

Search for the Fountain of Health
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Preface

First, allow me to explain human psychology as I see it. With the exception of a flash memory here and there (e.g., falling off a swing at age 4; taking an interminably long vacation trip by car to Michigan) I really don't recall much of what I did before high school. About age 14, I began to work on myself in various domains over extended periods of time. Chief among these quests was basketball. Enormous blocks of time were devoted to my dream of "someday ruling the NBA." By college, in the late 1960s, basketball would have been relegated to a "Hobby" on my resume.

Anyway, the "George, the NBA superstar" dream was joined by: "George, the math enthusiast;" "George, the saint;" "George, the world's greatest pal;" "George, the girl's-man;" "George the hard worker;" "George, the dyslexic;" and so forth. In its own time, each dream was written in my mind (as one might pen a novel) and "tried on" in my life. These believed-in imaginings and lived-in roles have each left their never-so-little scar on the person I have become. Adolescence and early adulthood are times when we "try on" new roles like a bride considers possible wedding dresses until she find a dress that looks and feels right for her. In my life, "basketball," "math" and "hard worker" are roles I still frequently inhabit—"saint" and "ladies' man," not so much anymore. Tried and abandoned roles become part of what we often lovingly refer to as "our misspent youth."

What do you think of the title, Search for the Fountain of Health? For many hundreds of years people believed there really was a Fountain of Youth out there, waiting to be discovered. But now we know no such magical spring exists. Then what are people searching for today?

I use "health" as a portmanteau term—physical health, financial health, social health, political/governmental health, professional health, and many more. Think of my adolescent basketball story. It was a conduit that helped me to develop other important roles as an adult (e.g., George the tireless worker, physically healthy George, George the sports psychologist, George the parent, etc.). Basketball George was a

vital, healthy role throughout my life and it remains healthy today—in spite of the fact that I recently chipped my three year old grandson’s tooth on the rim while he was dunking. “Don’t ask!”

Not only does each of us get to choose which roles we will audition for in life, we also get to determine what constitutes success (or health) in that domain. Is Basketball George’s story of success? Absolutely. Is basketball LaBron James’ story of success? Absolutely also. Is basketball LaBron James’ story a success by Basketball George’s standards? Almost certainly “yes.” Is Basketball George’s story a success by LeBron’s standards (e.g., win an NBA championship, being league MVP, etc.)? Not even close! But here’s the good part: you get to set the height of the bar you wish to clear in each domain—and that’s cool. [Note that Bernie Madoff may have cleared his own bar for legal/moral investing, but society’s response is (and ought to be), “Who cares. Go to jail, Bernie.”]

My entire personal and professional adulthood has been spent working to become the healthiest and happiest person possible, given the lights and talents I possess. In several domains, I believe I have made some progress. You’ll read my progress reports in several domains later. In most domains I’ll be completely silent as I have little or nothing to offer. In a few domains, I’ve spent a lifetime searching but have come up with nothing original. For example, in “spiritual George” a lifelong journey is reported in less than a handful of pages. I wish I had more—but that’s all I got. Fortunately for you, libraries have been filled with what others have offered on the topics of spirituality and religion.

We’re all searching for our own fountains of health. Mine focusses upon psychological, financial, physical, and family health—mixed with a dollop of spiritual, political, and social/environmental health. By reflecting upon my interrelated searches, I hope you will be provoked to consider the several fountains of health that constitute the stories of your life. It’s my belief that if one better understands where she or he is going, it increases ones chances of finally getting there. Here’s hoping we all enjoy our lives’ journeys.

Forward Juan Ponce de Leon

Ponce de Leon's career as an explorer, civil administrator, and land owner was truly remarkable. The first governor of Puerto Rico, he is also credited with the discovery of Florida. Although these accomplishments are noteworthy, his place in the modern mind comes from his heroic (but, of course, futile) search for the Fountain of Youth—a myth that antedated Ponce de Leon by many hundreds of years.

The myth of a fountain or stream giving health and youth is, probably, almost as old as the world itself. Prester John, the real or legendary King of Central Asia told the reigning Pope that he knew of such a wonder. And further, he said, it was in his realm, at the foot of Mount Olympus, just three days journey from Paradise (the Garden of Eden?) and whoever tasted of this spring would, from that day on, never know fatigue and would always be no more than thirty years old. (King, 1963 pp 25-26)

If one's mind has been consumed by the vision of a fountain of youth, Florida would be an ideal location to set this myth,

Florida has been granted the boon of many health-giving springs. Too numerous to count are those fortunate ones who have benefited through the gracious help of Florida's climate. The sun, the salt breezes, the invigorating ocean, all have contributed good shares in making Florida known as the Sanitarium of the United States. The story goes that Ponce de Leon heard of the Youth's Fountain from an Indian who related how an old man was rejuvenated through its magic waters. But Ponce himself was far from being withered or wilted. If he went after such bright waters, it was not only to help himself alone, but to locate a wholesome spot and then recommend it to others. There is no evidence that he ever did include this idea in his travels and explorations. The Indians of Porto Rico had long kept this legend in their memories. (King, 1963 p 25)

While it is unclear the extent to which Ponce de Leon believed the Fountain of Youth myth, clearly the Indians of Puerto Rico believed it. The Indians were happy to imagine Ponce's westward journey as a quest after the legendary Fountain of Youth.

My interest in the Fountain of Youth fantasy rests in its place in an older, broader utopian stream of imagery. About the Fountain of Youth legend, King (1963) writes,

Such a legend is as ancient as time. Even the Indians over here in the Caribbean Islands knew it by heart. What might one not find in exotic Florida, Florida that some of its press agents have described as, “Where the summer spends the winter...”

So much was guessing and groping in the early days over here. “Seek and ye shall find,” meant many things to different people. Some went searching for material goods, wealth and power. It was easy for them to believe in a youth fountain in this marvelous western region. Homer, the first Greek poet, who lived before 700 B.C., wrote about the Bright Isle to the West. Plato, the Greek philosopher whose life span was anywhere between 427-347 B.C., described Atlantis as a large island in the western sea where Utopia existed, a highly civilized city that was wiped out by an earthquake. Plato told all this in his great work, *THE REPUBLIC*. It was a beautiful place, knowing nothing of poverty or hardships.

And then, so much later, in 1516, Sir Thomas More, took this as the title of his book, *UTOPIA*. Probably Thomas More was inspired by tales of this new world...St. Augustine, a Doctor of the Church born 354 and died 430, composed, *The City of God*, which was a divine Utopia... Francis Bacon, the English philosopher and statesman, (1561-1626), set fourth another utopia, called, *THE NEW ATLANTIS*, also surely influenced by the great activists in the new world to write this work on scientific principles. James Harrington, the English writer (1611-77), published an utopian *Commonwealth of Oceania* (1656) inspired by and inspiring Americans and elsewhere. (King, 1963 pp 28-29)

Thinking as Story Telling

All thinking represents one form (or another) of storytelling. For example, in several later chapters I'll tell mathematical tales of investment strategies. You will be charged with judging whether or not I've handled the mathematics properly. If they pass mathematical muster, one then might wonder whether they make sense as a viable investment strategy (for proper mathematics do not always point to a sound investment strategy). Finally, a mathematically sound, winning business strategy might depict an ethical nightmare. For example,

...first you steal one million dollars from a bank. Then you invest the money in tax free bonds that yield 2.25% interest for an annual yield of \$22,500...

The mathematics seems right, the investment seems solid, but the ethics of how you obtain your capital??? Stories must be viewed from a variety of perspectives in order to properly judge their appropriateness. When one is liberally educated, the “liberal” has no relationship to our familiar liberal-conservative political dichotomy. “Liberally educated” means the person is capable of accurately evaluating knowledge claims from a variety of perspectives (i.e., mathematically, politically, ethically, scientifically, etc.). [Appendix A depicts human thinking as an exercise in story elaboration and traces its consequences for psychology, other sciences, society, and the like. All Appendices in this book are intended for more advanced thinkers who require deeper analysis of the claims made herein. Most readers can skip the Appendices if the claims seem reasonable.]

Modern psychology appreciates that stories create realities as much as time, place, and societies also create the realities in which we dwell. The English psychologist, Miller Mair (1988, p. 127) proclaimed,

“Stories are habitations. We live in and through stories. They conjure worlds. We do not know the world other than as story world. Stories inform life. They hold us together and keep us apart. We inhabit the great stories of our culture. We live through stories. We are *lived* by the stories of our race and place. It is this enveloping and constituting function of stories that is especially important to sense more fully. We are, each of us, locations where the stories of our place and time become partially tellable.”

On March 4, 1513, Ponce de Leon set sail with three ships and 200 men from Puerto Rico toward the northwest in search of...What? What exactly was it that de Leon was looking for?

Wikipedia claims, “Most historians hold that the search for gold and the expansion of the Spanish Empire were far more imperative than any search for the Fountain (of Youth).” But popular legend now holds that Ponce de Leon discovered Florida while searching for the Fountain of Youth. However, Wikipedia quickly

adds, “Though stories of vitality-restoring waters were known on both sides of the Atlantic long before Ponce de Leon, the story of his searching for them was not attached to him until after his death.”

I guess we’ll never know for sure what Ponce de Leon was really looking for when he made his first voyage to Florida. However, the more Romantic tale—of him searching for the mythical Fountain of Youth—clearly won out over the historians’ view that it was just another grab for wealth and empire. What does that tell us about the power of a compelling story when pitted against the cold “facts of the matter?” While it was clear that Ponce de Leon knew of the Fountain of Youth story, the historical record seems to reveal no evidence that he was moved (or motivated) to action by it. And yet, de Leon’s contemporary significance is bound up with the Fountain of Youth story. Is this a “man bites dog” event? Perhaps a gripping story (the search for the Fountain) abducted a man’s (Ponce’s) story for its own purposes.

Us or Our Stories: Who’s Living Who?

Are you aware that many tens of thousands of people around the world currently believe that they have been abducted (and often experimented upon) by aliens? Judging from the rest of their lives, these people look as psychologically healthy as you or I. So is this flight into an unbelievable (at least to me), fanciful story a one-time, slip-of-the mind? Apparently it is. [Appendix B elaborates the psychology behind how fantasy prone individuals can slip into believing a compelling, possibly-true story about their place in the Universe.] Obviously I believe real abduction by aliens has never occurred. If later today I am abducted by aliens, then abductees everywhere have my profound apologies for once believing that UFO abductions represent a completely-psychological phenomenon. But so sure am I, that I’ll take bets that I’ll never be abducted by aliens.

Ever since 2001: A space odyssey, Star wars, ET, Star trek, Contact, Signs, Interstellar, Gravity and many more books and movies, we have wondered if we humans are alone in the universe. Such fictional stories (and they are all works of fiction) are intended to thoroughly engage our minds and emotions in the possibly-true reality of aliens, space travel, worm holes, and the like. That some people take these fictional

representations of possibly-true stories a bit too seriously is but the latest example of an age old problem for humans. The movies Interstellar and Gravity are similar in that in each film new technologies allow heroines to enter worm holes that allow them to travel to worlds that are hundreds of light years away from earth and then return. In these movies, the round trip takes the heroines only a handful of years—in earth time. People leaving these movies might feel as if they accompanied the time travelers on their remarkable journeys, but the moviegoers realize they experienced those journeys only in their imagination—no one actually journeyed to those far-off worlds.

Some people are not as skilled as you and I at knowing which of our experiences actually occurred in reality and which we remember only because we fantasized about those experiences occurring. I know this is hard for some readers to swallow, but the line between fantasy and reality is crystal clear for some people and barely discernable in others. The former group are concrete individuals while the latter group are fantasy-prone types. Both groups can be psychologically healthy or they can have mental health problems. In their personal and professional lives, the fantasy prone types are far more imaginative and creative.

In Intellectually Turbulent Times

Juan Ponce de Leon lived in intellectually turbulent times. Columbus had just discovered a “New World.” He had done so by sailing west to reach the East. That can only occur if the earth is “round.” There were already numerous hints in scientific circles that the earth was a sphere and not a flat plane. And while most ordinary citizens were still flat earthers, there was an almost palpable sense that science was on the verge of some discoveries that might rock the world’s intellectual foundations.

Were the Ponce de Leons, the Columbuses, the Magellines, the De Sotos, and their ilk more likely to be “concrete” or fantasy prone types? Framed slightly differently, how many times must a person step on a ship in their imagination and experience the discovery of new worlds before they are brave enough to risk it all and actually head west to reach the East?

Immediately following World War II was another intellectually turbulent time. By then we'd seen pictures of jet planes, rockets, and the destruction wrought by atomic power. We looked heavenward and wondered "what next?" While gazing into the seemingly infinite abyss of space, of course one might wonder if some being out there might also be gazing back at us. That's when we humans "saw" the first flying saucers. Soon almost everyone was "seeing" them—as all human communities are susceptible to group influence effects. This is an instance of where believing is seeing. Of course, it wasn't long before our first "abduction" occurred. Then another. Then another. Now there have been hundreds of thousands of abductions, perhaps more. But where did these abductions occur? In reality or in the imaginations of fantasy prone individuals?

I remember exactly when I definitively answered the "abduction; real or imaginary" question for myself. I was studying a different, intellectually turbulent time: the last decade of the nineteenth century. Then, everyone knew lighter-than-air machines (like balloons) could fly. But would a heavier than air (like an airplane) machine ever fly? [Recall that the Wright brothers' Kitty Hawk experience occurred in 1903.] However, scientific journals and many newspapers were a-buzz with the possibilities of heavier-than-air flying machines. "Abduction" (by people flying in heavier than air machines) reports also occurred throughout the last years of the nineteenth century. One newspaper editor characterized it thus, "This has certainly been one of the most remarkable crazes in the history of human delusions." ("Time for a rest," San Francisco Examiner, Nov. 26, 1896, p. 6).

These nineteenth century abduction claims are virtually identical to the 1950s, 60s, and 70s flying saucer claims except: 1) the pilots were American scientists, inventors, or industrialists instead of little green aliens; 2) the heavier-than-air ships were being kept secret until patents, additional investors, etc. were obtained; 3) the ships were powered by steam, coal, a remarkable antigravity discovery, etc. and 4) the space craft pilots all spoke perfect English. The specifics of the abduction tales were exactly what a late nineteenth century mind would think about the next amazing scientific development.

How can I say those nineteenth century abduction claims (in all likelihood) did not occur, an interested reader might wonder? Well, 120 years later, having put men on the moon and returned them to earth, we still (to my knowledge) haven't created a plane that runs on coal, steam, or "a remarkable antigravity discovery." At some point, one can say "case closed." All those Americans who claimed to have flown around in heavier than air machines in the late 1890s, in all likelihood never left the ground. Because of our later research (see Appendix B) on UFO abductees, it now seems likely the abduction reports were from Fantasy Prone Personality-types who experienced abduction fantasies that were so real to them that they misremembered them as actual events rather than as merely remarkably-real fantasies.

How Believed-In Imaginings Become Real Lives

To summarize, Ponce de Leon was a relatively fearless explorer. But don't you think he imagined himself discovering new lands and returning home safely before he set foot on such a dangerous mission? Did those fantasies include discovering a Fountain of Youth or were they simply about increasing wealth and empire? We honestly don't know. But whatever the motives, they were sufficient for him to finance and lead a 200 man, 3 ship expedition to (what later became known as) Florida.

So now, patient reader, I must ask, "How does foresight and the ability to fantasize work to create the reality that becomes your life?" While Ponce de Leon may or may not have been searching for a Fountain of Youth, history tells us that he didn't find one. Why didn't he find such a fountain? In all likelihood because they don't exist. [However, as was true for alien abductions, my apologies in advance to any Fountains of Youth out there that might be waiting to be discovered.] We do know Ponce de Leon was looking for wealth and to extend Spanish rule over new lands—there he was quite successful. If he wasn't looking for a Fountain of Youth, but stumbled upon one, that would have been icing on the cake. Undoubtedly Ponce would have proclaimed the Spanish equivalent of, "Never look a gift horse in the mouth."

Everyone would like to live in a healthy society. It is now completely clear that all societies on earth are imperiled by the growing threat of climate change due to humans' excessive burning of hydrocarbons to power

our lifestyles. My concern for our planet's environmental future was inspired by another dreamer—Stanford Ovshinsky. Stan produced numerous innovations in the 1960s, 1970s, and 1980s to blunt the progress of greenhouse gases that he foresaw before almost anyone else. [See an excerpt from Stan Ovshinsky and the hydrogen economy: Creating a better world in Appendix C.]

I remember the day I read an Argonne National Labs/Cal Tech report that said that all of the world's energy needs could easily be met (cleanly, without greenhouse gases, and renewably) solely through solar photovoltaics. My mind was seized by this solution to our societies' energy and environmental problems. I foresaw through fantasies how this solar solution would work many thousands of times (usually while on my daily health-seeking walk) until finally my friend Tom Kanczuzewski and I took the plunge and started our own solar development company. [One can trace the path of our Solar Ship's progress thus far at www.inovateus.com] But the present book will not be about companies built on dreams of improving our environmental/societal health. Instead this book deals with two companies that seek to enhance our physical well-being by translating recent breakthroughs in diseases where excessive inflammation is implicated (Rock Creek Pharmaceuticals, Inc.) and a stem cell company that creates products that stimulate healing (Osiris, Inc.).

In both the Rock Creek and Osiris cases, brilliant men and women foresaw the ways that powerful anti-inflamitants and adult stem cells might greatly enhance humans' physical health. Each company launched upon long and arduous scientific adventures to mold their naturally occurring entities (anatabine citrate for Rock Creek; adult stem cells for Osiris) into powerful, useable therapeutic agents. Two noble quests—to be sure.

Sadly, noble quests usually fail in our current business environment. My own Inovateus Solar adventure has only turned a profit once in its first seven years. Its future is far from assured. My book on Stan Ovshinsky and the hydrogen economy traced the remarkable inventions of a true scientific genius. Sadly, Stan was an ordinary (or worse) businessman and his company (Energy Conversion Devices) went bankrupt several years ago. Whether Rock Creek and Osiris succeed or fail, I believe the world will be a better place for their noble

efforts. Unfortunately, the fates of most dreamers (i.e., employees, investors, etc.) are tied more closely to their companies' ultimate success as a business proposition.

As I write this Forward, both Rock Creek's and Osiris' fates are still in doubt. I know you join me in wishing them well as they struggle to achieve their noble quests. Unfortunately, as the television alien—ALF—once said, “It’s a tough universe out there.” Indeed it is. But since we are dreaming, imagine a society built on the success of noble quests, rather than the winner-take-all model of brutal competition that our version of free market capitalism now endorses. Are there models of societies that produce far more winners than losers? Might such societies be healthier places for humans to live, work, and dream?

Chapter 1

Dream a Little Dream With Me

Walt Disney claimed that, “A dream is a wish your heart makes, when you’re fast asleep.” Not for me. I dream when I’m wrestling with unsolved problems.¹ In a recent dream, God (well, Jesus actually) shared His latest problem with me and asked for my counsel. The church had put forth two excellent candidates for canonization—Albert Schweitzer and Mother Theresa. While Jesus thought both would make exemplary saints, He worried that the church might be understanding its task in the world too narrowly. Jesus had hoped that His church would work to build a better world—not just to offer comfort to downtrodden victims in a cruel world. Hadn’t the Holy Spirit engineered the election of Pope Francis to make just point? Here’s how the Lord put it:

“Most people, if asked to rank order Albert Schweitzer, Mother Theresa, John Snow, and Ignatz Semmelweiss as candidates for sainthood would put the first two names at the top and confess ignorance about the latter two. Yet in terms of contributions to humankind, like the number of lives saved, Snow and Semmelweiss tower over the other two.”

“It may seem subversive or mean spirited to fail to praise Schweitzer and Theresa as recent-day saints, but I greatly prefer the canonization of Snow and Semmelweiss. Schweitzer was trying to save humanity one person at a time. Similarly, Mother Theresa, with a heart full of compassion and kindness was also trying to save the world one person at a time. It simply can’t be done. By way of contrast, John Snow figured out that cholera was a water-borne disease long before the noxious agent causing cholera had been identified. He observed that the pattern of cholera infection was related to where drinking water came from; in the most famous act in the history of public health he removed the handle from the Broad Street pump and stopped a cholera epidemic.”

“Semmelweiss puzzled over the high rate of child-bed fever and death in women in the public wards of hospitals in Budapest. [In those days physicians didn’t wash their hands, but wiped them dry on the lapels of their frock coats, so the more experienced physicians had stiffer and smellier coats.] Semmelweiss finally decided that somehow medical students and obstetrical trainees were carrying some poison from the dissecting rooms of the anatomy lab to the women giving birth. He ordered all of his medical trainees to wash their hands for ten minutes before they delivered a baby. Suddenly and precipitously the rate of child-bed fever and death dropped to almost nothing. Of course the great experts of the day did not believe either Snow or Semmelweiss. But fortunately, as Freud was wont to point out ‘The captains and the kings depart, truth remains.’”

¹ Many years ago, George Albee (Past-President of the American Psychological Association) infected the soul of this rookie psychologist through a brilliant President’s Column entitled, “No More Rock Scrubbing.” That’s where this dream really originated.

“The point here is that Snow’s and Semmelweis’ work illustrates the truth of the dictum that ‘No mass disorder afflicting mankind has ever been eliminated or brought under control by attempts at treating the affected individual.’ These two public health saints have saved millions of lives while Schweitzer, full of heart and compassion, was treating suffering individuals in his jungle hospital in Africa and while Mother Theresa was administering to the poor and the hopeless in Calcutta. Individual treatment has no effect on incidence.”

“One cannot help but admire and respect those selfless people who reach out in humanitarian concern to support suffering individuals. But at the same time, if we respect evidence, efforts at primary preventions are even more humane and admirable if our criteria include the reduction of mass human suffering.”

Jesus’ thoughts reminded me of a trend within psychology that George Albee had highlighted years ago.

“Lord,” I began, “With the exception of a small number of community psychologists, prevention has not been the focus of current psychological intervention efforts. One need only read the divisional newsletters and the APA Monitor to see how important individual psychotherapy, delivered by individual practitioners, has become. The mission of this large group of psychologists has changed the structure of APA. While valiant efforts are being made by APA to keep science alive and content, a great many scientists are dissatisfied and the scientific training of applied psychologists has been put on the back burner in a great many clinical programs. Prevention gets little or no play in psychology.

The field of public interest in psychology has also suffered an eclipse. Political conservatives rarely get involved in public interest issues unless they are forced to. Conservatives favor the status quo and resist social change. There has been a major move towards more conservative right-wing explanations of mental and emotional disorders for at least the past forty years. We are told by the American Mental Health fund that ‘All mental illness is a medical illness.’ Conservatives within Psychology believe that nearly every mental condition is a brain disease or genetic defect. The American public is being educated to believe that anxiety, phobias, obsessive compulsive behavior, depression, bipolar disorders, schizophrenia, alcohol and other drug abuse, and juvenile delinquencies are all caused by bad genes or bad brains. The advantage for conservatives of this organic model is that it means that no social changes are required to reduce the stresses of sexism, racism, homophobia, and exploitation of the poor and homeless. Prevention efforts are opposed as woolly-headed idealism. In fact the National Alliance for the Mentally Ill publicly denounces efforts at prevention.

The prevention of mental and emotional disorders must involve social change efforts at creating a more egalitarian and just society...”

“Enough!” the Almighty bellowed, “Mother Theresa and Schweitzer are saints. Now I gotta get word to the Pope to get the canonization of Snow and Semmelweiss started... We have to recognize the importance of prevention...”

“I don’t think Snow and Semmelweiss were even Catholics,” I mused.

“Who says you gotta be a Catholic to be a saint?” the Almighty asked testily, “You certainly don’t have to be a Catholic to get into heaven. Why, even George Albee is up here...”

“Albee made heaven?” I asked excitedly.

“Of course he did—he’s a good man.” Jesus replied. “He’s always talking with a small group of psychologists three clouds over. Four clouds over a group of lawyers meet and discuss...”

“Wait,” I interrupted, “Albee’s in heaven! Then why are you wasting your time talking to me when the source of this wisdom is just three clouds over?”

“Kid,” God said, “I got out of the game about 2,000 years ago. I no longer influence the world of human affairs. Albee got taken out almost 20 years ago. Now I wonder who’s left in the game to make a difference...”

“Me!!” I shouted, as if struck by a bolt of lightning. “I gotta get out of bed and...”

I awoke shortly after I hit the floor. My elbow hurt, but I sensed no permanent damage had been done. Being in a hypnogogic brain state, the proper sequencing of events can sometimes get a little out of order.

“What’s going on? Are you OK?” my sleepy wife asked.

“Just fell out of bed—I’m OK,” I said as I rubbed my elbow. “Gotta go.”

“Where are you going?” my groggy better-half asked.

“To work.” I shouted as I sprinted for the shower. “I finally know exactly where I’m going. For me, three clouds over is Heaven, four clouds over is Hell.”

In the shower, I first turned on the water. Only after being doused with freezing water did I angle the shower’s spray toward the wall. I was still groggy and struggling with the sequencing of my

actions. As I reached for the soap I remembered how Albee ended his “No More Rock Scrubbing” column many years ago,

“Last Spring I offered a couple of bright undergraduate students the opportunity to attend out annual conference on prevention, this one entitled ‘Improving Children’s Lives: Global perspectives on prevention.’ After some agonizing they both decided that they would rather go to Alaska and volunteer to scrub oil off rocks on the beach caused by the Exxon Valdez spill. Somehow this symbolized for me one of the critical intellectual conflicts in our society. Should we sit around and scrub oil off rocks after the oil spill or should we demand that safer tankers be required by international law? Treatment or prevention? Schweitzer and Theresa, or Snow and Semmelweis?”

Nancy had gone back to sleep so I quietly slipped out of our bedroom. I was sure she was baffled by my antics, but I was thrilled that she was back asleep—perhaps dreaming her own little dream.

What does my fanciful dream have to do with the story of anatabine? Does Rock Creek Pharmaceuticals possess the rights to a drug of use in the treatment of diseases that are due in large part to the effects of inflammation? “Yes,” Rock Creek, the FDA, and I would reply. Or does Rock Creek possess the rights to a nutraceutical (a compound that naturally occurs in plants) that is beneficial to humans in the prevention of a number of diseases and conditions that are related to unchecked inflammation? Star Scientific—the predecessor of Rock Creek—and I long ago believed that to be true. Is Rock Creek’s compound a drug, or a nutraceutical, or both? Thus, Anatabine requires two stories—a twice told tale—for you to really understand this prevention/therapy miracle.

I’m afraid I’ve gotten ahead of myself in telling this modern day morality tale. I have yet to introduce our hero:

Anatabine is one of the minor alkaloids found in plants in the solanaceae family, which includes the tobacco plants and tomato. Commercial tobacco plants typically produce alkaloids at levels of 2% and 4% of total dry weight, with nicotine accounting for about 90% of the total alkaloid content, and the related compounds anatabine, nornicotine, and anabasine making up nearly all the rest. These compounds are thought to be biologically active, and part of plants’ natural defense system against insects.

Anatabine has been studied in animal models and in cells to see if it might be useful for treating nicotine addiction and inflammation and has been studied in models of diseases characterized by inflammation, such as Alzheimer’s

disease, thyroiditis, and multiple sclerosis. On a biochemical level, it appears to be active against certain nicotinic acetylcholine receptors. [Wikipedia, November 16, 2014]

Having been introduced to the hero, are you now ready to hear the compound's tales?

Chapter 2

Introducing: Star Scientific

It was a morning almost exactly like the many thousands that preceded and followed it. I arrived at my office in Haggard Hall many hours before the sun would rise. I went downstairs to the Psychology Department's Lounge and started the day's first pot of coffee. I remember nothing more about that day until the telephone rang several hours later.

"Hello."

"Good morning, George. It's Ed Stephan."

"Fast Eddie! How's it going?"

"Pretty good, laddie. Do you still like Osiris?"

"Absolutely. Stem cells are the future. Are you getting ready to jump in also?"

"Perhaps. But not just yet. Tell me, what do you know about inflammation?"

"Not much, actually. I know that when you get an infection your body's immune system is mobilized to fight-off the infection. It produces an array of agents like white blood cells, cytokines, microphages, and such. The body rushes these compounds to the site of the infections and one hell of a battle takes place! The pain, redness, pus, and such at the site of the wound are the debris left by the fight."

"You actually know more about inflammation than I would have expected of a psychologist."

"Funny thing, Ed. Freud thrust early psychology into the medical model as a way to understand psychopathology. A foreign body, or a virus, or a bacterium invades the body. A doctor—wielding a modern medical device like penicillin—rushes in and effects a cure. The psychological parallel was thought to be: Your parent uses an inappropriate parenting style on you as a kid and you later develop a neurosis. A brave psychotherapist—wielding Freudian psychoanalytic techniques, of course—rushes in and effects a cure. Viola."

“...and I sense that you’re not buying that conceptualization, laddie.”

“Well, it’s got some value. But early psychology—and modern psychotherapy—has swallowed the medical model hook, line and sinker. And that’s a mistake. A few years ago I read an amazing book entitled, The Body is the Hero. It claimed that medicine rarely cures any disease. Rather, the body always heals itself. Modern medical techniques simply help the body to win it’s battle with the diseases. So, this book claims the medical model doesn’t even work well for medical problems. Then what are the chances for the medical model to properly characterize the treatment of psychological problems? In fact, I used to teach a course on conceptual models in psychology.

My poor graduate students in clinical psychology had just spent four or five years learning the medical model and an array of treatments that only make sense in the medical model view of psychopathology. And so I offer a seminar entitled “The psychology of healthy lifestyles,” that says if the medical model doesn’t work for medical problems, it surely doesn’t work for psychological problems. “Therapists never heal clients—clients always heal themselves. Psychotherapists are more like nurses than doctors. They only witness a client as he or she cures his or her own disorder. Advanced graduate students did not want to hear that message. But I didn’t care—my job was to teach them how to think like real scientists—not like hacks.”

“The Body is the Hero sounds like a great book,” Ed replied, “I’m gonna get it.”

“You can’t,” I replied, “it went out of print a few years ago.”

“Can I borrow your copy,” Ed inquired.

“Sorry,” I said wearily, “the last student I loaned it to never returned it.”

“Isn’t it always the case that it’s the last one,” Ed noted sardonically. “George, I’ve got a stock that you need to look into. It’s called Star Scientific.”

“Fire away, Ed. I’m taking notes.”

“Star holds the patents to a process for curing tobacco leaves that reduces the carcinogens in them to BDL—below detectable levels. In theory, one could smoke cigarettes cured in this manner and not get lung cancer. The big tobacco companies have been using Star’s curing process without paying them royalties. There has been a big court case raging for years. It’s still unclear who will win it, but if Star prevails, it could be worth a billion dollars.”

“So Star wants to be a tobacco company?” I asked.

“Not exactly.” Ed replied. “Their product is called Cig X—it’s a smoking cessation product. Most other smoking cessation products use nicotine—like those patches. But Star’s method uses anatabine—which is also found in tobacco leaves.”

“And this anatabine works better than nicotine replacement patches?” I asked.

“That I don’t know,” Ed replied slowly. “But anatabine is apparently an amazing compound in its own right. It might be the most powerful anti-inflammatory product known to man. What do you know about inflammation’s role in producing various diseases?”

“Not much, Ed, except that inflammation seems to be implicated in almost every auto-immune disease out there,” I replied.

“Not just auto-immune diseases,” Ed gushed. “Neurological disorders like Alzheimer’s, ALS, and thyroiditis, Chron’s, and many other problems.”

“Enough,” I said, “I’ll look into the company and get real familiar with Star Scientific.”

Star Scientific, at the dawn of the second decade of the twenty-first century, was an amazing company. At the heart of Star Scientific was Jonnie Williams—founder, inventor, CEO—and much more.

Chapter 6 Osiris 2015

Now that you know the history of OSIR, we might do a real time analysis (in June 2015, as I write this chapter) and imaginatively project the company's future prospects. One always does a projection into the future when making an important decision—like where to invest ones assets, whether to start a family, whether to move across the country, and so forth.

First, what are the general prospects for this field? Is Osiris in a growing or contracting business? Stem cell therapy is a growing business by almost anyone's accounting. Its growth was retarded for many years by the close connection (in the minds of far too many people) between abortion and stem cells. This association was never true for Osiris, because the company employed adult stem cells and cells harvested from umbilical cords after normal births. Fortunately, the bias against all stem cells has lessened over time, so that misplaced moral resistance no longer retards the growth of Osiris to any noticeable degree. Sadly, other companies that still work with embryonic stem cells cannot make the same claim.

Second, some companies are run by brilliant scientists who turn out to be mediocre businesspersons. Here I am thinking of Stan Ovshinsky—one of the most gifted scientists who ever lived. Sadly, he could not willingly give up control of the company (Energy Conversion Devices) that was charged with converting his inventions into a thriving business. The bloody conflict over control of Stan's company was a prime cause for the eventual collapse of Energy Conversion Devices. Is Osiris likely to experience a similar fate?

Fortunately, Osiris is closely held by a small group of insiders, the most salient of whom is Peter Friedli chairman of the Board of Osiris. Peter is a gifted businessman who first cut his biotech teeth on _____ which was sold to _____ in _____. He then founded Osiris in 1992. The company's first twenty years involved remarkable scientific progress with modest translation of intellectual capital into profit. Over the past year (2014) the company has exhibited a move to profitability that will (in all likelihood) continue unabated. However, what sets Osiris apart from virtually every other biotech company is its low stock float

(about 33 million shares) and its rock-solid cash (and securities) position (about \$100 million). The business side of Osiris could easily be a model for all biotech companies. When you purchase OSIR shares you receive more than two decades of scientific capital and a rock-solid, rapidly growing business.

The bane of every biotech's business model is the incredible amount of time and money required by the Food and Drug Administration (FDA) to bring a drug to market. Osiris' research has produced a stem cell drug (Prochymal) and several stem cell medical devices (Grafix, Bio4, Cartiform, Menix). Osiris quickly partnered with Mesoblast in the development of Prochymal to avoid the enormous costs of drug development and the inevitable risk of failing to get approval of the drug for particular disease indications. Osiris relinquished upside potential on Prochymal to avoid large costs and business uncertainty.

Grafix, on the other hand, came to market bearing far less risk and expense than Prochymal. Osiris built a sales force around Grafix and kept all of Grafix' revenues for itself. Grafix will be the reliable workhorse of the company for the immediate future. Its reliable revenue growth and enviable profit margin make Grafix a perfect flagship product.

Bio 4, Cartiform, and Menix quickly came to market just as Grafix was still being ramped up. The Osiris team chose to keep its 100+ person sales team focused upon selling Grafix and instead chose to partner with Stryker (on Bio 4) and Arthrex (on Cartiform). Almost immediately 20,000 additional salespersons hit the streets selling Osiris' products. Once again, some upside on Bio 4 and Cartiform was sacrificed to create steady, immediate streams of profits. In summary, under Peter Friedli (chairman) and Lode Debrabandere (CEO) Osiris' business decisions have proven to be conservative and enlightened, in my opinion.

What about future products? Will Osiris continue to develop new products to expand its product line? This is a difficult question to answer as Osiris is the most tight-lipped, publically traded company that I've encountered. Is this tight-lipped organizational tendency a good or a bad sign? Making company information public prematurely is considered a mistake by Osiris because doing so can surrender some of its competitive

advantage in the field. I have no problem with this stance, except that it makes doing deep research on the company especially difficult. However, I see no reason to doubt that Osiris will generate new products to grow its catalogue of products.

Revenue from sales for the last year (primarily from Grafix) has been: \$13 M (quarter ending June 2014); \$17 M (Sept. '14); \$19 M (Dec. '14); and \$21 M (Mar '15). Income for that period was: \$-1.88 M (Jan '14); \$.64 M (Sept '14); \$.81 M (Dec '14) and \$1.37 M (Mar '15). Thus, revenues are growing steadily while losses have become (seemingly) consistent profits. What's not to like about the business profile for a company like that? Almost a decade ago I invested into a very speculative stem cell company: Osiris Therapeutics. Today that company looks very safe with a bright future as every business decision Osiris' principals have made seems to enhance profitability while reducing exposure to risk. What once was speculative, now appears to be solid.

What the Future Holds for Osiris

One of the most enduring findings (going back at least to the 1960s) in American culture is that about a half of marriages will end in divorce. In my Healthy Lifestyles course at Notre Dame I ask students to raise their hands if they intend to get married. In almost every class more than 95% of the students raise their hands. I indicate that indeed the overwhelming majority of Notre Dame graduates do get married. Then I ask them to raise their hand if they think they'll get a divorce. In thirty-five years of teaching at Our Lady's University, only two students have ever raised their hands. But we know (from historical data) that about half of all students will get a divorce. What's the problem here? At this point in time, one-hell-of-a-discussion always erupts. That's also why I always claimed I had the "greatest job in the world." It's also why, when asked about retirement, I say, "It's a mixed bag—some parts I like, some I miss like crazy." But what does all this have to do with Osiris' future?

First, no one can predict the future perfectly—which is why starting a company or buying a company's stock is always an exercise in risky business. However, I believe I can look at some couples standing at the

alter and say, “Even though they can’t predict whether they’ll have a long marriage or a quick divorce, I think I can make a pretty good prediction.” [My family will never forgive me for what I’m about to say. At the wedding reception for one of my cousins, several of us made a bet about how long the marriage would last. I bet one year. My kid brother bet one month and he won—even though he overestimated also.]

What might be true of predictions about marriages, might also be true about predictions about companies and stocks. When I first invested in Osiris about eight years ago, it had obvious, enormous potential, but I knew almost nothing about how it would conduct its business. So I took a small position in the company—I signed on to their dream (in a tentative way). With every subsequent business decision they’ve made, my confidence in the company’s business acumen has grown (and so I continued to increase the number of Osiris shares that I held). Osiris has traded away a bit of its upside over the years, but who hasn’t thought that their spouse was absolutely perfect, as they proclaimed, “I do.” Not quite perfect, my wife Nancy is still far more than I deserve in a partner. Osiris still has enormous potential as an investment.

Divorce for me? Sorry, it ain’t gonna happen. In fact, I’m taking bets from anyone stupid enough to bet against my marriage. Will I ever give up Osiris? Only when they pry my cold, dead fingers from those wrinkled stock certificates...When you’ve been married as long as I have, it’s troubling to even think about not having your spouse. I’m tied to Osiris, I don’t even want to think about life without her. That’s why I was deeply troubled when Stan Ovshinsky’s dreams died the day Energy Conversion Devices went bankrupt—and it had nothing to do with money.

In my humble (because it is fallible) judgment, Osiris is a rock solid company. That confidence allows me to venture into the very risky dream world of Rock Creek. But what if Rock Creek goes belly-up? Well, to paraphrase Bogie, “We’ll always have Osiris.”

Chapter 7 Rock Creek 2015

I think it's fair to say that Rock Creek is currently on the ropes as a business enterprise. Anatablock, sold as a nutraceutical, used to be a reliable source of revenues. However, FDA pressure forced Rock Creek to remove Anatablock from the supplements market. Thus, Rock Creek's financial health took a dramatic turn for the worse.

The company's stock price took a huge hit also dropping to a post reverse split low of \$1.50/share/ The equivalent pre reverse split share price would have been \$0.06/share (while the preceding 52-week high was \$16.00). Thus, company officials were forced to virtually abandon the interests of early shareholders in order to save the company and did the 25-to-1 reverse split.

At the end of June, 2015, there were rumors of favorable study results (especially from a New Zealand, Phase 1 study) but no public announcement had yet been made. Clearly, these were the times that tried stockholders souls.

Then why did I (and several others like me) continue to buy shares of Rock Creek? Simply said, I knew from first-hand experience that anatabine citrate worked and I had bought Mike Mullin's dream for what Rock Creek might yet become. I was following a hunch and a dream. Are there any better set of reasons to buy a stock?

The FDA's roadblocks to drug approval forced Rock Creek to seek Phase 1 approval for anatabine citrate in England. We expect to know whether other pharmaceuticals or biotech companies are likely to partner with RCPI in the beginning of 2016. Thus, my wager on Rock Creek has a likely life of about six months. At this point, I believe there is a 10% chance of my Rock Creek wager paying off. Why would I subject my family's finances to such a risky wager?

The object in investments is not to have no risk in one's portfolio, but rather to have some risk that is uncorrelated (as much as is possible) with all other assets. So here's a little chart of my assets:

<u>Assets</u>	<u>Risk</u>	<u>Correlation with Rock Creek</u>
Social Security	5%	.00
Annuities	0%	.00
Money Market \$	0%	.00
Osiris	50%	.10
Home, autos, etc.	5%	.00
Inovateus Solar	50%	.00

That chart should be quite revealing to you. My Rock Creek investment is extremely risky right now. My Inovateus Solar investment is moderately risky now (50%) but becoming less risky by the day. My five other categories of assets have (at most) trivial levels of risk. Thus, I rate the risk level of my portfolio over the six domains listed above plus Rock Creek, as very low overall.

Am I diversified? Given that the highest intercorrelation among any asset category with any of my other asset categories is thought to be .10 (the correlation of RCPI and OSIR), I believe my portfolio is magnificently diversified—despite owning only two stocks. Certainly, it is far better diversified than anyone who relies on a well-diversified stock portfolio as their primary safety net. [More on diversification and risk management later in Chapters 9-12.]

Chapter 8

FATflammation

I was in Barnes and Noble last week to read the latest Fantasy Football magazines when the pink and yellow cover of a new book caught my eye. My heart sank when it became apparent the author believed that the inflammation of fat cells caused weight gain. But the other material on the cover made it look like just another diet book. So I dismissed it and quickly exited the store.

My ride home was unhappy. The book was clearly about inflammation. I was writing a book on Rock Creek and anatabine citrate which were all about inflammation. How could I run away from a potentially relevant book just because of my disgust for what the dieting literature had become? I owed it to myself to at least read the dust cover to ascertain whether the book was relevant to my task. Early the next day I returned to Barnes and Noble. It was another dieting book alright. However, the quotes by others made it clear that I ignored it at my peril. “From Alzheimer’s to diabetes to coronary artery disease, inflammation plays a pivotal role in all degenerative conditions. *How to Fight FATflammation* leverages the newly discovered relationship between gut bacteria and signaling systems in body fat to provide a rock-solid program to curtail inflammation and enhance weight loss as well.”-David Perlmatter, MD “It can’t be said any simpler. When we are inflamed we are unwell, overweight, and hopeless. Finding our way back to health may be as easy as quashing inflammation.” –Tosca Reno “Inflammation forms the root of nearly every disease and creates weight loss resistance. In her book, *How to Fight FATflammation*, Lori Shemek provides a groundbreaking three-week plan that reduces inflammation to help you gain perfect health and fast, lasting fat loss.” -J.J. Virgin

I knew I had to buy the book, but I read Fantasy Football magazines for another hour, hoping I could find some reason not to spend \$28 to learn how to fight FATflammation. Eventually, I bought the book.

Lori Shemek believes that “the dreaded FATflammation Four—sugar, refined grains, high-fructose corn syrup, and artificial sweeteners” are ubiquitous in our diets and serve to inflame our fat cells. Because this inflamed state has become chronic for so many of us, we live with almost-permanent, oversized, inflamed fat

cells. Shemek's diet program aims to remove the sources of the fat cell inflammation from our diets to allow our bodies to function in the normal, non-inflamed manner they were intended to follow

Shemek offers a number of positive eating suggestions that echo what other diets have offered over the years. Suggestions like "drink more water," "take a multivitamin," "eat more fruits and vegetables," "take certain probiotics," etc. are common diet recommendations. However, some of her ideas are quite radical. For example, "don't worry about calories," "eating some fats is recommended," and so forth directly contradicts ideas promulgated by other diets. She even offers what is almost a rank ordering of nuts—almonds, walnuts near the top. Macadamia nuts oils make them very good also. Peanuts seem to be farther down the list, and their value plummets if we eat them as peanut butter where refined sugar has been added. These suggestions might appear somewhat arbitrary to your ear. However, the value of How to Fight FATflammation lies in its commitment to linking being overweight to chronically inflamed fat cells in one's body.

For years I resisted the conclusion, that almost everything bad that occurs in ones body as we age, is due (to some degree) to the effects of inflammation. It just seemed too simplistic an answer to be true. And yet, the more I read and think about degenerative disease processes, the more plausible this thesis becomes. Shemek adds to the chorus of professionals claiming that inflammation plays an important role even in processes that we formerly believed were not produced by inflammation. This chorus is music to the ears of all anatabine citrate advocates both for its prevention and its treatment implications.

True Confessions

This is as good a time as any to confess that while I loved Shemek's book, and her analysis of why it is next-to-impossible for many of us to lose weight, I didn't even try out her diet. Her three week attack on FATflammation in our bodies was too radical, too complex, and too extreme for my tastes. All that I was able to accomplish was a few (hopefully) health enhancing changes in my diet. For example, I found Shemek's analysis of why we should drink (in my case) from 40 to 80 ounces of water per day very compelling. I now drink far more water than ever before. Similarly, I take a daily multivitamin as I now see our diets' vitamin and

mineral deficiencies more clearly. Third, my intake of refined grains and sugars has gone way down—although not nearly as radically as Shemek’s three week diet would have them go down.

If we consider Shemek “the doctor” and me “the patient,” then I readily admit that I am only partially following the doctor’s orders—I am self-medicating. This might be like a patient stopping his intake of penicillin when he feels better, rather than when the prescription directs him or her to stop taking the pills. We all know how dangerous it can be to ignore ones’ doctors’ orders. And still I do so. Why?

When one takes responsibility for his or her own life and health, several important changes occur. First, one realizes with certainty that everyone has a strong opinion about how you should act. However, in truth, no one knows anything for certain. Second, because everyone is different, even if an answer is perfect for someone else (which I doubt in the first place) it may only be partially good/helpful/true for you (because of your differences from them). So, what is one to make of the cacophony of advice thrown at you regarding: diets, finance, your health, religion, child rearing, your marriage, etc, etc? I recommend that each of us start by “going with what we got” thus far in life. When I assumed control of my spirituality, it was a standard Christian version (Roman Catholic) because that was what I knew best at the time. Little by little I’ve modified the standard approach to Christianity to a spirituality that better fits me. Of course, in the process I hope I’ve developed a slightly better form of Christianity than the one offered to us in the standard version. Whether it is better or worse than the standard version is not for me to decide. My hope is that any God (worthy of that designation) would understand why I search as I do. For better or for worse, I’ve staked my eternity on that wager.

Back to Shemek’s FATflammation diet. Am I 100%-in on her diet? No. Has my approach to healthy eating moved closer to her vision? Absolutely. She has impacted my food intake more than any other person save my mother (initially) and my wife (of late). Thank you for that influence Dr. Shemek.

One final change in eating needs to be mentioned. I averaged about one large (12 oz) bourbon and coke per day and one glass of wine every other day. Initially, the coke was regular coke. But my wife moved me to

Diet Coke because of her concern about calories and sugar. Shemek convinced me that artificial sweeteners are worse for me than are calories, so I decided to return to Coke (in spite of its refined sugar). But then a funny thing happened—I stopped drinking my daily mixed drinks entirely. Even my wine consumption has been cut in half. Why? I have absolutely no idea. All I know is that I'm guzzling water and lemons (Shemek loves lemons as they cleanse some organ {I can't remember which} of toxins.) I haven't had a mixed drink in about three weeks. How long will this change last? Honestly, who knows?

Finally, Stenger has given me a new mantra, "A Granny Smith a day keeps the doctor away." On the left rear of my desk top is a 24-year-old picture of my sons (one holding a baseball glove, the other a basketball). Behind the picture is a bag of green apples I bought at Costco—they're from Chile, even though it's summer. I have no idea why they've come all that way. But I eat one every day that I see them.

Part B Be Lions

“Be lions, roaring in the forests of knowledge
Whales, swimming in the oceans of life.”

Seals and Croft
(*East of Ginger Trees*)

Throughout grammar school and high school I was in the bottom half of my classes—sometimes, close to the very bottom. Still, I was the hardest-working slow student in every class. My disability—dyslexia—wouldn’t be diagnosed until many years after my time as a student. Like everyone else, I believed the obvious—I worked hard and achieved little—I was far from the brightest candle on the cake. Thus, intellectual humility came easily to me.

Despite the meager returns that my efforts yielded, I developed a love of learning. Equally important, I developed a ravenous appetite for trying to understand most things—even things that seemed to be obviously beyond my ken. I developed a taste for overreaching. Be forewarned, this part of the book might contain some staggering overreaches. However, the Seals and Croft quote that begins this interlude instructs us to, “Be lions, roaring in the forests of knowledge.” Cowards should seek alternative employment—like politics or the law.

My career goal during high school was to someday become a high school teacher. As an adult, achievement of each modest career goal tempted me to look for another challenge. Fifty years after graduating high school (at the time ranking 147th out of 150 graduates), I finally became what I am today. Happily, each of us can (or will someday be able to) make that same claim.

If you find my roaring style off-putting, my apologies. But, after all, that’s simply what lions do. Perhaps, someday in the future, we will meet in another of life’s venues. There, I hope, you’ll find my more whale-like demeanor appealing. But since this is a book about ideas, I’ll be roaring for the next while.

Chapter 9

The Diversification Myth²

Two very different investment strategies will hold our attention. One, through diversification, hopes to ensure an investment's survival into the long run. Another strategy is designed to outperform the market through a small number of well-researched, investor-selected stocks. There is a critical assumption that likely governs one's choice of one strategy over the other. If you believe in efficient markets, diversification makes sense. If you believe, as I do, that markets are very inefficient, and that individuals can outperform the market as a whole, then diversification will serve to lower your long-term returns in the stock market.

I've studied and invested in about 25 stocks over the last decade. Several of these are listed in column one of Table 1. Column two gives each stock's price on May 7, 2010. In column three, I've rank-ordered these stocks based on my percent of certainty that they will outperform the market. The numbers in column four represent the percent of certainty a believer in Efficient Market Theory would have for these same 25 stocks (i.e., 50%).

A Fair Market Theorist (i.e., one who believes markets are efficient) might be correct because everything I know about these 25 stocks already lies in the public domain. Thus, any reason I might have for viewing OSIR and LGND more favorably than NABI and VION has already been taken into account by the market and thus is reflected in the stock's price. In other words, my co-author (Elihu Feustal) believes the market delivers (almost) perfectly rational prices (even if the trades are made by obviously irrational individuals). I, on the other hand, see the market prices as (likely) as irrational as the individuals who make the trades. My confidence ratings in Table 1 attempt to depict the present irrationality in prices for my group of 25 stocks.

² This chapter begins by reprinting parts of Chapter XVI from the 2010 book *Conquering Risk: Attacking Vegas and Wall Street*, by Elihu Feustal and George Howard.

Table 1
Confidence in Returns in Stocks
By George and a Fair Market Theorist

Stock	May 7, 2010 Closing Price	George's Confidence	"Fair Market" Confidence
1. Osiris	(\$6.56)	96	50
2. Ligand	(\$1.60)	94	50
3. Energy Conversion	(\$5.88)	75	50
4. Star Scientific	(\$1.71)	74	50
5. Satcon	()	71	.
.		.	.
.		.	.
.		.	.
24. Nabi Biopharm	(\$5.09)	6	50
25. Vion	(\$0.08)	4	50
		<hr style="width: 50%; margin: auto;"/> X \cong 50	<hr style="width: 50%; margin: auto;"/> X= 50

Were you to follow the strategies of earlier chapters in this book, you would look for archival data that would speak to the validity of the Fair Market Theorist (all stocks' validity coefficients are approximately equal) versus my belief that you can spot (and perhaps profit from) price differences that are due to human irrationality.

On the Wisdom of Narrow Versus Diversified Portfolios

A study by Chance Windle³ tested whether diversification in portfolios is helpful or a hindrance in obtaining desired positive rates of return. Twenty professionals in the investment community gave lists of up to 25 stocks that represented a well-diversified portfolio for the next year. They were asked to identify the stock (or small number of stocks) that they felt offered the best expected return. In Table 1, column three, the top two stocks had ratings in the mid-90s. The third and fourth place stocks ratings were in the mid-70s. These four top

³ Windle, C (2010). "Against diversification: The effect of know-something investors." Dissertation submitted to the Department of Psychology at the University of Notre Dame, Notre Dame, Indiana.

stocks would be considered the narrow portfolio. The remaining 21 stocks would be added in order to diversify the portfolio. Those 21 stocks were deemed the broad portfolio.

The number of stocks in the narrow portfolio ranged from four to five stocks (in Chaunce's study) and the number of stocks in the broad portfolio ranged from 15 to 16 stocks. Over the next year a fictitious \$100,000 was invested equally in the stocks in the broad portfolio; \$99,000 was invested equally in the stocks in the narrow portfolio (with the remaining \$1,000 used to buy portfolio insurance, explained later). Across the 20 participants, the narrow portfolio stocks increased by 34 percent over the next year (without commissions) while the broad portfolio is increased by 26% (without commissions). The inclusion of commissions decreased the narrow portfolio's returns to 30 percent and decreased the broad portfolio's returns to 20 percent. This is because narrow portfolios paid commissions between eight and ten times. Broad portfolios on the other hand, paid commissions between 30 and 32 times.

While there was little correlation between stock ranks and rates of return overall, the 30 percent versus 20 percent rates of return suggest the returns of the top four or five stocks are exceptional. How important is the difference between 30 percent and 20 percent rates of return on our investments? If you had \$100,000 in investments, at the end of one year the 30 percent account would be worth \$130,000 versus \$120,000 (for the 20 percent account). That's not much of a difference. However, after 20 years, the 20 percent account would grow to \$3,833,760 which is very good. The thirty percent account, on the other hand, would then be worth a staggering \$19,004,964!

These data suggest there is a rather healthy relationship between the ranking system seen in column three of Table 1 and the rates of return of these stocks. At least in this study, individuals were outperforming the markets. Under such circumstances a diversified portfolio would be counter-indicated, if you were trying to maximize your rate of return on your investment. This point can be made in a slightly different manner. Investors are used to performing cost/benefit analyses. Let's conduct such an analysis for the #1 (Osiris) stock and the #25 (Vion) stock in Table 1. Given generally good results in the next year, Osiris (in my opinion) could

double in price for a gain of \$6.56. Given generally bad results in the next year, Osiris could lose 20% of its value (or \$1.31). Further, the chances of good results in the next year (again, in my opinion) are three times as likely as are bad results. Thus, $\$6.56 \times 3 = \19.68 minus $1.31 = \$18.37$ might be a crude index of Osiris' (one year) cost/benefit analysis.

For Vion, good news might triple its price while bad news might drive it into bankruptcy. Those gains (+.16 versus -.08) lead to a cost/benefit values of \$.08 because I believe the outcomes are equally likely. The cost of each investment is also germane. Osiris requires an investment of \$6.56 to obtain the potential outcome of \$18.37, thus the ratio is 2.8. For Vion, the \$.08 value requires an investment of \$.08 for a value of 1. If that difference (2.8 versus 1) translates into different rates of returns on actual investments (as was true in Windle's study) diversification is counterindicated.

The value of diversification lies in the fact that a well diversified portfolio is very unlikely to go to a value close to zero, whereas a narrow portfolio (especially one containing only one or two stocks) might meet with catastrophic consequences. As the last stock market recession (of 2007-2009) attests, diversified portfolios can lose half their value or more. Diversified portfolios can suffer huge percentage losses, but they (for all practical purposes) will never sink to a zero value. In the Windle study, about \$1,000 in portfolio insurance was purchased for the narrow portfolio to counter this lone extra value of diversification. So the narrow portfolio was at least as well-guarded against catastrophic losses as was the broad portfolio. Now, everything depends on the rates of return of the two portfolios.

Insurance of the narrow portfolios was obtained by buying far-out-of-the-money puts with strike dates near the end of the study. Twenty thousand dollars worth of insurance was purchased overall to insure the stocks in the narrow portfolios. One stock dropped so much that the put actually paid out. Of course, in no case was the loss on the narrow portfolio even close to being large. Thus, in this study, the insurance policy was completely unnecessary. However, leaving ten percentage points of return on the table (by having a diversified portfolio) ought to be of great concern.

The results of this study are very significant. Conventional wisdom has always told us to “Diversify, diversify, diversity!” as it is safer than putting “all your eggs in one basket”. However, it is irrefutable that a diverse portfolio will have more transaction costs than a narrow portfolio. This study also challenges the validity of Efficient Market Theory, and supports the belief that individual investors can outperform the market by carefully choosing one or two exceptional stocks.

Perhaps we should forgo diversification, and follow the advice of Warren Buffet when he stated “I prefer to keep all my eggs in one basket and watch that basket closely.”

An Update and a Second Look Forward

So that was the diversification study as of 2010—but now it’s 2015. What happened in the real world of investing to my real dollars over that half-decade? Table 2 updates the Table 1 data as of March 18, 2015.

Table 2

Stock	May 7, 2010 Price (% of account)		March 18, 2015 Price (% of account)	
1. Osiris	\$6.56	(75%)	\$18.19	(92%; 84,000 shares)
2. Ligand (6:1 reverse split in 2011, AVE= \$9.60)	\$1.60	(5%)	\$72.01	(0%)
3. Energy Conversion	\$5.88	(15%)	--	(0%)
4. Star Scientific (Changed to Rock Creek Pharmaceuticals)	\$1.71	(5%)	\$0.11	(8%; 1,400,000 shares)
5. Satcon	()	(0%)	--	(0%)
.
.
.
24. Nabi Biopharm	(\$5.09)	(0%)	--	(0%)
25. Vion	(\$.08)	(0%)	--	(0%)

Several observations about my stock-picking powers might be offered. First, I am a pretty bad stock picker overall. By 2015, four of my seven named picks had gone bankrupt. Fortunately, I was only hurt by one

of those disasters (Energy Conversion Devices) where I lost 15% of my 2010 holdings. Second, I only profited slightly from my finest pick. Ligand went from \$9.60 (\$1.60 x 6 [due to 6:1 reverse split]) to \$72.01 (almost an 8-fold gain over a 5-year period). Even though it was my second pick overall, I only had 5% of my account invested there. But to make matters even worse, Ligand went from \$1.60 to \$2.40 and I sold—content with a 50% gain. Thus, I wasted virtually all of the Ligand’s almost 8-fold gain. To top things off, I plowed my Ligand dollars into Star Scientific which promptly lost 95% of its value. Oy vey!!!

Before you write me off as the “worst investor ever,” note that over the five year period in question the value of my portfolio more than doubled. How can that be—you wonder. It’s because 75% of my portfolio was invested in my first pick (Osiris Pharmaceuticals). The cynics will claim, “He just got lucky.” I think not. And since we should recall that the point of this discussion is to dissuade you from having diversified portfolios, you might look more carefully at my next set of bets (made on March 18, 2015).

I reduced my Osiris position from 90,000 shares to 84,000 shares—even though I still liked that stock’s long term prospects. The proceeds from 6000 shares at a little under \$18 per share allowed me to purchase over 1,000,000 additional shares of Rock Creek (at prices ranging from \$0.13 to \$0.10). Thus, I had raised my bet on Rock Creek to 1,400,000 shares, or \$154,011 in value (1,400,100 times \$0.11). I still had \$1,527,960 invested in Osiris, so even after adding over 1,000,000 shares of Rock Creek, Osiris represented only a little under 90% of my portfolio’s value. I also felt no need to purchase insurance against Rock Creek’s demise, as Osiris serves as my insurance policy.

Well, I’d love to tell you how this third “called shot” turns out, but I cannot. I just placed the bet. You must look up the price of OSIR and RCPI to see how I did. [Remember to check for possible stock splits or reverse splits as they will radically alter the rates of return you calculate. No sooner did I speak, then RCPI engineered a 25 for 1 reverse split. Thus, my “in price” for RCPI went from \$0.11 to \$2.75 and my position went from 1,400,000 shares to 56,000 shares.] Also gains or losses are to be determined for this third study relative to index averages over that time period (e.g., if the S&P 500 loses 50% over that time period, then a

40% loss in my portfolio is “better than average”). So, you tell me, how did I do? Would I have been better off to have diversified? I hope not.

The Windle study was the first “called shot.” The 2010 to 2015 results presented in Table 2 represented the second “called shot.” The 2015 stock weightings (OSIR [about 90%] and RCPI [about 10%]) represent my latest bet. You will now determine my gains/losses with today’s stock quotes. Since diversified portfolios mimic index returns, how did my two-stock portfolio fare? And what does that suggest about the value of having diversified portfolios? I’ll close with a brilliant quote from Upton Sinclair, “It is difficult to get a man to understand something when his salary depends upon his not understanding.” Thus, understanding why diversification is a disputed concept will always be a difficult idea for someone in the investment community to grasp. As owners of “buggy whip” factories were the last to see the coming dominance of automobiles; cigarette company executives were the last to appreciate that smoking causes lung cancer. To this day, fossil fuel executives can’t see that our energy future lies with alternative energy; and the NFL still thinks repeated brain trauma does not lead to degenerative neurological disorders (e.g., Alzheimer’s, ALS, other dementias). But the rest of us know better.

Chapter 10 But Honestly

The final paragraph of the last chapter was rather challenging. Imagine how you would feel if you were an investment analyst, a tobacco company executive, employed in the hydrocarbon burning business, or if you were Roger Godell (Commissioner of the NFL). Your opinion was portrayed as dominated more by self-interest than by dispassionate rationality. My friend, Ed Stephan, spent his life in the investment industry. He was convinced he was helping his investors to become more financially secure in their post-retirement years. To the extent Ed believed my arguments in Chapter __, reading it must have hurt. I'm sorry, Ed, but in any attempt to understand humans, one must seriously confront the problem of reflexivity—or, what do these arguments say about my own actions. Here's a look at reflexivity in its most simple form.

Might someone have read the preceding chapter and thought, "George seems rather well informed about stocks like Osiris and Rock Creek and he was invested in them at the time this book was written. Might I leverage his research and buy those stocks?" Well, if oil executives' ideas on alternative energy are suspect because their financial interests will profit by burning more hydrocarbons; and investment counselors' thoughts on diversification are suspect because their commissions depend on well-diversified portfolios; then why would anyone buy a stock that George owns since a rising stock price furthers his financial interests also. Are my thoughts on Rock Creek just as problematic as a tobacco company executive's thoughts on whether smoking causes lung cancer? I think they are—because of reflexivity.

In the 17th century, the notion of rational objectivity developed in the natural sciences. The philosopher of science, Stephen Toulmin (1981) describes rational objectivity in classical science (as exemplified by Newtonian physics) by noting that an object of study never knew it was being studied. Therefore the object would continue to behave without any perverseness leading it to react to the knowledge that it was being observed. The scientist is one who studies a system without intervening in the operations of the system. The notion of "rational objectivity" in science required a lack of reciprocal interaction between observer and object. The scientist was to observe nature, but nature was not to reflect upon itself being observed. But is the subject

matter of psychology (namely, human beings) suited to these demands of rational objectivity? Don Bannister (1966) thinks not, and colorfully analogizes the situation:

“I am reminded of a recurrent theme in certain types of science fiction story. The master-chemist has finally produced a bubbling green slime in his test tubes, the potential of which is great but the properties of which are mysterious. He sits alone in his laboratory, test tube in hand, brooding about what to do with the bubbling green slime. Then it slowly dawns on him that the bubbling green slime is sitting alone in the test tube brooding about what to do with him. This special nightmare of the chemist is the permanent work-a-day work of the psychologist – the bubbling green slime is always wondering what to do about you.” (1966, p. 22)

So allow me (a bubbling green slime) to explain my history of investing to you so that you can appreciate my “moves” in a proper manner. Around 1980, my niece married a man who managed a biotech investment fund. I thought biotech might be a means of human betterment and might also offer some good investments. Thus, I educated myself in biotech. If you return to the stocks mentioned in the two tables of the previous chapter, you’ll notice that five of the seven stocks mentioned were biotechs. A fortuitous historical accident (my niece’s choice of a partner) profoundly influenced my investment history. Nothing in my personal and/or educational history pointed toward an interest in biotechs. Albert Bandura () wrote a brilliant article, “The effect of chance encounters on the life course,” which is the psychological equivalent of “The beat of a butterfly’s wing in China causing a hurricane in Florida.” Sadly, we still don’t know how to parlay Bandura’s insight into a reasonable science of human lives. And finally, as is true of biotechs in general, many of my picks also went belly-up.

The Role of Values in Human Life

What if my niece had chosen to marry a tobacco executive, or someone in the oil industry, or the head of a gambling casino, or an investment banker, or a weapon's manufacturer, instead of the biotech expert she, in fact, chose? Would things have worked out differently for me? Of course they would have!

Two roads diverged in a wood, and I—I took the one less travelled by, and that
has made all the difference.

Robert Frost (*The Road Not Taken*)

I'd like to think that my values would have kept me from investing in tobacco or weapons, or the like—but one never knows for certain. However, there is a second strain to my investing history—alternative energy. In the Tables in the last chapter, Energy Conversion Devices and Satcon are in the alternative energy domain. I also co-founded a solar development company—Inovateus Solar—that has not yet gone bankrupt. Sadly, my other two alternative energy stocks have gone bankrupt.

In summary, I try to avoid stocks that conflict with my social values (e.g., weapons manufacturers, gambling stocks, tobacco companies, etc.) because such companies (despite what good they might accomplish—like a fabulous rate of return on our investment) pull us toward a future filled with human suffering (in my opinion). I'm certain I've missed out on some fabulous investments in those domains, over the years, but so be it.

Biotech stocks generally move society toward a better future, as they often search for cures to damaging human diseases. I'm proud of my investments in biotech, and I've been adequately financially rewarded for playing in the biotech sphere.

Investments in alternative energy seek to create a cleaner, more sustainable future for our children and grandchildren. Thus, I am extremely proud of my investments in alternative energy. How have alternative energy stocks fared as prudent investments, one might ask? Not very well, thus far. So if I had to do it over,

and I knew then what I know now about the relative success of biotech versus alternative energy, would I have acted differently?

This is not a question for me alone, each of us must answer it truthfully for ourselves. Would you have gone for the “sure investment,” or would you have tried your best to build a better world, in spite of your losses as an investor? I would make the alternative energy investments again—in spite of their outcome thus far! I can say that with confidence only because my investments have done fine overall thus far. Many years ago, I answered for myself the question. “How much is enough?” If I eventually lose every cent I threw at alternative energy, I’ll still have enough money for my happiness (in all probability).

So let’s revisit the bet on the future made in Table 2 of the preceding chapter. Most of my money is bet on Osiris—a stem cell company that will enrich many suffering human lives that is also a reasonable bet for increasing stock prices. I put about 10% on Rock Creek, even though its chances of remaining in business are less than 50-50 (in my opinion). However, if anatabine becomes available for human use, it will be a huge benefit to many people. If I lose all my Rock Creek money, I will not mind at all. Why?

Perhaps William James said it best,

“What do you think of yourself? What do you think of the world? ...These are the questions with which all must deal as it seems good to them. They are riddles of the Sphinx, and in some way or other we must deal with them...In all important transactions of life we have to take a leap in the dark...Each must act as he thinks best; and if he is wrong, so much the worse for him. We stand on a mountain pass in the midst of whirling snow and blinding mist, through which we get a glimpse now and then of paths which may be deceptive. If we stand still we shall be frozen to death. If we take the wrong road we shall be dashed to pieces. We do not certainly know whether there is any right path. What must we do? Be strong and of a good courage. Act for the best, hope for the best, and take what comes... if death ends all, we cannot meet death better.” (James, 1897/1956, pp 30-31)

Perhaps that’s enough roaring for now.

“Be lions roaring in the forests of knowledge
Whales swimming in the oceans of life

Prepare to meet Abdu'l-BahAi in the Garden of Clove.”
Seals and Crofts, (East of Ginger Trees)

Chapter 11

Pat Cox

I'd now like you to meet another wounded intellectual warrior—my friend, Pat Cox. This roaring lion was among the first to recognize anatabine citrate's stunning worth. As early as 2005, Pat was bellowing claims like, "anatabine citrate is the greatest medical discovery during my lifetime." When reminded that he saw the birth of penicillin, he had to think about whether he wanted to retract his claim, but he didn't. Here's a recent letter (April 17, 2015) from Pat's Tech Digest:

"Dear Reader,

There were 27 students in my third-grade class. I remember that number for one reason. One day, the teacher set up a kind of arch and told us all to form a line around the outside of the room. She told us to say aloud, in sequence, the sevens, eights, and nines of the times tables as we passed through the arch. Then, after reciting our multiplicative product, we would circle the room to go through the arch again.

It was widely accepted at the time (and probably still is) that all students should memorize the multiplication tables through 9×9 . The teacher assured us that each time we walked through the arch, our sequential product would be different, thus helping us learn the entire table.

So the first student walked under the arch and said, "Seven times one is seven." The second would say "Seven times two is fourteen." You get the picture. After my first pass through the mathematical portal, it dawned on me that this exercise wouldn't accomplish the teacher's stated purpose. Each of the 27 students reciting the three times tables would always repeat the same product. The boy or girl who said "eight times five is forty" would always make the circuit and say "eight times five is forty" again.

So when it came time for me to walk through the arch the second time, I asked her instead if she realized that each of the 27 students engaged in consecutively reciting the multiplication product would repeat him— or herself infinitely or until class was over.

Honestly, I was just trying to help. The teacher's expression, however, quickly morphed from a cheerful self-satisfied smile into the visage of absolute despair. She leaned into my face and demanded of me, "Why do you always have to ruin everything?"

Prior to that moment, it had never occurred to me that I always ruined everything. In retrospect, I did realize I asked a lot of questions about our math lessons that she didn't seem to have answers for, but I really wasn't trying to ruin anything. It

was then, for the first time, that I began to suspect that I related to mathematical concepts somewhat differently than others.

I don't think the incident made complete sense to me until just a few years ago, when John Mauldin and I had our genomes sequenced. More important, our genomes were analyzed by some of the best genomicists in the world.

Turns out I have a number of genes common to people with highly developed math skills. This includes the "AA" allele of the ATOH7 gene, which is apparently ancestral to the Neanderthal. This allele is also common in people who suffer certain retinal disorders, which I've experienced, as well as a lack of social skills.

Some people describing this lack of social skills use the word "autism," and I do have markers for autism as well. I haven't got anything against the word, but I'm not convinced that the tendency to see things analytically rather than emotionally should be considered a handicap. In fact, I personally feel that the people who dominate political policy discussions by virtue of their ability to appeal to emotion are handicapped by an apparent lack of basic mathematical and analytical skills. We see this in finance as well. Emotion-driven people don't seem as capable of focusing on long-term trends. Usually, they're traders at the whim of prevailing sentiment.

Legendary investors, however, tend to exhibit characteristics associated with autism. Warren Buffett, for example, has been labeled autistic by his biographer. Buffett's investment philosophy is, in fact, extremely long term and mathematically driven, so it may technically be true. Obviously, it's not a handicap for him, and I admire his investment philosophy.

Bayesian Analysis Applied to Transformational Technologies

Another man whom I admire is Thomas Bayes. The 16th-century English statistician, Presbyterian minister, and member of the Royal Society is noted for several things, including his defense of Isaac Newton's work on calculus. However, Bayes was also a pioneer in probability theory.

Today the phrase "Bayesian analysis" means many things, some of which Bayes probably wouldn't agree with, but his central observations are indisputable. His methodology for decision making, which I'm oversimplifying here, is basically this: if we multiply the likelihood (probability) of something happening by its consequences, we have a very useful analytical tool. In a simple yes/no decision, we can compare two things happening by estimating their probabilities times their total impact.

In finance, this is extremely useful and, I think, intuitively obvious. Say, for example that somebody discovers a technology that may cure a disease. Bayes would have us ask at least two questions: How probable is it that it will fail or succeed?; and what will be the consequences of both of those outcomes?

Hypothetically, let's assume that our best estimate of success/failure is 50/50. If the technology fails, the outcome is simple. You lose your investment. A successful outcome, however, is a more complicated calculation. If a cure for the disease has a relatively small payoff, a 50/50 risk may be excessive. If, however, the technology addresses some life-threatening condition with no competition, then the payoff can be enormous, moving the risk calculation into the positive.

So we make those calculations, and our portfolio is based on this kind of analysis. Probability, however, is probability. If we have a probability of 99%, we can predict that it won't happen 1% of the time. This is why we have a diversified mix of companies. You don't bet everything on one venture because there are always exogenous variables that can change things. We will, with a mathematical certainty, lose some of our investments to unforeseen events, though we can expect that a broader portfolio will nevertheless outperform alternative investments. This is Finance 101."

-Patrick Cox

Pat's last paragraph is telling. The one percent possibility of an investment's failure serves as grounds for portfolio diversification. By now, patient reader, you understand that Pat and I disagree on the value of diversification. Because I recognize risk also, I opt for the "insurance approach" by buying far-out-of-the-money puts at a trivial cost to the investor. Our understandings of how to deal with uncertainty are based upon different rational strategies. Pat and I both love differences, as long as each approach is rational. I trust we will remain good friends (in spite of our differences), Pat. Too bad your third-grade teacher saw your analysis of her multiplication game as a threat. One loses friends when one sees differences as threats. But back to Pat's last two sentences. "We will, with a mathematical certainty, lose some of our investments to unforeseen events, though we can expect that a broader portfolio will nevertheless outperform alternative investments. This is Finance 101."

Pat is correct both early and late in the quote. Some investments will go sour due to "unforeseen events." And the value of diversification is straight out of Finance 101. Unfortunately, (I assert with a lionine roar) the underlined portion of Pat's quote is simply wrong (in my not-terribly-humble opinion.) [If by

“alternative investments” Pat means real estate, money markets, works of art, and the like, then all bets are off. However, I think he means narrow portfolios—such as the single stock—and thus I disagree.]

Pat hosted me at his home in Marco Island, Florida last February. Marco Island in February is heaven—some kids have all the luck. Because Pat is an expert in Transformational biotech investments, I brought up an old friend of yours and mine—Osiris therapeutics (OSIR). Pat didn't like the idea of OSIR and instead offered Biotine (BTX). After heated discussion, I realized that two issues separated us: 1) the value of embryonic stem cells versus adult stem cells and 2) the importance of the time dimension in investing. Pat thinks embryonic stem cells will defeat mesenchymal stem cells eventually. Pat might well be right in that belief. We'll see. I think time is a crucial factor in all investment strategies. How about entertaining a “thought experiment” considering those two differences in our opinions.

Allow me to offer the following empirical test of our differing investing strategies. Give each of us \$1,000,000 to invest. Pat stocks up on BTX (at \$5.67 per shares at 10 AM, May 4, 2015) while I put every cent I own into OSIR (\$15.84 at 10 AM on May 4, 2015). [Pat likes diversification, so if he wants to buy a couple of handfuls of other stocks and thus hedge his bet on BTX, so be it.] I'll take my 63,000 shares of OSIR and have plenty of money left over to cover commissions. Absent diversification, Pat could get 176,000 shares of BTX and cover his commissions also.

Here's the crux of our wager: OSIR is a company built to deliver on the promise of adult stem cells relatively quickly (in the next 12 to 18 months) whereas BTX might eventually win the race, but it might take many years to do so. Thus, I'll set a target for OSIR—let's say a price of \$32 or about a 100% gain. If OSIR gets anywhere near that target, I'll sell half of my position and plow the proceeds into BTX. In all likelihood, I will win this wager unless BTX explodes before OSIR does—or if both crash and burn.

If you follow my logic to this point, think back to Pat's tribute to Bayesian approaches. Pat instructs us to estimate the likelihood of success and then multiply that likelihood by the payoff for success. So here goes. I think OSIR is the more likely of the two stocks to “pay off” first. If I get a 100% payoff, fantastic. If I'm

forced to settle for a 50% profit, so be it. Remember, I expect great things from both OSIR (based upon my analysis) and BTX (based upon Pat's analysis).

When I get my hoped-for price, I'll sell as many shares as needed to match Pat's position in BTX. This effectively cancels out our BTX wager. Thus, my remaining OSIR position becomes my margin of victory whether the stock price increases or decreases from that point on.

It is these mathematized projections into the future that help us to build healthy financial futures. This is how I, "Search for the Fountain of Financial Health," in my life. The next chapter will consider the role that fantasy projections can play in aiding or diminishing our physical, emotional, spiritual, etc. health profiles. But first we must consider Pat Cox's role in fostering the health of anatabine citrate during its formative years as a product controlled by Star Scientific Corporation. You recall that John the Baptist was the voice in the wilderness crying out to make-safe the way of the Lord.

Pat the Baptist

Pat Cox has a very troublesome job. He's paid to foretell the future. That in itself is difficult enough. But not only is he charged with separating future "winners" from "losers," he is to identify the "transformative winners." That hurdle is sufficiently high that only the extraordinarily brave (or the extraordinarily stupid) would even attempt it. Pat Cox is anything but stupid. Let me offer one example.

Pat realizes Osiris might well be a solid winner for investors like me, but it is not transformative-enough for his job description. Recall that earlier I said that Rock Creek was now the "risky" portion of my portfolio and that Osiris served as insurance for that risk. One doesn't insure risk with more risk. I agree with Pat that Osiris is now not transformative-enough for his job description. But it meets my needs for sane, solid growth perfectly. However, the best laid plans of mice and men often go awry—so you tell me, "How has my \$15.84/share Osiris bet fared thus far?"

How has Pat's plug of RCPI (formerly Star Scientific) fared to date (in 2015)? Not so well, I'm afraid. Using reverse split adjusted historical prices, it was once over \$200 and over \$100 several other times. Currently, it's valued at \$2.05. So most people who took Pat's advice on RCPI have been burned badly. [As of May 15, 2015, I'm down more than \$1 ½ million dollars on RCPI.] And still I buy more—based in large part on Pat's analysis. Why?

In my judgment, Pat is both smart and honest. That's why I still follow his advice and call him "friend." [I also clearly understand Rock Creek represents the most risky investment I now hold and that it is more likely to go bankrupt than to yield profits.] Investing is a difficult, dirty game. You need brains and nerves of steel to play successfully. The same is true of gambling. I almost never gamble, but I'm committed to investing because I'm reasonably smart, I have nerves of steel, and I take responsibility for my failures. Few of the people who fail when taking Pat's advice can honestly make that claim. Thus, many blame Pat for risks they took based, in part, on Pat's analysis. I care (rightly or wrongly) too much about what other people think of me. Thus, I would be ill-advised to try to do Pat's job. Still, I'm glad he does it.

In 2010, the gambler, Elihu Feustal, and I wrote a book entitled Conquering Risk: Attacking Vegas and Wall Street. Both Vegas (gambling) and Wall Street (investing) are war zones. Unless you are mentally and psychologically ready to go to war, stay away—as you are simply throwing away your hard-earned money.

A few people dislike Pat Cox because he routinely points out the impacts that our businesses and our investments will have on our society. Pat immediately saw that anatabine had the potential for extending human life and health. He quickly pointed out that widespread use of anatabine would improve lives of countless individuals—like you and me. But then—instead of remaining silent—he noted that it might endanger the profits of many giant pharmaceutical corporations (who prefer treatment to prevention) and further weaken already fragile government institutions like Social Security. Unfortunately for Pat, naked emperors still resent anyone who states the obvious. But Pat speaks truth to power. That's another reason I'm proud to refer to him as my friend. Unfortunately, the powerful often resent truth-speakers like Pat.

Chapter 12

Investment Analyst Speak With Percentaged Tongue

There is a classic line that appears in many mid-twentieth century cowboy and Indian films where a Native American addresses the assembled and intones, “White man speaks with forked tongue.” The allusion to the forked tongue of the serpent highlights the belief that some words are chosen to mislead—that they are baited traps waiting to be sprung on naïve innocents, those who tend to take statements at face value. Imagine you are having your bi-annual meeting with your investment advisor (who is looking after your \$100,000 portfolio) and you begin by saying, “So Bob, how did we do over the last two years?”

The analyst answers, “Well, our results were mixed actually. In the first year, our stocks went up 50%; while in the second year we lost 50%.”

[Before reading any further, state precisely the current value of your account (which started two years earlier at \$100,000). Have you stated your answer? Then read on.]

Advisors then typically launch into complex analyses of some stocks rising while others fell and why we hit on some investments while losing on others. Ten blustery minutes later, in summary, my advisor states, “...it’s really hard to know exactly why these stocks behaved as they did. But based upon what we’ve learned over the last two years, I’ve got a set of twenty-five new stocks that I really think will work even-better for us this time.”

So now we return to your estimate of your portfolio’s current worth. I’m certain a few careful readers noticed that our advisor had created a diversified portfolio (consisting of 25 stocks) and so I will pay 25 separate commissions each time I buy stocks and 25 more each time I sell stocks. [Plus there’s usually a 1%-or-so fee for use of the account.] So if you guessed an account value in the area of \$98,000 or \$97,000—congratulations! My heart would swell with teacherly-pride were I to hear that your reading of the

Diversification chapter earlier in this book sensitized you to the corrosive effects of gobs of commission charges on your financial health. So is my little story over? Not quite, as it turns out.

Two weeks later my wife is working her way through the mountain of junk mail that seems to accumulate on our kitchen table. She gasps in horror, “Oh my God, honey, what happened to our investment account?”

“We’re down a few thousand,” I reply. “But I’m certain we’ll turn that around this year. Broker Bob said these new stocks he put me in are going to...”

“No honey,” she wails, “there’s only \$73,000 of our \$100,000 left. We’ll never be able to retire on that...”

“Embezzlement!” is the first word that leaps to my mind. Unfortunately I should have suspected, “Multiplication.” Your \$100,000 increased by 50% in the first year, so at the start of the second year the account was worth \$150,000. Half of \$150,000 is \$75,000, so at the end of the second year it is worth \$75,000. Deduct fees and commissions and you now realize where the \$73,000 came from.

Perhaps the problem is that you gained 50% first and then lost 50%. What if you lost first and then gained? Two quick calculations reveals you lose again. As my father used to moan, “Sometimes you just can’t win for losing.”

I storm into Bob’s office the next day to confront him with the fact that I was on to his treachery. I had him do the, “up 50% then down 50% and you lose one quarter of your investment,” exercise. Bob is completely discombobulated. Trust me, he isn’t nearly good enough at acting to have faked his response. Bob was more stunned by the disconcerting result than I was. But he makes his living by calculating profits and losses. How could he possibly not have known? [I’ve tried the exercise on several dozen investment professionals and only two have indicated that they knew the counterintuitive result would occur.]

I've been reading the Business sections of newspapers almost every day for more than six decades. Prominently displayed in virtually all Business sections are the "Top Percentage Gainers" and "Top Percentage Losers" of the day. Have you noticed that the percentage gainers almost always are greater (e.g., 50%, 47%, etc.) than the percentage losers (e.g., 30%, 28%)? Does that mean people are making more money on winners each day than they are losing on the in losers? Or does it signal a red herring as the 50% gain and the 50% loss should have signaled?

It turns out that percentages do not speak with forked tongues when we compare stocks on the "gainers" list with stocks on the "losers" list. If you have equal dollar investments (e.g., \$1000) on the top "gainer" (e.g., 50%) and a top "loser" (e.g., 50%) both yield a \$500 change in value. Now imagine you had 3 such stocks that each gained 50% on a particular day and 2 stocks that lost 50% on the same day. [You had \$1000 invested in each of the 5 stocks.] What does your intuition say? Are you a net gainer for the day or does your intuition mislead again—as was the case when a 50% gain was followed by a 50% loss?

Well, three stocks that each gain \$500 gets you \$1500 in gains. Two stocks each lose \$500 for a \$1000 loss. Thus, you are \$500 to the good over the five stocks—as your intuition would suggest.

Contrast that scenario with one that is very similar. Imagine you start a week with a \$1000 stock. You gain 50% on Monday, Wednesday, and Friday; but book 50% loses on Tuesday and Thursday. Before you calculate: what says your intuition about the value of your stock (that began as a \$1000 holding on Monday morning) on Friday afternoon? State a concrete value (e.g., \$750 or \$1000 or \$1250) before calculating. Now, how did your intuition about a week with three 50% gains and two 50% loses stack up against your calculated mathematical reality?

To summarize crudely, my mathematical intuitions seem to yield valid results if the multiplicative acts are independent of one another. When the multiplicative operations are done in sequence (with the outcome of the first operation influencing subsequent operations) my intuitions can falter badly. Trust me, if I check the

newspaper each day of a week and gain 50% three times and lose 50% twice, I think I've made money. But by now we know that my \$1000 account is actually worth \$844 (less commissions).

Background Assumptions: Can't Think Without Them

Shall we play with our intuitions once again? By now, everyone knows that saving for retirement is a crucial part of maintaining our financial health when our earning years come to an end. Of course, the crucial questions are: 1) how much money do you need to retire safely? And 2) how do you get from here (graduating college) to there (retiring around 65 years of age)?

About 20 years ago I decided to create a realistic example of two pairs of Notre Dame students who marry and work toward their financial futures about 43 years off. Here's the exercise.

Salaries of A and B		Couple A			Couple B		
		Assets A	Interest Expense A (yr)	Savings A (yr)	Assets B	Interest Expense B (yr)	Savings B (yr)
Start	40,000	-40,000			-40,000		
End yr 1	42,000	-42,000	4,000	2,000	-38,000	4,000	6,000
Yr 2							
Yr 3							
.							
.							
.							
Year 43							

Guess concrete values for these two variables

In my Psychology of Healthy Lifestyles course I try to help students to make a connection between how their present daily acts will inexorably lead to their lives' destinies. The day-to-day decisions to drink (or not to

drink) large quantities of alcohol over time can produce an addiction (or, conversely, a healthy use of distilled spirits). Similarly, conscientiously developed and practiced work habits generally lead to professional success—or failure. And finally, small differences in habits of spending versus saving lead to ___! Exactly what do these small differences in money management styles (i.e., whether to spend or save) lead to over time? Consider the following thought experiment.

Imagine two sets of identical twins (one set of males, [Adam & Bob], one set of females [Alicia & Barbara]) who decided to marry one another (Adam marries Alicia: Couple A; Bob marries Barbara: Couple B) upon graduating from Notre Dame. My reason for imagining pairs of identical twins who marry is that I want to make these pairs equal in every way (e.g., intellectual prowess, motivation and work habits, investment acumen) save one — Couple A likes to spend 95% of their after tax income, while Couple B chooses to spend 85% of their after tax income. That one, small difference in savings between the pairs of imaginary couples will be responsible for all differences in their assets at retirement.

A few realistic starting values (circa 1997) and constants must be determined before we can begin our thought experiment. Notre Dame Arts and Letters graduates average \$26,000 for their starting salaries. If both spouses work, the couple would earn \$52,000 per year before taxes. The IRS estimates that such a couple would pay approximately 23% for federal, state, local, and social security taxes. This estimate is too low if the wage earners are self-employed, and for the couples' later working years when the incomes are much higher. However, the 23% tax bite will be considered constant throughout each couple's working career.

Notre Dame's office of financial aid says that the average level of student loan indebtedness of graduates is \$16,250 — or \$32,500 for each couple. Students also tend to have about \$3,750 (\$7,500 per couple) in other debts (e.g., credit card debt, personal loans, auto loans). Thus, the starting value for salaries for Couples A and B is \$40,000, and the couples' assets are entered for both as \$40,000 of debt. The interest rates on student loans range from 5% to 7.4%; auto loans are currently around 9%; while my colleagues' credit cards charge from 16% to 21% annually on unpaid balances. An overall interest rate of 10% was chosen for this exercise. My retirement money has averaged 7.15% (TIAA: bonds) and 14.06% (CREF: stocks) in annual returns for the last ten years — thus a 10% return on investment seems reasonable. Given these estimates,

Couple A saves \$2000 in their first year of work while Couple B saves \$6000. If one chooses different starting values and constants, the net wealth of each couple at retirement will change.

[Now estimate the value of each couple's assets at retirement. This represents the heart of this first exercise, so force yourself to write an exact estimate of assets after the 43 years of work and savings for Couple A and another estimate for Couple B.]

Since starting values and constants are the same for both the thrifty (B) and spendthrift (A) couples, the difference between the assets (see Table 1 now at the end of this chapter) of Couples A and B at retirement represents the cable-like vice that develops from the fragile thread of a savings habit that persists over 43 years. Table 1 reveals that Couple A (5% savings rate) must immediately declare personal bankruptcy if they retire at age 65, since they are \$325,987 in debt and they no longer have salaries that justify carrying such a high level of personal indebtedness. Couple B (15% savings rate) retires with a positive net worth of \$3,841,246. Since all factors (including professional success as measured by annual salary) were equal for both couples, the enormous differences in terminal outcomes (bankruptcy versus wealth) are due solely to the couples' different saving habits (i.e., 5% versus 15%).

Before I explain the assumption that leads to your misleading estimates in this first exercise, I'll explain a second exercise. I've found that second thought experiment in probabilities is quite appropriate for students beginning a course in Probability and Statistics or a course in Philosophical Psychology.

Care to Play a Simple Game of Chance?

As you know, a die has the numbers 1 through 6 on each of its six sides. As you can see, I've altered the values on the six sides of four dice. For example, Die A has a value of "5" on three sides and a value of "1" on each of the other three sides; Die B has "3" on each side, etc.

Die A	Die B	Die C	Die D
1	3	6	0
1	3	6	0
1	3	2	4
5	3	2	4
5	3	2	4
5	3	2	4

I wager you do not know enough about probabilities to be able to figure out which is the best of these four dice. When you think you know which is best, let me know and we'll play for a buck. Each of us will roll one of the dice and the first one to win five rolls gets the buck. Which die would you select? Don't read any further until you've decided which die you'd stake your hard-earned cash on.

Rest assured that I have never lost a cent playing this "game of chance" and I play until all students cry "uncle" (usually not before I'm \$15 ahead, and once not until I was almost \$100 ahead). Of course, no money ever actually changes hands. However, by the time the last student surrenders, all are anxious to know what it is about probability theory that they don't yet understand.

Explanation of Exercise #1: To Spend or not to Spend?

Values obtained for approximately the first ten years of Table 1 generally conform to students' expectations of how savings and debt grow. But eventually the calculated levels of wealth and debt begin to shock these undergraduates. Why is it that so many people are shocked by the enormous wealth and debt that one can accumulate over time? Lend me a paragraph or two of your time and attention to milk your intuition regarding how we often misunderstand growth rates.

Please answer each of the three questions below, before reading any further. Which of the following choices would you take in each case?

- A) A penny that doubled tax deferred every day for a week, or one million dollars?
- B) A penny that doubled tax deferred every day for a month, or one million dollars?
- C) A penny that doubled tax deferred every day for a year, or one million dollars?

Few people take the doubling penny for a week — as seven time blocks is clearly a short-term proposition. In fact, the doubling penny is worth only \$1.28 after seven doubles. Conversely, intuition usually suggests that a penny that doubles 365 times (question C) would be quite valuable indeed. It is question B (an investment that compounds 31 times) that seems to produce a split in college students' intuitions (about half take the doubling penny, the other half take the million dollars). At the end of the second week the compounding penny rises in value from \$1.28 to \$163.84. At the end of the third week the penny is worth

\$21,611.52, and it grows to \$2,782,418.56 by the end of week 4. So the doubling penny wins after four weeks. But the typical month is slightly longer than four weeks — it's 31 days. Why quibble over a paltry three more compoundings? Because it makes almost a 20 million dollar difference (\$22,259,344.48 versus \$2,782,418.56)!

What is wrong with our intuition when many of us select \$1,000,000 instead of the \$22,000,000 option (the penny that doubles every day for a 31-day month)? Psychologically speaking, we mistakenly think we are dealing with an arithmetic progression when, in fact, untaxed, compound interest (and debt also) grows geometrically. How can our intuitions be deceived so badly?

Explaining Exercise Two: On Which Die Will You Die?

In our second exercise, no matter which die you select, I can select one that will beat you the majority of the time. Let me show you how this works. Start with Die B (all 3s) and compare it with Die D (4s and 0s). Since Die B always yields a 3, and Die D delivers a 4 on 66% of the rolls, then Die D generally beats Die B. Thus, we can state that $B < D$. Can we find any die that is superior to Die D? Well, Die A (5s and 1s) is superior to Die D. Half the time Die A yields a value of 5—which always beats Die D's 4s and 0s. And even when Die A yields a value of 1 (half the time), it still beats Die D's 0s. Thus, A is superior to D, and we can now say that $B < D < A$. Can we find a die to beat Die A? Die C (6s and 2s) always beats Die A whenever Die A comes up as "1" (half the time). And when Die A comes up as "5" (half the time) it still loses to Die C's 6's. Thus, Die C is superior to Die A, and we now know that $B < D < A < C$! So we have now proven that Die C is the best die—haven't we? Yes we have—if and only if probabilities follow the transitive law!

And what is the transitive law? If you (Y) weigh less than your father (F), and your father weighs less than me (GH), and I weigh less than Refrigerator Perry (RP—a 300 + pound football player), then we can state that $Y < F < GH < RP$. The transitive law states that you can safely conclude that you weigh less than Refrigerator Perry. I feel that conclusion is warranted because I believe the transitive law holds for weights. But is the transitive law a valid assumption in the domain of probabilities? Let's find out.

If the transitive law holds for probabilities, then since $B < D < A < C$, one could safely conclude that $B < C$. Since Sancho Panza declared that "the proof of the pudding is in the eating of it," let's take his epistemological recommendation and compare Die B with Die C. Die B always produces a "3" whereas Die C

produces a “2” on 66% of the throws. Thus, $B > C$, which is the opposite of what the transitive law holds. Thus, in the dice exercise, you were impaled upon the horns of a set of nontransitive dice. No matter which die you choose, there is always a better die left for me to select.

Because you (trusting reader) believed that the transitive law held for probabilities, you assumed there must be a “best” die to be found. It turned out you were chasing “swamp gas.” The ironic part is that many people assume transitivity without even knowing what it is—let alone that they are wagering their hard-earned money on the law’s appropriateness for this particular “simple game of chance.” Once again, my father’s warning of years past proves true, “If you’re gambling, look around the table. If you don’t know who the sucker is—it’s you.”

But our larger point, about the role of unproven assumptions, is as important as the anti-gambling message. Our beliefs, knowledge claims, interpretations, rules of thumb and so forth are only as good as the many background assumptions that undergird our efforts to make sense of the world we inhabit. Donald Campbell (1974) concretizes this reality for research scientists in his Doubt-to-Trust ratio. In order to assert any knowledge claim, we are dependent upon numerous background assumptions that we often trust implicitly. When the assumptions are wrong, our knowledge claims are hollow.

Perhaps William James’ philosophy of pluralism (see A pluralistic universe, 1907) was the first sustained philosophical treatment of the role that ones’ perspective plays in the creation of the reality that one experiences. James’ vision suggests that we ought to be very humble about our beliefs, views, knowledge, etc., as one realizes that the world we experience can be expected to shift radically when viewed from a different perspective. All seekers of wisdom should strive for an appropriate level of humility, as it is so easy to fall under the spell cast by our regnant belief systems.

So, tell me, do you believe in the truth of multiplication—or does it speak with a forked tongue? You might reply, “The process of multiplying always works. However, sometimes it can be used to mislead our intuitions.” So tell me, how do you propose to use this marvelous mathematical tool? I am simply probing whether the background assumptions in several cases warrant the conclusions my intuition might draw.

I just finished reading a book entitled How not to be wrong which offers mathematics as the royal road to accuracy in our thinking. In the previous chapter of this book, Pat Cox also offered mathematics as a way of thinking more clearly. However, while I agree with both these thinkers, (that mathematics helps us to move closer to “truths,”) absolute truth remains a horizon-concept that we may move closer to. Sadly, we never actually arrive at “Truth.” This is because all tools are only as good as the mind (and the background assumptions) of the workman who wields them. Even simple tools—like percentages and multiplication—can be misused in ways that mislead. But don’t get me started on advertising, which is a systematic altering of our beliefs (whether they are initially right or wrong) into a new belief system that favors the advertiser (regardless of the rightness or wrongness of this new belief) and typically prods us to behave (to buy the advertised product) in ways that threaten our financial health. For the more things you buy the closer you get to a 5% savings rate (and bankruptcy in retirement) and the farther you stray from saving 15% (and reaping your just deserts).

Most young people quickly run into financial trouble. Their knee jerk reaction is to resolve to earn more—and that’s the wrong move. The best way out of financial difficulties is to spend less. Appendix E analyzes this reality in detail by asking, “Is your money working as hard as you are?”

Table 1

Differences over time in assets for a couple who saves 5% of their after tax income (Couple A) versus a couple that saves 15% of their after tax income (Couple B)

	Salaries of A and B	Couple A			Couple B		
		Assets A	Interest Expense A (yr)	Savings A(yr)	Assets B	Interest Expense B (yr)	Savings B (yr)
Start	40,000	-40,000			-40,000		
End yr 1	42,000	-42,000	4,000	2,000	-38,000	4,000	6,000
End yr 2	44,100	-44,100	4,200	2,100	-35,500	3,800	6,300
End yr 3	46,305	-46,305	4,410	2,205	-32,435	3,550	6,615
End yr 4	48,620	-48,620	4,631	2,315	-28,733	3,244	6,946
End yr 5	51,051	-51,052	4,862	2,431	-24,313	2,873	7,293
End yr 10	65,156	-65,156	6,205	3,103	12,032	(248)	9,308
End yr 15	83,157	-83,157	7,920	3,960	84,708	(6,621)	11,880
End yr 20	106,132	-106,132	10,108	5,054	219,804	(18,604)	15,162
End yr 25	135,454	-135,454	12,900	6,450	460,414	(40,097)	19,351
End yr 30	172,878	-172,878	16,465	8,232	877,319	(77,511)	24,697
End yr 35	220,641	-220,641	21,013	10,507	1,586,273	(141,341)	31,820
End yr 40	281,600	-281,600	26,819	13,410	2,775,942	(248,701)	40,229
End yr 43 (Age 65)	325,987	<u>-325,987</u>	31,046	15,523	<u>3,841,246</u>	(344,971)	46,570
		\$32,598 in interest expenses due every year of retirement without reducing total indebtedness			\$384,124 of interest is available every year of retirement without touching principle		

() in Interest Expense reflects a positive return on investment. Also, all returns on investments are treated as tax deferred, since 15% of earnings can be tax sheltered each year under combinations of company retirement plans, SEPs, Keoghs, and IRAs.

Chapter 13

Regulators Should Toil for the Common Good— Not for the Benefit of Companies They Regulate

On June 12, 2015, Pat Cox alerted us to a possible, important regulatory transformation

Dear Reader,

This issue isn't going to be what I had planned it to be. Our household is in upheaval right now because an older relative just slipped hard down the slope of cognitive decline. My wife has experienced a truly unpleasant role reversal, taking the car keys away from her father following a couple of scary events. Routes that he's driven for decades now baffle him. He's been lost several times and recently had an accident.

The rapid onset of his dementia has been startling. When I started writing about Alzheimer's and dementia, my father-in-law was fine. Now his ability to care for himself is slipping away fast.

For several years, I've been predicting that US policy makers would be forced to recognize the need for serious reform of the drug and device approval process. The reasons are pretty self-evident, but I'll lay them out in case you missed it.

The biggest part of government spending is healthcare expenses (just as it is for many families). This isn't really surprising as healthcare is the largest industrial sector in America and most of the world—bigger than energy and military spending combined. In a real sense, the central activity of the human species is fighting illness and death. Even during downturns, healthcare is remarkably countercyclical.

Right now, however, things are changing. As I've so often said, birthrates are plummeting and life spans are skyrocketing, increasing the average age of populations worldwide.

The undiscussed consequence of this change is that healthcare spending increases exponentially along with the average age. For example, healthcare costs about 10 times as much for the average 80-year-old than for the average 10-year-old...

The last year has, in fact, been a watershed year as more and more healthcare experts have pointed out the need to shift from a war on disease to a war on the process of accelerated aging, which is the underlying cause of most diseases.

Now we're seeing the first real sign that the alarm is being heard in political circles. Newt Gingrich has written recently and positively about a bipartisan attempt to accelerate biotechnological progress called the 21st Century Cures Act. This legislation would increase the budget of the NIH and hopefully reduce the regulatory burden on biotech startups.

Moreover, it's pretty clear that the NIH has not yet focused sufficient resources on solving the root cause of Alzheimer's and all the other biggest diseases: accelerated aging. This is really a shame because so much progress has been made in this area already.

Truly astonishing discoveries have been made about aging in the last 10 years...If these discoveries aren't overlooked, then they are probably in development and being hindered by US regulations that focus on "cures" rather than the amelioration of the aging processes that cause diseases.

So we have an NIH that wants to fund new research and a hegemonic FDA that delays the application of those discoveries. Stuck in the middle are discoveries that could actually solve real medical and fiscal problems—if somebody other than start-up biotechs (the low men on the totem pole) were doing so.

Among the most important of these prior breakthroughs is sigma-1 receptor activation of autophagy and life extension... [Pat then turns to anatabine citrate.]

Chronic autoimmune inflammation, activated by the NFκB transcription factor, is another major cause of accelerated aging and telomere loss. Anatabine citrate is an enormously promising compound that reduces age-related autoimmune inflammation. Its effectiveness, reported in the recent publication of Alzheimer's mouse data, is not a surprise. It is only one of many indicators, along with massive anecdotal evidence from hundreds of thousands of people who used the product when it was sold over the counter, that this molecule is a huge anti-aging breakthrough. I have no idea why the FDA is not fast-tracking it.

-Pat Cox

Pat tells us there is a new law under consideration that will aid companies like Rock Creek and Osiris as they work hard to bring good things to our lives. Who would oppose such an effort? Obviously, the moneyed

interests who now sell “cures” to people once they have become sick. This is predominantly the large pharmaceuticals. By having a drug approval process that is so long and expensive, small biotech companies (like RCPI and OSIR) are often forced to partner with the large pharmaceuticals to get their products through the arduous drug approval process.

Even though Osiris was the first company to obtain approval of a stem cell product, prochymal (for graft versus host disease), they quickly partnered with an Australian biotech firm (Medtronic) to pursue prochymal’s potential for indications beyond graft versus host disease. This was a prudent strategy because Osiris had limited resources and an array of other stem cell, therapeutic products (e.g., grafix, Bios 4, cartiform, Manix) that needed to be developed. Had the drug approval process (and the medical devices approval process also) been more streamlined, Osiris might not have needed to partner prochymal for additional indications.

Similarly, when Rock Creek decided to get approval for anatabine citrate as a drug to treat various illnesses, they chose to get approval in Europe instead of in the United States. It was estimated that obtaining approval in England took approximately half the time and half the money that is required to obtain approval in the United States. Time and money were precious commodities for Rock Creek at that time (early 2015), so the European route was taken. A moment’s reflection reveals that this situation leads to numerous American jobs being needlessly exported to other parts of the world. When our children complain they must go abroad in order to obtain good jobs, we should remember that it was our policies (by the FDA in this case) that sent those jobs overseas.

I live about 100 yards outside Congressman Fred Upton’s Michigan congressional district. I know Fred Upton because of his concern for environmental issues and my commitment to solar energy. As the chairman of the U.S. House Committee on Energy and Commerce, Fred was a central figure in crafting the 21st Century Cures Act. In a Viewpoint column in the [South Bend Tribune](#), Congressman Upton joins Pat Cox and Newt Gingrich in suggesting that the bill’s changes represent good business strategies that will make Americans healthier in a variety of ways.

A Cure That Helps Patients, the Economy

by Fred Upton

The 21st Century Cures Act is a breakthrough bill — a bold, nonpartisan piece of legislation designed to speed the delivery of life-saving drugs and devices to patients across the country. It is the product of more than a dozen listening and information gathering sessions during the past year — an unprecedented approach to legislating. My partner, Rep. Diana DeGette, D-Colorado, and I left no stone unturned in our quest for ideas and potential solutions on how Congress could work together to achieve a win for patients and families everywhere.

As we head into the next phase of this journey toward House passage, it's important to remember a few key points about the 21st Century Cures Act.

The 21st Century Cures Act cuts government red tape by streamlining the drug and device review apparatus. In the 21st century, health care innovation is happening at lightning speed, but many government rules and regulations were developed in another era. The 21st Century Cures Act enables us to embrace all that modern technology has to offer, which includes unleashing the power of personalized medicine. Ultimately, this means more and better cures and treatments for patients, more quickly, while maintaining the current U.S. standards of excellence in patient safety and protection.

The 21st Century Cures Act will help create jobs and boost our economy. In my home state of Michigan, we stand proudly on the cutting edge of medical innovations at research labs, universities, and medical device manufacturers. In order to remain the worldwide leader in health care and medical innovation, we need the 21st Century Cures Act. If we lose the lead, we lose with it thousands of U.S. jobs to places like China. From small medical device manufacturers to large biomedical research facilities, and everything in between — medical innovation spurs U.S. economic growth and creates local, good-paying jobs from coast to coast. Keeping these jobs here at home also means patients here have access to the result of this work faster.

The 21st Century Cures Act is fiscally responsible. It makes targeted increases to funding of the National Institutes of Health and the Food and Drug Administration alongside policy changes to ensure that the agencies can operate more efficiently and effectively. These increases are fully offset elsewhere in the legislation. Increasing funding for research is also an investment in our future and one that will lead to savings that come from more effective cures and treatments for disease. These savings can help drive down the costs of our nation's entitlement programs — the leading drivers of our deficits and debt.

The 21st Century Cures Act recognizes that health care is uniquely personal and private. That's why, even as the legislation works to improve communication and collaboration among researchers, patients and practitioners, it maintains critical privacy protections and limits data sharing provisions to those covered by all the HIPAA privacy and security rules.

The fight to treat and cure disease is an urgent national priority. The 21st Century Cures Act will help patients, cut government red tape and help create jobs and boost our economy. It is fiscally responsible and maintains health care privacy. These are principles everyone should agree on. The 21st Century Cures Act is a bold initiative, but at its core it is very straightforward: Save and improve lives...

It is clear that the public good is served by drug approval (and drug devices approval) systems that are simple, fair, and effective. Established pharmaceutical interests should not be allowed to influence drug approval policies if in the process the policies establish roadblocks to companies that would promote competitors to the pharmaceutical companies' current products. The most important task of government is to fight for the common good whenever free markets are being perverted by moneyed interests seeking to limit competition to their established products.

Speaker Gingrich and Congressman Upton remind the FDA that getting helpful drugs approved is as much a part of their mandate as is protecting the public from harmful or ineffective products. The congressmen see the protection of American jobs as an important good that the FDA needs to also keep in mind. Further, I speak of the FDA only because RCPI and OSIR are drug and medical devices companies. However, all American regulatory agencies are similarly mandated.

For example, Rock Creek is strapped for cash as I write. They are forced to sell their stock to new investors at ridiculously low prices in order to continue their efforts to bring anatabine citrate to market. This dilutes the ownership of current shareholders. [Thus, the recent 25 for 1 reverse split of RCPI stock.] Because drug approval by the European Union is quicker and less expensive than in the United States, Rock Creek is seeking approval in England first for anatabine citrate. This could be the first step toward Rock Creek

becoming a European company and depriving our children of good American jobs. Gingrich and Upton remind the FDA of their responsibility to check this destructive trend.

Chapter 14

Protecting American Jobs—The Stock Market's Role

Stock prices are a crucial factor for all young companies. However, the Securities and Exchange Commission (SEC) generally has more to do with stock prices than does the FDA. The SEC is charged with stopping illegal securities practices, such as illegal short selling [Some short sellers behave in a legal manner and their right to do so ought to be protected.] However, a subgroup of short sellers behave illegally and the SEC ought to prosecute these criminals.

Larry Smith offers an overview of how illegal short sellers can manufacture imaginary shares of a company, flood the stock's market, and thereby lower dramatically the stock's market value. Such, illegal, get-rich-quick schemes can cripple any company and eventually drive it out of business. Illegal short sellers tend to prey on the young and the weak companies. The SEC is charged with being the shepherd to all American stocks. To the extent that SEC personnel do not protect all of our stocks from wolves (illegal short sellers) they are derelict in their duties as good shepherds and deserve to be replaced with competent regulators.

Illegal Naked Short Selling Appears to Lie at the Heart of an Extensive Stock Manipulation Scheme

Posted by Larry Smith on Jun 16, 2015 • (8)

Investment Consequences of Naked Shorting

Only a motivated enforcement agency with subpoena power and an accompanying powerful enforcement infrastructure can prove that naked shorting is at the heart of an extensive stock manipulation scheme. However, I believe that the observational evidence is overwhelming that naked shorting practices are widely used to manipulate the stock prices of emerging biotechnology companies as well as many other small and large companies. Unfortunately, naked shorting is an investment variable that investors must understand if they are going to make investments in the emerging biotechnology space in particular and the equity markets in general.

Investors may decide that they just won't invest in companies that are most subject to naked shorting, but this would eliminate many small emerging growth stocks with exciting potential. For those like me who are attracted

by potentially breakthrough technologies, you will inevitably get caught up in a manipulation that leads to a suddenly plunging stock price of a company in which you are invested. Invariably the scheme starts with and is perpetuated by a flurry of blogs, tweets and message board comments which proclaim that the technology is worthless; management is a band of liars and thieves; and people with a positive view on the Company are being paid by the Company. Then come the lawsuits against the Company and management by the usual group of class action law firms. Each year this scenario is played out hundreds of times.

This carefully scripted and long used manipulation scheme by short selling hedge funds is all meant to shake and then break investors' confidence. The result is usually a painful, steady, day by day erosion of the stock price due to naked shorting practices. Stocks can be cut in half by naked shorting on the basis of little or no change in fundamentals. If you are going to invest in this area, you must decide when this occurs whether you believe strongly in the Company and can ride out the storm or want to cut and run. However, sometimes it happens so rapidly that the latter is not an option. On the positive side, these manipulations can often lead to some excellent investment opportunities if the fundamentals remain intact, investor confidence returns and the shorts are forced to cover.

The Rationale for Investing in Small Emerging Biotechnology Companies; Is It Worth It?

I worked for many years on Wall Street as an analyst covering large pharmaceutical and biotechnology companies and rarely dealt with small companies which I arbitrarily define as having market capitalizations under \$1 billion. From my experience with these large companies, I came to believe that they were excellent at drug development and commercialization and sometimes innovation, but depended extensively on small entrepreneurial companies for their pipelines. Many, indeed most, of the paradigm changing technologies are initially pursued by small companies. The big companies generally wait for proof of concept and then swoop in to either license the technology and/or the drugs stemming from it or to purchase the companies outright. This can lead to some incredible homeruns for investors in small companies so much so that one success can offset several failures.

The behavior of the big companies is understandable as the number of intriguing and promising new technology approaches in drug development seems endless. I personally have done some tracking of over 300 biotechnology companies and this is not an exhaustive list. Moreover, exciting new technologies are evolving like lava flowing over the rim of a volcano. Even big companies lack the infrastructure and financial resources needed to aggressively pursue more than a small fraction of drug development opportunities. Once committed, the development costs for a new drug can run into the hundreds of millions and even over \$1 billion of costs. And of course, the failure

rate in new drugs is astronomically high. I have seen estimates that for drugs that begin human phase 1 trials, perhaps only 1 in 10 will reach phase 3 and in phase 3 a significant percentage will fail. And even of those that succeed only a few become blockbusters.

With this high rate of failure, drug development is not for sissies. Research people at large companies get rewarded for successes and fired for failures. Hence there is a tendency to focus on evolutionary (me too) drug development in which there is less risk and leave the paradigm shifting efforts to entrepreneurs willing to accept the very high risk of failure for the extraordinary rewards in those few cases in which success is reached. What are those odds for success? I have no data to back this up, but the chance for moderate success is less than 1 in 10 and for home runs is in excess of 1 in 25 or 1 in 50. Take these numbers as being representative of the risk as opposed to a well-researched estimate.

Wall Street analysts have risk profiles that aren't that different from research people at big pharma. They gain fame for being correct on a stock and can lose their jobs if they take a risk on an unproven drug or technology and get "blown up". As a result, many early stage companies are ignored by analysts or primarily covered by analysts working for investment banks who specialize in bringing such companies public; naturally analysts employed by investment banks are always positive on the stocks their firms underwrite.

As I looked at this situation, about five years ago, I sensed an opportunity to try to bring quality research to some of the companies in this vast universe of poorly followed companies. Obviously, it is not possible to cover all possible companies so I focused on just a few in which I tried to do exhaustive research that could give me an edge. My strategy was primarily although not entirely to focus on stocks that could be homeruns. (Please refer to my earlier comments on the risks involved). Recognizing the high potential for failure, I tried to find as many opportunities as possible and never put all my eggs in one basket. In my own portfolio, I invest in a large number of early stage biotechnology stocks as I fully recognize that I am going to be wrong in a significant percentage of the stocks I deal with. [Smith calls his strategy asymmetric investing and it is explained in more depth in Appendix F.]

Upton, Gingrich, Cox, Smith and their colleagues ought to be extremely concerned. If agencies like the SEC, FDA, etc. are in any way in cahoots with pharmaceuticals strategizing to reduce competition for their products, or with illegal short sellers who manipulate markets solely to enrich themselves (but who kill young

American companies in the process) then stock markets—and perhaps free market capitalism itself—might have no future.

I'm still in the market—trying to help the RCPI and OSIR dreamers of the world to achieve their worthy goals. But my faith is sorely tested. If I—and many millions more like me—abandon our markets, what will be left???

Godspeed to the progress of the 21st Century Cures Act through both Houses of Congress. Does the SEC even have a coherent strategy for ending the travesty of illegal short selling? If so, then tell us what strategy you are following to cure this cancer upon our free market, capitalist system.

No sooner had I written the above thoughts when Rock Creek announced the positive results of its proof of concept research (on July 1, 2015) before the market opened. In the first hour of trading, the stock jumped by 37% (from \$1.52 to \$2.09). Then over the next 12 hours of trading (2 market days) the price slowly declined to its original price. A seemingly endless procession of 100-, 200-, and 300-share sell orders relentlessly pushed the stock price down. Over these two days stock volume was more than 10-times its normal pace. It had all the earmarks of the sort of short attack that Smith described.

Because I'd been thinking of the SEC, I decided to make a complaint about the RCPI trading to the SEC's office of its Whistleblower.

SEC Office of the Whistleblower
100 F Street NE
Mail Stop 5553
Washington, D.C.

July 6, 2015

Dear Colleagues:

I am a recently retired professor of Psychology at the University of Notre Dame who is writing a book entitled [Search for the Fountain of Health](#). The book considers ones' physical, psychological, spiritual, financial, political, and other domains of health or wellness. In the physical health domain we explore two

biotech companies that seek to offer solutions to chronic health problems. I own stock in both companies (Osiris Therapeutics [OSIR] and Rock Creek Pharmaceuticals [RCPI]) and write in the book about how stocks are an important part of diversified asset portfolio in our search for financial health.

In the political/social health portion of the book we trace threats to citizens' security. Illegal stock manipulation can easily wound a person's financial health. I write about the SEC's role in protecting investors from threats. [I am happy to send you drafts of these chapters if you desire.] We focus on illegal short selling as a pernicious threat to Americans.

As best I can tell, there appears to be no problems with illegal short selling for OSIR—although there is a large short position (3,327,318) for a stock with only 35 million shares.

RCPI, on the other hand, reported fabulous results this week on its proof of concept drug studies. The stock price went up by more than 35% in the first hour. Then enormous volume slowly dragged the stock price down, so that by the end of the next day the stock price was exactly where it was before the wonderful news was announced. The day of the announcement more than a third of the stock's outstanding shares were traded. There are currently 755,668 shares short with outstanding shares (computed from market cap) of 10 million shares. Having closely observed RCPI's progress for years, I believe its stock movement cannot be explained by anything other than illegal (naked) short selling.

Please share with me the results of your investigation as I intend to include this letter in the book as well as your response. Because of their interest in the 21st Century Cures Act, the book is also being shared with my friends Congressman Fred Upton and Senator Joe Donnelly.

I look forward to your investigation into this complaint.

Sincerely,

George S. Howard
University of Notre Dame

Chapter 15 Healthy Societies

Can a growing tree stay healthy in a sick forest? Typically not. Whatever is killing the rest of the forest usually overtakes healthy, solitary trees also. Thus, we need to think about our society's health, as our own physical, emotional, financial, etc. health usually hinges on our living in a healthy-enough society.

A society can be sick or healthy in a variety of ways. Nazi Germany was sick politically when Adolph Hitler was named Chancellor. Greece is the current poster child for a financially-sick country. Finally, the United States possesses a first-class military and thus is as well defended as a country can be in a world plagued by terrorism as well as traditional military threats.

I recently read a fine book by two economists (Gernot Wagner and Martin Weitzman) entitled, Climate shock: The economic consequences of a hotter planet. Their message was clear; our human contributions to global climate change are now so obvious that climate deniers are either incapable of thinking beyond their own self-interest or are terminally stupid. The climate science community is now univocal. Climate changes in the future are now unavoidable and will have severe economic consequences. Failure to initiate remedial measures to mitigate future consequences of climate changes represents a socially and economically insane position.

Wagner and Weitzman's program of change is both draconian and impressive. First, they estimate the current worldwide incentives to support the hydrocarbon burning industries (oil, coal, and natural gas) to be about \$500 billion per annum. Such price supports should be drastically slashed immediately with the saved billions being transferred to clean and renewable industries (e.g. wind, solar, geothermal, tides, hydro). Second, carbon released into the atmosphere should be properly priced and added to the prices of our energy sources (e.g., electricity, gasoline). Suggested current carbon levies range from \$40 to \$400/ton of carbon released. Third, the free market will then dramatically reconfigure our desired energy sources in a way that ameliorates climate threats in an expeditious, healthy manner. Fourth, other externalities (e.g., health costs, acid rain) caused by our hydrocarbon-burning approach to energy can be included into the cost of energy as desired. Finally,

some of the \$500 billion in saved yearly hydrocarbon incentives might go toward needed infrastructure improvements, such as upgrading countries' electric utility grids. Michigan is now weighing such a move—a modest adjustment to gasoline prices to fund highway improvements and to lower income taxes. In Arkansas, a similar bill is already law.

An acute observer will immediately recognize that Wagner and Weitzman's suggestions call for zero-cost changes to the societies involved. Current incentives would simply be switched from one set of energy companies (i.e., coal, oil, etc.) to a different set of energy companies (i.e., electricity, wind, solar, etc.). However, the resulting energy structure would no longer add to the enormous bill for climate change that we are currently passing to our children and grandchildren.

One could still produce electricity from coal or from the sun; or drive a gasoline powered or an electric car; or heat one's home with natural gas or electricity. No one's freedom would be abridged in any way. The resulting energy economy would (finally) reflect the true costs of our energy choices and gently move our society toward a clean, sustainable energy system.

If you believe (as I do) that Wagner and Weitzman's solution to our energy troubles is Solomaniian, then one must ask, "Why don't we just implement it?" Sadly, our society has a badly broken political system. The hydrocarbon corporations have been awash with money since the end of World War II. They have bought their incentives through massive political contributions to countless politicians in both political parties over the years. Money always seems to get its way in politics—and no one has more money than the hydrocarbon burning energy lobbies. Our problem in fixing energy is due to our badly broken political system—but you knew that already.

Instead of a professional political class like we now have in Washington, I'd prefer the Jeffersonian ideal of professionals from all walks of life (e.g., teachers, lawyers, electricians, laborers, etc.) who serve severely time-limited terms of office (4 to 6 years) who then returned to their private lives after their service to the common good has been completed. Because they are sent to Washington DC—as opposed to Indianapolis,

Austin, or Sacramento—their votes are in the service of all Americans, not simply the interests of the states that elected them. Not having to stand for reelection enables politicians to cast votes that are good for the entire country, even if it hurts his or her state’s populace. The remaining group of stakeholders that politicians would be urged to represent vigorously are those voiceless Americans (such as the as yet unborn) who will bear the consequences of today’s political decisions. For any society to be healthy, politicians must learn to speak for the future—not for today’s highest bidder.

If politicians are at the beck and call of today’s moneyed interests, forward-thinking energy solutions (like Wagner and Weitzman’s) struggle against overwhelming obstacles. The future that the politicians of today are creating might well be nightmarish. To twist an old saying, “A country that spends its time attending to the moneyed interests of the present has no future.”

Washington politicians ought to represent a cross section of Americans who hear arguments for various possible futures for our democracy. Their votes should represent the legitimate interests of all Americans—both living and yet to come.

...and that when reality bitch-slapped me

While waiting for the SEC’s office of the Whistleblower to answer my letter regarding naked shorting of RCPI stock, I often talked about the SEC with friends. My lawyer/gambler buddy and co-author nonchalantly asked, “Have you read,” ‘No one would listen?’” He gave me the book and it was the coup de gras for my SEC hopes.

The author, Harry Markopolos, gave the SEC all the information it needed to nail Bernie Madoff on four separate occasions between 2000 and 2008. The SEC did nothing! At the time Markopolos sent in his first accusation of Madoff, Harry estimated the size of the Ponzi scheme to be between \$7 and \$8 Billion. When Madoff finally turned himself in to the police (the SEC never even knew he was doing anything wrong) there was \$65 Billion in losses due to his scheme.

The SEC might have been the most incompetent organization ever during the first decade of the 21st century. This will give you a feel for Markopolos' (2010) analysis of the SEC.

“It was then that I began to understand that the SEC is a government agency that had been captured by the private industry it was created to regulate. The mission of the agency supposedly was to protect investors from the financial predators in the industry; instead it was protecting those financial predators in the industry from the investors. The people charged with regulating the industry were primarily concerned with their own paychecks. They didn't care a rat's ass about protecting investors. And it was then that I realized that I had two opponents, Bernie Madoff and this nonfunctioning agency that seemed to me to be doing everything possible to insulate him.” (pg. 127).

The SEC's “investigations” of Madoff were jokes more than they were serious investigations.

“What really bugs me is that the SEC caught Madoff lying to its investigators repeatedly, and making false statements to a federal official is supposed to carry a five-year (rarely imposed) maximum sentence; yet they never referred him to the Department of Justice for criminal prosecution. It seems that there is a double standard at the SEC where the big firms don't get prosecuted for anything other than misdemeanors, but the small firms get shut down for anything more than minor infractions. Trained fraud examiners know to immediately expand the scope of their exam as soon as someone lies to them. That's the signal to dig in and redouble your efforts, because once you catch them in a lie you know you have them back on their heels. One would think that SEC enforcement lawyers would at least comprehend that making false statements is a criminal offence and have the courage to stand up to a powerful Wall Street figure and send a deterrent message to industry that this sort of behavior will not be tolerated.”

Neil Chelo (one of Markopolos' colleagues) visited a fund that was invested in Madoff. They suspected the fund knew Madoff was a fraud but stayed invested anyway. When discussing a manager at the fund, Markopolos opined,

“Neil and I both believed very strongly that he knew. He was much too smart to believe in either the tooth fairy or Bernie Madoff. But his attitude was very typical of the attitude on Wall Street. Those people who knew something was wrong and had not invested with him went along with the unspoken industry code: It it’s not my business and it doesn’t affect my business, I’m not going to get involved. And those people who were invested with him and knew something was wrong kept silent because his returns were too good. Bernie Madoff could not possibly have gotten away with it for so long without the silence of so many people. Madoff wasn’t an aberration; he was a creation of the profit-at-all-costs culture of Wall Street. And maybe the scariest thing about Bernie Madoff?

He isn’t the only one. Like unvanquished monsters, there are more of them out there in the dark.”

In many ways, Wall Street is an ethics-less zone.

“What surprised me from the very beginning of my career was the level of corruption that was simply an accepted way of doing business. Bernie Madoff wasn’t a complete aberration; he was an extension of the cutthroat culture that was prevalent from the day I started. This is not an indictment of the whole industry. The great majority of people I’ve met in this industry are honest and ethical, but in a business where money is the scoreboard there is a certain level of ingrained dishonesty that is tolerated. I became disillusioned very quickly. I learned that the industry is based on predator-prey relationships. The equation is simple: If you don’t know who the predator is, then you are the prey.”

And finally, Markopolos echoes Patrick Cox’s “salvation through mathematics” theme outlined earlier.

“After spending so many years trying to convince government officials, reporters, and fund managers that Madoff was a fraud and being rejected or ignored by every one of them, it’s human nature to at least wonder if I never doubted myself. There is a single irrefutable fact that I relied on: Numbers can’t lie. That’s the basis of my career. First examine the numbers, then investigate how those numbers were generated.”

If you are not yet convinced that Wall Street is a cesspool, two very understandable, readable book by Michael Lewis are Liar's Poker (1989) and The Big Short (20) and, of course, Harry Markopolos' No One Would Listen (2010).

In light of Wall Street's perfidy, you must be wondering, "Then why are you still in stocks, George?" Because I trust no one on Wall Street. I do my own research—slowly and oh-so-carefully. I take ideas from people like Patrick Cox and Ed Stephan and then I check those ideas carefully myself. Thus, I am completely responsible for all of my investments—the good, the bad, and the ugly.

I have a flashbulb memory from over a half century ago, as my Southern father tried to teach his Yankee teenage son some lessons in ethics/strategy,

"Boy, what if you're in a card game and you catch another guy cheating you. What would you do?"

"Tell him he's a cheat and he better stop it."

"What?" my dad drawled. "and get yourself shot?"

"Okay. Okay." I said. "Then I'd cheat him back and take his money."

"And when he realizes your cheating him, he pulls out his gun and shoots you."

"No. I guess I'd just quit the card game."

"You would? And let him walk away with all your money that he cheated you out of?"

[I offered a few more possible actions but my dad easily shot all of them down. Finally, I surrendered, "I give up. What's the right answer?"]

"There is no for-sure right answer, boy. But there is one for-sure wrong answer—to continue playing the game fairly."

So you see that it is with great reluctance that I admit I'm still playing the Wall Street game—fairly. Even though he died years ago, I pray I never hear my father say, “Told you so, boy.”

Chapter 16 Healthy Spirituality

This is the single topic in this book on which I am least qualified to speak. However, its importance demands that I take a brief, simple brush at the topic. It is impossible to think mathematically, scientifically, and politically without telling oneself a plausibly true story. The same is true for the domain of spirituality and religion. Appendix ___ presents the background and implications of this “story telling” understanding of thinking. The validity of the background assumptions of our spiritual stories limits their validity and (perhaps) their usefulness in our particular situations. For example, Notre Dame favors a Catholic story of faith. What if their background assumptions are incorrect? What if there was no historical Jesus? What if He did exist, but he knew he was not God, but only a human? One can see that every failed assumption limits the religion’s validity but not necessarily its usefulness as a spiritual story—as a religion. What is true for Catholic belief is as true for any other religious or spiritual way of thinking. The recent book Zealot is an interesting historical assessment of the “Jesus stories,” that we tell ourselves as if they were literally true.

To my mind, one thinks spiritually whenever one confronts the fundamental questions of life from the perspective of what we know to be best in ourselves. For me, the perspective has a decidedly Christian flavor, because I was a believing, practicing Catholic for the first quarter century of my life—I even was a monk (a Marist Brother) for six years. Thus, my spirituality is peppered with numerous “Truths” that originated in the Old and New Testaments. However, over time I have evolved into non-doctrinaire believer. My form of Christianity reflects the truths I’ve discovered through the course of my life, as much as it follows the dictates of any organized religion. How strongly do I believe in my spirituality? Like you, I’ve staked my eternity on it.

Most Christians’ God looks a lot like the Jesus we meet in the New Testament—as does mine. My God also looks a lot like my father—John Howard. My dad was one of the most understanding and loving men that I’ve ever met. His religion wasn’t God-centered, it was nature-centered. This will be difficult for most readers to understand—but my father was as comfortable eating the bear as he would have been had the bear eaten him!

Both outcomes were just nature's way of working things out. Crazy, huh? Finally, there's a bit of a Buddhist in me. This storyline comes from a strange place—my younger son, Greg. For no reason at all, in high school, Greg read Chronicles of The Tao and he became a baby-Buddhist. Well, of course, I had to read the Chronicles also. Bottom line, after paying Catholic school tuition for sixteen years for Greg—I got to become a bit of a Buddhist myself. Money well-spent.

After sixty-seven years of telling myself Catholic-stories, nature-stories, and Buddhist-stories, I have a laser-sharp sense of what's right and wrong (for me). I have little insight to offer about what's right and wrong for you—you're on your own on that one. Finally, I usually do what's right (in my view) but unfortunately I still sometimes do what I know to be wrong. Nobody's perfect.

If you've gotten this far in this book you ought to know quite a bit about my “religion.” It's people-centered, as I'm always searching for ways that people might become healthier, happier, and wiser. It's social, because twenty-first century problems can only be solved collectively—not by one or a handful of dedicated people. Finally, it's spiritual because we need a vision of what we're working toward. Spirituality gives us a vision worth pursuing. If you don't know where you want to go, it's unlikely you'll arrive at a place worth inhabiting.

Spirituality is vitally important in our lives because it is there that we learn to distinguish between “true Gods” and “false Gods.” If someone speed-reads this book they might (wrongly) conclude, “Money (and the mathematics of making money) are George's Gods.” But you, careful reader, know better. For me, money is a means to achieving important true goods, such as physical health, education, loving relationships, etc. Mathematics is a method for developing clearer thinking. One tests her or his ideas by holding them up to the scrutiny of mathematical testing. [Lots of important questions in life are not testable mathematically—but the majority are.] Speed readers hate ideas—and try to get through them as quickly as possible. But thoughtful readers know that I see mathematics and money as valuable tools to be employed in the service of my “true Gods.”

Obviously, libraries of books have been written on the characteristics of healthy societies and spiritualities. Go to your favorite library and feast upon the banquet of volumes that flesh out the topics hinted at in these hors d'oeuvres on healthy societies and spiritualities.

Chapter 17 An Ode to Moderation

In a sense, this entire book has been an ode to the virtue of moderation. Because we live in an age of extremism, radicalism, and winner-take-all philosophies, a song of moderation ought to be a welcome tune. While our ancient intellectual roots (e.g., search for the golden mean) flourished in the soil of moderation, this set of tentative virtues is now seen as a wishy-washy stance held by “losers” and luke warm personalities—people too tepid to aggressively state “their truth.” For my first twenty years as a professor, evaluating a student’s work as “average” was taken as asserting he or she was near to the golden mean of the class. A place from which none of us wished to wander too far away. In roughly my last twenty years of teaching, to evaluate a student as “near the class average” was to deliver a stinging rebuke. In the student’s mind, I had labeled her or him as “mediocre,” “typical,” or “average.”

A student of mine had just lost the championship bout in the NCAA fencing tournament, making her the second best fencer in the nation in her weapon. Because I’ve never come close to being the second best in the nation at anything, I congratulated her on her achievement. I was stunned when she fired back, “You’re congratulating me for being first among the losers!?!?” I was terribly saddened to watch her snatch failure from the jaws of accomplishment. One would hope that something in her Notre Dame education would have inoculated her against such fanaticism. However, I’m afraid her extremist all-or-none view is now commonplace—and that is sad.

Recall that in Appendix E, the vices of extremism and fanaticism are dissected in “The Perfect Class.” In my opinion, the best introductory level book on moderation is, “The Road to Character” (2015) by David Brooks. Contrasting our “resume virtues” (i.e., achieving wealth, fame, and status) with our “eulogy virtues” (i.e., kindness, bravery, honesty, and faithfulness), Brooks says we have deified the former virtues in creating the culture of the “Big Me.” We no longer see the central task in life as creating our own character—which means cultivating the eulogy values. Now our goal in life is to become the next Donald Trump.

A more complex treatment of the case for moderation is given by Harry Clor (2008) in “On Moderation: Defending an Ancient Virtue in a Modern World.” Clor explicates the politics, psychology, and philosophy of moderation as an antidote to our extremist, resume virtues of the Big Me society. Brooks and Clor agree that a philosophy of moderation is infinitely more difficult to defend than the simplistic truisms of our radicalized, extremist age (e.g., I’m anti-America; I’m against big government; I’m against new taxes; I’m anti-choice; etc.). However, in our heart-of-hearts, each of us knows that simplistic platitudes cannot be accurate, simple and generalizable for problems in our complex, multidimensional world. Single-answer solutions (while being appealingly simple) cannot possibly be accurate for the many disparate problems we encounter in contemporary society. Thus, while beliefs like “it’s God’s will,” “the free market will fix all,” and the like may, sometimes be appropriate answers, they cannot serve as a reasonable default response. Stated slightly differently, if God gave each of us a neocortex, presumably she or he wanted us to use it from time-to-time. Moderation is a philosophy of life that requires a good deal of cognitive capacity and a lifetime of reflective experience in valuing complex problems.

Single issue thinking demands we know simple arithmetic. If markets are good, understanding more domains from a market perspective represents a better situation. Thus, seeing our love relationships from a market perspective creates a better circumstance because markets produce better outcomes. N (domains now ruled by markets) + 1 (a love relationships market) $>$ N (domains now ruled by markets). Simple arithmetic.

Moderation, on the other hand, demands knowledge of calculus. There are many goods in the world, and since our resources are limited (e.g., only 24 hours in a day, a finite amount of space on this planet, finite cognitive capacity), we must judiciously allocate our scarce resources to the goods we value. Computationally, this involves solving multiple simultaneous equations with X unknowns (where X is the number of values we choose to honor). We are far beyond the simplistic mathematics of addition, which is why a philosophy of moderation is an intellectually tough row to hoe. However, the mathematically disinclined should take heart, calculus would be required if you want an “optimal” solution, but optimization is another form of extremism.

Psychologists, like Herb Simon, Daniel Kahneman and Amos Tversky, have shown that humans “satisfice” rather than optimize or maximize. This means humans can learn to consider many values simultaneously and come up with a solution that is “good enough” (i.e., it satisfies the person’s needs sufficiently well) and so calculus (and a maximized solution) is not required.

In fact, life teaches us how to honor many values simultaneously. My dear friend, Naomi Meara, always used to tell me, “Never do anything for only one reason, George.” What she meant was that we should choose to do those things that simultaneously honor many values. For example, throughout my sons’ grammar and high school years I coached many of their sports teams. I did so because I wanted to spend more time with my sons than my father was able to with me (Reason #1). The coaching served as preparation for my “Coaching Youth Sports” class at Notre Dame (Reason #2). Because it was a Catholic grammar school, I was serving my church (Reason #3). I was writing a book on coaching at the time and my coaching experiences in several sports (i.e., basketball, soccer, lacrosse, and fencing) gave me a broad range of actual examples (Reason #4). My interest in character development led me to focus on developing better citizens rather than maximizing our won-loss record, so I made a civic contribution also (Reason #5). At the time, I was teaching, writing, researching, and doing administrative tasks for 60+ hours a week, thus my exercise routine was insufficient. I served as the referee at basketball, lacrosse and soccer practices—I routinely got quite a workout (Reason #6). Naomi was quite pleased that I got six bites out of my “coaching apple.” No calculus was required, my solution honored many values and thus was plenty good-enough for me.

To those who only knew me superficially, my motivation was obvious, “George coached because he always liked sports.” In reality, life is far more complex than one might ever understand as an outsider. The view from within cuts far closer to the truth of one’s life—although sometimes the view from within is nothing short of chaotic. The good life consists of taming a possibly-chaotic inner life by subjecting it to a few fiercely held principles. We call these principles our core values. My hope is that this book served to better illuminate

both my and your core values. Were your efforts adequately repaid with wisdom? Mine were. I don't write to benefit others, I write to enrich my own life. It was good for me—was it good for you also?

A careful reader might wonder whether a book that advocates owning only two stocks (Osiris and Rock Creek) can be considered at all moderate. Staking all of one's equity resources on two—rather than twenty-five stocks—might represent an extreme concentration of risk. Recall that for me, diversification comes over asset classes (fixed income assets, real estate, solar assets, money markets) rather than within the equity asset category. The number of stocks owned also raises the specter of the costs of entering any asset category.

Some asset categories are easy to enter. For example, choosing a money market is a relatively straightforward endeavor. [While a few money market funds have gone bankrupt, it is an extremely rare occurrence.] However, I've had to study over twenty companies just to come up with two that (I hope) will be winners. Given I'd like to be a "good enough" professor, writer, husband, father, grandfather, citizen, coach, church member, etc., etc., the time remaining for the study of stocks was extremely limited. In life, the choice of which domains to invest your two most precious commodities—time and energy—is perhaps the most important decision one is called upon to make. In order to be extraordinary in a domain or two in our lives (being an excellent husband and father and an excellent professor were my choices) I had to choose to be merely "good enough" in most other domains. Again, "The perfect class" (Appendix E) goes into these issues of choice in great depth.

Leading a balanced worthwhile life requires a lifetime of thoughtful, nuanced thinking and practical experience. Thus, while one can achieve the peak of one's knowledge in middle age, the peak of one's wisdom is likely to be achieved later in life. As I approach the end of my seventh decade of life, I know that I still gain in wisdom with each passing year. While I've begun to experience the decline of my intellectual and physical powers already, it is comforting to know that for the domain of wisdom, for me, the best is yet to come.

Chapter 18 Imagine

Did you know that you are at the peak of your intellectual powers (computational skills, memory, etc.) in your late teens and throughout your 20's? Then decline gradually sets in. Somewhere in your 60's or 70's, this slow decline generally accelerates. However, your 30s, 40s, 50s, and 60s are important because of the addition to your stores of knowledge and wisdom that you make. I wish to address these important additions. Imagination is a key element in our continued adult learning and seasoning.

Because I was beset by childhood learning disabilities (i.e., dyslexia), I got a slow start in the knowledge, education, wisdom, etc. games. Luckily, I stayed in the education field and for almost 50 years I was paid (sometimes as little as \$2400/year, as a graduate stipend) to think about how human learning, knowledge, feelings, etc. grow and mature. In my opinion, imagined mathematical scenarios play a key role in testing and refining our ways of knowing. Many shy away from math, but this is really simple math.

Ever Play Fantasy Football?

Millions of people play fantasy football. They participate because it's just fun. I wrote a book on fantasy football because it's a great laboratory for sharpening human strategizing. The two chief strategies for playing the game well that people effortlessly engage in are drafting smartly and working the waiver wire from week to week. For whatever reason, trading—the third way to play better—is seriously underutilized. Allow me to show you how I train students to trade more effectively. [I assume the reader has played Fantasy Football. Thus, apologies in advance to any readers who have difficulty following this explanation.]

We start with absolutely terrible news for you—your best quarterback has just been knocked out for the rest of the season. The replacements on the waiver wire are less-than-inspiring. But suddenly another competitor offers you a trade wherein you give up a very good running back for an average running back and a mediocre quarterback. You click on the EVALUATE TRADE function and yahoo says you improve by +16 and your competitor improves by +24. [Positive numbers mean Yahoo believes your team is improved;

negative numbers suggest your team is weakened.] What would you do? Accept or reject the trade? People overwhelmingly reject this trade.

This is so because, in spite of Yahoo saying it makes your team stronger, inspection of the players involved reveals your competitor has offered you a terrible swap. Which is why you reject the trade. However, we ought to examine the differing opinions that you (bad trade for me) and Yahoo's (supposedly objective analysis) arrived at. To understand your evaluation, we must return to the league's draft.

Based upon your league's roster settings and scoring, every league is a potentially different reality from every other league. One's first sense of the value of all players typically come from the fantasy football magazines. Their evaluations are with respect to a standard league configuration (typically not a PPR [point per reception] league). Now let's think of three running backs who were grouped closely in many magazine ratings, but who possess vastly different styles: Albert Morris (great runner, average pass catcher); Ladarius Murray (good runner, good pass catcher); and Andre Ellington (average runner, great pass catcher). In a standard league the rank ordering might be: Morris > Murray > Ellington. In a PPR (+1 point per reception) the rank ordering might be: Ellington > Murray > Morris. Suppose the league is a partial PPR (i.e., + .5 points per reception) then the ranking could be: Murray > Ellington > Morris.

Thus, you can see why each league is potentially a universe unto itself based simply upon its' settings. You might forget (for example) that you're in a PPR league and thus overvalue Albert Morris. Yahoo's ratings of the proposed trade (that was suggested above) is with respect to the exact settings of your league—in that sense it can claim to be an objective assessment. But being objective does not mean the assessment is completely valid. There inevitably will be errors in any evaluation system: the football magazine's; Yahoo's; and your evaluation also. This is what makes Fantasy Football fun—your evaluation is tempered by the football magazine's, Yahoo's, the input of experts on television, etc, etc. But you add your own special sauce. [We see Indianapolis, Chicago and Detroit games almost every week in my house. Does that mean I overestimate Luck, Cutler, and Stafford in my search for a quarterback? Probably.]

Andrew Luck is better than Culter and Stafford, so we'll replace Luck with Joe Flacco (as the new Indianapolis QB) who is arguably equal to Cutler and Stafford. My son John lives in Indianapolis. Let's say his rank ordering is Flacco > Cutler=Stafford. I've been a Chicago Bear fan for years. My ordering is: Culter>Flacco=Stafford. My son Greg lives in North Carolina, and as far as I know he's sick of John and I overvaluing Flacco and Culter, so his rank ordering might be Stafford>Flacco=Culter.

Now suppose God knows (and we'll never know this because God doesn't talk directly to us) that all three QBs are equal. If John, Greg and I pick in any order (and if all better QBs have already been picked) then each of us will get our top pick: John gets Flacco; Greg gets Stafford; and I get Cutler. Each of us gets the player we overvalue. Similarly, we'll almost never pick a player that we undervalue. This is why after the draft, most people feel they had a strong draft.

The interested reader can now go back to the three running back situation outlined above and conduct the three selections for three coaches who all agree that the running backs are exactly equal on talent, one of whom thinks it's a standard league (he/she gets Alfred Morris regardless of picking order), another thinks it's a PPR league (she/he gets Andre Ellington), and one who thinks it's a partial PPR (that person gets Ladarius Murrary.) Like my sons and our quarterbacks, each of us is happy we were able to get "our guy." However, in this situation there is an objective truth. Yahoo's evaluation will agree perfectly with whichever coach remembered which setting had been selected for their particular league. But all coaches go away happy because they got their preferred QB and RB. "Let the season begin," they exult.

So now we return to the trade before you: you improve +16, the trade proposer improves +24. To repeat, people overwhelmingly reject this trade, in part, because they overestimate the value of the players on their roster—that's why they got them in the draft. In fact, trade proposals almost always look unfair to the recipient of the proposal—in spite of what Yahoo might say. So here's my advise: in this case, trust Yahoo's advice and let's play out the scenario.

...and the Winner is...

You swallow your better instincts and accept the trade. Let's evaluate the trade's consequences. You are in a 16-team league.

	<u>First Trade</u>	<u>Second Trade</u>	<u>Third Trade</u>	<u>Sum</u>
You	2	2	2	6
Proposer, Team 2	1	9 ½	9 ½	20
Team 3	9 ½	1	9 ½	20
Team 4	9 ½	9 ½	1	20
Team 5	9 ½	9 ½	9 ½	28 ½
↓				↓
Team 16	9 ½	9 ½	9 ½	28 ½

For the first trade, the trade's proposer (Team 2) got the best of the deal (+24 according to Yahoo) so she gets Rank #1. You get Rank #2 (because Yahoo says you improved by +16). The remaining 14 teams went unchanged and thus they tied for 9 ½th place. So far so good. Now I propose that you offer Team #3 a green-green trade. Let's say it's +28 for Team 3 and +18 for you. Will Team 3 take your proposed trade? If he has two neurons firing in sequence, he will. Now let's enter the trade into our table. In this second trade, Team 3 gets the #1 rank, and you get rank #2. All others are unchanged and thus get Rank 9 ½. Can you see the pattern emerging? Let's do one more trade. Make an offer to Team 4 that she can't refuse. Team 4 gets +41, you take +24. Despite her natural preference (her overvaluing) for her players, she can't deny Yahoo's assessment and accepts (while wondering how she got so lucky). Enter the data for the third trade and sum over the three trades. [Because these are rank orderings, lower is better!]

...and the winner is? Whoever traded most—even though you “lost” every single trade. This is a logic championed in St. Francis’ Prayer for Peace, “...for it is in giving, that we receive; it is in pardoning, that we are pardoned; and it is in dying that we are born to eternal life.” If St. Francis were still alive I’d offer a friendly addition to his prayer—“...and it is in losing trades that we might win our league.” But seriously, we see most things in our society in terms of competition. Thus, success seems to be in the “survival of the fittest.”

I think that competition is an inappropriate way to understand life. Far better to see life as a cooperative endeavor. In your moment of need (your QB got injured) I don’t force a punitive trade on you. Instead, I offer a trade that Yahoo says favors you and gives you help at quarterback—I also get some help elsewhere like running back or wide receiver. “Don’t worry about you getting more than me,” I reply, “if I need help later in the season, perhaps you can return the favor.” Then I propose a good trade to a different team...I believe the winners will emerge from amongst those of us who cooperated. The losers will be those who could only compete—they are left to wonder why such fierce competitors as themselves can’t seem to do anything but lose.

[Of course, a simpleton can screw up any good idea. Let the other team win the trade—but not by too much. If you propose trades wherein the other team gets +100 pts and you get +1, you’ll soon run out of good players on your team, so you can no longer construct green-green trades. Let the other team win—but don’t give away the store.]

Why play fantasy football? Well, it’s fun, so why not? It also helps clarify how to work in relationships—how to cooperate while fairly competing. Our society badly misunderstand the meaning of the word “compete.” We see it as “to struggle against” an opponent. One wins and the other must lose. The ancient meaning of the word “compete” was “to struggle with” another. We give our all to bring out the best the other can give. In a great contest we both produce our personal bests—under such circumstances does it really matter who’s personal best was infinitesimally higher? If you have trouble even understanding that view of competition, it is because our society is hell-bent on certifying “winners” even if it mean creating “losers” in the process. If you think it’s bad in the context of a single game, how do you feel about the NCAA basketball

tournament where sixty-some losers must be sacrificed to produce a single winner? If our society seems filled with pain and depression rather than joy and accomplishments, perhaps it is because we have created situations that multiply “losers” instead of creating more “winners.” As Epictetus said long ago, “Nothing is either bad or good, but thinking makes it so.” We could easily change our thinking. That’s what smart, creative adults do in life. We take the world as it’s given to us and we imagine how it could be improved slightly. Given the inevitable declines in our cognitive powers later in life, it’s the only way this 67 year old might still be smarter than he was at 66 years of age.

[If you wish to read other parts of the only half-finished book: Search for the Fountain of Health, go to <http://psychology.nd.edu/faculty/faculty-by-alpha/george-s-howard/> and click on “George Howard’s Latest Book: Search for the Fountain of Health.”]

Appendix G Nick, Me, and Risk

On March 18, 2015 my basic bet was 84,000 shares of OSIR at \$18.19 per share (total investment of \$1,538,360) and 1,400,000 shares of RCPI at \$0.11 per share (total investment of \$154,000). [The 25 for 1 reverse split of RCPI left me with 56,000 shares of RCPI with an average “in price” of \$2.76 per share.] But in life, things (like stock prices) are continually changing.

In about two months after my stock bet (on May 20, 2015), OSIR had gone from \$18.19 to \$18.50. More importantly, RCPI had fallen from \$2.75 per share to \$1.80. Had I done nothing, my 92/8 ratio of OSIR to RCPI would have risen to 95/5. I would have only half the amount (5%) of RCPI that I desired with my 90/10 initial bet.

Rather than sitting tight with my initial bet, I constantly readjusted my positions to reflect changes in stock prices. So my positions on May 21, 2015 were 81,000 OSIR (originally 84,000 shares) and 101,800 RCPI (originally 56,000 shares). I now had roughly \$1,500,000 in OSIR and roughly \$191,000 in RCPI for an 87/13 ratio. I had actually overcorrected slightly (as my ideal was 90/10).

There are two ways one might correct for imbalances caused by changes in stock prices. The first approach is simple: sell shares of the stock that rises (OSIR in our case) and use the proceeds to purchase more shares of the stock whose price had been falling (RCPI). I rarely use this approach as a slightly more complex method yields better results. The second method utilizes Covered Call options.

On May 21, 2015, OSIR opened at around \$18.30. I could have sold at that price, I didn't because I'm a bit more greedy than most. Instead, I put in an order to sell Covered Call options on 1000 shares. The Bid was \$0.65 and I asked \$1.10 on the Call \$18 option. There were exactly four weeks until the strike date (June 19th).

This was the fourth straight day I'd made the same trade offer and it hadn't yet been taken—as Call markets are often quite illiquid. I suspected the stock price would have to go up to the \$18.50-\$18.80 range for my Call offer to be filled, and the stock price had steadfastly refused to go that high. Stalemate.

If the stock price had cooperated, here's how the trade(s) would have proceeded. If the price bounced up to about \$18.80, someone would have accepted my Call offer at \$1.10. [It's a covered Call because I have the 1000 shares that I am pledging to deliver on June 19th already in my account. If I didn't already own shares, it would be a naked Call.] So somebody out there might have given me \$1,100 for the option to buy 1000 shares of OSIR from me on June 19th at the price of \$18. Why would another investor do so, instead of just buying the stock outright at say \$18.70?

Suppose the Call buyer had a bond that would mature in a month but only had \$1,100 available for investment now. Further, suppose someone told the buyer that OSIR was likely to explode within the next month. With his \$1100 the buyer could buy about 50 shares of OSIR now or he could buy the 1000 Covered Call options that I'm selling. Imagine things go exactly as this new OSIR investor imagines. With Calls he controls my 1000 shares and in two weeks OSIR goes from 18.70 to 38.70!

For his \$19,100 investment (\$1100 now plus \$18,000 more in a month) he owns 1000 shares of OSIR valued at \$38,700. He made a profit of almost twenty thousand dollars off an initial investment of only \$1100. So now we understand perfectly the buyer's motivation. Of course, if the price of OSIR drifted up slightly in the month to \$19.10, then the buyer got his 1000 shares at exactly the right price. If the shares stayed at \$18.70 for the month, that loss (between \$19.10 and \$18.70) is charged to the buyer. So now we understand the buyer's motivation, what moves the seller of the Covered Call?

If (hypothetically) the stock price was \$18.70 when the call was sold, then I had effectively sold the 1000 shares of OSIR at \$19.10 (\$1100 immediately plus \$18,000 in one month). If OSIR goes to \$39.10 immediately, the roughly twenty thousand profit goes to the buyer. How do I (the seller) feel? Think long and hard before answering that question. [I still own 80,000 shares of OSIR. A \$20 price increase nets me a gain of

\$1,600,000. Do you think I'll shed a tear over the \$20,000 that got away, when I just pocketed \$1,600,000? Exactly how greedy do you think I am?]

If OSIR stays at \$18.70 for the next month, I got \$19.10/share for selling a stock that never got over \$18.70. Not bad. Even better, suppose the price drifts down to \$17.95 at the strike date. Then the call likely won't be exercised and I get to keep my 1000 OSIR shares and the seller's \$1100. I might then offer a Covered Call (perhaps a July 18 call) at about \$0.75. The stock price would likely have to rise to \$18.30 to \$18.50 for me to get a fill. So much for hypotheticals. What happened (in the real world) since I began writing this appendix?

OSIR opened at around \$18.30 today. Had I put in a market order, I would have had almost \$18,300 in my account and 1000 fewer OSIR shares. But I didn't. I've told you that I've already overcorrected to an 87%/13% OSIR to RCPI position. So I'm in no great hurry to sell more OSIR. It will take a great deal to entice me to sell more now. So, in search of a great deal, I offered covered calls (June \$18) at \$1.10. An effective sale price of \$19.10 was rich enough to entice me to become further depleted of OSIR in favor of RCPI. Sadly, instead of rising, OSIR's stock price went from \$18.30 to \$18.01 currently. Of course, no one bought my offered Call (and even though there are still two hours of trading left) I'll likely end the day with as many OSIR shares as I started with. Oh well, tomorrow is another day.

So now that you understand how Calls work, let me introduce Nick to you. Nick Kanczuzewski is also an owner of Inovateus Solar. He's about half my age and is rapidly growing his expertise as an investor. Like me, Nick owns OSIR and RCPI. However, his largest investment is in General Electric. Given its size, earnings history, and dividend, GE is a far more conservative stock than the other two. Nick is currently a far more conservative investor than I, but that's appropriate given he's just getting his feet wet in the investing world. He does own RCPI, which is more than enough risk for him at this point in his life. Like me, Nick is currently a winner in OSIR and a loser in RCPI. Nick's GE stock offers stability and dividends. While I'm rebalancing my OSIR/RCPI mix toward a 90/10 split, Nick is not. Why?

Rebalancing is a difficult thing to do. Nick's made two bets (OSIR and RCPI) and no sooner does one prove correct and the other incorrect than I tell him to sell some of the winner and purchase more of the loser. Nick immediately thinks, "But what if I'm throwing good money after bad (on RCPI)?"

There is nothing wrong with Nick's hesitancy to rebalance—my suggested changes lead to even greater risk in his portfolio. Like almost everyone, the less risk for Nick the better. But I'm in a slightly different position. I'm trying to balance risk over several investment categories (e.g., retirement annuities, money market funds, partial ownership of Inovateus Solar, etc.). The stock portion of my investment portfolio is the only portion of my assets with more than a vanishingly small amount of risk. Thus, if I put all my stock money into a low risk stock (like Nick's GE), my assets would be close to risk free. If I had already met my overall investment goal (but I haven't yet) I would go risk free immediately. While others would be satisfied with my wealth, I take seriously the possibility that my wife and I might easily live another thirty years. Further, I have family members who need financial help. So I maintain some risk in order to grow further.

I hesitate to mention this final point as it can be misunderstood easily. I consider myself an expert on risk. [This is my third book on risk analysis in narrow domains.] I also believe the gospel exhortation that we develop and use all of our talents. To hide ones light under a bushel basket is not a good thing to do. We should (properly) use all of our talents. I use risk more than most, but I think I use risk wisely.

Nick currently sees excessive risk taking as a vice to be avoided—and on this point I agree. But what is "excessive risk"? And does it remain constant over our lives. Obviously not. One would never urge a two year old child to cross a busy street on their own. But you and I certainly can cross busy streets safely. In my opinion, Nick is growing nicely into a proper (for him) use of risk in his business affairs.

I predict that in the future Nick's investment portfolio will be a bit riskier than it is now. I hold my (riskier) portfolio up as an example of why someone might choose a riskier mix of stocks than he currently holds. However, were he to match my portfolio's risk profile tomorrow, it would trouble me greatly. It might suggest he does not properly appreciate the dangers that risk holds. Although I've been a member of Notre

Dame's clinical psychology faculty for 35 years, I try to avoid seeing behavior in terms of possible psychopathology. But if Nick rushed toward risk too soon, one might fear his potential for some sort of gambling addiction. But that is not the case, I'm delighted to report.

Risk and Addiction

I'll close this Appendix with a few thoughts on the pricing of stocks. My coauthor and friend, Elihu Feustal, believes in efficient market theory and thus he believes that what I'm about to say is close to pure bunk. You've been forewarned—it's controversial. Pat Cox has told us that investments involve the proper assessment and balancing of risks and rewards. Seven years ago I bought my first shares of OSIR. At that time all stem cell stocks were badly undervalued because of George W. Bush's antipathy for anything that might be associated with his Great Satan—abortion. Barack Obama was already implicated in our future, so the prospects for all stem cells stocks had brightened. But none of the stocks' prices reflected the change. Even when a new president assumes office, it can sometimes take years for his or her new policies to emerge—and then more years for the relevant stocks to reflect those changes. So I saw good reasons that OSIR's brighter future was not yet reflected in its stock price. Thus I began building a large OSIR position—at what I hoped were discounted prices. Turns out I was right. When I bought OSIR, it was discounted because it was a stem cell stock and because the stock market appears to steeply discount all futures that will take more than a year to materialize. Since I thought OSIR would take about four years to turn a profit, I believed OSIR was doubly discounted (stem cells and time). So I bought and I hoped. [It turns out it took about six years for OSIR to become profitable. It's funny how one can be somewhat wrong and still make a right decision.]

Today (May, 2015) stem cell stocks do not appear to be discriminated against and OSIR is now as close to permanently profitable as one can hope to get. Still, the stock's price does not yet reflect its future earnings prospects. Thus, I see OSIR as a safe bet with a promising future (expected price appreciation). Since it is far past 2015 as you read this Appendix, if the price is still near \$18/share the Efficient Market Theorists were correct and I am still missing something. If OSIR is \$30 or higher in price, I'd say our stock market never was

efficient, and that in over 35 years of practice, I've developed an eye for the market's inefficiencies. [Nick's been investing for less than a handful of years. With decades of experience, I'll bet on his eye for inefficiencies also.]

So why do I sell small quantities of OSIR in order to buy huge quantities of RCPI? Because OSIR no longer has time and fear on its side—but RCPI certainly does. Thus, I continue to rebalance (buy more RCPI) to achieve the 10% of high risk holdings in my account. I do this in spite of the fact that I think RCPI is more likely to go bankrupt than it is to become profitable. [I currently own 1 ½% of RCPI's shares (120,000 of 8 million shares, post reverse split)—and I'm just a retired school teacher. By the way, I fully expect to get diluted down to about 1% RCPI if the company makes it to profitability.]

But you, patient reader, are in the perfect position to judge whether I was right to keep 90% of my investment in (the no longer risky) OSIR and to continue adding to the doubly discounted (by fear and time) RCPI. Your control group should be the change in whatever index you wish between May, 2015 and today's stock prices. So, tell me, how did my stock choices fare?

Appendix Finding Out About Naked Shorting

Finding Out About Naked Shorting

I started developing my website and its content about four years ago. As I gained more experience, I was startled to find that there was another very important force at work on these companies that was apart from the fundamentals that I was focused on. One would expect a high level of volatility in the stocks in which I specialize. However, this could not always explain the demoralizing collapse of a meaningful number of stocks that I am involved with following some news event. Suddenly and without a major change in the fundamental outlook, I would see stock prices cut in half in a short period of time. During this time there was invariably a steady day by day price erosion (naked shorting at work) accompanied by an unending stream of contrived negative news flow that was demoralizing to me and other investors.

In order to give more insight into what a naked shorting attack might look like, I have put the predictable elements of a typical attack based on my experience in living through a number of them on separate companies.

- Shorts like to target emerging biotechnology stocks that are engaged in high risk drug development and are not widely covered by quality research analysts.
- The initial and subsequent attacks are almost always triggered by some news event. Obviously, the shorts seek out negative news or an event that creates uncertainty. However, sometimes an attack can be based on a positive news event which the shorts spin to make it appear negative.
- Using the ready platform afforded by the internet and social media, a blogger associated with the shorts goes to work with a negative interpretation of an event. These are usually not sophisticated analyses and are usually limited to one or two pages of text which is invariably one-sided and unbalanced. These are meant to provide “intellectual” reasons and cover for the short attack.
- The most prominent of these bloggers usually have no backgrounds in biotechnology analysis or expertise in the science. I believe that in many cases, hedge fund employees actually write the articles which are cut and pasted into the comments of these bloggers.
- The heart of the naked shorting scheme involves a group of hedge fund traders conspiring to steadily knock out offers for the stock and to trigger stop loss orders (This is explained later in this report). This is called walking the stock down. The power of these conspiracies is striking and in many cases allows the shorts can largely determine the price that they want the stock to trade at.

- The stock weakness gives legitimacy to the contrived negative blogs. The idea is to create fear and uncertainty among investors by making all news events appear to be negatives and to fabricate new issues that the shorts hope will demoralize investors.
- The first time I came up against this, my thought was that the blogger was someone who was just more cynical about the chances for success and had an opposite point of view from mine. This is understandable and common in research analysis. I wrote a respectful rebuttal to their argument.
- I thought that after their rebuttal to my rebuttal, this would end the discussion. We had expressed our opposite points of view, would respectively disagree and move on. This had mainly been my experience in my Wall Street days as an analyst when I disagreed with another analyst. I was wrong.
- The situation quickly escalated. In the rebuttal, the blogger accused me of being stupid, deceitful and being paid by the Company to write positive comments.
- In this case, over 20 articles were then written in a period of a year. Usually, they were timed to a press release and regardless of the news and without exception each was interpreted as a major negative. A major strategy was to argue that management was lying to investors and manipulating the stock.
- The stock would go down on good news, bad news and uncertain news. One of the pillars of stock manipulation is to make good news appear to be bad.
- The blogger was indifferent to truth and actually would make up information that was factually incorrect. When made aware that the information was wrong, he/she would ignore it and even repeat it in later blogs.
- There are a number of bloggers who participate in these attacks. Many of these bloggers appear to work together and coordinate their negative attacks. It is striking that many of these people have connections to one another. Many of them were trained at a well-known blogging site that was founded by hedge fund people.
- Sophisticated use is made of the Internet and social media. Twitter is used to signal that an attack has begun.
- Shorts are well connected to mainstream media and are adept at getting them to unwittingly participate in the scheme.
- Vicious attacks are launched on writers who might have an opposite but hopefully more well-reasoned and balanced view. The usual line is that they are being paid by management to write positive articles.
- Seeking Alpha has become very friendly to articles supporting short selling and is used extensively by the hedge funds. The site actually promotes as one of its favorite authors a person who writes only negative attack article on companies in which he claims that managements are lying and paying authors who have a positive view on the Company. In his disclosure, he states that he shorts stocks, then publishes a negative article on Seeking Alpha and

states that he may cover immediately after the article is published. This seems to meet the definition of a pump and dump scheme. He also acknowledges that he is collaborating with other short sellers. I think they contribute the information for most of his articles

- Seeking Alpha allows articles to be published by anonymous authors. These articles are often extremely bearish and are almost certainly written by people at hedge funds.
- Hedge fund create pseudonyms and publish on a daily basis negative comments on message boards like Yahoo and Ihub.
- Law suits appear after articles and allege misconduct on the part of managements and urge investors to participate in a class action lawsuit.

Initially, I attributed these actions to people who were just more cynical than me and honestly came to their bearish views. I am also very cognizant that there is not an insignificant amount of stock manipulation that warrants shorting some stocks. There are some bad actors who pump stocks up and then dump them and this is every bit as egregious as naked shorting attacks. Interestingly, I believe that the hedge funds who short can be enthusiastic participants in these manipulation schemes as well. I also understand that managements can and usually are over enthusiastic in presenting the outlook for their companies. They have so much personal wealth and intellectual effort invested in a Company that objectivity can be difficult. I also have to admit that I have a bias toward optimism largely stemming from the belief that we are in a scientific renaissance in biotechnology that will lead to a meaningful number of breakthrough drugs and accompanying home run stocks. I recognize this personal bias and try to adjust for it, but I am only human.

The above paragraph shows that not all of the investment land mines can be attributed to naked shorting. However, it seems to me that many are. Initially I thought that what I now believe to be naked shorting stock manipulation was attributable to market forces. The catalyst for my changing my view was coming across a shocking You Tube commentary by Jim Cramer of CNBC fame. He explained in detail how as a hedge fund manager, he participated in schemes to manipulate stocks. If you haven't seen this it is a must watch.

This was a wakeup call for me and for the last few years, I have been doing a great deal of work on naked shorting. As I talked to companies, I heard the same stories over and over about techniques used to drive down their stock prices and I came to believe that there was manipulation going on and that it was extensive. The names of hedge funds leading the attack kept coming up in situation after situation. It has been my intent to write an article on naked shorting, but this is an enormous project and while I think I understand the effect that naked shorting can have on

stocks, I lack the understanding of the trading techniques used to implement what is essentially an illegal stock manipulations scheme.

Counterfeiting Stock; An Eye Opening Article

Recently, one of my subscribers sent me an article that covers the ground that I wanted to cover in an eloquent way and is much better than what I could have done, especially on the esoteric trading techniques used to cover up this illegal activity. It largely expresses what I would like to have written. He sent me a link to a website called Citizens for Securities Reform. On this website there was a link to an article called Counterfeiting Stock and a number of other articles on stock manipulation. This article was essentially the one I would like to have written. I have decided to reproduce the article on my website in its entirety. I certainly don't have the information needed to prove the hypotheses presented in the Counterfeiting Stocks article. Only an organization with subpoena power and huge investigative resource can really determine if this article is correct. The author of this article has the following disclaimer and I would make his disclaimer mine.

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Sources — Information used was obtained from public records; the SEC; the Leslie Boni Report to the SEC on shorting; evidence and testimony in court proceedings; conversations with attorneys who are involved in securities litigation; former SEC employees; conversations with management of victim companies; and first hand experience as investors in companies that have suffered short attacks. This web site is sponsored by Citizens for Securities Reform.

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What to Do? — Many of our elected officials at the federal and state level do not understand most of what is contained in this paper. They must come to understand this fraud, and, more importantly, understand that their constituents are angry. Pass this information to everyone you know — put it in the public conscience. Then the citizenry needs to engage in a massive letter-writing campaign. Feel free to attach this report. Make sure your elected officials, at the federal level and state level know how you feel. Ultimately, votes in the home district will trump money from the outside.

Appendix: The Perfect Class

There must be a million ways to prepare to teach a class. It's twenty minutes till class starts. What will we cover? I lean back in my chair and gaze out my office window on the North Quad. . . .

"Okay, gang. Get quiet. Listen up." I begin. "Today we tackle the most difficult topic in this class. Anybody want to take a guess at what it is?"

As the conversations and fidgeting slowly subside, the room becomes ever more quiet.

"Drugs and alcohol?" a voice in the back asks.

"Nope," I reply.

"Sex and AIDS?" a girl offers.

I shake my head negatively and continues to wait.

"Religion?" a third student volunteers.

"Nope," I respond.

"Homosexuality?" is offered, and then immediately dismissed.

"All of these topics are real simple in comparison with the topic I have in mind for today. Think about it! Who in here is pro drug abuse? Who is completely opposed to sex? Or who wants to advocate for AIDS? All of these topics have obviously right and wrong positions."

A few students acted as if they were seriously mulling over endorsing one or more of the inappropriate options, but it was clear that their indecision was meant as a joke. I pause, then continued. "No, the topic I have in mind for today is much more controversial than those issues. Instead of telling you what the problem is,

let me give you an example of how fundamentally you and I disagree on this topic. Tell me, how many of you want to get an 'A' in this class?"

Every student pauses, as the query had all the earmarks of a trick question. I then fill the silence, "Well, that makes my job easier. If no one in here wants an 'A', I'll see to it that no one gets an 'A'. Now I only have to decide who gets the 'B's,' 'C's,' 'D's,' and 'F's.' Nervous laughter by some and a few shouts of protest by others accompanied the rush of hands to express their hope of obtaining an 'A.' "So everyone here wants an 'A,'" I summarize.

"Not everyone," Brian Selman says softly. "I didn't raise my hand."

"So that means you don't want an 'A,' Brian? If I told you exactly what you needed to do to get an 'A'—you wouldn't care to do it?"

"No, sir," the linebacker replied. "I'd do it. I just mean that I almost never get 'A's' in my classes so I don't expect to get an 'A' in this one. Especially since it's football season . . ."

"I understand that Brian. But that's not exactly the question I asked. Suppose I told you all of the things you needed to do to get an 'A'—and they would all be things you are able to do. Would you do them in order to get an 'A'? Would you do that work for an 'A'?"

"Oh!" Brian replied hurriedly. "Then I would do it. Of course, I would."

"Why?" I asked.

The silence was deafening. Students shifted uncomfortably in their seats not because they didn't know the answer, but because they couldn't grasp the point of the question. After many puzzled looks and unknowing grins, a typically quiet girl raised her hand barely to shoulder height. When my eyes met her's, she spoke softly.

"Why would we work to get an 'A'? Is that the question?"

"That's precisely the question," I said emphatically.

“Isn’t that what we’re here for? Isn’t that why we’ve agreed to pay a really high tuition? I don’t understand the question. Isn’t that what we’re supposed to be doing here? Are you telling us not to study for your class?”

“No. Not at all,” I replied. “If anyone cares to study for this class—please feel free to do so. And if anyone gets an ‘A’ in the course—that won’t bother me.”

I responded to the students’ puzzled looks with teasing smiles. After a pause, I added, “I just find it hard to believe that all of you are enthralled with the content of a course that you didn’t choose to take. I mean, none of you requested this course, you were all forced to take it. You had to take a University Seminar, and the First Year of Studies assigned you to take my course on the Psychology of Healthy Lifestyles. And so it’s stunning to me that when I ask, ‘Who is willing to work for an ‘A’ in this course?’ I find that everyone is willing to do so. That’s really sick!!”.

Most students laughed at the thought of a psychologist labeling students who work hard to get good marks as pathological. Unfortunately, this psychologist was dead serious, “I’m not kidding. You guys are so brain-washed into getting good marks that you don’t recognize it as a screw-up when you try to get all ‘A’s.’”

After twenty seconds of stunned silence and perplexed looks, Tim went for the bait, “Okay, professor! I’ll bite. What’s better than all ‘A’s’?”

“A few ‘A’s’, a few ‘B’s’, maybe even a ‘C’, and a life!”

“What are you saying? All work, no play makes Notre Damers dull boys and girls?”

“Exactly and not quite,” I replied. “If you’re working frantically because you want all ‘A’s’ then you’ll not only become dull, you’ll eventually be disappointed with your education and perhaps even with your life. That part of your answer I agree with completely. The part of your answer that I might take issue with is the implication that it is too much work that constitutes the problem. In fact, some of the hardest working people I know are among the happiest and healthiest people I know. So hard work per se is not the problem. It’s whether you’re working hard because you are genuinely passionate about your work—because it is your work—or whether you are working frantically at what someone else tells you to do.”

“So the problem is whether you’re following your true dream or someone else’s dream for you—like something your parents want you to do,” Anita offered.

“Exactly. But, unfortunately, our American educational system does a terrible job of helping kids find out what they are passionate about. We tell you what courses you should take, and then we wonder why your interest in most courses is only luke warm. Then whatever effort we get from students is targeted toward avoiding the dreaded ‘B’s’ and ‘C’s’. Often the only real passion we teachers see is from those crazy fanatics who are hell-bent on graduating from Notre Dame with a perfect 4.0 grade point average.”

“Are you really that disappointed with us, professor?” Anita asked.

“No I’m not, Anita. In fact, it’s because I’m so pleased with your work so far, that I’m crazy enough to attack a topic this fundamental to your belief system. Even if I present my ideas perfectly, most people will reject them as crazy—and perhaps dismiss me along with the ideas. But I’ve decided to lay out my beliefs on this topic because a few of you have convinced me that you are capable of questioning some fundamental assumptions of our society. So here goes.

“Several years ago two kids in California dropped out of school to build computers. Their names were Jobs and Wozniak. Another kid began to write the software that allows virtually all computers to run. Who am I talking about and where am I going with this?”

The sea of faces seemed universally perplexed by the challenge of responding to both an easy and an impossible question. Finally, Tim raised his hand and began slowly, “Well, Bill Gates is the easy answer. As to the hard question, all I’ll say is that I really can’t believe you’ve come to praise the Bitch Goddess Success.

I was initially startled by Tim’s response. Then I smiled, as I recognized William James’ phrase for ‘the sickness that lies at the heart of the American spirit’—Americans’ worship of the Bitch Goddess of Success. I walked over to Tim’s desk, chuckled, and whispered a reply that only Tim could hear easily, “No, friend. I come to bury the bitch.”

“Great! Tim barked. “But why use billionaires as examples? You’re never gonna convince us that they are unsuccessful.”

“I’m not gonna try to convince you that they are unsuccessful—they are very successful in my eyes. As are Mother Theresa, Albert Schweitzer, Tom Dooley, and John D. Rockefeller.”

“Rockefeller just doesn’t seem to fit with that last group,” a voice from the back of the room announced. I was embarrassed because I should have known his name—but didn’t.

“He fits perfectly well, if only we were able to be money-blind. A racist is a person who can’t be color-blind, and the sickness at the soul of our educational system has a lot to do with the fact that we can’t be money-blind. We find it hard to imagine success without money, and, similarly, how can earning lots of money be failing?”

“We should act as if money doesn’t matter?” a faceless voice from the back of the class queried.

“Absolutely not!” I replied. “An old Spanish proverb correctly observes, ‘If money be not thy slave—it will be thy master.’ We need to watch our money—and most importantly, our spending—like a hawk! Money is an important means to a happy, successful, and productive life. Unfortunately, for too many people, money is an ‘end’ not a ‘means to an end’ in their lives. We learn how to make lots of money in order to have the freedom to do what’s important in our lives. But when people earn ‘enough’ they don’t stop working for money. No matter how much money they have, it’s never enough. So people spend their lives as slaves to making ever more money. Rarely do people say, ‘I now have enough money. Now I’ll turn my attention toward what is really important in my life.’”

“Are you saying that if we make money at something, it can’t be an important activity?”

“Not at all. I make a decent living teaching at Notre Dame, and I think it’s important work. I also listed Gates, Jobs, Wozniak and Rockefeller as successes, and they made serious money.”

I walked to the desk, picked up a book, and said, “This is a book on the biology and psychology of altruism entitled Unto Others. My last example of a successful life is a nameless biologist—or perhaps it’s a group of biologists—who are responsible for the following, fascinating bit of knowledge.” I then read from the book.

To see why evolutionists cannot resist talking about altruism, consider the trematode parasite Dicrocoelium dendriticum, which spends the adult stage of its life cycle in the liver of cows and sheep. The eggs exit with the feces of the mammalian host and are eaten by land snails, which serve as hosts for an asexual stage of the parasite life cycle. Two generations are spent within the snail before the parasite forms yet another stage, the cercaria, which exits the snail enveloped in a mucus mass that is ingested by ants. About fifty cercariae enter the ant along with its meal. Once inside, the parasites bore through the stomach wall and one of them migrates to the brain of the ant (the subesophageal ganglion), where it forms a thin-walled cyst known as the brain worm. The other cercariae form thick-walled cysts. The brain worm changes the behavior of the ant, causing it to spend large amounts of time on the tips of grass blades. Here the ant is more likely to be eaten by livestock, in whose bodies parasites may continue their life cycle. This is one of many fascinating examples of parasites that manipulate the behavior of their hosts for their own benefit. For our purposes, however, the example is interesting because the brain worm, which is responsible for putting the ant in the path of a grazing animal, loses its ability to infect the mammalian host. It sacrifices its life and thereby helps to complete the life cycle of the other parasites in its group. It is hard to resist calling this kind of behavior altruistic, even if the parasite doesn't think or feel anything about its fate.

Closing the book, I smiled and asked, "Can anyone tell me why I made this unknown biologist my last example of success?"

That anonymous voice from the back of the room ventured an opinion, "Because you wanted to gross us out?"

"No, that was an unintended, positive outcome," I chuckled.

The voice continued, "Seriously, is it because no one would go into that disgusting line of research with the thought that they could make a lot of money at it?"

"Yep," I smiled. "That's my hunch. I'm guessin' that this biologist began to study this trematode parasite—perhaps in graduate school—and the more he or she learned about it, the more perplexed and

fascinated the biologist became. Perhaps it became the biologist's dissertation topic. In which case the person would have spent a year or two working on this parasite pretty much full time."

"Isn't that like getting money for the work?" the nameless face in the back of class queried. "You make more money once you get a Ph.D."

"That's correct. Do you think I'm opposed to making money? Didn't you know that most of your tuition dollars go toward paying faculty salaries? I'm not a wealthy man, so if Notre Dame stopped paying salaries, I'd have to find work somewhere else. What I'm suggesting instead is that if you fix your eyes on making money, you might miss your passion in life. This biologist found his or her passion in life in a most unusual place—a lowly parasite. But here's the amazing thing—by following his or her passion, we learned something fascinating about the biological basis of altruism. I think that the biologist was probably rather surprised by the altruistic behavior of that brain worm. The biologist wasn't setting out to prove that there is a biological basis for altruism—much more likely he or she was simply trying to understand the life cycle of this strange little parasite."

"So you want us to choose our passion over money?" Anita asked skeptically.

"No! It's not an either/or choice." I replied emphatically. "If you follow your passion, you'll be so good at what you're doing that the money will follow. I believe that Bill Gates and Steven Jobs make obscene amounts of money because they are following their passions. But if someone else got into computer hardware or software because they wanted to make lots of money, not because they loved these areas, they wouldn't have been nearly as good at their work as were Gates and Jobs. And you know what happens to mediocre competitors in the business world—they get eaten alive. So, follow your passion and you'll be good at what you do. Follow money and it's unlikely you'll find what you are passionate about. And here's my last point—I can't prove it, but I think it's true—in the long run you'll actually make more money by following your passion than by following money. But even if that last point is not true, you'll make enough money, and you will definitely be much happier with your life and career if you follow your passion."

I suddenly realized that I had lapsed into a speech, when I really wanted to lead a discussion. "Hey, who put me up on that soapbox?" I kidded. "Tell me, what do you people think about what I said?"

Time passed slowly until Anita wondered aloud, “I get the money and passion part, but why is somebody messin’ up if they get all ‘A’s’?”

The temptation to lecture was almost irresistible. Still, a psychologist sometimes has to stick to his game plan, “Good question! Who can begin to answer it?”

“‘A’s’ are like money.” Tim began without even raising his hand. “Spend all your time working for all ‘A’s’ and you won’t have any time left to find your passion—or is it that you won’t have the energy left to find your passion?”

“Both,” I replied. “Suppose our imaginary biologist simply memorized that the trematode parasite Diocrocoelum dendriticum is found in the liver of cows and sheep—because she or he thought that was all that was needed for the test. Then that person could spend the rest of the evening memorizing other biology facts that might also be on the test. Or he or she could be using the extra time to study for tests in calculus, theology, sociology or literature—to maximize the chances of getting all ‘A’s.’ Instead, the passionate learner hops on the internet and burns the remainder of the evening learning everything there is out there about Diocrocoelum dendriticum. A few months of this and the budding biologist has a report card full of ‘B’s’ and ‘C’s’, a passion for an organism, and the start of a brilliant career.”

“Wait a minute,” Mr. Anonymous announces. “Becoming an expert on a liver-lovin’ parasite, while pullin’ down ‘B’s’ and ‘C’s’ represents a brilliant career?!? I don’t think my dad and most med school admissions boards would agree.”

“Write a long letter to the world’s leading scholar in bovine parasitology and I’ll bet you get a fellowship to study for a Ph.D. in biology. Perhaps your father had his heart set on you going to med school, but he’ll get over it. After all, whose life is it? And the world will take a passionate parasitologist over an uninspired doctor any day.”

Tim could contain himself no longer, “I can see why this biologist’s career and life might be more satisfying when she or he follows their passionate interests, but how can you say the biologist is more successful than a Bill Gates? Think of the jobs Gates created, the money he’s made, the power, the fame. You still don’t even know this biologist’s name—while everybody knows who Bill Gates is.”

“Great comment, Tim. You’ve now hit the point where this analogy breaks down. Bill Gates was so successful because he was following his passion also. Initially he was following his interest in computer software, not success and money. I’ll bet there were dozens of Bill Gates-types who also were following their passion for computer operating systems who were not nearly as successful as Gates. Who cares?! If they were following their passion, and if they made enough money to have a decent life, that’s success in my book. All of these people—no matter how little money they made—were successful in my book.”

“Getting back to someone who gets all ‘A’s’ being a screw-up. . .” Anita laughed.

I corrected her gently, “Getting all ‘A’s’ per se isn’t the screw-up. Failure is overworking in order to get all ‘A’s’, or not giving sufficient time to topics you have a passionate interest for in order to study for something you could care less about. Those are the times when pressure to succeed—whether internally or externally generated—causes us to screw-up.”

“Are you telling me that you don’t get upset if your kids bring home bad grades?” queried that person in the seat of the unknown student.

“That’s exactly what I’m saying. My boys are in junior high and they are both very bright. The older one is dyslexic. His typical grade is a ‘B’ and he gets about equal numbers of ‘A’s’ and ‘C’s.’ He works pretty hard in school (the teachers say) and he does enough homework to satisfy me.”

“So what’s he passionate about?” Brian wondered.

“Basketball, rap music, and his social life. Nothing academic yet, if that was your question. But that’s fine with me for now. He’s a pretty typical 13-year-old.”

“And you never hassle him about school?” Brian asked incredulously.

“Rarely,” I replied. “Sometimes he doesn’t do any work in a subject. Or he might get a bad conduct report from school. Then I’m on his case. That’s when I see to it that his social life goes into the deep freeze. But he’s always back on track in two to three days. Greg, my younger son, has an easier time academically. He gets mostly ‘A’s’, an occasional ‘A-,’ and once in a blue moon, a ‘B.’ He doesn’t study near as much as his older brother, but then again, he doesn’t need to.”

“What’s he passionate about?” Anita wondered.

“Fencing, basketball, and fantasy adventures—he loves this Brian Jacques guy.”

“What did he get his ‘B’ in?” someone asked.

“Religion,” I replied. “Greg said his teacher was a jerk who wanted him to memorize stupid stuff. I made Greg show me his religion book and his test. Then I made him give me his views on those topics. Since I thought Greg’s theology was superior to this teacher’s, I told him the ‘B’ was fine with me if it was fine with him.”

“Did he keep on gettin’ bad marks in religion?” Brian wondered.

“Nope. He went back to gettin’ ‘A’s.’ Religion isn’t hard for Greg—and he isn’t opposed to gettin’ ‘A’s.’ I honestly never asked him why his marks improved. Maybe the material in the next section was less objectionable to Greg. Or maybe his teacher became less jerky . . .”

“Or maybe Greg sold out for the ‘A’,” the anonymous one observed cynically.

I smiled and noted, “You don’t know my Greg.”

Tim needed a concrete example, “Let’s get specific. Who in here should be working for a ‘C’ rather than an ‘A’?”

“Good question,” this psychologist replied. “Let’s analyze your situation, Tim. What’s your major?”

“Premed,” Tim replied to the groans of several students.

“Doctors ought to be interested in the psychology of healthy lifestyles. Do you enjoy this class and its readings more than your other classes—like Calc and Orgo?”

Tim’s “Get serious,” was met with gales of laughter.

“Sorry Tim,” I teased. “You’re not a good candidate for a ‘C.’ I guess you’ll have to settle for an ‘A’ in this course.”

As his colleagues gave him good-natured grief, Tim tried to make the best of his verdict, “It’s a dirty job, but somebody’s got to do it.”

“Maybe I ought to work for a ‘C’,” a quiet girl volunteered. Since this was the first time she had volunteered a response all semester, I was very pleased she’d spoken up.

“Why’d you take this course?”

“My coach advised me to take it to fulfill my social science/history requirement.”

“What sport?”

“Cross country.”

“What’s your major?”

“Engineering.”

“What do you want to do with that degree?”

“Build computers.”

“Wow,” I observed. “You’re sport is in season, you’re taking a math- and science-heavy schedule. What do you do for a life?”

“I teach English to children at Casa de Amistat.”

“Are you a freshman?”

“Yep.”

“How’d you get hooked up with Casa so quick?”

“My sister’s a senior. She’s tutored there for three years.”

I threw up my arms in mock resignation, shouting, “What need have we for further evidence? The woman gets a ‘C’.”

Everyone laughed except the engineer-in-the-making who wore an apprehensive smile as she waited for further clarification.

The anonymous guy in the back of the room pounced upon the opening like a trout on a May fly. “Clear out, honey. He just offered you a ‘C’ for doing next-to-nothing. I’d take that offer in a heartbeat.”

“ which is why I haven’t offered a ‘C’ to our loquacious friend in the back. This place would be dead as a morgue if he didn’t come to class.” I observed. “. but I’m betting I could save myself an ‘A’ by buying her off with a ‘C’ now. This is a writing intensive course with an essay final. Did you ever win an essay contest, distance lady?”

A slight nod of her head indicated she had.

“I’m thinking, high school salutatorian?”

Her arched eyebrow said, “Higher.”

“Get out of town, lady!” I roared. “Better than the salutatorian? Take the ‘C.’ I’ll see you at the final, but the final is just a formality—you got the ‘C’. This lady’s got ‘A’ written all over her face. I feel like I’m saving myself an ‘A.’

“Take the ‘C’ and get serious with your Playstation, honey,” the voice of anonymity advised from the bowels of the back row. But the runner had no intention of quitting. Even in her worst nightmare, she pulls down a ‘B+’. A ‘C’ is completely unacceptable.

“Do you want me to take a ‘C’ in your course, Professor?” the runner asked skeptically.

“Depends,” I replied. “Do you like this course more than your engineering and science courses?”

The freshman smiled sheepishly and replied, “This course is okay.”

I translated, “That’s a polite way of saying ‘Not really.’ Now tell me, does a runner plan out a marathon in advance?”

“Absolutely,” she replied.

“When a marathoner hits the wall, that better not be the first time she entertained the possibility of its happening. Am I right?” I asked.

“Sure. You gotta have a strategy for every race.”

“A strategy and contingency plans.”

The runner nodded in agreement. “So if I hit the wall later this semester, and I have to back off on some subject, you’d recommend Healthy Lifestyles rather than Calculus or Electronics. Is that what you’re saying?”

I beamed with approval, “Hey, if I sacrificed my Physics and Philosophy marks in order to protect my Psychology grades, you can certainly sacrifice your Psychology marks if your Engineering courses need protecting.”

“You took ‘C’s’ in Physics and Philosophy?” Brian Selman asked incredulously.

“Actually, I worked for ‘C’s.’ And while I didn’t quite make them, I didn’t fail either. But this was all before grade inflation struck. Back then ‘D’s’ weren’t that bad. I mean, lots of guys got them . . .”

“You got ‘D’s’!?” Brian asked in a voice that shouted, ‘Say it ain’t so—Joe.’ “How’d you get in so much trouble that you had to work just to get ‘D’s’?” Brian continued.

“I was taking 24 hours that semester.”

“Twenty-four hours? That’s impossible!”

“I had to. That’s how many hours I needed to graduate. All I needed was ‘D’s’ to satisfy the area requirements—so I graduated.”

“You were still satisfying area requirements when you were a senior? Did your advisor screw-up?”

“No, back then everyone was ‘doing their own thing.’ After all, it was 1969—people were a lot more laid-back about requirements then. I started out as a math major and then switched to psychology.”

“Was math too much for you?” Mr. Anonymity editorialized.

“Nope. I always got great marks in math. But it just wasn’t any fun anymore. Even though my major was psychology, I taught high school math and physics.”

“But didn’t you get a ‘D’ in physics?” Anita asked.

“Yep. But that was college physics not high school physics. Besides, physics was one of eight courses that I was taking, and I had no interest in it at the time. If I’d wanted to, I could have gotten a much better mark in physics. I was more interested in other courses.”

“If you had no interest in physics, why did you teach it?” Anita persisted.

“Psychology wasn’t taught in high school back then. If I wanted to teach, I had to teach math and science.”

“How did teaching physics go?” Anita asked.

“Oh, I loved it. But after two years of teaching math and science I missed psychology. So I went to graduate school to get a Ph.D.”

My eye caught the clock at the front of the room. I thought for a moment, then realized I needed to summarize, “Today college students seem much more concerned with their grades than we were thirty years ago. It’s as if students today think that two or three bad grades will ruin your career.”

“Well, won’t it?” Anita asked.

“Nope,” I replied. “But most people around here believe a few bad marks will. So my chances are small of convincing you that a handful of bad grades won’t cripple your career. But before I go further, I need to correct a possible misconception. The main reason I am trying to destigmatize low marks is not so that you’ll feel better when you get lower grades. Rather, I think students are not following their intellectual interests in the depth that they ought to because they are spreading themselves thin in order to get the highest possible grades in all areas. That’s the screw-up I’ve been attacking. Follow your love, your genuine interests, and your passion. If you are working hard at something you love, forget about your overall GPA. Don’t kill yourself trying to get all ‘A’s’. Take ‘B’s’ and ‘C’s’ where you deem they are appropriate. See the extremism of

wanting all ‘A’s’ as the mistake. Perfectionism is a sickness. Extremism, even in the service of a virtuous cause, is to be deplored by reasonable...”

The cynic in the back was waving his hand frantically, “You’re not this worked-up about GPAs. What are you really talking about?”

Because I had planned out the class, I knew the answer—The absolutism of modern society is creating frantic, hollow people. However, since I was trying my best to use a Socratic teaching method I demured, “I’m not sure exactly what I want to say, but you wanna’ know what really pisses me off? At next Saturday’s football game, about eight times, the NBC cameras will show the Notre Dame student section. And there’ll be about twenty jackasses, mugging for the camera, shaking their index finger, screaming, ‘We’re number one! We’re number one!’ What a bunch of jerks! They are such an embarrassment to us. Those idiots remind me of those dogs you see in the back window of cars—with their heads on springs—if they could talk, I guarantee the dogs would be saying, ‘We’re number one! We’re number one!’”

As the roars of laughter subsided, the blabbermouth in the back tried to rouse the rabble, “Let’s tell the truth in our cheers. ‘We really stink! We really stink!’”

“We don’t stink!” I bellowed. “We’re a winning team! We’re 4 and 3 for christsakes!”

“Then what should we say to the NBC cameras?” Anita asked softly.

“We might try telling the truth,” I whispered in reply. “But I wager that our commitment to extremism and perfectionism keeps most of us from even knowing the truth—let alone speaking it.”

I hurried to the front of the classroom and wrote “We’re ___ ___ ___” I then turned to the class and announced, “Everybody write down their answer to next Saturday’s truthful pregame chant. Do it now! You have to tell the truth in four words or less. I’m gonna’ call on people, so everybody’s got to come up with something. We’re ___ ___ ___. Tell the truth about our football team.”

After a minute’s wait I began pointing at students who each offer their versions of truthful chants. I then responded to each ‘Truth.’

“We’re really desperate.”

“Yep.”

“We’re struggling.”

“Yep.”

“We’re still hoping for a major bowl.”

“Unfortunately, our chances are slim and none. But that’s a good one.”

“I don’t follow football. I can’t come up with an answer.”

“Okay.”

“We’re playing for next year.”

“Perhaps.”

“We’re looking for a new coach.”

“I hope not.”

“We’re in disarray.”

“Could be.”

“I couldn’t come up with anything.”

“That’s okay.”

I sat on the desk and spoke slowly, “Most of those were true statements, but they really weren’t true analyses of our football season thus far. Follow me on a thought experiment, if you would. Imagine we had the eleven coaches we face this year in a room before the season began. In a secret vote (for honesty reasons), they have to guess what our record for the season will be. They know our team well. They are all optimistic people who hope to beat us, but coaches who tend to underestimate their opponents don’t last long in the profession. Brian, what record do they think we’ll have? What’s your guess?”

“I dunno. Eight and three maybe?”

“Yep.”

“Tim, what do you think?”

“More like seven and four.”

“That’s what I guessed. We have a tough schedule, but not a backbreaker. We have good talent at every position. We are, however, very thin at running back, defensive line, and defensive back. While defensive line and running back have held up so far, we lost a starting cornerback and his replacement—a walk-on freshman—early in the season. If we give that new information to the eleven coaches, what do they guess? I think they’ll say 5-6 or 4-7. And what do they think our record would be after our first seven games? I’d guess 2-5, 3-4, or 4-3! So I think a truthful chant for our team would not be ‘We’re number one!’ That’s just stupid. We should be chanting, ‘We’re modestly successful!’ or ‘We’re exceeding expectations.’”

The roars of laughter foresaw the nation’s astonishment if Notre Dame’s spring-head dogs were to chant, ‘We’re exceeding expectations,’ in response to a 4-3 start. But the football players in class were ashen-faced.

“What’s it like over in the Joyce Center these days, Brian?” I asked softly.

The linebacker shook his head in disbelief and muttered, “It’s grim—really bad.”

“It sure is, son,” the psychologist replied. “The pressure is withering.”

“So you think the disappointment and the pressure are uncalled for,” Tim suggested.

“Absolutely,” I replied.

“But isn’t that a coaching strategy designed to make players hate losing?” Tim continued.

“And how effective is that strategy?” I countered.

“It might work sometimes,” Tim offered.

“And I guarantee it fails sometimes,” the teacher replied. “Bottom line is that nobody knows for sure which coaching strategies will work and which will blow-up. I just hope that the coaching staff has the

capability of responding to the enormous pressure that they're under by either passing it along to the players or by shielding the players from it completely. Then, at least, their actions would represent a coaching decision. If a coach is incapable of one or another of those responses, then I think we should fire the coach and get someone who has more coaching flexibility.”

“But even if the coach could shield the players from the pressure, you'd allow him to dump it on them anyway?” Brian asked.

“Wow, this is complex,” I replied. “Let me break down my answer into several parts. First, in a very few cases, for individual players turning up the pressure represents both a good coaching decision(which is concerned primarily with wins and losses) and also a good psychological decision—and by that I mean to hell with wins and losses, what's best for this kid for the rest of his or her life (the sort of issues that good parents worry about)? Second, in perhaps an equal number of individual cases, while it might get more wins in the short run, turning up the pressure will also have negative long term psychological effects. I can't prove that point, it's just my experience over the years as an athlete, psychologist, coach and parent. Third, my experience at Notre Dame is that our teams are almost always under too much pressure—both internally and externally generated—to win. So turning up the pressure on the whole team is probably a bad coaching decision, and it is almost always a bad move for the student-athletes psychologically also. But, of course, all of this is unprovable, it's my experience, and after all, who died and left me God?”

“But still,” the cynic in the back row opined. “given what you just said, why shouldn't Notre Dame fire any coach who puts pressure on his or her athletes?”

“Remember, a moderate amount of pressure is often good. We're talking about putting extreme amounts of pressure on student-athletes. But there's also a fairness issue here that needs to be considered. Fairness to the coaches is also at stake. It's duplicitous for us to put extreme pressure on our coaches to win and then tell them they can't pressure student-athletes, if the coaches genuinely feel doing so will help them to save their jobs. Let's be fair about this. If we continue to squeeze coaches to win, there will be negative consequences on our student-athletes. It's only human nature. Just like if we continue to squeeze faculty to be excellent scholars for tenure, there will be negative consequences for undergraduate teaching—it's just human nature. And don't fall for the lines of rhetoric about what we do in the scholarship domain having no negative

effects on teaching. Everything in the world of human affairs is interconnected. That's why it's so difficult to do the sorts of analyses about human lifestyles that we attempt in this class. My summary is that until we can tell coaches that their job security rests with an analysis of their coaching—where under some circumstances people have many more losses than wins but still are graded as effective coaches—we are wreaking bad coaching decisions on our student-athletes. Bottom line, we have to let coaches get some 'B's' and 'C's' in some classes, if we are to demand they get 'A's' in the more important domains."

I turned toward the front of the class and was shocked, "Whoa. Look at the time. We've got to get out of here. Today's class was entitled, 'The Dread Disease of Perfectionism: Theoretical Issues.' Our class on Friday will be, 'Against the Dread Disease of Perfectionism: Treatment Strategies.' For anyone interested in getting an 'A', or an education in psychology..."

"Or both?" came the voice from nowhere.

"Or both." I replied cheerfully. "You can write a preview paper. Think of paradoxes like Chinese handcuffs, or success through defeat, or 'it is in dying that we are born'. That sort of stuff. Okay? Write essays on how to defeat pressures toward perfectionism in your lives."

Students were doing dozens of things—gathering books, staring blankly, nodding enthusiastically, whispering to one another, and the like. I needed one more minute, "Okay gang. Get quiet. Listen up. (Pause) For reaction papers to today's class, imagine the following scenario. Each of you grades me on today's class. What do you give me? A? B? C? D? F? We average those twenty grades and it comes out to a B+. I yell 'B+! That's a perfect class!' Write a reaction paper to that last sentence. Okay?"

Students headed for the door as the back-row-brain yelled, "Can we write a reaction paper on whatever we want to?"

I smiled resignedly and said, "Whatever! If it's wise, and about real-life issues, it's related to this class—so I guess you can do it. But I'd really like you to seriously try planning some losses into your lives. So please? Do it for me? Write about my perfect B+."

I was jolted from my reverie by a delicate knock on my open door. It was our distance-running computer-engineer-in-the-making.

“I’m sorry to disturb you, professor,” she began demurely.

“That’s okay,” I replied. “I was just preparing for class.”

Her quizzical look suggested she thought I might be joking. But she decided she’d better play it straight. “Class was supposed to start ten minutes ago. Should I tell the kids to wait for you?”

“Of course you should!” I bellowed as I fumbled to find my course folder. “Tell them to stay put. Today we’re gonna have the perfect class.”