

THE EXPERT WITNESS MANUAL

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**THIRD THURSDAY CLE
EXPERT WITNESSES**

(7-18-99 draft)
[**BOLD**=Confirmed]

*Sponsored by the Family Law Section and
the Professional Development Department
of the State Bar of Texas*

- Thur 7/15/99 Noon-2:00pm Expert Witness telephone CLE
- Topic: The New Legal Reliability Standards Under *Daubert, Kuhmo, Robinson, Gammill, Kelly v. State, & Nenno v. State* (“Toto... I have a feeling we're not in Kansas anymore”)
- Panelists: **Moderator, Richard R. Orsinger, Attorney at Law, San Antonio**
Professor Dan Shuman, SMU School of Law, Dallas
Judge Paul Womack, Texas Court of Criminal Appeals
Justice Deborah Hankinson, Texas Supreme Court
- Thur 8/19/99 Noon-2:00pm Expert Witness telephone CLE
- Topic: Can DSM-IV Diagnoses and Psychological Evaluations Meet *Robinson/Gammill* Reliability Standards?
- Panelists: **Moderator, Richard R. Orsinger, Attorney at Law, San Antonio**
Professor Dan Shuman, SMU School of Law, Dallas
Jan Marie DeLipsey, Ph.D., Dallas
John Zervopoulos, Ph.D., J.D., Dallas
Hon. John Specia, 225th Dist. Ct., Bexar County
- Thur 9/16/99 Noon-2:00pm Expert Witness telephone CLE
- Topic: Business Valuation: Assets & Liabilities Approach Compared to the Capitalization of Income Approach and Discounted Future Cash Flows Approach
- Panelists: **Moderator, Richard R. Orsinger, Attorney at Law, San Antonio**
Patrice Ferguson, CPA, JD, Houston
Scott Turner, CPA, Corpus Christi
Hon. Tom Stansbury, 328th Dist. Ct., Fort Bend County
- Thur 10/21/99 Noon-2:00pm Expert Witness telephone CLE
- Topic: Psychological Syndromes: Substance or Smoke Screen? Discussing Battered

Woman Syndrome, Child Sexual Abuse Accomodation Syndrome; Repressed Memory Syndrome; False Memory Syndrome

Panelists: **Moderator, Richard R. Orsinger, Attorney at Law, San Antonio**
Jan Marie DeLipsey, Ph.D., Dallas
Georganna Simpson, Attorney at Law, Dallas
Hon. Bonnie Hellums, 247th Dist. Ct., Harris County

Thur 11/18/99 Noon-2:00pm Expert Witness telephone CLE

Topic: Tracing Commingled Marital Property

Panelists: **Moderator, Stewart Gagnon, Attorney at Law, Houston**
Doug Fejer, CPA, Dallas
Robert Cocanower, CPA, Fort Worth
Hon. Frank Sullivan, 322nd Dist. Ct., Tarrant County

Thur 12/16/99 Noon-2:00pm Expert Witness telephone CLE

Topic: The Child as Witness: Competency, Custody Cases, Sex Abuse Cases

Panelists: **Moderator: Richard R. Orsinger, Attorney at Law, San Antonio**
Duke Hooten, TDPRS, Boerne
Jan Marie DeLipsey, Ph.D., Dallas
Ed Silverman, Ph.D., Houston
_____, [Nationally-Recognized Authority]

Thur 1/20/00 Noon-2:00pm Expert Witness telephone CLE

Topic: Business Valuation: Adjustments for Control Premium, Minority Discount, Marketability Discount, and Blockage Discount; Restricted Stock; Classes of Stock; Buy-Sell Restrictions

Panelists: **Moderator: Cheryl Wilson, Attorney at Law, San Antonio**
Dan Hanke, CPA, San Antonio
Robert Cocanower, CPA, Fort Worth
Hon. Susan Rankin, 301st Dist. Ct., Dallas County

Thur 2/17/00 Noon-2:00pm Expert Witness telephone CLE

Topic: Recovered Memory/False Memory: Valid or Voodoo?

Panelists: **Moderator, Richard R. Orsinger, Attorney at Law, San Antonio**

Jan Marie DeLipsey, Ph.D., Dallas
_____ [Nationally-Recognized Authority]
Hon. Dean Rucker, 318th Dist. Ct., Midland County

Thur 3/16/00 Noon-2:00pm Expert Witness telephone CLE

Topic: Character and Value of Employment Benefits

Panelists: **Moderator: Joan Jenkins, Attorney at Law, Houston**
Bill Clifton, Attorney at Law, Dallas
Mary Jo McCurley, Attorney at Law, Dallas
Hon. Jim Squire, 312th Dist. Ct., Harris County

Thur 4/20/00 Noon-2:00pm Expert Witness telephone CLE

Topic: Relocation of Children: Legal Issues and Mental Health Evidence

Panelists: **Moderator: Hon. Ann Crawford McClure, 8th Court of Appeals, El Paso**
Stewart Gagnon, Attorney at Law, Houston
Richard Warshak, PhD, Dallas
Hon. Susan Rankin, 301st Dist. Ct., Dallas County

Thur 5/18/00 Noon-2:00pm Expert Witness telephone CLE

Topic: Proving the Value of Real Property

Panelists: **Moderator: Wally Mahoney, Attorney at Law, Pasadena**
_____, Real Estate Appraiser, _____
Robert Montgomery, Attorney at Law, Houston
Hon. Craig Fowler, 255th Dist. Court, Dallas County

Thur 6/15/00 Noon-2:00pm Expert Witness telephone CLE

Topic: Abuse and Neglect of Children: Battered Child Syndrome, Fetal Alcohol Syndrome, Shaken Baby Syndrome, Munchausen Syndrome by Proxy, etc.

Panelists: **Moderator: Duke Hooten, TDPRS, Boerne**
Nancy Kellog, MD, San Antonio
_____, Criminal Defense Attorney, _____
Hon. Randy Catterton; 231st Dist. Ct., Tarrant County

Thur 7/20/00 Noon-2:00pm Expert Witness telephone CLE

Topic: Proving Tax Considerations in Divorce

Panelists: Moderator: Richard R. Orsinger, Attorney at Law, San Antonio
Dan Hanke, CPA, San Antonio
Doug Fejer, CPA, Dallas
Hon. Jim Squire, 312th Dist. Ct., Harris County

State Bar of Texas
Family Law Section's

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VOLUME 1

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PART 3

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PART 3

Mental Health and Family Relations

Chapter 3-4

The Scientific Bases for Psychological Theories¹

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3-4:1 Data Underlying Psychological Theories

¹Primary Author: Richard R. Orsinger, Attorney at Law, San Antonio. Secondary Authors: Jan Marie DeLipsay, PhD; Georganna Simpson, Attorney at Law, Dallas; Edited by: Jeanne Rothberg, M.S. Pharmacology, M.S.Ch.E., Houston.

Traditionally, the scientific underpinning of psychological theories has consisted of three things: experiments, anecdotal histories of individual patients, and large-scale surveys. More recently, the underpinning of psychology has been expanded by advances in neurological science that reflect an increasing amount of information on the physical counterparts of thinking and feeling. Advances that will merge psychology and biological science are also developing in the field of genomic biology; e.g., the discovery of genetic influence in determining whether an individual will be fat or thin, heterosexual or homosexual, bipolar, etc.

3-4:2 Experiments

Controlled experiments have been called “the most powerful research method” available in psychology, because they can provide firm evidence of cause-and-effect relationships, which cannot be done with other psychological research methods.² This is because, in the ideal controlled experiment, all variables are held stable except for the independent variable, which is manipulated to measure its effect on the dependent variable.³

3-4:3 Single-Case (Anecdotal) Studies

Long before large-scale surveys were developed, medicine and then psychology moved forward with single-case studies. Case studies involve intensive research of a single person or event.⁴ Social scientists today still conduct single-case studies.⁵ Single case studies in abnormal psychology are detailed descriptions of individuals with unusual or scientifically interesting disorders or responses to new or uncommon treatments.⁶ Single-case studies are also used for the investigation of clinical practices, because they can be carried out by a clinician, without the need for research facilities, and can be done quickly. Case studies are also used in cognitive neuropsychology, where researchers examine normal and abnormal functioning in brain-damaged patients in order to test theories of information processing.⁷ One problem with single-case studies is that the patients are highly selected (leading to sample bias), and the results cannot be generalized to the broader clinical population.⁸

Case studies sometime proceed on the basis of “negative case analysis,” in which the researcher forms a tentative hypothesis, searches for data that disconfirms the hypotheses, revises the hypotheses to adjust for

²ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS AND STATISTICS xi-xii (1995).

³ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS AND STATISTICS xii (1995). The independent variable is the factor that is manipulated by the researcher. The researcher looks to see how the dependent variable changes in response to manipulation of the independent variable.

⁴ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS AND STATISTICS 88 (1995).

⁵ANTHONY ROTH & PETER FONAGY, WHAT WORKS FOR WHOM? A CRITICAL REVIEW OF PSYCHOTHERAPY RESEARCH 16 (Guilford Press NY 1996).

⁶ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS AND STATISTICS xv (1995).

⁷ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS AND STATISTICS xv (1995).

⁸ANTHONY ROTH & PETER FONAGY, WHAT WORKS FOR WHOM? A CRITICAL REVIEW OF PSYCHOTHERAPY RESEARCH 16 (Guilford Press NY 1996).

disconfirming data, searching for more disconfirming data, etc. Depth in testing an hypothesis using negative case analysis helps to offset the fact that the results of case studies usually cannot be generalized beyond the individual.⁹

3-4:4 Large-Scale Surveys

Surveys are based on the view that the best way to get information about people is to ask them about it.¹⁰ In a survey, the researcher poses specific questions or items, in a survey instrument, to respondents whose answers or reactions are recorded. There have been only two large-scale surveys of mental health in America: the ECA (1980-85) and the NCS (1990-92).¹¹

3-4:4(1) Types of Information Sought

Surveys solicit information that falls into categories: categorical information; self-reports of past behavior; opinions, beliefs, attitudes and values; self-reports of intentions concerning behavior; and sensitive information regarding the past, present or future.¹²

“Categorical information” includes dimensions that people use to describe themselves, such as age, educational level, employment status, etc.¹³ It is believed that people usually give accurate information in response to this type of inquiry, and the margin of error is usually small.¹⁴

Self-reports of past behavior rely entirely on the accuracy of what is reported, which frequently cannot be verified. Self-reports of past behavior can be confounded by the respondent’s failure to understand what information is sought, faulty memory, refusal to divulge the information, or affirmative misrepresentations.¹⁵

The phrasing of inquiries into opinions, beliefs, attitudes, and values can affect the survey results. For example, sometimes posing a question about having an opinion causes examinees to form an opinion where one did not already exist, thus inflating estimates of the number of opinions held.¹⁶ Where an inquiry presents two alternatives and no neutral alternative, examinees are likely to assume that the researcher wants one or the other

⁹ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 89 (1995).

¹⁰ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 79 (1995).

¹¹The Epidemiologic Catchment Area (ECA) and National Comorbidity Survey (NCS) are discussed in Chapter3-6.

¹²ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 79 (1995).

¹³ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 80 (1995).

¹⁴ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 80 (1995).

¹⁵See ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 80 (1995).

¹⁶ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 81 (1995).

answer, even if neither are the answer the examinee would pick.¹⁷ It has been determined that slight changes in the wording of questionnaires can have an impact on the responses. Thus, it is recommended that surveyors should use preexisting questionnaires or other measures, and that if a new measure of attitude to employed, it should first be subjected to empirical testing to determine its reliability and validity.¹⁸

Self-reports of intentions can be broken down into three categories: attitudes toward behavior; subjective norm and beliefs about what one is expected to do; and perceived control over behavior.¹⁹ To predict future behavior, one must determine all three of these aspects of intention.²⁰

There is a concern that, when asked sensitive information, respondents may refuse to give truthful information about themselves. One study suggested that a factor tending to increase the likelihood of disclosure of sensitive information is the commonly-held opinion that a person's beliefs and behaviors are similar to the view of others.²¹ Research shows that establishing a rapport with the respondent increases the degree of disclosure, so that sensitive questions should be put towards the end of the survey instrument.²²

3-4:4(2) Mode of Administration

The three predominant methods of asking survey questions are face-to-face, telephone, and mail.²³ Face-to-face is time-consuming and expensive, and requires well-trained interviewers. It is the best mode, however, to use for lengthy, complicated survey instruments containing numerous items that may elicit responses that generate follow-up questions. Telephone surveys cost less than face-to-face surveys, and the prevalence of telephones in the home supports conducting surveys by telephone. Random digit dialers permit random selection of persons, including persons with unlisted numbers. Telephone surveys are close to face-to-face surveys in utility. Mailing survey instruments is the cheapest method, but has a lower response rate than face-to-face or telephone surveys, although enclosing money and sending reminders increases response rates. Also selection bias could occur because persons who are more interested in the researched issue are more likely to respond. An additional disadvantage with mail is difficulty in obtaining addresses and lack of verifying the identity of the respondents.

3-4:4(3) Sample Selection

¹⁷ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 81 (1995).

¹⁸ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 81 (1995).

¹⁹ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 81 (1995).

²⁰ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 81 (1995).

²¹ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 82 (1995).

²²ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 82 (1995).

²³The authority for this paragraph comes from ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 82-83 (1995).

Surveys are conducted with a smaller number of people who are supposed to represent the entire group.²⁴ In order to extrapolate from the sample to the entire group, it is important for the sample to be representative of the whole group. There are two kinds of sampling procedures: probability and non-probability. Probability sampling involves selecting a sample when every person in the larger group has a possibility of being picked. Non-probability sampling involves all other ways of selecting a sample where some members of the group have a zero chance of being selected.

All probability samples are selected by some variation of simple random sampling, where each person has an equal chance of being selected.²⁵ When there are subgroups, such as race, gender, religion, nationality, etc., simple random sampling may cause subgroups to be over or under-represented. To overcome this, stratified random sampling is used, whereby each subgroup is treated as a population and random sampling techniques are applied to that subgroup.

Non-probability samples are created based on availability or convenience. A non-probability sample does not provide a basis upon which to make valid inferences from the sample to the overall population, because of the inability to measure sampling error.²⁶

3-4:5 Naturalistic Observation

Surveys involve interaction between the researcher and the respondent.²⁷ In contrast, “Naturalistic observation” involves studying behavior without interfering with what is being studied. In employing naturalistic observation, the researcher must avoid “intrusion,” or having an effect on the activities being observed. In selecting an event to observe, the researcher can evaluate behaviors that are non-verbal (body movements like facial expressions, eye contact, hand movements, posture), spatial (distances between one person and the other, or between a person and a thing), extralinguistic (rate, tone, volume, and characteristics of speech), or linguistic (content of speech or writing; content is manifest or latent). The researcher must also determine what behavior he or she will sample: time sampling (observing for specific periods of time) or time-point sampling (once-per-hour, etc.). If the behavior to be studied is a response to a stimulus, the researcher can use event sampling, looking at how someone reacts to the triggering event. In that instance, observations at preset times are not needed.

In a naturalistic observation, the behavior must be recorded and coded (interpreted).²⁸ Sometimes

²⁴The source for this paragraph is ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 83 (1995).

²⁵The source for this paragraph is ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 84-85 (1995).

²⁶The source for this paragraph is ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 83-84 (1995).

²⁷The source for this paragraph is ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 85-87 (1995).

²⁸The source for this paragraph is ANDREW M. COLMAN, PSYCHOLOGICAL RESEARCH METHODS & STATISTICS 86-88 (1995).

researchers will use a check-list coding scheme, which standardizes the way observations are recorded and interpreted. This method also involves deciding what is important before it happens, which can have a limiting effect. The creation or choice of a check-list is thus very important.

When observations are noted without inferring a meaning, the technique is unstructured or ethological, sometimes called “natural history.” The ethological approach separates the process of recording from the process of interpreting. The interpreting is done later.

There are four major sources of error that reduce the reliability of natural history: inadequate sampling (the sampling process is not systematic), chance response tendencies (poorly trained or under-motivated observers replacing formal category definitions with idiosyncratic definitions), change in the participant, and changes in the situation (i.e., the observed reacts to the observer and changes the course of behavior).²⁹

3-4:6 Ecological Inference

It should be noted that single-case studies, and most experiments and surveys involve small numbers of people, and that often broad generalizations are hypothesized on small samples. This process of abstracting general principles from one group and applying those principals to another group or a general population is called “ecological inference.” The question is how accurately can we generalize from a specific group to the population at large. When this type of reasoning occurs, it should be subjected to validity analysis.

While a large number of small surveys arriving at the same conclusion may give comfort about the conclusion, a small number of small surveys does not constitute much support for a finding or a theory. Even when the researcher is guarded in drawing conclusions from a study, experts in litigation may ignore the qualifiers and attribute more significance to the study than it merits. It is important to evaluate the degree to which the study supports the expert’s conclusions and the issues before the court.³⁰

3-4:7 Publication

Social science involves the conducting of experiments or studies, publication of results, criticism, and support by other scientists, and further publications relating to the topic. The publishing process permits the social science community to learn of developments so that the entire group can move forward collectively to achieve a more accurate understanding of psychological issues.

Psychological articles generally consist of a title page,³¹ an abstract,³² introduction,³³ method,³⁴ results,³⁵

²⁹The source for this paragraph is ANDREW M. COLMAN, *PSYCHOLOGICAL RESEARCH METHODS & STATISTICS* 87-88 (1995).

³⁰Look into U.S. Supreme Court case (1/25/99) rejecting President Clinton’s request to perform the next U.S. census by statistical population selection.

³¹*PUBLICATION MANUAL OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION* 7 (4th Ed. 1995). The title page contains the title, the author’s name and affiliated institution. *Id.*

³²*PUBLICATION MANUAL OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION* 8-11 (4th Ed. 1995). The abstract is a brief, comprehensive summary of the contents of the article. The abstract is sometimes used for

discussion,³⁶ references,³⁷ appendix,³⁸ and an author note.³⁹

There is a hierarchy of prestige among professional journals, and presumably the more prestige journals publish the more authoritative articles.⁴⁰ Citation services exist that permit you to see how many times a scientific

indexing and electronic retrieval databases. *Id.*

³³PUBLICATION MANUAL OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION 11-12 (4th Ed. 1995). The introduction opens the main body of the paper by stating the specific problem being studied and describing the research strategy. The introduction will develop the background in the literature and will present the logical continuity between the prior work and the current work. *Id.*

³⁴PUBLICATION MANUAL OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION 12-15 (4th Ed. 1995). The method portion of the paper details how the study was conducted, giving sufficient detail to permit the reader to gauge the reliability and validity of the methods and to permit other investigators to replicate the study. The research participants should be identified, and if humans are the subject, then the method used to select and assign them should be disclosed. Demographic characteristics of participants should be disclosed if important to the results. Each step in the execution of the research should be disclosed. *Id.*

³⁵PUBLICATION MANUAL OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION 15-18 (4th Ed. 1995). The results section should summarize the data and the statistical treatment of the data. The writer should disclose all relevant results whether they support or contradict the hypothesis of the study. The results section typically includes tables and figures, a statistical presentation, statistical power consideration, statistical significance, and effect size and strength of relationship. *Id.*

³⁶PUBLICATION MANUAL OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION 18-19 (4th Ed. 1995). The discussion section should contain the author's evaluation and interpretation of the study. Does the study support or not support the original hypothesis? Should further research be pursued? *Id.*

³⁷PUBLICATION MANUAL OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION 20 (4th Ed. 1995). The references section gives the full citation to all documents mentioned in the publication, together with other important references. *Id.*

³⁸PUBLICATION MANUAL OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION 20 (4th Ed. 1995). An appendix is not always included. When it is, the appendix might contain information that would be of interest to the reader, but which would be distracting if included in the main body.

³⁹PUBLICATION MANUAL OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION 21 (4th Ed. 1995). The author note identifies the institutional affiliation of each author, the sources of financial support, acknowledgment of contributions of non-authors, and the person who may be contacted for further information concerning the article.

⁴⁰Eugene Garfield, *Long-Term Vs. Short-Term Journal Impact: Does It Matter?*, (2-2-98) <http://www.the-scientist.lib.upenn.edu/yr1998/feb/research_980202.html> [7-11-99].

article has been cited in subsequent articles.⁴¹ Either approach permits you to gauge the degree of acceptance of the ideas expounded in the article.

“Meta-analysis” is used to permit data from separate studies to be considered collectively.⁴² Meta-analysis produces a single estimate of the statistic being studied.⁴³ In doing a meta-analysis, you must determine an effect size for each study.⁴⁴ Meta-analysis is criticized because the reviews ignore single-case studies; can include studies of questionable methodological adequacy; include studies not directly relevant to the clinical issues; assume that the distributions of the studies are normal when, in fact, a distribution of the studies have been skewed; only tap previously published studies, which have had positive findings; and sometimes fail to use proper statistical data analysis.⁴⁵ One writer notes studies suggesting that journals are more likely to publish the results of positive over negative clinical trials, which skews the objectivity of meta-analyses.⁴⁶

3-4:8 Peer Review

Under *Daubert* and *Robinson*, one of the factors to consider on the legal reliability of an expert’s methodology is whether the expert’s theory has been subjected to peer review and/or publication.⁴⁷ As noted in

⁴¹The topic of “citation analysis” is discussed in Eugene Garfield, *Commentary: Scientists Should Understand The Limitations As Well As The Virtues Of Citation Analysis* (7-12-93) <http://www.the-scientist.library.upenn.edu/yr1993/July/comm_930712.html> [7-11-99]. See also David A. Watson, *Citation Impact Factors* (12-7-98), <http://www.the-scientist.library.upenn.edu/yr1998/dec/let3_981207.html> [7-11-99]. A discussion of such a citation service can be found at Institute for Scientific Information, *History of Citation Indexing* <<http://www.isinet.com/hot/essays/21.html>> [7-11-99].

⁴²ROTH & FONAGY, WHAT WORKS FOR WHOM?: A CRITICAL REVIEW OF PSYCHOTHERAPY RESEARCH 22 (1996).

⁴³COHEN, SWERDLIK & PHILLIPS, PSYCHOLOGICAL TESTING AND ASSESSMENT: AN INTRODUCTION TO TESTS AND MEASUREMENT 143 (3rd Ed. 1996).

⁴⁴ROTH & FONAGY, WHAT WORKS FOR WHOM?: A CRITICAL REVIEW OF PSYCHOTHERAPY RESEARCH 23, (1996). “Effect size” refers to the magnitude of differences between the control group and the experimental group expressed in standard deviation units on the normal distribution. *Id.* A standard deviation unit is a measure of the scatter of cases around the mean. In a normal distribution, 68% of the cases fall within (+1) and (-1) of the mean.

⁴⁵ROTH & FONAGY, WHAT WORKS FOR WHOM?: A CRITICAL REVIEW OF PSYCHOTHERAPY RESEARCH 23 (1996).

⁴⁶Stephen P. Hoffert, *With Increasing Use Of Meta-Analysis Come Efforts To Boost Validity*, (1-5-98) <http://www.the-scientist.library.upenn.edu/yr1998/jan/hoffert_p7_980105.html> [7-11-99].

⁴⁷*Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 593-94 (1993); *E.I. duPont de Nemours v. Robinson*, 923 S.W.2d 549, 558 (Tex. 1995).

Merrell Dow Pharmaceuticals, Inc. v. Havner,⁴⁸ “[p]ublication and peer review is a significant indicia of the reliability of scientific evidence when the expert’s testimony is in an area in which peer review or publication would not be uncommon.” The Texas Supreme Court does not require publication as a prerequisite for scientific reliability in every case, but counsels courts to be “especially skeptical” of scientific evidence that has not been published or subjected to peer review.⁴⁹

In the United States today, there are two forms of science-related peer review: peer review in publishing⁵⁰ and peer review in awarding grants for scientific study. Historically, acceptance through peer review was some assurance that a scientist’s views were considered tenable by other scientists. Peer review has also served to protect science against the negative impact of nonscientific factors on the development of science. But the peer review process is fast becoming an uncertain source for measuring legal reliability, as explained below.

3-4:9 Refereeing For Scientific Publications

Prior to the creation of a scientific community in the 1600's, scientists disseminated their discoveries through private correspondence and rarely-published books.⁵¹ With the rise of experimental science, researchers recognized the need for a better way to share information on new discoveries. The Royal Society was founded in London in 1660; the Académie des Sciences was founded in Paris in 1666.⁵² The first scientific journal was privately published in France in 1665.⁵³ A few months later the Royal Society in London started the first serial publication of a learned society.⁵⁴ Society journals published experiments conducted in the presence of members of the society, and reprinted “conference papers” presented orally at society meetings. Publication in these society

⁴⁸*Merrell Dow Pharmaceuticals, Inc. v. Havner*, 953 S.W.2d 706, 726 (Tex. 1997).

⁴⁹*Merrell Dow Pharmaceuticals, Inc. v. Havner*, 953 S.W.2d 706, 727 (Tex. 1997).

⁵⁰Peer review [in publishing] is a quality control process which ensures that the papers published in a journal are of appropriate quality, describing valid research results which have not previously been published. It is operated by academics as a service to their peers (payment is usually nominal or non-existent). The precise organization of a peer review system depends on the size of the journal, the editor’s views and historical arrangements.” “Report on Stage One,” *ESPERE* E-7 (Nov. 1996) <http://www.endocrinology.org/espere/stg1_rpt.pdf> [1-11-99].

⁵¹Nancy Fjällbrant, *Scholarly Communication--Historical Development and the New Possibilities*, <<http://educate.lib.chalmers.se/iatul/proceedcontents/Abs97/Nancy.html>> [1-10-99].

⁵²Nancy Fjällbrant, *Scholarly Communication--Historical Development and the New Possibilities*, E-2 <<http://educate.lib.chalmers.se/iatul/proceedcontents/Abs97/Nancy.html>> [1-10-99].

⁵³Nancy Fjällbrant, *Scholarly Communication--Historical Development and the New Possibilities*, E-3 <<http://educate.lib.chalmers.se/iatul/proceedcontents/Abs97/Nancy.html>> [1-10-99].

⁵⁴The journal was *Philosophical Transactions of the Royal Society of London*, Ann C. Schaffner, *The Future of Scientific Journals: Lessons From the Past*, E-2 <<http://www.uni-koeln.de/themen/cmc/text/schaf94a.htm>> [1-11-99]; Nancy Fjällbrant, *Scholarly Communication--Historical Development and the New Possibilities*, <<http://educate.lib.chalmers.se/iatul/proceedcontents/Abs97/Nancy.html>> [1-10-99].

journals carried a “hallmark of quality.”⁵⁵ At the same time that learned societies and scientific journals were coming into being, libraries, newspapers, and almanacs, were also established and were used to disseminate useful and scientific information.⁵⁶

Sometime in the 1700's, the refereeing process for scientific articles developed.⁵⁷ By the 1840's, the Royal Society of London occasionally asked scientists to read scientific articles submitted for publication in its journal.⁵⁸ At the same time, American scientific journals engaged in occasional peer review.⁵⁹ Since World War II, the refereeing process has developed to the point that today there are thousands of refereed journals around the world that publish scientific articles.

"A peer-reviewed journal is defined by the International Committee of Medical Journal Editors as ‘one that has submitted most of its published articles for review by experts who are not part of the editorial staff.’”⁶⁰ While there are a number of benefits from peer review in publishing, for legal reliability purposes the most important is the operation of the peer review process as a quality control mechanism for the quality of articles published in journals.⁶¹

3-4:9(1) The Process of Refereeing Review for Publications

The publication peer review process is described as follows. A submitted manuscript is initially assessed by the journal editor, who has the responsibility to protect the journal’s standing by offering good quality articles of interest to subscribers. The editor will consider whether the article: adds to existing knowledge; relates to what has previously been written; appears valid relative to the body of knowledge; is easy to read; has arguments

⁵⁵Nancy Fjällbrant, *Scholarly Communication--Historical Development and the New Possibilities*, <<http://educate.lib.chalmers.se/iatul/proceedcontents/Abs97/Nancy.html>> [1-10-99].

⁵⁶Nancy Fjällbrant, *Scholarly Communication--Historical Development and the New Possibilities*, E-9 <<http://educate.lib.chalmers.se/iatul/proceedcontents/Abs97/Nancy.html>> [1-10-99].

⁵⁷See John C. Burnham, K. Patterson, “The Evolution of Editorial Peer Review,” 263 JOUR. AMER. MED. ASS’N 1323-29 (Mar. 3, 1990), cited in Sweitzer J, Cullen D, *How Well Does A Journal’s Peer Review Process Function?*, 272 *Jour. Amer. Med. Ass’n* 152 (1994) <http://www.ama-assn.org/public/peer/7_13_94/pv3038x.htm> [7-11-99]; David Kronick, *Peer Review in 18th-Century Scientific Journalism*, 263 *Jour. Amer. Med. Ass’n* 1321 (March 9, 1990).

⁵⁸Tom Abate, *What’s the Verdict on Peer Review*, <<http://www.columbia.edu/cu/21stC/issue-1.1/peer.htm>> [1/10/99].

⁵⁹Tom Abate, *What’s the Verdict on Peer Review*, <<http://www.columbia.edu/cu/21stC/issue-1.1/peer.htm>> [1/10/99].

⁶⁰Lois Ann Colaianni (MLS), *Peer Review in Journals Indexed in Index Medicus*, 272 JOUR. AMER. MED. ASS’N pp. 156-158 (1994) <http://www.ama-assn.org/public/peer/7_13_94/pv3107x.htm> [1-12-99].

⁶¹Paul Evans, *The Peer Review Process*, LITERATI NEWSLINE (1994/1995) <<http://www.mcb.co.uk/services/articles/literati/peer/peerrev.htm>> [1-10-99].

that flow logically; and reaches strong conclusions.⁶²

If the editor decides that the submitted manuscript merits consideration to be published, (s)he will refer it to two to four independent reviewers who are researchers or practitioners in the field covered by the article. Sometimes the reviewers are members of the journal's editorial advisory board, and sometimes they are selected ad hoc by the editor. The refereeing is usually double-blind, meaning that the identity of the author and the identity of the reviewers are unknown to each other. However, critics of the process suggest that the reviewers are often familiar enough with the field to be able to identify the author and his or her institution from the writing, citations, etc.⁶³ The reviewers often have a checklist of things to consider, and room to note comments. Sometimes there is a point system for rating aspects of the article, such as technical adequacy, readability, value to reader, originality, etc., so that an overall numerical score can be assigned to the manuscript.⁶⁴

The reviewers evaluate the article and make inquiries and/or suggestions as to changes, which are then forwarded through the editor to the author, with a decision to reject, accept, or return for revision and resubmission. If the article is revised and resubmitted, it will be reevaluated and either accepted or rejected.⁶⁵

3-4:9(2) Refereeing for Papers at Scientific Conferences

A similar peer review process is often used for determining who will be invited to deliver papers at scientific conferences. An article is submitted to the program chair, who refers it to the program committee, which refers it out to referees.⁶⁶

3-4:9(3) Problems With Refereeing for Publications

Problems with publication peer review include: some reviewers allow their personal biases to influence their decision; reviewers sometimes make errors in judgment; reviewers can disagree on the merit of the same article; anonymity gives authors little recourse to bad decisions; the peer review process can take from 1-to-3 months, or even longer, delaying dissemination of the information; reviewers are paid little or nothing, so that

⁶²Paul Evans, *The Peer Review Process*, LITERATI NEWSLINE 2 (1994/1995)
<<http://www.mcb.co.uk/services/articles/literati/peer/peerrev.htm>> [1-10-99].

⁶³Paul Evans, *The Peer Review Process*, LITERATI NEWSLINE (1994/1995)
<<http://www.mcb.co.uk/services/articles/literati/peer/peerrev.htm>> [1-10-99].

⁶⁴Paul Evans, *The Peer Review Process*, LITERATI NEWSLINE 2 (1994/1995)
<<http://www.mcb.co.uk/services/articles/literati/peer/peerrev.htm>> [1-10-99].

⁶⁵Paul Evans, *The Peer Review Process*, LITERATI NEWSLINE p.1 (1994/1995)
<<http://www.mcb.co.uk/services/articles/literati/peer/peerrev.htm>> [1-10-99].

⁶⁶"Refereeing," <<http://www.cpsc.ucalgary.ca/projects/grouplab/699/refereeing.html>> [1-10-99]. The review process for articles at the Second International Congress on Peer Review in Biomedical Publications is described in "Editorial," <http://www.ama-assn.org/public/peer/7_13_94/ed4040x.htm> 1-12-99].

review time is donated, and reviews can sometimes be superficial.⁶⁷

In recent years, concerns have arisen about peer review for scientific publications. Three international conferences on peer review in biomedical publishing have been held, in 1989, 1993, and 1997. The 1997 International Congress on Biomedical Peer Review and Global Communications was attended by more than 300 participants from 46 countries.⁶⁸ Studies were presented showing that: (1) 17% of articles in six leading U.S. medical journals gave credit to “guest” or “honorary” authors, who did not meet recognized criteria for being included as an author, or failed to credit a ghost author, who had done significant work on an article; (2) authors tend to ignore related research in other disciplines, and ignore investigations (especially non-English reports) in other countries; (3) many authors leave out information that does not support their conclusions; (4) some peer reviewers give deference to manuscripts from well-known investigators and those from prestigious institutions; (5) peer reviewers in one study caught only two or three of eight errors intentionally introduced into test articles; (6) negative studies that lead to non-significant results often are not submitted for publication, resulting in other researchers conducting the same non-productive tests; (7) editorial boards sometimes fail to anticipate what the journal’s readers want to read.⁶⁹

Some studies have reported low levels of agreement between referees (i.e., low interrater reliability) for social and behavioral science journals--with an interrater reliability coefficient as low as 0.20.⁷⁰

Added to suspicions about the fairness of the peer review process is “inflation” caused by the great increase in the number of peer-reviewed journals. Authors tend to submit their articles to a succession of journals of diminishing stature until finally a journal is reached that will publish the article. Peer review standards for the accepting journal may be much less rigorous than for the rejecting journals, raising the question of whether the peer review acceptance of an expert’s articles should itself be evaluated for credibility. As noted in one article on the subject:

⁶⁷Paul Evans, *The Peer Review Process*, LITERATI NEWSLINE 3 (1994/1995)
<<http://www.mcb.co.uk/services/articles/literati/peer/peerrev.htm>> [1-10-99].

⁶⁸Joan Stephenson, *Medical Journals Turn Gaze Inward to Examine Process of Peer Review*, 278 JOUR. AM. MED. ASS’N 1389 (1997). “International Congress of Biomedical Peer Review,” <<http://www.ama-assn.org/public/peer/session.htm>> [1-12-99].

⁶⁹Joan Stephenson, *Medical Journals Turn Gaze Inward to Examine Process of Peer Review*, 278 JOUR. AM. MED. ASS’N 1389 (1997).

⁷⁰Ajaz R. Rana, James Whitescarver, Sudha Godala, & Firas Aljallad, *From Isolation to Collaboration: A WWW based Collaborative Review System*, <<http://hsb.baylor.edu/ramsower/ais.ac.96/papers/rana2.htm>> [1-12-99], citing: P.H. Munley, B. Sharkin, & C.J. Gelso, *Reviewer Ratings and Agreement on Manuscripts Reviewed for the Journal of Counseling Psychology*, 35 JOURNAL OF COUNSELING PSYCHOLOGY pp. 198-202. (1988); G.J. Whitehurst, *Interrater Agreement for Journal Manuscript Reviews*, 39 AMERICAN PSYCHOLOGIST 22-28 (1984); S.D. Gottfredson, *Evaluating Psychological Research Reports: Dimensions, Reliability, and Correlates of Quality Judgments*, 39 AM. PSYCHOLOGIST 22-28 (1978); E.O. Smigel & H.L. Ross, *Factors in the Editorial Decision*, 5 THE AMERICAN SOCIOLOGIST 19-21, (1970); W.A. Scott, *Interreferee Agreement on Some Characteristics of Manuscripts Submitted to the Journal of Personality and Social Psychology*, 29 AMERICAN PSYCHOLOGIST 698-702 (1974).

Every major traditional field has a few high status journals whose content is controlled by a small set of gatekeepers and is widely read within its scholarly community. Other journals that are believed to be of lesser quality and at the bottom tier are "write only journals" that few scholars read regularly.⁷¹

How can the quality of an article's peer review be evaluated? One possible way would be to rank the publishing journal based on its rejection rate on submitted articles.⁷² The importance of an article itself could be measured by the number of times it has been cited in subsequent writings.⁷³

3-4:10 Rising Costs and The Electronic Revolution

The word "crisis" frequently surfaces in descriptions of the current state of scholarly publishing. Universities are a main publisher and purchaser of scholarly literature. The university publishing system is faced with declining sales of monographs⁷⁴ and the increasing unwillingness of universities to subsidize publishing at a loss. Universities are therefore declining to publish as readily as they have in the past. University library systems are caught in a squeeze between a vastly increasing body of information,⁷⁵ spiraling increases in the cost of subscriptions,⁷⁶ and decreased funding. They are therefore looking for a way out of the paper subscription way-of-life.

⁷¹Rob Kling & Lisa Covi, *Electronic Journals and Legitimate Media in the Systems of Scholarly Communication*, THE INFORMATION SOCIETY: AN INTERNATIONAL JOURNAL 261-271 (Nov. 1995) <<http://www-slis.lib.indiana.edu/TIS/klinge2.html>> [1-12-99].

⁷²The rejection rate, for example, of the British Medical Journal, is over 90%. Paul Evans, *The Peer Review Process*, LITERATI NEWSLINE 2 (1994/1995) <<http://www.mcb.co.uk/services/articles/literati/peer/peerrev.htm>> [1-10-99].

⁷³However, in that case, the potential bias of the editor is ranked along with the editor's selectiveness.

⁷⁴"Monographs" are books relating to a topic.

⁷⁵The number of published scientific papers doubles every 10 to 15 years. *The Changing World of Scholarly Communication Challenges and Choices for Canada*, Final Report of the AUCC-CARL/ABRC Task Force on Academic Libraries and Scholarly Communication (Nov. 1996) <<http://www.aucc.ca/english/sites/aucclarl.htm>> [1-11-99]. See Joseph J. Branin & Mary Case, *Reforming Scholarly Publishing in the Sciences: A Librarian Perspective*, NOTICES OF THE AMS (April 1998) <<http://www.ams.org/notices/199804/branin.pdf>> [1-11-99], citing to a mathematician at AT&T Bell Laboratories who estimates that the number of scientific papers published annually has doubled every 10-15 years for the last two years. ("AMS" is the American Mathematical Society).

⁷⁶Between 1986 and 1993, the unit price of subscriptions increased by 108% and the cost of monographs (scholarly books of limited distribution) increased by 46%. *The Changing World of Scholarly Communication Challenges and Choices for Canada*, Final Report of the AUCC-CARL/ABRC Task Force on Academic Libraries and Scholarly Communication 4 (Nov. 1996) <<http://www.aucc.ca/english/sites/aucclarl.htm>> [1-11-99]. In the library industry this is called the "serials crisis." See Joseph J. Branin & Mary Case, *Reforming Scholarly Publishing in the Sciences: A Librarian Perspective*, NOTICES OF THE AMS p. 475, 477 (April 1998) <<http://www.ams.org/notices/199804/branin.pdf>> [1-11-99].

The situation is further complicated by the fact that “[t]oday we are at the threshold of the greatest change in scholarly communication and knowledge transfer that the world has ever seen (even including Gutenberg and the printing press).”⁷⁷ Scholarly publishing is reinventing itself to take advantage of internet email⁷⁸ and electronic publishing on the World Wide Web. A number of electronic journals have been launched,⁷⁹ and are in the process of establishing credibility as peer-reviewed journals that are merely using a new medium of distribution.⁸⁰ Increasingly, scholarly writing is moving into the public grasp through conference materials that are published on the World Wide Web. And some researchers and writers are publishing their own work through the World Wide Web, avoiding the delays associated with the peer review process and paper publishing.⁸¹ As an added plus, writers who self-publish are not required to surrender to the publisher the copyright on their articles as a quid pro quo for having their work distributed.

As the sanctity of the publishing peer review process erodes under increased scrutiny and a proliferation of little-read journals, and the market for paper publications declines, and the need for a publisher is supplanted by the ease of self-publishing on the World Wide Web, peer review could become less and less of a place to look for legal reliability of scientific theories. Even today, however, a concerned lawyer may wish to explore the claim of peer review made by an adverse expert, both to attack admissibility and to attack credibility.

3-4:11 Peer Review for Grant-Based Research

Peer review for government-funded and private foundation-funded scientific research in the United States began with the National Academy of Sciences, founded in 1863, which convened ad hoc committees of experts

⁷⁷Nancy Fjällbrant, *Scholarly Communication--Historical Development and the New Possibilities*, <<http://educate.lib.chalmers.se/iatul/proceedcontents/Abs97/Nancy.html>> [1-10-99].

⁷⁸See, for example, "ESPERE," the Electronic Submission & Peer Review Project" of the University of Ulster and the Society for Endocrinology. <<http://www.ulst.ac.uk/espere>> [1-10-99]. The Project is investigating the technical and cultural issues involved in electronic submission and peer review of articles relating to the biomedical sciences. ESPERE's principal focus at this time is the use of Adobe Acrobat PDF to transfer technical articles, including appendices.

⁷⁹As of November, 1996, there were 1,700 electronic journals and newsletters, of which 25% were estimated to be peer reviewed. *The Changing World of Scholarly Communication Challenges and Choices for Canada*, Final Report of the AUCC-CARL/ABRC Task Force on Academic Libraries and Scholarly Communication 8 (Nov. 1996) <<http://www.aucc.ca/english/sites/aucscarl.htm>> [1-11-99].

⁸⁰Rob Kling, *Controversies About Electronic Journals and Scholarly Communication: An Introduction*, THE INFORMATION SOCIETY: AN INTERNATIONAL JOURNAL 243-246 (Nov. 1995) <<http://www-slis.lib.indiana.edu/TIS/intro114.html>> [1-12-99]; Rob Kling & Lisa Covi, *Electronic Journals and Legitimate Media in the Systems of Scholarly Communication*, THE INFORMATION SOCIETY: AN INTERNATIONAL JOURNAL 261-271 (Nov. 1995) <<http://www-slis.lib.indiana.edu/TIS/klinge2.html>> [1-12-99].

⁸¹The American Psychological Association discourages this practice, as risking the loss of previously-unpublished status, which is a condition to publication in paper journals.

to distribute private gifts to meritorious researchers.⁸² During World War I, the U.S. government began funding scientific research through the National Research Council, which used private committees to award research funds.⁸³ With the founding of the National Science Foundation and the National Institutes of Health, merit-based review of government funding for scientific research was definitively established in America.⁸⁴

While grant peer review once served to separate more “acceptable” research from less “acceptable” research, in recent years requests for funding have so far exceeded available funds that acceptable scientific projects are being rejected due to lack of funds and not lack of merit. Increasingly choosing which research gets funded is less a function of merit and more a function of preference or bias of the peer reviewers.⁸⁵

Dr. Eve Barak, special assistant for peer review of the NIH, said that there are grant applications that receive favorable reviews but that are not funded due to lack of money.⁸⁶ In 1985, the NIH funded 33.1% of applications. In 1994, the number dropped to 25.4%.⁸⁷

In 1994, the U.S. government’s General Accounting Office (GAO) issued a report on peer review for NIH and NSF grants, having examined 246 winning and losing grants and having interviewed 1,400 reviewers at NIH, NSF, and the National Endowment for the Humanities. The report criticized the peer review process for reviewers favoring: those whom they knew over those whom they did not know; prominent applicants over lesser-known applicants; leading institutions over less prestigious ones.⁸⁸ The GAO recommended continuing the grant peer review process, but with the inclusion of more women, minorities, and junior researchers in the evaluation process.⁸⁹

⁸²Tom Abate, *What’s the Verdict on Peer Review*, <<http://www.columbia.edu/cu/21stC/issue-1.1/peer.htm>> [1/10/99].

⁸³Tom Abate, *What’s the Verdict on Peer Review*, <<http://www.columbia.edu/cu/21stC/issue-1.1/peer.htm>> [1/10/99].

⁸⁴Tom Abate, *What’s the Verdict on Peer Review*, <<http://www.columbia.edu/cu/21stC/issue-1.1/peer.htm>> [1/10/99]. Peer review is also used by state governments and private foundations to allocate grants.

⁸⁵Tom Abate, *What’s the Verdict on Peer Review*, <<http://www.columbia.edu/cu/21stC/issue-1.1/peer.htm>> [1/10/99].

⁸⁶Tom Abate, *What’s the Verdict on Peer Review*, <<http://www.columbia.edu/cu/21stC/issue-1.1/peer.htm>> [1/10/99].

⁸⁷Tom Abate, *What’s the Verdict on Peer Review*, <<http://www.columbia.edu/cu/21stC/issue-1.1/peer.htm>> [1/10/99].

⁸⁸Tom Abate, *What’s the Verdict on Peer Review*, <<http://www.columbia.edu/cu/21stC/issue-1.1/peer.htm>> [1/10/99].

⁸⁹Tom Abate, *What’s the Verdict on Peer Review*, <<http://www.columbia.edu/cu/21stC/issue-1.1/peer.htm>> [1/10/99], citing *Peer Review: Reforms Needed to Ensure Fairness in Federal Grant Agency Selection*, Gov’t Accounting Office (June 1994) (gao/pemd-94-1 Peer Review).

At the present time, peer review in the funding of scientific research proceeds in approximately the following manner.⁹⁰ The researcher develops a hypothesis and searches the literature to ascertain what experiments have been conducted that might impact the idea. Alternatively, a researcher might take another scientist's hypothesis and test results, and conduct research to confirm or reject the earlier results. The researcher completes a research application form, which describes the hypotheses to be tested, the historical significance of the hypothesis, and the methods of testing, and the test subjects participating in the research. The applicant outlines the scientific and statistical methods for evaluating the results of the study and states the goals and objectives of the research study.

If the research is to be conducted through a teaching or research institution, the application will be evaluated by an institutional review committee which verifies that the proposal conforms to the institution's by-laws governing research, including relevant ethical standards for research on humans and animals. The institutional review committee may also evaluate methodology and may call upon outside experts to provide peer review input.

Upon clearing the institutional review committee, the application then goes to the granting agency, where it is reviewed by advisory committees of experts providing peer review. These peer review committees evaluate the proposal for importance and soundness and make a recommendation. When there are more applications than money, a decision is made which projects to fund. The applications are usually graded and ranked with numerical scores; high scores denote highest merit. Funding awards are then announced to those who rank in a selected percentage of overall candidates; the percentage varies with the number of candidates and total award monies.

The grant peer review process is often criticized. One critic observed that the grant peer review process has given rise to a new breed of scientist--the grantsman, whose talents are not as a scientist but as an application writer who can successfully work the peer review process.⁹¹ Also, the peer review committees tended to include successful scientists, success being measured by the ability to do research which in turns depends on the ability to get funding.⁹² This may create an unconscious bias to favor the qualities that lead to funding and not the qualities that lead to better understanding. In response to criticism, the National Institutes of Health launched an inquiry into the grant peer review system and developed recommendations that were implemented.⁹³ As available funds diminished, criticism of the system increased. The system was described as "vicious beyond imagination" and a "mask of madness."⁹⁴ One study of the grant peer review process led to the conclusion that

⁹⁰The following description is taken from Ian R. Hart, *The Peer Review Mechanism for Funding Medical Research*, Thyroid Foundation of Canada <<http://home.ican.net/~thyroid/Articles/EngE8B.html>> [1-12-99].

⁹¹D.R. Forsdyke, *On Giraffes and Peer Review*, 7 FED. OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY J. 619-621 (1993) <<http://physics.uscs.edu/users/Links/native/pr.html>> [1-10-99].

⁹²D.R. Forsdyke, *On Giraffes and Peer Review*, 7 FED. OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY J. 619-621 (1993) <<http://physics.uscs.edu/users/Links/native/pr.html>> [1-10-99].

⁹³D.R. Forsdyke, *On Giraffes and Peer Review*, 7 FED. OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY J. 619-621 (1993) <<http://physics.uscs.edu/users/Links/native/pr.html>> [1-10-99].

⁹⁴D.R. Forsdyke, *On Giraffes and Peer Review*, 7 FED. OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY J. 619-621 (1993) <<http://physics.uscs.edu/users/Links/native/pr.html>> [1-10-99], quoting Joshua Lederburg and Phillip Sharp, respectively. See Joshua Lederburg, *Does Scientific Progress Come From Projects*

"the fate of a particular grant application is roughly half determined by the characteristics of the proposal and the principal investigator, and about half by apparently random elements that might be characterized as the luck of the draw."⁹⁵

The grant peer review process for the National Institutes of Health in the USA underwent a major overhaul in 1998. The National Science Foundation also recently altered its grant peer review criteria in response to concerns from the science and engineering community.⁹⁶

A 1997 report of a study of peer review of the quality of care physicians were giving to patients reflected unsatisfactorily low interrater reliability,⁹⁷ attributed to (1) an inability of reviewers to differentiate between cases, (2) systematic bias from reviewers, and (3) systematic bias related to the level of professional training of the reviewer.⁹⁸

3-4:12 Peer Review in Mental Health

In *Daubert* and *Robinson*, the experts in question were involved in concrete fields of inquiry (physical science), involving the effect of chemicals on organisms. How does the peer review factor translate to mental health?

Peer review for grants and publication exists in the mental health area. However, since many issues in mental health are more subjective than in the physical sciences, the peer review or refereeing process in mental health is even more vulnerable to attack for lack of objectivity.

The peer review process appears to have faltered in the area of data analysis of mental health statistics. In 1997, the American Psychological Association fielded a task force to consider complaints that mental health researchers were improperly analyzing their data. In particular, there was concern that researchers were

or People?," 32 CURRENT CONTENTS, LIFE SCIENCES 5-12 (1989); Philip A. Sharp, *The Crisis in Funding: a Time for Decision*, 62 CELL 839-840 (1990).

⁹⁵D.R. Forsdyke, *On Giraffes and Peer Review*, 7 FED. OF AMERICAN SOCIETIES. FOR EXPERIMENTAL BIOLOGY J. 619-621 (1993) <<http://physics.uscs.edu/users/Links/native/pr.html>> [1-10-99], quoting Stephen Cole, J. Cole, & G. Simon, *Chance and Consensus in Peer Review*, 214 SCIENCE 881-886 (1981).

⁹⁶Formerly, reviewers commented on four aspects of a proposal: researcher performance competence, intrinsic merit of the research, utility or relevance of the research, and the effect on the infrastructure of science and engineering. Beginning October 1, 1997, reviewers are asked to comment on two aspects of the proposed activity: its intellectual merit and quality, and its broader impacts. *NSF to Adopt New Merit Review Criteria*, FRONTIERS (July/August 1997) <<http://www.nsf.gov/od/lpa/news/publicat/frontier/7-97/7merit.htm>> [1-10-99].

⁹⁷"Interrater reliability" is a measure of the consistency of a method of evaluation, when used by different observers, or "raters." If most observers viewing the same information arrive at the same conclusion, interrater reliability is high. If the observers viewing the same information arrive at different conclusions, interrater reliability is low. In this study, the rates were geriatricians and geriatric nurse practitioners.

⁹⁸Smith, Atherly, Kane & Pacala, *Peer Review of the Quality of Care*, 278 JOUR. AM. MED. ASS'N 1573 (1997).

improperly using null hypothesis significance testing, leading to misassessment of odds that research findings are the result of chance. Task force co-chair Robert Rosenthal (Ph.D.) at Harvard University, said that “[t]hings have gotten pretty bad in psychological data analysis,” and that too often researchers draw conclusions without fully understanding their data or its meaning.⁹⁹

3-4:13 Implications for Trial Practice

The state of peer review presents problems and opportunities for trial lawyers. When a serious legal reliability challenge is leveled against an expert’s methodology, a claim that the expert’s research and publications have been subjected to peer-review should be examined. Not all journals use peer review, and some journals with peer review do not apply it to every article. If a published article was peer reviewed, counsel should inquire into how many journals rejected the article. And the quality of the publishing journal can be gauged by percentage of articles rejected, total circulation, etc.

If peer review is present, it could be that the approval was for research that arrived at different conclusions from what’s being offered at trial. If so, the peer review lends no support to the question at hand. Similarly, peer review of an expert’s article lends support only to the methodology in that paper, which may not be the methodology used for the lawsuit.

Even if a challenge to the peer review status of an expert’s research or publications does not lead to exclusion of his or her opinion, deficiencies can be offered to the fact finder as to the expert’s credibility.

3-4:14 Reliance on Published Information

Some propositions in mental health are well-established and are recited in textbooks as accepted views. Many other propositions are controversial and are supported or contradicted in published literature. A proponent of a view, including an expert witness, may cite supporting publications without citing opposing publications. Some experts will support opinions given in specific cases by studies that may be far from similar to the case in question. Any use of publications to support an expert opinion should be thoroughly examined to see if the publication actually support the opinion, and an additional inquiry should be made for contrary authorities. In many instances, there will be an issue of ecological validity in generalizing from a study to the case in question and that connection should be strictly scrutinized.

⁹⁹*APA Task Force Urges a Harder Look at Data*, APA MONITOR (March 1997) <<http://apa.org/monitor/mar97/stats.html>> [1-10-99].