why). More commonly, not only have I been present, but attorneys have asked me to assist in developing lines of cross-examination after hearing the direct testimony. I have also attended depositions of other experts for the same purpose. I assume that, in the absence of specific instructions from the bench or objection by counsel at a deposition, this violates no rule.

### *Direct Examination*

1. One of the key ideas from this section of the paper is that any limitations or negative features concerning the expert's conclusions or qualifications are far better brought out in direct testimony than on cross-examination. This is one of those occasions in which full disclosure and sound tactics lead one to the same conclusion. The two rules are:

- a. *Always* explain.
- b. *Never* overstate.

2. While humor may indeed be inappropriate in many situations, it is important—especially in a long trial—to appear human rather than robotic, and to present the material in as clear and interesting a fashion as possible. Simple things, like vocal pitch and facial expression, are important. This advice is more relevant to direct examination than to cross-examination. There is a tension in cross-examination which is inherently interesting.

### *Cross-Examination*

1. First, if there is any cross-examination on credentials, it normally follows direct examination on that subject, prior to substantive testimony. Most lawyers tell me that they prefer simply to accept the expert's qualifications at this point. If he is well qualified, cross-examination is likely to enhance his credibility. If not, his deficiencies will turn up in some other way. I once appeared to testify in a corporate bankruptcy case. Counsel explained to the court that I was going to render an opinion as to the present and future cost of medical benefits to a group of retirees of the company, and established the relevant aspects of my background. An opposing attorney asked whether I had ever made such estimates before, and I said that I had, citing examples at his request. He then asked whether I had previously made such estimates for retirees of a *bankrupt* company. When I said that I had not, he moved to disqualify me. The judge, after listening to a fairly lengthy tirade on the subject from the attorney, ruled that the element of bankruptcy was not relevant to my testimony, and allowed me to proceed. Further, he seemed, thereafter, to lean harder on that attorney than on anyone else connected with the proceedings.

2. I have seen an expert disqualified only once. Cross-examination revealed that, while his qualifications were excellent, he had turned the project over to other professionals and was really preparing to testify to their opinions, not his. The attorney, having lost his expert, called the people who had done the work; as they were called on short notice, they were not well-prepared

for testimony. This is the lesser of the two reasons for being thoroughly familiar with all aspects of the work and opinions to which you are to testify.

3. The more important reason for knowing the work in detail is this: many attorneys approach the cross-examination of experts by first attacking, not the conclusions, or the principal assumptions leading to them, but the details—documents, data, arithmetic, and so on. Surprisingly often, the expert will not be familiar with all of the data sources or cannot readily reconstruct the arithmetic. In fact, not infrequently the arithmetic is wrong in some minor aspect. This often has little to do with the overall conclusions, but, especially in jury trials, it appears damaging because it questions the expert's credibility. Tedious though it may be in a complex case, there is no substitute for doing the detailed work required to have the absolute possible command of detail. Not only does it enhance credibility, it reduces fear!

4. Mr. Paquin's eleven rules for responding to cross-examination are excellent and practical. An actuary who knows his opinion and its derivation thoroughly, and who is alert (but not defensive) in cross-examination would do well to follow them.

### *Federal Income Tax; Interest on Judgments*

I have nothing to add to Mr. Paquin's discussion of taxes. The intertwining of federal income tax and interest on judgments is of particular interest in cases in which the plaintiff is a life insurance company, especially given the interplays of the 1959 tax act. Assume, for example, that Life Insurance Company A sues Entity B for damage as a result of some act of B. Assume further that the court finds A to have been damaged to the extent of \$X of lost "underwriting income" in 1975.

- a. What amount should B be obliged to pay A upon judgment in, say, 1982?
- b. To what extent does the answer depend on the tax phase of A in each intervening year?

I ask the questions, not because I know or expect to be told the answers, but to emphasize that the issues are unsettled. They involve not only federal income tax but assumptions as to investment and reinvestment, as well as the tax treatment of the judgment itself to the recipient. Further, they appear to involve not only economic reality, but seemingly artificial factors of a legal nature. When asked to make calculations involving matters such as these, I have responded by requiring that the attorney set the rules. Does he, for example, want my best estimate of economic reality? Does he want me to use a "statutory" rate of interest? Does he want me to omit interest entirely, and disclose that I have done so? From what date is interest assu-

mend to accrue, for example, date of damage, date of the filing of the action? I then work within those rules. The most complex cases, like the ones Mr. Paquin cites, are those in which the financial effect of the loss extends into the future.

### *Fees*

Mr. Paquin cites four possible approaches toward fees. For complex corporate work, neither (1) nor (2) is appropriate, because the time simply cannot be estimated in advance. I prefer (3) to (4), assuming that high-intensity work and low-intensity work will average out. They are not that different, because in most consulting offices, a lot of the data-gathering and preparation of numerical results will involve the time of staff people with lower billing rates than that charged by the consultant.

### *Conclusion*

Finally, the testifying actuary should consider the audience to whom he is speaking. It is natural, in answering a question, to focus on the person who asked it. However, in this instance what is natural is not correct. The audience is not the attorney asking the question; it is the jury or, in a nonjury trial, the judge. In many courtrooms, a witness will never look at the judge or jury if he looks at the questioner. However much it matters, the judge and jury seem to appreciate being spoken to, and their reactions are much more relevant to the outcome of the trial than those of the attorneys. Testimony is, more than anything else, a test of the actuary as communicator. In communication, the audience is the most important factor.

#### ROBERT J. MYERS:

Any actuary who is about to testify in a court case would be well advised to first read Mr. Paquin's paper. I should like to discuss several points with which Mr. Paquin did not deal and also amplify on his remarks about the choice of assumptions.

When measuring the loss of earnings in case of death or disability, one of the basic elements of actuarial professionalism is that the actuary should give the same answer regardless of whether testifying for the plaintiff or the defendant. Manipulation of economic assumptions as to the future trend of wages, prices, and interest rates can produce vastly different results.

In my experience as expert witness, I have often had economists as the opposition expert. In a number of cases, the economist assumed a high rate of wage inflation (on the basis that this was what was currently occurring) and, at the same time, a low interest rate (on the basis of the average over

several decades in the past) which significantly overstated the present value of future earnings. Obviously, this is an incorrect, illogical procedure. It seems apparent to me that expert witnesses in these areas should be actuaries (who recognize the necessity for consistency among long-range cost assumptions), rather than economists (who do not have such expertise).

One example of the improper approach that economists often take in making actuarial computations is contained in "1972 Lifetime Earnings by Age, Sex, Race, and Education Level," Research and Statistics Note No. 14-1975, Social Security Administration. Although this publication contains data that may be of value in this area, it presents figures of dubious worth when it uses discount rates as high as 8 percent in connection with static earnings levels.

What then are the proper and consistent long-range assumptions to use for wage increases, price increases (if applicable), and interest rates? I believe that the Intermediate (Alternative II-B) assumptions used by the actuaries of the Social Security Administration in the 1983 OASDI Trustees Report are quite reasonable. In general, they assume 4 percent annual increases in the CPI, 5½ percent annual increases in wages, and a real interest rate (over increases in the CPI) of 2 percent. In essence, then, it is assumed that if prices remain stable, wages will increase at an annual rate of 1½ percent, and the interest rate will be 2 percent.

If we are considering only wage increases and interest rates (as is most common in valuing future lifetime earnings), then, as actuaries, we know that for all practical purposes the significant element is the difference between the interest rate and the increase in wages (which in this case is 1½ percent), rather than their absolute levels. In other words, virtually the same result will be obtained if we assume no increase in wages and a ½ percent interest rate as compared with, say, using a 7½ percent annual increase in wages and an 8 percent interest rate. It may take some explaining to get this point across to nonactuaries! Under the foregoing basis, the results are practically the same as the Alaska rule, which assumes completely static conditions under the theory that the inflation rate (presumably for wages) roughly equals the interest rate.

In connection with the Feldman approach, Mr. Paquin points out that, in recent years, wages have not kept up with inflation. This is not the case currently, although it was in 1978-82. I believe that, over the long run, wages will rise more rapidly than prices, although possibly not by the 1½ percent differential referred to previously. In balance then, a differential of ½ percent to 1 percent as between the interest rate and the annual increase in wages seems reasonable. It matters little what rate of wage increase is used as long as the proper differential for the interest rate is maintained.

Mr. Paquin gives a sample report as to the findings of the actuary in a particular case. One assumption is that earnings will increase at an annual rate of 10 percent and that the interest rate is only 8 percent. In my opinion, this negative differential of 2 percent is excessive. It is also assumed that the individual will work until age 70 (as against his average age at death of 75.57). In my opinion, the age of 70 for the retirement age is somewhat high. Even more importantly, it would appear that the calculation is made on the assumption that the individual lives precisely to his life expectancy and then dies. This "cliff" approach does not seem to be in accord with generally-accepted actuarial principles, under which one should consider the year-by-year probabilities of survival—and also desirability of labor-force participation, as can be derived from census data or using the Tables of Working Life developed periodically by the U. S. Department of Labor.

At times, it is dismaying to read judges' decisions and to see their ignorance of subjects like mortality, life expectancy, and the relationship of wage and interest-rate trends over the long run. Yet they sometimes speak as though they were experts and base their decisions on illogical reasoning. Perhaps, it would be better if legislatures were to enact laws setting forth more specific standards for valuations of future earnings.

#### MURRAY PROJECTOR:

Mr. Paquin's paper is most timely as more and more actuaries are now becoming involved in litigation assignments.

Actuarial involvement in litigation is usually in valuing economic damages for personal injury cases, or valuing retirement benefits for divorce cases. Although the paper's title covers litigation in general, the text is limited to personal injury assignments, without mention of the similarities or differences for personal injury and divorce assignments. Some of Mr. Paquin's conclusions based on his experience in personal injury assignments do apply to divorce work.

For example:

1. Understanding lawyers is as important as understanding actuarial mathematics.
2. Divorces are litigated, not arbitrated.
3. Judges must decide whether a proposed pension expert is properly qualified, yet do not always have the proper background for making that determination.
4. An expert witness should avoid personal bias, invalid assumptions, incorrect data, calculation error, and conflict with prior reports.

5. An expert witness should not practice law in written reports or in courtroom testimony.
6. Misleading "yes" or "no" questions are often used by opposing counsel in cross-examination. Adding "why" to a "yes" or "no" answer is of help to the expert witness, provided that the witness is not compelled by the court to answer "yes" or "no" without amplification.

Examples of the differences include the following:

1. Divorces deal with petitioners and respondents, not with plaintiffs and defendants.
2. Divorces are ruled on by judges, not by juries.
3. Divorces are always state procedures; federal rules of evidence do not apply.
4. Depositions of divorce actuaries are permissible but hardly ever used. A request for deposing an actuary expert witness is usually a sign of attorney ineptness. The actuary needs to oppose the deposition request and can generally persuade the requesting attorney to cancel his request.
5. An oral report to the client attorney in advance of the written report is usually unnecessary and wasteful.
6. Occasionally court testimony is requested by subpoena, but customary practice avoids subpoena procedures.
7. Similarly, sequestration of witnesses is extremely rare in connection with actuarial participation. The same comment applies to court instructions forbidding actuaries from mentioning certain matters.
8. It is inadvisable for a divorce actuary to ever mention life expectancy values. Most nonactuaries who are accepted as pension experts by the courts still believe that the present value of a life annuity is equal to the present value of an annuity-certain for the expectation of life. Any gratuitous reference to life expectancy values reinforces the misconception.
9. It is inadvisable to depend on attorney clients for interpreting state legislative and case law relating to divorce valuations. Family law is overwhelmingly complex, and few family lawyers have the time, background, or motivation to become expert in pension valuation case law. In addition, advocates cannot be expected to interpret difficult case law with objectivity.
10. It is advisable for the divorce actuary to become knowledgeable in governing state law. This knowledge should be made available to the client attorney before testifying but without practicing law on the witness stand.
11. It is advisable to design the written valuation report so that it can serve

as the outline for courtroom testimony, if such testimony should be required. In this way, there is no need for separate courtroom testimony notes.

12. It is advisable to bring all worksheets and easily portable sources to the courtroom. The ability to answer questions by reference to sources on hand improves one's credibility as an expert witness. The risk of the opposing counsel successfully requisitioning our invaluable sources for submission to the divorce court is then miniscule.
13. It is advisable, of course, that our attorney client arranges for a copy of our report to be in the judge's hands before beginning testimony. Other visual aids, bulky or otherwise, are not generally needed.
14. Courtroom testimony, as a percentage of written reports, is infrequent. In many cases, the divorce actuary needs to take the initiative in keeping this percentage as low as possible. Initiative means urging attorney clients to send report copies to opposing counsel well in advance of scheduled trial dates, offering free telephone question and answer time to opposing counsel, pretrial consultation with opposing experts, and so forth.

My comments come from the California arena, where divorce litigation and actuarial involvement in divorce litigation are growth industries. Some of the items do not apply in all states, but most of them apply in most states.

Mr. Paquin's guidelines are very helpful for actuaries who are involved in personal injury litigation. However, they are not designed for actuaries who are involved in divorce litigation.

THOMAS P. TIERNEY:

Mr. Paquin has written a very fine paper and one for which I commend him. His explanation of the procedural framework that surrounds an actuary's rendering of testimony, in particular, is most informative. There are six items that I want to comment on briefly:

1. *Credibility* is, as Mr. Paquin mentions, a very important characteristic for a witness. How credibility is achieved, however, is something that each actuary must find for himself. Some of the points made in the paper such as responding to one's oath with an emphatic "I do" rather than "yes," avoidance of levity, and the answering of questions about witness compensation by attributing fees to one's employer may work well for some actuaries but not for others. In my own experience, I usually take the oath with a soft monotone "Yes, I do." As a defendant's rebuttal witness, I've seen many plaintiff's actuaries play a good straight-man

while under cross-examination. (I do think it's almost always best to avoid stand-up comedy.) I think that an emphatic "I'm paid \$1,000 a day" or "I'm paid \$1,500 a day" can often enhance credibility. The key factors seem to be an actuary's confidence in what he says and an attitude of comfort or relaxation when making a statement; the former should not be a problem as long as one is well prepared, but the latter may be more difficult. I do not know how an actuary can make himself relaxed while on the stand. If after a few appearances, an actuary finds himself continually nervous, and, in particular, if he finds cross-examination to be stressful, then witness work probably should not be a part of his practice. Mr. Paquin's comments in the introductory section of his paper about the qualities of a good witness and the eleven points that are outlined in his section on cross-examination defenses are stated very well.

2. *Opinions versus Conclusions.* If a witness gives a reply to a question that is based on a premise that he does not believe, his answer is properly called a conclusion rather than an opinion. There is nothing wrong with rendering testimony conclusions and, in fact, they may sometimes be required by what may be seen as bad law (such as the "Alaska" rule) or because the opposing parties have stipulated something (such as a future work-life expectancy) with which the actuary disagrees. Usually, however, a conclusion arises in response to a far-fetched hypothetical question that is encountered on cross-examination or occasionally arises from his own employer's far-fetched question on direct examination. In the latter instance, the actuary should explain to his side, if he knows about the question in advance, that he has trouble with the question's premise and that he may end up rebutting himself if the cross-examination is good.
3. *Advocacy versus Neutrality.* A good witness, as Mr. Paquin mentions, should be neutral when he is on the stand, but this neutrality only applies when he is actually testifying. At all other times, whether it be while passing notes to counsel from the spectator's gallery, conferring in the courthouse corridors, or attending strategy sessions back at the office of the attorney who has hired him, he should consider himself a consultant to the attorney and, as such, do whatever is possible to advance zealously that attorney's position. However, he must be just as zealously neutral on the stand. To me this means not ignoring the "Dr. Smith" queries or bobbing and weaving around cross-examination questions which, if properly answered, will hurt his employer's case. Trying to decide how much elaboration makes an answer the "whole truth," is not for the actuary to determine. He should just continue answering until he feels satisfied his response is complete. As a practical matter, the questions on cross-

examination are usually pretty narrow, and if the actuary has rendered opinion rather than conclusions on direct examination, there is not much chance of hurting his employer's case. Still, in those occasional instances where opposing counsel gets lucky with a question, the actuary's oath requires him to give a truthful answer.

4. *Jones & Laughlin Steel Corp. v. Pfeifer* is a U.S. Supreme Court decision (No. 82-131) handed down on June 15, 1983, giving an extensive and well-reasoned opinion concerning the subject of actuarial testimony. It technically only applies to federal maritime actions brought under the U.S. Longshoremen's and Harbor Workers' Compensation Act, but as a practical matter it will undoubtedly become the standard for all federal cases in the near future, and, because it is good law, it will probably be cited by many states as well. Except for this comment and a few others mentioned below, I'll leave an explanation of this decision to Mr. Paquin in his author's review.
5. *Earnings Capacity* is a concept that in most jurisdictions, has evolved into what actuaries would define as statistical expectation. It represents what will most likely be earned in the future, not an upper bound for this quantity, and it normally allows for the possibility of unemployment. The explanation given by Mr. Paquin may still have application in some locations but I do not think there are that many still holding his view. *Pfeifer*, for example, requires that future earnings be developed by referencing "the worker's annual wage at the time of injury."
6. *Actuarial Assumptions and Methodology* are subjects that Mr. Paquin did not have to devote much ink to because of his paper's audience. There are, however, three points that I believe might be noted. First, I think it is always best to get information about an individual's health and personal habits at the time of the alleged tort. Second, I do not think it is wise to rely too heavily on other experts or the attorney retaining you when formulating actuarial assumptions. The danger here is that one will wind up rendering conclusions rather than opinion. I disagree with Mr. Paquin that pretrial lost earnings can be established without actuarial testimony and it should probably be noted as well that *Pfeifer* makes the pretrial/posttrial distinction moot since it requires the locus of actuarial calculation to be the tort date. Third, brief mention might be made of the U.S. Department of Labor publication of work-life expectancies since these are extremely useful when computing future earnings estimates. *New Worklife Estimates* (Bulletin 2157 published in November 1982 by the Bureau of Labor Statistics) is particularly useful.

In conclusion, I again want to commend Mr. Paquin for a very fine paper.

Where I occasionally disagree with him, it should be noted that the subject matter will always be controversial. Mr. Paquin's paper has been a help to me, and I'm sure many other actuaries will find it to be of similar value.

ROBERT TOOKEY:

Two members of my immediate family who have been practicing law for many years, brother Bill Tookey, and son-in-law, Lindsey Feldman, reviewed Mr. Paquin's paper. They were very impressed, giving it A+ marks, and they provided me with a suitable track for this discussion.

When an actuary accepts an assignment as an expert witness he should, after absorbing the pertinent points of Mr. Paquin's paper, decide on how much education is required for his first student—the attorney (or the attorney's client) who hires him. The education process continues for other involved parties: other expert witnesses, the judge, the jury, and any person whose role in the courtroom or deposition picture is important.

The sponsor's attorney will or certainly should coach the actuary on all the eight fundamental courtroom comportment rules so carefully set forth in the author's section entitled *Utilizing Cross-Examination*.

My own experience has emphasized the importance of rules four and five. "Confine your answer to the questions asked." (Don't volunteer.) "Don't answer a question with a question unless a clarification is needed." (If the cross-examiner is overly aggressive and abusive, you have the right to ask, "Will the clerk please repeat the question" and that "time out" will have much the same effect as a time out in football.)

Nonleading questions should be specific. During a deposition, a lawyer was very vague in asking me, "Will you please tell us all about yourself?" She promptly got to the specifics, "What is an actuary?" after I commenced an enthusiastic narration of my love life. My reply on the definition of an actuary was that of the then Society of Actuaries president, Jack Bragg, which I still use, "A professional who is expert at the design, financing, and operation of insurance plans of all kinds, and annuity and welfare plans." (That says it all in that number of words.)

The author mentioned that the expert might even be questioned on the time he took to pass his exams. The time length to pass actuarial exams and the attained age of becoming an FSA, are of trivial interest to the court. There are many determinants affecting the period of an actuary's attainment of Fellowship (early motivation, on-the-job study time granted by his employer, interruption due to recall to military duty, changed marital status, exam syllabus changes, and the distractive influences from such other disciplines as accounting, operations research, and so on. Therefore, his ex-

perience and expertise germane to the case would be viewed as far more important than the time he needed to complete the Society of Actuaries examinations.

As to fees, our recommendations are:

- (1) Do not gamble with your time.
- (2) Negotiate an immediate and precise formula for your compensation.
- (3) Base the compensation on a per diem rate for time in court or in deposition and an hourly rate for preparatory work and follow-up work.
- (4) Obtain a *retainer* (down payment) from any client that you haven't worked with before or who may not have the capability of paying if he doesn't win his case.
- (5) *Never* base your fee on the award for your client. It violates our rules of professional conduct and most rules of common sense. Make it clear that you are being paid for your report, and in no way is your compensation affected by the results of your testimony.

It appears that the author's primary experience is in Georgia, where laws of easy divorce and community property do not prevail as they do in California. In California, we have a plethora of divorce settlements in which the spouse's (usually the husband's) pension value enters into the settlement. The trend has been for prompt agreement as to its worth to avoid a problem of continuing measurement. It's interesting how far apart the values of the pension, as calculated by the two actuarial experts, can be (all a matter of assumptions). Some expert witnesses simply charge a flat fee for their report on present value of pension benefits with an additional charge for time and expense for court appearances. Computer programs have been developed for the divorce cases involving small settlements (under \$100,000) to minimize professional fees in this area. I understand the specialists make it up on volume, which we certainly have in the golden state.

My own experts, Bill and Lindsey, had one final word of advice. In a litigated case, mentally assume the devil's advocate role. With the prudent man's latitude permitted in actuarial assumptions, try to anticipate the other actuary's valuation, assuming you are he. That should facilitate a settlement.

(AUTHOR'S REVIEW OF DISCUSSION)

CLAUDE Y. PAQUIN:

The world is full of skeptics. The judicial system itself seems to reflect healthy skepticism. Those who were skeptical after reading this paper will be heartened by the expert discussion of Mr. McCarthy. He has supplied examples that corroborate and illustrate, in a most interesting fashion, many points made in the paper. The grade of A+ assigned to this paper by Mr.

Tookey's lawyer-relatives is also heartwarming, as is Mr. Tierney's assessment.

The subject of this paper has an extraordinarily wide scope which extends far beyond law and actuarial science. Economics and psychology can occupy a prominent place in the actuarial expert witness' work, as can many other fields of knowledge. Hence, I have not indulged the thought that this paper is comprehensive or "perfect." If it is helpful, that may be achievement enough. In any event, the attempt to provide facts and demonstrations, in the form of exact quotations of pertinent legal materials or complete citations to their source, should be noted.

As expert witnesses, actuaries can be helpful in many more fields than loss of earnings computations. All actuaries are experts in some areas, while different actuaries have supplementary expertise in areas within which they have specialized, such as insurance (life, health, or property and casualty), pensions and other employee benefits, and social insurance plans. Many actuaries have even developed expertise in subspecialties, such as product development, corporate planning, Taft-Hartley plans, and so on.

Areas which can readily be thought of as valid subjects for actuarial expert testimony include (in addition to wrongful death and loss of earning capacity cases) actuarial malpractice and the valuation of certain liabilities or assets (such as the value of an interest in a pension plan), whether it be for tax or partitioning purposes (as in a divorce case, where the division of property could be settled, mediated, arbitrated or adjudicated, though the termination of the marital relationship is reserved for adjudication). In fact, actuaries seem quite talented at analyzing very complex financial situations and bringing order out of apparent chaos.

Another subject that cannot adequately be commented on here is the actuary-lawyer relationship. In theory, the lawyer should inform the actuary as to whether the law applicable to an individual case requires or forbids the use of interest discounting or of assumptions on income taxes, personal consumption expenditures, inflation, and so forth. In practice, some actuaries may know more than some lawyers on these subjects, and it is then appropriate for the actuary to suggest diplomatically that one approach or another be used. On all matters turning upon an interpretation of the law applicable to the case entrusted to him, it is normal and proper that the lawyer should have the final word (and the professional responsibility which goes with it). When appearing in court in a hotly contested case, it is probably best for the actuary to have developed beforehand (when appropriate) and be ready to present an assortment of answers (values) which are each based on a different set of plausible assumptions, if the client can afford to pay for all the necessary calculations. (As I will show later, recent remarks

of the U.S. Supreme Court indicate that the calculating can sometimes be overdone.)

It may also be worth emphasizing that some problems may have more than one right answer. When a court makes an award, it must settle on one definite amount. Hence, while it is proper and wise to offer a range of reasonable values (based upon assorted reasonable assumptions, consistent with one another), the expert should normally offer an opinion on his informed perception of what is the best answer.

The 1983 Audit and Accounting Guide prepared by the American Institute of Certified Public Accountants on Audits of Employee Benefit Plans refers to "the fair value of investments valued *in good faith*." This "good faith valuation" concept does deserve the emphasis placed upon it, in different terms, in the discussions.

The actuarial profession is currently "enjoying" a considerable degree of scrutiny from all branches of government and, to a lesser degree, from the media and the public. It is noteworthy that, after this paper had been written, the U.S. Supreme Court considered the use of inflation assumptions and interest rates in loss of earnings cases subject to federal law. In the June 15, 1983 decision styled *Jones & Laughlin Steel Corp v. Pfeifer*, \_\_\_U.S. \_\_\_, 103 S.Ct. 2541, 76 L.Ed.2d 768, the court held that a federal judge sitting in Pennsylvania should not feel bound (in a case involving a claim under federal law, in this case the Longshoremen's and Harbor Workers' Compensation Act) to follow the *Alaska rule* (or total offset rule) imposed by the Pennsylvania Supreme Court on the Pennsylvania state courts (for cases involving state law) under *Kaczowski v. Bolubasz*, 421 A.2d 1027 (1980).

As Mr. Tierney noted, the U.S. Supreme Court's comments in that case are instructive. The court does refer to an estimated stream of income, made up of wages and fringe benefits and diminished by income taxes and work-induced expenses (such as transportation to work), and it acknowledges that, for simplicity's sake, some of these elements are ignored or deemed to be offsetting. On wage inflation, the court had this to say:

With the passage of time, an individual worker often becomes more valuable to his employer. His personal work experiences increase his hourly contributions to firm profits. To reflect that heightened value, he will often receive "seniority" or "experience" raises, "merit" raises, or even promotions. Although it may be difficult to prove when, and whether, a particular injured worker might have received such wage increases, . . . they may be reliably demonstrated for some workers [footnote omitted].

Furthermore, the wages of workers as a class may increase over time. . . . Through more efficient interaction among labor, capital, and technology, industrial productivity may increase, and workers' wages may enjoy a share of that growth. Such productivity increases—reflected in real increases in the gross national product per worker-hour—

have been a permanent feature of the national economy since the conclusion of World War II [footnote omitted]. Moreover, through collective bargaining, workers may be able to negotiate increases in their "share" of revenues, at the cost of reducing shareholders' rate of return on their investments [footnote omitted]. Either of these forces could affect the lost stream of income in an inflation-free economy.

The court referred to wage gains of the first type as "individualized," while it labeled those of the second type as "societal."

Referring to a case it decided in 1916, the U.S. Supreme Court reiterated in *Pfeifer* that "in all cases where it is reasonable to suppose that interest may safely be earned upon the amount that is awarded, the ascertained future benefits ought to be discounted in the making up of the award," and it stated that "the discount rate should be based on the rate of interest that would be earned on 'the best and safest investments,'" after-tax. The court went on to note that "[o]ur sister common law nations generally continue to adhere to the position that inflation is too speculative to be considered in estimating the lost stream of future earnings; they have sought to counteract the danger of systematically undercompensating plaintiffs by applying a discount rate that is below the current market rate," whereupon the court embarked on a scholarly consideration of the approaches taken in England (discount at 4.75 percent), Canada (use 7 percent), and Australia (2 percent, as with the *Feldman* approach).

These views are particularly interesting since one discussant noted that the sample report in the paper displayed a wage increase of 10 percent per year and an interest discounting rate of 8 percent. It was argued that current social security statistics would support wage increases due to increased productivity of only 1.5 percent per year: hence, if the 8 percent discounting rate represents true interest of 2 percent plus 6 percent due to inflation, the wage increase rate should not have been 10 percent but, instead, 7.5 percent (made up of 6 percent for inflation and 1.5 percent for increased productivity). Though the sample report purported to serve only as an illustration, this attack on the appropriateness of the 10 percent rate of increase in wages (a net increase of 4 percent above inflation) is subject to the following rebuttal.

Increases in individual productivity generally exceed increases in group productivity. This is particularly so with occupations where one's skills are continuously developed and sharpened through experience, as is generally the case for white-collar work (the type of work performed by the person described in our illustration) and in the professions. A 25-year-old coal miner's services are probably worth as much per hour, and compensated as much, as a 50-year-old coal miner's (though I confess little knowledge of coal mining and could be mistaken; I acknowledge, too, that a coal miner

could be promoted to a supervisory position). An office worker's worth in the marketplace is believed to bear some relation to his age (in a general way). General population statistics such as those reflecting social security earnings are based on stationary populations, not on cohorts. From one year to the next, the population statistics drop high salaried older individuals who have retired from the work force and add low salaried young individuals who have just entered the work force. This can distort the import of the statistics with respect to a "cohort," as illustrated by the example which follows.

The following table was constructed empirically so as to show the earnings of a white-collar employee population. It was assumed that the employer has 40 employees in the work force, ranging in age from 25 to 64, with each one (except the youngest) older than the other by one year. Each year, when the 64-year-old employee retires upon reaching 65, a 25-year-old employee is hired. Let us suppose further that the employer paid his workers a salary equal to \$600 times their age, in 1982, and, because of greater productivity in the office, increased his wage scale by 1.5 percent in 1983. The employees' earnings by age would then be as shown in the following table.

Statistics on a stationary population basis would show that employee wages went up by 1.5 percent (from \$1,068,000 to \$1,084,020) from 1982 to 1983. But the individuals involved saw their wages go up quite a bit more, except for the employee who was 64 years old in 1982 and whose payroll wages dropped to zero in 1983. If we exclude from the 1983 payroll figure the 25-year-old who was not on the payroll in 1982, and if we exclude from the 1982 payroll figure the 64-year-old who retired after 1982, we have a cohort of 39 employees who were on both payrolls and whose 1982 and 1983 wages were \$1,029,600 and \$1,068,795 respectively. That represents an average

TABLE  
EMPLOYEE EARNINGS BY AGE AND CALENDAR YEAR

Employee Age	1982 Earnings	1983 Earnings
25	\$15,000	\$15,225
26	15,600	15,834
27	16,200	16,443
...	...	...
62	37,200	37,758
63	37,800	38,367
64	38,400	38,976
Total	\$1,068,000	\$1,084,020

increase per person of 3.8 percent. This is only an empirical example, but it serves to demonstrate that individual wages can go up faster (3.8 percent here) than is reflected in overall payroll statistics (1.5 percent here). (A study of the workings of the wage system of the U.S. government, as disclosed by the General Schedule at U.S. Code Title 5, Secs. 5332 and 5335, can be instructive, particularly since the U.S. government is most likely the largest employer in the free world.)

In short, the social security statistics upon which reliance is made for disapproving of the 10 percent wage increase and 8 percent interest discounting combination shown in the sample report illustrated in the paper appear to reflect only those wage increase factors which the U.S. Supreme Court calls "societal," and to fail to reflect those factors the court calls "individualized." (Statements made out of court, such as those found in a social security trustees' report, proffered to establish the truth of a proposition such as that the correct measure of inflation-free earnings growth is 1.5 percent, are hearsay and generally inadmissible as evidence. However, an expert is not prohibited from consulting books in arriving at his opinion; the book simply may not be allowed to supplant the expert's judgment.)

The U.S. Supreme Court's *Pfeifer* opinion is worded in a way which makes it pretty clear that individualized and societal factors may be considered, in estimating future wages in an inflation-free economy, only if sufficient proof is offered, in the form of foreseeable promotions (individualized), for instance, or of foreseeable productivity growth within the worker's industry (societal). The words *proof* and *foreseeable* here are key words which suggest that just "assuming" a 4 percent rate of growth in future earnings may not prove good enough. Unless proper proof is forthcoming, the 4 percent of the sample report (although not necessarily wrong) could indeed be "impeachable" in court. (This is not to say that the 1.5 percent from social security statistics would clearly be right either; but so long as the 4 percent is unproven, the 1.5 percent would certainly appear "more right," as it has an articulable basis of support. If the 4 percent assumption is to be defended in court, it has better have an adequate foundation.<sup>1</sup>)

<sup>1</sup> To help resolve the problem of foreseeability in assessing "individualized" factors, one could think of foreseeability in an individual sense and in a statistical sense. Viewing foreseeability in an individual sense, one would ask the question, "what would this person's earnings have been?" Viewing foreseeability in a statistical sense, one would ask the question, "what would the earnings of a similarly situated person have been, on the average?" I suggest that one should use foreseeability in an individual sense over the short-term, and foreseeability in a statistical sense over the long-term. So long as the exercise does not degenerate into delusive exactness, it would have evidentiary value far superior to the use of unsubstantiated simple projections such as annual salary increases of "4 percent above inflation." (As an exercise, the reader might ask himself how he would compute, and prove, the value of the future earnings of an actuarial student fatally injured right after passing Part 4 of the Society's actuarial exams.)

This digression on whether a net inflation-free wage gain of 4 percent or 1.5 percent appropriately may be assumed in lost earning capacity cases brings up questions of evidence, namely about which party has the burden of proof, when the burden of going forward with the evidence shifts from one party to the other, what is admissible, when the evidence is sufficient, and the weight to be given to the evidence. Needless to say, the trier of the facts will be influenced by the believability of the witnesses, and the propriety of the assumptions selected may come under greater scrutiny than the computational steps used to derive the value.

Even though the paper explains the normal sequence of a trial, one might point out that on evidentiary issues one will encounter "mini-trials" within the trial itself. Qualifying a witness as an expert is such a proceeding, which explains why (as Mr. McCarthy correctly stated) the would be expert can be cross-examined on his qualifications before the "main trial" proceeds further. (On being cross-examined, later on in the trial, with respect to any improperly transcribed deposition testimony, the expert can always explain the error, but this exercise will weaken his testimony. How much trust would anyone put in someone who had the opportunity to review, correct and sign the transcript but didn't bother?)

Jordan's textbook on life contingencies, a mainstay of actuarial education for many years (since at least 1952), makes the following statements:

It is popularly believed that the expectation of life is widely used in actuarial calculations. . . . One of the persistent misconceptions is that the present value of a life annuity at age  $x$  is equal to the value of an annuity-certain for a term equal to the life expectancy at age  $x$ .

C.W. Jordan, Jr., *Life Contingencies*, Society of Actuaries, 1952. pp. 246-47.

These statements are then followed by a mathematical demonstration that the value of the annuity-certain for the life expectancy is greater than the life annuity value.

Many actuaries take this too literally. When one knows how to do things the right way, it is hard to see why one would want to make the effort of doing things the wrong way, even for the sake of expediency,<sup>2</sup> and to that extent their comments are justified. But in practical terms, considering working lifetimes (instead of entire lifetimes) and the relatively low levels of mortality that are now observed at preretirement ages, the use of annuities certain factors (for a period representing the worker's remaining working

<sup>2</sup> For the story of an expensive lesson (\$466,926, not counting fees of lawyers and actuaries) on the use of actuarial approximations (involving an \$84,000 reserve), see *Group Life & Health Ins. Co. v. U.S.*, 660 F.2d 1042 (5 Cir. 1981), cert. denied, 73 L.Ed.2d 1349. This classic tax case shows how using a factor of \$750 per \$1000 in force in computing group disabled lives reserves can be quick—and deadly.

lifetime) may be regarded as fairly harmless. The U.S. Supreme Court indicated its awareness of this situation, in the *Pfeifer* case, *supra*, in these terms:

The lost [income] stream's length cannot be known with certainty; the worker could have been disabled or even killed in a different, non-work-related accident at any time. The probability that he would still be working at a given date is constantly diminishing [footnote omitted]. Given the complexity of trying to make an exact calculation, litigants frequently follow the relatively simple course of assuming that the worker would have continued to work up until a specific date certain.

In concluding its opinion in *Jones & Laughlin Steel Corp. v. Pfeifer*, *supra*, the U.S. Supreme Court stated:

We do not suggest that the trial judge should embark on a search for "delusive exactness" [footnote omitted]. It is perfectly obvious that the most detailed inquiry can at best produce an approximate result [footnote omitted]. And one cannot ignore the fact that in many instances the award for impaired earning capacity may be overshadowed by a highly impressionistic award for pain and suffering [the court's footnote indicating that pain and suffering awards might, on the average, account for 72% of the total awards].

"Delusive exactness" should not characterize the actuary's work. It is easy to see how judges and juries can grow impatient and weary when a battle of experts, founded on delusive exactness, is waged in the courtroom. (Yet opinions do vary on a lot of things, and that's why we have courts.)

These extensive references to opinions of the U.S. Supreme Court are not intended to suggest that the court's opinions are necessarily binding in matters of state law—particularly when they constitute dictum (an authoritative pronouncement) as in *Pfeifer*. This is also not the proper time and place to discuss the relationship between federal and state law in the U.S. It should suffice to say that the U.S. Supreme Court generally has the benefit of comprehensive briefs from a variety of interested parties (including *amici curiae* (friends of the court), which at times have included the American Academy of Actuaries), and that its opinions are by and large very well reasoned if not downright scholarly, and thus quite influential.

As for the rules of evidence, it might be unwise to dismiss the federal rules as irrelevant to state proceedings, since state rules are to a very large extent identical to the federal rules, one might also note that the trend has been toward uniformity among the states in this as well as in the rules of civil procedure. As a practical matter, and in a nonparochial setting, reference to the federal rules can be appropriate and helpful. (One discussant seemed to think that divorce cases involve only petitioners and respondents.

Many states, New York and Georgia included, label the parties in a divorce action as plaintiff and defendant, instead of petitioner and respondent.

One discussant suggests that boasting of commanding fees of \$1,000 or \$1,500 a day may bolster one's credibility. That may be questionable psychology. A juror looking at a defendant which pays such fees could well conclude that the defendant can afford to pay a hefty judgment. A juror looking at any party which pays such large fees could think that a witness being paid that much might be willing to testify to anything. The credibility of the witness might still best be brought out by a careful presentation of his qualifications, rather than by his price. Obviously, strategies and opinions do vary on these matters.

I trust that the apparent harshness of some of the discussants' comments toward economists, lawyers and judges was unintended. After all, one purpose of the paper is to foster greater understanding of the problems facing the various participants in a process which is not claimed to be perfect. It is not just actuaries who have their "first case," or their first case of a kind. It happens to economists, lawyers and judges, too. Hence, a certain amount of forbearance toward inexperience might prove ennobling. One could note too that in the courtroom as on the football field, both the officials and the players can make bad judgment calls and very irritating mistakes. With this paper, the actuary will at least become acquainted with some of the rules.

In loss of earning capacity cases, an informed selection of assumptions with respect to foreseeable future earnings appears more important (and controversial) than the reduction of these earnings to an actuarial "present value." This paper, however, is only tangentially concerned with that type of case. The paper's purpose was to guide the actuary through some of the legal procedures and concepts he may encounter as expert witness. I hope it has fulfilled that purpose adequately, and I thank the discussants for their display of interest in the topic of this paper and their worthwhile comments.

I did not mean to slight Canadian members of the Society of Actuaries by not touching upon Canadian practices in this paper. This is a paper, not a treatise, and assorted limitations prevented me from covering the subject from the Canadian perspective. My personal experience (as a native of Canada with lawyer-relatives in Canada) suggests that there is a great deal of similarity between the Canadian and U.S. legal systems, which both claim the English common law as their source (though Louisiana and Quebec offer variations which, on balance, appear less extensive than one might think).

Thus, I feel confident that Canadian actuaries can derive some value from being exposed to the ideas presented here.

