

From Alpha Chi's *Recorder*, Vol. 44, No. 3, 2001

Cash, Chaos, and Quantum Theory: What Happened to Due Process?

By Philip C. Williams

The following article by Philip C. Williams is featured in the 2001 Alumni Issue of the Recorder, Vol. 44, No. 3. Williams, after practicing law for fifteen years, now is assistant vice president for academic affairs at Gardner-Webb University, Boiling Springs, North Carolina, where he is also assistant professor of health management and law. He holds both a Ph.D. from the University of North Carolina and a law degree from Columbia University and is author of a legal handbook, From Metropolis to Mayberry: A Lawyer's Guide to Small Town Law Practice, published by the American Bar Association.

"I ought to know by this time that when a fact appears opposed to a long train of deductions it invariably proves to be capable of bearing some other interpretation."

Sherlock Holmes (Arthur Conan Doyle), *A Study in Scarlet*

Students are taught in law school that our Founding Fathers' paradigm of due process—preserved in the Fifth and Fourteenth Amendments to the U.S. Constitution—derived from the Magna Carta signed by King John at Runnymede in the year 1215. It declared that "no freeman shall be taken or imprisoned, or be disseized of his freehold or liberties or free customs, or be outlawed or exiled, or any otherwise destroyed . . . but by lawful judgment of his peers or by the law of the land."

Now, nearly 800 years later, we teach our business and social science majors that the purpose of procedural due process is essentially unchanged: to ensure that government provide adequate notice of legal proceedings and an impartial hearing (Cheeseman). Rule of law, basic fairness—what sentiments could be more central to a definition of ordered liberty? Yet a train of recent events, conceptual discoveries, and technological advances ought to force a reexamination of our current understanding of due process, especially as it appears to be interpreted in modern litigation.

The Train of Recent Events: The Role of Cash in Modern Litigation

One could argue that the zenith—or nadir, depending on your point of view—of due process in American legal history was reached exactly in the middle of the O. J. Simpson trial. Millions of people witnessed the active influence of personal money on our judicial system. A single individual charged with a capital crime was able to hire a team of lawyers and expert witnesses capable of filing and litigating every conceivable motion, exposing every conceivable weakness in the government's case, and thoroughly ensuring that nary a thread of procedural due process would go unexplored for their fortunate client. The fact that 99.9 percent of American

criminal defendants would be unable to afford such depth and breadth of "due process" was not lost on the American public. The takeaway message for many television viewers was rather simple: in today's criminal justice system, the odds of a not-guilty verdict are directly proportional to the amount of money spent on lawyers and expert witnesses. You get as much due process as you can afford.

This public perception is not confined to our criminal justice system. Jonathan Harr's 1996 thriller *A Civil Action*, popularized by the 1998 movie starring John Travolta, involved the crucial role of money in determining the fate of a group of families whose children died of leukemia, possibly as a result of drinking water polluted by a local factory. Readers and moviegoers learned one of the raw truths of modern personal injury litigation: it costs money. In this particular case, the costs involved hiring expert witnesses, digging up vast territories in search of laboratory samples, and conducting chemical analyses. As costs mounted into the hundreds of thousands of dollars, the message to movie viewers was again rather clear: odds of bringing a successful lawsuit in our civil justice system is directly proportional to the amount of money spent on lawyers and expert witness activity. You get as much due process as you can afford.

Enter Chaos and Quantum Theories

Cash is not the only unwelcome guest at our due process banquet. 20th Century developments in chaos and quantum theory argue (1) that minor forces at the beginning of the litigation process may determine the ultimate outcome of that litigation, and (2) that the particular outcome—indeed, the entire process—may be unpredictable. Chaos and quantum theories have already found their way into the strategic planning courses of major business schools (McDaniel 22). These theories must ultimately be addressed by legal scholars as well, particularly those concerned with our society's expectations regarding due process.

Since 1975, mathematicians have been wrestling with a set of new paradigms based on the work of T. Y. Li and J. A. Yorke. These paradigms, collectively known as "chaos theory," argue that some processes are extremely sensitive to and/or dependent upon early events (82). For example, the mistake of a millionth of a degree in the angle of a missile launch can result in a flight of several thousand miles being off target by hundreds of yards—a difference between the missile striking an elementary school and hitting a military installation. In business, the seemingly minor choice of one lending institution over another in the early stages of some venture can have major unforeseen implications for a merger or acquisition taking place years later. Or, to render the problem in human terms, one small incident in the life of a toddler can result in crippling fears that plague an individual long after adulthood.

Since 1975, chaos theory has influenced nearly all academic disciplines, especially those relating to the physical sciences and technology, theology (especially epistemology), and business organization theory (especially with respect to rapidly changing industry sectors such as health care and technology). In the physical sciences, physicist Mitchell Feigenbaum and computer scientist Oscar Lanford have used chaos theory to model hydrodynamics. In theology, John Polkinghorne has suggested that the "eternal viewpoint"—one in which God already knows the outcome of a closed system—is no longer a coherent possibility, given the openness and uncertainty implicit in chaos theory. In organization theory, Robert Hernandez, Arnold Kaluzny, and Cynthia Haddock have suggested that if we are to accept the principles of chaos theory, leaders of health services organizations cannot expect to be in complete control of change, much less crises such as the anthrax outbreak of 2001.

How does any of this techno-talk affect due process? Consider the chronology of a typical lawsuit, one involving a host of strategic and tactical decisions. Any experienced trial attorney would confirm that early choices often play a vital, even decisive, role in determining the outcome of a given case. For example, which witnesses should I depose? When and how should I depose them? What questions should I ask? What, if any, questions should I not ask? What motions should I bring? When should I bring them? The list of early, potentially critical events goes on and on.

According to chaos theory, decisions made by attorneys and clients at the earliest stages of litigation can have the most profound effect upon the ultimate result. For example, the decision to choose Dr. X instead of Dr. Y as our principal expert witness can lead to major differences in findings, which can in turn lead to major differences in how we view the case, what motions to bring, and, ultimately, which side wins the lawsuit. Instead of our placing heaviest focus on the trial itself, chaos theory argues that we should be analyzing more carefully the earliest stages of the litigation process: the selection of forums, venues, attorneys, witnesses, judges, trial strategies, and the like.

Let us envision a decision tree illustrating the application of chaos theory to one tiny facet of a typical lawsuit. An early question facing the trial attorney might involve which expert witness to hire. Unknown to the attorney, Expert A, if hired, would arrive at an opinion stressing theories X, Y, and Z, Z being her own unique specialty. Expert B, if hired, would agree with Expert A regarding theories X and Y, but would stress theory W instead of theory Z in his preliminary report, W being Expert B's unique specialty. Let us assume that since both experts are creative and since both have a greater level of expertise in this field than does the attorney, he simply cannot know in advance the content or relevance of theories Z or W, both theories arising only in the minds of particular experts after hearing the unique facts of this case. In other words, the attorney will know about theory Z only if he hires Expert A, and he will hear about theory W only if he hires Expert B. Yet theory Z (or W) might be the very theory that tips the scales in favor of this attorney's client.

One could agree that the attorney's choice here is essentially random, though normally an attorney would have at least a modicum of knowledge, albeit hearsay in many cases, about the expert's successes or failures in previous trials. The decision tree does not end at this point, however. Even after the expert has taught the attorney all about Theory Z (or theory W), the attorney must decide whether to emphasize that theory at trial. If the answer is yes, the attorney must decide whether or not to expend funds on further research in that area. Such research may lead to a set of new theories and choices that require the hiring of yet another expert, and the decision tree grows more complex.

We must realize that such a decision tree represents only one branch of a much larger and more detailed decision tree. Hiring a particular expert witness is not, in reality, an isolated decision. It is the end result of dozens of previous decisions and current tactical choices, each adding and eliminating a host of competing options. Chaos theory argues that these early choices are powerful influences—indeed the most powerful influences—on the future course of the litigation; so much so, in fact, that an attorney would be wise to spend more time charting the early direction of pretrial discovery and less time on what might actually happen in the courtroom. One obvious conclusion to be drawn from chaos theory is that due process might be enhanced if the trial itself were moved closer to the start of the litigation process, where the really momentous decisions were being made.

Chaos theory is not the only conceptual revolution that ought to be causing thoughtful people to call for a reexamination of judicial process. Quantum theory was born of the efforts of the German physicist Werner Heisenberg, who in 1927 observed that the position and momentum of a subatomic particle cannot both be specified simultaneously (McDaniel). Attempts to measure the position of a particular particle interfered with the particle's measured speed, and vice versa. The problem, it turns out, is that modern science has reached a point where the subatomic particles it is trying to measure are actually smaller and more sensitive than the tiniest stream of electrons from the electron microscope being used to observe and measure those particles.

Imagine that a team of scientists was trying to determine the exact speed and angle of a rack of billiard balls immediately after it was struck by the cue ball. But imagine that the scientists were forced to choose tiny magnetic ball bearings as the numbered balls and were required to use a magnetic cue ball the size of a basketball. Each time the highly magnetized cue ball approached a magnetized ball bearing, the latter would either be attracted or repelled to such a violent extent that measurements with regard to speed and angle would be largely worthless. In fact, the scientists would not be measuring anything about billiards, but would instead be measuring the effects of the approaching force of a magnetic field.

Subatomic particles prevent scientists from using traditional microscopes because the rays of light used in such instruments are themselves much larger than the subatomic particles—just as the magnetic cue ball was too large for the numbered ball bearings. Unfortunately, the same problem occurs when modern-day electron microscopes are used to observe particles smaller than electrons. The electrons themselves are so large that their very presence distorts the natural movement of the particles being observed.

In a more general way, quantum theory warns us that any measurement of a phenomenon may affect the phenomenon itself. For example, a nature photographer might desire to understand the feeding habits of wild boars. In order to capture evidence on videotape, the photographer might construct an elaborate blind out in the forest and might camp out for days and nights on end, waiting for the wild boars to feed. But if the boars can smell the presence of the photographer—and especially the photographer's food—they might change their natural feeding habits and spend far more time than normal inspecting the blind.

As a rookie trial attorney, I was forced to learn this concept the hard way during the voir dire stage of a trial, when each attorney is allowed to question potential jurors in order to unearth any possible bias they might harbor against the interest of that attorney's client. I soon discovered, to my horror, that if I asked questions that were too intrusive or personal, I risked offending a potentially favorable juror. How many people would appreciate being asked about their most personal secrets in open court? But if I failed to ask those same questions, I risked allowing a biased juror to remain on the case. The very act of asking a highly charged question in order to ensure a fair trial might actually bias the jury against me!

Systematic attempts by our society to observe and evaluate judicial fairness, for example, by allowing the presence of cameras in the courtroom, end up altering the very process we were hoping to observe. During the O. J. Simpson trial, American TV viewers were treated to scenes of judges, attorneys, and witnesses who appeared to be playing to the camera instead of to the jury. Quantum theory warns us that the more closely we attempt to measure and monitor due process, the more we tend to influence and distort that process.

To completely avoid the effects of quantum theory, the legal system would need to study its own procedures—somehow—without any important player in the system knowing and

therefore being affected by the observation process. But therein lies the contradiction: Our legal system requires that any changes in due process be arrived at openly and fairly. In other words, any covert attempt to "observe" due process (secretly monitoring judges, juries, or lawyers) would be considered a violation of due process itself! Once the word got out that courts were being secretly observed, the integrity of the legal process would immediately be questioned. Honest people would wonder who was doing the observing, and how we as members of a democratic society could be certain that the observers were any less biased than the actors being observed.

Together, chaos and quantum theory cast doubt on the ability of current procedural devices to ensure the fairness of a judicial outcome. Chaos theory forces us to wonder about the cumulative effects of the many early decisions made long before a jury is impaneled. What the jury actually sees and hears may consist of less than one percent of the potential decision tree, the limbs of which were pruned early in the process. If we are lucky, that one percent may include all relevant data while excluding irrelevant and misleading information. But recall the expert witness example. The attorney is forced to make a critical decision before the relevance of crucial information is even known. No one could ever know what relevant information might have been hiding along the unblazed trail.

Quantum theory forces us to wonder whether it would be possible to evaluate due process without denying due process at that very moment. When we design a set of guidelines for judges and trial attorneys to use to ensure fairness, these become parameters of a new game, the rules of which must again be litigated and reinterpreted. When we insist upon an even-handed application of the rules already laid down, this very insistence consumes time and resources that might better have been spent on the substantive issues of the case. We find that we can have a speedy trial (speed being essential to personal vindication and reparation) or we can have a scrupulously fair trial (lots of time being essential to a careful examination of the facts), but we cannot have both at the same time. According to quantum theory, we are forced to make unpleasant choices. In our modern interpretation of due process, we have chosen an expensive version of thoroughness over timeliness, yet we are thorough at exactly the wrong points. While insisting that undue amounts of time be accorded to evidence studied in the latter stages of litigation—that is, at the trial itself—we ignore the loss of evidence, memory, time, and money that accompanies our painstakingly meticulous procedures. In the process, we grind everything to a pulp, including, unfortunately, the fortunes and feelings of our clients, crime victims, and families.

Let's Go to the Video Tape, or Perhaps Let's Don't

Fans of professional football will remember the manner in which instant replay was used during the 1986-91 seasons. One team would demand that the referees reconsider a particular call by reviewing a video tape. The crowd in the stadium waited impatiently while referees huddled to examine each camera angle as seconds passed into minutes. Finally, a decision would be reached, sometimes confirming the original call, sometimes reversing that decision, but always creating new controversy. Had the referees looked at the video images correctly? How could they call that play a touchdown when both television commentators agreed that the runner's knee was down?

What killed the instant replay rule in 1991 had little to do with a lack of fairness in the procedure. On the contrary, the problem was that the fixation on fairness was killing the pace of the game. Fans who paid money to see a football game were being treated, instead, to a lengthy and boring exercise in due process. The forest was being forgotten for the sake of the trees.

Although the National Football League saw fit to resurrect the instant replay rule in a different form beginning in 1999, the creation of the new technology and the persistence of the rule raise an issue pertinent to constitutional due process. At what point does a microscopic fixation on due process at every moment of a lawsuit wind up jeopardizing the whole of justice in the long run?

Civil and criminal defendants have long understood the advantages of delaying tactics. Procedural motions can tie up litigation for months and even years. During that time witnesses disappear, memories change, war chests are depleted, and wills are broken. As the old saying goes, "justice delayed is justice denied." Yet our entire modern system of pretrial discovery is founded on the notion that justice requires equal opportunity for both parties to pursue a series of depositions, interrogatories, admissions, physical examinations, and other procedures. These measures are designed to eliminate what the system considers to be the ultimate enemy of due process: the element of courtroom "surprise."

Due Process Versus Process Ad Nauseum

Is surprise, in fact, the worst enemy of due process? Here we come full circle to the topics of cash, chaos, quantum theory, and not-so-instant replay. Cash can buy delay and it can also reduce chaos for a party by eliminating the need to choose from among competing experts and theories. As in the case of O. J. Simpson, a party can simply hire as many experts as possible and try every theory until one can be found that the opponent hasn't mastered. As our world grows more technologically specialized and complex, our ability to outfox our opponent increases. Since the chemical and physical processes of DNA are too esoteric for most attorneys and jurors to understand, we find the jury can be wowed with an analysis more thorough and expensive than that of our opponent and—voilà!—we win the point, and maybe even the lawsuit. Hijinks like those were not available when Honest Abe practiced law with Billy Herndon.

Quantum bias is a close cousin to our instant replay analysis. Through the judicial micromanagement, examination, and reexamination of every facet of the discovery process—through each pretrial discovery device, motion, and counter-motion—we delude ourselves into believing that this level of thoroughness is, ipso facto, more just and fair than the surprise we might encounter in a speedy trial. Did the months of DNA research that led to weeks of yawn-provoking testimony during the O. J. Simpson trial really lead us closer to a just result? We need to remember that with every passing day evidence was handled, corrupted, and rendered useless. As more time passed, the freshness of key witness testimony diminished, and the relevance of seemingly insignificant facts (would a dried-out glove actually fit the defendant's fingers?) began to obscure the larger importance of the forest of evidence all around.

The delays endemic to our legal system cause average American citizens—who may become legitimate civil plaintiffs, defendants, or crime victims—to experience a suffering that passes into bitterness as weeks turn to months and years, all because tedium and thoroughness are deemed necessary to produce a fair trial. Innocent civil and criminal defendants feel the tightening screws of institutional blackmail as the jury of public opinion reaches its decision in the media, too impatient to await a decision so far in the future.

Was there less justice in Daniel Webster's day, when trials were heard as soon as the parties could find a courtroom and a judge? Ironically, the problems perceived as due process obstacles of that day—the need to wait months for a circuit-riding judge to reach town—would hardly faze a modern court in this day of rapid transportation and instant communication. How do we combat the cynicism that the influences of cash, chaos, quantum theory, and replay-ad-auseum are wreaking on our judicial processes? It may be too much to ask amid our current

environment, where imagery and glitz seem to trump substance at every turn, but we may just discover that a return to the virtues of an honored judiciary making timely decisions would go further toward guaranteeing procedural due process than anything else we could devise.

Works Cited

- Cheeseman, Henry R. *The Legal and Regulating Environment: Contemporary Perspectives in Business*. New York: Prentice Hall, 2000.
- Feigenbaum, M. J. "Quantitative Universality for a Class of Nonlinear Transformation." *Journal of Statistical Physics* 21 (1979): 25.
- Hernandez, S. R., A. D. Kaluzny, and C. C. Haddock. "Organizational Innovation, Change, and Learning." *Health Care Management*. Ed. Stephen M. Shortell and Arnold D. Kaluzny. Albany, N.Y.: Delmar Thompson Learning, 2000.
- Lanford, O. E. "A Computer-assisted Proof of the Feigenbaum Conjectures." *Bulletin of the American Mathematical Society* 6 (1982): 427.
- Li, T. Y., and J. A. Yorke. "Period Three Implies Chaos." *American Mathematical Monthly* 82 (1975): 995.
- McDaniel, R. J. "A Strategic Leadership: A View from Quantum and Chaos Theories." *Health Care Management Review* 22 (1997): 21.
- Polkinghorne, J. "Chaos and Cosmos: A Theological Approach." *Chaos: The New Science, Nobel Conference XXVI*. Ed. John Holte. Lanham, Md.: University Press of America, Inc., 1993.