



EMORY
UNIVERSITY

Creativity Conversation

Transcript from a conversation between
E. O. Wilson and Rosemary Magee

October 23, 2008

Emory University
Atlanta, GA

As part of an ambitious strategic plan, Emory University has developed a university-wide Creativity & Arts Initiative that seeks to integrate the arts across the educational spectrum, foster an environment of creativity, and contribute to the world of knowledge and culture. Emory is fully committed to a liberal arts education that forges both new connections and new ways of seeing.

Emory University Creativity Conversations

E. O. Wilson and Rosemary Magee

October 23, 2008

Eley: Welcome to this creativity conversation with Rosemary Magee and E.O. Wilson. My name is Bill Eley. I am fortunate to introduce this conversation today. I work in medical education in the medical school, but the reason I'm here is I've had the great fortune of working with Rosemary Magee, Bobby Paul, Tom Jenkins, Leslie Taylor, and others on our Creativity & Arts Initiative, of which this is a part and I might say a very successful part.

Before I introduce our participants, I want to say a little bit about the series of upcoming activities. Emory's Creativity & Arts Strategic Initiative and the Center for Creativity & Arts along with others are joined with Emory's Computational and Life Sciences Initiative to bring you this event and a series of activities over the course of the next day and through the academic year. For more information, obviously look at the website, <http://www.emory.edu/evolution>. These events are in part the bicentennial of the work of Charles Darwin and the sesquicentennial of the publication of the first edition, *On the Origin of Species*. We are marking these anniversaries by exploration of current understandings of evolution as theory in process, not just in sciences, but across a range of fields and activities. Darwin's theory of evolution and the broader context of evolutionary theory are now critical elements of our explanation of all life, behavior, and the course of nature. In considering evolution, speciation, selection, environmental influences, we have an opportunity to think about what we do as educators and try to overcome some of our own institutional barriers that sometimes inhibit new thinking. To tell you one example, the events over the course of this year have been developed to help scientists and artists to be in conversation in new ways. These are sponsored by Emory's Center for Creativity & Arts. In another example, these events offer an opportunity for Emory to expand its partnerships with secondary education. We welcome secondary school science teachers who have joined us here today to develop new curriculum in the life sciences. In the future we hope to develop more public activities around evolution and welcome input on how to proceed.

Now, let me introduce our featured speakers. Most of you know Rosemary Magee. She's our Vice President and Secretary of the University. She earned her Ph.D. in religion and literature from our own Graduate Institute for Liberal Arts.

Dr. Magee has served in numerous capacities in our senior administration and teaches in our creative writing program. As co-chair of Emory's Creativity & Arts Initiative, she's helped launch a number of new programs across the University and has developed one of the most engaging, this series of creativity conversations. Her conversation partners so far have included Salman Rushdie, Seamus Heaney, and Umberto Eco. And coming up on November 5th, this is an advertisement, at seven o'clock in the Carlos Museum she will interview Emory's own Pulitzer Prize winning poet, Natasha Trethewey, and Emory professor of music, Steve Everett, whose musical composition, *Ophelia's Gaze*, based on Professor Trethewey's work, will be premiering at the Schwartz Center on November 15th. To finalize my unabashed promotion of this series I'll refer you to a handout in the back.

It's our special privilege today to hear Rosemary Magee in conversation with someone who can be legitimately called Darwin's heir. E. O. Wilson has an extraordinarily propitious intellect. He's helped to transform our understanding of nature and of ourselves, and through his eloquent writing he has reached audiences throughout the academy, but I also think as importantly the public at large. He earned B.S. and M.S. degrees from the University of Alabama, his Ph.D. for biology at Harvard, where he has taught for many years and is now the Pellegrino University's Research Professor Emeritus. He is recognized as one of the world's greatest living scientists. He has discovered hundreds of new species and perhaps more importantly, has urged us to consider the thousands of species yet undiscovered. He is often referred to as the father of biodiversity. He's won numerous leading scientific prizes including the National Medal of Science and the Crafoord Prize of the Royal Swedish Academy of Sciences. He's the author of more than 20 books, two of which on human nature and *The Ants*, with Bert Hölldobler, won Pulitzer Prizes. His most recent book, *The Creation: An Appeal to Save Life on Earth*, along with other works will be on sale this evening following his talk at Glenn Auditorium.

It is indeed my honor on behalf of our University and our community to welcome our speakers and our audience to this conversation on creativity. Thank you very much.

Magee: Dr. Wilson . . . Ed, if I may . . .

Wilson: (southern accent) Ed...

Magee: (attempted southern accent) Ed... Okay, I've been practicing -- *Ed*. That was a great introduction. It's an honor to have you back on the Emory campus. We had an opportunity to speak just in May when you received an honorary degree from Emory, so we consider you one of our own. Bill gave a great introduction, however, he missed one piece and that is that your most recent book is actually *The Superorganism*, on termites, bees, wasps, and ants. And so that leads me to

my first question for you. Poets have talked about ants. Robert Frost referred to ants as a curious race. Ogden Nash has a poem about an ant who made herself illustrious by constant industry, and you've written this new book and have started your career with ants. Tell me, what is the fascination with ants? Can you explain that to me?

Wilson: Ants are real cool. Well, let's start with saying that -- noting that they're the dominant insects. I think even though there are only 14,000 species known and there are a million species of insects known, ants all around the world make up about 15 to 20 percent of the biomass. They really dominate the world. They have for 100 million years. They are the principal turners of the soil. They beat earthworms there. They are the principal predators of little creatures. If there were no ants you really would see bugs. They are our principal scavengers. They're the cemetery squads of the world for little creatures, and they are among the main balancers thereby of the land ecosystems.

But there's something else about ants that should be of interest to scientists and to everyone, and that is that they are the other pinnacle of social evolution on this planet. Their societies are extremely highly developed and sophisticated. They represent a form of social life so different from our own, so advanced that it might be the kind that we would expect to find if we did encounter advanced social existence on another planet. They, for example, differ in the way they communicate. We are the most audio/visual creatures on earth. That's one of the peculiar things about people they don't know. I mean we can't smell anything worthwhile. We can't hear very well. I mean look at elephants and bats talk without our ever being able to hear them unaided and so on. And they are much closer to the commonality of life on earth, which is primarily 99 percent chemical in their communication. They do -- everybody does it but us -- by pheromones. And ants have carried it to an extreme length. Ants, we discovered, starting back in the '50s, use somewhere between 10 and 20 kinds of pheromones, each with a different meaning. Substances they release from their bodies -- that ooze out of their bodies, each has a different meaning, and they can be combined and even produce something like syntaxes. And they can be put out in different concentrations so that one concentration means one thing and another concentration means another thing and so on. They speak and therefore they are totally different. It's impossible for us to think of how an ant thinks.

And finally, I saved this for last, Rosemary, all ants' colonies or the population of all ant colonies are female. They're the ultimate feminist society, so if you want to see where we're headed, what could be the ultimate--What about males? Because all the ants you see are all females. But of course most of them are sterile. They're in the service of a queen somewhere. I should say they're supporting a queen somewhere down in the ground usually. And so, you were asking me what happened to the males. Well, males are manufactured by the colony once a year for a very brief period of time. They're total parasites, the ultimate layabouts.

They never do any work. Never. And they're just supported by their sisters for a short while, and they have just one function in life. Now, in this group am I allowed to go further?

Magee: You can tell whatever you like.

Wilson: Well, you can see from their anatomy, if you ever catch a male ant and look at it, they're winged, but most importantly about them is that they have huge eyes for orientation and finding females. And they have tiny mandibles, jaws. They can't take care of themselves. They have to be fed by regurgitated food. They have large genitalia and they only have one form of behavior and that is during the wedding flights when all the winged ants come out and the young virgin queens are mated so that they can drop their wings and start a new colony on their own, that's the only time the males come out and do anything. And essentially what they are is guided sperm missiles. They mate once. There are huge numbers of males usually fighting over one female. Only one succeeds, but whether you succeed or not, there's only one thing you're programmed to do after that -- die. Well, you're not allowed back into the nest, and you're just expected to die, so you die. So, I'd say we belong happily to an egalitarian mammal society and as a bumper sticker in the South used to say about gods, guns, and guts, let's keep it that way.

Magee: Well, you've convinced me on the feminist critique here. Your life has taken some interesting twists and turns. As I understand it, when you were a young boy in a fishing accident you suffered damage to your eye. You initially were interested in flies. When you went to sign up for military service, you were excluded because of your eye injury, and so you ended up going to the University of Alabama. And after other twists and turns ended up as a professor at Harvard. So, how is it that a young boy from Alabama ends up as a famous scientist? Is it free will, predestination? Is it fate, natural selection, adaptation, or just plain luck?

Wilson: All of the above. It sort of helped that I was a geographical minority, I think, when I applied to Harvard. I was at the University of Tennessee. I thought that was the end of the line. I'd get my Ph.D. there and then I'd go home. But I got an invitation to apply to Harvard, and, I think, up there the admissions, this was 1951, they were saying a young scientist from Alabama? Well, that was the first wave of affirmative action. But mainly, Rosemary, to be semi-serious, I had a passion. I developed a passion as a kid for nature, for natural history, for getting out, for understanding and seeing everything, studying everything I could find out there. I loved butterflies, snakes. I guess part of the reason was, too, that I attended 16 schools in 12 grades because my father was always wandering around. He was an auditor. I never figured out and it was too late to ask him before he died why he kept changing jobs. I think it was because he was in a branch of government where you travel a lot. So I never had a lot of friends. I had a buddy or two somewhere or other, but generally speaking I was forced out and I

found a whole world of wonderful things in nature. And while I'm up on the soapbox saying that, I don't expect young people to spend that much time exploring natural history on their own, but I think like a lot of educators I expect them to spend a little time. I think that we are at a period in our society, in our history, where we've gone indoors too much and that's true for young people, especially in that sensitive period of their development when they could broaden their vista, their experience, their emotional resources to include the natural world.

Bear in mind, and here I get into really troubled ground for some parts of this country, but it's 5 million years since our line split from the chimpanzee line right up to practically the last instance of time, 10,000 years of Neolithic evolution in agriculture, kids learned and lived in natural environments. They had to, to survive. They had to be learned how to hunt. They had to know how to gather their food. They had to know large numbers of different kinds of organisms in order to survive; what could kill them, what could provide food, what could provide shelter. That was for millions of years. And that affiliation to nature, which I like to call biophilia, is manifest in many ways now in our preferences.

For example, our selection of habitation. It reflects, most now agree who study it, our African savannah origins; namely, when we have complete freedom in selecting a place to live, unlimited money, unlimited choice, people everywhere, and it's cross cultural, people select three features. They want to be on a prominence, up a little bit. They want to look out over a savannah, we'll call it park, and with a grassy area with scattered trees and copses. And they want to be next to a body of water. And they will, among the high-income people, the ones that will be paying the taxes and the next administration, they will pay any price to get that even though it has no practical application. In fact there's so many things that we do that really are rather irrational. They're part of human nature. And to come full circle back and actually answer your question, I think I had the great good fortune of having that Paleolithic education. Many of you will know a book called *Last Child in the Woods*. It's worth reading about what we're missing. And to people who say, oh well, it's okay to grow up indoors in the suburbs and cities because people are perfectly happy, I would say cattle in an Abilene feed lot are perfectly happy, but they're not really developing as a complete manner for their species. And we're not developing as a complete manner for our species that brings the happiness and fulfillment that is our birthright. And so, I'm pleased to say that there was even a resolution before Congress, I don't know if it passed, fairly recently, which was called Leave No Child Indoors. I hope I've given now an idea of why I came out of the backcountry of Alabama determined to become a scientist who spent his life working on nature.

Magee: And we're glad you did. So, really you're a naturalist who turned into a biologist who turned into someone who explores the boundaries of biology and its interface

with other disciplines. And in fact you've written about the search for the unification of knowledge. So here we are at a university. You work at another university. There are many departments in our universities and many divisions, if you will. And within those departments and divisions there are more disciplines and divisions and so forth and so on. How practical and plausible is it really for us to search for the unification of knowledge?

Wilson: I'll talk a little bit about that tonight, Rosemary, but sure that was the subject of the book, *Consilience*, which was published 10 years ago, to explore this. It was kind of a daring idea then 10 years ago that we could unify the disciplines, the great branches of learning: natural sciences, social sciences, humanities. Unify them along their borders across what can be called the borderland disciplines, which are now beginning to proliferate particularly along the edge of biology. And then from the social sciences side in fields like cognitive psychology and biological anthropology and so on, are bridged disciplines, and they're beginning to meet halfway across the divide between the great branches of learning, the former deep chasm with fields like neuroscience and human genetics and sociobiology. It's an exciting time to recognize that the supposed divisions between the great branches of learning that actually began in the medieval times and persist until today are not natural boundaries. The famous line that C. P. Snow articulated between the sciences and humanities are not epistemological boundaries—they're not a Hadrian's Wall built by the humanities to defend it against the barbarians of science. They are, in fact, what they're not at all—a true division. What it is, is a very difficult to enter, almost inaccessible up till now, broad domain of unexplored phenomena having substantially to do with evolution, the nature of mind, and the nature of creativity. Hence, good for you for having this seminar and that we are beginning to realize where knowledge is headed, that is, the acquisition and the teaching of knowledge is headed, to include these borderland disciplines and to build programs around them along with traditional disciplinary agendas and programs. And that it is here that a lot of the most exciting research and learning is going to occur.

It has to do with the great questions of the nature of mind and what human nature is. What is human nature? That's a question we've never, almost never tried to address face to face. And when we finally work out where we came from, who we are, how the mind works, why we behave in the way we do, why we have certain kinds of aesthetic preferences, and other fears and phobias and all of this great *mélange* makes sense in terms of our history, then it seems to me that we will be approaching the original re-returning and re-approaching the original goal of the Enlightenment, which gave way before romanticism and just the incompetence of disciplines then to address the key issues. And we will actually begin to start asking in our education and in our research the great questions that, if you may recall, Paul Gauguin scrawled on his canvas of his Tahitian masterpiece, what was his final contribution, and it was boldly said: Where did we come from? Who are we? Where are we going? Or as another French writer put it later very well, all of

humanity's problems come from the fact that we do not know who we are or what we wish to become. Those are the great questions I think ought to be addressed like a drumbeat in our universities and in education in the future.

Magee: Let's talk about human nature since you raised the topic. We see around us much evidence of disarray, chaos, confusion, violence at times, and yet you seem -- we talked a little bit about this at lunch today -- you seem to be very optimistic about the human prospect. What do you think are the essential qualities of human nature that through evolution -- or whatever other explanation people might provide -- are the essential qualities of human nature?

Wilson: I'll try defining it for you if you'd like.

Magee: That would be great.

Wilson: That'll be just an old thing. Human nature, what is human nature? Human nature is not the genes. They prescribe the properties of human nature. Human nature is not the cultural universals, which anthropologists love to list; the things that all societies do like hierarchical arrangements, chiefdoms, taboos, the same rights of passage. Even, as it's now being pointed out, the one common quality of all religions is, maybe it's not a surprise, the Golden Rule. Every one of the religions of the world has something like the Golden Rule. That's not human nature. Those are the products of human nature.

Human nature is the ensemble of epigenetic rules, which are inherited. And these epigenetic rules -- epigenesis, as you know, has to do with the programs that lead to development of properties, whether they're anatomical or behavioral. And the epigenetic rules of humanity are essentially those sets of prepared learning and counter-prepared learning, and some fairly rigidly prescribed reflex actions that all together make up what's unique about humanity. That is, we have predispositions to learn certain things. Certain things are very pleasurable. We pick them up quickly, some automatically. We're practically driven to pick them up, for example, language, or a little less so, but nonetheless very powerfully developed--like phobias. Our phobias and intense aversions to certain things are those that were the big dangers to our ancestors over millions of years. So, we, for example, quickly pick up a phobia against a snake, an insect, being in a too-tight space, running water, heights. . . you know what the phobias are. Everybody knows about them, if they don't have one or two. And we do not develop phobias about the things that nowadays really kill us, which are knives, guns, speeding automobiles, and so on. We can just get in one near fatal incident after another and then go right back and be doing the same thing in six months. But all you have to do, as a particularly young person, have a snake wriggling in the grass and someone say, yeow, get away, get away, there's a snake there. And you actually could have a phobia thereafter. It's amazing.

Well, if you go on down for more-or-less trivial ways in which the mind develops, it's built to develop. And we can announce them if we can explain how they came about, and eventually we can understand their genetics and what the programs actually are -- and the way the brain is wired and our learning capacity connected with them -- you'll have a complete account of human nature.

Magee: Aren't there some things that are outside our ability to explain? Again, we talked a little bit about that earlier today, certain mysteries of the world that -- even as we explain yet another phenomenon or another behavior or another process -- somehow are always outside our ability to explain.

Wilson: Yeah, we've talked about this before just recently, and what is science? Science is just what we really know about the world that we can experience, share, test, and know. Will science finally explain everything? I don't think so because that's the equivalent of saying will there always be things that we can't explain or we can't explain except in the greatest term -- I mean a term of greatest scale, space, and time. We'll never be able to be precise in explanations of endless kinds of phenomena. I think, for example, we'll be able to predict human behavior and social behavior a lot better than we're doing it now in time, but never very precisely. And as far as the physical sciences are concerned, I think it was Einstein that says God does not need mathematics, he counts. And only by counting, presumably, and then what good would that do you when you get down to particle physics and quantum events because you can't really predict all of that. Only then could we really predict well into the future anything, and we have no ability to predict much of anything at a very small space, time, level from previous knowledge.

So, there will always be areas that lie ahead. There will always be the horizon and the next mountain ridge that you can see vaguely through the clouds, and we'll head in that direction. And I say to that, good, because the part of human nature we haven't really got a grip on understanding it very well is our desire to explore and to expand. From our history as a species, we are the most expansive species probably ever in the history of life. That is, a species that started in one place that was parts of Africa and did so well that it expanded and didn't stop until it had populated every island in the world virtually and all of the continents and so on. And what our ancestors were doing then was multiplying rapidly as they were expanding. And there was an enormous genetic, Darwinian advantage to have that drive to explore because those who explored, those who took off and kept going into the next unoccupied territory would multiply there, and they would leave more of their genes and so on around the world. And the drive to explore then can be linked to our love of mystery; that we always want to find something new, to go to some new place. And if we can't do it right away on earth, we want to go to it on a planet somewhere. And that's what our dreams consist of. We dream of new worlds and new places to explore and understand, and the scientist dreams of great discoveries in areas that will be full of surprises.

And in our conversation at lunch, we talked about will there ever be a limit to what human beings can know and shouldn't we just slow down maybe. One thing we could do is take it easy and try to live with what we know and have, and be content. The answer is, absolutely not. The human spirit and the love of mystery and the need to constantly explore I like to express all together in a bundle of the image of Icarus, the son of Daedalus, who against the advice of his father, he had his wax wings, tried to see how high he could fly. Well, he could fly all the way to the sun, and of course he got too high, and the wax melted on his wings, and he fell to the ground. And so, the charge to humanity, at least the charge to scientists -- call it arrogant if you will, they're thrusting, ambitious, never, never easing up - - is let us see how high we can fly before the sun melts the wax of our wings.

Magee: Well, speaking of great explorers, let's talk for a second about Darwin. You said that from Copernicus we learned that the earth is not the center of the universe, from Darwin that humanity is not the center of creation, and also from him about the astounding power of the natural creative process. You've edited a collection of Darwin's works, and I'd like you to talk a little bit about this astounding power of the natural creative process that you refer to in association with Darwin.

Wilson: Tonight, Rosemary, I will. The main part of my talk tonight will be an introduction to Darwin and Darwin's great books, and I'll try to explain how I see the story of Darwin as kind of an epic of a young man who progresses in different stages of thought ending up in the fourth of the four great books, the *Expression*, the proto psychology, *The Psychology of the Expressions of Emotions in Man and Animals*. Well, the reason for the enormous importance of Darwin was -- and I remember that Charlie Rose interview I had with Jim Watson a couple of years ago -- Watson and I started talking about it, and we finally ended up agreeing: Charles Darwin is the most important person who ever lived.

Now, for that bold statement, and I know many of you are thinking, well, what about that fellow in Jerusalem? Well, that aside, why should that be the case? Well, up until Darwin it pretty much was agreed that religious myths of the origin of humanity, which of course differ from one religion -- even one denomination -- to the other, were the explanation of humanity. That we were created by gods that put us on earth pretty much in this form, that we're to rule upon the earth or at least rule over our territories. And that all seemed to work because it certainly satisfied what could be called the deepest craving, the deepest emotion of humans of all and that is tribalism. That is the strong desire to have a group that you feel allied to by blood perhaps, but certainly by belief and by common gods. And so, that persisted.

And what Darwin proposed turned everything upside down, and that's why it seems so unacceptable. He said, no, humanity is self-produced, life is self-produced by the process of constant, random genetic change, although he didn't

use that word, shaped and selected by natural selection. And now we know from a more modern view that with the few thousand genes and several billion base pairs, any given species is having a constant flow of new mutations arising and being tested. And these mutations aren't just substitutions of base pairs, but they are things like the duplication of DNA sequences, of by ploidy, by duplicate, you know, the addition of the same segments in the same chromosomes by translocation and so on. In other words, the genetic code is constantly being altered by accident, and this is something we understand very well now. And it's inevitable -- this is the most fundamental law of it -- inevitable that some of those combinations create traits that do better than other combinations. The ones that clearly do badly are the ones that are called genetic disease. I mean to take the extreme example. And that since those that do best in whatever layer of life it is, combination of surviving long enough, of having enough reproduction, of being able to bring children to maturity, and so on, that those genes will be the ones to represent the species several generations down the line.

And when you think of that and then you add, as Darwin did, the possibility that species are multiplying, too, then you can see that this is a process of enormous power, of creativity, particularly since this has been going on for three and a half billion years. Basically that's what it is. In other words, it doesn't need to be directed. It isn't directed. It just happens. And that's a profound ontological perception of what humanity is all about. And naturally it wasn't going to be happily received by everyone, and yet it's curiously liberating when you realize that who's in charge of humanity, who determines our fate -- we do.

Magee: Darwin was a great writer, as well as a scientist. His writings are interesting and thoughtful and reflective. You're a writer, as well as a scientist, too. And in addition to your scientific writings, you're now exploring the world of fiction. So, can you tell us a little bit about what you're working on and also your creative process?

Wilson: All right, ask me a soft question. Let me put it this way. The ideal scientist thinks like a poet -- and at that level let me point out that there are no differences fundamentally between scientists and creative artists -- thinks like a poet, but now works like a woodpecker -- a bookkeeper and I don't know how an Ivorybill got in this. Every time I get close to where Ivorybills might be that intrudes in my...

Magee: We do tend to bang our heads against--

Wilson: I was just down, incidentally, with the Choctawhatchee River in the panhandle of Florida. I was in the area where it's supposedly been seen by biologists from Auburn, but as a University of Alabama graduate, I'm not completely trustful of that. What was your question? No, wait a minute, wait a minute. I'm sounding like a presidential candidate. If you can't answer a question, change the subject.

All right, I'm going to try to answer it. The ideal scientist, and I'll get it right this time, thinks like a poet, works like a bookkeeper, and occasionally writes like a journalist. So, there are not very many people who do that or try to do those three things, at least beyond, that is, to go on and write and explain. But I believe that good scientists, if they put their minds to it, really could do it well because the quality of writing, of speech, is a reflection of the quality of thought. And let me say this about scientists, and I include Nobel Laureates, of whom I know a great many, are mostly journeymen, meaning they're not really very smart. They are basically hard workers who by application, understanding an important problem, and long work and ambition come up with an important discovery. But the business of science is discovery. If you make a discovery, verifiable discovery in science, then you're qualified for life as a scientist. If you make a great discovery, you are qualified for life as a great scientist. It doesn't matter what kind of a jerk you are otherwise or whether you don't ever make another discovery, that qualifies you as a scientist. And I think you see what I'm getting at. And so, there's a very different kind of intelligence involved in being a creative artist. The scientist can dream of some problem and a solution and having reached it made a great discovery, but it's something else entirely to be able to leap over and involve themselves in the world of imagination. So, that brings me to my novel.

My novel, the one I'm writing, is my first, my only, and my last. But I'm learning a lot. I have one of the great editors in America working with me. I lucked out with him. His name is Bob Weil, and he's at W. W. Norton. And I'm crafting a novel that takes place around an imaginary lake in south central Alabama near the Florida border and events and families that are in Mobile. And the purpose of it is to trace the history of a young man who becomes fixed upon a place in nature. It's Lake Knockabee, that's fictional, in Knockabee County, and he lives in the county seat of Clayville. All fictitious, but I make them as realistic as I can. And for various ways and by various routes, he develops a deep sense of place and decides upon learning that this area that he loves is one of the last remaining sections of old growth of longleaf pine. Incidentally next week I'm going to be at the Longleaf Pine Alliance meeting in Florida. It once covered 60 percent of the Deep South and is down now, the old growth section, to a tiny fraction. So, he then involves himself in the effort to save this one place to which he has become bonded. And by so doing I'm able to present the natural history of this place, how it works, how it has worked for millions of years, and then show how he saves it by actually not becoming a biologist. We naturalists and biologists, including professors of biology, are powerless in that sort of thing, except to change opinion. He saves it by becoming an attorney. He goes through law school and he learns how the system works, and in a courtroom drama manages to pull it off. And since we're in a primitive area in the South right now, we're 10, 15 years behind much of the rest of the country. We're still involved in sort of an elementary struggle between developers who can't quite get it yet and conservationists who haven't learned how to handle it. So, that's basically what it is. I'm having a lot of fun doing it.

And what have I discovered? I discovered, as my editor warned me, writing fiction is really hard. Of course you can create your people, you can create your place, but when you get down to the real creative parts of conversation, dialogue, of describing detail, of developing character and doing it indirectly by conversation and dialogue, and by incidents and how they react and what their facial expressions are, and then you build mood by learning how to present detail in the background that is mostly irrelevant and yet is there to create mood. I think I'm talking to knowledgeable people in this audience when I say that. That's not easy, and it's given me a lot more respect for this creative process and the creative arts.

Magee: How do you feed your own creative spirit, both as a writer, now as a novelist and also as a scientist?

Wilson: Well, I'm a workaholic. That's right. I've harnessed workaholism. I'm not ashamed of it and I go pretty much every day. But that brings me to a subject again that we brought up at lunch, and I wish President Wagner was there as well. And we had some really interesting exchanges, so I might as well tell you the following that I did bring up then. I'll just repeat it.

What makes a creative person? It's not simple. I think we have a view of scientists, for example, that somehow they're extremely bright people and that they, particularly if they have mathematical capacity, even genius qualities, that, oh, they can go on. That's what makes a scientist. No it doesn't. I'm going to give you the I.Q. scores of two of the most famous scientists of our day. Richard Feynman was a great theoretical physicist of our time, 121. Jim Watson, codiscoverer of DNA, master molecular biologist who created a whole university at Long Island, Cold Spring Harbor, led the genome project to completion, 122. May I confess mine that I got in Decatur senior high school and was ashamed of it until I learned their scores? A towering 123. Does this mean that we're just dumb and it was luck? No. It just means that there's something else that we don't measure about creative people and that in education we'd better learn not just how to help everybody get up to a certain level, leave no child behind, but also to cultivate ability when we see it.

So, I'm going to tell you what the ideal scientist is. The ideal scientist is someone bright enough to see what needs to be done, but not so bright they get bored doing it. And then you might ask, well, while Feynman and Watson are muddling around with scores barely above average, what are all those young geniuses doing who scored 160 and 170? What happened to them? Does this mean they were becoming super scientists? No. What they did was to -- they had it easy and they grew up and they joined Mensa clubs and now work for the IRS.

So, what are the other qualities? Well, it's not hard to see. Passion. For some reason, passion for a subject. That's why I have the young man in my novel -- I'm explaining how you develop passion and ambition. We're supposed to not to admit that. You're supposed to only say if you're representing yourself as a pure scientist, which is a lie: "Oh, I'm only interested in truth. My colleagues and I -- all we want is to find out the truth." No. I said you get credit as a scientist if you make a discovery, so the ambition is to make a great discovery. That's what all the good ones are out for. They are trying to make a great discovery. That's why being bright enough to see where the best discoveries can be made is important. And the way I put it to my students for years at Harvard was in choosing an area to work in, a specialty or line of research, do not use the military dictum. Do not march to the sound of the guns because if you march to the sound of the guns that's where all the action is and all the good stuff has been picked up. March away from the guns and you're going to risk when you do it, when you go into a new area you're going to risk being lost for a while. You're going to risk not being appreciated for a while, of making discoveries that aren't appreciated because it's not part of the scientific culture yet. But in the end you will be more successful.

And what else goes into being a scientist? Entrepreneurship. All the outstanding scientists I know, or most of them, are entrepreneurs, and they're not much different from successful business executives and founders of companies and corporations that I've known. I've known quite a few of those, too. That is a desire to create something new, living, of succeeding in building an institution. Scientists want to build an institution. They want to build a part of knowledge that becomes an institution.

And then anger. You need to be angry to be really creative. We've heard that constantly with artists who cut their ear off and jump off of high buildings and generally go mad and put their heads in an oven and so on while they're writing great poetry and doing their final big painting and so on. Anger. In scientists, anger is very healthy and particularly if it's directed against the status quo. I mean you feel that things have stagnated, that the wrong people are getting credit, that the subject that you wanted to develop, the discoveries you made are not being recognized and it makes you want to drive forward, continue and continue and continue. That doesn't do it by itself. But it's a good little element. It creates free songs of pleasure each day. You asked for it, and I don't live here, so I don't have to face the consequences of what I'm saying.

Magee: Speaking of anger, and you also used the term passion, your book on creation seeks to find a common ground among environmentalists, scientists, and religious groups -- people who frequently are at odds with one another. How is it that we can work together to find this common ground, especially when we're talking about the major creation that we're all dealing with, the earth?

Wilson: For years I worried about the lack of interest in conservation. Our focus on the environment now fortunately is rising rapidly. America is now pastel green anyway. I think it's irreversible. We're going green. The world is going green. It's mainly about the physical environment, if you think about it, and still not much attention to the living environment. So, I was concerned very much that it seemed that only elite environmentalists, professional scientists, and mostly well-educated people were concerned about the living environment because that's a harder one to get your mind around. The disappearance of ecosystems and species and why that's important, and it just wasn't spreading. People didn't get it so much. They didn't care as much as they do now about climate change and so on. So, I said to myself we've got to get the people on our side because, as you well know, political decision making in this country now is not from the top down. It's from the people up increasingly. With those knife-edge elections that we have every couple of years, polls, the discussion groups, they are what's becoming more and more important and what the people want is what is most likely to get done.

And then I asked myself who are the people? And, of course, we are the most religious community in the world, of all of the industrialized nations. Seventy-five percent of Americans are flat-out religious believers. Two or three percent are those awful atheists that everybody wants to dump on, and they don't amount to anything. Americans are religious believers. Forty percent approximately of Americans are Evangelicals. I was raised an Evangelical. So, I started thinking about this. How do you talk to the people? Well, there's a principle that's called conflict resolution. I didn't get this out of a textbook. It's interesting. It's obvious. Conflict resolution experts say what you've got to do essentially is find common ground with your opponent and sidestep the issue that's dividing you because, again, this is part of human nature to start polarizing and then increasingly not give ground. But if you can find another issue that's real important and then ask for their help in forming a coalition, you actually can make progress with a pretty strong opponent, even an enemy.

So, I applied that instinctively in a book called, *The Creation*. I'd been raised a Southern Baptist. I don't think I could have pulled this off if I'd been a nice Jewish boy from Brooklyn. I could say in effect we are fundamentally different in the way we view the world, but I came from the same background, for what that's worth. And now I addressed a pastor, a Southern Baptist pastor, the imaginary, *apostrophically*, that's a word I can use at a place like Emory. And essentially what I did was say, "Pastor, we need your help." I was addressing everyone, but in particular I wanted it to reach the religious community and most particularly I wanted to reach the Evangelicals. And then I presented what was happening. I implied evolution, but I sidestepped that issue because I realized that it is not really a religious issue. It is a tribal issue. Biblical literalism and hard right beliefs in things like the Book of Revelations and so on, that's tribal, and that's why Richard Dawkins just makes people madder. You don't carpet bomb people. If it was only religion, then that would be theology, and it would be a few theologians

in the Southern Baptist Conference and elsewhere talking about whether evolution is part of it. But if it's tribal it means that when you insist on pushing on people a view that is counter to some of the essential beliefs of their tribe, what unites them as a people, which is what Evangelicalism does, then you're always going to lose. If, on the other hand, you say let us put that aside because there's a huge area of concern that we need to solve together and that's saving the creation -- I wasn't afraid to use the word -- it worked.

I discovered when that book was published that in fact there were already movements afoot among Evangelicals and in virtually every Judeo-Christian denomination to do something about the creation. It was beginning to catch hold. And when the book was published it led to a coalition of Evangelical leaders and environmentalists and scientists. We even had a retreat, built a covenant, and it's helped move more quickly the creation care movement. They had it in Evangelicalism. I was invited actually to join or to visit the head of the Mormons. And I met them in the president's office, it was an amazing experience, just so they could talk about this -- ask for their help. That's the way to get people on it because fundamentally they believe; they believe that we should be saving that.

Magee: Ed, thank you for your presence among us, for your work as a scientist, an artist, and a creative thinker.

END