DON'T BE *SUCH* A SCIENTIST

TALKING SUBSTANCE IN AN AGE OF STYLE

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by

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This book is dedicated to Professor Robert T. Paine,
who taught me how to study the ocean and have fun doing it.

Contents

Introduction

*"You think too much! You motherf***ing think too much! You're nothing but an arrogant, pointy-headed intellectual—I want you out of my classroom and off the premises in five minutes or I'm calling the police and having you arrested for trespassing. And I'm not f***ing joking, you a**hole."*

Well. That was my introduction to Hollywood, complete with the personalized profanity. Thirty-eight years old. Just resigned from my tenured professorship of marine biology. Invested every cent to move to Hollywood. Entered film school at the University of Southern California and signed up for an acting class with this crazy teacher, now blowing her lungs out at me in front of the class.

I'm looking at this beast and flashing back to Antarctica, 1985, Cape Byrd, getting chased out of the water by a ten-foot leopard seal. Thinking that the seal seemed less threatening than this teacher. Thinking that the seal was more predictable.

To make matters worse, I had been warned. A screenwriter buddy got me into the class. He was friends with the teacher. His warning went like this: "She has laser beams for eyes and can see into your soul. Don't even think

about questioning her. Just listen to every word she says and know she's always right. She's the best acting teacher in Hollywood—she's worked with everyone from Dustin Hoffman to Al Pacino. Don't think you're smarter than her."

He said that over a game of pool, along with a variety of tall tales involving his Hollywood adventures, some of which I felt certain were hugely exaggerated. The "laser beam eyes" bit made it seem like just more of his hype.

So here I am. Standing in front of two dozen kids—all twenty-something hipster/aspiring actors, now roaring with laughter as this version of Bette Midler-on-angel-dust tears apart "the old dude."

I stand before her, hands at my sides, palms open, saying, "I'm sorry, I'm just here to learn about acting." It's the first night of class. She teaches the Meisner technique—one of the most highly respected forms of training for actors. It revolves around repetition exercises: Two students stand in front of the class. One says, "That's a lovely blue sweater." The other replies, "This is a lovely blue sweater?" The first one repeats, "That's a lovely blue sweater." If the original statement is sincere, the repetitions take on a sweet tone until someone finally feels an emotion and expresses it by saying something like, "Thank you for the compliment." If the original statement is sarcastic, it doesn't take long for the sweater wearer to end the exchange with an insult.

So I'm in front of the class and my assigned partner, a gorgeous twenty-two-year-old Malibu party girl, stands opposite me and is told to begin the process with an observation. She could have commented on my shirt. She could have commented on my posture. But instead she looks me over and says . . . "You're going bald!"

Like a pack of wild hyenas, the entire class erupts with screaming, almost violent, laughter. The little sweetie looks to them with a smile and a gesture of "Boo-yah!" The teacher watches with fire in her eyes, and I'm supposed to answer.

"I'm going bald," I reply with a nervous, humiliated smile.

We trade the line twice more, and then it happens. The venom-spewing tirade begins with "How does that make you feel?" as the teacher jumps up from her chair and confronts me.

I shrug. I've been living in university settings for twenty years. Baldness has been a badge of legitimacy in that world. I've looked in the mirror. I can see it. No need to get mad at me. Everyone says I'm a nice guy. I'm just here to learn. "I don't know," I reply. "No big deal."

The fire escalates. "What do you mean you don't know? We want to hear what you're feeling. We want to *see* what you're feeling. Don't try to stand here and tell us you have no feelings. This beautiful young girl says you're going bald, like a pathetic limp-dick old man. She's insulted you. Now I'm asking you again, *How does that make you feel?*"

Again I shrug and smile—and even make the fatal mistake of saying, "I'm not feeling anything." To which I should have added, "Why should I? I'm a scientist."

Well, that's what triggered the final eruption.

The veins were bulging out of her wrinkled neck as she blasted forth. "You *cannot*, I repeat, *cannot* come into this classroom and have no feelings. You can be sad, you can be glad, you can be mad, but the one thing you cannot do is tell us you've thought things through and have no feelings. That's what intellectuals do. They intellectualize the world. They move it all into their heads. They suck the life out of life. And that's why nobody wants to watch an intellectual act. Actors act. They actually *do* things. Intellectuals don't act, they think and talk."

On and on.

And that's where this book begins—with the realization that as an academic I had been trained to think rather than act. I heard that, and a whole lot more, in this acting class in 1995.

I did leave the premises that night, and I was definitely rattled. They say

that fear of public speaking is one of the most widely shared phobias. I'm guessing that fear of public acting in front of a pack of attractive kids who are laughing at you has to rate right up there, too. I stayed up for hours that night talking on the phone to old friends, wondering what the hell I had gotten myself into and giving some thought to the possibility that the move to Hollywood was simply a bad idea. It wasn't too late to slink back to New Hampshire and cancel my resignation, though I kept flashing back to the scene in *An Officer and a Gentleman* where Richard Gere is doing push-ups in the rain, crying and screaming at the sergeant, "I got nowhere else to go, sir!" That was kind of my predicament.

I spoke with my screenwriter buddy the next day. He called the teacher up. She didn't know I was his friend. Being pure Hollywood, she melodramatically apologized in front of the class the next night for having treated me so poorly, then told me to sit down and shut up, and continued to abuse me for the next year.

The class was of moderate interest then and for a while after. But it all changed in 2002, when I returned to working with academics. Suddenly the experiences of that course came raging back like a flood of suppressed memories.

I found myself listening to scientists and, even worse, science communicators and thinking back to that wretched woman screaming at me—"You're too cerebral! Stop thinking and *act!*" I began seeing all the worst traits from acting school played out instinctually by these folks.

The acting class was the pivotal moment in my life, causing my fragile intellectual noggin to crack wide open and the former professor to see his scientist's life in a new light. It gave me a 180-degree different perspective on my previous profession. For fleeting moments I could actually see and hear the consequences of so much education and development of the brain. All of which eventually led me at times to begin saying to old science friends and colleagues, in trying to help them communicate better, "Don't be *such* a scientist!"

A Scientist Turns Filmmaker

This may sound like a lot of silly fun, but guess what's at stake here—the entire fate of humanity. Let me explain.

What's the most important problem confronting humanity today? I think most people would agree it's the question of whether we're going to exceed the resources of the planet, destroy the environment, and end up in total chaos leading to the post-apocalyptic visions that centuries of science fiction writers have warned of. Science can avert such a nightmare.

With the knowledge of science we can solve resource limitations, cure diseases, and make society work happily—but only if people can figure out what in the world scientists are talking about and why they should care.

How bad is the situation with scientists and their communication skills? Well, I think it's at a crisis stage. Consider this: On June 23, 2008, James Hansen, head of NASA's Goddard Institute for Space Studies, gave a speech at the National Press Club in Washington, DC, in which he said, "CEOs of fossil energy companies know what they are doing and are aware of the long-term consequences of continued business as usual. In my opinion, these CEOs should be tried for high crimes against humanity and nature."

Now, don't get me wrong—James Hansen is a superstar of the science world and deserving of the Presidential Medal of Freedom for his efforts in speaking out against the George W. Bush administration's tampering with scientific studies. But this book isn't about making people think scientists are cool. If that's all you're looking for, you should go elsewhere. It's about examining the truth, which, by the way, is what science is supposed to be about.

And the truth is that the idea of trying energy executives for "crimes against humanity" is somewhere between laughable and insulting to the general public. This shows the extent to which scientists and the general public are not on the same wavelength. It's as simple as the words of the prison guard in *Cool Hand Luke*, spoken to inmate Paul Newman: "What we have here is . . . failure to ko-mune-eee-kate."

When the disconnect between the science community and the general public is this large, there's definitely a problem with communication. It's like an infant, not yet able to talk, screaming and crying at its parents, trying to tell them something is wrong. And the parents are just staring at the child, unable to understand.

It doesn't matter if the reality of the situation is that neglecting global warming could kill more people than a crime against humanity like the Holocaust. The only thing that matters in American society is perception (the old "perception is reality" bit). And, to the general public, accusing quiet businessmen of such crimes gives the impression that scientists have lost their minds.

I got to see how bad it all is when I was invited to take part in a special symposium in December 2006, at a meeting of the American Geophysical Union titled "Communicating Broadly: Perspectives and Tools for Ocean, Earth, and Atmospheric Scientists." It's the largest annual gathering of climate and ocean scientists, and that year it was in San Francisco, with nearly 15,000 in attendance. I don't like the meeting because of its enormity, so I initially declined, but the organizers made me an offer I couldn't refuse.

They put me in the middle of the opening session, amid the nation's top global warming scientists, including the very same James Hansen; Stephen Schneider, head of Stanford University's climate center; Michael Oppenheimer, head of Princeton University's climate center; and a half dozen other big names. Plus Al Gore was set to give the keynote address in the session. It was too huge an invitation to turn down.

I spent three months working on my presentation—I edited a ten-minute video for which I would provide the narration live, perfectly timed to weave in and out of the audio. It had both silly clips from my comic work and a very serious message about the role of likeability in the broad communication of science.

The experience turned out to be stunning, but in the worst way possible.

I sat there that morning in disbelief as the speakers—supposedly the best of the best when it comes to presenting science to the public—gave some of the dullest, most uninspiring presentations I've ever seen.

Worst of all was Hansen (again, a true scientific hero), who gave a tedious and disorganized presentation. This comes as no surprise to any major climate scientist. They all know Hansen's a nice guy but not a dynamic speaker.

Now, yes, I know that many in the science world feel that someone like him shouldn't be criticized. They're saying, "If you want to help the cause of science, just keep your mouth shut." But most scientists know that science is built on a tradition of honest, at times (as I will explore in chapter 4) harsh, critical evaluation. So I'm not about to just sit quiet on this issue.

Hansen spent the first five minutes showing a single graph of temperature versus atmospheric carbon dioxide. The audience was dutifully respectful of him, given his greatness. But all he was doing was talking "science" rather than "science communication," the supposed focus of the symposium. He finally looked at the crowd and said, "I guess you guys want to hear what it's like to testify to Congress." Everyone nodded yes.

He stumbled on, reading his talk haltingly from a laptop to the audience of five hundred. Then, after a total of twenty minutes, the moderator told him he was out of time. He turned to the crowd and simply said, "Well, I've got a bunch more slides. They're all on my Web site if you want to see them." Then he slapped shut his laptop and left the room, presumably headed for the airport. No conclusion, no summary, no overall point to what he said. Just "That's all, folks!" followed by the twenty-three skidoo, exit stage left.

The other speakers weren't much better. They tossed up one PowerPoint presentation after another. After a while it was just blue slide, blue slide, blue slide (by the way, don't miss "The Blue Slide Pioneers" in chapter 4). And yet all the while they were held up as experts on "communicating science broadly."

Now, as I discuss in chapter 3, two main errors can be made in presenting science to the public. The first is an error of accuracy. Had even one of the speakers made a significant mistake in accuracy—maybe stating that current atmospheric carbon dioxide levels are around 800 parts per million (ppm) rather than 385 ppm—the audience of experts would have torn the speaker to shreds.

But the second is an error of boredom, in which the speaker fails to make a presentation that holds anyone's interest. Such mistakes are traditionally shrugged off as no big deal—"At least he got the facts right." No harm. Well, I maintain that today there is in fact harm.

A New Priority for Science Communication

The time has come, in our new media environment, which is so cluttered with information that it is at times hard to tell fact from fiction, for new attention to be paid to this second type of error. The powerful and effective communication of science has to be a much higher priority than ever or the science community will lose its voice, drowned out by either the new anti-science movement or just the cacophony of society's noise.

So I spoke with the organizers of the symposium the following week. They said they were disappointed. They had thought their cast would have done a better job. But they also said I was about the only person they'd heard any complaints from. Most of the people were so dazzled by the credentials of the speakers and excited to have Al Gore at the end of the session that they didn't really consider whether the title of the symposium had been justified. I found that distressing, especially given the attacks that are under way against science these days.

A backlash has developed against science, in disciplines ranging from evolution to global warming to mainstream medicine. An entire antiscience movement has emerged that truly does threaten our quality of life. Large groups of people are fighting against hard, cold, rational data-based science and clinical medicine, simply saying they don't care what the science says.

Major groups are now arguing against certain childhood vaccinations on the basis of fears that are grounded not in scientific data but in anecdotes and innuendo. These are vaccinations that have been responsible for eradicating terrible diseases. It is a genuine threat to society.

In the midst of this conflict, communication is not just one element in the struggle to make science relevant. It is *the* central element. Because if you gather scientific knowledge but are unable to convey it to others in a correct and compelling form, you might as well not even have bothered to gather the information.

Seeing Is Believing (That Communication Is Important)

As you read on, you will realize that much of this book focuses on filmmaking—making films, watching films, and understanding "the language of film." Many scientists will say, "This is not for me; I'm not a filmmaker." Well, guess what—if you aren't yet, you probably will be soon.

I came to this realization in 1997, near the end of film school, when I met with Elizabeth Daley, dean of the USC School of Cinema-Television (now called the USC School of Cinematic Arts). She said that film is a language that everyone learns to "read" from a very early age. A young child has no problem watching a scene in a television program that changes from a man picking up his car keys to the man driving his car. The child doesn't sit and wonder, "How did that man suddenly go from picking up keys to driving his car?" No, the child is able to fill in the missing scenes of the man leaving his house, starting the car, and driving off (called "ellipses" in the language of film).

But when it comes to "writing" the language of film, over the past hundred years only select individuals have mastered this technical medium. That is now changing rapidly.

Daley envisions a day in which everyone in every discipline will routinely communicate through the use of film—both writing and reading in the medium. And I have seen the beginnings of this in the science world since the

1980s—slowly at first, but quickly in more recent years as a result of new video technology.

Today, when I run a video-making workshop at Scripps Institution of Oceanography with graduate students, almost all of the students have already had some experience with shooting and editing their own videos. That's a drastic change from just a few years ago.

So the fact is, the science world is in many ways converging on Hollywood. What?! Think that's a heretical thing to say? Don't believe it? Let me hit you with a little anecdote from my recent past.

I was helping a large science organization set up an evening event in Hollywood for which the organizers wanted a couple of scientists to talk, and they wanted them to be truly exceptional speakers. The communications director left me a phone message asking for help. I called back and told her about two scientists I know who are tremendous public speakers. She left me another message a few hours later, saying, "A bunch of us got together in my office and found clips on the Internet of one of the scientists, and you're right, he's amazing. But we couldn't find anything on the other one. Could you send us some tape of him?"

When I heard that last phrase, I got a minor case of whiplash. I called her back and left her a message saying, "Do you know who traditionally says that phrase—'Send us some tape on this person'? That's what Hollywood casting directors say to agents when they want to consider an actor without having to trouble the actor to come in for an audition—'Just send us some videotape of the actor's best scenes.'"

So take a moment now to think about what this means. In the near future—maybe it's already happening—prominent scientists who are good speakers are going to edit together their "demo reels" in the same way I've helped dozens of my actor friends in Hollywood edit their demo reels. Instead of taking scenes from movies and television shows, the scientists will take scenes from talks they have given.

Scientists will post their "reels" on YouTube for event organizers to con-

sider. And, with time, they will realize that the best parts of their reels come from the talks they give where the lighting and camerawork and sound recording are best. They will realize that even if the substance of their talk is identical in all the talks, the style of the talks that are recorded effectively is what makes those videos better.

As they look at their reels over time, they will realize that it really does matter if they dress well and comb their hair and maintain good posture. Though traditionally scientists have focused more on substance, in the future they will increasingly realize that style matters when it comes to communication, just as the people of Hollywood have known for over a century.

And I have nothing to do with this transition of scientists becoming more aware of these elements. With most of what I have to say, I'm just the messenger.

From Sea Stars to Hollywood Stars

So my message, that science communication is extremely important, is not particularly novel, but my approach to it is, to say the least, unique. I say this because I undertook a journey, starting in 1989, that few (if any) tenured science professors have ever attempted. It's been a journey to the epicenter of the most powerful mass communications machine on the planet—Hollywood.

After spending two decades battling my way into the inner sanctums of academia, I switched careers at age thirty-eight and did my best to party my way into Hollywood (yes, party; that's the main work mode for Hollywood).

And I do feel that Hollywood is the most powerful, albeit hard to control, mass communication resource of today. When a blockbuster movie suddenly makes dinosaurs more interesting than ever, the subject permeates every level of society, from magazines to elementary schools to dinner conversations. The impact can last for many years. And when a Hollywood

celebrity pulls a shocking stunt (like a "wardrobe malfunction," as I mention in chapter 2), it sends equally powerful waves throughout society.

Two Other Books

In addition to this book, there are two others I would like to publish. A whole tome could be filled with adventures from my twenty years as a marine biologist. I got my start when I dropped out of college in my sophomore year and ended up in Puerto Rico working on an oceanographic project. I spent years in the Caribbean studying coral reefs—Jamaica, Panama, the Virgin Islands—and then migrated west to the Pacific. I spent the 1980s in Australia doing fieldwork for my doctorate from Harvard University, going back for a postdoctoral fellowship, and then finally settling in for the pot of gold at the end of the academic rainbow: a tenure-track professorship at the University of New Hampshire.

For the uninitiated, tenure means employment for life. They can't fire you. It's what every academic dreams of. By 1994 I had earned tenure at UNH. I had a group of graduate students studying with me, a major grant from the National Science Foundation, and twenty published research papers; at thirty-eight, I had essentially achieved the sort of career success I'd hoped for way back in college. I was professionally content. But, just as tragically as a happily married person can fall in love with another person, my heart had begun wandering from science to another career: filmmaking.

My affair with film had, actually, been slowly developing. Throughout the 1980s I gave countless slide shows about not just my research but also all the adventures I'd had diving around the world—from living on an island on Australia's Great Barrier Reef for a year to diving under the ice in Antarctica to living in an undersea habitat for a week and eventually meeting the guru himself, Jacques Cousteau. I enjoyed giving the talks and telling the stories. And by the early 1990s I'd become intrigued with the power of video to supplement what I had to say.

I often thought about putting those stories in a separate book, and in fact

that book exists, sort of. In 1989, in a blinding blaze of passion I wrote a 120,000-word manuscript in four weeks, titled "Coral Reefs and Cold Beers," which centered on my best and most favorite stories, starting with the years I'd spent living on Lizard Island on the Great Barrier Reef. It was full of tales of getting drunk with fishermen, dodging sharks, and having the time of my life studying marine biology—including thoroughly enjoying the hypothetico-deductive process of science in the field. But alas, its brow wasn't sufficiently high for the literary world, which demanded in 1989 that scientists write only in a voice of deadly seriousness. Despite three literary agents, a couple dozen publishers, and at least one academic press that gave it the green light, it never made it to publication. The overall opinion was summed up by one editor, who said, "The partying theme gets in the way of the science." (Bah, humbug.)

The other book I've thought about writing is a thorough review of the state of science literacy in America today. It would examine the literary and popular image of scientists in our culture—how they are portrayed in movies and what effect that has on the public's support for science in general. Fortunately, that job has been covered by Chris Mooney and Sheril Kirshenbaum in *Unscientific America: How Scientific Illiteracy Threatens Our Future*, published about the same time as this book.

Two Careers in Storytelling

So "scientist-turned-filmmaker" ends up being the label that has been applied to me, which seems like a professional stretch, yet there is a unity to the two careers. They are both, in the end, about telling stories. A scientist goes out into nature, gathers data, comes back to the laboratory, and puts it together in order to present to the world a story about how things are. A filmmaker goes out into the world, shoots film, comes back to the editing suite, and puts it together in order to present to the world a story about how life is. Same basic creative process. One group just tends to be a little better at the art of storytelling, as I'll explore in chapter 3.

My formal entry into filmmaking began in 1990, when I made a first, silly short film, *Lobstahs*, a five-minute piece on how to eat a lobster that starred a couple of New Hampshire lobster fishermen. By the next year I was receiving awards at the International Wildlife Film Festival for my films, including *Barnacles Tell No Lies*, a jazz music video about the sex life of barnacles. And I had begun exploring the bigger picture of the film world, including initial trips to Hollywood.

Academic friends would ask, "Why are you so interested in Hollywood?" and I would paraphrase the famous bank robber Willie Sutton (when asked, "Why do you rob banks?" he's said to have replied, "Because that's where the money is"). I'd say, "I'm going to Hollywood because that's where the mass communication is."

By mid-1993 I had approached USC's cinema school and spoken with an admissions advisor, who asked my age. I said thirty-seven. He said, "You're right on the cusp—better act now or it will be too late." Suffice it to say, I acted.

I made my move to Hollywood in January 1994, fittingly just in time for the Northridge earthquake. I rented an apartment in Beachwood Canyon, right below the Hollywood sign, and lived there for more than a decade as my journey led me to film school, through the two-year acting program, to premiering my films at festivals from Telluride to Tribeca, to short films and commercials with such actors as Jack Black and Dustin Hoffman, and eventually to my documentary feature *Flock of Dodos: The Evolution–Intelligent Design Circus*, airing on Showtime.

It's been fifteen years now since I jumped ship on academia, and I have lots of genuinely insane Hollywood stories from the countless nights of partying and networking. But, in the end, it all comes back to that acting teacher screaming at me. That was the golden moment. That was when I knew I wasn't as worldly smart as I had been led to believe in academia.

And that's most of what this book is about—the fact that academics (and scientists specifically) tend to think that the solution to *all* problems is edu-

cation. Which seems logical at first. But the extension of such a notion is that, all else equal, highly educated people are better at everything.

I thought that was true in August 1994. I had several college degrees. I knew a lot. I figured I must know more about communication than the "idiots" in Hollywood. Boy, was I wrong. As I hope to make you see.

FOUR

Don't Be So Unlikeable

One night in Hollywood, a few years after film school, I hopped in the car with two former classmates, Jason Ensler and Jay Lowi, and Jay's girlfriend, Courtney Ashley. It was Friday night, we were headed to a party in the Hollywood hills, and all of us were feeling optimistic at the end of a good week. Jason was being considered as director of a television show, Jay was up to direct a movie, and I had a feature script that several companies were thinking about optioning. With a big smile, I said from the front passenger's seat, "You know, by Monday afternoon we could all be major players in Hollywood!" Before anyone could agree, Courtney spoke up from the back seat. "Now, listen," she said hesitantly. "I don't mean to be . . . how shall I say this . . . 'the Randy' of this group, but . . . I think the odds of that happening are awfully slim." The car was silent for a moment as we processed this. Then everyone burst out laughing, and continued laughing for the rest of the night, as a new expression was born that we still use to this day. Whenever someone is deluding himself with excessive optimism and losing touch with the cold, scientific facts of the real world, somebody invariably chimes in, "Now, listen, I don't mean to be 'the Randy' of this group, but . . ."

Like a Completely Dreamless Sleep

It's time to add up everything we've been through so far and consider how it affects the most important variable—whether the people in the audience

like what they're hearing. You can avoid the pitfalls of the first three chapters (be not so cerebral, be not so literal minded, and tell a good story), but if there's something about you that people don't like, you're still not going to communicate very effectively. So let's begin by examining the unique aspects of the scientist's persona.

A fun piece of knowledge for marine biologists is that the great American novelist John Steinbeck spent much of his life probing the interface between science and society. Though he was a man of letters, his very best friend in life was a scientist—Ed "Doc" Ricketts, a marine biologist. Ricketts not only fascinated Steinbeck but is also believed to have been the inspiration for, and at times the source of, much of the author's deepest and most contemplative writings. Some biographers of Steinbeck have even hinted that, at one point, when he was most fed up with the viciousness of literary critics and the superficiality of the world of fame that engulfed him, Steinbeck toyed with the notion of chucking it all and going off to study sea creatures full-time with his marine biologist buddy. When Ed Ricketts died in 1948 in a car-train collision, Steinbeck was jolted and said, "He was part of my brain for eighteen years."

In 1940, at the height of their friendship, but in what some believe was Steinbeck's winter of his own discontent, he took a sea journey with Ricketts. Steinbeck's second marriage was unraveling, Ricketts was trying to escape a failing relationship of his own, the planet was on the brink of world war, and the two men sought a spiritual escape through the ocean. The book Steinbeck wrote upon his return (much of it cribbed from Ricketts' journal), *The Log from the Sea of Cortez*, is considered by many to contain some of Steinbeck's most complex and sophisticated writing.

In one of my favorite passages, so relevant to the persona of a scientist, Steinbeck recounts the story of Jimmy Costello, a Monterey news reporter who was called to the beach one day on the news that a "sea serpent" had washed ashore. A wave of excitement had swept the town. Jimmy managed to find the creature and the assembled mob on the beach.

> He rushed, approached the evil-smelling monster from which the flesh was dropping. There was a note pinned to its head which said, "Don't worry about it, it's a basking shark. [Signed] Dr. Ralph Bolin of the Hopkins Marine Station." No doubt that Dr. Bolin acted kindly, for he loves true things; but the kindness was a blow to the people of Monterey. They so wanted it to be a sea serpent. Even we hoped it would be. When sometime a true sea-serpent, complete and undecayed is found or caught, a shout of triumph will go through the world. "There, you see," men will say, "I knew they were there all the time. I just had a feeling they were there." Men really need sea monsters in their personal seas and the Old Man of the Sea is one of these.

Steinbeck goes on to describe the mythical Old Man of the Sea and then comes back around:

> For the ocean, deep and black in the depths, is like the low dark levels of our minds in which the dream symbols incubate and sometimes rise up to sight like the Old Man of the Sea. And even if the symbol vision be horrible, it is there, and it is ours. An ocean without its unnamed monsters would be like a completely dreamless sleep.

Let's take a moment to savor the beauty of what Steinbeck meant. It is the downside of scientific thinking—the evisceration of all that is mystical, alluring, mesmerizing, and elusive about life. It is the snapping on of the light in the dark room where the imagination is running wild, only to shed the light of science and reveal that no, there really isn't anything too crazy going on here. It's just a basking shark. No need to indulge your fantasies.

Had my friend Courtney been there, she would have told Ralph Bolin to word his message as "Now look, I don't mean to be the Randy of this group, but there are no sea serpents and this thing is just a basking shark that we've all seen a thousand times before."

And the whole crowd of townspeople would have taken this in, looked at one another for a moment, and shouted back at Bolin, "*Oh, don't be such a scientist!*" Then they would have gone back to calling it a sea serpent.

This, once again, is representative of the standard psyche and public presentation of the scientist. It is a negating role: the designated driver, remaining sober amid the fantasy-blinded townspeople. Truth teller is a valiant role, and I am in no way saying scientists shouldn't play it. When the spread of sexually transmitted diseases can be prevented by the use of condoms, we certainly don't want scientists to hesitate in advocating them simply to avoid spoiling the romance of sex.

But in the end . . . it's just not a very likeable trait. Nobody likes a party pooper. So the question is whether there are ways to play the scientist role without being the negating, annoying, no-fun voice. Essentially, is it possible to be the scientist and still be liked? That is the focus of this most important chapter.

Rising Above

Before I get to the more positive side of things and address the subject of being likeable, let me begin with the inverse—how to be unlikeable, and what the consequences are.

It's time to go back to that acting class that so thoroughly spun my head around. Yet another basic principle was ground into us night after night: all else being equal, audiences do not like characters who "rise above." To rise above is to condescend, talk down to, be arrogant, act superior. All of those things. They are unlikeable traits. The audience no likey.

To see this up close and personal, we did exercises in which we acted out two different approaches to the same problem. The first involved rising above; the second didn't.

So again, we're back in acting class, this time with two students playing a husband and wife at home. The husband has just discovered that his wife stole $100 from him.

In version one, he is furious, can hardly contain his anger, treats her in a degrading manner, and calls her all sorts of terrible things. He says, "You stupid, lying, thieving tramp. You're a scumbag. Give me back my money or I'll slap you!"

It doesn't take long for the audience to start feeling sorry for the woman, figuring there must have been some reason for her to take the money and that he should try to be more understanding. Before you know it, it's the criminal (the wife) who has the sympathy of the audience.

In version two, the husband avoids rising above at all costs and tries to come down to the wife's level or lower. He speaks softly to her in a pleading, compassionate, understanding voice. "How could you do this? We've worked so hard to build a trusting relationship. I just don't understand. You must have a good reason for it, since I know you would never do this without one. Still, this hurts me very deeply."

In this version the audience feels for him, turns to her, and practically wants to speak for him, saying, "Yeah, you rat, how could you do this?" And she is left with a great temptation to say, "Ah, quit your sniveling," which is, alas, rising above, and the end of her with the audience.

It took me a while to really take this in and digest it. But when I did, I realized the value of this dynamic in the real world. I can tell you that, since watching those exercises, I have put it to use several times in actual conflicts.

The fact is, when something has gone wrong, and especially when people know they are guilty of something, they are defensive and ready to escalate immediately. All you have to say is "You lying thief" and the other person will shoot up higher with "Well, who are you to talk—remember last year when I caught you . . ." and the whole conflict spins out of control.

But this is where you do have a certain amount of control over your own destiny. If you manage to restrain yourself, you can take the confrontation in a completely different direction. And I have done it—actually surprising people who expected me to erupt in anger.

Just last week, a friend caught a student cheating on an exam and asked

for my advice. I said, "Instead of rising above and scolding this student, see what happens if you come down to his level—make it clear you were hurt that he did it and ask why he did." Sure enough, the student ended up pouring his heart out, crying, and agreeing to withdraw from the class on his own. The professor had been braced for all-out warfare and was shocked by the different outcome.

In fact, my entire movie *Flock of Dodos* is one big exercise in *not* rising above. I interviewed people whose ideas and viewpoints I consider largely foolish and illogical yet restrained myself from belittling them. Many viewers have asked, "How did you keep from shouting at them?" and critics complimented the film for avoiding the attacks one would expect from an evolutionist.

The acting classes paid off.

Rising above is a guaranteed path to conflict, which is sometimes okay, but it's important to know that it is not the only way to approach an issue—and, more important, people don't like it.

Just look at your typical villain. What's the most common trait, for everyone from Hitler to Dr. Evil? It's the arrogance of believing they are smarter and better than the rest of the world. It's a repulsive trait—a guaranteed pathway to not being liked. It doesn't matter how smart you are. And, in fact, it's characteristic of some smart people.

British filmmaker Adam Curtis created an excellent documentary on the history of public relations titled *The Century of the Self*, which focuses in its first half on Sigmund Freud's nephew Edward Bernays. The man was a genius at mass communication, applying many of Freud's ideas to marketing and founding the profession of public relations in the 1920s. But, according to his daughter, he could also be arrogant, condescending, and hateful. She recalled, "It can be a little hard on the people around you. Especially when you make other people feel stupid. The people who worked for him were stupid. And children were stupid. And if people did things in a way that he

wouldn't have done them, they were stupid. It was a word he used over and over and over—dope and stupid."

I'm afraid that is the same kind of language I heard coming out of the highly educated evolutionists in the summer of 2005, and it helped prompt me to make *Flock of Dodos*. They called the proponents of intelligent design all sorts of names. I thought to myself, "Don't they realize how they're coming off? Are they clueless about such simple interpersonal dynamics?"

Angry and Arrogant

So let me take a minute here and venture into one of the most powerful, interesting, and sometimes distressing emerging modes of communication for the science world—the blogosphere.

Seed magazine was founded in 2001 with the subtitle *Science Is Culture*. In 2005 the publishers got the nifty idea of pulling together the most popular blogs of major scientists. What began with a dozen or so blogs suddenly developed into a large sucking force, drawing in a whirlwind of other bloggers, until by 2007 there were about seventy-five blogs, all organized under the label ScienceBlogs.

In June 2005, as I was starting to look into the conflict surrounding the teaching of evolution versus intelligent design, I began checking out some of the evolution blogs. What I saw kind of stunned me.

I had been part of the science world for over thirty years by then, and I had been reading scientific writings since way back in the early 1970s. I had read firsthand accounts like *The Double Helix* and *"Surely You're Joking, Mr. Feynman!"*; the writings of Stephen Jay Gould, Carl Sagan, and E. O. Wilson; and dozens of other personal narratives and essays. And in all my readings I had never encountered a scientist using foul language. Not in the books, not in the journals, not even in the magazines.

Now, all of a sudden, here were scientists writing directly from their laboratories, using the foulest, crudest, and most hate-filled language

imaginable about the intelligent design movement. I honestly couldn't believe it. I was baffled, and not in a good way. The voice that came through in all of these blog posts, and even more intensely in the comments of fellow evolutionists, was not just offensive; it was also incredibly condescending and arrogant.

The more I read, the more my mind drifted back to the acting class. To watching, night after night, how an audience responds to the simple act of rising above. And I began to wonder, first, whether these evolutionists had any idea of how poorly they were coming off to the general public, and second, whether they cared.

After following these blogs for a couple of years, I have to conclude that these writers really don't understand how they're perceived and largely don't care. But their venom was a starting point for *Flock of Dodos*—I wanted to capture just a little bit of this arrogance, condescension, and closed-mindedness and then see how the general public would react to it.

I succeeded, in the form of a poker game I filmed for the movie. I assembled seven of my old evolutionist buddies for an evening of gentlemanly poker, which eventually deteriorated into a bitch session about intelligent design. Finally two of the bitchers turned on each other, creating a spat that can only be described as off-putting.

I honestly hadn't intended to end up with such a negative portrayal of academic scientists, but the group did what they did without much prompting. It was just a typical night among a group of academics. In the end, it was the strongest element in the movie and what the critics cited most in their reviews.

The power of this negative portrait emerged in our very first screening. Three hundred and fifty people had gathered for a sold-out show in the suburbs of Kansas City. At the time, the community was in the thick of a battle over the state school board, which had been taken over by members who opposed the teaching of evolution.

Among the audience members that night were a dozen or so high school

seniors, brought by their biology teacher. There was also a science reporter from the journal *Nature*, and she spoke with these students after the film. She said the single biggest impression they walked away with was not that the intelligent design advocates were dishonest, which they clearly are in the movie, but that the evolution professors were arrogant, condescending, and irritating.

And there you have it: yet another instance of the need to not be *such* a scientist. Yes, we know you're smart, but if you act like you're smarter than everyone else, you will quickly lose them at "You probably wouldn't understand this."

Want more proof?

Unlikeability on Display: A Debating Faux Pas

A while back, a public debate over global warming was held in New York City. Two teams of three experts squared off over whether global warming is a crisis or not. Before the debate, the organizers polled the audience about which side they agreed with; then they repeated the poll when it was over. During the debate, the two sides argued vigorously, and there really didn't seem to be an obvious winner in terms of content presented.

However, when it came to style, there was one defining moment, according to the three audience members I spoke with—a moment that swung the tide for anyone who was undecided on the issue.

It was in the middle of the two sides arguing a point. The moderator zeroed in on one of the members of the "global warming is a crisis" team, asking him why he felt his opponents were misrepresenting the issues in their presentation. The scientist replied, "I don't think they are completely doing this on a level playing field that the people here will understand." The audience didn't like this.

It wasn't a malicious thing to say. There were no bad intentions, and I hate even citing this incident, since the scientist is a really good guy. I could just as easily have said the same thing without thinking. But, in a venue like

that, perception is reality. And the comment was perceived to be condescending. It was a very educated Manhattan audience, and they didn't take kindly to it. On the recording of the event you can actually hear people objecting in response.

When the debate ended, the second poll revealed a shift of about sixteen percentage points against the "global warming *is* a crisis" team. And while it's true that the organizers had to some extent "stacked" the audience toward one perspective, there is no denying how this incident played. According to all three of my sources, you could feel the mood shift right at that moment. They felt that the vote had little to do with the substance of what was presented that night. It mostly came down to style and an unfortunate moment of talking down to the audience.

Style becomes so much more powerful than substance in large public venues with broad audiences. And this brings us to a fundamentally difficult dynamic.

Science Is, Unfortunately, a Negating Profession

I touched on this a bit earlier, in chapter 3. Now I'll go into it in depth.

The entire profession of science has at its core a single word, and that word is "no." Science is a process not of affirming ideas but of attempting to falsify ideas in the search for truth. This is what a hypothesis is—an idea that can be tested and possibly falsified and rejected.

When you give a scientist a paper, he or she reads it with the assumption that the writer is guilty of being wrong until proven innocent. The writer proves his or her innocence by either presenting data or citing sources. With each statement made in the paper, the scientist reading it says, "I'm not sure I believe this." As the author presents graphs and tables of data and cites sources, the good critical scientist attempts to falsify what is being said.

Eventually, after the scientist has examined the data, looked up the cited sources, and found that in fact, despite considerable effort, the hypothesis

presented cannot be falsified—only then does the scientist finally start to relax a bit and say, "Well, okay, I think I can probably live with this."

Tough business. It really is. As I waded through my first decade of rejection in Hollywood as a filmmaker, people would ask me whether I found the rejection hurtful or depressing. And I would respond, "Are you shitting me? Do you have any idea what it's like to deal with the rejection of scientists? Hollywood folks reject things on the basis of the idea that 'it just didn't grab me,' and they can't even articulate the reason for their decision. When scientists reject you, they hit you with a stack of data and sources that are the basis for it. That's the sort of specific, substantive rejection that truly hurts."

A Critical Thing Called "Critical Thinking"

This negating approach gives rise to something known as critical thinking, which I believe can, to a large extent, be learned. I say this because of a wonderfully stupid experience I had as an undergraduate.

I grew up as a God-loving (sort of), Kansas-raised, young Republican imitation farm boy (I was raised in the suburbs of Kansas City but knew some farm boys) who transferred from the University of Kansas to the University of Washington in Seattle halfway through my undergraduate career. There I fell in with a bunch of sandal-wearing, establishment-questioning, nonconforming (though looking very much alike) hippie graduate students in biology.

One night, at a dinner party blanketed by incense, candles, and patchouli stench, I got into an argument about politics that quickly turned into me, the frat boy from Kansas, versus them, the unwashed masses. Somebody finally interrupted me to say, "How do you know that's true?" And I very smugly and confidently shot back, "I know it's true because I read it in *Reader's Digest*."

Well . . . you can imagine what happened. There wasn't the slightest trace of a smile or humor on *my* face—I *was not* joking—but the entire dinner

party erupted into a screaming, howling pack of jackals, rolling on the floor, peeing in their pants, slapping each other on the back, as I sat there angrily shouting, "What? What? What's so funny?"

Bastards.

It proved to be a moment of awakening. A voice in the back of my head asked at that moment, "Is it possible that not everything written in *Reader's Digest* is correct?" I'd honestly never considered that.

Don't worry; I went to graduate school at Harvard and got cured. And the world of science was the biggest part of my "awakening." Which convinces me you can actually learn to be a more critical thinker ('cause I sure was a dumb Kansas bumpkin back then).

So in the beginning, when I was a junior at the University of Washington, I would read a paper for a discussion group, think, "Wow, what a great and exciting study," and then attend the formal discussion with the graduate students, every one of whom, as they filed into the room, would say, "This week's paper is a piece of crap!" And my smile and enthusiasm would immediately wither into nods of agreement, saying, "Yeah, it really sucked," even though I had no clue why.

That was when I first began to learn the idea of reading a scientific paper with "no" being the starting point.

Fifteen years later, as a professor at the University of New Hampshire, I would bring a half dozen graduate students into my office to discuss recent research papers and realize the tables had turned. The students would come in saying, "That was an interesting paper we read this week," and I would scowl at them with a look of "What do you mean?" Then I would tear into the paper, pulling it apart at the seams, showing them how poorly designed the hypotheses, experiments, and analyses were, and accusing the writer of presenting a discussion that was totally bogus. And on some days they would cower and glare at me as if to say, "Dude, don't be *such* a scientist."

It's a problem. It's at the core of the entire world of science. And it can, and frequently does, run amok. You meet scientists who have lost control of

this negating approach to the world and seem to sit and stew in their overly critical, festering juices of negativity, which can reduce down into a thick, gooey paste of cynicism.

You should have seen some of the department meetings I sat through in the zoology department at UNH. Good ideas would be presented and then ground to shreds by the fifteen or so professors present who proudly "poked holes in it." Finally, whoever had presented the good idea would leave with the feeling that it wasn't such a good idea after all.

Crucified by a Scientist

I got my own dose in graduate school of how badly scientists can lose control of their critical approach. A professor on my thesis committee was notorious for his destructive behavior with students. And he did it with me. He turned what was to have been a routine one-hour oral exam—where professors ask you a few softball questions just to let you show off how much you know, and then pass you—into a five-hour ordeal of humiliation and frustration. The worst experience of my academic career.

The same professor demolished the careers of numerous graduate students. One close friend quit her doctoral program after five years of work because he did the same thing—only worse—to her in a committee meeting. As she was showing slides and presenting her research to her committee of five professors, he flipped on the lights and said, "I want you to stop right there and tell us what distinguishes you, in the way you're doing this research, from a common hired laboratory technician."

What do you say to that?

She quit. He went on. He mellowed over the years and eventually became less destructive. But there are countless stories like that; I've listened to so many over the years. In the last discussion I had with Stephen Jay Gould, he commented on what a shame it is that it takes so much positive energy to build up a student's inspiration and drive, yet only a single negative experience to obliterate it all. It's not an even balance, as I'll discuss in a

minute. But first, a few words about this spectrum that exists in scientific thinking.

Science, like art and most other professions, requires a mixture of two elements—creativity and discipline. Science without creativity is dull, but science without discipline is dangerous. And here we are again, back to these two key elements—the objective and subjective parts. Discipline is the rigid, regimented, more robotic objective component that has to be brought to bear for science to work properly. Wild ideas are fine, but without discipline they become a waste of time and energy. Creativity is the more human, liberated, unrestrained element that must be let loose for it to work. Science without at least a little bit of creativity is just plodding detail that does not expand our understanding of the world.

But at the ends of the spectrum—at the far ends—lies darkness.

Creativity, unleashed with no restraints and allowed to shoot too far out on that end of the spectrum, eventually results in sloppiness. This is the classic mad scientist stereotype. You see it in the real world of science. You can usually spot it in the scientist's office—you walk in and there's junk piled everywhere, hundreds of cartoons and meeting badges and photos plastered all over the walls with no organization whatsoever. And you ask for a copy of a paper by the scientist and he spends the next fifteen minutes exploring stacks of papers while talking to himself and discovering manuscripts that have been lost for weeks. Just like Doc Emmett Brown (Christopher Lloyd) in *Back to the Future*.

That's the funny part of sloppiness. But the more tragic part is when those scientists give talks at scientific meetings or write papers and their data are as big a mess as their office. Then it's not so funny. It becomes sad, depressing, and dysfunctional. Particularly when you watch the better scientists rip into them in public during the question session at the end of their talk.

At the other end of the spectrum lies an even more destructive excess. Discipline shows itself in critical thinking and the ability to organize the sci-

Table 4-1. Creativity and Discipline Spectrum

I----------	I----------	I----------	I
Sloppiness	Creativity	Discipline	Cynicism

entific process effectively. It is essential, but just on the other side of discipline lies this abyss, this quagmire, this Hades known as cynicism.

In its lighter forms it's funny and even somewhat healthy. But in its most concentrated state it becomes a toxic miasma where not even the existence of a soul can be seen. It's a dragon, content only when it has managed to breathe its fire of negativity across the rest of the sparkling universe. And that force of negativity is the handicap that dogs the world of science when it comes to mass communication.

The Core Problem: No Doesn't Equal Yes

So what's so bad about negating? Being known as a tough critical thinker sounds like a good thing. And when you watch a group of top scientists get together and critically analyze a proposed idea, doing what they are best trained to do, it can be an impressive spectacle—like a group of competing alpha males pounding their chests and proclaiming dominance as they grind up what previously sounded interesting.

But it's a different story when you take that behavior out from behind closed doors. What is admired within the cloisters of academia can be horrifying when unleashed on the general public. And that's because the masses thrive not on negativity and negation but on positivity and affirmation.

Don't believe it? Just watch *The Oprah Winfrey Show*. What do you see, day after day? Stories of hope and joy, uplifting, inspirational, fulfilling . . . the kind of stuff that makes scientists want to vomit. But there you have it. Like night and day. Scientists versus the rest of the world.

Just look at the most popular movies. They're mostly inspiring stories of hope. Not a lot of blockbusters that end with the hero plowing his truck into a school bus full of kids.

Now you're thinking, "But science is fun! I've even seen that slogan on buttons from the National Science Foundation. Kids love science. It can be uplifting, too."

Well, yes, in the right hands and presented the right way. But let it not be forgotten that deep in the belly of the beast that is science resides a ferociously destructive force. And what is scary is that the force is both powerful and unifying. Let me tell you about it.

The True Believer

I'm no long-term fan of conservative writer P. J. O'Rourke, but he did nail one of the most insightful essays on the American environmental movement with a piece he wrote for *Rolling Stone* for Earth Day 1990. He gave it the brilliant title "The Greenhouse Affect," and he drove his cynical SUV-like voice right into the heart of the environmental movement, pulled out a bullhorn, and captured the core of the worst side of environmentalism.

What he talked about is the incredible unifying force created by negativity and hatred. Citing Eric Hoffer in *The True Believer*, he said, "Hatred is the most accessible and comprehensive of all unifying agents. Mass movements can rise and spread without belief in a God, but never without belief in a devil." He then recounts the famous anecdote of a Japanese diplomat sent to Berlin in 1932 to study the National Socialist movement. When asked what he thought of Germany's social agenda, he replied, "It is magnificent. I wish we could have something like it in Japan, only we can't, because we haven't got any Jews."

The world of science does have a devil, and that is inaccuracy. Things that are factually wrong are so motivating that I have seen scientists at meetings whom I know dislike each other team up to attack a speaker whose ideas they both believe are wrong. It's the basic "my enemy's enemy is my friend" dynamic inexorably come to life. That's how powerful this force of negation can be. But again, when you bring it out into mainstream society, the dynamics just aren't the same. Scientists have to learn to hide their inner

Frankenstein when in public. Which they normally do. But, thanks to modern technology, glimpses of this cynicism are now no farther away than the screen of your laptop.

The Joy and Bane of the Blogosphere

As I mentioned earlier, an increasing number of scientists have created their own blogs and are now building a public audience for their raw, unedited, uncensored thoughts of the day. And that's great. Blogs are immensely compelling. They capture that unscripted spontaneity, that this-could-go-anywhere energy, that's so important in engaging an audience. Science blogs can attract people who wouldn't naturally sit down and read *The Origin of Species* but who are intrigued by the frank debates about evolution.

Unfortunately, these debates can get more than spirited—they can get really mean-spirited. Much has been written about the overall tone of bloggers in general—not just scientists. Stand-up comic Patton Oswalt described the problem in rather crude terms on the Comedy Central show *Lewis Black's Root of All Evil*:

> Bloggers have taken one of the most essential human activities—communicating—and degraded it to nothing more than electronic poo flinging. No, no, I'm sorry, that was an insult to the fine poo-flinging community, because at least poo flingers take into account wind velocity, aim, and poo density.

If you take an acting class, you'll get a little insight into the dynamics of negativity. In learning to act (which is essentially a form of communication), anger is the starter/entry/first-step emotion that most actors are drawn to.

Our instructor explained to us from the outset that the real goal of acting is to "lose yourself" in the performance—to become so totally absorbed in the character that you basically *are* that character while you're onstage. The part of your brain that keeps saying "I'm acting, I'm up here acting, this is still just an exercise in pretending" finally gets shut down.

We didn't see it happening at all in the beginning. People would do exercises and you could tell they were just play-acting. But a few weeks into the program, people began to have breakthroughs where suddenly something very different and magical would happen. They would dive so deeply into a performance that, when the instructor finally shouted "Scene!" and walked onstage, the actor would look dazed for a few seconds as he or she let go of the fantasy world and returned to reality. The instructor always picked up on those moments and excitedly shouted to the class, "You see, you see—look at this actor! She doesn't even know who she is right now—she fell so deeply into this character she has to shake herself to come back down to earth."

But here's the interesting part. The easiest and most accessible means of finding your way into that world of real acting was through "negative spirits"—basically anger, rage, hatred, bile, screaming, shouting—you name it.

And, to be honest, the simplest piece of dialogue for breaking through was two words, "*Fuck you!*" Night after night we would have to sit and listen to our classmates screaming this over and over again.

We did all those exercises for a year, and then we were ready for the more advanced stuff, including "good spirits"—the exact opposite. That's where we were able to see how harsh the contrast was.

It turns out it's a whole lot harder to convince people you're happy than it is to convince them you're mad. The standard exercise was to receive the news that you'd just won a million bucks in the lottery. You'd be amazed to see how difficult it is to make that moment believable. It's just so much more complex, elusive—hard to even put your finger on it. I only know we sat there night after night watching classmates get the good news and dance around in circles, jump up and kiss their partner, and say, "Yay! Yay! Yay!"—and none of it was the least bit believable.

So here's my take on the blogosphere: the joy and bane of blogs is that the vast majority of their authors are not veteran writers. They are mostly newcomers with little experience in communicating to an audience. And yet

they seek to create a compelling and believable voice—one that many people will want to listen to. They face the same challenge as the starting actor.

It's not surprising, then, that they would be drawn to the same entry point in reaching their audience—the immediacy of anger. The new blogger, I would bet, almost always makes his or her first breakthrough—meaning a post that is widely circulated and talked about—not by extolling the joys of daily life but by cranking up the rage and anger, producing the sort of typical "rant" that draws readers in and gives them the feeling that they are listening to a voice that is speaking the truth (and notice that a rant is also a good source of tension or conflict, making it into a good story for people to relate to).

Bottom line—the blogosphere is filled with introductory students, just like in the acting class—all seeking a voice and trying to write something compelling. Anger is their entry portal.

When I realized this, I began to have much greater respect for the bloggers who have moved beyond the elementary emotions of negativity to the higher plane of good spirits (yet avoiding cloying, syrupy "Kumbaya" blather). They are a rare but highly cherished group. When you combine positivity with the spontaneity of blogs, you get a pretty powerful method of communication.

Positivity and Natural Selection

One very simple notion that Stephen Jay Gould drilled into our heads, in the years I spent hanging on his every word, was that of the basic elements of natural selection. He would say it's a relatively simple two-step process. The first step is the creative, nondirectional phase when offspring are created; the second step is the deterministic, much more directed phase in which the environment selects for those with the highest fitness.

This simple conception for natural selection parallels all the two-step/birfurcating/duality phenomena I've described. And it's especially similar to the creative process and the scientific method in general.

When you have a problem to solve, you undergo the same process. First you brainstorm in a totally uncritical, nondirectional way in order to think of all the possible ways you can solve the problem. The more uninhibited you can be, the better the chance of coming up with something brilliant.

Then you enter the second stage, in which you select the ideas that are reasonable. It's basically positivity followed by negativity. And it works well, provided you keep the two separate.

But the positivity stage—the creative stage—is the most vulnerable part. And that is where negativity can wreak havoc. All you need is one person in a brainstorming session who starts saying, "Oh, that's a stupid idea," to immediately constrain the whole creative process. This is when lateral thinking gets inhibited. This is what produces the "typological thinking" that bedevils so many taxonomists—the idea that all species within a group have already been described, and therefore any variation from the established types is simply abnormal rather than a valid description of a new species.

It's a sort of closed-mindedness. And that's what negativity can lead to. Of course, excess positivity can lead to flakiness, but that's way over in the other direction.

All the truly creative scientists I've ever known have had a wonderful aura of positivity around them. They are creative, they are able to discover large ideas, it's a very positive process, and in the end, if you really think it through, you'll realize . . . it's not that different from improv comedy. Just a whole lot of "Yes, and"-ing at work.

The Interview Dilemma: Yes versus No

We now have these two giant forces—the positivity of spontaneity versus the negativity of critical thinking—that seem to be in opposition to each other yet are both crucial to communication. This may leave scientists in a quandary over how to present themselves to the public, particularly when being interviewed.

Should they be the designated driver and make sure not to commit mistakes? Or should they be the fun, lively, go-with-the-flow "Yes, and" good sport who is the life of the party? The former runs the risk of coming off as an unlikeable grouch. The latter can be an absolute disaster, allowing the interviewer to tell the world that global warming will cure cancer and make everyone's lives wonderful.

The solution is, once again, partitioning. Just as natural selection has two phases, just as creativity has two phases, just as science has two phases, so can the interview subject. The bobbing and weaving between modes can create texture and complexity in the interview, instead of it being one-dimensional. A question is asked, the answer begins with a spark of spontaneity—a set of possible answers—and then discipline is imposed.

Q: What do you think caused the dinosaurs to go extinct?

A: Lots of ideas—could have been an asteroid, could have been climate change, could have been too much television, maybe they just got bored, I don't know, but there is a lot of evidence to suggest that one hypothesis is the most logical, which is . . .

There are ways to modulate the answers.

So Are You Telling Us to Get a Hollywood Makeover?

If being unlikeable is a bad thing, then the obvious question is "How can we be more likeable?" I, of course, spent time in acting classes listening to the instructors talk about what makes characters more likeable, and everyone from the beginning of grade school thinks about what makes someone more popular than others. So should scientists just get a makeover and tell everyone what they want to hear?

This question comes up at many of the *Flock of Dodos* screenings, and I see it discussed on blog discussions of the movie. A number of scientists have implied that I'm suggesting that all scientists spend time in Hollywood, take acting classes, and buy new clothes. That's not what I'm saying at all, but

it's entertaining to listen to these conservative voices in the science world. They vocalize the ever-present forces opposing change. And it's fun to see them be wrong. Just take, for example, the way scientific presentations have changed over the years.

The Blue Slide Pioneers

I attended my first scientific talk in 1976. Back then, all scientists made their own 35 mm slides for their presentations by drawing graphs on white paper, placing them on a photo stand with lights and a camera mount, and photographing them on standard 35 mm film. The result was projectable slides that looked just like the artwork—black lines and text on a clean white background. But then someone discovered a new way to do it.

It was called diazo processing, and it produced white lines and text on a soothing blue background. Scientists began showing up at meetings and giving talks using these slides, which looked so different. And I distinctly, distinctly, distinctly remember hearing the first responses to them.

Specifically, Jim Porter, a coral reef ecologist from the University of Georgia who was a very flamboyant and lively speaker, was one of the first to use them in my field of marine ecology. I remember standing in the lobby during the East Coast Benthic Ecology Meetings at the University of Maryland in the spring of 1978 and listening to a group of scientists quietly cursing the man—calling him a showman and a huckster and asking, "Who does he think he is?"

It might as well have been a group of church elders fretting over a youngster who was combing his hair the wrong way. Same mass conservative behavior. Everyone subconsciously or consciously attempting to make sure nothing ever changes, regardless of whether it's an improvement on the past or not.

What's funniest for me is that—I guarantee you—*all* of those scientists assembled that day, and at many other meetings where I heard the scoffs of

skepticism, are today using the standard PowerPoint slides, which have that same soothing blue background with white letters.

Things do change, but scientists are for the most part programmed, all else equal, to resist changes. And it's particularly difficult for them when it comes to the changing dynamic in communication between substance and style.

Today, Style Is the Substance

It's now time to delve into the core conundrum faced by the world of science. There are many books in the field of communication theory that address this, and I don't have the space or interest to discuss them all here, so I have only one book to point you toward. But it's a good one.

Richard Lanham, in his 2006 book *The Economics of Attention: Style and Substance in the Age of Information*, provides a basic catchphrase—that today "the substance is style." Those are words to live by. What he means is that for every given message there are the same two parts we have discussed—the objective and the subjective, the substance and the style—only he refers to looking *at* the message rather than looking *through* the message. He is pointing to the difference between getting caught up in the style of what is communicated (the "at") and being able to get past style and into the substance (the "through").

Scientists do a good job of looking through the message, into the heart of the substance that's being communicated. But most people never get past the "at" part.

The amazing thing about scientists is that, if you went to a scientific meeting and a speaker got up dressed like a clown, the scientists in the audience, along with everyone else, would initially focus on looking "at" the appearance of the clown. But if the clown began talking about important discoveries and suddenly reexamined a hypothesis in a new and important way, the scientists would be able to get beyond looking "at" the clown and would

actually look "through" the clown's appearance to hear the substance of what was being said. And if it were true and correct, the scientists would have no problem having a serious discussion with the clown afterward. Seriously. I swear this is true. All you have to do is go to a scientific meeting and see some of the weird people (and I say this lovingly). They might as well be dressed as clowns.

There is one very famous scientist who for decades has dressed like a homeless person, maintained an unkempt beard, and picked his nose unashamedly *during* his talks to hundreds of scientists. Over the years his audiences have just gotten used to it. The man is brilliant. There's no more reason to focus on his nose picking than to get hung up on Stephen Hawking's computer-generated voice. Scientists know how to do this. It's sort of the upside of being literal minded—the ability to focus only on what matters.

In contrast, going back to the clown, members of the general public would never get past looking "at" his appearance. Later they would talk about what a fool he was. End of story. Didn't matter what was said. Never got past the big red nose and floppy shoes.

That's the difference between substance and style. In today's world people's minds are cluttered with excessive information. As Lanham describes it, we live in an "attention economy," in which the resource in shortest supply is people's attention. Given such a circumstance, your message means nothing if it isn't noticed. And that just takes us back to my earlier discussion about "arouse and fulfill." It's the same thing—the need to arouse is the same as the need to gain attention. Without it, you're spinning your wheels.

This is where unlikeability can sometimes come into play. It's entirely possible to use it as a tool to gain a certain (albeit limited) amount of attention. You can stand up and insult a room of people, and if you're quick to turn it into a joke, you can actually do a good job of arousing them to what you have to say. But there's a big difference between using a tiny bit of unlikeability intentionally as a tool and just plain being unlikeable.

All else equal, unlikeable traits are simply things to identify and then avoid.

And now I shall launch into the most important element of what I have to say, which provides the synthesis of the previous sections.

That element is . . .

Likeability

The tide goes out; the tide comes back in. The tide has been going out for a long time in this book. It's time now for it to ebb and reverse direction.

I've told you about all the ways scientists, and academics in general, can go wrong in trying to connect with the broader audience. And there are surely plenty more ways I haven't even begun to touch upon. But there comes a time to end the critique and answer the question, "So what do you suggest we do?"

Let's start with the idea of being likeable. And I don't mean telling people what they want to hear (though sometimes that can be a good idea) or being a sycophant. Those pathways are too direct.

Likeable Electoral Candidates

So who are you going to vote for in the next round of political elections? Will you read the speeches of the various candidates, figure out exactly where they stand on the issues you believe are most important, and assess their leadership skills? Or will you just vote for the one you like best? Maybe vote for the man or woman you saw in television ads who sounded like a pretty decent and level-headed politician. The one you . . . liked.

This is one of the themes presented in *Freakonomics*, the hugely popular book by Steven Levitt and Stephen Dubner. They talk about the widely held belief that, because of the huge amounts of money spent on political campaigns these days, some people believe it's as simple as whoever raises the most money wins. But Levitt and Dubner put this assumption to the test.

They looked at a large number of cases where two candidates have run against each other twice. Just as with William Jennings Bryan, who lost the U.S. presidential election to William McKinley in 1896 and then ran against him in 1900 and lost again, there are many cases where the loser again runs against the same incumbent.

They examined only the instances in which the loser spent more money the second time around, and they found that it made no difference. Money wasn't the factor. Likeability was. When the public doesn't like someone, no amount of money is going to get that candidate elected.

Bubba and Teflon

And, of course, what is the ultimate example of the importance of likeability? For the past three decades, it was Presidents Ronald Reagan (the Great Communicator and the Teflon President) and Bill Clinton (Bubba). Both of them set the standard for likeability in America, and both had an ability to evade the facts of a situation simply by using their charm and charisma.

We'd like to think the general public is so interested, so analytical, and so savvy that they can devour all the long-winded speeches and arguments they are presented on given issues. But they're not. And by "they" I mean myself included. We're all too swamped these days to be able to read and analyze everything.

When the information reaches excessive levels, as Richard Lanham reviews in detail in *The Economics of Attention*, there comes a shift from substance to style—the only way to deal with the "information firehose," as he calls it.

Likeable Lawyers

Of course, this phenomenon isn't limited to politics but can be seen in every area of life, including the courtroom.

My elder brother is a lawyer in Montana, in charge of training the state's public defenders. I sent him an article from the January 2006 issue of *Esquire*

magazine that he still uses in his workshops. It's titled "The Drowsy Dozen," by Chuck Klosterman, who argues that the time has come to get rid of the silly, idealistic, antiquated notion of "a jury of peers" and replace it with a system of professional jurors.

He says this because he's sat on too many juries in which two weeks of detailed testimony is presented on forensic science, fiber analysis, DNA testing, and all sorts of other sophisticated science that sails right over the heads of the jurors. At the end of the two weeks the jurors sit in the jury room, totally lost to the science, and end up making their decision on the basis of which of the two lawyers they found most convincing, trustworthy, authoritative, and, basically . . . likeable. Bottom line, they opt for style over substance.

Snap Judgments

Lacking the time and energy to evaluate the information being presented, people end up evaluating the presenter. They are no longer able to transcend style to get to substance. As Lanham says, style becomes the substance.

By the way, the decision of whether you like or trust someone happens very, very quickly. In *Blink*, Malcolm Gladwell cites Nalini Ambady's work on "thin slicing," which focuses on the accuracy of judgments people make based on only short clips of video. She and her colleague James Rosenthal gathered ten-second clips of professors teaching and had students watch and evaluate the professors on a series of standard variables—is the professor warm? enthusiastic? interested? well organized?—as if they were filling out student evaluations for an entire semester. When they compared the results with evaluations made by students who actually did have the instructor for the semester, the correlation was 0.76, meaning that a judgment made in a few seconds was about the same as one made over several months.

Scientists would like to think that people base their opinions about others on a thorough job of getting to know the "reality" of who they are. The harsh truth is that opinions are mostly based on the quick "perception" of

who they seem to be. And this means that simple, superficial elements—such as picking your nose or wearing clownlike clothes—can be extremely important.

Yes, that is today's world. I'm sorry to be the bearer of such news, but likeability is a very important factor. And let me tell you about my own experience with likeability in the television world.

The Power of Jack Black

I mentioned earlier that I wrote and directed a television commercial (or public service announcement, PSA) with twenty comic actors, including Jack Black. He played the lead role as the conductor of our bad symphony for the oceans. When I finished editing the PSA, I hired a distributor, who packaged it, sent it off to 1,000 television stations, and then provided us with "tracking statistics" showing where and when it aired across the country.

Figure 4-1. Comic actor Jack Black turned in a splendidly silly performance as conductor of the *Ocean Symphony* public service announcement in 2003. His likeability factor was as big as his eyes. Photo by E. Schmotkin.

The PSA proved enormously popular, airing on roughly 350 stations for a total of well over 30,000 showings, generating more than $10 million in free airtime (television stations choose a select number of PSAs and broadcast them for free).

Our distributor randomly chose a dozen stations that had aired the spot and then contacted them and ran them through a simple questionnaire. The main question was "Why, given the huge number of PSAs that you receive and the small number you can air, did you choose this one?"

For nine of the twelve respondents, the answer was not that they chose it because of the importance of its message, or the relevance of its message to their viewers, or the effectiveness of its message. No, those are all criteria that would have involved the substance of what we produced.

To the contrary. Nine of the twelve respondents said, "We aired it because we liked it."

It was that simple. They popped the tape into their VCR (it was still pre-DVD days), they watched it, they all laughed, they all agreed they are big fans of Jack Black, overall they liked the spot, and so they aired it.

Now compare that result with the PSA produced by the Less Than One campaign, mentioned in chapter 1. That PSA had a dark, gloomy tracking shot of a bulldozer in a landfill pushing a mountain of garbage. As it faded to black, you heard gurgling of bubbles underwater and the narrator saying, "That's what we're doing to our oceans."

I spoke with a PSA programmer at a television station in Los Angeles. He said they received that PSA, they watched it, they said to themselves, "Our viewers don't want to see that sort of dark and gloomy message on their TVs," and they threw it in the trash. Literally.

The likeable PSA scored over $10 million in free airtime. The unlikeable PSA scored virtually no free airtime.

Am I proud that I had to stoop to making a silly bad symphony for the oceans with comic actors in order to get my message on television? Not really. It's a shame that our society has changed from the 1950s, when the NBC

show *Watch Mr. Wizard* played to millions of kids and inspired more than 50,000 Mr. Wizard Science Clubs. But things have changed. We live in a new media environment, with different rules. And those rules make the conveying of substance harder than ever. But not impossible, if you're willing to learn the basic constraints of the system.

So What Makes Someone Likeable?

If likeability came down to a formula, scientists would figure it out and be the most popular people in the world. Of course, it's far too subjective for that. But we do know likeability is inextricably tied to elements arising from those lower organs—humor, emotion, passion.

And you can't overlook the overall role of fun. Edward Castronova makes this point in his recent book *Exodus to the Virtual World*. In a speech, he said, "Fun is a societal element that governments have yet to fully appreciate." If you can create an atmosphere of fun, there are no limits on popularity.

In the end, it is these human qualities that can reach beyond "the choir" of those who are interested in science no matter what. They can be incredibly powerful in mass communication. And, even as the new media environment has, in many ways, made communicating substance harder, it has also opened up new opportunities.

In the old days, scientists were forced to keep their heads low, their noses to the grindstone, doing their humble research and quietly awaiting the day when a journalist would knock on the door of their laboratory and ask them to explain their scientific work to the world. But that day is now over. New technology has brought about many changes in communications, and in the world of science this could prove to be one of the most profound developments.

With the advent of such innovations as blogs, video technology, and YouTube, a new day has arrived for scientists. No longer do they have to sit quietly awaiting that visitor from the media world. They can themselves "be the voice of science." And this is the subject of the final chapter.

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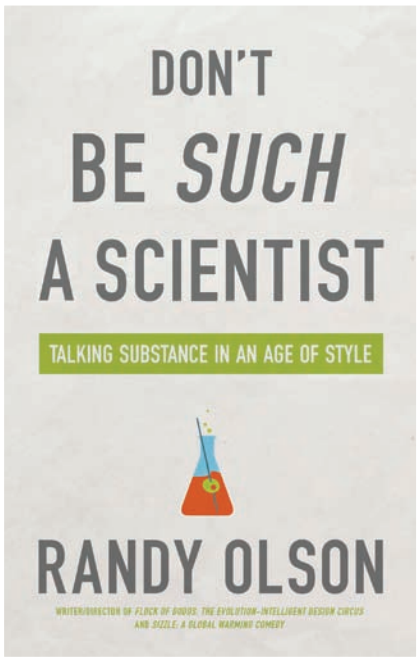

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Don't Be Such a Scientist

Randy Olson

Most scientists don't care how they are perceived, but in our media-dominated age, style points count. In *Don't Be Such a Scientist*, science professor turned Hollywood filmmaker Randy Olson shares the secrets of talking substance in an age of style.

The key, he argues, is to stay true to the facts while tapping into something more primordial, more irrational, and ultimately more human. You'll laugh, you may cry, and as a communicator you'll certainly learn the importance of not only knowing how to fulfill, but also how to arouse.

Randy Olson

Randy Olson earned his Ph.D. at Harvard University and became a professor of marine biology before moving to Hollywood for his second career as a filmmaker. Since obtaining an M.F.A. from the University of Southern California School of Cinema, he has written and directed the critically acclaimed films *Flock of Dodos: The Evolution-Intelligent Design Circus* and *Sizzle: A Global Warming Comedy*, and co-founded The Shifting Baselines Ocean Media Project, a partnership between scientists and Hollywood to communicate the crisis facing our oceans.

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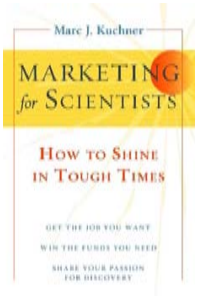

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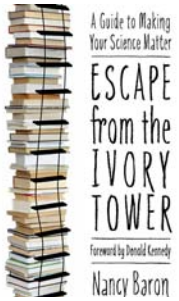

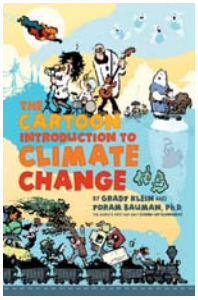

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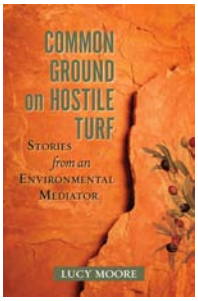

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