

RECORD, Volume 28, No. 3*

Boston Annual Meeting
October 27-30, 2002

Session 1GS Keynote Address

Track: General Session

Speaker: PETER L. BERNSTEIN

Summary: Peter L. Bernstein is president of Peter L. Bernstein, Inc., established in 1973 as economic consultants to institutional investors and corporations. He writes and publishes an analysis of the capital markets and the real economy, "Economics and Portfolio Strategy," read by managers and owners of assets amounting to more than five trillion dollars. Bernstein was the first editor of "The Journal of Portfolio Management," which started publication in 1974; he is now its consulting editor.

He lectures widely throughout the United States and abroad, has authored eight books in economics and finance, and has published many articles. His most recent book, "The Power of Gold: The History of an Obsession," was published by John Wiley & Sons in 2000. "Against the Gods: The Remarkable Story of Risk," published in 1996, has sold over 500,000 copies worldwide. Bernstein's keynote address will draw from his extensive knowledge in this area.

MR. W. JAMES MAC GINNITIE: Good morning. I'd like to call this meeting to order and welcome all of you to Boston and the 53rd Annual Meeting of the Society of Actuaries. This morning I'd like to begin by acknowledging and welcoming several special guests who are with us today. When I call your name, would you please stand and be recognized? It is with pleasure that I welcome 11 past presidents of the Society of Actuaries. The first is Robert Myers, who later this week turns 90. With the other ten, if you'd hold your applause, we'll get to the main speaker a little more rapidly. The other past presidents are: Bob Hoskins, Barbara Lautzenheiser, Daphne Bartlett, Gary Corbett, Don Sondergeld, Sam Gutterman, Dave Holland, Anna Rappaport, Norm Crowder, and Rob Brown.

* Copyright © 2003, Society of Actuaries

Please join me in welcoming our current president-elect, Harry Panjer, and our new president-elect, Neil Parmenter, and I'll also introduce our executive director, Sarah Sanford.

I also want to recognize the members newly elected to serve on our Board of Governors. Again, please hold your applause. Serving as vice-presidents are: Dick London, Ed Robbins, Shirley Shao. Serving as Board Members are: Tom Bakos, Janet Carstens, Mark Litow, Josephine Marks, Mike McLaughlin and Kathy Wong.

For the past several days, we've had dignitaries from other actuarial organizations meeting with us. With us is Jobar Ferrara, president of the Actuarial Society of South Africa; From the American Academy of Actuaries, we have Dan McCarthy, president; Bob Anker, president-elect; and incoming president-elect, our own Barbara Lautzenheiser.

From the Canadian Institute of Actuaries, we have President-Elect Mike Lombardi. From the Casualty Actuarial Society, we have President Bob Conger and President-Elect Gail Ross. From the Faculty and Institute of Actuaries, we have President Tom Ross. From the International Actuarial Association, we have President Edward Levay. From the Institute of Actuaries, we have the immediate past-president, Peter Clark. And from the Society of Actuaries in Ireland, we have President Eamonn Heffernan.

Congratulations are in order for a group of members celebrating their anniversary year as Fellows or Associates. Please stand as I announce you and we'll applaud everybody together at the end. Fifty years as a Fellow: Bob Hoskins, a former president; 40 years as Fellows: Gary Corbett, also a former president, and Carol Hutchinson. My own class is 35 years: Neil Parmenter, our president-elect; Jim Reiskytli; Bill Schreiner; and Barry Shemin. Celebrating 35 years as an Associate: Michael Jaquint. Please join me in congratulating these members.

It's my privilege to continue the tradition of honoring outstanding individuals with the President's Award. This award is in recognition of their contributions to the profession as volunteers and also to the impact that they have had on me personally over my years as an actuary, which has made my year as your president possible and much more meaningful. The awards were presented at the Board of Governors dinner on Saturday. The recipients this year are: James Anderson, posthumously; Ron Bornhuetter, Hans Buhlmann, Yves Guerard and David Scott. They have provided a high degree of volunteer effort to the actuarial profession over an extended period of time. Please join me in thanking the Presidential Award recipients.

I'm also pleased to announce the recipients of the John E. O'Connor, Jr. Distinguished Service Award that was created in 1999 for distinguished service by a volunteer member of the Society of Actuaries. This award was also presented at

the Board of Governors dinner on Saturday night. I can think of no one who better represents the spirit of volunteer service to the profession and to the larger community. Please join me in honoring Bob and Karen Shapiro, recipients of the John E. O'Connor, Jr. Distinguished Service Award.

Now it's my privilege to welcome the newest members of the actuarial profession. We have 24 new Associates attending their first meeting. Would you please stand so that we can congratulate you?

This year Harry Panjer and Norm Crowder had the pleasure of greeting new Fellows at the Fellowship Admissions Courses in Peachtree City, Ga.; McLean, Va.; Englewood, Colo.; and The Woodlands, Texas. We have 43 individuals attending their first meeting as Fellows of the Society of Actuaries. Please stand for a well-deserved round of applause.

A quick procedural announcement: I would like to encourage those of you who are interested in what's on the horizon for the Society to attend Session 43, "On the Horizon: How the SOA Is Working For You." In that session, President-Elect Harry Panjer will be leading a discussion of key strategic issues.

The Halmstad Prize is administered by the Actuarial Education and Research Fund and is given annually for actuarial research in memory of David Halmstad's significant contributions to that research. This year's recipients are Hans Gerber and Elias Shiu for their paper, "Investing for Retirement: Optimal Capital Growth and Dynamic Asset Allocation." It is a timely topic, indeed. Elias is unable to join us today, but Hans is here to receive his third Halmstad Award. Hans is, by the way, a doctoral student of Hans Gilman, who was recipient of one of the Presidential Awards.

One of the major volunteer roles in the Society is that of the chair of our Annual Program Committee. Lou Weisz has fulfilled that role during this past year and would like to say a few words at this time.

MR. WEISZ: From those of us on the 2002 Annual Program Committee, welcome to the 2002 Annual Meeting, and welcome to the wonderful city of Boston.. Boston is a great city, but be careful walking—it's a great walking city. The drivers around here are crazy. The only thing crazier, though, than the drivers, are the pedestrians. There's a jaywalking law in effect, but most people jaywalk. You people are not native to this area, but please be careful. We want you all to be able to enjoy the full meeting.

There are great areas around the city to visit right around here in the hotel area. The Back Bay area was a swamp that was filled in beginning in the mid-1800s. There is also Beacon Hill, and you can walk to both of these areas from here. You can also visit the North End, which is the Italian area not too far from Quincy Market, or Cambridge and Harvard Square. For the latter places you may want to

take a cab or a subway.

Boston has great restaurants. It's a wonderful city. Come and enjoy it, as well a great meeting.

The background for the meeting is that we have had relatively tough economic times and it's had an effect on our products and our financial commitments. The stock market has been in decline for two or two and a half years. Maybe we're near the end, maybe not. What's the assessment on some of the products? Asset fees on variable products have been declining because of the declining stock market. 401(k) plans have had tough times with the decline in the stock values—the dynamics have changed from three or four years ago. With the declines in fixed interest rates, interest guarantees on our life insurance and annuity products may be kicking in. Health care costs are rising after several years of relative calm. Pension plans have been changing to cash balance plans, and for the defined benefit plans, with the fall in the stock market, costs have gone up. Plans that were overfunded are now underfunded.

We've got an exciting two-and-a-half-day program here in Boston. We've got great sessions planned with speakers from inside the Society and outside as well. The breaks, the reception and the exhibit hall provide good opportunities to socialize.

I want to thank the Program Committee for working hard to put this together over the past year. There are representatives from all of the SOA sections on the committee. They've worked along with their own sections. I particularly want to thank Carl Meier, the vice-chair, who will be next year's Program Committee Chair, and Members At Large, Bob Omdal and Lorraine Mayne. If you're here, please stand up and be recognized.

The SOA Annual Meeting exists because of SOA members volunteering their time in addition to the Society staff. I personally feel that there's an obligation to give back to the SOA. For me, it started right after Fellowship. We've gotten into the Society only because of the work and time and effort of others who have come before us to design exams, write all the study materials, and now it's our turn to give to the next generation as we continue to educate ourselves. Examples are to serve on an E&E Committee, Continuing Education or other committees or sections right after Fellowship.

As I'm up here, I'm thinking that I would have had an awful lot of trouble doing this about a dozen years ago. About ten years ago I joined Toastmasters and you might say, "Hey, this isn't for me," but we always have technical training; we don't have the training to get up in front of an audience. I got training there. It's training in front of very small groups, but it's plan presentations as well as being able to provide off-the-cuff answers. We need this because we have to feel at ease speaking and we have to get our thoughts organized while we're speaking. We need this to make statements of public opinion, whether we're doing this

individually or for companies or for firms or for the Academy as they make public statements. With this, I wish you a successful annual meeting for the next two and a half days.

MR. MC GINNITIE: Thank you, Lou. We owe a great deal of thanks to you and all the very hard-working members of the Program Committee.

Our keynote speaker this morning is Peter Bernstein. He is a financial historian. He's the head of his own investment advisory firm, which he established back in 1973. He's a Harvard graduate and a former member of the research staff of the Federal Reserve Bank of New York. He was an air force captain in World War II, assigned to the Office of Strategic Services in the European Theater. In 1951, after teaching economics at Williams College, (where he tells me he did not know Wallace Jordan, because he left before Jordan went up there) and a five-year stint in commercial banking, Mr. Bernstein joined the nationally known investment advisory firm managing individual and institutional portfolios.

For many years he taught as an adjunct professor at the graduate faculty of the New School in New York City. He lectures throughout the United States and abroad. He's authored eight books in economics and finance and published, of course, many articles. His latest book, which I'm sure many of you have had an opportunity to read is, *The Power of Gold: The History of an Obsession*, but his book of greatest relevance to us is *Against the Gods: The Remarkable Story of Risk*, published in 1996, which won the Edwin G. Booz Prize in that year. In 1998 it won the Clarence Arthur Kulp/Elizur Wright Memorial Award from the American Risk and Insurance Association. That was as recognition for an outstanding original contribution to the literature of risk and insurance. Please join me in welcoming Peter Bernstein.

MR. PETER L. BERNSTEIN: When I got the call to see whether I'd be available to talk at this meeting today, I was told by John Riley that actuary is the most risk-averse profession in the world. I thought that was an interesting characterization for people who spend their lives getting their hands dirty in this stuff, but it reminded me of the first actuary I ever met, and I didn't even know what an actuary was when I met this guy, and I'm not sure I knew when I was finished meeting him. I'm not sure I know yet. I go back to the summer of 1944, when I was, as Jim mentioned, serving with the Office of Strategic Services (OSS) in London and this was a time of the V-bombs—nasty little pilotless jet aircraft that came over stuffed with explosives (sounds kind of familiar). The engine would cut off over London and it would come down—boom. Since these were pilotless and didn't need anybody looking out, they came day and night.

I was assigned to live in a flat on Sloane Square with three other fellows, one of whom was this character working in the air ministry. He had been recruited in the OSS because he had the highest score on the army intelligence test of any American soldier in the United Kingdom at that moment, so I guess he had

something going for him. But, in any case, the rest of us just got used to this foolishness. It was amazing how, under conditions like that, you could go on about your business, but this guy, the actuary, would show up at the flat to bathe and shave and have breakfast and then go back to the air ministry where he slept, because they worked underground there. He never saw daylight the whole time he was in London except to shave and bathe and have breakfast, so that was pretty risk-averse.

I'm going to talk about risk, about the nature of risk, and I'm quite sure that many of the things I'm going to say will be familiar to you, but I want to put them in a setting that I hope will give you some perspective in being of greater assistance to your clients in dealing with this whole subject of the unknown future. I would also like to put emphasis on certain things that you can carry with you to them that may increase the value that you give them.

When I was working on the book on risk, the most interesting definition that I found was one by an English economist who said that risk means that more things can happen than will happen. This is a very fancy way of saying that we don't know what the hell is going on. It's a useful way to think about what we're wrestling with; that more things can happen than will happen—that no prediction, no estimate of probabilities is ever certain, and that's good news. When I get to the end I'm going to tell you why I think that's good news.

We're familiar with what I just said and we've learned an immense amount over the years, over the centuries really, about how to measure this messy stuff, but the real question is, to what extent does measurement lead to understanding? The numbers are important, but they're only the very beginning. They're the raw material. My presentation is going to move as follows: First, I'm going to offer some thoughts about the whole concept of central tendencies (averages and norms), which are the meat and potatoes of what all of us do. Then I'll talk about the two most important lessons that I learned in writing "Against the Gods" (neither of which I realized while I was writing it, only after it was all done; I thought, "Wow, this is what should have been on page one"), and finally, how all of this ties into, as I said at the beginning, how it can make you more helpful. Since I've never given a speech in all my life, where at the end somebody doesn't say, "How do you like the market?" I am going to interpolate in here some comments about the stock market because I know if you applaud, you will applaud because I talked about the stock market.

I'm going to begin with the simple and overarching fact that if we knew the future, nobody would be in this room. You would be out digging ditches and working as dentists or doing something really useful for society. But because we don't know the future, we have jobs; we have a business to do. Because we don't know the future, surprise is inevitable; we are going to be wrong, we are going to be wrong. I read something very recently that I thought was interesting. It's not uncertainty as such that bothers us, but unknowledge. As John Maynard Keynes once said, "We

simply do not know." Therefore, surprise is inevitable. And when it happens it tells us that the system that we thought we understood (and surprise can happen in many areas of life) is showing signs of instability. Alan Greenspan, after the crisis in 1998, said, "We found out the world didn't work exactly the way we thought it worked. It's not behaving the way it would under 'normal' conditions, and I use the word 'normal' in quotes."

There is no reason why we should always expect matters to be normal. Indeed, is normal normal, or is normal perhaps something abnormal? In trying to answer that question, I'm going to tell you a story about the great evolutionary biologist, Steven J. Gould, who just recently died. He tells this story in a wonderful, wonderful book called, "Full House: The Spread of Excellence from Plato to Darwin." Gould was told about 20 years ago that he had an incurable cancer called mesothelioma, and that the median life expectancy for people diagnosed with this is eight months. Now, what do you do when somebody tells you that your median life expectancy is eight months? Commit suicide, carry on as nothing had happened, get another opinion or pray?

Gould chose prayer in a sense. His religion is Darwinian evolution. Darwinian evolution is a system in which nothing happens randomly; every event, every effect has a cause. It is a system that is not chaotic, but in which the variety of causes is so enormous that we can't make predictions. Darwin perceives the future not as a ladder—somehow over time we get better and better and humans are a big advance over the primeval ooze and so on, which is the way we like to think about it—but rather as a bush or a tree that's growing and there are branches. We don't know how many branches it's going to have; we don't know where the branches are going to have subbranches. We have a general idea of what this thing looks like, but have absolutely no sense of how it is going to develop in detail. We just don't know, but everything that happens there happens as a result of a cause.

In this Darwinian religion, variation stands out as the fundamental reality, and calculated averages simply become abstractions. This is the key sentence of what I'm trying to tell you—that variation is the fundamental reality, not the calculated averages. Starting from this, Gould said to himself that it would be an error to view the measure of central tendency as the most likely outcome for any single individual, because there is this tremendous variety in life and on earth, and it may not apply to any single individual.

I was a trustee at TIAA-CREF for many years until they finally retired me, but when I was on the board we were under fire because TIAA-CREF was not gender-neutral, and the case that the women made and won was that each individual woman doesn't necessarily have a longer life expectancy than any individual man, and therefore we had to have gender-neutral policies. Gould said to himself, "I am not a measure of central tendency, either mean or median; I am one single human being with mesothelioma, and I want the best assessment of my own chances."

Furthermore, there's not much room between zero and eight months median. There's not much room between the absolute minimum of, "I die at this moment," and the median, but way out on the other side of the median it goes—goodness knows, how long can you live? Half of the variation is scrunched into the left half up to eight months, but the right half could extend out forever, in theory. So he looked at himself and said, "I'm young and full of fight; I have a supportive family; I live in a city offering the best medical treatment, gentlemen, Boston; and I've had an early diagnosis." If he had been mesmerized by the central tendency, he might well have committed suicide, but he lived for 20 years with this disease and died only a few months ago.

Now, I linger with this point because I think it's a great story, but it's one to keep in mind, and Gould makes the point in a more general sense, a philosophical sense, very interesting. I'm now quoting from him: "We are still suffering from a legacy as old as Plato, a tendency to abstract a single ideal or average as the essence of a system and to devalue or ignore variation among the individuals that constitute the full population. We have never put aside this distinctive view that populations of actual individuals form a set of accidents, a collection of flawed examples, each necessarily imperfect and capable only of approaching the ideal to a certain extent. We regard variation as a pool of inconsequential happenstances, valuable largely because we can use the spread to calculate an average, which we may then regard as the best approach to an essence."

My thesis is that all of us, not just as actuaries and investors, but all of us in a very broad sense, depend far too much on measures of central tendency and therefore are mesmerized by the hole rather than the doughnut. This organization—I must say I've spoken to a lot of different kinds of groups—is the only organization I'm aware of that takes this idea as an important part of your work and has a whole separate section devoted to it. John Riley was good enough to send me a bunch of your literature and work and so forth, among them the publication from the Actuary of the Future Section. They say this: "For all of our newsletters, seminars and research projects, we should continually reinforce the central concept of disruption and discontinuity." That's from the minutes of their meeting on October 22, 2001, and having read that, I thought, "Why am I going to give this speech? They've got it."

Let me come forward from this to two of the lessons I learned from writing "Against the Gods," and this idea reflects through it. Many of you, I hope, have read the book, but even if you have, after the book is written and it's all bound and in print and looks gorgeous with a cover on it and everything, you look at it and say, "Now I know what it's about," and I wish I'd known this when I started. Three hundred years ago Gottfried Leibniz wrote, "Nature has established patterns originating in the return of events, but only for the most part. No matter how many experiments you have conducted"—no matter how many models you build—"you have not thereby imposed a limit on the nature of events so that in the future they would not vary." There is no $R^2 = 1.0000$.

The trouble with most of us is that we focus on the 95 percent of the results that we believe are not due to chance, because it makes life a lot easier, and that the essence is in the measure of the central tendency. We live with averages, and these days the statisticians have found all kinds of new sorts of averages—arches and garches and God knows how many arches of various types—trends, R^2 , coefficients of correlations, normal and other species of distribution. There is the theory of probability itself, which really expresses shares of certainty. The theory of probability says we know all the outcomes; the question is just, how are they going to break down, how are they going to be distributed? But we don't know all the outcomes. What we know is only for the most part, but only for the most part is not everything. Our errors stem from deviations from the averages of the norm, from the outliers, from outcomes never even imagined, and in the past year or so Americans have learned about outcomes never even imagined, but that is the way life develops. In other words, we can't ignore the possibility of the outliers and indeed should focus on the outliers because only for the most part is not sufficient. That is lesson number one.

Lesson number two, Pascal. We trace the theory of probability back to Blaise Pascal. Pascal was a man who spent half his life going to church, being ascetic and leading a very virtuous life and the other half doing exactly the opposite. But he finally yielded to the virtuous side, retired to a monastery, left the gambling tables and the other places he enjoyed and wrote his memoirs. In the process, he asked an interesting question: "If you had to toss a coin that wouldn't land until the end of eternity, but if it came up one way it would tell you that God is and the other way it would tell you that God is not, if you had to bet now, how would you bet?"

And he said, "This is not very easy; there is a 50/50 probability, but I have to make a bet because the way I bet is going to affect the way I live beyond eternity." We don't know whether God is or God is not and we can't wake up one morning and say, "I believe or I don't believe"—that is a matter of faith. This is a very important question, but we do have a choice because we can live—choose to live as though God is and lead a virtuous life. Or we can choose to live as though God is not and lead the other kind of life. How do I make that choice? He said, "If I decide to live as though God is, I'm going to pass up a lot of those goodies, but I won't have had such a bad life after all. But let's look at the opposite. If I choose to live as though God is not and I'm a sinner and I'm wrong and God is, I've got BIG problems." *The consequences always dominate the probabilities.*

Let me give you some examples that tickle me and interest me in illustrating all of the points that I'm trying to make. One of them strikes very close to home. A couple of years ago I was invited to speak to AIRMIC, the Association of Insurance and Risk Managers in Great Britain and they had just published a very handsome pamphlet called, "A Risk Management Standard" and it's about how to structure an organization to deal with this whole problem. It's very good. It's quite complete, and it's very calming. As you read this, you think, "Boy, we are never going to get

caught short with this structure." It's just wonderful. I'm not telling tales out of school because I've sent them a note saying exactly what I'm saying to you, but they list the various kinds of probabilities in one place and the only reference in this entire booklet to extreme outcomes is a place where they say, and I quote, "Not likely to occur in a ten-year period or less than two percent chance of occurrence." For the people who were in New York City on September 11, that's not very a reassuring way to think of how we deal with life. It's just not helpful. It's where risk management matters the most and therefore requires the largest focus of our attention rather than just a little box in the thing and no further examination of this.

I'm in the investment world, as you know, and we live with this problem in the investment world all the time. We have wonderful long-term series of stock returns, bond returns and so on—Ibbotson, Sinquefeld, and so on, and these things are like beacons that lure us into their clutches; we hang onto them. They have sigmas, and sigmas get their due, but what we really like is the averages because the averages lead us to make estimates of what's normal, but Gould reminds us that there is no such thing as normal. Variation in the history of the capital markets, up and down and up and down, is not, as Gould used the expression—it's not a pool of inconsequential happenstances. Variation in the capital markets is Darwinian—each episode is a result of the preceding episode. It's not a series of accidents and therefore this is not a random series, this is history from which we can derive an average and feel some confidence in it. Each episode is a result of the preceding episode.

Goodness knows what we are going through at this moment in the capital markets is a consequence of the foolishness of 1998-2000. And that, in turn, was the climax of a bull market that grew out of the dark days of the 1970s and our ability to overcome the problems of the 1970s: high rate of inflation, the war and the consequences of war in Vietnam and so on. Those high rates of inflation developed from the sense that we were never going to have the Great Depression again and we knew how to deal with those problems and that government could create and maintain full employment no matter what. So that great period grew out of the Depression and the Depression itself was a consequence of what had happened during World War I and the aftermath of World War I and so on, going back to the beginning of time. Each episode is a result of the preceding episode and it makes for a very heterogeneous bunch of stuff.

Here's another thought on the same subject. A man named Laurence Siegel (Siegel is the braintrust of the Ford Foundation) wrote an article in the journal that I edit, called the "Journal of Portfolio Management," in the Spring 1997 issue, with the interesting title, "Are Stocks Risky? Two Lessons." Ibbotson and Sinquefeld, these long-term averages, are good estimates of no-catastrophe conditions, but are certainly not inevitable. Suppose you were an investor in 1900 and somebody came along and said to you, "The best way to manage risk is to diversify; you've got to be diversified, so don't put all your money in the United States." (This is 1900.) "There are a lot of other interesting places around the world where

economic growth is taking place: Britain, Germany, Argentina, Russia and Japan." So you put your money in those places in 1900 and how do you feel later on? Not very good.

I'm still working with Siegel. A god doing a Monte Carlo simulation on possible outcomes in the 20th century would face a massive decision tree in which the particular sequence of events that has taken place would be only one and not necessarily even the best and certainly not the worst. As Siegel puts it, "Risk is not short-term volatility, for the long-term investor can surely afford to ignore that. Rather, because there is no predestined rate of return, only an expected one that may not be realized, the risk is the possibility that in the long run the return on stocks will be terrible." Even if stocks come back in the long run, the ones who live to see that and profit from it are seldom the ones who lose out on the way down.

When the 1929 crash came, I went with my mother down to the boat to meet my father (in those days people traveled on steamers). We went down to the pier to meet him and I remember him coming off the boat in a Homburg hat (very elegant). Mother said, "Allen, Allen, what are we going to do? What are we going to do? It's terrible." So he said, "Don't worry; stocks are still higher than they were when my mother died." Well, his mother died in 1927, and at the moment he was quite right. My father died in 1951. I was thinking of going into the stock market in 1927 and going out in 1951. How would you have done? 1.87 percent per year compounded with an inflation rate of 1.79. But if my father had lived another five years after 1951, he would have been a lot richer than he was.

All of this reminds me of another article I like to quote by a man named Richard Bookstaber, who for many years was global risk manager for Salomon Brothers, but he got out before Salomon Brothers got mud on its face (recent mud) and joined a hedge fund. Anyway, he gave a paper in which he made the following points—I'm giving the same message and variations on the theme. The three or four outliers that muddy the volatility estimates—that make the volatility estimates questionable—are the key points. It's better to throw out the bulk of the distribution and study the furthest outliers. Here is a point that Bookstaber makes that I hope you will carry away. We all understand these things; we all know these things. You don't really need me to remind you of them. The awful question is, how do we deal with them? This is not a question of mathematics; this is not a question of probability theory or any of the things that you learn in actuarial school. This is a matter of decision processes and gets back to Pascal—understanding consequences and knowing how to deal with consequences. It's a matter—and this is Bookstaber's point—of organizational structure.

When September 11 hit in New York, the thing that impressed me the most was the ability to revive from this terrible event, and what gave me a sense of what it is about Americans that gives us faith, was that within one week, and the terrorist attack was right in the middle of the financial district, the financial markets were operating again. I never read in detail about how in the world they ever did that—

got all the wires and the pipes and God knows what, put together—but clearly there was an organizational structure within those markets and the stock exchange in particular to deal with physical catastrophe of this nature.

It is really in the organizational structure that we must deal with these things. We can't forecast and we can't even visualize them; we just know that they're working out there so you can't deal with them by saying to somebody, "There's a one percent chance that this place is going to blow up in the next five minutes." But if this place does blow up in the next five minutes, how do we deal with it? We have an example of this in Russia at this very moment, and they dealt with it and one way was not the best way, but what's the best way? I don't know. Clearly there was an organizational structure that dealt with this in a way that none of us could have visualized from the outside if we hadn't known it was coming.

But in working with your clients in this whole messy thing we call risk management, it is in how this organization will deal with the risks that are not in the pamphlet, that are not the usual things, fluctuations in their sort—reputation risk or goodness knows what else—but the things that are off the wall. What do we do when those things occur? The greatest risks are the risks that we don't see and the most difficult problem is in preparing in advance for that kind of thing.

Things do shift with dramatic suddenness and we find the world doesn't work the way we thought it worked. I'm old enough to have been in the stock market in 1958 when all of a sudden stocks went up so sharply that dividend yields on stocks were less than dividend yields on bonds—unthinkable. I was in a little firm with older partners and they said, "Don't worry; this is an anomaly; it will set itself to rights." That was in 1958, and I'm still waiting.

There was OPEC in the 1970s shoving the price of oil to a level that nobody had dreamed about and the disinflation that came in the 1980s was a constant set of surprises. Everybody overestimated what the rate of inflation was going to be even when it was clear that it was going down. We see the smashing of familiar parameters all the time and have to learn how to live with them.

I'm going to put it one more way, and then I'm close to done. We use words to characterize these moments as discontinuities, paradigm shifts, regime changes, but they're funny words if you think about it. Steven J. Gould and his fellow Darwinians would laugh at us for using such words. Darwinian theory, that tree, does not recognize discontinuities, paradigm shifts and regime changes because before there is discontinuity, there must be continuity; before there are paradigm shifts there must be a paradigm; before there are regime changes, there must be a regime. In other words, we must have trends, norms, averages and other indicators of central tendency before we can perceive what are shocks. But diversity is so great and every event can lead to such a wide variety of outcomes that really and truly, there is no such thing as a state of nature that we can identify as a paradigm. The trick in risk management is in recognizing that normal is not a

state of nature, but a state of transition and that trend is not destiny.

All of this sounds difficult and grim, but basically I think this is very good news and not a grisly tale. One of these older partners who didn't believe that stocks could yield less than bonds taught me an important and interesting thought process that I'm now going to put to you to deal with this. One way to really try to understand the question is to follow it out to the extreme and see what it looks like out there and then come back and you learn something in the process.

What would life be like if Steven J. Gould was wrong and Darwin was wrong and everything resembled its central tendency? What if we were all clones of just one human being? This would not only be very boring, (I know I'm great, but enough of me is enough) but really very risky. Variety is what makes risk management possible. Indeed, variety is not only the spice of life, but also the essence of survival. Not all disasters happen at the same moment. We don't all come down with mesothelioma at the same moment. Diversification of risk matters not just defensively, but because it maximizes returns as well, because we expose ourselves to all of the opportunities that there may be out there. Diversification is not just a defensive step, but to my way of thinking, a strong offensive step.

Somebody once told me that if everything you own makes you comfortable, you're not diversified. The only time you're really diversified is when you have assets you don't want to own. If you take variety away and nothing remains but averages with zero standard deviations and central tendencies always on the mark, what is so good about that? You crush human free will in a world where everything is predetermined, and decision-making becomes an obsolete skill. But I'm happy to say that taking away variety is a fantasy and that reality is vastly preferable to that. We only need to acquire the ability to make the distinction between what's variety and what's not, and that will help us to understand what we're doing when our noses are on the grindstone.

MR. MAC GINNITIE: Thank you. That was an excellent presentation. We have plenty of time for questions and I'll try to referee.

MR. MAX RUDOLPH: Mr. Bernstein, in the last 20 years a lot of new financial tools have become available that are proposed to manage risk—things like swaps and options and forwards and futures and things like that. Do you feel that, for the world as a whole, they have done their job in managing risk, or because of the volatility that comes with them, that they've actually increased risk?

MR. BERNSTEIN: It's a very open-ended question, and I answer it for the most part—yes. The part that's missing is the future, which we don't know. I think this is wonderful. I think all kinds of new instruments are wonderful because they do expand the opportunity set, no question about it, and even their novelty and their structure and the role that they play help us to understand more deeply the conventional instruments that we use. It's really only after options came into being

that people in the bond market began to understand what some of those animals were that they were trading (I don't mean their customers, I'm talking about their instruments). Many bonds are full, stuffed with implicit options. I think this is a very welcome development, and so far I think that it has been very helpful not only specifically in using these instruments for hedging, but, as I say, in helping us to understand better what the nature of risk is about and where it lies.

What we don't know is, there are always counterparties and we know from Long-Term Capital Management what kinds of problems can emerge, and since much of it is not visible, what's lurking in there that could blow. I've been very impressed when you look at what's happened in the last two years and the stresses and so forth within the system that we've gotten this far without a mishap. I do worry about it, but I do think that the regulators and so on have been very sophisticated in dealing with these things, so I think it's much better that we have them than not have them, and that we've probably gotten further than we would have gotten in this whole economic and financial mess that's developed with derivative systems than we would have without them.

MR. JERRY ENOCH: As you encourage us to pay more attention to the outliers and perhaps give less emphasis to the means and as you say that there is no paradigm, to keep me from taking your statements a little bit too far, what would you say is the proper place for the study of history?

MR. BERNSTEIN: I wrote a book before "Against the Gods" called "Capital Ideas," which was about the history of the development of modern portfolio theory and a relatively short history. Then I wrote "Against the Gods," which is long history, and starts with the Greeks and moves forward. Then I wrote, "History of Gold," which is also something to do with economics but really goes back to Moses coming down from Mt. Sinai and finding the Jews worshipping the golden calf. Now I'm working on another book, which is all history and no economics, so I've come full circle to be a historian and I hope there is something in history.

Of course, we learn from history. One of the things we learn from history is that there is no such thing as normal; certainly history shows that. There is no average of historical experience that will help us tell what the future holds.

History also tells us that Darwin was right, that there are no random accidents in history; each event develops from some kind of a cause. History leads to interesting thought exercises. I was talking to a friend last night about Henry Kissinger, who I heard give a very interesting talk one time about what would have happened if the British and the French in 1935, when Hitler walked into the Rhineland, instead of letting him do it, if they had taken military action then at which point even their limited means were much greater than what Germany had. This would have been a perfectly rational decision to make and it would have changed the course of history. Julius Caesar crossing the Rubicon—I don't have to remind you of all these moments.

Everything that I have had to say is there in history, and it is history that helps us understand what I've been talking about. Indeed, what I've talked about is all things out of history—even Steven J. Gould is a story out of history—to remind us of these points, so we must know history. And you'll read my book, that's even better.

MR. JAMES GEYER: For a long time, actuaries have had involvement with capital management analyses. One of the things we try to do is determine the capital needed for different products, so we look at our life versus annuity, etc., and the common technique for doing that is to look at historical averages and historical standard deviations and use those standard deviations to try to understand relative riskiness.

While I appreciate that is sort of the normal way to do things, it's long bothered me because the results are so sensitive to those historical standard deviations. Everything you've said here supports my concern with that—that the normal or the past standard deviation is fairly limited experience and not random, but if we don't have that, I guess the other way of doing it is to try to conceive of different possible futures and how bad different things could get. I'm just interested in your observations on that and if you've had any experience with companies, banks or insurance companies trying to get a grip on relative riskiness of products.

MR. BERNSTEIN: It's a very interesting question. I haven't had the specific experience that you're talking about, but I have been exposed to very similar things. We have to live with what we can understand and what we can deal with, and you can't run a business on the assumption that all the outcomes are going to be things that either you can't even imagine or are at the tails of the distributions because most of the time, things do move along in familiar ways, and to run a business on unfamiliar ways is an extremely risky thing to do.

I read an article in one of your publications about shapers and followers. Not everybody can be a shaper, and that's what you do if you're operating on the extremes. You have to deal with these things, but in the end I think the way you deal with them is with Pascal. I found Pascal's wager is the most useful way to make decisions in my own personal life as well as in business life. You set up a framework that looks like normal and will probably be okay and you say, "We'll move ahead on this basis, but if we are wrong, what are our options? How well protected are we? How flexible are we? If more people die than expected or more people live longer than we expected, can we recoup? Are there other sources of capital we can draw on? Do we make a reservation? Do we make reserves for something like this?" All you do is say, "This is what we think is going to happen, but what happens if we're wrong?" If you haven't prepared in advance for the possibility that you're wrong, you're down the tube, but you can survive all kinds of surprises if you at least thought about this and have some sense of where you will turn when the event occurs. So, they're not mutually exclusive, but it's a pattern of

thought in dealing with these things.

You can't make all your structure on the assumption that everything is going to be chaotic, because if it is, you shouldn't proceed at all. But you ask, "How do I deal with it if it comes to that?" Usually these things are opportunities, because if you can get a jump on the competition, they're going to be affected by this, too. You've got something going for you. The U.S. capital markets were a triumph last September, and I don't think it is a coincidence that the currency remains generally strong at a moment when a lot of things look black. This is an okay place to keep assets. There was opportunity for us in that terrible event, too.

MR. PHILLIP CERNANEK: Good morning, Mr. Bernstein, and thank you for your comments. In addition to Pascal's bet on whether there is or is not a God, do you have two or three favorite outliers that you might give us for consideration?

MR. BERNSTEIN: Well, I mentioned a couple. I think when the dividend yields went below the bond yields, this was a shattering, enormous event, and because of some other work I was doing recently, I happened to go back and look at that particular moment again. It wasn't as though things hesitated and got very close and then linked together. But the stock market just went up like that in 1958, and as a result the dividend yield went right through down below and bond yields weren't all that high at that moment either. It was interesting because you had to answer the question: Why did that happen? The stock market at that time was not institutionalized to the degree that it is today. Investors by and large were much less sophisticated than they are today, and yet they did something unthinkable and what motivated this? As I look back on it, I think two things motivated it.

One, there were a few young people like me coming into the markets who didn't have the Great Depression and the crash smashed into their memory banks. Also, when World War II was over, it was widely expected that once the dynamic of the economic stimulus of the war petered out that we'd be back in the Depression again. Here we were in 1958, we'd had a recession of some magnitude, but it wasn't awful, and people realized that we were not going to go back into the Depression. If we have a system that doesn't have these terrible, terrible fluctuations, then we have a system that grows. Then the upswing is going to be better than the downswings. It was just at that time, in the late 1950s, that growth took hold as the dominant investment concept, and it went off from there. This was a very, very big moment.

OPEC is another on the other side—in the sense that America came out of World War II so powerful (I choose when I say this a little carefully, but I think it's true) that we thought there wasn't anything we could do that would get us into trouble; we could deal with anything. The Vietnam adventure was an example of this, and the OPEC thing was not long after Vietnam was over. We're not an island; we live in a great world that does impose itself on us one way or another. One goes through these things in life. I've had ventures in my personal life that I would classify like

that where suddenly I had realized things I had never realized before—we all have them. But the important thing, I think, in looking back on them is to ask, "How did we deal with this?" I think Americans made a mess of the 1970s—a consistent, repeated mess because we couldn't understand what was happening to us, and this is why the great bull market that began in 1982 went for 20 years, because we did finally come to grips with it and we did do all the things that we had to do to make up for the mistakes of the 1960s and the 1970s, so we had 20 wonderful years in living off that process of doing things better and getting better.

I think now we're going through another kind of a threshold; exactly how it will work out, I don't know, but we have new problems to deal with that are unfamiliar to us, that are not the same problems we dealt with from the 1970s, and I think we will deal with them successfully because there is wonderful flexibility in this system, much more than any other. The English-speaking countries as a whole have this quality. I don't know why, but they do. A gentleman who does not come from an Anglo-Saxon country said something very interesting to me before the session. He said that probability as a concept is the only thing in the history of risk that is western in its roots; that we are willing to ask questions; that we understand there is an unknown; that we sit in a room and argue with one another is something—and I've been doing history—the history that I'm working on is early 19th century United States. Tremendous ferment and getting richer from the ferment—that's something we have, thank God, and I hope we continue to have. I didn't mean to make a speech.

MR. DANIEL MATERN: Taking risks involves trust, and I think you've seen a breakdown of that in the accounting scandals and that, but could you give something other than the standard, "you punish people who don't tell the truth"? What is the incentive, say, to tell the truth and to recover the trust that's been lost? You could say in a general sense, the market, but what are some of the things you would look for?

MR. BERNSTEIN: There's a very important lesson in this. I answer it from my own background because I did grow up in the Depression and experienced the New Deal and a period when government was held up as the thing that would solve everything for us, that government does play a very important role. There was a belief in the 1990s that I think ran to an extreme that developed out of the wonderful contributions that Ronald Reagan and Margaret Thatcher made that there was too much government in our lives, we had to have a freer kind of society. But like every theory, it can go too far. There was faith that markets would cure all problems by themselves, and to a significant extent, the markets have cured this problem and those people are on the run.

I'm concerned about the backlash that we're going to have businesses run by bean-counters instead of risk-takers, and that's not good either, but you can't rely on the markets to understand everything; you can't rely on everybody always telling the truth. There are too many self-seeking temptations when you're in a

position of power, and we do give these people positions of power, so it is essential that the regulators are in there. I hope that they do it with the right degree of touch and sophistication so they don't stifle the appetite for risk, but I think there was too much deregulation. Deregulation only works when everybody is virtuous and flexible. The deregulation of power in California was the consequence of deregulation that was only for the most part, but not for the whole part, and a bunch of wheelers and dealers took advantage of that. It's not easy to do it right. We went too far one way. I'm now hoping we don't go too far the other way.

MR. JOHN SHEPHERD: (McCarr University, Sydney, Australia). Mr. Bernstein, being here in Boston reminds me of one of the quotes you used in "Against the Gods." I think it was Fischer Black who said, "Markets look a lot less perfect from the banks of the Hudson than they do from the banks of the Charles." When I share this with my students, who are the future actuaries, they tend to be a little geographically embarrassed and they can only see one meaning to the word 'bank'. One of my research projects is on the preferred learning styles of actuaries, and I'm starting to find an interesting result that, roughly speaking, 60 percent of actuaries are convergers; 30 percent are assimilators and only five percent are accommodators and five percent are divergers. I'm wondering if, in light of the things that you've been talking about this morning, variability in the makeup of a profession might be a valuable commodity. Might it be true that a more diverse profession, perhaps, is a stronger profession? I wonder if you could comment on this.

MR. BERNSTEIN: How could I answer that except to say yes? Diversity is enormously important. Nobody has all the answers. If somebody had all the answers, I wouldn't have been able to make my speech today and that would have been a shame for me because I've enjoyed it so much. But, yes, diversity is tremendously important. This is where new ideas come from. If the person who knows it all has no vision of what else can happen—by all means, yes. I must say this is not being polite because you've been a wonderful audience, but the material I was sent to read about this was an eye-opener for me. I did not know that this profession was as vibrant as it is and as open to new paths and new ideas as it is, and I think it's marvelous. I say in all seriousness that I wish my own profession were as open as this and as self-generating of new thoughts and new ideas as you are.

MR. ROBERT L. BROWN: I wanted to follow up on your comments about the events you're living are consequences of past events. Would you comment on what I'll call erroneous mass psychology? The stock market in 1998 probably had some basis for its value, but we're now paying for the fact that there was irrational exuberance, to quote Mr. Greenspan. How can millions of people not understand they're beyond the 95th percentile even if reversion to the mean shouldn't be accepted as the key element? Could you just comment on this erroneous mass psychology?

MR. BERNSTEIN: I love your question because it's a toughie. I don't think any of us understands this. It has happened repeatedly in history, as I don't have to tell you. "Manias, Panics and Crashes: A History of Financial Crises," is a wonderful, wonderful book by Charles Kindleberger. If you've never read it, read it. This is the best history of this stuff that I've ever encountered.

There's an interesting example away from the stock market that I wrote about on January 1, 2001. You know the famous story of the Japanese emperor whose new clothes are fictitious and he goes out in them and he's stark naked—"The Emperor's New Clothes." The interesting thing about that story is that everybody knew what was going on. Nobody was fooled, but everybody was afraid to speak up; there was no contrary opinion. The guys who supposedly sewed the clothes kept saying, "Look what great sewers we are," and the emperor said to all the employees, "Oh, they're making wonderful, wonderful clothes." Nobody dared to say, "This is ridiculous." It's finally only when a child speaks up during this great parade when he's going through with nothing on that the child says, "But he has no clothes on," that the crash comes and the bubble bursts.

There is something about wanting—not only do crowds behave in particularly obnoxious ways, but there is something that we want to be part of; we don't want to be the outlier, we want to be part of the group. I think, in quotes, "Everybody knew that the stock market was crazy and too high and that these companies were fluffy," but you ride it and be part of the group at the cocktail party or around the bar or whatever. It was chic. I know all sorts of people engaged in this, and I was just horrified at what they were doing. They were managing money and losing clients. Because of my background I was always a very conservative money manager, and as the 1960s wore on we became an outlier and we began losing clients to the go-go players. I couldn't change my style; it was just what I knew, so I didn't succumb, but we were losing business and there was a lot of pressure and a lot of pain in this, so it's hard. It's very hard to buck something like this when it's happening, even though it's called a rational bubble in economics. Everybody knows what the end of the story is going to be, but nobody knows when that end is going to come, and therefore, it's very hard not to go along with it. It's unfortunately a familiar story in human history.

MR. MAC GINNITIE: I think we have time for one last question.

MR. EDWARD BETTETO: I have a simple question. Is the risk of deflation currently an outlier or an inlier?

MR. BERNSTEIN: I don't know. I had a very interesting discussion two or three days ago with a very good friend from Australia, a man who is a very distinguished banker in Australia. He brought this up and said, "The policymakers, the authorities have to act as though this is a real risk because to err in the other direction when things are so delicate would be fatal." It's better to take the risk of having inflation in this environment than to do the opposite. Don't have itchy trigger fingers. I think

this is very important, and in many ways the policymakers will determine this and it may happen in spite of them. I don't think so, but as I say, it's 50/50. But if the policymakers begin to act the other way, don't let the economy have its head if it gets stronger, but put on the brakes prematurely, and it's not only the brakes that may or may not be so powerful, but the mentality, the expression that inflation is just around the corner and we have to do something about it, would be the worst kind of thing to do at this moment, so a lot depends on the authorities.

In this case, I think there are more controversial things about Greenspan than I think he would like, because he isn't this great guy, but he is very good on that score. He is sensitive. He's probably better at creating liquidity than taking it away and he's willing to give the economy its head, so in this case I think he plays a crucial role. I don't think it's going to happen, but I think again we have more resiliency and flexibility in this system so that the Japanese example isn't necessarily the path that we would follow if the price level did begin to sink. Deflation is a terrible illness to cure because, like inflation, it's self-generating. Once you begin to feel that if you wait because what you want to buy will be cheaper tomorrow than today, you wait and then by God it will be cheaper, but then you'll wait some more. So it is very, very difficult to confront—more difficult to confront than inflation. You can choke off an inflation, but you can't necessarily cure a deflation by flooding a system with money, as the Japanese system shows. It's a very dangerous (and nasty is too mild a word) condition and you must do everything possible to prevent it. I think between, unfortunately, the war and that the system does seem to be reviving, that the chances are small or that maybe it's less than a 50/50 chance, but it's big enough, so I worry about it, too.

MR. MAC GINNITIE: Thank you very much. I think that consuming a doughnut will never be the same after this speech, and I hope that Amazon.com is braced for a surge of orders on your books. The session is adjourned. Please enjoy the rest of the meeting.