AMERICAN LEGAL INSTITUTIONS

EXPERTS IN CIVIL CASES

An Inside View

FRED PRICHARD

Law and Society
Recent Scholarship

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Experts in Civil Cases
An Inside View

Fred Prichard

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To my son Frederick, the love and joy of my life.

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Contents

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Introduction

This book examines struggles between forensic engineers and attorneys as they search for a coherent voice of truth in the equivocal fragments of accident investigations. I examine these struggles on both defense and plaintiff sides in product liability cases involving serious injury and death. The emphasis is on the particular intra-side conflicts and negotiations that occur between attorneys and engineering experts in the course of evaluating evidence and accounting for "what happened" in particular accidents.

Noting the side specific contingencies of accounting for what is ostensibly the "same" evidence for each side is not to critique or make light of the serious work being done. On the contrary, it is only by closely examining the practical contingencies of each side that we can hope to know what good scientific and legal practice consist of as "shop floor achievements" (Garfinkel 2002:95). As David Livingstone succinctly put it in his geographical study of how specific worksite contingencies have shaped scientific thought since the 18th century, "in different spaces different kinds of science are practiced" (2003:15).

My inside view came from working with attorneys and experts as a "paralegal" in a private law firm for a year. For comparative purposes, I spent a second year interviewing plaintiff attorneys, defense attorneys and forensic engineers outside of the firm. Drawing together two years worth of participant-observation, interviews and case file materials, this book examines the techniques and complex working relations of a wide variety of forensic engineers and attorneys in the shop floor making of product litigation.

Existing research on the use of experts in litigation is inadequate in two ways. First, most of this research focuses only on expert trial testimony. In so doing, it ignores the pre-trial social processes through which attorneys and experts come to understand the case. Moreover, since at least 80% of civil cases settle before trial (Galanter 1988:21-23), this research entirely neglects those routine activities that constitute the actual work of attorneys and experts in the vast majority of cases.

Second, the few studies that do touch on the role of experts in preparing cases do not analyze specific examples of the situated negotiations and worksite practices involved. This lack of specificity truncates understanding of the open-ended, emergent processes whereby the evidentiary and legal strategies of the case evolve in attorney-expert exchanges. Previous studies also tend to be based on landmark appellate cases that are not a staple of typical law practices. In contrast, this book focuses on the in-course unfolding of relations between expert engineers and attorneys in the local law offices, laboratories, and corporate conference rooms that provide a hidden terrain of American adversarial justice.

From household appliances to mining equipment, sport utility vehicles to push lawnmowers, product litigation in America has grown rapidly in the last 25 years. Increasingly, one hears claims of "frivolous lawsuits" and "junk science." Tort reform efforts, in every jurisdiction, have gathered popular support by portraying the partnership of attorneys and scientific experts in broad strokes as a duplicitous collaboration of greed and prostitution that debases both professions. By examining the work that engineers and attorneys actually do in putting together product liability cases, I show that they have ever changing relations that defy such simplistic formulation.

Too often, writers exaggerate the differences between scientific and legal practice, forcing them into tidy dichotomies: The goal of science is understanding the truth -- the goal of law is to win a decision. Scientific knowledge accumulates slowly, over decades -- legal knowledge must be produced in a short, finite period of time. Science is collaborative, recognizing grey areas -- law is confrontational and black or white. Scientific conclusions are open to review -- legal decisions are final. These largely unexamined dichotomies hold science and law as separately organized institutions with inevitably clashing goals and methods.

A spokesman for the "clashing" camp, Peter Huber, argues that because their goals are fundamentally at odds, science put to legal use tends to turn "pathological" (1991). However, Huber's sweeping indictment of science in the courtroom presents only a very limited view of the actual use of science in law. In his focus on mostly sensational jury verdicts, Huber ignores the vast majority of more ordinary cases that attorneys typically drop or negotiate a settlement based on the opinions of their scientific experts. What many

critics of scientific experts in the courtroom don't take into account is the far more pervasive role these experts play in *preventing* litigation.

Even one of the most hardboiled critics, Marcia Angell, admits that "About three-quarters of tort claims are settled before a lawsuit is filed," and of those filed "only about 3 percent of personal injury claims ever come before a jury" (1997:71). Yet, after evidencing high rates of early settlement -- most being negotiated before a case is even filed -- Angell inexplicably concludes, on the very next page, "No longer does [the legal profession] emphasize negotiation and conciliation, or measure success by whether litigation can be avoided." To properly understand and assess the partnership of attorneys and scientific experts in settling or dropping the massive underbelly of tort litigation, researchers must look behind the courtroom and official documents, to the pre-trial evaluation and preparation of cases.

In sharp contrast to those who see science and law as separate, autonomous institutions, Sheila Jasonoff argues that they are mutually sustaining and co-evolving threads of the same undertaking: "The legal system has long looked to science as an indispensable ally in a shared project of truth-finding" (1995:42). Through large scale longitudinal analyses of court decisions and the evolution of technology, Jasonoff demonstrates, in many diverse substantive areas, how the distinctive traditions of law have shaped science and vice-versa. Perhaps the most penetrating recent account of specialized knowledge in law is Mariana Valverde's study of court cases in which key forensic experts appear as speaking and perceiving the world through constantly evolving hybrid languages somewhere between law and science (2003). These studies are extremely important in comprehending the

ongoing historical intertwining of science and law. However, what they lack is evidence of the everyday shop floor exchanges and techniques through which attorneys and experts actually fit science to the demands of law, in real time. To help fill this gap in the literature, the present book examines the worksite strategies and negotiations that shape the facts and fates of product cases, taking readers to the highly localized settings where civil experts produce legal knowledge in conjunction with attorneys.

Although attorneys and scientific experts often pull in different directions in their struggle to strategically control the truth between themselves, it is through such competition that they eventually hit upon a direction to walk together. In negotiating their differences, attorneys and scientific experts not only define the issues and contentions of the case they are working on -- they define themselves as professionals and warrant their distinctive practices. Through direct observation and interviews with practicing forensic engineers and attorneys, I document the remarkable extent to which attorneys and engineers co-produce the very professional boundaries thought to separate them.

The case evaluation and preparation work of engineers is largely unknown because most of it occurs in secret consultation with attorneys, behind the closed doors of private manufacturing companies, engineering firms, and law firms large and small. In these virtually impenetrable settings, one finds the dilemmas and contingencies of producing what often appears in the glare of public trials as a polished mix of legal advocacy and science. Few viewing the public spectacle of a product trial may realize the extent to which it is the end product of a difficult adversarial struggle, not between the two sides, but between attorneys and a

variety of engineers on the same side, each committed to a different "professional vision" (Goodwin, 1994:606) of the evidence. By the time the general public sees it, such cases have undergone countless revisions, radical shifts in nature, and corresponding shifts in the roles and relative dominance of the formative players. Here there is no separating the facts of the case, as they come to be understood, from the nuanced social relations of the attorneys and engineers putting it together.

As Ronald Thomas argues, it is precisely through such conflict, the "juxtaposing of different discursive fields in the analytical situation," that modern people come to know "the truth" in cases where the evidence is not clear-cut (2000:52-3). Where Medieval jurists used trial by fire and water to reveal the truth in difficult cases (Bartlett 1986), today it is only by reconciling the divergent discourses of science and law "to speak as one voice" (Thomas ibid.:53) that the witnessable truth of legal matters comes to be known.

In his groundbreaking analysis of the history of criminal punishment, Foucault argues that, with the 19th and 20th century proliferation of scientific expertise in sentencing decisions, legal power and knowledge became fragmented "into a strange scientifico-juridicial complex," "a network of relations, constantly in tension" (1995:19-26). To understand legal power and knowledge as the integration of distinctive professional rationalities, it is counter productive to try to disentangle science and law as dichotomous institutions. A better metaphor for the relationship between science and law is Charles Perrow's notion of "organizational Pushmepullyous" (1999:10). These are complex organizations, such as a nuclear power plant, the daily operation of which is structured by the push and pull of

organizational contradictions between diverse groups of administrators, scientists, and technicians whose everyday interaction nonetheless constitutes an important part of the plant's operating system. Like these complex organizations, today's legal system is not -- and cannot be -- controlled by a single elite group, as Foucault demonstrates in the realm of criminal sentencing. Extending Foucault's analysis to the civil arena, this book describes how legal knowledge and power is diffused among competing groups of scientific and legal professionals in the joint making of product liability cases.

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CHAPTER 1

The Firm

Along the streets of Capital City, up stairs, through doors, behind receptionists and more doors, attorneys and engineers built product liability cases that shaped the future of American industry. They built these cases in private conference rooms, using special languages, customs, and practices that, to me, initially were as unintelligible as a foreign culture.

I gained access to this strange and hidden world by working as a paralegal at the law firm of Wilson, Rice, Hunt, and Fisk (all names have been changed). I acquired this position through a friend who was an active partner in the firm. The friend was Howard Hunt. Hunt had been the law school roommate of Don Nathan, a childhood friend of my wife. Nathan introduced me to Hunt at a party shortly after my wife and I married, in 1990 (approximately 7 years before the period of observation). Hunt, my wife and I went on to socialize at many weekend gatherings and take several

vacations together. When, years later and living on different coasts, I thought of working at a law firm to research this book, I naturally thought of Hunt. I called him and said that I was planning to write a book on exchanges between attorneys and experts -- could I work at his law firm for a year to collect data? Hunt said that it was alright with him -- as long as he didn't have to pay me -- but he would have to clear it with his other four partners at the firm. He requested a proposal for my study and an example of a previous study that I had done on attorney interaction with judges in-chambers. Hunt passed these materials around to his firm partners, and they agreed to "hire" me without pay, allowing me to observe and participate in their work with experts from April 1997-April 1998.

Wilson, Rice, Hunt, and Fisk (hereafter referred to as Wilson) occupied the second floor of a two story, river front office building on the Boulevard of downtown Capital City. The firm handled a mixture of personal injury, malpractice, product liability, and wrongful firing cases -- staples of local law practices, judging by attorney advertisements in the local yellow pages.

On my first day at Wilson, Hunt gave me a key to the building and introduced me to the five secretaries and the receptionist. In a short time I also met his four partners, the firm's two associate attorneys, one assistant attorney, and an employee referred to as "gopher," the office errand runner. Hunt told the attorneys and staff that I was doing research for a book on relations between attorneys and expert witnesses. He instructed staff to give me complete access to office resources, such as computers and copy machines, including any case files that I requested.

Added to these office privileges, I had unprecedented access to Hunt and the associate attorney who worked closest with him, Kelly Tilman. They opened to me their calendars of meetings with experts and co-counsel not only at Wilson and other nearby law firms but also at the distant offices of corporate clients where we traveled by jet.

Wilson differed from typical law firms in one important respect: it handled a substantial percent of plaintiff and defense cases: 30% plaintiff and 70% defense, founding partner Herbert Rice estimated. According to Rice, he and Peter Wilson started Wilson as a plaintiff's firm. They had been classmates in law school, both attending on the GI Bill and both having fought in the battle of Guam. They graduated in 1951 and started Wilson and Rice in 1956, taking mostly personal injury and labor dispute cases for plaintiffs. The firm remained almost completely plaintiff until the early 1980s when young Howard Hunt started taking insurance defense cases. Over the next 15 years, Hunt became the firm's "rainmaker." He established a defense clientele that included some of the largest manufacturing and insurance companies in the world, shifting the firm's business to primarily civil defense cases. Although Hunt came to handle mostly defense cases, he continued to handle a variety of plaintiff cases and expressed a preference for the latter.

In the year that I worked with him, Howard Hunt was 47 years old. He had been acting as lead attorney in both plaintiff and defense cases for 17 years; and, with a current caseload of 180 cases, he was by far the most active partner at Wilson. Attorneys from other firms, including some who had faced him on the other side, praised Hunt as one of the best attorneys in the state. Locally renowned for his skills as a negotiator and litigator, Hunt often was chosen by other

attorneys to mediate disputes outside of the Wilson firm. By all accounts, Hunt was perceived as a highly skilled and seasoned attorney able to successfully try cases on either side.

Although Hunt's ability to handle a substantial number of plaintiff and defense cases was atypical for attorneys, the challenges he faced appeared to be highly consistent with those expressed by other attorneys whom I observed and interviewed in straight plaintiff and defense firms. Wilson's practice of handling both permitted a unique comparative analysis of the sides, albeit within a single firm. Working on both sides also mitigated bias that inevitably would have resulted from working at a firm that handled only one side of cases. To broaden and check the reliability of my observations at Wilson, I audiotaped 38 interviews with attorneys and experts outside of the firm. Producing a data set of approximately 2,800 pages of interviews and fieldnotes, I was able to explore a variety of distinctive attorney-engineer relations that constitute the most active types of partnership in the making of ordinary product litigation. However, given the small non-random sample, my purpose is not to generate statistical inferences but rather to comprehend the complexity of attorney-engineer relations for these particular people.

My Role at Wilson

I took handwritten field notes at Wilson, on legal pads, approximately 2 to 3 days per week, using intermittent days to reconstruct my notes at home on a word processor. At meetings, Wilson attorneys introduced me to co-counsel, company clients and experts as their "paralegal." My ostensive role as a paralegal provided unlimited opportunities for taking notes openly and unobtrusively since note taking

was considered part of my job. When people talked at meetings, I continuously recorded their discussions as close to verbatim as I could. Other participants also routinely took notes at these meetings, reinforcing the normality of my note taking. When my participation in discussions precluded taking notes, I later reconstructed those passages from memory, at home or in a nearby conference room.

When not attending meetings, I read the files of developing cases and discussed them with Wilson attorneys. These discussions occurred not only in Wilson offices and conference rooms but also frequently at lunches and on car rides to collect evidence. In some of the larger defense cases, I also consulted with attorneys from other firms representing other parties called "co-defendants." I became a kind of sounding board for Wilson attorneys as they developed hypotheses about what occurred in injury cases. Howard Hunt explained that he sometimes became so involved in cases that he lost a certain amount of critical perspective, and it helped to check his interpretations against an "informed layman" like me.

Because of Wilson's particular hodgepodge of insurance and manufacturing clients, I was able to assist Hunt and his associates in a wide variety of defense product cases. These cases were given to Hunt by the manufacturer's insurance provider. Since I will be talking about most of these cases at length in subsequent chapters, I will introduce them here briefly.

In one case, we defended an Italian company that manufactured and exported restaurant pasta making machines to the U.S. The case involved a company-made pasta machine that mangled a local restaurant worker's hand and arm as she cleaned the machine's cutting blades. In another

case, we defended a Taiwanese manufacturing company that made a string of ornamental Christmas tree lights alleged to have caused a house fire that killed two children and severely disfigured their mother. Three other defense cases that I worked on involved severed limbs and lawnmowers made by a large American company. The damages claimed in these defense cases ranged from a low of $50 thousand, for the amputation of a local man's big toe in a lawnmower accident, to $22 million for wrongful death, pain, and suffering in the Christmas tree light case. Hunt settled all of these cases out-of-court, except for the one involving the big toe.

Hunt also evaluated two plaintiff product cases while I was there. One involved the death of a 12 year old girl in a mini-van rollover. The other involved the death of an infant in a car seat. After receiving unfavorable evaluations by consulting product engineers, Hunt dropped these cases.

I also worked on three plaintiff cases not discussed below because they were not product cases. Two were malpractice cases, one involving an amputated leg, the other a post-surgery death. The third was a wrongful firing case involving a manager discharged for alcoholism. Hunt settled the malpractice cases. The firing case went to trial where Hunt won for the alcoholic ex-manager a jury award of $750,000 for back pay and damages.

The files on these cases grew by the boxful while I was there, the Christmas light case accumulating over 12 legal file boxes. Attorneys explained that because they carried such large caseloads, they could not possibly read all of the incoming material that went into these files. Thus, Hunt often handed me a box of incoming documents with the sole instruction, "See if there's anything bad in here."

Because I read and studied these files in detail, Hunt and Tilman often asked me questions about certain documents or alleged facts, typically finding me in the library or calling me at home when I was out of the office. Tilman routinely took me to depositions involving these cases where, on breaks, she sometimes asked me to critique her questions and the deponent's answers based on my knowledge of the file. I also regularly attended case planning sessions, and Hunt eventually taught me to locate experts for his cases. By participating in the daily work of putting together cases that Hunt bought in, I learned part of the craft that I was studying, enabling me to better view attorney-engineer relations from the perspective of practitioners.

I also formed after-hours friendships with attorneys from other firms, attending legal seminars, state bar meetings, dinner parties, weddings and other celebrations. At these functions attorneys invariably assembled in small, informal groups at the fringe of the room and compared the cases they were working on. They often discussed the quirks and details of these cases with great delight and animation, drinks in hand. During the period of observation, Hunt married an attorney from another firm. Along with other attorneys, my wife and I co-hosted their engagement party. We also hosted an engagement party for another pair of attorney friends who wed during the study. Through these extra-firm associations, my wife and I became regulars in attorney social circles that spanned Capital City. Thus, both on and off the job, I immersed my self in the local activities of a group of attorneys who lived the practice of law.

Organization of the Firm

The firm was relatively small and mostly run by the partners. The partner on a case was typically referred to as the "pointman," meaning that he or she designed and orchestrated the case, identifying the issues, hiring the experts, and preparing the experts before depositions and trials.

At the next pay grade, an associate attorney typically collected evidence, such as depositions, often following the instructions of and reporting to a partner. The associate on a case tended to work closely with experts in the field, going on accident investigations, suggesting certain tests, discussing test results, and sometimes suggesting further tests. The associate typically was responsible for putting together accident reports in collaboration with the experts for their side.

Lowest in the attorney hierarchy, the assistant attorney typically did much of the voluminous legal writing and filing required in a case, writing such things as complaints, counter complaints, interrogatories, and responses to interrogatories. The assistant on a case typically worked closely with the associate and had few independent exchanges with experts.

But within this firm hierarchy, attorney roles varied considerably from case to case. For instance, it was common for an associate on one case to function as the pointman on another. The assistant often filled in for the associate. Thus, each attorney worked in multiple, distinctively evolving relationships with experts from case to case.

Roles of Experts

Hunt, like the other attorneys interviewed, employed two main types of expert per case: "damage" experts and

"liability" experts. The liability experts on a case reconstructed what happened in the accident. Attorneys used them primarily to pinpoint the cause of the accident. Damage experts estimated the total financial loss associated with the accident. At a minimum, the damage experts typically included an "examining doctor," a "vocationalist" and an "economist" who, working in succession, estimated the plaintiff's damages. The other side typically hired their own set of damage experts.

First, a doctor from each side typically examined the plaintiff, describing each injury in detail and performing range of motion tests on injured joints and limbs. Second, each side's vocationalist, usually someone from a social work background, read the examining doctor reports and found jobs that the injured plaintiff could possibly do, compiling a report on the plaintiff's post-accident earning potential. Finally, each side's economist, typically a certified public accountant, used the vocationalist and doctor reports to estimate the plaintiff's total lost income, medical expenses, and on-going rehabilitation expenses. Thus, a succession of damage experts on both sides estimated plaintiff losses resulting from the injury.

Liability experts were typically engineers or medical doctors. When Hunt worked for the defense, he tended to use the opinions of liability experts to deny liability on the part of the company that made the product. When on the plaintiff side, he used them to attribute liability to the manufacturing company. At a local "continuing legal education" seminar that I attended early in the period of observation, attorneys and judges referred to product cases as "battles of the experts" because it was up to each side's engineering liability experts to provide the decisive hard evidence that established

the cause of injury for the court. In addition to reconstructing the cause of injury, liability engineers for each side also evaluated the safety design of the product in question. Because engineers analyzed the physical evidence at the core of product liability cases, attorneys on both sides typically presented them as their key experts.

The roles of liability engineers were further divided into what attorneys and engineers referred to as "consulting experts" and "trial experts."

Consulting experts on each side typically assisted in the investigations that the respective attorneys relied on to secretly evaluate whether or not the case was worth pursuing. Attorneys on both sides of potentially high-dollar cases typically hired a variety of consulting engineers, with different sub-specialties, who separately examined the product or accident site.

These consultants typically drew informal, tentative conclusions based on limited information, much of it supplied by their attorney clients. Attorneys typically instructed consulting engineers in short memos that 1. Noted the presumed facts of the case, 2. Briefly discussed the attorney's initial theory of what happened, and 3. Instructed the engineer to test that theory as a series of specific hypotheses. Because consulting engineers were undisclosed experts whose work product was protected as confidential under the attorney-client privilege, attorneys sometimes instructed them to furnish their findings and opinions in written reports that were not discoverable by the other side.

If attorneys deemed the case worth pursuing, they hired "trial expert" engineers to conduct fuller, more expensive investigations of the accident, providing evidentiary documentation that they anticipated needing at trial.

Attorneys on both sides typically hired trial engineers after receiving reports from damage experts and after initially evaluating the merits of the case using consulting engineers, sometimes hiring trial engineers from the ranks of favorable consulting engineers.

Since trial engineers gave public testimony, they were not protected under the attorney-client privilege. Anything that they discussed with attorneys was considered "discoverable," meaning that the other side could question trial experts about any such discussion in interrogatories, depositions and trials. Attorneys from Wilson and other firms said that they typically instructed trial engineers by telephone, thereby leaving no record of their discussions. They also told trial engineers to refrain from taking notes and to furnish all opinions directly to the attorney by telephone. I observed that as Wilson attorneys spoke to trial engineers on the telephone, they sometimes jotted their findings on post-it notes that they stuck to the outside of files for easy removal in the event of a request for discovery by the other side. Hunt and Tilman often also used this note taking practice when talking to consulting experts on the telephone. As cases reached an advanced stage of discovery, attorneys and favorable trial engineers typically went on to co-author a "final report" analyzing the cause of the accident and assessing the safety design of the product in question.

Because of their distinctive roles, consulting and trial engineers formed distinctive work relationships with attorney clients, and with each other. Also -- like partner, associate, and assistant attorney roles -- the roles of consulting and trial engineers changed from case to case. For example, it was common for a trial engineer on one case to be a consulting engineer on another case for the same attorney. And because

attorneys sometimes hired trial engineers from the ranks of favorable consulting engineers, an engineer's role sometimes changed within the same case. Thus, like each attorney, each engineer typically had many distinctively evolving relationships with attorneys and with other engineers across their caseloads.

Engineering experts also had different prior work affiliations that shaped their participation in the case, the two major types being "in-house" and "independent" engineers. "In-house" engineers worked for the defendant company that produced the product at issue in the dispute. The in-house engineers that Hunt and Tilman worked with often had a hand in designing the product in question. Because they worked for the defense client and they typically had a great deal of litigation experience regarding the product in question, in-house engineers often dominated Hunt and Tilman in exchanges that shaped the content of their product cases. "Independent" engineers typically worked for an engineering firm that specialized in providing attorneys with consulting and trial experts. Attorneys on both sides appeared to use their financial position as the paying customers of independent engineers to direct, to some extent, how these engineers worked on the case.

When in-house and independent engineers worked for the same (typically defense) side, their preexisting institutional commitments made for distinctive relations with attorneys and with each other. In-house experts working for the defendant company tended to work exclusively on the defense side, with some exceptions. On the other hand, the independent engineers that I worked with and interviewed strove to balance their caseloads between both sides to avoid the appearance of bias associated with always working for

one side. Thus, across their caseloads, independent and in-house engineers constantly shifted relations, sometimes appearing as teammates on one case and as rivals on another. Independent engineers similarly shifted adversarial relations with attorney clients across the sides. Often this shift occurred when an attorney hired an independent engineer because he or she was particularly effective *against* the attorney in a previous case.

Furthermore, it was not unheard of for an independent expert to cross sides in the same case. For instance, in defending the Italian pasta machine manufacturing company, Hunt's independent trial engineer wrote a final report that was extremely unfavorable to a co-defendant in the case. When the lead plaintiff attorney read the report, he worked out a settlement agreement with Wilson defense attorneys that entailed signing a contract permitting the plaintiff attorney to hire Wilson's defense engineering expert to testify against the remaining co-defendant.

Also the engineer's stature greatly affected relations with attorneys. The elite upper echelon of expert engineers hailed from major metropolitan areas like Chicago, New York, and Los Angeles. They were often patent holding, industry pioneers in product safety design. Some had founded private safety consulting companies that served large industrial clients. Some headed safety research institutes. Most held academic rank at a prestigious university. This top echelon of engineers often chaired the Occupational Safety and Health Administration (OSHA) committees and the American National Standards for Industry (ANSI) committees that wrote the safety standards for particular commercial products. Because a central issue in virtually every product case was whether or not a certain safety standard or set of standards

had been violated, these committee chairs were in high demand as consulting and trial experts. Some OSHA and ANSI committee chairs that Hunt hired had been involved in thousands of cases, acting as both consulting and trial experts. In disagreements with attorneys, these top engineers often refused to alter their opinions for the attorney's adversarial advantage. Many readily suggested alternate legal theories that better fit the physical data, as they saw it. And attorneys often reluctantly accepted their theories. Thus, upper echelon engineers frequently dominated exchanges with attorneys.

However, most of the engineers that Hunt hired were far from upper echelon engineers. Some were local construction engineers that Hunt hired because they happened to work on a particular building project that he was investigating. These happenstance engineering experts often were crucial to the case because they provided both factual and expert testimony. Few had litigation experience, and Hunt reported that they typically were so uneducated in legal affairs that they did not comprehend the extent to which he had groomed their testimony for adversarial advantage.

On the other hand, some local engineers had acquired extensive litigation experience. These engineers often had full-time government jobs which permitted "moonlighting" as an expert witness on the side. A few highly seasoned local experts were engineering instructors from area technical schools or community colleges. Where the top echelon engineers typically accepted cases only in their narrowly defined fields, these local engineers tended to testify on demand in a broad range of engineering sub-specialties, earning them the designation, "jack-of-all-trades."

Adding yet another layer of complexity to attorney-engineer relations, some engineering experts were in turn

sued by former attorney clients alleging breach of contract or misconduct in the course of performing investigations. One highly active local engineering expert whom I interviewed reported that he had four such suits currently pending against him. In sum, the making of product cases was contingent on a staggeringly complex and ever changing constellation of attorney-engineer relations.

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CHAPTER 2

Conflicts

Regardless of side, institutional affiliation, or level of experience, all of the engineers and attorneys in this study reported conflicts in developing product litigation with the other. I found that product suits are doubly adversarial in the sense that the conflict between plaintiff and defense sides is largely shaped by a hidden adversarial front between attorneys and engineers on the same side. Where the inter-side conflict reflects the divergent interests of plaintiffs and defendants, the intra-side conflict reflects the commitment of attorneys and engineers to professional groups with divergent interests and agendas.

Rick Johnson was a mechanical and electrical engineer who left academia to start a private consulting firm. A local "jack-of-all-trades," he estimated working on approximately 3,000 cases over his 12 years as a self-employed expert for both plaintiff and defense sides. Typical of the engineers I interviewed and worked with, Johnson summarized his conflicts with attorneys in terms of a discrepancy about "the

truth:" (For readability, I have deleted redundant or parenthetical talk in some quotes.)

> They don't care about the facts. They don't care about the truth. Lawyers don't. They care about representing the client. Well, engineering training is different. You're trained to look at everything, all the evidence, and then put it in a screen and sift it out and see what pops out. So, if you do your engineering properly, you look at physical data. You look at physical facts. You do number crunching and equation solving, and that tells you a particular scenario of the event or accident. I think their training teaches them to be an advocate, to disregard certain facts and only introduce the facts that are relative to their theory of the accident. I think that's the basic conflict. Their training is totally different than ours.

Johnson makes a vivid contrast between the training of engineers and attorneys. As he sees it, "the basic conflict" is methodological. From the perspective of engineers, attorneys are advocates, trained to start with a conclusion that favors their client then fit evidence to that conclusion by introducing supportive facts and suppressing others. Contrastingly, the engineer is trained to reach a conclusion last, after examining all the available "physical facts" of the accident using analytical methods that are designed to minimize the extraneous influences of a paying customer.

Attorneys emphasized that the major struggle in working with engineers was widening their focus from a technical analysis to the broader objective of winning the suit, which meant not only presenting sound conclusions from an

engineering stand point but also convincing a jury composed of people who typically had no previous grounding or interest in engineering whatsoever.

For attorneys on both sides, convincing a lay jury required, first and foremost, winning their trust. Many attorneys reported that, in the intensely adversarial context of the courtroom, the way to build trust was not by presenting exhaustive expert analyses but rather by presenting a compelling story.

While often expressing respect and sometimes awe for engineering rigor, attorneys constantly worried that their expert engineers were too narrowly dispassionate, hard to follow, counter intuitive, and refutable on the basis of eyewitness testimony. Attorney attempts to change the way that engineers thought and talked about the case made for conflict at every step in the preparation of product litigation.

Attorneys reported that conflicts arose primarily because engineers had a different "agenda." In particular, their willful skepticism conflicted with the trial attorney's goal of producing a clear-cut case for the client. Russ Murrell, who headed the product litigation division of a prominent defense firm, explained these different agendas and why they caused his "biggest problem" with engineering experts.

> The biggest problem that I find, that I have and that I am aware of other lawyers having, relating to engineers -- I'm referring to in-house engineers -- is that they have a different agenda than defense lawyers. Defense lawyers are trying to determine, "What is the truth, and how do we bring the truth to the jury? -- as it relates to this case." Engineers are looking more for, "What is the situation with the

> product, and how can"-- with them it's always, "How can we make it work, and how can we make it work better?" And in doing that they are willing to look at weaknesses, short-comings, problems with the product. And they make notes about it. They ask questions about it. And they're usually very honest and exacting about it. In a legal context, that's often taken as a criticism, an engineer's criticizing a product, when really what the engineer is doing is trying to find a way to make it better or to work better, or more smoothly, or more efficiently, or more cost effectively. And I find that to be a real problem. They are willing to be candid and open about it. And they're willing to be open minded. Whereas a lawyer would say, "Well, lets talk about this issue, and here's what we want the answer to be -- is that right or not?" And an engineer might say, an engineer will not say "yes" or "no." Most of the time they'll say, *"Well,* lets go back to the beginning and lets work our way through it and see where it takes us."

According to Murrell, "the biggest problem" he and other defense attorneys have in using company or "in-house" engineers as experts is their recorded history of improving company products by criticizing them. According to Murrell, his engineers continually "look at weaknesses, short comings, problems with the product," in an effort to "make it...work better." Their agenda and documentation of criticizing the product to improve it is a "real problem" for Murrell because it conflicts with making a clear-cut case that the product was safe.

Adding to the difficulty, these conflicting agendas entail conflicting ways of thinking and working. As Murrell expresses it, engineers are "willing to be open minded" -- willing to change their mind as evidence emerges; and therefore, they are reluctant to answer attorney questions with an unequivocal "yes or no." But, of course, attorneys need definitive and timely answers to prepare for trial. As a result, attorneys on both sides tend to emphasize "what we want the answer to be" from the very outset of the investigation while engineers struggle to resist such conclusions pending their evaluation of the available evidence.

Many engineers reported a struggle to remain open minded in the face of attorney propounded theories of how the injury occurred. In-house expert, Norman Carney, a restraint system engineer who designed seatbelts and airbags for a major U.S. automobile manufacturer, described the "adversarial feeling" of preparing his deposition and trial testimony in private meetings with local defense trial attorneys.

> I've run into roadblocks, in that kind of a setting, where I'll get an attorney that comes in. And maybe he's the top dog attorney. And his whole business in life is actually trial proceedings. And there it's very pointed. And they will operate pretty much, there is no latitude for discussion: "When I ask a question, I want you to give me the answer. I want you to give me the trial answer. And if I don't like it, we're going to put it on the mat right now, and we're going to discuss it. We're going to tear it apart. And I'm going to tear you apart in the process." Woo, all of a sudden I've got this real adversarial feeling. I don't

> get the sense that we're working together here. I'm trying, as much as I can, to accommodate their wishes and still stay objective and factual with the knowledge that I am bringing to the case because they're not going to get me to say something that I don't believe. But on the other hand, I have to say it in the way they are comfortable with. So, that is really a struggle. And it's probably the toughest part of any relationship I have with my attorneys through the course of a case.

For Carney, an in-house engineer accustom to openly discussing the strengths and weaknesses of product designs with colleagues, "there is no latitude for discussion" with attorneys whose "whole business in life is actually trial proceedings." We sense Carney's alienation at the closed minded approach of attorneys who demand "the trial answer." He characterizes his sessions with local trial attorneys as "adversarial," a "struggle" "to accommodate their wishes and still stay objective and factual." Carney went on to give an example of such a struggle in one of his first preparation sessions with a local trial attorney:

> Bill asked me a question about whether the belt was on or not, the lap belt. And I said, "Well, could have been. But then, it may not have been." Woo, rockets went off. "What do you mean? You're my expert in this case, and you say it 'could be' or 'couldn't be?' Look, I'm going to tell you. The other side doesn't waffle. They pick one view. And they will push that view. And they will make their case in front of a jury. And there will be no misunderstanding. There will be no gray area. They will take a position one way or

> the other and make it stick. Now, they don't have any other course of action. That's their life. They make their living going in front of juries and making statements, whether they have facts to back them up or not. Now you, you can go back to designing cars. You have another career. They don't. You better start thinking like they do." Wow, I mean, I don't think my dad ever dressed me down like that. And boy, we were just within the first half hour of this little prep session. And all the sudden, I'm just, woo, I'm trembling. The next words out of my mouth better be right, or this guy's just going to give me another little beating here. And boy, I'll tell you. He made me take a whole different approach to that afternoon than I had ever experienced. He has a very rigid standard by which he is going to run his time in this interface. And if you didn't have an opportunity -- and in this particular case, we did not have much opportunity at all to interface on the particulars of the case -- you can really have some divergent views that have to be overcome very quickly to have an effective session.

Here Carney describes a fight with Bill, the attorney, over the question: Was the plaintiff wearing a seatbelt or not? The jury focused attorney demands an immediate, unequivocal answer -- "yes" or "no." But for the data focused engineer, there is room for nuance and discussion. Attorneys perceive such uncertainty as disastrous for their case. Carney describes the exchange as a "beating" that leaves him "trembling" with fear as he struggles to chart a course

between the conflicting demands of legal advocacy and scientific creativity.

Attorneys reported that engineers thought about the case in ways that were fundamentally different from them. Veteran defense attorney, Russ Murrell, indicated that the very sense of precision that made for good engineering often made engineers unsuitable his purposes:

> There are many engineers I've worked with that I won't call as a witness. They are so bright. They are so good at what they do. But it's like saying, "Fred, do you have the time?" And an engineer will say, "Yes." And they won't tell you the time, until you ask for it. Now that's a little bit of an exaggeration because most engineers, you say, "Do you have the time, they'll say, "Ya, it's 10:40." But that's the kind of thing you get with engineers.

In this quote, Murrell discusses what he sees as a major drawback of engineering precision and rigor. The engineer's specialized rationality appears pedantic to the attorney and lay jury. Although exaggerated, the time example underscores what Murrell sees as a profound gap in basic understanding between attorneys and engineers, in the mental habits and background assumptions that color their thinking and create misunderstanding about even such mundane affairs as asking the time of day.

Likewise, engineers reported profound communication difficulties that they attributed to basic differences in the way that attorneys thought about the case. According to Wayne Ellis, an independent automobile design expert who worked on both plaintiff and defense sides,

> Engineers and lawyers look at things different ways. I would explain it as the engineers, we like to think of things as why, how did that happen. Ever since I was a kid, I have been taking things apart, because I wanted to know how they worked, why did they work. So engineers kind of want to know the whys, the wherefores, and 'how does that work?' type of thing, and a lawyer wants to know who's at fault and who's going to owe money, and the 'why' isn't necessarily 'who's at fault.' Fact of life. Cars crash when you hit solid objects. Is that bad? And that's the question they want to know. Is that bad, is that wrong, was that poorly designed? You look at that and you say, "Well, I don't know. It's physics. It's not bad or good, it's physics." So again, there's a different thought process.

According to Ellis, he and other engineers view a car crash in terms of "why" the crash occurred, meaning "how did that happen?" -- this being a matter of value-free physics rather than culpability. But, as he sees it, attorneys view the same car crash in terms of blame: "who's at fault and who's going to owe money" -- this being a matter, ultimately, of moral judgment. Ellis reports being unable to answer the attorney's moral question "is that bad, is that wrong, was that poorly designed?" from the stand point of his calling in pure physics. Here we see that, from Ellis's perspective, the worksite struggle for inter-professional discourse involves not only divergent ways of thinking but also different moral orbits. We sense that Ellis considers the attorney's questions of culpability to be beyond what he considers to be the proper jurisdiction of physical science.

Yet it is precisely through such inter-professional discussion with attorneys that Ellis is pushed to define this moral boundary of engineering.

Attorneys reported similar communication barriers related to differences in the way that engineers viewed the case. Russ Murrell summarized his frustration in communicating with engineers in the following way.

> Lawyers, many times, will come in with a broad-brush question, and it's like trying to put a square peg in a round hole. The engineer has a real difficulty with that. In fact many times, an engineer will say, "I can't answer your question the way you've asked it because you're asking me about round pegs in square holes, and you've got to convert one of 'em before I do that." And that frustrates lawyers who want to think like lay people and try this case like a lay person because the jury's going to be made up of lay people. If there's any engineers on the jury, they're gonna get struck. So, sometimes you have a difficulty with communication.

"It's like trying to put a square peg in a round hole..." In this vivid imagery, we see Murrell's clear sense of a difficult to reconcile gap in communication between attorney and engineer. Murrell expresses it in terms of a difference in operational scope regarding the case. Attorneys "who want to think like lay people" ask "broad-brush" questions because, in their experience, these are the questions that register with lay jurors. In developing product litigation, attorneys strategically visualize the case from many perspectives: juror, judge, client, other side. Attorneys perceive engineers as

unwilling to cater to these lay perspectives in their analysis of the cause of injury. In Murrell's experience, engineers, focused on the technical details of how the accident occurred, cannot readily answer the broader questions that attorneys deem most relevant to winning the case.

Adding to communication difficulties, important words and phrases had quite different usages across the professions. Particularly troublesome were the two words at the center of most product suits: "defect" and "failure." Because of the different ways that these words worked within their respective language traditions, attorneys and engineers often had to negotiate radically different interpretations of the physical evidence in accident investigations. Engineer Wayne Ellis best described this difficulty:

> I recently helped answer some interrogatories, and the word failed was in a lot of them. I was working on these alone, and I called the attorney when I was done and I said, "Okay, how am I supposed to interpret the word fail? Because in engineering, fail has a different meaning. Fail means plastic deformation. It can no longer perform the job it was designed to perform." He said, "In legal terms, the word fail means defect." He said, "Everywhere that it says failed, just substitute the word defect, and answer the question." To an engineer, fail is not necessarily a defect. Everything will fail if I put enough force on it, if I put enough stress on it, if I use it in a manner that it wasn't designed to be used, anything could fail. So, there are some differences there. That's something you have to kind of learn if you want to discuss the engineering term and the engineering field -- I could

> put something in my tinsel tester and pull it until it breaks. Well, I would say it failed at X number of pounds of tension. Somebody else could interpret it that there is a defect because it failed. It wasn't defective. It went three times farther than I thought it would. That's what the engineer would say. The [attorney] would say, "Well but you said it broke." Breaking is bad; so therefore, it's defective. He thinks failed means bad and means defect. I think failed means reached the limits of the design capability and the limits of the material capability. Reaching the limits of a design or material capability is not necessarily bad. And yet he might interpret that to be bad.

Although "fail" and "defect" are important words in both professions, they appear to be used quite differently. According to Ellis, "failure" in the discourse of attorneys is bad: "failed means bad...means defect." This family resemblance between the three words (fail, bad, defect) is part of the legal tradition and technical discourse of locating blame. But in the discourse of engineers, "failure" merely describes the physical breaking point of a design material. As Ellis points out, all design materials have a breaking point, something that is neither good nor bad but simply a "fact" to be considered in designing a product. Thus, within the language tradition and technical practice of designing cars, "failure" in no way equates with "defect."

Attorneys reported similar difficulties in translating key legal ideas into concepts that engineers could address. Plaintiff attorney Jacob King, a founding partner in a local firm, described this as a common source of tension:

> One of the tensions you run into, particularly anymore, with engineering cases, is the language. There is certain language that we have to use, under the law. Things like "reasonable degree of engineering certainty," "reasonable degree of probability." And to some degree it pigeon holes opinions from experts a little more than the lot of them would like. I mean, most of these guys are engineers; they think in terms of gray a lot more than the law allows sometimes. So, that creates a little bit of tension. The [engineer] may be just personally uncomfortable with saying "to a reasonable degree of certainty" because he's thinking, "Well, it's 90 percent." He would prefer to say 90 percent. You, as the attorney, want him to say a reasonable degree of certainty, and 90 percent probably is reasonably certain to occur. But that's the kind of discussion you get into with an expert in that situation.

For the purpose of making a legal case, King wants his engineer to answer the question: Is the machine safe to a "reasonable" degree of engineering certainty? However, in King's experience with engineers, they don't think or talk that way. They deal in probability statistics, preferring to frame the question: What percent of the time will an accident occur? To the engineer who thinks and speaks in terms of probability, whose profession demands a numeric confidence interval, "reasonable certainty" is uselessly vague, if not self contradictory. Yet the law requires attorneys to furnish such an answer from a competent engineer. Here we glimpse, in only one linguistic nub, the professional difficulties that

attorneys and engineers must overcome to build a case together.

So, what types of struggles did these professional differences cause in the course of putting together product cases? I will examine this question first from the perspective of engineers, then from the perspective of attorneys.

Engineer's Perspective

Stretching

It wasn't that engineers completely refused to stretch opinions for the adversarial advantage of their attorney clients. In fact, they reported generally being willing to help attorneys win by stretching opinions to some extent -- as long as the opinions they expressed were within what they saw as a defensible latitude of engineering discretion, a sensed "comfort zone" perceived as allowable among professional engineers.

When asked whether he had observed cases in which he thought engineers had slanted evidence or stretched the truth to help their side, Darrell Maddox, a bakery equipment designer who worked as an expert for both plaintiff and defense sides, reported that a certain amount of evidencing slanting and truth stretching was an inevitable and acceptable part of the forensic engineer's job:

> Well, they always do that. You get two different viewpoints of the way the accident happened. When you're on the defense side, you know, you look at it one way. When you're on the plaintiff's side, you're bound to look at it the other way. That's just natural. That's just your job. As the defense, you're finding the things that [the manufacturer] did properly, and as

> the plaintiff, you're finding things that [the manufacturer] didn't do properly.

Here Maddox outlines what he sees as a legitimate, "natural" difference in analytical focus between the sides, given that one side is defending and the other side is blaming the manufacturer. Independent engineers, like Maddox, who work on both sides of product cases over their careers, report little difficulty adopting the side specific views and analytical assumptions of their attorney clients, recognizing that different ways of framing questions give rise to legitimate debates.

Engineers reported that they generally were willing to wade into the battle on one side or the other, offering what they could to help their attorney client from an array of acceptable, alternative methods or ranges of values for answering questions. For instance, Max Shull, a nationally active accident reconstructionist and engineering professor who worked both sides of cases, explained that, for the sake of accuracy, he preferred to estimate a vehicle's speed as a range of possible speeds, say 35-45 miles per hour rather than reporting a single, specific speed value. However, if his attorney client urged him to stretch for his side, Shull reported feeling comfortable with picking a helpful specific speed value at the high or low end of the range since any speed in the range was a mathematically defensible figure. Furthermore, he went on to say that there were three alternative formulas for calculating vehicle speed ranges: one based on the length of tire skid marks, one based on the amount of crush in dents, and one based on vehicle momentum -- each of which typically yielded a different speed estimate. He reported that, if his attorney client urged

him, he was comfortable reporting only the method that resulted in the speed that most helped his side. However, although Shull said that these were legitimate ways of stretching for his attorney clients, he reported that he always discussed with them the possibility that a good expert on the other side might attempt to discredit his methodology as biased.

Another accident reconstructionist I interviewed frowned on the practice of picking a high or low speed in a range to help his side, saying that, for the sake of impartiality, he always reported the middle value of the range as his opinion of the vehicle's speed. Thus, a practice within one engineer's perceived zone of comfort may be outside another engineer's perceived zone of comfort -- which is to say that a particular engineer's comfort zone is a personal matter that may vary considerably from engineer to engineer.

Nevertheless, almost all engineers interviewed reported that -- given the inexactness of engineering science, missing data, and equivocal test results -- there was a defensible margin of error for stretching opinions to help one's attorney client.

Lying

However, many engineers also complained that attorney clients pressured them in various ways to stretch their opinions beyond what they felt the available evidence and professional discretion allowed, sometimes urging them to participate in fabricating what the engineers considered to be outright lies. The attorney practice of pressing experts for the most favorable case possible made for strained relations that had to be worked out through compromise, if the relationship was to persist.

A common concern among engineers was that if they failed to please their attorney client, he or she would not pay them in the end, sometimes after the engineer had invested a large amount of time and money in the case. As electrical engineer Frank Rowe summarized it from the vantage point of his 30 year career as an expert witness serving on both plaintiff and defense sides,

> Attorneys need to win really in order to get paid in many cases. They start to take -- how should I put it kindly? -- devious means to get you to do things and sort of leave the experts in some instances hung out to dry when it comes time for payment.

As an example of such "devious means," Rowe reported that during one of his recent depositions in an electrocution case, his attorney client requested a break, escorted him into the hallway, and threatened to not pay him unless he told what he considered to be a lie:

> The attorney, during the course of that deposition, instructed me [in the hallway, during a break] to say that the power company could not make their power lines safe under any circumstances. And, I said, "No, that's not true. There are degrees of safety. You can't say that as a blanket statement, that they would never make their lines safe, that they absolutely refuse to take any necessary measures to make their lines safe. In fact, they do undergo a lot of work to make their lines safe. If that wasn't the case, there would be people being shocked and electrocuted everywhere. So, they've done a very decent job. It's

> just that in some instances where they cut corners is where you end up with problems." And he didn't like that. He wanted me to say the blatant statement that under no circumstances did this power company make its lines safe, and that they were grossly negligent in all their installations, and this is what led to his client's electrical shock. I refused to do that. [The attorney responded,] "I'm not going to pay you." And he didn't.

In this story, Rowe portrays himself as pitted against a plaintiff attorney client who demands an unequivocal answer -- "the power company could not make their power lines safe under any circumstances." Knowing details of power industry safety measures, Rowe is unwilling to stretch that far, preferring to say that power companies have "done a very decent job" of protecting people from electrocution, but in some cases "they cut corners" and ended up with "problems." As Rowe relates the incident, it is a fight between the lay-thinking, jury anticipating attorney who demands a definitive, all inclusive answer versus the industry savvy engineer who feels obliged to answer in shades of grey because he recognizes the complexity of the matter.

The attorney's demand for unequivocality is a reach beyond Rowe's comfort zone to what he sees as clearly "not true." When Rowe steadfastly refuses to cross that line, the attorney not only fires him but also refuses to pay him for work done. Refusing to pay is the strongest form of economic pressure that independent engineers report encountering from attorneys in the course of trying to protect what they see as their professional turf. In this case, the attorney and engineer cannot reach a compromise, and their

partnership comes to an end. In some cases, the attorney and engineer go on to sue and counter sue each other. In severing relations with attorneys, engineers most emphatically draw the bounds of their professional integrity and jurisdiction of knowledge.

Silman Plantz, residing in Chicago, was the founder and president of a large safety consulting firm. He was a patent holding mechanical engineer who estimated working on 30,000 cases for both plaintiff and defense sides over his 30 year career as an expert witness. Plantz, who also held academic rank at a state university, characterized the bulk of his attorney clients as "liars:"

> Now, no one wants to talk about this side of the business, but ninety-five percent of my work is dealing with liars. Ninety-five percent. It's not just Silman Plantz, it's my whole firm, and that's what we do. We deal with people who are not telling the truth. Most of them are not telling the truth because they're liars. Other groups are not telling the truth because they're ignorant. But the ignorant part is small compared to the number of people who are lying because that's how they make their living is by lying.

He went on to give the following example:

> One of my men just came back from New York, a gigantic law firm doing defense work, and the attorney said to him, "We want to let these people know how much work we've done on this case; that we didn't just give this a lick and a promise, but there's a lot of work that's been done. I understand there's about forty or fifty hours of work that you've

> done." My man says, "What are you talking about?" He says, "I have two hundred and twenty hours of work in this case." Two hundred and twenty hours. "Oh, no, no, that's way too much. You know, your forty or fifty is not enough, but two hundred and twenty is way too much. Can you testify that you've done a hundred and ten hours?" My man says, "No. No, I'm not doing that. Don't ask me to tell a lie like that because I won't do it. Don't ask me the question, and we'll just stay away from the whole thing, but I am not doing that." But that's the kind of thing that goes on. He's gilding the lily. He's got a great case, but it's not enough for him, so he has got to ask his people to lie, you see. Well, what happens is, in terms of relationships, obviously, that makes for strained relationships.

In Plantz's story about his engineering colleague, the attorney client asks the colleague to go beyond stretching the truth to reporting what both Plantz and his colleague see as a clear lie, making for "strained relationships." As Plantz tells it, the story unfolds as a struggle over the truth: the attorney asks the engineer to estimate his time at "a hundred and ten hours," and the engineer replies "No," insisting that the attorney not ask him "to tell a lie like that." Note that rather than walk away from the struggle and lose his attorney client, the engineer proposes a compromise: "Don't ask me the question, and we'll just stay away from the whole thing." Here the struggle takes the form of a negotiation not only over the matter of the engineer's hours but also over where to draw the boundaries of professional jurisdiction in their work on the case. How to question witnesses -- what questions to ask,

when, and in what order -- is ordinarily seen as the attorney's prerogative, an area belonging to his or her domain of professional expertise. However, in Plantz's account, the engineer asks the attorney to, in effect, suspend his prerogative to ask questions about the engineer's hours, in exchange for the engineer's silence about his hours -- a work related piece of information that is under the engineer's jurisdiction of knowledge, and properly his to reveal. Thus Plantz's story can be seen as relating a kind of professional *quid pro quo* in which the engineer proposes that each party relinquish to the other a piece of its professional turf in order to continue working together on the case. Here we see that, in the emergent process of negotiating the specifics of the case, prior professional boundaries become blurred.

Note that at the end of his story Plantz indicates that, in his mind, it is an example of "the kind of thing that goes on" in work with attorneys. Both Plantz's story and Rowe's earlier story seem to epitomize a prevalent and widely recognized trouble spot in attorney-engineer relations: the inevitable point at which the engineer feels it necessary to draw a line that he or she is unwilling to cross, marking a breaking point with the attorney client's agenda of advocacy. Through their exhaustive efforts to get the most out of their engineering experts in building a case, attorneys eventually force them to take a precise stand on their professional ethics and duties in practice, on the shop floor.

Given that different engineers may draw this break line in different places and that the same engineer may draw it in different places depending on how the particular case evolves and the particular attorney client the engineer is working with, it is not a line that can be defined in advance. In each accident investigation, this break looms as a vague trouble on

the horizon to be dealt with somewhere in the course of putting together the case. By the stories of engineers, we see that such trouble spots in the struggle between legal advocacy and scientific integrity are part of a professional lore that recounts and elaborates the perceived boundaries at the core of the expert engineer's role and livelihood. Through such memorably contentious exchanges with attorneys, engineers create a rich and vibrant tradition that uniquely justifies and gives purpose to their distinctive expertise.

Withholding Evidence

Short of asking them to lie, attorneys used more subtle and routine tactics to force their experts to state opinions out of their comfort zones. Many engineers complained that attorneys withheld damaging evidence to bend them to a favorable theory of the case. Again Rowe:

> This is where I sort of get a little, really ticked off at the attorney. Like, they'll have deposition testimony, and you'll know about it through reading some other expert's report that comes through from the other side that says, "I've reviewed the following." And, then you say, "Hey, I don't have any of this stuff." Then you call your attorney, and they say, "We don't think it's pertinent." "Well, why did the other guy review it if it wasn't pertinent?" "We don't know." "Well, what all did it say?" And they'll give you some wave of the hand in terms of what it said. When you get into court, you'll sometimes find that there was much more substantial information in there that -- whether he didn't want you to know it or simply was trying to economize, I don't know. That I can't give you.

> Sometimes, it can be very informative in terms of how you may have thought to deal with your opinions. That can get you in a lot of problems on the stand because you put forth one position and now suddenly they're giving you new information. "Is that going to change your opinion?" It could be devastating to a case. The attorneys don't want to see you say, "Well, I have to reconsider it," or, "Yes. It would affect my opinion." But, you have to do it. You're stuck. And, then he says, "Well, why did you do that?" I would have to tell him, "Hey, if you would have given the information, we could have gone through it and evaluated it at that point. Why didn't you do it?" I've even had attorneys, and these are the people I don't really like to deal with anymore, try to get you to bend their position a little and even have asked me to say that I've read depositions, when in fact they haven't given them to me.

A common complaint among engineers is that attorneys almost never send them the complete file on a case, instead selecting only those documents that they deem to be "pertinent." Attorneys I interviewed confirm that they do this, and I often helped attorneys select information for engineers at Wilson law firm. As Rowe indicates, attorneys typically offer economy as the reason for their selectivity. Regardless of the ostensive reason, the attorney practice of filtering what the expert sees in the course of forming his or her opinions appears to be virtually ubiquitous, on both sides.

We see in Rowe's account of this filtering practice that sometimes what attorneys leave out as "not pertinent" is extremely pertinent to the engineer, so pertinent that "it

would affect my opinion" in the case, he says. This type of information withholding makes Rowe "really ticked off at the attorney." At issue here is Rowe's sensed prerogative to conduct engineering investigations and draw conclusions based on what he, as a professional engineer, deems to be pertinent.

On the lookout for withheld information that could be important to rendering a sound engineering opinion, Rowe struggles to maintain his sensed jurisdiction of knowledge in the face of what he sees as attorney interference. With the expert engineer's characteristic unwillingness to impute human motive from empirical observations, Rowe states that he does not know "whether [the attorney] didn't want you to know it or simply was trying to economize" by withholding information. However, Rowe goes on to convey clearly his suspicion that some attorney clients deliberately withhold information "to get you to bend their position a little." Thus Rowe suspects that these attorneys use the account that something is "not pertinent" as a ploy to hide unfavorable evidence from him for the purpose of bending him to a more favorable opinion than he could otherwise render in good conscience, as an engineer. Here Rowe clearly sees the withholding of information as a deceptive tactic for pushing him beyond his zone of comfort, in effect, commandeering his jurisdiction of knowledge by stealth.

Although he perceives that it can be "devastating to a case," Rowe reports that if an attorney on the other side brings unfavorable, withheld information to light while cross-examining him, he feels obliged to revise his opinion accordingly, even if it constitutes an eleventh hour break with his attorney client's argument: "You have to.... You're stuck." Here Rowe appears willing to contradict his attorney

client's position in open court, thereby regaining control of his commandeered jurisdiction of knowledge, regardless of the consequences for the case. In such cases, Rowe's sense of being true to his professional jurisdiction vividly collides with his attorney's goal of client advocacy.

Note that although Rowe's account of this tense moment contains particular sounding attorney-engineer dialogue, it is not a story of a particular, actual instance of an attorney withholding evidence. Rather it is an ideal-typical story presented as a summary amalgamation of many such instances. Thus, the story appears to summarize what Rowe sees as a recurrent trouble spot in attorney-engineer relations. As an ideal-typical account of the dangers of evidence withholding, the story provides a script for organizing his own thoughts and conduct regarding this recurring trouble spot in attorney-engineer relations. Thus again, we see that attached to a recurring trouble spot in the struggle between legal advocacy and scientific integrity, engineers generate a professional lore that recounts and elaborates who they are.

It is through such contentious relations with attorney clients that Rowe comes to define what it is to be an honest, professional engineer. So deeply are the legal and engineering professions enmeshed in joint activity that Rowe emphasizes his people managing skills as an integral part of his competency as an engineer.

Restrictions

In addition to withholding specific pieces of information to influence engineering opinions, engineers complained that attorney clients commonly stopped their investigations prematurely. Independent automobile design expert, Wayne Ellis, complained that attorneys often stopped investigations

to lock engineers into dubious opinions that favored the attorney's client:

> A lot of times, you'll find that an attorney has gone to an engineer and said, "Here are some of the facts of the case. What do you think about that?" And they kind of give them an off-the-cuff opinion without doing too much work. And the guy says, "Great. Stop. Don't do any more work." And then he wants to hold them to that opinion when maybe the fact is that they haven't spent the time that they should have yet to render that opinion and to support that opinion. And yet all of a sudden they can't do anything more, and the guy's going to hang them out to dry on a case that he can't support.

In Ellis's account, the attorney client holds the engineer to a tentative, inadequately unsupported opinion by forcing him or her to stop working. Stopping the engineer's work at a preliminary point in the investigation, the attorney takes control of the engineer's work process. According Ellis, the problem this attorney control causes for engineers is that "the guy's going to hang them out to dry on a case that [the engineer] can't support." Here we see the sense of personal and professional responsibility that engineers attach to the final product of engineering investigations. By forcing engineers to stop working when "they haven't spent the time that they should have yet to render that opinion and to support that opinion," attorneys intrude on one of the most fundamental engineering prerogatives: the engineer's sense of when an emerging engineering opinion is well-formed enough to be presented as a scientifically defensible opinion.

Again the account is presented as an ideal typical story representing a difficulty that occurs "A lot of times." Thus, we see work stoppage as another prevalent trouble spot generating a professional lore that articulates the bounds of specialized knowledge at the core of the engineer's professional work. Through the accumulation of such exchanges with attorneys, Ellis comes to account for them as part of the distinctive vicissitudes of professional engineering.

Dictating Tests

Engineers also complained that, when allowed to conduct tests, attorneys and insurance companies often dictated the type of tests to be done. Again Rowe:

> Some of the insurance companies have even gone so far as to try and dictate the type of tests that can be done or should be done or which are acceptable to prove a point, when they're not the experts. I mean that's not their prerogative to do that. But, they have taken on that task in the medical industry in terms of telling the doctors what tests they can perform on patients and have gotten away with it. So, they feel, 'Why can't we do it elsewhere? If we can do it to the doctors when it involves human life, we can do it in a courtroom where all we are is trying to prove facts. We'll tell this guy, "Well, you can't do this testing. That's just it." Or, "If you're going to do the testing, you're going to do it this way, and that's the only way we're going to accept it."' I think there's a substantial amount of the problem on the insurance industry, but the attorneys are also just going along with it in many cases.

In this quote, Rowe sees the practice of insurance companies and attorneys dictating what tests to run and how to run them as a clear imposition on his jurisdiction of knowledge: "they're not the experts. I mean that's not their prerogative to do that." Again, Rowe renders an account of this intrusion with an ideal typical story using specific sounding quotes to represent what he sees as a recurring problem, another perceived trouble spot that compels the engineer to raise into specific relief what would otherwise remain an unspecified or vaguely assumed boundary. As these worksite conflicts emerge, the institutions of law and science sustain and elaborate each other in real time.

Financial Constraints

Another large source of tension, almost universally reported by engineers, was that attorneys imposed financial constraints on tests that forced them to cut corners, thereby compromising investigations. Rick Johnson, an engineer who estimated working on approximately 3,000 cases over his 12 year career as an expert for both plaintiff and defense sides, gave this typical example:

> Let's say we got a car wreck and it's an older car wreck and one of the vehicles was at Grasses of central Kentucky and the other vehicle was at the state line close to Pittsburgh. We know the vehicles are still available, but I've got to drive to Grasses and then I've got to drive the other way to the state line to look at the vehicles to measure and everything. So that might be an extra two grand on the case. It might be a fairly nominal case. Maybe a $15,000 case. So, are they willing to spend the extra 2 grand? Maybe

> not. So then [the attorneys] say, well you have good photographs, and can you do it from photographs? Yes, you can. [But] you're better off always looking at the vehicles. You always have to go to the scene.

Because of financial restrictions imposed by the attorney, Johnson is forced to forego what he considers to be an important step in any accident investigation: "You always have to go to the scene." Instead he must rely on photographs that he considers to be lower quality evidence.

Expert engineer, Silman Plantz, described attorney imposed financial restrictions as an inevitable part of his work:

> We are forever cajoling, screaming at and carrying on, "Why aren't you sending us the depositions in the case? Why are you not allowing us to go out there and look at the actual vehicle? Why are we not able to buy duplicates and run tests in the laboratory?" We have all those fights that arise because the case doesn't justify, you know, a proper technological look at things. And it all has to do with exposure. And there is nothing you can do about this. You know, you can talk about it till you turn purple, but the economics are the thing that drives it. I mean, it's just absolutely pointless to think that you are going to be able to spend a fortune when there is a limited recovery even if you're successful right down the line. You know, you see how that relationship applies. So that makes for very strained relationships because they're asking us then to give opinions that are based on a lot less than what makes a technologist

> comfortable. You know, it leads to speculation. It leads to hypotheses which are untested. It leads to a lack of analysis, a lack of experimentation, and it gives rise to a group of experts whose basic tools are their ability to lie and their willingness to lie.

Plantz characterizes his discussions with attorneys over the imposition of financial restrictions as "fights," expressing great frustration at his lack of control and the resulting loss of scientific rigor in forensic investigations. He views the loss of rigor and control as a serious erosion of professional quality that "gives rise to a group of experts whose basic tools are their ability to lie and their willingness to lie." Like Rick Johnson above, he attributes this situation to working with attorneys who are forced to place economics before sound science. To engineers, developing product litigation entails a constant fight between sound science and attorney imposed economics: a clash of the professional responsibilities of attorneys, oriented to the fiscal bottom line for their client, and engineers, oriented to the technical challenge of developing a scientifically adequate account of what happened in the accident.

For expert engineers, the fight to preserve scientific standards in the face of client imposed economic restrictions involved far more than the case at hand. It involved their reputations and careers. Jim France was a nationally renowned accident reconstructionist who reported doing more than 6,000 accident investigations in his 23 years as an expert witness. Until recently, France headed one of the oldest and most respected automobile safety research firms in the country. However, he reported that he had to dissolve his firm and

reopen under another name after a financial short cut imposed by a client drew national media attention.

After reports that Standard Motors trucks of a particular model were exploding during side impact collisions, a major American news broadcasting corporation hired France to test his hypothesis that the gas tank of that model truck leaked on impact. France reasoned that leaking gas alone could not cause the trucks to explode. There also had to be a source of ignition, like a spark, produced in the collision -- which only occurred in roughly 1 collision in 200, France estimated. Forced to work within the news corporation's budget of $2,000, France lacked funds to wreck a large number of trucks until one produced a spark naturally; so, he attached flares as an artificial source of ignition. According to France, this budgetary short cut, although a scientifically valid way to test the hypothesis of leaking gas, placed him in trouble with Standard Motors:

> You remember the MBC pickup truck thing where they crashed the Standard Motors pickup trucks? I did those. And probably the biggest reason we got in trouble with SM on that was because of budgetary restrictions that MBC put on us.

He went on to explain:

> Okay that was when we did the pickup truck crash tests, and MBC aired it, and the truck blew up when it was hit, a big ball of fire. And they failed to tell people that we had put these little flare igniters that we had taped to the frame member down by the gas tank. And also there was one other little thing that

> said that it didn't have a, it didn't have a standard gas cap on it -- which is true, it didn't. But we didn't get that one truck until nine o'clock the night before it was delivered. And we just didn't pick up on the fact that that wasn't the right gas cap. We didn't have time to get anything else anyway. But at any rate, the budget restriction by that entity of MBC was two thousand dollars. Well, my God, it cost us I think seven hundred a vehicle. So we had about five hundred dollars left, and most of that went to the system for the remote ignition of those little flares that we were putting on the vehicle. And so you know, there was no other instrumentation, there was no speedometer instrumentation, nothing. And so as they began to limit that money, it simply restricts the more instrumented and more scientific aura that you can put on a test. I mean and that happens, I can tell you that happens quite often.

Although France was sued and had to close his business over this incident, he insisted that there was nothing wrong with his test, scientifically. It was a controlled test of the limited hypothesis that *given an ignition source*, the truck will explode in a side impact collision -- providing extremely good evidence of leaking gas, and, thus, a gas tank defect, in his opinion. Note that France traces his trouble to a misunderstanding that his client, the news corporation, created when "they failed to tell people that we had put these little flare igniters...down by the gas tank." Here France blames his client for presenting the test on television without telling the lay audience about the limitations of the test, limitations that engineers customarily acknowledge in the

preface of announcing test results. Similarly, attorneys, insisting on unequivocal engineering opinions for lay jury appeal, pressure engineers to withhold customary scientific qualifiers and disclaimers about the limitations of their tests. And if these limitations later come to light, the engineer's reputation suffers.

Although France's client was a news corporation rather than an attorney, his experience illustrates a central dilemma for virtually every engineer who works for attorneys. If the engineer doesn't bend to meet the financial restrictions of the attorney client, the attorney will almost certainly fire him or her. But, at the same time, such bending exposes the engineer to criticism that could ruin his or her career as an expert witness. Thus the engineer's work with attorneys is a perilous, high stakes walk between the horns of engineering rigor and client imposed economics -- a tight rope walk that recurrently pushes the engineer to define the outer edge of his or her comfort zone.

Engineers also complained that because of financial restrictions, attorneys tried to stretch their roles to branches of engineering that were out of the engineer's specialty. Again, Jim France:

> It's cost related that we have such a problem with our attorneys. Because the cost of litigation has gone up so much in the past several years, they will attempt to take one expert and to apply his expertise not only in the field that he is an expert in, but they try to stretch it. You know, if there's another issue that has to be handled, instead of going out and getting a separate expert, they'll try to stretch your expertise into that. And, you know, you have to draw the line with them

> and say "Look, this is what I do. I can do all these other things, but this is my big field of expertise, and as you try to stretch me out of it, if I lose credibility in one of these little runners that you're gonna set out, the jury or the other side's attorneys are going to look at me with a little less potency in my real area." And it's very difficult to get attorneys not to try to stretch you out and use you for multiple disciplines of expertise.

Here France complains that, in addition to forcing the engineer to stretch his or her opinion in a particular area, attorneys also routinely try to stretch the engineer's area of expertise to cover additional areas that the engineer feels uncomfortable testifying about. France's resistance to being stretched to other domains of expertise because he fears losing "credibility" underscores his strong sense of occupying a particular domain of expertise and of respecting the particular domains of other types of engineer.

However, note that France does not flatly refuse to stretch to areas that he considers out of his domain of expertise: "I can do all these other things, but this is my big field of expertise, and as you try to stretch me out of it, if I lose credibility in one of these little runners that you're gonna set out, the jury or the other side's attorneys are going to look at me with a little less potency in my real area." Here we see that his sense of having a primary area of expertise notwithstanding, there is, for France, room to negotiate with attorneys as to additional areas of expertise he is willing to cover. Thus, when France says "you have to draw the line with them," he is talking about a negotiated line that is highly

contingent on particular worksite relations with specific attorneys.

After the news broadcasting incident, France gained considerable notoriety as a "whore" among engineers I spoke to and interviewed in the accident reconstruction business. Most of the attorney and engineer interviewees raised the issue of "whores" on their own accord, commonly characterizing them as engineers who, in exchange for expert witness fees, crossed the line of the interviewee's sensed professional comfort zone, telling what the interviewee saw as a clear lie or overstretching his or her qualified domain of expertise for the sake of furthering an attorney client's case. Here "whores" appear as a class of engineers who willingly relinquish control of their jurisdiction of knowledge to an attorney for money. Many interviewees spoke of "whores" with great scorn as a vast institution of fallen engineers jeopardizing "true" engineering science. Although interviewees spoke of whores as prevalent, perhaps not surprisingly, the "whore" was always someone else.

As the 'other' who crosses the line of the interviewee's comfort zone, the "whore" appears to function, for engineers, as a point of reference for organizing their own thoughts and conduct regarding the sensed but constantly renegotiated bounds of their professional propriety and domain of expertise. Several engineers I interviewed brought up France's use of flare igniters in the infamous news broadcasting episode. Although they did not always identify him by name, they referred to France (or "that guy") as an example of what they considered to be a "whore" -- which is to say that France became a kind of prototypical "whore" for these engineers, a folk villain in the professional lore surrounding the contentious, rough edge of attorney-expert

relations. How to balance the conflicting demands of advocacy and engineering rigor, where to draw the line between stretching opinions for one's attorney client and lying? By forcing engineers to negotiate this rough edge, attorneys push them to define that emergent line, the perilous outer rim of their professional jurisdiction, beyond which lies the whore.

Attorney's Perspective

Most attorney complaints about expert engineers centered on what was, arguably, the very thing that made them experts: their habitual use of specialized knowledge, vocabulary, and analytical techniques that were beyond the grasp of laypeople. Tod Quade, a nationally renowned plaintiff attorney specializing in airplane and helicopter product litigation, most succinctly summarized these complaints:

> The problem I think I've had with engineers is their ability to explain an engineering concept so that normal folks can understand them.

Plaintiff attorney George Albright, who began practicing law in 1962, spoke of the engineer's specialization as a kind of blindness.

> Some of these guys are so specialized -- like lawyers, or anybody else, or doctors -- they really don't see anything else other than their very narrow little area there.

Kelly Tillman, the Wilson firm associate attorney with whom I worked with on product cases, expressed a great irony of her work with some of the top electrical engineers in the country:

> They know everything in the world, but they couldn't explain how a mousetrap works to anyone with any sense.

The very thing that makes engineers usable and desirable for attorneys in court -- their command of expertise that is beyond lay understanding -- tends to make them unfit for the attorney's purpose of building a case that communicates a theory of what happened to a lay jury.

When asked to identify the major difficulty for her in working with expert engineers, Tillman responded:

> I think one of them is trying to get an engineer to speak on a level you can understand. I know where I want them to go in a case, and they want to bring all this extraneous science in. We are constantly trying to refocus on- to get them to explain on a level that a normal person can understand. Eventually, you learn all the jargon and the lingo that goes on, but that doesn't mean that a jury will, and probably keep bringing them back down. It's very esoteric, scientific discussions about what's going on.

What, for engineers, may be essential technical details are, for Tillman, "extraneous science." She reports knowing "where I want them to go in a case," but the engineer's "esoteric" language and thinking lead elsewhere, to a version of the case that is too full of engineering jargon and technical concepts

for the jury to follow. Thus, Tillman finds herself "constantly trying to refocus...to get them to explain on a level that a normal person can understand." Here the struggle is both personal and technical as Tillman herself must understand what the engineer is talking about in order to put together a theory that she believes the jury can understand.

She went on to give the following example of the challenges, from the Christmas tree fire case.

> On that case, it would be a constant challenge. Electricity is a mystery to me. You turn on a light switch, and the lights come on, and it's magic. There's a reason it does that, and they can explain the ohms and amps and the resistance and the current. There is a difference in all that, and trying to get them to sit down and say, "Christmas tree lights." They have five lines and draw you a little diagram that says this is exactly where it goes. And Bill Dagenhard, he eventually got very good at talking on my level. We'd keep throwing out, "No. You're not talking about current. You're talking about resistance." "I'm just trying to get an overall picture. That electricity goes out from the box, comes back into the box." "Well, it doesn't really travel out of the box," and then he'd use some scientific, and I'm going, "Wait a minute." We've got to explain to the jury. You plug it in, current has to come from the wall, has to go into the box and eventually comes back. It is very hard to try to get a story as opposed to a scientific description.

To Tillman, it is no idle concern, the conflicting discursive practices between scientific description and her project of

telling a story that is instructive to jurors. Here the problem for Tillman is not merely that engineering is too *technical* to understand -- it's that there is no story line that resonates with lay experience, the project of engineering being to describe what happened in terms of verifiable, measurable, forces of nature. Tillman requires a more anthropomorphic analysis of electricity, narrated around themes of human agency that many engineers consider to be properly outside of their jurisdiction of knowledge.

Note that, according to Tillman, one of the engineers, Bill Dagenhard, "eventually got very good at talking on my level." Attorneys are keenly aware that engineers are capable of learning to talk and think like attorneys. Attorneys report that once such rapport is developed, they generally prefer to reuse the engineer in subsequent cases rather than build a new relationship with an unfamiliar expert.

Attorneys on both sides reported that repeated use of an engineer taught them how to interact. In particular, attorneys reported that, through repeat use, they learned the engineer's level of competence, abiding prejudices, willingness to advocate, and temperament on cross-examination. Main informant Howard Hunt best summarized the benefits of repeat use this way:

> It helps because you know if they're a good witness or a bad witness and how they're going to handle it, and how much work you need to do for them, and how far they will go and stretch. I would say you learn how to interact with them and know how much to do with them. I guess you trust them to handle themselves on cross. You get to learn how much you need to prepare and how much you don't. You learn

> if they'll agree to your theories. You learn if they're liberal or conservative. You get an idea of what their biases are and how far they'll go. How far they'll stretch to your theory. While they're all fucking experts, and it all sounds like science, there's wiggle room in almost all of it, and they can go one way or the other with it. You figure out that. But you can't overuse somebody.

With these compelling reasons for reusing engineering experts, one might wonder: Why do attorneys take the trouble to locate and break in new recruits?

As George Albright explained, repeated use had an inevitable "down side" on cross-examination that offset the benefits of established rapport:

> There's a big problem about doing that. It's nice to have the fact that you get along with the engineer fine. He knows you. There's one up at Ivy University I used. Well, he's a nice guy. The problem with that is, if I use him over and over and over again, they properly can come in and say, on cross-examination in front of a jury, say, "Well, George Albright has used you over and over and over again." And if you're on a jury, you'd say, "What in the hell's this? Looks like some made up deal." So, that's a down side of doing that.

Attorneys on both sides reported that after approximately 10-15 court appearances, it was time to hire a different trial expert, sometimes shifting the veteran to a consulting expert role. Although attorneys did teach engineers to perform well in legal settings, they felt continually pressed to locate experts

with whom they had never worked, as Howard Hunt explained from the plaintiff attorney's perspective:

> I've used some people repeatedly. But you can only use them ten or fifteen times, and then you probably ought not to use them anymore because you've used them too much. Because if [defense attorneys] get up and say, "Gee, have you ever done any other cases for Mr. Hunt? How many times have you testified for him?" "Ah, 23 times." "Did all those involve plaintiff's cases?" "Yes." "In every instance did you find the product was defective?" "Yes." The guy just sounds like a whore. So it won't work. At some point you have to stop using the person. You can't use the same one all the time. It really affects that expert's credibility. I think you've got to be really careful about using them repeatedly. You have to get different people.

If they continue to reuse an expert, the fear is that the other side will eventually succeed in casting him or her as a "whore." For attorneys on both sides, an important part of their relationship with expert engineers is precisely that of having no extended public history with the other, also making for a rich hinterland of seasoned consultants. Anticipating what they perceive as a fatal cross-examination, the more active attorneys constantly hire engineers who are new to them, working out their roles and relations from near scratch.

Regardless of their level of experience, attorneys on both sides reported that a lack of communication was their biggest problem with engineering experts. Defense attorney Clark Dickson, who ran the product litigation division at a

prominent national firm, perhaps best summarized this complaint from the perspective of his 40 year career in dealing with engineers from the world's automobile makers.

> They want something more complicated and harder to understand than I want. But I look at it, what I want to put on is what I think the jury can understand, and I can sell to a jury. A lot of times an engineer will look at something and say, "This proves this," but who in hell can understand it? You go through all this, this and this, but it's just jumbo, mumbo jumbo. Nobody can follow that unless you can then simplify what he wants to do into what you think will be an understandable situation. You've got to sell it. You're responsible over it.

As lead defense counsel, Dickson is responsible for not only putting forth sound engineering but also, importantly from his perspective, translating it into terms that are understandable to a jury. On one hand, he needs an engineer's expert opinion to sell the case to the jury; but, on the other hand, "a lot of times" the expert's opinion is inscrutable "mumbo jumbo" that "nobody can follow" unless the attorney reworks it.

Howard Hunt complained that because engineers generally were unable to understand or communicate the theory that he wanted to sell to the jury, he had to do their work in many cases.

> That's probably the biggest problem was that they don't have any idea what's necessary. They can't communicate a sellable theory to a jury that you can convince six simpletons that you think they ought to

> give the money. While they might be absolutely right about what they're talking about, they can't figure out that you've got to have a narrow theory to go to the jury and one that they can understand and buy and one that you sell to them. That's absolutely the biggest problem whether it's an engineer or warnings expert or a doc, any of those people. Most of them are pretty bad at it. You've got to spend all of your time doing all the research. They're very bad at that, and it really pisses you off because if you're paying somebody, I mean they're getting paid a lot more than I am an hour. They want the money up front, most of them. And you don't have control over the time they're doing, and they don't do the work on your case.

It "really pisses you off," Hunt says, to pay engineers who may be technically "absolutely right about what they're talking about" but who are nevertheless unable to "communicate a sellable theory to a jury." Because of what Hunt sees as their inability to communicate, he feels compelled to do what he considers to be the engineer's work.

Veteran plaintiff attorney George Albright also complained of engineers who did no work on his cases:

> He is unable and unwilling to really work on the case. That is, you send him that scenario [of the accident]. And you made the appointment to him. You go in the appointment, and he's done nothing. He's not even read it. Maybe says, "Oh ya, I haven't got a chance to do it now."

Another common complaint about expert engineers was that they were unpredictable on the witness stand. Plaintiff attorney George Albright:

> Man, you never can tell about anybody. You never, ever can tell. He's liable to get in front of a jury, have been hungover the night before, have a bad day with his wife or something, and get up and be a terrible witness where he was just great. All of a sudden, he'll just come apart at the seams. Had a psychiatrist do that once -- just started crying and weeping. You just- you never do know.

Plaintiff attorney Tod Quade described the same problem and the money he wasted:

> I just had an engineer I spent $47,000 on by the time I finally fired him. I didn't realize until he was deposed that I couldn't use him. It doesn't work. You never know. You never know. You can meet someone the first day and think they're going to be great, and the day before trial, they are awful.

Because of their unpredictability, Kelly Tillman described working with engineers as "always an adventure:"

> You think they're just a really great expert and then end up being horrible. You've named him as an expert. You don't have anyone else; so, it's too late to get anyone else. And then you're trying to just limit the testimony to whatever it is they can testify strongly about and know about and hopefully the

> cross examination won't vary outside that narrow window for what you're using them for. Otherwise he can just be horrible. That's a scary thing. You get in the middle, and your expert goes through the floor. And the, "What do we do now?" That might be because his theories don't jive with what you're doing, or you find stuff out about him that you didn't know before. It's always an adventure.

Because attorneys recognize that their case hinges on expert engineering testimony and they "never know" what engineers will say under the pressure of testifying, they often prepare engineers with anxiety.

Hunt was quite open to talking with me about his difficulties in working with engineers, providing a rare glimpse of the grit and emotion involved. Having used hundreds of engineers in both plaintiff and defense cases, he was able to talk about specific difficulties on both sides -- working with independent engineers as a plaintiff attorney, and working with in-house engineers as a defense attorney. He discussed problematic relations with four distinctive types of expert engineer: inexperienced, experienced, in-house, and those he deemed as "whores." Hunt's ire at each type of engineer was directly proportional to the amount of control that they took from him by various means.

Although it is problematic to generalize to other attorneys, Hunt's discussion of specific difficulties with different types of expert engineer is valuable as an initial exploration of the range of problems one practicing attorney confronts. In describing problematic relations, Hunt differentiates between types of expert, providing his own typifications based on the relevance of engineers to his law work. His frank, and at times vitriolic, account of troubles

with each of the various types of engineer makes for a comparative study of the complex, social dynamics underlying a range of qualitatively different attorney-engineer relations.

Inexperienced Engineers

Hunt complained that the bulk of his expert engineers were too inexperienced in legal matters to understand what he wanted them to say. He provided the following examples.

> It's really hard sometimes when you have to have a theory of your case that's supported by engineering. Sometimes they don't have any understanding of what you're trying to get at or that you need to come up with something simplified. It's a pain in the ass dealing with people in trying to get them to say what you want them to say or in the manner you want them to say it. With engineering people like with product problems, I had the Mandolitis case that we're doing now with a mining engineering expert. I bet you, seven out of ten times, I have to do all the research. I mean I have to go back and get articles and find standards in their industry and do all the research they ought to know, that I'm paying them a lot of money to know. I have to provide it all to them so that they can testify to it. I've written experts' reports for them and said, "Here's a draft of the report. Fix it if you want to" because they're incapable of doing it. Or they hold themselves up to be an expert and they're really not. So that is a major ass problem, trying to find somebody who knows their subject matter because they all claim that they do and very rarely do you ever

find a guy that actually knows what the hell they're talking. Honestly, the biggest problem that I have with the experts is that they advertise themselves as experts, and they hold themselves out as being able to testify, and they really don't know what the hell their field is. It's unbelievable how many times you have to do the research. I had a guy from North Carolina, who was an expert on conveyers and conveying systems and gave a deposition, and it was awful. And that case is going to get thrown out. Absolutely, positively is going to get thrown out. And I had to go back through all the old ANSI standards and old engineering textbooks and shit and find all the literature that would have supported his opinions that he didn't have any idea. This guy was charging $200 an hour and was supposed to know what he's doing, and he really didn't. The guy was, I'm paying him a huge amount of money, and he turned out to be a great witness. He did really well with the jury, and he testified to all this crap that I gave him and in essence showed him what he should testify to, and he did a great job. He wanted to charge me a bunch of money and never really did what was necessary to win a case. I don't think very many of them have any idea of what's necessary to present to a jury to try and win a case. They just sort of talk esoterically about you know, of course it's unsafe and da, da, da, da, but they don't have any literature to back it up or research to back it up. I think, good attorneys, that on almost every case you have to go and become the expert.

In Hunt's experience, most expert engineers are so incompetent in legal settings that good attorneys have to "become the expert" themselves. What his engineers may well see as an intrusion into their professional domain, Hunt sees as helping expert witnesses "who don't know what the hell their field is." However, note that what Hunt complains of specifically is not that engineers don't know how to do engineering but rather that they don't know how to do law work. They don't know what it takes to backup a civil case with the kind of research, theory and evidence the Hunt needs for legal purposes.

Hunt becomes an engineering "expert" not to design or build products but rather to develop a supportable legal theory and to tell his engineers what to say in depositions and trials. What seems to anger Hunt is not engineering incompetence per se but rather working with engineers who are so inexperienced in legal settings that they take the case in an "esoteric" direction from the stand point of Hunt's legal agenda. It is this loss of control that appears to anger Hunt.

Speaking of engineering experts, Hunt says, "It's a pain in the ass dealing with people in trying to get them to say what you want them to say or in the manner you want them to say it." Here the inability of his inexperienced experts makes Hunt mute, unable to articulate his theory of the case to the jury.

Attorneys who work intensely on cases describe themselves as being "wrapped up" in them. This metaphor has the case covering the attorney's body, like clothing. If we take this covering image seriously, then it follows that when an inexperienced engineer's "esoteric" analytical direction mutes the attorney's theory and analytical insight about the case, it uncovers the attorney making him or her feel exposed.

The attorney's loss of control coupled with a corporeal sense of exposure make for tense working relations with inexperienced expert engineers.

Court Experienced Engineers

One reason to suspect that there is more to Hunt's anger at engineers than perceived incompetence is that he sometimes became even more angry at engineers whom he deemed to be highly competent. Speaking of competent expert engineers, Hunt emphasized their inflexibility:

> People that are very knowledgeable, because they've written all the subject matter, because they're known nationally somehow, they testify a lot. They know someone will eventually go out there and get all 200 depositions that they've given and get a copy of it and see if you're consistent or inconsistent. They're very, very, very careful about being consistent and won't stretch.

Whereas inexperienced engineers apparently will at least try to repeat what Hunt tells them to say, "very knowledgeable" engineers with a great deal of courtroom experience "won't stretch" at all for his side, sticking to an analysis that is consistent with what they've said in previous cases. These court savvy engineers also tend to insist on doing their own homework. Thus, for Hunt, highly experienced experts tend to reverse the ordinary division of labor between attorney and engineer: rather than the attorney doing the (inexperienced) engineer's work and telling the engineer what to say, the (experienced) engineer does his or her own work and tells the attorney what to say.

Attorneys sometimes became angry when their engineers told them what to say. Veteran plaintiff attorney George Albright seemed to take it as a personal insult, saying that he fired engineers who tried to tell him how to try his case.

> Now there's some personal stuff for the lawyer. Like me. I don't give a damn, if you're an engineer, how many times you've testified in court, you start telling me, "Well now see Mr. Albright, here's the way you do on that," and start telling me what I'm gonna do. It's a little consistent with what you asked me a minute ago, "Would you want some assistance from the guy?" Not really. You're the one that better know about how to argue a case to the jury. Not the expert.

A problem for local defense trial attorneys was that they often were not at liberty to fire uncooperative engineers. Because their corporate clients often hired the most renowned and court savvy engineers in their field, local defense attorneys often were forced to work with engineers who dominated their case. Providing an example of working with such an engineer, Howard Hunt related a case in which he used Silman Plantz, widely recognized as one of the top forensic engineers and product safety design consultants in the country. Hunt gave the following account of working with Plantz on a defense product case:

> Silman Plantz is nationally recognized and testifies in a whole lot of warnings they put on products. He is absolutely, totally and completely uncontrollable by an attorney. I hired him into the machine guarding, warning case because the client said they would be

using him, not because I'd picked him. He came down to do his deposition. His theory was to just be the worst obstructionist asshole that anyone could ever be during a deposition. I usually don't behave that way. I mean the guy won't answer questions or answers them with questions. And they get his deposition. The plaintiffs walked away, and I agreed that this guy would be the most awful witness I ever put on the stand anywhere because he would just be a flaming asshole. I tried to get him to literally sit down and go through the questions I would ask him at trial. He wouldn't tell me what he was going to say. Literally wouldn't tell me what he was going to say. We met with him in Rawlins the night before his testimony, sat down at a restaurant, and the guy absolutely, positively would not. He was loud, obnoxious and wouldn't tell me what he was going to say, and my [partner] and I left and went back to the hotel and said we're not going to put him on the stand. I don't know what he'll say. Whatever he says, he's going to piss the jury off. We decided the next morning that we had to put him on. We thought we were winning anyway, but we decided we gotta put him on because the client picked him. If we lose and don't put him on, they're going to blame us. I put him on the witness stand, and the guy was like Dr. Jekyll and Mr. Hyde. He turned into the nicest grandfatherly-type guy that you'd ever seen. He wasn't loud. He instructed the jury. He was pleasant. He was nice to the other side, sort of like you know, "No, you're just wrong about that, and I'll tell you why." He was as good as any expert I've ever seen

on a witness stand. He did great. He was one of few people that was very prepared and knew his subject matter and knew the studies that were out there and knew what had been done. And you didn't have to do any of that for him. But I was just unsure what the hell he was going to say. I mean every question I asked him, I didn't know if I'd stepped in shit or not. But the guy was great. He knew all the background. You didn't have to do it. You knew he was a great witness and communicated with the jury. He just didn't communicate with [attorney] clients. He was not ever, ever, ever -- and I probably wouldn't use him again -- he was never going to let the attorney determine how the case was going to be defended or the theory that you were going to defend. He just was, that was not going to happen. He was going to defend it in whatever way he thought was going to be good, and fortunately it was good in this case. But I've never used him again ever, for any reason. He'll never ever, ever let the attorney suggest to him what ought to occur. When you hire him, you've just got to hold your breath and hope that he does well because he's going to control the entire theory of your defense. How it's presented. When you'll present it. Period. He would never compromise it. He won't ever let you come up with another one. Just a slimy, nasty, mean, Jewish man who had more complexes than you could shake a stick at. He's arrogant and thinks he knows everything, under-your-thumb control freak. He got in front of the jury, and it was like totally Uncle Silman. He was good at that.

Hunt appears to be more angry at court savvy Plantz than at run-of-the-mill, inexperienced expert engineers -- so angry that he invokes an ethnic stereotype and has "never used him again ever, for any reason." Here Hunt's anger obviously has nothing to do with perceived incompetence. By Hunt's own account, Plantz is competent. In fact, Hunt finds Plantz "great" in exactly the areas where he previously complained that inexperienced expert engineers were incompetent: Plantz is "prepared;" he knows the subject matter, literature, background of the product, how to talk to the jury -- "And you didn't have to do any of that for him." "But," Hunt continues, "I was just unsure what the hell he was going to say." What angers Hunt about Plantz is that he is "uncontrollable." He refuses to go along with Hunt's theory of the case, and he will not even discuss what he plans to say at trial. Given Hunt's perception of Plantz as "the worst obstructionist asshole that anyone could ever be during a deposition," Plantz appears destined to embarrass Hunt at trial, filling him with anxiety.

The opposite of the obliging but inexperienced type of engineer, Plantz is so on top of his field and court experienced that "when you hire him, you've just got to hold your breath and hope that he does well because he's going to control the entire theory of your defense." Where the inexperienced engineer can mute the attorney's theory and analytical insight with "esoteric" science, the court savvy engineer can completely block the attorney's theory, taking the attorney on a strange and perilous course. "How it's presented. When you'll present it. Period. ...He won't ever let you come up with another one."

Where the inarticulateness of the inexperienced expert engineer makes Hunt inarticulate, the eloquence of the court

savvy engineer muzzles him. With Plantz dictating the defense case, Hunt stands as if naked before colleagues, stripped of his case, a vulnerable and awkward onlooker of his own fate.

Hunt's account of court savvy Plantz suggests that incompetence alone is inadequate as a general explanation for why attorneys become angry at their expert engineers. With both Plantz and ordinary expert engineers who lack litigation experience, the root of his anger seems to be loss of control coupled with anxiety over the prospect of embarrassment. Whether through the eloquence of a competent expert engineer or through the muteness of one who is deemed incompetent, expert engineers can take control of the attorney's case, uncovering him or her, making him or her feel vulnerable and ashamed.

In-House Engineers

Loss of control and a sense of embarrassment also appeared to explain Hunt's anger at in-house engineers who worked for the defendant company and who often designed the product in question. Hunt's work with in-house engineers also entailed working with in-house attorneys. His primary complaint about working with in-house engineers and in-house attorneys was that they dominated the case, giving him no control or credit in preparing the case:

> It's a problem with in-house people because, in-house people, you don't control the case. If you're using in-house experts, in-house attorneys with it, you don't get a chance to decide how to do it. So, it is a problem. It sucks because you always lose. If you win the case, the in-house expert or the in-house

> attorney says they directed it and orchestrated it. If you lose, they blame it on you.

Veteran defense automobile product litigator, Clark Dickson, identified the same type of dominance and scapegoating in his work with in-house experts and attorneys.

> I mean they would make suggestions, and if I disagreed with them, I would tell them that I disagreed with them, then we would talk it out. Sometimes, of course they'd- in essence I had to report to them; so, they could call the final shot on where to go on something that they would disagree with local counsel. Because, once again, they're interested in the final results; and when things go sour, they've got to answer to somebody too. I've had that in a number of cases, where you get a bad result and the people on top start looking to see what happened. Generally, an in-house counsel or an engineer would be much happier to blame a bad decision on the local lawyer than assume the blame for it.

In working with in-house engineers and attorneys, local defense attorneys confront essentially the same problem that they confront with court savvy engineers like Plantz: they control the theory of the case. Also like Plantz, in-house engineers tend to be top engineers in their field, combining strong engineering educations with years of practical experience in designing and building the very product at issue in the litigation. And if these products are in wide use, it is not uncommon to find in-house engineers who have testified or worked behind-the-scenes in thousands of cases. Thus in-

house engineers can have much more legal experience defending the particular product than the local defense trial attorney who often has litigated only a handful of such cases in his or her entire career.

For example, Hunt told me what it was like working with Karl Christiansen, the lead in-house expert in a recent forklift case that he defended, as local counsel.

> You've got [in-house engineer] [Karl] Christiansen there, defending the products that he designed himself. In that, we're going to recognize that he might have made a mistake or did something wrong? They're not as free to point out potential problems with their case as an outside expert is. You have to defend it exactly the way they want whether you agree with it or not. So you can't fire the expert. You could decide not to put him on. You can't get him to say something different. Not only can you not get him to say something different than what he wants to say, but they won't even generally just think about saying something different. So I prefer not to do that. I prefer just doing a plaintiff's case where you don't have a company telling you what to do or what their thoughts are. You don't have to use their experts. You can figure out what theory you think will sell and then find someone to fit it. It's just a hell of a lot easier to do plaintiff stuff than defense. There's less politics. Yeah, there's no politics. With in-house experts, they figured out one argument on one defense, and they won't consider other ones. They won't ever concede that there's a problem with their product.

"Not only can you not get him to say something different than what he wants to say, but they won't even generally just think about saying something different..." Here we see that, for Hunt, in-house engineers can be exactly like court savvy Plantz in that they know so much about the product that they will not even entertain the idea of going along with the local trial attorney's theory of the case, if it diverges from their own. Hunt apparently sees this domination as an endemic problem of defense trial work since he goes on to say that he would "prefer not to do" product defense litigation at all, favoring plaintiff's work "where you don't have a company telling you what to do."

Karl Christainsen was a Norwegian ex-patriot who immigrated to America in the late sixties to work as an engineer at an American forklift manufacturing company. Despite his 30 some years in America, he retained a heavy foreign accent. When I asked Hunt how he liked working with Christainsen, he responded,

> I don't like it one bit. You can't order them around, tell them what to do. I certainly wouldn't have hired a fucking Norwegian engineer with a huge ego. I don't want him going like this [waves his arms over his head] and saying how people were lifting pallets. And I also don't like working with another lawyer telling me how to try the case.

As we have seen, Hunt confronts the same level of dominance with in-house Christiansen as with savant Plantz; and, as we see in this excerpt, Hunt's anger flares to the same vitriolic level in recalling his lack of control, compelling him to invoke a similar type of ethnic stereotype: "I certainly

wouldn't have hired a fucking Norwegian engineer with a huge ego." On another occasion (between preparation sessions with Christiansen), Hunt told me that Christiansen was "uptight," adding that he was "a big Norwegian square-head type." In much the same way that Hunt uses a Jewish ethnic stereotype to explain Plantz's controlling tendency ("Just a slimy, nasty, mean, Jewish man...arrogant...under-your-thumb control freak"), Hunt uses a Norwegian ethnic stereotype to explain Christiansen's controlling tendency. As Jack Katz (1999) points out in his groundbreaking study of the genesis of driver anger in Los Angeles, invoking ethnic stereotypes commonly occurs as an advanced stage of anger, retrospectively coupling the angered driver's initial, bodily sensed emotion with an idealized account that sustains anger by casting him or herself as the victim of an ethnic group with innate moral defects.

Whereas inexperienced engineers who fray Hunt's professional cover through 'incompetence' are merely a "pain in the ass," experienced engineers like Christainsen and Plantz, who completely expose him, are morally repulsive. Accounting for his difficulties with engineers by attributing to them a sliding scale of perceivably innate moral defects ranging from the incompetence of the inexperienced to the stubborn pride of the ethnic know-it-all, Hunt constructs himself to be taken to a level of anger commensurate with his perceived loss of control.

Adding to his frustration, Hunt felt unable to express his anger directly to in-house engineers for fear of being fired. In the following quote (continuous with above), Hunt gave an example of his frustration in working with in-house engineers who had designed the particular devices alleged to be defective. This case centered on two of Christiansen's

groundbreaking safety patents for forklifts. One was a mechanism attached to the underside of the seat that automatically killed the engine when the driver dismounted or was thrown from the forklift. The other was a "no-lift-in-reverse" mechanism that prevented a driver from raising or lowering the lift when the vehicle was backing.

> They sent me a video. It must have cost them a fortune to make. It shows how the clutch pedals work, the safety cut off switch in the seat, the no-lift reverse. It shows them testing the seat switch with an ohm meter. I call them up and say, "Thank you for the video. It was very instructional, but I have a problem with it." I say, "The part where you show how the safety seat works is great, but it shows the forklift cutting off in 2 seconds. The one in the accident cut off in 7 seconds." I'd much rather tell the jury that the ANSI standard is 7 seconds, leave them with that upper limit and not show them one cutting off in 2. They say, "Ok, we can edit that part out." I say, "The part where you're hooking up the ohm meter is real nice; it shows that you get a different reading each time you do it, which is really great. But you're doing it on a different kind of seat switch than ours." They were testing the kind that bows out, not the one with the metal bar like we have in this case. They said, "But it's the same scientific principle." Ya right. I can see myself telling the jury that, and them saying "Why didn't he test the same type of safety device as the one in the accident? -- Because he knows damn well it doesn't work that way on that one." They say, "Well, isn't there something

> on the tape we can use?" I say, "The no-lift reverse demonstration worked real well; it turned right off when you put it in reverse. But you used a 1996 forklift that was a much bigger model." Ours is a little '86 model. You can't show that when ours is smaller and 10 years older. They'll ask, "How much did you improve it over 10 years?" I wanted to tell them to throw the video in the trash.

Note that, in Hunt's story of the videotape disagreement, he is very diplomatic in pointing out problems with Christiansen's video presentation, prefacing each criticism with lavish praise. Christiansen is also a vice president of the company. In addition to this case, Hunt has two other ongoing defense cases with this forklift manufacturing company. And because it is one of the world's largest manufacturers of forklifts and other heavy equipment, there are likely to be more cases in the future. Given that he cannot openly display his frustration to Christiansen without jeopardizing future business, the ethnic stereotype of the inflexible, egotistical Norwegian engineer allows Hunt to save and recreate indignant anger long after the fact, perhaps in audience with friends, colleagues, his wife -- or, as it happens in this case, the present researcher. Here the ethnic stereotype makes anger not only sustainable but, more importantly, transportable from the original scene of the perceived offense. As such, Hunt's use of ethnic stereotypes may be more indicative of anger temporarily constrained than of abiding ethnic prejudice.

Whores

Attorneys on both sides said that whores were plentiful and big trouble. But almost none admitted to working with whores. Plaintiff attorney Tod Quade explained the prevalent economic reason for avoiding whores.

> You want to avoid those experts at all costs because why would you want to spend $100,000 of your hard earned money on a dog case? I don't care how good an expert they are, they can't make a case that's not a case. When you work in the world I work in, people like Standard Motors and Soyota and Watercraft and Dell Helicopters, they don't blink an eye spending half a million dollars to defend a case. So they are going to wear your butt out. Whether you got a good engineer or a bad engineer, they are going to take you on, and I don't want an engineer who is going to make me spend my hard earned money just to have a lousy case and get beat up by a bunch of really good engineers. I can't believe anybody would want that to happen them. But there are people who do that. I don't. I try to stay away from those. They're too expensive.

Veteran defense attorney Clark Dickson said of whores:

> Those that I have found that work both sides of the fence generally will do anything for the money. We don't put on an act. I have never put on anybody that has fudged the evidence. I wouldn't do it. I wouldn't. If an expert would offer to do that, he's gone. I would never touch him again.

One of the few attorneys who admitted to working with whores was Howard Hunt, who reported that he used them very cautiously:

> There are fucking dickheads out there that'll pretty much say what you want. I think you have to be more careful of, while we were talking about you wanting to get an expert to come to your theory and you're thinking you're stretching them. Sometimes you've got to go the other way, and you have to take them and say, "That's too radical. We ain't selling that shit. Let's come up with a more logical one." It's still pretty liberal, but you're trying to get the expert to tone it down. That Rollosky, he just fucking about say anything you ever wanted him to say. You would have to take him the opposite way. Sometimes you have to do the opposite with them. If they're too willing to bend, you have to be careful because if they're actually too willing to bend, then they've probably said stupid shit in other cases. They've probably said that you need a parking brake on a shopping cart -- stuff that a jury will find is just bizarre. You may find that you've made a really, really bad mistake by getting that person. You've got to be careful. If you get some guy out there that's just saying whacko shit, I think that you can lose all your credibility. If they're too easy, you want to watch them. You've got to find someone that can come up with a theory you can sell, but it's got to be a logical one, and they can't go too far out on a limb. Otherwise, people make fun of them, and then you lose your credibility with the guy. It's over.

"If they're too easy, you want to watch them..." Hunt's problem with whores is that they are too willing to advocate for him, sometimes coming up with "stuff that a jury will find is just bizarre." Here whores reverse the ordinary relations of attorney and engineer. Where Hunt ordinarily struggles to stretch engineers into advocates, he struggles with whores to get them to "tone down" their advocacy. Where experienced expert engineers anger the attorney because they want to run the whole show, whores jeopardize the case by giving the attorney too much control -- they say "just fucking about...anything you ever wanted."

Plaintiff attorney George Albright identified these compliant types as the worst engineers he encountered: "The worst is a guy that will say things like, 'Well George, what do you want me to say? Where are we going? Where do you want to end up?'" Where the eloquence of the experienced expert muzzles the attorney, the whore gives him or her a megaphone to blow the case. But -- to the extent that the whore uncritically goes along with whatever the attorney deems best to say -- the whore allows the attorney to control the case. Thus, if loss of control is a consistent explanation for the genesis of attorney anger at engineers, then one would expect attorneys to be less angry at whores than at savants and in-house engineers like Plantz and Christiansen.

Hunt summarized his feelings about Rollosky's whoring in the following way.

> I guarantee if you call him and ask him if he'd run across some whores, he'd say, "Absolutely not me, but you know they're out there." And he's as bad as you could possibly, possibly ever get. I'll tell you what. A lot of them don't know that they're actually

> whores. I think you've got a lot of people out there trying to make a living and have found that they can do it by being an expert witness. They advertise and hold themselves out as an expert, and they're not very good, and they're not very competent in their field. They really don't know what they're doing. I'm telling you, generally they're so fucking happy that you've come up with all this shit, and they don't have to do it. Then they start thinking that they actually did it.

Although Hunt identifies Rollosky as a whore ("as bad as you could possibly, possibly ever get"), he charitably includes him in the ranks of the ordinary, inexperienced engineers "out there trying to make a living." Where Hunt fuels his anger at experienced expert engineers by attributing moral defects to them, he calmly dismisses the whore's moral defect -- "A lot of them don't know that they're actually whores." Of all the types of engineer he encounters, Hunt seems least angry at whores.

The only other attorney in the sample who admitted to using whores was Wilson founding partner, Herbert Rice, who began litigating product suits for plaintiffs in 1952. When asked "Does it make you nervous when you're using a whore?," Rice replied: "It doesn't because you know what the son-of-a-bitch is going to say." Because attorneys can control whores, there is less anxiety about embarrassment.

Although calling an engineer a "whore" is a stereotypical epithet, nowhere in the data is it uttered by an attorney in anger. The defining characteristic of a whore is willingness to uncritically go along with whatever the attorney client says. Because they leave the attorney's theory more intact

than savants or inexperienced experts, attorneys are less angry at whores.

The pattern of Howard Hunt's anger across the four relationship types appears to rule out engineering incompetence as an adequate explanation for attorney anger at engineers: Hunt is least angry at the incompetent whore who may lose the case for him, and most angry at the court savvy engineer who does "great" with the jury. Thus attorney anger at engineers does not appear to be directly tied to how well the engineer performs nor even to the outcome of the case. It is loss of control coupled with deep-seated embarrassment that consistently explains both the genesis and intensity of Hunt's anger across all the types of attorney-engineer relations that he identifies as relevant to his work.

Again, Howard Hunt is but a single attorney with personal idiosyncrasies that may or may not be representative of other attorneys. However, as we see in the next two chapters, controlling how engineers work is the central preoccupation in putting together product litigation for both sides' attorneys.

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CHAPTER 3

Evaluating Cases: Plaintiff Versus Defense

Given their divergent professional agendas and perspectives, it is surprising that attorneys and engineers managed to work together at all, let alone put together a coherent case. Yet they typically did put together a case that meshed the interests of both professions. They achieved this feat by tightly managing their relational difficulties at each stage of putting together the case.

Although attorney and engineer roles evolved dramatically in the course of working on a case, conflict related to their divergent professional agendas continued to define their relations at every juncture. The specific conflict management strategies shaping attorney-engineer relations differed greatly between plaintiff and defense sides, partly because of economic and organizational differences. However, the sides also shared more general strategies that transcended economic and organizational differences.

Economic and Organizational Structures of Dominance

Standing out in my interviews of plaintiff trial attorneys was their sense of enormous risk in putting together a product case on behalf of an injured client. Under the doctrine *non res ipse loquitur* (the facts don't speak for themselves), the plaintiff attorney had to show a pretrial judge a definitive, causal chain between the injury and the product in question. Failing to do so was sufficient grounds for dismissing the suit by summary judgment, a pretrial motion routinely filed by local defense trial attorneys.

Plaintiff trial attorneys reported that because the physical mechanism of product related injuries was almost always highly technical, the pretrial requirement to show cause required them to pay for the services of at least one engineer, often several, well in advance of trial. Plaintiff trial attorneys reported that they had to invest thousands and sometimes hundreds of thousands of dollars in expert engineering fees to get anywhere near the door of a courtroom.

The up side of this investment was that plaintiff attorneys were able to hire and fire expert engineers as they saw fit; and to some extent, they were able to direct how those experts worked on the case.

The local defense attorney on the other side was typically paid hourly by the defendant company's insurance provider to assemble and present the company's case in the jurisdiction where the accident occurred.

Where the plaintiff attorney chose his or her engineering experts, the defendant company supplied the local defense attorney with a team of company, "in-house" engineering experts. Because these in-house engineers worked for the defendant company, they functioned in a dual role as both client and expert to local defense attorneys. Where plaintiff

attorneys operated as paying clients, firing engineers who would not adopt their theory of the case, in-house engineers possessed the influence to fire local defense attorneys who refused to adopt the company's theory of the case. Thus, the economic and organizational factors structuring dominance between trial attorneys and engineers were reversed across the sides.

Controlling the Other

Yet, despite these structural differences, plaintiff and defense trial attorneys tended to use variations of the same basic strategy to control the corpus of engineering experts for their side. Within both sides, the basic attorney strategy for controlling experts was to separate them and selectively edit their opinions.

Engineers on both sides struggled against this strategy, attempting to organize themselves into a team and develop their own consensus within the side.

Plaintiff trial attorneys undercut engineering teams by hiring engineers one-at-a-time, in a consecutive series, beginning with the most narrowly focused specialists. On the defense side, in-house engineers easily succeeded in forming an integrated engineering team around the case. To balance this formidable team of in-house experts, local defense trial attorneys often located and hired a second set of independent experts, paid for by the defendant company's insurance provider.

Phases of Work

In making product litigation, attorneys and engineers organized their work into two distinctive phases. They called these phases "initial evaluation" and "trial preparation."

Although initial evaluation usually preceded trial preparation and entailed qualitatively different work, the phases were in other ways interlocking parts of the same dispute handling process. A good part of the willingness to negotiate came from the enormous expense and risk of basing legal arguments on expert trial testimony. As Marc Galanter points out, virtually all negotiation occurs in "the shadow of the law" (1985:1). From the initial evaluation onwards, attorneys orchestrated cases in reference to juries even while knowing that only a tiny fraction would go that far.

For attorneys on both sides, the main question for initially evaluating a case was: can I find a reasonable theory that I can sell to a jury? One of the main reasons for settling out-of-court was internal dissent among the side's experts.

The purpose of initial evaluation was to decide whether or not the case was worth pursuing. For the initial evaluation, typically done in secret, attorneys on both sides relied heavily on engineers to test and develop theories about how the accident happened. They called these engineers "consulting experts."

If attorneys on both sides deemed the case worthy, trial preparation began -- the second phase. In trial preparation, both sides located and prepared engineers for sworn public testimony. They called these engineers "trial experts."

Although both sides went through both phases, they did so in different time frames. By the time local defense trial attorneys began their initial evaluation, plaintiff attorneys typically were well into trial preparation. As the originators of product suits, plaintiff attorneys typically had a larger window for the initial evaluation, often employing a series of engineering specialists to explore multiple angles of liability before filing a claim. Plaintiff attorneys typically dropped

most of these consulting engineers and hired new engineers as trial experts. On the other side, defense attorneys often compressed the initial evaluation and trial preparation phases by using the same experts to function in both roles, somewhat blurring the line between initial evaluation and trial preparation.

Experts in Plaintiff Evaluations

Contrary to my initial expectation, plaintiff attorneys typically did not first recognize that they had a certain type of product case and then seek a matching engineer. Rather, at the first inkling of any possible product aspect, they typically sought a range of engineering opinions from a variety of consulting engineers then, through a series of collaborative efforts with them, came to recognize whether or not the case was a product case. Thus, for plaintiff attorneys, the first step in putting together a product case was recognizing that they needed consulting engineers to help them evaluate the case. In the following quote, George Albright, a practicing plaintiff attorney for 38 years, identified this recognition as part of the plaintiff attorney's special "expertise:"

> I think the first thing you have to do is- of course any lawyer, at least initially not with an engineer, has to have enough expertise to identify that an engineer is needed. You're seeing a lawsuit, and there's lots of different ways that you could miss knowing that you would need an engineer. And of course there's all kinds of engineers. The most common ones that used to be around were traffic engineers and reconstruction people trying to reconstruct accidents and determine

> how fast a car was going and that sort of stuff. But probably 20 years ago, it became a little more pronounced that you could see, for instance, a car wreck -- that's a real common one, the reason I bring it up -- that would have an ingredient in it that -- maybe have a blown tire or a rod that would go by in the car. The guy would have an unexplained something. So it would trigger, eventually it would trigger, some idea that there may be a products design or a problem in the thing. So I think the first step is that the guy, the lawyer, has to be able to identify that there is a need for it.

In this quote, Albright gives an account of the earliest phase of what for him is an ideal-typical product suit, emphasizing how cautiously he comes to recognize -- not that the case *is* a product case -- but that it "may be." His deliberations begin with a hunch -- "an unexplained something" like "a blown tire." Immediately, this hunch leads him not to statutes or involved legal theories but rather to the various types of engineer he may need to help him determine whether or not the case has any product aspects, and if so, precisely what type of aspects. Thus, before forming a legal theory of any depth, Albright visualizes the case in terms of the various expert engineers he needs to help initially evaluate the various product defect possibilities of the case. Put differently, his relations with engineers precede and are a condition for recognizing his case as a product case.

Albright's next challenge was to narrow his initial evaluation to specific parts and aspects of the product that were associated with recognized areas of engineering expertise (continuous with above):

> Then you kind of have to have some basic sense of 'What are you talking about?' Are you talking about the failure of a piece of equipment? Or are you talking about design? Or are you talking about whatever? Now all that may be triggered by the massive amounts of information that lawyers get from reading all this stuff that there's been a recall of a car or a product or whatever. And so, again, you'd be looking at what kind of stuff you're looking at because some of these guys are so specialized -- like lawyers, or anybody else, or doctors -- they really don't see anything else other than their very narrow little area there. They wouldn't see -- for instance, an engineer that was involved with the design of a piece of equipment really may not know anything at all about the flaws in the metal, the fatigue in the stuff which also can be an engineering problem that would cause the thing. So, you kind of have to look at that stuff and see where you are.

Note that as Albright starts to consider the specific product directions that he could pursue and the types of engineer necessary to pursue them, certain background assumptions about the respective roles of attorney and engineer come into play immediately. Most importantly, Albright, like virtually every attorney I interviewed, assumes that engineers cannot grasp the full range of product possibilities outside of their narrow sub-disciplines. To gain what he considers to be an adequate evaluation of the various possible product defects involved, Albright assumes the role of collecting, weighing and coordinating the opinions of various types of engineer. In seeking these various specialists and anticipating their

perspectival limitations, Albright's role as case manager begins to emerge even before he meets with prospective engineering experts.

Evaluating Cases: An Example from the Wilson Firm Case Files

In initially evaluating the merits of potential product cases, plaintiff attorneys relied heavily on the opinions of consulting engineers. These initial exchanges between plaintiff attorneys and consulting engineers determined which cases attorneys prepared for trial and which cases they turned down, thereby directly affecting the ability of injured citizens to obtain recourse through the legal system. Yet previous sociological literature offers no specific analysis of how attorneys use consulting engineers to initially evaluate product cases. To better understand the relational pressures that affect public access to civil justice, let us examine, through case file materials and my reconstructed field notes, an automobile rollover case that plaintiff attorney Howard Hunt refused to take after consulting with an array of engineering specialists.

On September 19th, 1997 (all dates slightly changed to preserve confidentiality) Mrs. Lola Thaxton (all names changed) rolled her mini-van, killing her 12 year old daughter April who was sitting in the front passenger seat. Howard Hunt's legal secretary knew Mrs. Thaxton and, by chance, arrived on the scene shortly after the accident, accompanying the unconscious Mrs. Thaxton to the hospital. After regaining consciousness, Mrs. Thaxton offered Hunt the case, and he agreed to "evaluate" it.

For his initial evaluation, Hunt retained a series of three consulting engineers: a bio-mechanical engineer, an accident

reconstructionist, and an engineer who had done several seatbelt failure evaluations. Hunt had a strong strategic reason for investigating the product liability angle of the accident: he believed that his client likely caused the accident herself through erratic driving. Moreover, because it was a single-car accident, there was no other motorist to sue. This left product liability -- in this case seatbelt failure -- as the only likely option for recovering damages.

Hunt retained the "bio-mechanical" engineer first. The specialty of bio-mechanical engineers regarding automobile accidents was to investigate how human bodies interacted with the interior of the automobile during the crash. On the day that Hunt retained the bio-mechanic, he explained to me why he hired this particular type of engineer for the case (as reconstructed from field notes):

> Hunt says that Mrs. Thaxton is positive that she saw April wearing her seatbelt before the crash. Yet paramedics arriving immediately after the crash found that April was not wearing a seatbelt. Hunt says that he hired the bio-mechanical engineer to evaluate the possibility that April initially was wearing her seatbelt, but it came unbuckled on impact, resulting in her death. In particular Hunt says he wants the bio-mechanic to tell him whether April died while strapped in her seatbelt -- if so, he "wouldn't have much of a seatbelt defect case" -- or whether she was wearing a seatbelt initially and died in a manner consistent with not wearing a seatbelt. He says that the later scenario must hold true for a defective seatbelt case. If not, he says he will not take the case. He says that he really wants to know the truth

> because this is going to be an expensive case that he "could get burned on." He explains that the mother driver had psychological problems before the accident, and the accident "really put her over the edge." I ask how she wrecked. Was another car involved? Hunt says no, she ran off the road and flipped. He says that the single-car aspect is a problem with the case. It means that the mother probably caused the wreck herself. So, he says, "everything depends on the seatbelt defect."

At this stage of the initial evaluation, Hunt clearly is uncertain as to whether or not he has sufficient grounds for proceeding with a product case. Anticipating that it will be a large and risky investment of his time and money, he requires some physical evidence of seatbelt failure before agreeing to take the case. Thus, as Hunt sees it, the case's fate rests on the answers he receives from his bio-mechanical consultant.

During the above conversation about the Thaxton case, I asked Hunt whether the consultants he used for the initial evaluation would also act as his trial expert witnesses. He responded, "Not necessarily," explaining that he was only using them to "evaluate" the case at this stage and might or might not use these particular consultants as his trial experts. He added that, at this stage in the case, he was not required to designate his trial experts, and since they were not designated as trial experts, these engineers could render opinions protected as confidential under the "work product" provision of the attorney-client privilege. Thus, during the initial evaluation, Hunt oriented to engineers not as trial experts providing favorable opinions for public consumption but rather as impartial confidants, providing frank technical

assessments that he relied on to decide whether or not to invest in the case.

Hunt went on to explain why he retained the bio-mechanic first in the series. He also explained the general economic rationale for evaluating the case using a consecutive series of consulting specialists (continuous with above).

> Hunt says that if he takes the case, it will involve "tons of experts:" the bio-mechanical engineer to match April's injuries to seatbelt failure, various doctors to further identify the cause of death, a fabrics engineer to evaluate the seatbelt, and an accident reconstructionist to describe how the wreck occurred. He says that, because of the vast work and cost involved, he wants to make sure it's a strong case from the outset. He says that's why he's sending it to the bio-mechanical engineer at the very beginning. He says that if the basic physics of seatbelt failure check out with the bio-mechanical engineering consultant, then he'll send the case to a medical consultant for a more in-depth analysis of her injuries. He says that if the case still holds up, he'll send it to other types of consultants, pausing to reevaluate the merits of the case after each consultant, before putting more money into it.

In the Thaxton case, we see that the fate of the case in the initial evaluation rests on a contingent series of engineering and medical consultants, working independently of each other. Hunt begins the series with what he apparently considers to be his most important evidentiary need: an

opinion from a bio-mechanical engineer matching April's injuries to a scenario of seatbelt failure. If he receives a favorable opinion from the bio-mechanical engineer, he plans to consult another type of specialist, then another, cautiously triangulating each of their opinions before proceeding further. By conducting his initial investigation serially, one expert at a time, Hunt minimizes expenses in the (likely) event that the case does not hold up. Furthermore, hiring one expert at a time prevents them from forming an engineering team that may develop an independent consensus about the case.

Hunt's secretary opened the Thaxton file on September 24th, 1997 (5 days after the accident). The first letter in the file was dated September 25th. In it Hunt asked Mr. and Mrs. Thaxton to sign release forms that he enclosed giving him permission to obtain copies of their daughter's medical and autopsy records. In a follow-up letter to the Thaxtons dated September 30th, Hunt's secretary conveyed the attorneys' sense of urgency in having a bio-mechanical engineer evaluate the case, as the first order of business. The letter read,

> Dear Lola and Doug,
>
> Here is another copy of the medical release I talked to you on the phone about. We need this back soon because we have to get the medical records so the engineer can compare April's injuries to the condition of the vehicle. Thanks.

When April's medical records arrived, Hunt told Wilson associate attorney, Kelly Tillman, to send them to Dr. Vincent Pointier, a bio-mechanical engineer with ABC Engineering,

Inc., located in an adjacent state. In the cover letter to the medical records, dated October 30th, Tillman emphasized to Pointier that, at this point, the attorneys were attempting to evaluate whether or not "a case exists." The letter went as follows.

> Dear Dr. Pointier,
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> Please find enclosed with this letter a copy of medical records for April Thaxton. As I explained to your assistant, April Thaxton was a front seat passenger in a mini-van when it rolled over in an accident on September 19, 1997. We are currently trying to determine whether or not we believe a case exists. It is our theory that there is a possible seatbelt failure in regards to Ms. Thaxton's seatbelt.

Tillman went on to provide a brief fact summary of the case, followed by specific instructions to the engineer.

> Ms. Thaxton's mother was driving the mini-van at the time of the accident and was ejected during the rollover. She is certain that her daughter was wearing her seatbelt at the time of the accident. When first responders arrived on the scene Ms. Thaxton was not wearing her seatbelt. She was found in the front passenger seat area, slumped down in the seat and was unresponsive. Ms. Thaxton later died of the injuries she received in this accident.
>
> What I would like for you to do is review these medical records and let me know if her injuries are (1) consistent with the seatbelt being on at the beginning

> of the accident and (2) if her injuries were consistent with being released from the seatbelt at some point during the accident. Again, it is our belief that at some point the seatbelt malfunctioned and released thereby causing the injuries which led to her death.

Note that Tillman directs Pointier to test two very specific hypotheses with only the medical records and her sparse digest of the presumed facts of the case to go on. By limiting Pointier to this summation of "the facts" and a narrowly defined technical directive, Tillman keeps him from grasping the full welter of the case.

Inconsistent information in the file is not passed along to Pointier, including: 1. the state police traffic report (received on 9/26/97) giving an eyewitness account of erratic driving, 2. a state police accident diagram (received on 9/26/97) that contradicts Mrs. Thaxton's first account of the accident, and 3. a memo (dated 9/30/97) relating a second version of the accident that Mrs. Thaxton related to her attorneys, contradicting both her earlier statement to police and the eyewitness statement to police. Lacking access to the complete file, Pointier has no basis for independently evaluating the attorneys' version of "the facts" of the case.

Plaintiff attorneys tended to cite cost or the specialist's own perspectival limitation as primary reasons for not completely opening their case files to consulting engineers. When I asked plaintiff attorney George Albright if he had ever sent the case file to an engineering consultant, he responded emphatically that he had not, citing cost:

> Oh, hell no. Good lord, no. No. -N-O-, no. You're gonna make a summary of the cold facts. I don't send

> him a file at all -- period. I mean, there'd be no reason to. This is the initial time you're gonna deal with him. I don't want him to spend a lot of money reading a file or anything. I want it: "Here's the facts. Here's what happened. This guy was in a golf cart that was driven by his son that had had three or four beers. And he got up to get out with no seatbelt, no impediment. And he made a turn. The guy made a small turn and fell out. Now, it was an Easy Ride golf cart, the most common one in the world. I understand you're familiar with that. Can you give me, under that setting and the angle of the turn, can you give me an idea what your thoughts would be about liability?"

Albright's account is typical of the matter-of-fact summary and narrow directive with which plaintiff attorneys typically dispatch their engineering consultants in the initial evaluation. No doubt, as Albright suggests, it saves plaintiff attorneys time and money to give their consultants narrow, predefined directives and simplified "facts," as opposed to allowing them free reins in the investigation. In addition, limiting the engineer's role and information also allows plaintiff attorneys to control the emerging theory of the case.

While acknowledging the attorney's economic rationale, consulting engineers nevertheless saw attorney imposed restrictions on their roles and information as a way to dominate them. Although attorneys genuinely relied on their engineering consultants' opinions to evaluate cases, these opinions were restricted to the kinds of questions and methods that attorneys imposed, strictly for the purpose of testing specific legal theories. On the whole, engineers were uncomfortable with the plaintiff attorney practice of

mobilizing them in investigations serially, one at a time, each with a narrow directive and limited information. Engineers preferred to work in communicative teams with other engineers with access to all the information that they deemed pertinent. They preferred to evaluate and follow this information wherever it led, insisting that the predefined directives of attorney clients infringed on their open-ended approach to investigations.

Veteran accident reconstructionist Jim France, who reported that 85% to 90% of his product cases were for plaintiffs, strongly objected to the narrow role that plaintiff attorneys typically gave engineers in the initial evaluation of cases. He insisted that plaintiff attorneys could gain a more accurate picture of what happened in the accident by using him as a "generalist" to initially evaluate the overall case rather than piecing together a composite evaluation from a disparate, contingent series of specialists, none of whom had an adequate grasp of what France described as "the big picture." France's orientation to comprehending the full case conflicted with the attorney strategy of controlling the case by narrowly directing a series of separate specialists, each with limited information. Predictably, France had recurring difficulties in persuading attorneys to give him a generalist role at the beginning of accident investigations.

> The thing that you have to explain to the attorneys is that they need somebody that's a reconstructionist, that's got a huge realm of experience, not just doing actual reconstruction, but knowing the crash worthiness, knowing bio-mechanic issues, knowing design issues. You gotta get that guy out there to look at that vehicle first.

In France's experience on cases, engineers like himself are not necessarily blinded by their specific sub-specialties. Rather it is the attorney who creates both the blindness and the narrow degree of specialization by limiting the engineer's information and confining him or her to an artificially circumscribed role.

In the initial evaluation of the Thaxton case, Hunt hired an accident reconstructionist, Russell Harper, as his second consultant. The specialty of accident reconstructionists is to recreate what happened in the accident by estimating such things as vehicle speeds and crash trajectories based on evidence such as tire skid marks and dents in the vehicles. However, Hunt hired Harper, not to reconstruct the accident but rather to help him locate a fabrics engineer to evaluate the seatbelt. He also asked Harper to look for company recall notices for that model mini-van and to send him articles on seatbelt failure from accident reconstruction journals.

Because their expertise is describing how car wrecks occurred, accident reconstructionists are standard experts in virtually every type of lawsuit involving car wrecks. Accident reconstructionists who have worked with many other types of engineer in a wide variety of accident investigations report that they accumulate a general working knowledge of other engineering sub-disciplines, their practitioners, and their practitioner's contributions to all types of accident investigations. Thus, accident reconstructionists report, attorneys sometimes use them in initial evaluations not for their expertise in reconstruction but rather to help them find other types of engineering specialist to do initial evaluations.

Although Hunt relied on the generalist knowledge of his accident reconstructionist to find his next specialist in the

Thaxton case, he did not permit Harper to reconstruct the full accident using the type generalist approach that Jim France advocated above. Hunt related that because it cost a great deal to reconstruct the whole accident, he typically evaluated the case using more narrowly focused engineers first, saving the reconstruction for last, if the case held up.

Note that delaying the full accident reconstruction until last also protects Hunt from having to compete with an accident reconstructionist who's wide range of engineering experience and orientation to reconstructing the whole accident might eclipse Hunt's control of the case from the outset. Instead, by directing his bio-mechanical engineer and his seatbelt engineer to focus on narrowly defined hypotheses within their respective areas of expertise, Hunt organizes the initial investigation such that he and associate Tillman are the only ones in possession of all the presumed facts and details of the accident. Although plaintiff attorneys frequently cite cost as the reason for distributing narrow tasks to disparate engineering specialists, the resulting compartmentalization of expert effort helps to maintain the attorneys' overarching control of the case.

Engineers saw risks in their circumscribed roles. Jim France provided the following example of a seatbelt case that a plaintiff attorney mis-evaluated because he too narrowly directed his consulting bio-mechanical engineer.

> One of my best friends is a bio-mechanic. He was enlisted to go look at a vehicle, and I think his bill was about seven thousand dollars to go look at this vehicle, by the time you look at travel and everything. And he was told that the person was in a certain seating position within the vehicle, and they wanted to know what was wrong with the seatbelt in that

position or if there was anything wrong with it, and why this person, because why did our particular person receive such severe injuries, and everybody else in the vehicle literally, and I mean literally, walked out of it. And they couldn't find the answer to that; so, this particular attorney, who is a very, very good trial attorney, gave the case up, gave it up to another. He just told their clients that he couldn't help 'em because the bio-mechanic could not find the problem. So then the new attorneys that got the case hired me. They asked me to go down, and I never asked them, you know, what should I look at because that's my job to determine that. That's the other thing that's hard to explain to an attorney is: I'm not gonna go down and look at one thing, I'm gonna look at the whole picture. I may focus on certain things that you want me to look at, but I gotta look at it all to get, you know, the big picture. You got to train them with that right off the bat. At any rate, when I went down to look at the vehicle, I looked at all the seat belt positions in the car, and I told my client who had gone down with me, I said "Well, it's really odd because I don't see any physical evidence on this seatbelt that it was being worn, but I do see physical evidences on these other three belts, and this one has the least load, this one has the next most load, and the one that I think this young person was in is over in this other position, and it definitely appears to be that way." So we followed up with the EMT reports, and I'll be doggone if the EMT reports didn't exactly put them in the same seats that I had them in. The difference was when you bring in that specialist who's a bio-

> mechanic, and you give him an issue and a place to look, that's what he's gonna look at. Whereas when you bring in your, I don't like to use the word generalist, but when you bring in somebody with that broader band of exposure, he's gonna look at everything and put the picture together for you so that you've got a sound basis for what you're looking at on step two, which is the injury mechanism. But if you don't do the first step right, you're gonna never get to the right conclusions for the second step. And it's very difficult to get them to understand to bring in somebody to look at the whole thing first, to identify various issues and to set the entire scenario up properly before you bring in your specialist.

France constructs his story of this case as an example of his recurring fight with plaintiff attorneys to control his work. From the beginning, France resists attorney attempts to limit his involvement and access to information. His first struggle with attorney clients is to gain a role as more than a specialist: a role that draws on his "broader band of exposure" across several pertinent engineering disciplines. He speaks of training attorneys "right off the bat" to use him as a free-ranging "generalist" rather than restricting his involvement to narrow, predefined directives.

It is no surprise that France finds it "hard to explain to an attorney" that "I'm not gonna go down and look at one thing, I'm gonna look at the whole picture." He seeks precisely the type of comprehensive assessment of the case that plaintiff attorneys keep from consulting engineers by restricting them to narrow directives and simplistic fact summaries. Giving the complete case file and an open-ended role to an engineer

with France's reconstruction experience of over 6,000 accidents is a threat to attorney control, in the event of disagreement.

Relatedly, France struggles from the beginning to reverse the attorney practice, seen in the Thaxton case, of putting off the accident reconstruction until other specialists do a favorable initial evaluation. In his eagerness to be first on the scene, France vies with the lead plaintiff attorney to lay down the factual framework that will define the type and roles of the particular engineering specialists needed for the case. France notes that "it's very difficult to get them to understand to bring in somebody to look at the whole thing first, to identify various issues and to set the entire scenario up properly before you bring in your specialist." Again, such attorney resistance is not surprising because defining the issues and identifying the necessary set of experts is precisely the overarching, managerial role that plaintiff attorneys maintain for themselves by fragmenting the engineering evaluation across separate specialists, none of whom has enough information to develop a viable alternative theory of the case.

In the Thaxton case, reconstructionist Russell Harper had his associate, Jack Stern, send Howard Hunt three articles on seatbelt failure, copied from accident reconstruction journals. They arrived with a cover form addressed to Hunt's attention. On the form, Stern had handwritten: "Russell Harper asked me to send this info," and below this, his advice on locating a seatbelt consulting expert: "Brad Tanner has performed several seatbelt failure evaluations or you could contact authors of the articles."

The first article described what to look for to determine if a seatbelt had been worn in an accident. The second

described the various ways that defective seatbelts fail and the post-accident indications to look for. And the last article described the history of seatbelt use in America, seatbelt regulations, and seatbelt suits. Thus, before allowing Harper a role in reconstructing the accident, Hunt educated himself for that role by reading pertinent accident reconstruction articles provided through Harper.

After reading the articles, I asked Hunt if he wanted to contact any of the authors to help him evaluate the case. He said "no," they would probably cost too much. He said that he had called Brad Tanner to do a preliminary seatbelt evaluation, and although Tanner did not have a great deal of experience in that area, his skills were adequate for the purpose of initially evaluating the possibility of seatbelt failure. But, he added, if Tanner's initial evaluation found evidence of seatbelt failure, he might contact one of the authors to do a more through analysis and serve as his seatbelt trial expert since the authors were probably among the top in the field. Thus, only after educating himself as an expert and confirming his theory through isolated consultants would Hunt consider hiring a more highly qualified trial expert who might threaten his control of the case.

Within the first week of November, 1997 (less than three weeks after the accident), Pointier and Tanner rendered their separate opinions to Tillman, by telephone. As was her practice with experts, Tillman summarized their conclusions in shorthand on post-it notes that she stuck to the outside of the file, for easy removal in the event that the other side requested the file during discovery. From her post-it notes and from discussions with her, I pieced together the following account of what each consultant concluded to Tillman on the telephone.

Tillman told me that, according to Tanner, April's seatbelt looked like it hadn't been worn. On her post-it note, Tillman wrote that the seatbelt had no characteristic "load marks" or signs of stretching that indicate that it held back a body during the crash. Tillman said that Tanner indicated that it was possible that the beltbuckle popped loose before the belt received any weight loading, but he considered it unlikely. Tillman noted on the post-it that Tanner indicated that buckles seldom pop loose, and when they do it is usually from a very hard initial side impact -- of which there was no evidence in this accident, it being a single-car rollover.

Tillman said that Pointier's bio-mechanical analysis also found little evidence that April wore a seatbelt during the crash. On a post-it, Tillman noted that Pointier found a large, deep laceration on April's left groin, an injury that could have been consistent with wearing a lap-belt. However, Tillman noted, Pointier found no injuries indicating that the upper torso-belt was used. Thus, Tillman said, it appeared to Pointier that either no seatbelt was worn or just the lap-belt was worn. From this, Tillman concluded that, since the lap and torso belt were part of the same belt unit, it appeared most likely that April was not wearing a seatbelt -- and thus, seatbelt failure was not a promising direction to pursue further.

Accordingly, in a letter dated January 14th, 1998, Hunt informed Mrs. Thaxton that he had conducted an "initial evaluation," and that he was not willing to take the case. The letter read, in part, as follows.

> Dear Lola,
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> This letter is to advise you that our office is not willing to accept representation of you with regard to

> your personal injury claim and the claim for the death of your child. You will find enclosed herewith copies of all of the medical records and other documentation that I have obtained during my initial evaluation. There is no fee due us for our services in this matter.

Hunt subsequently instructed his secretary to close the Thaxton file. A handwritten note appeared on the outside file cover reading: "Close and write off costs."

Based largely on the outcome of a struggle with consulting engineers to define the case around a profitable issue in the initial evaluation, plaintiff attorneys decide whether to close the case or to begin trial preparations. Here the fate of cases is decided not through adversarial exchanges across the sides, but rather through adversarial exchanges on the same side.

The adversarial nature of this struggle was most apparent when engineers and attorneys disagreed over what the case was about. To better understand the relational pressures that shape the fate of cases in the initial evaluation, let us examine how plaintiff attorneys and engineers handled case defining disagreements in the initial evaluation.

Jim France complained that, in initial evaluations, plaintiff attorneys sometimes used dry fact summaries and narrow directives to force on him what he considered to be a biased theory of how the accident occurred. In the following lengthy quote, he described his response to such a fact summary and narrow task directive.

> I had a case where the attorney wrote me, and he said "Hey, we have a client in the back seat, and in the impact he went forward, and his head struck the shift

lever, and it caused brain damage." And the car was no longer available. So there was only, at that time, five pictures of this car that they knew of that showed the vehicle after the accident. And I asked for the medicals, and then of course, as soon as you start asking for stuff, you know, they say "Well, we just want you to take a look at it and evaluate it." And I said "Well wait a minute. I can't evaluate it. I can't evaluate this guy's injury by your description of head injury. I need specifics." So, the first thing I asked them for was any x-rays, CT scans, nurses' notes, that kind of thing, the real in-depth hospital stuff. And again, even though I'm not a doctor, I've looked at thousands of these things and, you know, I can read an x-ray and a CT scan. I might not be reading it as a doctor reads it, but I know what I gotta look for. And of course that's all costing them money, and right there they might have to put four or five hundred bucks into it to get all that stuff. And you just can't let them, you know, short sheet ya. And so, you know, I just insisted, I said "I can't help you if I don't have that." And so after I got that information, you know, I saw right away that the impact to this kid's head was not sideways like the shift handle was on the shifter, but it was up and down, more like the blade of an ax. And so I told them, I said- And then one picture did show the shifter inside the car. And I said "Look," I said "the shift lever's not damaged. And this impact is to the frontal lobe of this guy's head. That's gonna take a fair amount of energy. And in my opinion it would damage that shift lever." I said, "So I don't think that's what he hit." Well,

they just, they didn't want to hear that. They said "Well look, there's nothing else there for him to hit, you know. He obviously did hit something." And so, I mean, they were really getting forceful: "Well, there was nothing else here, the dash isn't damaged," blah, blah, blah. "But the shift lever's right there, and it's exposed, and there's a big opening between the bucket seats," and they thought that that was a good issue. And I said "That may be a fine issue, but this injury is not compatible with that shift lever." So I said, "Are you sure there's no insurance company pictures of this car or something?" because the pictures we had were really just, there was a couple of the inside and one or two distant ones from the outside. Because I told them, I said "It looks like the windshield is torn, and it looks like the hood is folded up, and I have a suspicion that your client went clear up to the windshield and may have hit his head there." And so anyway, they actually, it took them a few weeks, but they got the stuff from the insurance company, and there was another, I think, five or ten pictures on it. And they did indeed show that the windshield was ripped, that the, you could see the edge of the hood that had made the cut in the windshield, and I could see that the hinge was broken on the hood. And so what had happened is the hood had come back through the windshield, the kid had gone forward and kind of, between the two seats, and his head had hit the windshield, and that's what had made the more ax-like cut in his head. And so, it took me a while to show them that this was the more likely path of the person, and then I showed them the federal

> motor vehicle safety standards that applied to the rearward movement of a hood, and they saw that "My goodness here, it's not supposed to do that." And at that point I explained, "But, you know, this is my opinion, you know, this is my medical observation. You're gonna need a bio-mechanic to develop that or to verify it." And so then they did. They went right to a bio-mechanic who looked at everything and said "Oh, absolutely it's not the shift lever, it's much more consistent with this," and then we built the case out of that. And here they had come to me, you know, with a completely improper theory that they pushed and pushed and pushed on, and were adamant, I mean, just adamant that that's what it was. And you know, finally I had to get to the point where I just said "Look, I don't see it that way, and I can't testify about it. If that's what you feel, then just don't use me as an expert 'cause that's not my opinion," and you have to stand your ground. But then, you know, like I said, once it all got said and done, virtually everybody, the whole team, had agreed, "Oh yeah, that's the way it was," and even the experts on the other side agreed, to a point, that that's probably where the injury occurred.

In this quote, France describes his work with attorney clients as a constant struggle to define the case in the face of conflicting professional agendas. The attorneys begin by attempting to force on him a typical summary of the accident that matter-of-factly states, as a foregone conclusion, the very cause of the injury that they ostensibly are paying him to determine. Here France recognizes that his attorney clients

are intent on bending him to "a good issue" for recovering damages by limiting his role and access to information. When France pushes for a more open-ended role, asking for medical "specifics...the real in-depth hospital stuff" to independently reconstruct how the injury occurred, the attorneys baulk, using their control of information to keep him trained on their summary version of what happened.

In another example, France noted that attorneys "will almost manage the case themselves," not only using fact summaries to groom his opinions but even falsely attributing opinions to him:

> There was another one where the car had been struck from the rear, and there was a severe brain injury to this young man driving. And there was a little bit of hair found on the D ring of the driver's side B pillar, where the little ring where the seat belt goes through that's up on the door post. And their guys were all saying, the attorneys, not other experts, were saying "Oh, okay, my goodness, his head hit that D ring, and that D ring area, it jumped out, you know, it sticks out from the B pillar, and it wasn't protected, it didn't have much of a covering over it or anything, and it really, you know, did this guy a job." Well, I couldn't make it to look at the car; so, I sent one of my associates, and when he went to look at the car, I said "Look, the car was hit in his right rear corner. I don't think, the kid's head, there may have been hair up there or something, but," I said, "the kid should have gone back toward his right rear corner." So when my investigator got there, he looked and, lo and behold, he was with the car about five minutes, and there's a

> big glob of hair on the back of the interior of the right rear corner of the car. Of course, unfortunately, the right rear corner had been pushed up almost through the back seat. So it was very close to the driver's head. But it wasn't the D ring. It was this right rear corner. Well, that of course nullified their entire theory of the D ring. And I mean, they argued with me for almost two months about that to the effect that they had even answered the interrogatories to the defendant that gave my opinion that the head hit the D ring. And I went ballistic. I said, you know, "That was never my opinion, never has been my opinion, and before we even looked at the car, I knew that that didn't happen." But they will sometimes be that strong in their assertions that they will almost manage the case themselves in answering interrogatories and stuff to what they just know some expert's gonna say. And again, you have to stand your professional objectivity and just stay there. You can't give into that, 'cause once you do, your soul is gone. And that's all we have up there on that stand is our integrity.

Standing by his "professional objectivity," France eventually prevails on the attorneys in both of the above cases to give him enough specific, primary information to form his own opinions. It is little wonder that plaintiff attorneys restrict France's access to such information. With this information, he immediately challenges their theories: "That may be a fine issue, but this injury is not compatible with that shift lever," he tells attorneys in the first case.

Winning access to specific, unfiltered information greatly expands France's role in these cases, enabling him to develop alternative theories that, as he says in the second case, "nullified their entire theory of the D ring." With direct access to the existing evidence and a comprehensive theory in the making, France encroaches on the role of the lead plaintiff attorney, going so far as to introduce "federal motor vehicle safety standards" that provide a legal avenue for his alternate theory, in the first case.

Importantly, France also requests a bio-mechanical engineer to "verify" parts of his theory. Here we see that giving France direct information and a generalist role also puts him in position to now choose and coordinate the efforts of the particular specialists he deems necessary to fill in details and lend credibility to his emerging theory.

In requesting the bio-mechanical engineer to verify parts of his theory, France launches a new expert relational structure for the side, that of a collaborative "team" of engineers who talk directly to each other rather than a series of separate specialists reporting directly to the attorney. By organizing a team of communicating engineers, France changes the attorney dominated social structure of the plaintiff side. Only by this coup does France prevail on attorneys to change their theory of the case to one that is more consistent with the demands of engineering rigor.

Plaintiff attorneys separate consulting engineers and attempt to pin them to profitable issues using simplified "fact" summaries and narrow directives. Highly experienced experts like France fight against these attorney created barriers by attempting to create an integrated team of engineers capable of forming an independent consensus based on their own, professional analysis of all the available

evidence. Thus, in the collision of their professional agendas, both engineer and plaintiff attorney struggle to establish dominance by controlling the way that experts work.

Experts In Defense Evaluations

The major automobile and other large manufacturing companies employed a full-time group of engineers who did nothing but evaluate and prepare defense product cases for the company. In a small percent of cases, these engineers also testified. Attorneys and engineers referred to these engineers as "in-house experts."

Most of the in-house experts I interviewed began working for a company directly after receiving either a BS or MS in engineering. They typically took an entry level job in one of the company's product design divisions. As they worked for the company, many continued their education by attending night school, receiving higher degrees and moving up in the company's product design hierarchy. Before becoming in-house experts, most had achieved highly successful design careers, many with ground breaking patents, some with entire company product lines to their recognized credit. In general, in-house experts came from the most loyal, hard working and knowledgeable ranks of company employee.

The in-house expert groups in America's largest automobile manufacturing corporations included virtually every type of engineering specialist associated with any aspect of cars, from metallurgists to bio-mechanical engineers. These company engineers formed teams in the course of initially evaluating accidents, often prior to local defense attorney involvement. The constituency of an in-house engineering team evolved around the task of initially

reconstructing the accident, drawing a particular mix of experts as indications of what happened emerged.

Typically choosing and coordinating the efforts of these in-house specialists was a highly seasoned, senior in-house engineer referred to as "chief in-house expert." This chief expert typically had conducted hundreds, if not thousands, of accident investigations for the company, examining many different types of company products, from virtually every angle of liability.

In choosing and coordinating the team of in-house specialists for cases, the chief expert took exactly the type of backstage, "big picture" role that Jim France fought plaintiff attorneys to achieve. In-house attorneys, mostly concerned with financial aspects of the company, tended to defer to the chief in-house expert in matters pertaining to the evaluation and preparation of company product cases. Thus, in terms of directing the litigation, the chief in-house expert for the defense had roughly the same dominant role as the lead plaintiff attorney on the other side.

In settlement decisions, local defense trial attorneys reported that they had little choice but to accept the chief in-house expert's recommendation. For example, Gary Breedlove, an associate attorney in the product litigation department of a prominent defense firm, reported the following.

> One of the things you run a lot: if they're in-house engineers, they have certain control to where they can end the litigation. In other words, if they get in there and look at the product -- if it's, say, it's a hose manufacturer who's manufactured hydraulic hoses -- they may have their in-house personnel come out and

> look at the hose and go, "Oh, this is a bad hose." And so, a lot of times those in-house people will possess the control to end the litigation when they find something wrong.

For local defense trial attorneys, the structure of attorney-engineer dominance is, from the outset, the reverse of that on the plaintiff side: Where plaintiff attorneys tend to tell experts how to handle investigations, in-house experts tend to tell defense attorneys how to handle investigations.

Chief in-house engineers forced local trial attorneys to pursue settlement not only when the product appeared to be faulty but also for economic reasons. When the estimated cost of bringing the case to trial exceeded the damages sought by plaintiffs, some chief in-house engineers took a cost-benefit approach to the case, urging local defense attorneys to pursue settlement. In the following quote, chief in-house riding lawnmower expert, Kurt Plum, expressed his personal belief that because local defense attorneys were paid by the hour, they were not highly motivated to end the litigation by settling the case. Plum reported that part of his job was urging local defense attorneys to ask plaintiffs for a settlement price:

> I'm not only the expert but also the corporate representative. So I have to see that a certain case just doesn't get spun out in nowhere. Let's see, a case where normalwise would settle for $15,000, and we have perhaps $50,000 in lawyer fees in there because they just keep on going. And I have to say, "Did the guy ask us for any money for it?" "No, he never asked." "Well did you offer him anything?" "No he

> didn't ask, and we didn't offer." "Well, isn't it time to before we take all those depositions and so on that we ask him what he wants?" Those are the conflicts. They're all those business conflicts. Where local lawyers, and part of it our lawyers, not watching close enough to say, "Wait a minute. There has to be an end of it, and when it's a $25,000 case, we cannot spend $50,000 just defending the case." So quite often there is a financial interest. When you're getting paid by the hour, you are quite often not that interested to get that case to pass over, as it should. Because that's all. When you have to take another trip, you make another trip, so it's not losing anything. So I have to watch the person on the other side and have to remind our lawyers, and say, "Wait a minute. We're not just in business to improve laws and who's smarter and so on. Let's finish this thing. Let's settle this thing. You've made a truce to settle." That is part of my job.

As the "corporate representative," Plum sits across from the plaintiff for the trial. Where ordinary expert witnesses are barred from the courtroom except when testifying, the company representative is allowed to be present for the entire trial. Thus companies often named their chief expert as the company representative, allowing him or her to hear the testimony as it emerged and to coordinate the defense rebuttal accordingly.

We see in the above quote that, before going to trial, the company representative/chief expert considers it part of his job to initially assess cases not only in terms of product liability but also in terms of litigation costs, reporting that he

routinely urges local attorneys to settle when it saves the company money. Acting both as evaluation team leader and company representative, chief in-house engineers dominate settlement decisions at every phase of litigation, thereby allocating the cases on which defense attorneys work. Where plaintiff attorneys mobilize engineers, engineers mobilize defense attorneys.

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CHAPTER 4

Preparing Cases: Plaintiff Versus Defense

Preparation is the be-all of good trial work. Everything else -- felicity of expression, improvisational brilliance -- is a satellite around the Sun. Thorough preparation is that Sun.
-- Attorney, Louis Nizer (Quoted on NPR's Justice Talking)

Picking Trial Experts, Plaintiff Style

For cases that survive the plaintiff attorney's initial evaluation, a new phase of work begins that attorneys and experts refer to as "trial preparation." During trial preparation, trial expert roles emerge as plaintiff attorneys choose the set of engineers designated to testify in public for their side. Because the emphasis in trial preparation shifts from technical investigation to public performance, these engineers often are not the same ones involved in the initial evaluation of the case.

We saw that, during the initial evaluation, plaintiff attorneys sought engineering opinions to test and develop their theory about the cause of injury. In preparing the case after the initial evaluation, plaintiff attorneys typically had a well developed causal theory of what happened in the

accident; and therefore, they sought experts at this stage mostly for the purpose of confirming that causal theory to a jury, not testing or developing it. When I asked plaintiff attorney George Albright if he had ever used an engineering trial expert to help him develop his theory or arguments in a case, he responded,

> Not really. I mean, you know what happened. At least in my experience, you know what happened. You'd know what you're argument is. You want that guy to tie causation. That's the whole deal of an expert. Causation. That's all you want to do. And there's a series of questions that you've got to get from him on that. That "To a reasonable degree of scientific certainty, Dr. can you say that this thing caused this thing." "Yes." You gotta have that word.

Rather than change their causal theory in the trial preparation phase, plaintiff attorneys report, they frequently hire and fire a series of candidate trial experts until they find one who is willing to confirm their existing theory to a jury. As veteran plaintiff attorney Herbert Rice put it from the perspective of his 42 years of practice,

> If they don't want to adopt your ideas and your theory and work from that to see whether you're correct or not, you just get away from them and find yourself another engineer.

Howard Hunt said that he sometimes had to hire as many as three consecutive engineers to review the case before finding one willing to "sell" his theory to a jury:

> I've done cases where I've hired experts and spent lots and lots of money and done the research and failed, what I absolutely thought was wrong and they ultimately wouldn't agree with it or wouldn't testify to it; and I had to go get somebody else because I thought their theories, maybe they were okay, but they wouldn't sell. I'm trying to think of an example of one that I did that on, and it happened recently. It happened in the mining engineering case that I had. I found some Mine Safety Health Administration regs that I thought were violated. I thought I could sell it to the jury, and the guy just wouldn't agree that he thought that was the cause of the accident. I paid him $8,000 to that point and just let him go and went and got somebody else. He wouldn't sell the theory that I thought was necessary to win it. That's why the whole thing's a farce, because people shop around for their experts. You have experts, and they tell you there's no case, and you say 'fine,' and then you go get another one. You might have to go get three before you come up with one that's a favorable opinion.

As farcical as shopping for trial experts may be, the practice tells us something very important about the integrity of experts. If Hunt fires as many as two out of three engineers because they refuse to support his theory, then the majority are not "whores." The reason that attorneys must shop around is that experts tend to be stubborn commodities. Because Hunt saw the better trial experts as unbendable, his strategy was to find one who was already disposed to his theory of the case:

> There are some experts that I know that I could go to, and they would say, "Every product is defective because it needs an inter-locking guard of some kind; so that, if you take this off, it turns it off. It does A, B and C." You know that that's just their mind set on what they think; so, if you see a product where you think, "Gee an inter-lock would be an easy thing to sell to a jury. And this is the type of thing that I'm thinking ought to be on this product," then that's who I ought to go to.

Recognizing that the particular training and experience of engineers can predispose them to his side, Hunt's strategy is to find an expert that he doesn't have to bend. Here we see another important synergistic relation in science and law. By screening multiple candidates to find an expert who is predisposed to their theory, plaintiff attorneys like Hunt often unwittingly help to establish paradigm differences in expert disciplines.

Preparing Cases, Defense Style

In sharp contrast to plaintiff attorneys, local defense attorneys reported that, in preparing cases for trial, they often readily incorporated the legal advice of their engineering experts, particularly when they were in-house engineers with a great deal of litigation experience. When asked how he handled the legal advice of in-house engineering experts, local defense attorney Gary Breedlove outlined the process of negotiation he faced:

> I certainly don't turn a deaf ear because they are very knowledgeable. They've been through litigation, and they know the process. Generally speaking, most of the times that's what you run into. So, I try and mesh the two ideas -- incorporate what I feel should be done in the case, recognizing that I am the expert with respect to local juries and what I think will and will not fly with the juries. So, I try and take the best of both worlds, if you will -- what the expert has to offer and incorporate that into my strategy because I'm certainly not the most brightest or brilliant person in the world. And they are the expert. And they have information that's helpful in that regard. So, I try to mesh 'em. I definitely don't turn a deaf ear. You know, you also have to worry about personalities. If you piss off the in-house engineer, then that can reflect badly on your- with your client who's your in-house counsel essentially to defend that company. So, you kind of have to handle them with kid gloves at times.

Here we see a much different way of relating to engineers in the trial preparation phase than the dictatorial style reported by attorneys and engineers on the plaintiff side. For local defense attorney Gary Breedlove, putting the case together is a series of delicate compromises with the in-house engineer, a "mesh" of ideas to form the "best of both worlds." Here Breedlove sees in-house engineers as "very knowledgeable" in legal affairs. He reports that "they've been through litigation, and they know the process;" so, "they have information that's helpful in that regard." Thus, Breedlove

has an orientation to in-house engineers that accords them a prominent place in shaping the case, from the outset.

We saw above that in-house engineers typically begin working on the case before the defendant company (or its insurer) hires the local defense trial attorney. The resulting collaboration of in-house engineer and local defense attorney has much the reverse employment footing of that seen on the plaintiff side: Where the plaintiff trial attorney hires and fires engineers, the local defense trial attorney serves at the pleasure of the in-house engineer who it is dangerous to "piss off" because he or she is influential in hiring and firing local counsel, as Breedlove suggests.

However, where the plaintiff attorney can replace an undesignated, candidate trial expert with relative ease, the defendant company cannot easily replace their local counsel whose identity is known to local plaintiff attorneys and whose knowledge of local laws, judges, and juries is crucial to developing a viable legal argument. Thus we find a more intimately negotiated evolution of the case on the defense side, a process of finely fitting the trial attorney's local knowledge with the more context independent mathematics and strategic approach of in-house engineers who typically have defended a range of company products in a wide variety of cases across the country, but typically not in the particular venue at hand.

Where plaintiff attorneys reported that they simply fired engineers who disagreed with their theory of the case, local defense attorneys reported that when in-house engineers disagreed, they maintained ongoing relations using "diplomacy." One prominent area of diplomacy reported by local defense attorneys was in urging in-house engineers and in-house attorneys to concede certain plaintiff contentions

that reflected unfavorably on company products or policies. These were usually contentions that local defense attorneys identified as unwinnable in the local venue and therefore best introduced to the jury as part of the defense theory. When I asked if he had trouble in getting in-house engineers to concede unfavorable points about company products, local defense attorney Gary Breedlove summarized the difficulty as he saw it:

> Yes. People tend to be defensive of their own kind -- a "protect your family" kind of a scenario. You try and be diplomatic about it, in dealing with the counsel, the in-house counsel, and the particular engineer. Try to be diplomatic: "Look this is something we're gonna have to concede." Or, "I think they're gonna prevail on this point. A jury's never gonna buy your argument." So, you really have to- when push comes to shove, the lawyer controls the litigation. And you just have to call them out on it and say, "This is what it's gonna be." But you try and be diplomatic on it.

We see Breedlove's strong sense that, as the local attorney presenting the case to the jury, he ultimately will argue the case as he see fit. And as many local defense attorneys reported, they typically were the ones who in-house engineers and in-house attorneys blamed for a loss, sometimes resulting in the loss of future legal work for that company. Thus, as Breedlove stresses, it is important for local counsel to be "diplomatic," strategically mitigating his or her personal accountability for a loss by negotiating each point of the

defense argument in advance with the in-house engineers and attorneys.

Another prominent case defining area of disagreement between local defense attorneys and in-house engineers was over the question of whether to base the case primarily on eyewitness accounts or on the available physical evidence from the accident scene. In-house engineers overwhelmingly preferred physical data. Former in-house automobile restraint systems engineer Joyce Edens's explanation of this preference was typical of the in-house engineers interviewed:

> Many times you're going to have eyewitness testimony, and you'll have that testimony read, but that's not really evidence to me. It's just something that needs to be considered because you can read testimony from five different people that witnessed the same accident, and they all are going to have a different interpretation of what they say. So, I have to rely on physical facts and physical evidence, the laws of physics and my background and my experience in basically evaluating what I see.

Because engineering is based on physics, engineers require physical data. And, as Edens notes, eyewitnesses are notoriously unreliable in recalling the physical details surrounding accidents. Thus, for Edens, as for virtually every rigorous engineer, eyewitness accounts are "not really evidence."

On the other hand, the local trial attorney's job is largely literary. He or she writes a compelling story of what happened using rhetorical and literary devices to account for the assumed "facts" of the case as clearly and as convincingly

as possible. Where in-house engineers routinely dismiss eyewitness accounts that conflict with their interpretation of the available physical data, local defense trial attorneys often are reluctant to do so, operating on the assumption that eyewitness accounts are the most accessible and compelling evidence to jurors; and therefore, they should be included in the story line whenever possible. Deciding how to treat eyewitness accounts was often a case shaping struggle between the evidentiary standards of local defense attorneys and in-house engineers.

The local defense attorneys with whom I worked at Wilson preferred to build a case that, as much as possible, accounted for both the favorable and unfavorable eyewitness testimony. Their deference to eyewitness accounts often conflicted with the in-house engineer's preference for physical data, resulting in a conflict that defined the very "facts" of the defense case.

A section of my reconstructed field notes excerpted below illustrates how such a conflict over evidence shaped the defense's version of "the facts" of a product liability case in which the plaintiff fell off a riding lawnmower manufactured by the defendant company, and it cut off his big toe. I initially handwrote the notes at a case planning meeting that occurred at the corporate headquarters of the defendant company, a large lawnmower manufacturer. The meeting, held around a table in a corporate conference room, was attended by the chief in-house engineer who served as the chief defense trial expert in the case, two in-house attorneys assigned to the case, Howard Hunt who represented the defendant company in the county jurisdiction where the accident occurred. And I was there as Hunt's paralegal.

In the excerpt below, Hunt and the in-house expert disagreed on which of two alternate accident scenarios they should put forward at trial. The scenario favored by Hunt was based on the eyewitness deposition of a teenage neighbor of the plaintiff who testified that the plaintiff was cutting grass vertically up and down a hillside bank when the mower suddenly reared up, pitching the plaintiff backwards and landing on the plaintiff's foot.

However the chief in-house expert, qualified as an accident reconstructionist as well as one of the mower's designers, argued from the layout of the accident scene that the plaintiff was more likely traversing the bank horizontally, making the mower constantly tilt sideways, which constituted an improper use that was specifically warned against in the owner's manual. All present agreed that the horizontal theory was a better scenario for the defense because the accident could then be attributed to operator error rather than to a defect in the product. However, as the excerpt reveals, Hunt and in-house attorneys diplomatically shaped the defense case around the less favorable, vertical scenario -- against the opinion of the in-house engineer -- because Hunt anticipated that the local jury would believe the teenager's testimony.

Hunt:	I think a jury will believe the kid. No reason for the kid to make it up.
In-House Engineer:	He is constantly putting himself at the point of tipping over [by traversing the hill horizontally].
Hunt:	The problem I have is I don't have anyone who says he did anything different than what he says he did.

Would that be an improper use of the mower if he went up 2 feet? I don't have anyone to testify to anything different. If he did what he said he did, would that be an improper use?

In-House Engineer: Yes. If you go 2 feet up a hill, you are going to have an accident.

Hunt: I'm just trying to figure it out. He probably did what I do with my dad's mower [i.e. cut the bank sideways]. The problem is we don't have any witnesses. He's going up the hill as far as he can, then he pops the clutch. If he takes it 2 feet up, you push the clutch in and pop it. Would it raise it up?

In-House Engineer: It doesn't make any sense. Would you go up and back when you could go sideways?

Hunt: That's fine and good, but what evidence do we have that he cut the hill higher than he said?

In-House Engineer: Common sense.

In-House Attorney #1: You might not be able to pull out a statement. The [plaintiff is] an insurance adjuster. He knows what to say.

Hunt: It seems to me the problem is if you want to say he was running up the hill, the best witness you have is the neighbor. And if you start

	calling him a liar, you have nothing.
In-House Attorney #2:	Is that 2 feet up or down hill?
Hunt:	He [neighbor witness] says he [plaintiff] goes up and immediately falls on his ass, and the mower keeps running.
In-House Attorney #1:	Why don't we stick with that?
In-House Engineer:	It's just a matter of time until he misjudges the hill.
Hunt:	You need the witness to say that he misjudged the hill. We're going to lose this case if we say this neighbor lied.

In this fragment the in-house engineer asserts his belief that, based on the physical layout of the accident scene, the plaintiff was traversing the hill horizontally when the mower tipped over -- again, a better scenario for the defense than the vertical scenario that the plaintiff side is offering. At one point Hunt draws on his personal lawn mowing experience to expresses agreement with the in-house engineer's horizontal scenario: "He probably did what I do with my dad's mower." Here we see the careful diplomacy of the local trial attorney, expressing personal agreement with the in-house engineer's account of the accident while opposing it as a convincing argument for the jury, without corroboration from an eyewitness.

In deciding how to treat the teenage neighbor's eyewitness account of the accident, the defense team went on to discuss the significance of his additional statement that the mower continued to run after the plaintiff fell off, traveling approximately 40 feet before it stopped. This statement was a

potential problem for the defense because the industry standard required the riding mower's engine to stop automatically within 7 seconds of operator dismount. The present in-house engineer had designed a gravity activated shut-off switch, located in the operator seat for that purpose.

Hunt:	If it went 30 feet [after the plaintiff fell off], how long did it take in first gear?
In-House Attorney #2:	About 5 to 6 seconds, which is consistent with industry standards. We don't want to call that guy a liar. When he testifies with a good explanation, he's going to give us some stuff he doesn't mean to.
Hunt:	On cross, I can get him down to 30 feet. I'm pretty sure I can. He becomes helpful to us.
In-House Attorney #1:	We should put our arms around the neighbor.

The local and in-house attorneys concertedly pressure the in-house engineer to accept the neighbor's less favorable, vertical scenario not only because they anticipate that the jury will believe the teenager but also because they anticipate relying on other parts of his testimony that can be made to appear favorable on cross-examination. Thus, they "don't want to call that guy a liar."

In this case defining exchange, the defense attorneys are less interested in what their particular engineer may regard as the physical truth of the matter than in building a coherent chorus of truth from the various eyewitness accounts

introduced by the plaintiff. Rather than impeach the plaintiff and his teenage neighbor using the in-house engineer's physical reconstruction of the accident, the defense attorneys work to formulate a favorable theory of what happened that strategically embraces the other side's deposition testimony. Here the defense side's version of what happened takes shape around what the attorneys see as the least assailable evidence. But note that there is more to "the facts" than a story crafted in simple anticipation of the other side's perceived strengths and vulnerabilities. To become such a strategy, it must be negotiated through the distinctive professional rationalities in tension within the defense side.

In the alignment of local defense and in-house attorney views favoring the teenager's eyewitness account over the physics-oriented view of the in-house engineer, we see that the struggle to define the case continues along profession group battle lines deep into corporate culture. On the other hand, these in-house attorneys also broke professional ranks with the local attorney, favoring some parts of the in-house engineer's accident reconstruction over the scenario that the local defense attorney propounded. In alternately urging the local attorney and the in-house engineer to consider each other's positions in case defining disagreements, in-house attorneys appeared to function as mediators or go-betweens taking elements from both perspectives and weaving them into a coherent account on which the local trial attorney and the in-house engineer could agree.

I interviewed the above in-house engineer, Kurt Plum, nearly a year after working with him on the riding mower case. When I asked him to describe disagreements with local trial attorneys over the theory or evidence of a case, Plum emphasized that -- because his in-house attorneys functioned

in an intermediate position between himself and the local attorney -- such disagreements were few and typically resolved to his satisfaction:

> Well, we don't have that much problem because we have a lawyer in between. When we go, for instance, to a trial or a deposition, we take our own lawyer along. The local lawyer's in charge of the trial and in charge of the deposition because he knows the law. But our in-house, a lot of conflicts which you would face, we don't have that much or I don't have to face them so much because a lot of things are straightened out already between our local lawyer and our company lawyer.

In addition to being trained in law, in-house attorneys typically know a great deal about company products, manufacturing processes, policies, and personnel. Therefore they are uniquely situated to mediate conflicts between local defense attorneys and in-house engineers.

Although Plum almost always worked as a company defense expert, he reported that he also occasionally worked as an expert witness for plaintiff attorneys who were suing competing lawnmower manufacturing companies for not using certain mower safety features that Plum designed and instituted at his company. In the following quote, Plum emphasized the absence of a supportive, intermediary attorney as the major difference between working on the plaintiff side versus the defense side.

> I'm fortunate that I very seldom work for plaintiff lawyers, the plaintiff. Basically there would be no

> lawyer in between. It would be strictly approached with me and the plaintiff [lawyer]. And the plaintiff [lawyer] would say, "Well, I'm hiring you, and I expect you to testify so and so." He's the guy who controls the money aspect of it; so, he would be the guy who would also like to tell me what I have to testify on it -- where in my defense case, the lawyers know already what I am going to testify and talk about, company lawyers. They carry the message around, and they'll say basically the same thing, like I am: "No, we're not doing it this way. That's how we're doing it. Look it here, that's our approach. Here are the questions what we ask, and here are the questions of what you should ask to the plaintiff," and so on.

For Plum, part of what's distinctive about his defense work is that he and company attorneys have "our approach" that has evolved from working together on previous cases. Through this experience, they have learned to take supportive roles, forming a collective "we" that, in Plum's view, warrants the authority to tell the local defense trial attorney how to run the case, even dictating the questions he or she should ask witnesses at trial.

On the other hand, when working on the plaintiff side, the case is "strictly approached with me and the plaintiff [lawyer]" who "controls the money aspect of it." Here Plum has no corporate "we" behind him. It is the plaintiff attorney "who would...tell me what I have to testify on it." As an isolated, paid expert for the plaintiff, Plum feels little control in shaping the case.

Plaintiff Trial Expert Roles

The first official document that plaintiff attorneys produce in the trial preparation stage of product suits is a complaint, filed with the court and the other side. Soon after plaintiff attorneys file the complaint, the period known as "discovery" begins at a date set by the court. Discovery is the official period for taking depositions and requesting documents from the other side. It roughly spanned from the filing of the complaint until about two weeks before the trial date.

During discovery, the sides may elect to send a list of questions called "interrogatories" to the other side, requesting, among other things, the names and opinions of engineering trial experts. As their work filters from private engineering and law offices to official public records, great changes occur in the roles and relations of attorneys and engineers on both sides. In fact, the skills and public persona of the "trial expert" are so different from that of the consultant that both sides routinely hire new engineers to function in this role.

As trial preparation begins, a dramatic change occurs in the engineer's struggle with plaintiff attorney clients. We saw that in the initial evaluation, Jim France struggled against the narrow directives of plaintiff attorneys for a role that cut across multiple engineering specialties. In the trial preparation phase, France's struggle with attorneys was the reverse. Now the fight was to stay strictly within the confines of his accident reconstruction specialty, against attorneys who routinely tried to "stretch" him to a role covering multiple engineering specialties:

> Because the cost of litigation has gone up so much in the past several years, [attorneys] will attempt to take one expert and to apply his expertise not only in the field that he is an expert in, but they try to stretch it. You know, if there's another issue that has to be handled, instead of going out and getting a separate expert, they'll try to stretch your expertise into that. And, you know, what you have to, you have to draw the line with them and say "Look, this is what I do. I can do all these other things, but this is my big field of expertise, and as you try to stretch me out of it, if I lose credibility in one of these little runners that you're gonna set out, the jury or the other side's attorneys are going to look at me with a little less potency in my real area." And it's very difficult to get attorneys not to try to stretch you out and use you for multiple disciplines of expertise.

Again, we saw that as a consultant evaluating the case off the public record, France struggled against the narrow directives of attorney clients to gain a role covering multiple areas of engineering expertise. However, as a trial expert answering interrogatories and preparing to testify in public, he now struggles against attorney efforts to "stretch" him to multiple areas. Displaying his orientation to the front stage of civil disputing, France explains to attorneys that "if I lose credibility in one of these little runners that you're gonna set out, the jury or the other side's attorneys are going to look at me with a little less potency in my real area." Having once struggled to gain a backstage "generalist" role, France now struggles to trim his public persona to the dimensions of what he anticipates lay jurors will recognize as a specialized expert.

The plaintiff attorney's needs simultaneously shift when trial preparation begins. To initially evaluate the case, the plaintiff attorney chooses an assortment of inexpensive specialists to do a series of quick, preliminary investigations. But to cut the tremendous out-of-pocket expense of preparing for trial, the plaintiff attorney now wishes to stretch France to multiple roles.

France countered attorney pressure to stretch him by using much the same strategy that he used to counter attorney pressure to narrow him. He organized his side's assorted engineering specialists into a team, with each engineer covering a specific set of issues that corresponded to his or her specialty (continuous with above):

> And so you really have to sit down, and in my opinion you have to sit down with them right off the bat and go over the team that is necessary, and I think that's probably one of the keys to a good attorney-expert relationship, is having that meeting up front and plan the case and plan the application of this expert and how this expert will fit with other experts that may be needed on the team. And if they get that understanding from the get-go, then it seems to smooth out the relationships as you go along.

In France's experience, narrowly defining the roles of trial experts is crucial to "good" or "smooth" relations with attorneys. Continuing on the theme of resisting plaintiff attorney attempts to stretch him during trial preparation, France went on to down play the attorney's economic incentive.

> Each issue takes the same research whether I do it or another person does it. You know, so all the time, the time demand is gonna stay the same. The only difference is you're dealing with one expert, and he can typically integrate it better. You know exactly what you're gonna say about this one issue; and therefore, you're not gonna say anything that contradicts that when you're talking about another issue. And that, that of course is what they worry about with multiple experts is the possibility of a wedge being driven between little teeny-appearing differences in opinion from one expert to the other. But you know, again, that's part of that attorney-engineer relationship is getting the attorney to realize the boundaries of the comfort zone of the expert.

Here France gives a performative reason, besides economy, for the attorney to stretch him: "one expert...can typically integrate it better" than a team of multiple experts who may contradict each other on the stand. He goes on to say that attorneys worry about the "possibility of a wedge being driven between little teeny-appearing differences in opinion from one expert to the other" during cross-examination. Thus, as France sees it, the attorney change in pressure from narrowing his role to stretching his role is similarly motivated by anticipation of France's appearance front stage.

France went on to provide additional details in a longer, more specific account of his trial preparation struggle with plaintiff attorneys:

> Many times, usually -- let's just take an automotive accident which is what I'm the most familiar with --

there are three and sometimes four areas where there are experts involved. For me personally, they'll try to take me and push me into design engineer, and you know I've had tons of experience. I mean, my God, you know, 23 years and six thousand accidents, I feel very comfortable in talking about the design of certain things in the vehicle. But, I'm not a design engineer. You know, and sometimes you need that person that's had either experience in industry or experience in design that has to specifically talk about, and they'll sit there and say "Well, Jim you've taken apart some two, three thousand seatbelts." Yeah, that's true, and I know seatbelts inside and out. But that doesn't mean, you know, if somebody asked me what was the rotational energy on this little widget in that seatbelt as it struck this other piece, that I know the answer to that question. And so again, they'll try to stretch me to use me as that, and sometimes it's because they like the way I testify, and they know that I'll be able to explain it. My major area is the reconstruction of the accident. But it's the reconstructionist's job to know enough about the mechanics and the engineering properties and the injury mechanisms. See, I can deal with an injury mechanism. I mean I have no problem testifying as to what caused the injury inside the vehicle of the occupant. That actually is part of accident reconstruction. That goes to the movement of the occupant and what he contacted, and you're gonna have physical evidence sometimes of blood and skin and hair and tissue and stuff. But what it doesn't go to is well, what actually caused the pathological injury to the occupant. Yes, I know it was the A pillar

> or he hit his head, and I know that that caused closed head injury because that's what the medical report says, but how did it cause that closed injury? That's where I stop. And I've gotta be able to take it when I'm testifying, testifying and explaining to the jury the aspects of the reconstruction, and then I gotta hand that baton off very neatly to that bio-mechanic. And then he's gonna start with "Okay, the head is hit up here, we've seen the hair," blah, blah. He's gonna repeat a little of what I've said, and then go into the anatomical and the biological aspects of it, and the force, the forces that were acting upon the actual occupant. And then the reconstructionist has also gotta be doing the same thing with design. "Okay, here's the seatbelt; the seatbelt failed; we've got physical evidence on the belt where it's pulled out ten inches. And, you know, in my opinion that's not the way they're supposed to work." You know, you can get those kind of opinions in because in the crash test they're only allowed to move, or it's suggested in the federal motor vehicle safety standard that they move no more than one inch. So I can refer to things like that, but I hand it right off showing, you know, here's the physical evidence on the belt where it's pulled out; when we looked at the retractor we found this little piece laying in the bottom of it, and I hand it then right to that [design] engineer to go in and talk about what failed mechanically.

Here we see that France is just as mindful as attorneys of the possibility of "a wedge being driven between little teeny-appearing differences in opinion from one expert to the

other." Anticipating this possibility, France and the other engineering specialists choreograph their testimony to abut with a slight overlap. France explains that at the end of his accident reconstruction testimony, he touches on the next bio-mechanical issue, knowing exactly where to "stop...and...hand that baton off very neatly to that bio-mechanic" who, in turn, is "gonna repeat a little of what I've said, and then go into the anatomical and the biological aspects of it." France then describes "doing the same thing with design." This precise dovetailing of expert testimony at the boundaries of each specialist provides a united front that is difficult for the other side to divide during cross-examination. By making a precise division of labor along specialist boundaries, France attempts to achieve the same quality of performative continuity that attorneys hope to achieve by blurring one specialist across multiple areas of expertise. Although both engineer and attorney are oriented to building cohesion in the trial preparation phase, their struggle over the scope of engineering roles continues to be defined by conflicting agendas.

France also notes that attorneys "try to stretch me...because they like the way I testify, and they know that I'll be able to explain it." We saw that plaintiff attorneys choose consulting engineers, in the initial evaluation phase, for their expertise in evaluating a narrow technical question. However, in the trial preparation phase, France now describes the ascendancy of general communication skills over technical expertise in attorneys' preparation of trial expert engineers.

During discovery, attorneys on both sides evaluated how their experts held up under fire. George Albright described a mining injury case in which he replaced his declared trial

expert after he performed poorly in a deposition. According to Albright, this initial expert "was a practical guy that had worked for coal companies," "knew about this particular coal processing matter," "was a delightful guy, very pleasant fellow," and who "talking with him, you could get a lot out of it." But, because he was "inarticulate" when the other side took his deposition, Albright reported that he told him to "take a vacation" before the trial to a neighboring state where he couldn't be subpoenaed. Albright then replaced him with an "articulate" engineer who testified before the jury as Albright's trial expert. According to Albright, "The other [articulate] guy testified pretty nicely. And the other guy had gotten most of his information from the other [inarticulate] guy. That's how you do that."

Nationally renowned, plaintiff aviation product attorney Tod Quade emphasized the importance of demeanor and decorum over technical exposition for engineering experts preparing to take the witness stand. Quade reported that he chose, as trial experts, engineers who could win the "trust" of lay jurors not through technical explanations of what happened but rather by distinctively looking and acting like engineers:

> I say this with no small amount of amusement: I like for my engineers to look like an engineer. My metallurgist, I mean his haircut makes Dr. Einstein's haircut look neat. I mean it's white, and it goes all over the place. It almost looks like he stands in front of a fan before he comes to court. They typically don't dress very well, although they don't dress badly. They're neat, they're clean, but they don't look like a lawyer or a congressman or a senator. They look like

an engineer and a professor of engineering, which is what they are supposed. I don't want to make this sound childish, but engineers have to look like engineers for the jury to say, "Yeah, that's what an engineer looks like." Now once in a while, someone will be so good that it doesn't really matter. But, typically I like them to look a little bit like a wacky professor or at least have that sort of geekish, and it's not necessarily just the looks. Sometimes it's their mannerisms. If you ever watch engineers in their latter years, as their eyesight goes as it does with all of us who have to read a lot or work a lot, they're very funny the way they move their glasses to look at detailed pieces that they might want to express their opinions about. And the way they do that can be very soothing to the jury, sometimes comical, but always fulfilling the jury's concept of, "I can trust this person." But see, that's what the bottom line gets down to. I mean you have to understand, and a lot of people don't understand this. I don't want my jury at the end of Dr. Smith's testimony to understand the science of aeronautical engineering. What I want them to do is know they can trust Dr. Smith's understanding of aeronautical engineering. If they distrust Dr. Smith, I don't care how much you teach them about engineering, they're never going to be able to accept what he said was the reason the crash occurred or whatever. Those affectations, with an "a," are important to me because they are going to be important in the jury accepting the knowledge that this person is giving them. I think that's a big mistake of a lot of lawyers, trying to teach the jury the whole

> concept through a witness. I don't do it that way, normally. What I want them to understand is the witness understands it, and explain it to them enough so they generally understand the framework and then say to themselves, "We can trust that witness. He's telling us the truth. He knows why it broke and he's telling us why." That's the reaction I want from the jury.

In this quote, we see that Quade does not want his engineering experts to provide the jury with a detailed technical understanding of the accident. Rather he wants a "framework" from his engineers and the type of distinctive clothing, hair, and mannerisms that display to jurors that the expert knows the technical details, without having to go into them. Here we see that the emphasis in preparing for trial is on casting a performance for lay jury appeal.

In the initial evaluation phase, plaintiff attorneys hire engineering consultants to evaluate narrow, technical questions. As they prepare for trial, both plaintiff attorneys and engineers shift their emphasis to front stage performative over backstage technical engineering roles, transforming conflicts and conflict management strategies.

Defense Trial Expert Roles

In the midst of backstage, case defining negotiations with in-house engineers and in-house attorneys, local defense trial attorneys often located and hired an "independent" engineering expert, not affiliated with the defendant company, to act as the defense trial expert who would testify on behalf of the company in depositions and in trial, if the case did not settle. Many local defense attorneys said that

they preferred to use an independent rather than an in-house engineer for the public record because in-house engineers were typically career employees of the defendant company, a fact thought to cause what one local defense attorney described as "visions of bias by the jury." Absent client objections or other offsetting factors, local defense trial attorneys preferred to use in-house experts as backstage consultants and independent experts as front stage witnesses. Thus, as with plaintiff trial attorneys, defense trial attorneys also divided consulting and trial expert roles based on a presentational strategy, in anticipation of public cross-examination.

Hiring an independent engineering trial expert also allowed the local defense attorney to negotiate an intermediary position between the in-house and independent engineers, acting more as a mediator or facilitator than as a direct combatant in case defining disagreements with the in-house engineer and attorney. Local defense attorney Gary Breedlove reported that he avoided conflict with company personnel by using the in-house engineer as a consultant in conjunction with an outside, independent engineer:

> Generally speaking, if I have the opportunity, I like to use in-house engineers as consultants and hire outside engineers to do the independent testing. It avoids all the other things that you have to deal with, all the headaches and handling the client and the in-house engineer.

We have seen that in-house engineers rely on in-house attorneys as mediators to avoid conflicts with the local trial attorney. In the present quote, we see that the local trial attorney, in turn, relies on independent engineers to avoid

conflicts with in-house engineers. For the defense team, unresolved conflict between the in-house expert and local trial attorney is so disastrous that both rely on a member of the other's profession to smooth relations. As the in-house attorney mediates disagreement between the in-house engineer and the local trial attorney, the local trial attorney mediates disagreement between the independent and in-house engineer. Thus defense-side relations between company and non-company personnel are buffered at every juncture by defense attorney mediators, in contrast to the largely unmediated attorney-expert exchanges on the plaintiff-side.

Picking Defense Trial Experts

The chief in-house engineer tended to take the role of the backstage generalist who, in conjunction with attorneys, coordinated the front stage, independent expert testimony across multiple areas of engineering expertise. Correspondingly, the independent engineer, located and hired by the local defense trial attorney, tended to take the specialist role of the trial expert who publicly testified about particular issues that fell within his or her recognized field of engineering expertise. Because local defense attorneys typically located and hired the independent trial expert, it ultimately fell to them to identify the most pertinent area of engineering expertise available for the case. Local defense attorneys depended largely on information supplied by plaintiff attorneys in the complaint and in interrogatories to identify the particular independent trial expert they needed. Taking strategic advantage of the defense's dependence on them for pertinent information, plaintiff attorneys often wrote the complaint in an open-ended manner that made it

extremely difficult for defense attorneys to determine the specific area of engineering expertise from which to draw their trial expert.

The defense's difficulty in choosing an expert based on information supplied by the plaintiff tended to offset their financial advantage in hiring experts. With insurance company funding, defense attorneys could afford to hire the most highly qualified and experienced independent engineer in the world for the particular engineering defect alleged in the complaint. To hire the best was the defense rule of thumb. Furthermore, particularly in high-dollar cases, defense attorneys reported that they also put on retainer the second, third, and sometimes fourth best independent experts -- not because they planned to use them, but to prevent plaintiff attorneys from hiring them.

Plaintiff attorneys blocked the defense's potential to horde the best experts by confronting defendants with a staggering number of diverse allegations in complaints and interrogatory answers. Although the defense typically could afford to hire the best experts, the number and diversity of allegations prevented them from identifying the type of specialist to hire. Furthermore, plaintiff attorneys typically put language in complaints reserving the option to amend it in light of new evidence, allowing them to completely change the allegations initially stated, sometimes calling for completely different types of expert. The plaintiff attorney practice of making complaints as open-ended as possible as they reviewed company records made available through discovery continually beguiled defense attorneys who needed to hire a liability expert as soon as possible to prepare for trial.

Adding further uncertainty, plaintiff attorneys typically wrote complaints to include as many co-defendants as possible, often covering the gamut of those producing, distributing, and maintaining the product. Plaintiff attorneys reported that adding defendants not only multiplied legal options, but also increased the likelihood that co-defendants would turn on each other, deploying their trial experts to the plaintiff's advantage. The diversity of parties and allegations made it very difficult for defense attorneys to identify specifically what and who the plaintiffs primarily blamed for the injury, making it nearly impossible to reliably choose the liability trial expert they required.

Discovering What the Case is About:
An Example from the Wilson Firm Case Files

The information that plaintiff attorneys furnish in complaints and interrogatories is vital to the defense side's understanding of what the case is about and, consequently, their identification of the particular independent trial expert on whom their case hinges. To understand how this formal exchange of information across the sides shapes the defense's emerging comprehension of the case and selection of trial experts, let us examine how local defense trial attorneys responded to the complaint and series of interrogatories in a product case that I helped to prepare.

In this case lead attorney Howard Hunt and Wilson firm associates defended an Italian pasta machine manufacturing company, La Semolina, insured by one of the law firm's main insurance company clients. The plaintiff, Laura Rider, was a restaurant worker injured on January 5th, 1995 when her right hand and arm were pulled into a La Semolina pasta machine as she cleaned the machine's large mixing bowl and cutting blades. The machine broke her fingers and pushed cutting

blades through her hand and arm, resulting in permanent, life-altering disability, both sides' damage experts agreed.

The Rider case complaint had a total of three counts and 41 allegations, many of which contained multiple sub-allegations. "Count One" of the complaint was a "Claim For Injury Caused By Deliberate Intention." Under count one, there appeared a series of numbered allegations. The 9th allegation pertained to the pasta machine and its maintenance. This allegation was comprised of 10 sub-allegations that constituted the section of the complaint pertaining to "specific" product defects.

The 9th allegation was first stated in general, followed by the 10 more specific sub-allegations. These more specific sub-allegations were set off from the initial statement of the 9th allegation by paragraph indentation and small case letters: a), b), c) through j). To keep the reader oriented, I analyze the sub-allegations paragraph-by-paragraph, demonstrating the enormous breadth of issues that local defense attorneys for La Semolina faced as they attempted to identify what the case was specifically about and choose a corresponding trial expert engineer. First the initial statement of the 9th allegation:

> 9. On January 5, 1995, the La Semolina Pasta Machine constituted a specific unsafe work condition existing in the work place of the defendant, R.G.M.I., Inc., doing business as The Olive Branch, which presented a high degree of risk to the employees of said defendant, including the plaintiff, Laura Rider, and a strong probability of serious injury in that:

This initial statement of the 9th allegation alleged that Laura Rider was exposed to "a specific unsafe work condition" that

"presented a high degree of risk to the employees...and a strong probability of serious injury..." First, note that although the 9th allegation portends specificity, it names three responsible entities: La Semolina, The Olive Branch, and R.G.M.I., Inc. Each of these entities had a distinctive relationship to the plaintiff on the day of her injury. The Italian company, La Semolina, made the pasta machine that mangled her hand and arm. The Olive Branch restaurant, one of a national chain, employed Rider and provided the site of her accident. And R.G.M.I., Inc., the parent company of The Olive Branch restaurant franchise, maintained the pasta machine that injured Rider.

In reading this allegation, lead defense trial attorney Howard Hunt noted that it was impossible to discern which of the three entities the plaintiffs were blaming for the accident: was it his client, La Semolina, for making a defective machine; was it the restaurant for failing to adequately train employees to use it; or was it the parent corporation for failing to properly maintain the machine? The list of more specific sub-allegations constituting the 9th allegation only compounded Hunt's uncertainty:

> a) the La Semolina Pasta Machine lacked the proper shut-off devices in the event of an emergency, or in the alternative, such device or devices were not properly located and marked;

Sub-allegation (a) initially identifies what, at first, sounds like a specific product defect: "the La Semolina Pasta Machine lacked the proper shut-off devices in the event of an emergency." However, the plaintiff attorney goes on to qualify this allegation by saying, "or in the alternative, such

device or devices were not properly located and marked." This qualification appears to acknowledge the plaintiff attorney's understanding that the machine possibly did, in fact, have shut-off devices. Keeping options available in the event of this possibility, the plaintiff attorney makes a contingent allegation of a completely different nature: "in the alternative" the shut-off devices "were not properly located and marked."

This "alternative" allegation left Hunt and his associate, Tillman, wondering: was the plaintiff attorney alleging that the machine had no shut-off devices, improperly located shut-off devices, or improperly marked shut-off devices? Here, defense attorneys viewed subsection (a) as containing three qualitatively different hypotheticals, the first two being mutually exclusive alternatives, with no clear indication of what specific product defect the plaintiff was alleging.

Subsections (b) through (j) greatly compounded their inability to identify a specific product defect:

> b) the La Semolina Pasta Machine lacked other safety devices and safeguards;

For the attorneys defending Le Semolina, this unspecified "other" sub-allegation opened an unlimited number of potential product defects, possibly including a lack of protective safety shields.

Defense attorneys viewed the next sub-allegation in this section as being of a completely different nature.

> c) the La Semolina Pasta Machine lacked adequate instructions for operation;

This sub-allegation raised issues of instructions and accompanying documents that defense attorneys regarded as distinct from the previous issues relating to the design safety of the machine, possibly requiring an altogether different type of engineering expert. But here the complaint was inscrutably vague to defense attorneys, not stating what instructions the machine allegedly "lacked" but rather merely saying that they were not "adequate."

This sub-allegation left local defense attorney Howard Hunt and his associates wondering what type of instructions the plaintiffs were referring to: instructions for making pasta, instructions for cleaning and sanitizing the machine, or instructions for avoiding accidents? Defense attorneys complained that each of these areas of instruction fell to different realms of engineering expertise, making it impossible for them to identify the specific type of engineer they would need as their main trial expert.

The next sub-allegation added another wrinkle in the defense's choice of a product expert:

> d) the La Semolina Pasta Machine lacked adequate warnings of the potential hazards and dangers of operation;

For local defense attorneys, this allegation opened yet another distinctive area of engineering expertise -- the field of identifying potential operating hazards that cannot be eliminated through fail-safe devices or safety shields and, accordingly, are best addressed through warning labels placed on the machine. Here defense attorneys thought they might need an engineer specializing in warning labels.

The next sub-allegation (e) stated that R.G.M.I., Inc., the parent company of the restaurant, failed to properly equip or maintain the pasta machine. To local defense attorneys for the manufacturer, this sub-allegation appeared to attribute the cause of the accident to improper maintenance or use of the machine by the restaurant's managers, under franchise with R.G.M.I., Inc.

> e) the La Semolina Pasta Machine was otherwise not properly equipped or maintained by the defendant, R.G.M.I., Inc., rendering it unsafe for use or operation;

Defense attorney Howard Hunt and his associates saw this failure-to-maintain allegation against the restaurant franchise as opening an entirely different avenue of legal liability that was incompatible with holding their client, the machine maker, liable. However the plaintiff attorney went on to qualify this sub-allegation with yet another alternate sub-allegation, one that provided for the continued liability of the machine maker:

> f) in the alternative, the La Semolina Pasta Machine was of such a condition that it could not be rendered reasonably safe for use or operation by defendant, R.G.M.I., Inc.'s employees, including the plaintiff, Laura Rider;

The remaining 4 sub-allegations in the 9th allegation section allege a litany of negligence on the part of the restaurant franchise, comparable in scope and content to the innumerable and inscrutable allegations made against the

pasta machine maker. To spare the reader redundant analyses, I list these allegations then discuss their relevance in bulk.

> g) the defendant, R.G.M.I, Inc., failed to have in place a proper lockout/tagout procedure with respect to the La Semolina Pasta Machine;
> h) the defendant, R.G.M.I, Inc., modified the La Semolina Pasta Machine so as to render it unsafe for operation;
> i) the defendant, R.G.M.I., Inc., did not establish a program of employee training to insure the safe operation of the La Semolina Pasta Machine and specifically failed to instruct the plaintiff on the proper and safe method of removing dough from in, around, and underneath the machine parts, including the mixing bowl;
> j) there were other conditions which resulted in or contributed to a high degree of risk to the defendant, R.G.M.I., Inc.'s employees including the plaintiff, Laura Rider, and a strong probability of serious injury in regard to the operation of the La Semolina Pasta Machine.

In assessing these last sub-allegations, Howard Hunt concluded that the defective product sub-allegations against his client, Le Semolina, were logically incompatible with the sub-allegations against the restaurant franchise: "They can't have the employer at fault and the machine at fault. Either the machine caused her injury or the employer caused her injury. One has to be dropped. They can't have it both ways." To this, I responded, "What if the employer failed to maintain the machine, and there was a design defect that, in

combination, caused her injury?" Hunt answered my question by explaining that "In law, we have something called *proximate cause* --- you have to go with the closest cause. I don't see how it could be the employer and the machine."

With the sundry and, in part, mutually exclusive (alternate) sub-allegations constituting the 9th allegation, Hunt said that he could not identify a specific product defect from the complaint; and therefore, he could not identify the type of independent engineering expert or experts he would need for the case.

I asked Hunt if he often encountered this type of difficulty in defense cases. He reported that it was quite common for plaintiff attorneys to initially use a "shotgun" approach, alleging every option available for legal recourse, making it impossible for the defense to identify, let alone prepare, prospective liability trial experts.

However, Hunt and other defense attorneys reported that plaintiff attorneys typically reached a point in the course of pre-trial negotiations at which they wished to settle the case, and at that point they typically made very specific and unequivocal allegations. Plaintiff attorneys likewise reported a settlement strategy of clarifying the issues following a period of obfuscation designed to hamper the typically better funded defense attorney's trial preparation and drive up their cost.

In the Rider case, Hunt guessed that, unless the plaintiffs wanted to settle, he probably would not be able to identify a specific product defect until he deposed the plaintiff's engineering trial expert. So -- although poised with insurance backing to hire the best -- Hunt lacked adequate information as to the specific area of expertise he needed. Thus, where

plaintiff attorneys typically hired trial experts shortly after the initial evaluation, defense attorneys, hampered by plaintiff obfuscation, often had to wait until they were well into the discovery phase of trial preparation to hire trial experts.

Hunt answered the complaint against Le Semolina by denying all the allegations. In conversations with me, Hunt said that the machine had both an off switch and a fail-safe mechanism, in case the off switch malfunctioned. Hunt explained that the fail-safe mechanism was a metal plunger that the lid of the mixing bowl pushed down to complete the electrical circuitry that ran the machine, turning off the machine whenever the lid was raised enough for someone to get a hand in the mixing bowl. However on this particular machine, a part in the lid mechanism had worn out, making it possible to run the machine with the lid open, restaurant workers testified in depositions.

Hunt wondered incredulously what sort of product defect argument plaintiff attorneys might develop against La Semolina. "Are they going to say that we should have made a machine that couldn't wear out? Or are they going to say that the machine should have had a second fail-safe mechanism for the first fail-safe mechanism?" "If so," he continued, "why not have a third fail-safe mechanism for the second-fail safe mechanism, and a fourth for the third, until the machine is covered in buttons."

Hunt also produced seemingly exhaustive operating, cleaning and safety instructions that came with the machine. Furthermore, a photograph produced by the plaintiff attorney showed a large, orange warning label on the front of the machine that read "Caution: Unplug Machine Before Cleaning." It was obvious to defense attorneys that Rider had

not heeded this warning, opening the possibility of attributing the accident to operator error.

I asked Hunt if he thought that the plaintiffs would want to settle with Le Semolina since the safety design, instruction, and warning defects they alleged seemed dubious. He shrugged and shook his head, indicating that he didn't know. Then I asked why he thought the plaintiffs were suing La Semolina in the first place since they seemed to have a better case against the restaurant for not replacing the worn part in the fail-safe lid mechanism. Hunt responded that the suit against the restaurant was a "mandibular" case (employee suing employer), and the Federal Court in the district where the case was to be tried had never ruled for a plaintiff in a mandibular case. So, he said, plaintiff attorneys probably were bringing the product suit against Le Semolina as a backup.

The attorneys for Le Semolina and Olive Branch restaurant responded to the complaint by filing a joint request to the plaintiffs for more information, consisting of 23 interrogatory questions. The first two of these questions asked plaintiffs to clarify their allegations regarding the "specific unsafe working condition" cited in their 9th allegation:

> 1. Please describe with particularity the specific unsafe work condition(s) which Plaintiffs claim existed in support of their pending claims under [State] Code 23-4-2.
>
> 2. For each of the specific unsafe condition(s) detailed in response to interrogatory 1, please set forth all facts in support of Plaintiffs' claim that each alleged specific unsafe work condition presented a high

> degree of risk and a strong probability of serious injury or death.

The plaintiff attorney replied to the defense's first and second interrogatories with the following "objection."

> Objection... Defendant has failed and refused to answer many of the discovery requests propounded by the Plaintiffs which may be relevant and material to Plaintiffs' proof of these allegations. Therefore, it is impossible for Plaintiffs to provide a complete answer to this question at this time.

This response provided the defense with no additional insight as to the "specific unsafe working condition" alleged.

The defense's third interrogatory question asked for specific information about the plaintiff's experts:

> 3. Please provide the names of any experts the plaintiffs are relying on in support of any claim that a particular unsafe work condition presented a high degree of risk and a strong probability of serious injury or death. Please provide each expert's area of expertise, educational background, degrees and/or qualifications, the substance of each expert's opinions, each expert's present title and position, and the address and phone number of each expert.

The plaintiff attorney also objected to this request to identify his experts, saying that it was "premature." However, while reserving his right to change experts in light of new evidence, he went on to volunteer the identity of his current engineering trial expert:

> Objection. Premature. Plaintiffs will provide the names of their expert witnesses and all of the other information that is required by the Rules of this Court when it is appropriate to do so. Without waiving this objection, plaintiff states that one of [sic] experts is Darrell Maddox of York Pennsylvania, who has expertise in bakery equipment. Again, his opinions and conclusions regarding the unsafe working condition in question cannot be answered in full at this time. See objections to Interrogatories No. 1 and 2.

Although no closer to discerning a specific product defect allegation to defend against, defense attorney Howard Hunt saw here an indication as to the type of trial expert he might need: a baking equipment expert to match the plaintiff's expert. However, Hunt's initial reaction was that the plaintiff attorney may have hired the wrong type of expert since the machine in question was a pasta machine, not a baking machine.

Along with his answers to the defense interrogatories, the plaintiff attorney sent a bundle of publications containing regulations from the Occupational Safety and Health Administration (OSHA) and the American National Standards for Industry (ANSI). Hunt said that the OSHA regulations applied to the restaurant, and the ANSI regulations applied to the pasta machine. From this, he guessed that the plaintiffs were probably going to argue that the Italian pasta machine did not meet American industry standards for bakery equipment. Thus, Hunt decided to seek, as his trial expert, the chair of the ANSI bakery equipment board that wrote the current standards. In particular, he

wanted this expert to evaluate whether or not any of the ANSI standards for bakery equipment applied to the Le Semolina pasta machine, and if so, how.

Most defense attorneys who I interviewed and worked with reported that their caseloads varied between approximately 50 to 75 active cases at a time. In a few highly active defense firms, attorneys reported caseloads varying between as much as 180 to 200 cases at a time. On the other hand, most plaintiff attorneys reported concentrating their efforts on their most promising 3 or 4 cases at a time, with plaintiff attorneys from the most active firms reporting working as many as 10 to 12 cases at a time. Thus defense trial attorneys typically could not invest as much time in the case at hand as their plaintiff rivals.

Furthermore, because defense trial attorneys built their case largely in response to the plaintiff's complaint, they typically had a more compressed time frame in which to prepare than the plaintiff attorney who had up to two years from the time of the accident to file a complaint in this state. Where the two year statute of limitations for filing a complaint often provided plaintiff attorneys with enough time to work with a series of candidate trial experts until they found one willing to support their theory of the case, defense attorneys responding to the complaint typically had less time to screen engineers and no detailed theory to use as a basis for screening. Yet despite the constraints of less time and larger caseloads, local defense trial attorneys also routinely screened a series of candidate trial experts until they found an agreeable one, as happened in this case.

Hunt gave me the job of locating the engineering trial expert for Le Semolina. He told me to start with the current ANSI chair of the bakery equipment board and work down

the list of board members until I found one willing to evaluate the case. The following reconstructed field note fragment describes my exchange with Hunt in more detail.

> Hunt comes into the conference room with the plaintiff's reply to his first set of interrogatories about the Rider case. It is a thick stack of papers and baking industry publications with a rubber band around it. Hunt takes it apart and goes to a publication by the American National Standards for Industry (ANSI). It sets out the industry safety standards for baking machinery. Hunt says that it looks like the other side's expert is probably going to say that the pasta machine wasn't up to the industry safety standards. He opens the ANSI publication and finds the page that lists the committee members names -- the people who wrote the standards. He says that I should call the chair, Robert C. Alderson, find out if he's an engineer, and ask him if he'll look at our case. Hunt says, in particular, he wants to know two things from Alderson: 1. Does he consider our equipment to be bakery equipment, according to the ANSI standard? -- in other words, do the ANSI baking standards apply to this pasta making machine? And 2. if the standards apply, does this machine comply with the standards? Hunt says that I should find out if Alderson holds an engineering degree, tell him to send his CV, and ask him his cost. And if he's not around anymore, I should call the second, then the third person on the list until I find someone who was on the committee that drafted the industry standards. He says that the ANSI publication does not list the

> phone numbers for committee members, but I might find their numbers in the registry of the American Society of Bakery Engineers since the ANSI publication says they are members. He adds that sometimes engineers refuse cases because they are too busy or have a personal distaste for litigation. In those situations, he says that he asks the engineer to recommend another engineer who might be interested.

Although they typically have a far less developed theory than plaintiff attorneys as they look for trial experts, we see in this fragment that defense attorneys also shop for expert witnesses, screening a series of candidates to locate a suitable engineer for their side.

Although the plaintiffs' reply to Hunt's interrogatory helped Hunt narrow his choice to a bakery equipment expert, he still did not know how to prepare this prospective expert, not knowing what the alleged product defect consisted of nor what particular industry standards applied, as the following field note fragment revealed (continuous with above).

> Then Hunt starts leafing through the ANSI publication again. He says that we need to look up our type of machine and read what the safety standards are. We scan the table of contents, but nothing jumps out at us. All the categories are for baking machines. Ours is a pasta machine. There is a section on "Mixers." Hunt turns to that section. There are several subtypes: "Horizontal Mixers," "Vertical Mixers." We read the section on horizontal mixers -- two pages of specifications for the mixing hopper. As he reads the specifications, Hunt says, "I

> don't know which ones really apply." Shortly, we give up trying to figure out what particular standards the pasta machine might have violated. Hunt says that that's something the expert will help us figure out, and he puts the publication aside.

Note that Hunt anticipates relying on his prospective trial expert engineer to help him discover what industry standards the pasta machine may have violated. Here Hunt plans to use his trial expert to do much the same type of initial investigation that plaintiff attorneys use consulting expert engineers to do. As Hunt prepares the defense case, his state of knowledge is roughly equivalent to that of the plaintiff attorney at the very beginning of the plaintiff's initial evaluation phase: Hunt senses that there may be a problem with the product, but he doesn't know what.

As with plaintiff attorneys and their trial engineering experts, the division of labor between Hunt and his prospective trial expert begins to emerge before they meet. However, for the defense side, struggling to identify the alleged product defect, the division of labor is much different. Where plaintiff attorneys tend to dictate to their trial experts what the case is about, Hunt depends on his prospective trial expert to tell him what the case is about. Because defense attorneys have few specifics, large caseloads and narrow time frames, they tend to compress the case evaluation and preparation phases by using their trial expert to help them initially evaluate the case.

Often genuinely unable to identify a specific product defect from plaintiff complaints, defense attorneys are willing to accept their engineering trial expert's technical input in shaping what the case comes to be specifically about. And in

relying heavily on their trial engineers' technical contribution to develop the case, defense attorneys appear to accept more readily the engineers' sensed comfort zones in defining their roles as trial experts.

Joyce Edens, a bio-mechanical engineer and former restraint systems designer for one of the big American automobile makers, worked as an independent expert mostly for defense attorneys. Edens stressed that, with a few notable exceptions, defense trial attorneys tended to respect her technical opinions and role definition, tending not to push her to testify outside of her specialty or conform to a pre-written "script" devised by the attorney for adversarial purposes. In the following quote, Edens contrasted her defense work relations to the more dictatorial style that she saw rival experts struggle against and that she encountered first hand in her limited work for plaintiff attorneys.

> For the most part, I think most [defense] lawyers are real good about letting you define what you are comfortable evaluating, and they respect the fact that you're willing to do that. There are some that just don't understand that, but I think for the most part you tend to see that, like many of the lawyers that I have worked with are real good that way, and they'll just say, "Are you comfortable with this?" If you say "Well no," then they'll say, "Well do you have a recommendation on someone else that this might be better suited for them?" I'd say it's more uncommon to find a lawyer that pushes that than it is to find a lawyer, I mean, there's more lawyers that respect that boundary than those that don't. It seems to me that you see more of that on the plaintiff's side, where

they really try to find somebody and make them a jack-of-all-trades. I do primarily defense work, but it has more to do with the fact that because I was at Standard Motors, I feel I have a confidentiality agreement with Standard Motors, and many of the auto manufacturers that I've done investigations with, they have shared confidential documents with me and information, and I have had a very good experience with the attorneys I work with because they are for the most part not the ones that are going to write your script and not the ones that are going to tell you what to say and not the ones that are going to try to get you to do things that are outside of your area of expertise. For the most part, they respect those boundaries. They respect your expertise and recognize that you cannot be a jack-of-all-trades. So, I would say it's more of a rarity to find someone that does not respect those boundaries. But they exist. I've done a few plaintiff's cases, and I make it pretty clear with those guys right up front, when they call, that I have no problems working on a plaintiff's case, but you have to respect my opinions and respect my boundaries, and if you can't do that, then maybe they want to find someone else. But, I know that, just from my perspective in dealing with the plaintiff's lawyers obviously from the other side, you do seem to see a lot more of them trying to use one person trying to evaluate everything, the lawyer kind of writing the script for what they think the allegations should be and are and what the defects they think are, and it just seems to be, that's more on the plaintiff's side than what I'm exposed to.

Although Edens's negative assessment of attorney-engineer relations on the plaintiff side may be biased by her work predominantly against plaintiffs, her assessment of her relations with defense attorneys as "very good" contrasts sharply with assessments of attorney-engineer relations from expert engineers on the plaintiff's side. As we saw with engineering expert Jim France, engineers who testify a great deal for plaintiffs tend to confirm Edens's perception that plaintiff attorneys routinely attempt to script engineering testimony for adversarial purposes and stretch engineers to trial expert roles beyond their expertise. On the other side, defense attorneys using trial experts to help identify what the case is specifically about cannot tell them what to say readily at the time of hiring. Thus, by necessity, defense attorneys tend to be somewhat less dictatorial in their early relations with trial experts.

In-House and Out-House: Making "The Best of Both Worlds"

Local defense trial attorneys reported that they typically prohibited communication between independent engineering trial experts and in-house consulting engineers. In the following quote, local defense attorney Gary Breedlove described the strategy behind this separation.

> It lets you have really the best of both worlds. By using the [in-house] consultant, you can gain the same information and knowledge from that guy or woman on both the product and the strategies, and turn that over. You're kind of the filter. You filter out the bad stuff and direct it on to the independent witness.

In his phrase "the best of both worlds," we see Breedlove's orientation to building his case by integrating into one favorable account the disparate perspectives of his experts. He describes separating experts to edit their opinions in much the same manner as plaintiff attorneys, using undisclosed in-house consulting engineers for initial evaluations, discarding "the bad stuff," and passing the favorable findings on to an independent trial engineer who can testify unequivocally as to the cause of injury. Although local defense attorneys typically worked with consulting and trial experts concurrently, they separated them for control, using essentially the same divide-and-edit strategy that plaintiff attorneys achieved by hiring and firing a consecutive series of engineers.

On both sides, the purpose of dividing and editing experts was to extract from their divergent views a single favorable account of "what happened" in the accident. To build such an account, defense attorneys constantly triangulated the opinions of their in-house and independent experts. As Breedlove explained,

> I'll bounce ideas off [the in-house consultant]. You know, when the [independent trial witness] says this -- particularly if it's somebody that I'm not familiar with or haven't worked with before -- just because they're an expert, you can't take them at their word; so, you want to make sure that the reasoning and the rationale that they've done, or what have you, is sound. And so, I'll go back to a consultant, or what have you, or run it past in-house engineers.

By checking the opinions of independent experts with in-house consulting experts, Breedlove gauges the distance between his experts.

Truly intermediary, Breedlove checked opinions in the other direction too. When I asked him, "Do you ever run things past your outside engineer to check on the opinions of the in-house guy?," he responded,

> Oh, sure. Sure. Ya. I do. The information flows both ways, generally speaking, between my in-house or my consultant and my outside engineer. But you have to be a filter there and protect what gets- And that goes back to using the consultant to do the initial testing. I don't want any bad results getting to my trial expert and tainting him. So, you have to be heads up and make sure you stay on top of it. The information does flow both ways, but you need to be more careful when it's going from a consultant to your trial.

By constantly cross-checking the opinions of each expert against the other and carefully filtering out bad results, defense attorneys build a coherent and favorable account in the same basic way as plaintiff attorneys. It is through such triangulation and filtering that each side's arguments and strategies emerge.

However, the defense attorney filtering process was complicated by their shorter time frame and shared control of the case with chief in-house experts. As a result, trial experts and in-house consulting experts often worked in close, yet carefully buffered, partnership from the initial evaluation onwards. To understand how defense experts and attorneys

filtered information under these circumstances requires a specific example.

Filtering Defense Experts:
An Example from the Wilson Firm Case Files

The following case provides an example of how local defense trial attorneys managed to separate the roles of consulting and trial experts while mobilizing them at the same time.

The case concerned a house fire that killed two young children and severely disfigured their mother who survived and brought suit. According to the mother's deposition, the fire started in their family Christmas tree, at the top of a string of ornamental Christmas tree lights that allegedly sparked and ignited the tree that ignited the house. Wilson represented the light string maker, a Taiwanese company insured by one of Wilson's insurance clients.

The mother filed suit in local circuit court for 22 million dollars in damages and suffering, contending that a defect in the string of light bulbs caused the fire.

In response to the suit, Wilson defense attorneys hired two groups of electrical engineering experts, residing approximately 300 miles apart. One group, based at a local technical university, were hired as consulting experts. The other group, based in a large out-of-state city, were hired as trial experts. Attorneys hired the latter group as trial experts largely because of their reputations for technical thoroughness and extensive experience in electrical product litigation. The consulting group were less experienced in litigation, but they were deemed highly competent and accessible.

To initially evaluate the case, local defense attorneys sought engineering opinions from both sets of experts as to

whether or not the plaintiff's light string could have produced a spark under the conditions described by the plaintiff and her husband in depositions.

The light string in question was destroyed in the fire; so, to test the plaintiff's theory, Wilson attorneys bought new light strings of the same make, model, and year as the original, and from the same store. They bought three strings of lights: one for the consulting engineers to test, one for the trial engineers to test, and one they kept in the office for themselves to examine and discuss.

Attorneys instructed the consulting engineers to try their best to produce a spark from the light string by short circuiting the wires under normal, 220 milliamps per second, household electrical current. Meanwhile, attorneys instructed the trial engineers to devise a testing procedure to determine whether or not the light string could produce a spark, but not to begin testing until the attorneys instructed them to do so.

Within a few weeks, the consulting engineers told attorneys that they could not produce a spark from the light string using 220 current. Attorneys then instructed the consultants to further test the lights under more extreme conditions than that described by the plaintiffs. The consultants then uncoiled the six wires constituting the light string and short circuited each individual strand of wire. They reported to attorneys that they still could not produce a spark using 220 household current.

Defense attorneys then instructed the consultants to increase the current above household limits. Not until the consultants nearly doubled the level of household current to 400 could they get one of the uncoiled wire strands to spark.

With these favorable initial test results from consulting engineers, Wilson attorneys, in turn, instructed the trial

engineers to attempt to produce a spark from their light string, using the method they had devised. It turned out that the trial engineers had devised a more rigorous testing procedure than the consultants. In brief, their procedure recognized that household current alternated between peaks of up to 300 milliamps per second and lows of less than 220. They reasoned that if they crossed the wires at the peak point of the alternating cycle where the current was strongest; there was a greater chance of producing a spark than if they crossed the wires at the low end of the cycle. Thus, to adequately test the lights under conditions that could have existed at the time of the fire, the trial engineers used a "peak voltage" meter that allowed them to short circuit the wires exactly as the current peaked.

The trial engineers' procedure for testing the lights was to short circuit an unwound, individual strand of wire at each light bulb juncture as the current peaked, and to continue this procedure down the string of lights, photographing each short for evidence of sparking. As they neared the bottom of the light string where the circuit was the shortest, pictures of the wire, magnified 5,000 times, began to show "molten pitting," a sign that the wires were beginning to melt. When they discovered the molten pitting, the trial experts stopped testing the light string and told the attorneys that they should have the consultants continue the test because it appeared likely that the wires would spark as the circuit became increasingly short toward the end of the string.

With this news, Wilson attorneys instructed the consultants to use a "peak voltage" meter and start shorting their light string where the trial experts left off. When the consultants, in fact, produced a spark near the end of the light

string using the trial experts' testing method, Wilson attorneys settled the case out-of-court for $5.5 million.

By closely directing and coordinating the efforts of consulting and trial experts, local defense attorneys keep the editorial buffers in place, even while using both to help initially evaluate the case. Through this fine grained filtering process, defense attorneys attempt to piece together from the findings of disparate experts a definitive team line accounting for "what happened" in the accident. In this case, the account that began to emerge was the wrong one for the defense.

On Making One Voice From Many

Veteran electrical engineer, Frank Rowe, reported that, as a defense trial expert, he often identified the particular risky parts of testing procedures and referred them, through the attorney, to the consulting engineer:

> Sometimes you can do tests that don't help you, but you don't know that initially. That's a difficult task. The way we can sometimes handle that is to have the attorney initiate the test with another group that we deal with and sort of build a Chinese wall between myself and the other group -- so that I don't know what they're doing, but I sort of tell him these are the types of tests I want done, and they will do some initial testing to find out if there is any useful results in it. Provide him with a report. Now, he can choose to use or not use that report as he sees fit. If their results seem to be favorable, he can then bring me in contact with them, and I can refine the test. Do you see what I mean? There have been instances where it's of strategic value not to have test results because

> sometimes they go contrary to what you want to prove.

According to Rowe, if the test results achieved by consultants "seem to be favorable," the attorney may elect to bring the trial and consulting engineers into more direct contact. Here we see that the attorney filter between consulting and trial experts becomes increasingly porous as the case begins to take definitive shape. With the accumulation of a body of "favorable" test results, the case congeals around a witnessably coherent account of "what happened" that all on the team can support.

However internal disagreement, both expert to expert and attorney to expert, often stifled efforts to build a unified account of the accident. When no single "voice of truth" emerged to provide a team line, defense attorneys examined their legal options and often chose to settle. Gary Breedlove described this choice for local defense attorneys:

> What if the outside [expert] says, "Well the in-house [expert] is full of shit and doesn't know what he's talking about?" Then you have to take into account a lot of things: the trial strategy, where you are, and really what you think is gonna fly. If looking at it, to me, the in-house guy makes more sense, I find him more credible, then that's when you get into the cost-effect analysis and determine whether to settle the case. You don't have to just fold up your tent and go home. You can still rely upon the other expert if the opinions are favorable. But the mere fact that two people who are on your side view things differently should give you some indication that it's not an open and shut case, and you've got risks.

When their consulting and trial experts cannot reconcile their divergent views, defense attorneys recognize that they "got risks." In fact, fitting diverse expert opinion to a single coherent account of the accident is so difficult that in most cases attorneys decide that it is not worth the risk, providing a major impetus for negotiating settlement out-of-court.

Conclusion

To understand what happens to cases out-of-court, one must understand the relations of experts and attorneys whose work constantly shifts between the protean borders of science and law. In the process of attempting to reconcile their conflicts, attorneys and engineers shape not only the select few cases that reach a courtroom but also seal the fate of the far larger proportion that do not. Far from merely being a means to bring frivolous lawsuits to court, attorneys on both sides use expert engineers primarily to settle or drop cases out-of-court. This book has provided a view of the under-studied and misunderstood politics of managing the vast, untold majority of civil cases that never see the public light of day.

At the start of their respective initial evaluations, neither side's attorneys typically know what the case is specifically about nor what type of engineering expert or experts they need. Both plaintiff and defense attorneys negotiate their way through this uncertainty, improvising the case as they encounter resistance from engineers. In the ensuing struggle, each professional group attempts to pull the other, from whatever position of dominance they can achieve.

As editors of expert opinion, both plaintiff and defense trial attorneys generally take a large role in organizing and creating what the case comes to be about. Some differences in the way that they control engineers can be traced to structural differences of time frame, caseload, cash flow, and organizational dominance. But despite these structural differences, plaintiff and defense trial attorneys manage expert engineers using variations of the same interactional strategy. Both control the case by keeping experts separate and editing the flow of information between them from the initial investigation onward. If a sellable theory emerges from the initial investigation, attorneys on both sides hire and, if necessary, fire a series of trial experts until they acquire a set who are willing and able to testify to that theory. At each stage, the attorneys on both sides attempt to control the case by placing their voices between that of their experts. Be it plaintiff, local defense, or in-house attorney -- their backstage role is to orchestrate from the many diverse voices of their experts a unified, coherent account of the accident that can stand up as "the truth." Notably, attorneys don't succeed in shaping a coherent voice of truth in most cases. In dropping or settling cases that fall apart under their evaluation, attorneys and experts dispense an informal brand of truth and justice that dwarfs the output of courts.

I found little evidence to support the common wisdom that expert engineers tend to be "whores" willing to adopt an attorney's theory of the case simply because the attorney deems it sellable to a jury. This common misperception overlooks the fact that most of the time attorneys do not have a worked out theory of the case when they hire engineering experts. It is only by working with a collection of diverse engineering experts over a period of months or years that

attorneys come to recognize how a particular accident may be linked to product defects. As we have seen, attorneys hire engineering experts for initial investigations not as public advocates but rather as frank confidants to help identify and get rid of cases that are a waste of time and money. It is hard to imagine a more just and efficient system for sorting out frivolous law suits.

In the relatively few cases that emerge from the investigative stage with an intact voice of truth, attorneys on both sides often shop for trial experts who agree with their theory. Many critics of science in law point to this buying and selling of expert opinion on the open market as a sure road to scientific corruption and prostitution. Yet if trial experts were actually as unscrupulous as the common wisdom suggests, then attorneys would not need to shop extensively from expert to expert to find a favorable opinion. As we have seen, the need for shopping arises precisely because engineers tend to be uncompromising in their opinions about the cause of injury.

Crusaders against expert duplicity have not observed the contentious backstage social dynamics through which attorneys and engineers actually develop the evidence and legal strategy of cases. Their competing agendas produce adversarial relations on each side, at every juncture in the making of product litigation. Attorney-engineer relations are adversarial to the extent that each is faithful to the peculiar training, methods, and goals of his or her profession. On each side, the making of product cases can be understood only as a tenuous collective work, improvised in the welter of organizational conflicts as perceived and negotiated by the competing professionals who put them together.

In my opinion, it is a big mistake to institute legal reforms aimed at minimizing the conflicts between science and law. Through their never-ending struggles to strategically control the truth, attorneys and scientific experts diffuse legal power and knowledge among diverse perspectives, ensuring that no single elite group controls the machinery of dispute resolution for its own purposes. Secondly, it is through such conflicts with their scientific experts that attorneys recognize that most product cases don't merit pursuit. To the extent that a reform succeeded in reducing these attorney-expert conflicts, it would also reduce their major impetus for disposing of cases out-of-court.

We should also be extremely wary of legal reforms designed to "level" the playing field between plaintiff and defense sides. Most such reforms are polemic efforts to tilt the existing balance to one side or the other. The two principal resources in putting together civil cases -- time and money -- are already balanced across the sides. Plaintiff attorneys tend to have more time per case, but less money; defense attorneys tend to have more money, but less time. The third crucial resource for producing civil litigation is information about the plaintiff and the defendant. Each attorney typically knows more about his or her own client than the rival attorney on the other side, and both rely on the attorney-client privilege to keep their secrets. In the interplay of information gaming across the sides, attorneys and experts work out a fragile shop floor order responsible for informally settling on a massive scale some of the most tragic and intractable disputes in contemporary society. It is imperative that we understand how the system *works* before trying to "fix" it.

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Index