Today, our talk is going to be by Dr. Warren Allmon entitled "What did Darwin Do?"

Dr. Allmon is the Director of
the Museum of the Earth at
the Paleontological Research Institute in Ithaca,
New York associated with Cornell University.

Dr. Allmon is a permanent paleobiologist
doing research on diversity of life ecology,
specializing in Mesozoic and Cenozoic gastropods.

Dr. Allmon's speech is certainly going to be enthralling.

So a welcome warm,
and in case you didn't know,
there's a sign up sheet for historical in paleontology.

I believe there's a sheet going around for
the human studies poll for
psychology or something like that.

Sign up at the end if you haven't already,
the sheets will be up here at the beginning.

I believe there's a reception to
follow in the faculty or in
the campus terrace over on the other side of campus.

So without further ado, Dr. Allmon.

[APPLAUSE]

Never introduce anybody by saying they're enthralling.

Thank you. It's a pleasure to be here.

I'm honored to be part of
the lineup that you've had over the last week.
I hope that looking at what you've already been hearing about over the past week, I hope that maybe I summarize a lot of the topics that you've already heard about. Certainly for those of you who are in this magnificent evolutionary studies program, much of this will not be new. But I hope that maybe I look at it in a different way, at least that's my idea. Can everybody hear me if I stand apart from the microphone? Yes. Yes? Okay. What I want to talk about today is what I have come to call the Darwin paradox or a Darwin paradox. I'm sure there's other Darwin paradoxes, and I will get to what Darwin did. But to do that, I want to talk about this paradox. The paradox is as follows: Darwin is, as many of you already know, one of the most important intellectual figures in human history, and that has nothing to do with whether you like it or not, or whether you agree with him or not,
or whether you even know what he did.
Darwin is objectively one of the most influential,
important people that has ever lived.
He has changed the way much more than biology
works as I'll talk about
a little bit and as many of you already know.
But here's the paradox.
Most people either don't know anything about him,
or if they do know something about him,
they don't like it very much.
In the most technologically,
scientifically sophisticated country in the world,
poll suggests that only 30-40 percent absolute
maximum of Americans say
they accept anything that Darwin said.
All the polls over
the last 20-30 years are consistent in saying that
40-60 percent of Americans
reject all or most of what Darwin said.
How can this be? How can Darwin
be this incredibly important guy,
this incredibly influential guy
that we should all learn about.
If you haven't read about Darwin,
you're not an uninformed person, which I totally believe,
and have most Americans
either not know anything about
it or reject what they do know.
That's what I want to explore today.
I think it's not just an intellectual exercise,
it's a profound question for
anybody concerned with science,
for anybody concerned with
questions that you hear about on the radio every day.
The future of the economy,
the future of humanity itself.
I really mean those lofty thoughts.
That's where I want to go for the next few minutes.
I can't think of a better way to say this,
Darwin is a really famous guy.
You can measure that in a whole bunch of ways.
These are just some slightly goofy ways to
measure how famous Darwin is.
I'm too old to know whether these are important or not,
but I'm told that these
are important ways to measure Darwin.
This says that if you Google Image Darwin,
least yesterday, you get 7,000,600 hits.
If I Googled Abraham Lincoln images yesterday,
and I got I think it was about twice that.
Fun parlor game is to get people's Google share.
Darwin is not the most famous guy the world.
Jesus does about twice as well as Lincoln.
But he's better than
all the kings and queens of England that I can think of.
He's an important guy if you Google him.
Where's the number?
If you Amazon him,
you get 93,734 responses.
If you put Charles Darwin instead of Darwin to get rid of the Darwin,
Australia travel guides,
then you get a smaller number, but not much.
Darwin is really famous guy.
Darwin's got his name on a lot of stuff.
He's got his name on part of the library at the Massachusetts Institute of Technology opposite Isaac Newton.
Most people don't know who Isaac Newton is either.
But somebody must have thought they were both important because they put them on this building.
Cambridge University, one of the England's preeminent universities has about 30 colleges in it.
One of the named for him.
Somebody must have thought he was important.
He's on the £10 bank note in England.
He's on the $10 bill in England, if you will.
He's on postage stamps in many countries.
There's a city for him in Australia named for him.
How many scientists have cities named for them?
Darwin's have big deal,
at least somebody thought so.
Darwin is buried in
Britain's Arlington National Cemetery.
You all have heard of Arlington
National Cemetery where we
burry really important people to our country.
Britain's equivalent to that is Westminster Abbey.
If you go to England,
you fight through the tourists in London,
and you go to this beautiful church.
Inside the church, actually inside
the structure itself are tombs of the most famous,
most important, most heroic people in English history.
About 20 feet from Isaac Newton who
has this gigantic tomb thing
is this very modest stone on
the floor that says Charles Darwin's buried there.
The point is that somebody thought Darwin was a big deal.
A bunch of people clearly thought Darwin was a big deal.
It is not a couple of
scientists saying, "Hey, notice him."
By all of these completely nonscientific,
slightly goofy measures, Darwin is
a major figure in recent world history.
Yet, I picked these mostly at random.
You could find your favorite,
the Creation Museum in Northern Kentucky.

I like the line on opening day.

Creation Museum's had millions and millions of
visitors since it opened just a year or two ago.

This one I like, this is the Answers in Genesis website.

All of you've been celebrating Darwin's bicentennial.

Their message on Darwin's bicentennial is 200 lost years.

The paradox is how can some people, lots of people,
whole countries, think that

Darwin is so worthy of praise.

How can the Creation Museum
in Northern Kentucky get millions of visitors and
two presidents of the United States in my lifetime
have said that evolution isn't
worth being taught exclusively in science class.

How is that possible? That's what I want to talk about.

You all know what I'm about to say,
but I just want to give you some numbers in case you
haven't seen some actual numbers.

You've heard this, I'm sure before,
but here's some actual numbers
and it doesn't matter what year you pick,
by the way, if you go look at the Gallup poll.

The Gallup Poll has been asking about the same question,
almost exactly the same question of Americans about

evolution for the last 30 years.

As you know about any polls,
the exact results you get
depends on how you ask the question.
The numbers will fluctuate
based on how you ask the question.
But if you look at all
of the numbers over the last 30 or 40 years,
you get about the same results.
I just want to show you some examples of that.
Half of Americans are creationists,
if you just cut right through it.
Half of Americans either say
or when you ask them some more detailed questions,
they do not accept evolution
by any definition; their creationists.
Just for example, in 2005,
54 percent do not think
that human beings developed from earlier species.
Obviously, you can word this lots of different ways.
That's up from 46 percent in 1994.
Forty-nine percent believe plants and
animals have evolved from some other species,
but 45 percent do not believe that
and don't look for internal consistency here, by the way.
These are people who either they stop them in
the shopping mall or they get them on
the phone while they're cooking dinner.
These are people who are just
giving their answer off the top of their head.  
It's like asking you what you think  
of the current labor situation in Albania.  
Don't ask for internal consistency on the polls. 

Forty-six percent believe humans  
and apes have a common ancestry,  
47 percent believe we do not.  
Forty-six percent agree with the statement,  
"Darwin's theory of evolution is proven by  
fossil discoveries," 48 percent disagree.  

Then here is the most recent of  
a popular approach to  
doing this on an international basis.  
This is part of the very popular industry  
showing how awful American education is,  
which is popular amongst certain circles.  

It truly is awful.  

I don't need to say that it isn't.  

[LAUGHTER] This asks some version of the question,  
do you accept evolution?  

There is lots of ways to ask that,  
but it has some version of the question,  
do you accept evolution,  
and it asks it of adults in industrialized countries.  

It always starts on the far left.  

The highest numbers are always in Scandinavia where we  
seem to think that everybody is smart and beautiful.
[LAUGHTER] It always ends down here with Lithuania and Croatia and Cyprus.
I didn't know Cyprus was an industrialized country until I saw this.
We are above only Turkey.
[LAUGHTER] Turkey is the only country in the industrialized world that has fewer people in it that accept evolution.
Of course, you've heard this gets on the front of US News and World Report with substitute anything else, math.
[LAUGHTER] The point is, Americans do not accept evolution, Darwin, however, it is phrased.
The question can be put a little more pointedly.
Darwin is a really big deal.
I'm going to now talk about this in a little more detail.
What do we mean by Darwin being a big deal besides his name being on a building.
Darwin changed the way Western culture thinks about itself.
I'm going to make a stronger statement which is common in the literature.
We live in Darwin's world, we live in a world that is totally imbued with Darwin's thought.
You may not know that, but we do.
But most Americans don't know that.
If they did know it, they wouldn't like it.

When they hear this word, Darwin or evolution, they run the other way.

Who cares? Now some of you, thanks to your enrollment in this program, you've already demonstrated that you have some interest in this.

The vast majority of Americans, even if they would grant the things that I've put up here would say, yeah, so what, we got bigger problems.

I hope to convince you that that's not the case.

In what way do we live in Darwin's world? Why is this guy so famous? What did he actually accomplish? What did he do?

It is a fact of history by which I mean, that it did occur that Darwin convinced everybody who knows anything about the subject that evolution occurred. That doesn't mean that evolution did occur. It just means that by the time Darwin died, as I'll show you in a second, the thinking world, it's difficult to come up with a way to say this that doesn't sound terrible.

Anybody who knows anything, the thinking world, anybody who thinks about anything, it's difficult to come up with a way of saying it,
was convinced that evolution had occurred by 1882 when he died.

He Furthermore,

was the first person to propose a mechanism by which evolution occurred that ultimately became widely accepted.

That's the second thing he did.

The third thing is not often associated with his name, but you don't have to look very hard to convince yourself of it. Darwin essentially, he didn't invent biology, but he made biology possible. He made modern biology possible. By that, I include everything, agriculture, medicine, everything that we now take for granted as the science of biology is made possible by what Darwin did.

This, of course, got him into trouble. But we should flip it around and look at it as a great accomplishment. Darwin is the first person in human history who told us scientifically who and what we are. Nobody had ever done that before. We've done it a lot of other ways, non scientifically, but nobody had ever come up with a scientific approach that seem to have good support for
telling us who we are and how we got here.

Plus, even if you've never heard of Darwin in biology class, you still live in Darwin's world. You still live in a world that is totally imbued with the ideas, the thoughts, the implications of what he thought and wrote about. So that's why he's on the building at MIT.

Let's go into this in a little more detail. I was talking to the group before this and said I wouldn't ask for a show of hands. I won't ask for a show of hands now. I'll just simply say there's [NOISE] 10 or 12 or 15 books in English that if you haven't read them, you're not an educated person. I haven't read them all either. The Origin of Species is one of them. If you haven't read it, you're not an educated person. Fun parlor games, sit around, and make your list of 12 books. Not only is it the best book ever written about biology, but it really is a great read. It is literature. Don't let anybody tell you otherwise. Yeah, I know it makes it a little bit dense. Reads like a Sears catalog sometimes because
he fills it up with lots of examples.

But he does turn a phrase, and so it is worth your time, so I strongly encourage you to read it. You can read it online.

It's very important to recognize, even if you don't read it that the origin did two or tried to do two separate things, separate but related things.

Thing number 1, Darwin tried to convince his reader that evolution had taken place. That evolution was the best explanation for observations we can make about the natural world.

The second thing he tried to do was to convince the reader that he, Darwin had a mechanism by which evolution occurred, and he called that natural selection.

Those two things, now Darwin mixes them up a little bit. You have to know already where he's going if you haven't encountered it before. But once you know that these two things are in there, you can see that they're separate.

The proof that they're separate, and this is one of my really important points tonight. The proof that they are separate is the different fates of these two goals.

Goal number 1 was accomplished by the time Darwin died.
Darwin died in 1882.

This was published in 1859.

In 20 years, Darwin had convinced
the thinking west that evolution had occurred,
and nobody who knows anything, again,
I can't think of a less
or more diplomatic way to say that,

nobody who knows anything about biology or geology
has wondered whether evolution
is true or not since about 1882.

That does not mean that it's true.
It just means that nobody who
knows anything has wondered about it.

That's a profoundly important point.
I'll come back to in a second.

But the second idea,
the second goal, had a different fate.

In this, Darwin was a complete failure,
certainly within his lifetime.

It wasn't until the 1940s,
60 years later the scientists,
biochemists came to
general acceptance of natural selection.

So within 20 years, everybody accepts evolution.

In 60 years, they accept Darwin's mechanism.

It is important to remember what evolution is.

Darwin, a fan of trivia point,
Darwin does not use
the word evolution in
the first edition of The Origin of Species.
The last word of the first edition,
he went through six editions.
The last word of the first edition is evolved,
but the word evolution never appears
in the first edition of the Origin of Species.
Darwin didn't use that word. He didn't like it.
He used the much better phrase,
descent with modification, which is,
I don't know, it sounds I think it's more elegant.
It maybe doesn't have
the zip zing for our years of evolution.
Darwin adopted the word evolution in
later editions because other people started using it.
Descent with modification actually
tells you what he's talking about.
It tells you that we must have genealogical connection.
That's the descent part and change through time.
You got to have both.
You've got to have both because lots of smart people
before Darwin thought that
you could have one or the other.
Darwin said that organisms are linked
by genealogy and change through time,
and that's what we today mean by evolution.
Let me just give you one snapshot
to try to convince you of this statement that I've made,
that everybody who knew anything
was convinced of evolution by the time Darwin died.
Darwin attended Cambridge as
an undergraduate in late 1820s,
and when Darwin went to Cambridge,
you could not take biology for credit.
You could take minerology for credit,
but you could not take biology for credit.
You could take botany as what
we would today call a extracurricular activity,
but you could not take biology for
credit in the late 1820s.
Darwin publishes The Origin of Species in 1859,
and by the time Darwin dies,
evolution is on exams at Cambridge.
That's just a fact, that happened,
and the point is,
nobody has wondered about it ever since then.
No scientist has gotten up in the morning and said,
"I think I'll test evolution today."
Since about 1880, that is the reason I emphasize
that is because that is profoundly
misunderstood by most Americans
and by people elsewhere as well.
If you go to the mall tonight and asked people,
“What do you know anything about Darwin or evolution?”

About 50 percent of them, 40 percent of them will say, "Well, I've heard that there's a lot of doubt about it."

Ronald Reagan said that scientists are arguing about it.

Scientists haven't argued about descent with modification in 130 years.

No serious biologist or geologists, not one, has argued about that in a 130 years.

Okay. But what about natural selection?

Natural selection, you-all know the outlines of it.

It's a good idea that exists in the ether, and we'll come back to that.

[NOISE] It's a pretty straightforward idea.

It says the following; more offspring are born than can survive to adulthood.

The analogy that I use, I guess I can use it with this audience.

You have to be careful when you're saying this to high-school students.

Suppose you say to a group of high school students in the fall that they are guaranteed admission to the college of their choice, all expenses paid, no matter what they do for the rest of their senior year in high school.
I'm sure this wouldn't have apply to any of you.
But you think we'd see any change in
behavior during the rest of their senior year.
Again, it didn't apply to you, but yeah,
we might expect to see
a slight change in behavior on the part
of high school seniors if we
told them it didn't matter what they did,
they're guaranteed a place in
college of their choice, all expenses paid.
Darwin noticed that that's not the case for organisms.
Organisms are not guaranteed a place at the table.
Organisms are not guaranteed to survive.
There is vastly more reproduction
then there is survival to adulthood.
That's true with every single organism
up until very recently,
it was true of humans too.
Tragically, it's still true of some human populations.
But it is true that the vast majority of babies
that are born in this world of all kinds of
organisms die before they reach adulthood.
That means what?
That you have to get out and hustle for a living.
If you inherit from your ancestor,
features that allow you to hustle with more success,
to survive and leave more offspring,
then it follows and it must follow
that organisms will pass on to their descendants,
on average, more genes
that allow them to survive and reproduce successfully.
It must be the case that [NOISE] has happened,
that's all natural selections.
Why wasn't it widely accepted until the 1940s?
We don't have time to go into all of that,
at least one reason was that biologists and
geologists at the time thought that there
must be something else doing this,
they acknowledged that natural selection
must occur because logically it has to,
if these things occur,
if these patterns occur.
But they thought there were other mechanisms.
Remember that a guy named
Gregor Mendel was unknown at the time.
Gregor Mendel was ironically working
at the same time as Darwin in the 1860s,
with peas in the garden over in
Austria while Darwin was in England,
but the two never read each other.
So Mendel died and Darwin died,
and it wasn't until 1900 that Mendel was
rediscovered and inheritance was understood.
So Darwin didn't understand inheritance.
There were a lot of things that Darwin didn't know,
and that also contributed to
a lack of acceptance of natural selection.
In any case, natural selection,
as sketched out by Darwin,
was not widely accepted
until the middle of the 20th century.

[NOISE] For our purposes tonight, here's the punchline.
The story I just told you of widespread,
almost immediate acceptance of descent with modification,
but delayed acceptance of Darwin's mechanism
means that we can
argue about the thing at the bottom here,
and it doesn't have anything [NOISE] to
do with the thing at the top.
We can argue about the thing at the bottom,
and we all do.
There are fist fights at
scientific meetings today about the bottom thing here,
about the mechanism of evolution.
[NOISE] If you take a poll at a scientific meeting,
the evolution meetings, for example,
which happen every year, I've to take a poll,
you would probably get 70-90 percent
of evolutionary biologists saying natural
selection's the principal but
not the only mechanism for evolutionary change.
But you'd get little fist fights in the course.

Nobody, obviously no evolutionary biologist,

but no biologist who knows anything,

what I mean by that is

no biologist who thinks about this on

a regular basis wonders about the one on the top.

Historically, that is clearly the case.

So Darwin invented evolutionary biology

and he convinced people that it was true.

[NOISE] What do I mean he made biology possible?

I was talking to the group earlier,

and I said, imagine,

everybody has suffered through

some form of introductory biology,

try to think back on even the worst part of that.

Think back on anything you

experienced in introductory biology.

You were looking at a worm,

you were looking at a bug,

you were cutting up a pig, whatever it was.

Try to imagine doing that,

if you had a bad teacher,

maybe you don't have to imagine.

Try to imagine doing that with no possibility,

no suggestion of a scientific explanation

for what you're looking at.

Imagine nothing at all.
There is no scientific explanation that explains why the veins in the pig go this way and not that way.

There is no explanation for why leaves are green.

There is no explanation for why there's bumps on the shell other than it's just there.

That was biology when Darwin went to Cambridge.

Physics had already succeeded.

Newton was 200 years earlier.

Newton had a big success.

Physics was doing just fine.

Astronomy was doing just fine.

Chemistry was doing just fine.

But biology wasn't really science yet.

It was what was disparagingly called natural history.

It was description.

You can describe until you turn blue.

But there was no scientific structure for trying to explain things.

That is, of course, one of the most important thing science is supposed to do for us.

It isn't just supposed to list things, it's supposed to explain things.

We are so used to thinking about biology in those terms.

In the group before, I said, if you went to the doctor, and the doctor just said,
You'd go to another doctor.
You couldn't conceive of a doctor just saying there just isn't an explanation, it's just there.
You'd go to another doctor.
The reason your crop died is because it just did.
[LAUGHTER] You'd find a different extension agent.
That was Biology 150, 200 years ago.
The fact that biology is no longer that way is Darwin's legacy.
By showing how it was possible to explain biology in a materialistic, naturalistic, scientific framework,
Darwin essentially took the scales off of people's eyes and said,
"Oh, I get it, this is how it might be approached."
It's not accidental.
Go back and read the chapter of your biology book that you always skip, that introductory chapter that does the history.
When did most biological fields start?
Late 19th-century.
So all of the questions that we all take for granted, including you pre-meds.
All of the questions we now take for granted in biology and all of the approaches that we take for granted in studying them,
including medicine, medicine wasn't very much past description then either.

Now we treat a science in large part because of Darwin.

I got on your website yesterday and I just ran off the bio courses. I'm not agonizing over it very much, and skipping all the ones that seem to not have a particular field associated with it. I checked off the ones that would make absolutely no sense at all without evolution. I checked the courses that would make no sense at all without evolution. [NOISE] You get the idea.

This is perhaps the most widely used quote in talks like this, or when evolutionary biologists talk to general audiences, "Nothing in biology makes sense except in light of the evolution."

It's used all the time, but what does it really mean? It means that if you go outside tonight and pick up a leaf, or a twig, or a dead bug, or [NOISE] you go home and feel your heartbeat, if you ask why any of those things exist the way they do. We have no explanation to answer the question, other than evolution.
Maybe there is one, could be,
but we have to go [inaudible 00:32:58].

There is no other scientific explanation
other than evolution.

Don't let the pre-meds fool you.
Don't let the molecular biologists intimidate you.

They think about evolution too when they need to.
They go and sequence their DNA,
or they do their organic chemistry,
or they do their cell biology,
and then they say,
"Well, how come this looks like that and not like that?"
We have no answer except evolution.

[NOISE] Think about what science actually is for.

Yeah, I know, it's to make
better toothpaste and better cars and all that stuff,
but that's when you make technology out of it.

What is science really for?

Science is to explain things.

Science is not to catalog things,

science is to explain things,
to answer the question,
how come things are the way they are?

There is no theory in biology
for doing that, except for evolution.

Darwin starts the origin, and I admit,
this is another reason it might be a little
inaccessible to modern 21st century audiences, the first chapter in The Origin of Species is about pigeons. I didn't understand that either until somebody pointed out to me that pigeon fancy and pigeon breeding was like Nascar in 19th century Britain. It was the immensely popular hobby of the middle class, and everybody understood pigeon breeding. Darwin starts off with pigeon breeding cause all his readers would know about it. He starts off with pigeon breeding because it's an analogy for what he wants to talk about, but it's more than an analogy. Agriculture is evolution. [NOISE] It isn't like evolution, it is evolution. It's evolution driven by human selection, but it is evolution. We know, for example, that the little seed pod there on the left from a grass called Teosinte that grows wild in Mexico, we know that that's the ancestor of your cornflakes. [NOISE] We know that because we did it. We know that in large part in New York state that all of
those kinds of apples came from a common ancestor.
We know that that has occurred.
That is evolution.
Evolution is happening every day.
I'm a new parent, I have a two-year-old,
so I am acutely aware of this.
You go to doctor, two-year-old has an earache,
"Can we have the antibiotics,
please, so we can go to sleep?"
[LAUGHTER] Any parents here know what the doctor says?
Nope, I don't think so.
Not sick enough. What do you mean not sick enough?
What are talking about? Why are they saying that?
Because we're giving too many antibiotics,
because western medicine gives
antibiotics because they work,
but what is the effect of giving lots of antibiotics?
We are causing the evolution
of more antibiotic-resistant bacteria.
The hospital in Ithaca, very good hospital,
tells me that in any given time,
there are probably two or three strains
of bacteria that are
totally resistant to
any known antibiotic running around the hospital.
Very scary if your two-year-old has the [inaudible 00:36:24].
There is an immense literature,
and you read about it all the time, that the AIDS virus is evolving.
In fact, the origin of the AIDS virus was an evolutionary event from the Simian Immunodeficiency Virus.
We know that this has occurred.
We know that we're now coming to understand, we've always known it, but we're now coming to understand that many of the conditions that trouble us, particularly in modern societies, are clearly not caused by a germ or a disease in the restricted sense, but the fact that we now will a different lifestyle than the lifestyle of our ancestors. This has become particularly noticeable with obesity. There's now a whole Amazon obesity and diet, and you will get books called things like "The Neanderthal Diet and The Pleistocene diet. That will say, "If you eat like a caveman, you will actually be better off. If you eat like a modern American, you will walk like a modern American."

[NOISE] Our bodies are not designed to eat and do the things we're doing now. They aren't, otherwise, we wouldn't be in the
I'm being a little bit glib, but not totally.

Again, what's the basis for saying this?

Science is about seeking an explanation.

Why are we all so fat?

It's killing us. Why would that happen?

Because evolution built us, goes the answer.

Evolution built us to like sweet,
salty things dripping with fat.

They all used to be in low abundance.

We were not built
for those things to be in high abundance.

When put in the presence of high abundance
of those things, we get in trouble.

Well, none of what I've just said would trouble anyway,

I daresay, except this one.

Darwin knew that. Darwin was very clear to himself,
to his wife, to his diary.

There's one line in The Origin of Species about humans,

"Light will be thrown on the ancestry of humans."

He knew exactly what he was saying,
or not saying, but
everybody could read between the lines.

It had been clear for hundreds of years

that humans shared
more features with some organisms than others.

You don't have to know anything,
or have a particular point of
view to know that you have more in common
with a gorilla or a chimpanzee
than you do with a giraffe.
The question was, what's the significance of that?
This is a pre-Darwinian figure here.
Saying that those similarities exist is one thing.
Saying that you are actually
connected to those organisms,
you personally are connected
to those organisms, that's something else.
I personally have no problem with it, other people do.
Always look at cartoons if you want to
know how people respond to things.
So here's contemporary Darwin cartoons,
Man is But a Worm.
That's from Punch just before he died.
It refers to his last book [NOISE] which was about worms,
about earthworms, but notice how it's drawn.
It's the classic man coming up from the slimy things.
Indeed, that's how many people think of evolution today.
If you're channel surfing late at night,
you run into televangelists and those kind of programs.
I, onetime, ran into one,
and all I caught was the word Evolution, so I stopped.
All I heard was this idea
that man came from a little blob of jelly is just silly.
[NOISE] So [LAUGHTER] there's
man coming from a little blob of jelly.
Darwin caricatured as a living ape.
You can't read the caption up there,
but that is the gorilla crying
because he's not being admitted to the gentleman's club,
[LAUGHTER] which Darwin has
said he should be admitted to.
Darwin knew exactly what he was getting into,
and there was a lot of reaction to this.
Even to this day, there are lots of people,
including the previous pope,
who have absolutely no trouble with evolution
at all, except for humans.
That's a common response.
You do not need to be a scientist.
Again, I'm a father of a two-year-old now,
and so you do not need to be a scientist
to look at pictures like this,
or look at little people and notice these things.
We are clearly apes.
We are clearly apes in
any descriptive [NOISE] sense of the word.
In any scientific sense,
that is, look at the genes,
look at the morphology,
looks at the skeleton, look at everything,
and you-all heard this before,
we're 98 percent identical to chimpanzees.
It is now been determined we are 99 plus
percent identical to Neanderthals.
That was just out this week.
By any measure, by all measures, we are apes.
We don't like that. Well, get over it.
I don't like being with Americans sometimes.
I don't like being from New York sometimes,
but I am.

[NOISE] [LAUGHTER]
I just wanted, this is not a political announcement.

[LAUGHTER] By any comparison,
we are organisms like any other.
But of course we're different from all other organisms.
But all organisms are unique.
I wish I could just talk about
this slide, but I'm not going to.
It is a vast field.
Those of you who are not science people,
I hope that you will use your involvement in
the evolution studies program to mind this.
It is an enormous field.
There is a huge literature
on the effect of Darwin on philosophy.
For our purposes this evening,
it doesn't matter what that effect is.
It has stimulated a huge critical literature.
There are a whole schools of thought called Evolutionary Psychology and Darwinian Philosophy. There are whole branches of the social sciences that depend on or are based on Darwinian influences. Your own Psychology Department is one of the more active departments in the nation in Evolutionary Psychology. Sociology, History, Linguistics, Economics is a very important evolutionary discipline with biologists getting invited to economics meetings.

There is an enormous field called evolutionary or Darwinian literature right now studying Dickens and studying Faulkner and studying Bram Stoker and studying all of these famous authors, looking at their Darwinian influences. But I want to focus on these last three in particular. You all take for granted. I take for granted, that we live in a time of change. I need not emphasize that. I'm not dissing the people that are less than 25 here when I say that your attention span is notably less than mine was at your age. We live in a time of absolutely brutal constant change. You take that for granted. That is so completely different
from Western civilization 150 years ago.
Even in Victorian Britain which was
a time for them, rapid change,
industrialization,
increasing scientific development,
imperial expansion, etc.
Even in that sense of change,
it was really all about no change.
It was really all about
keeping things exactly the way they were.
Which and pick your favorite example,
it meant keeping the British Empire.
It meant keeping white guys on top.
It meant keeping lower classes on bottom, all that.
It was all about stability.
Western civilization was all about stability.
If you read actually
western history over the last century and a half,
many people will say it wasn't till the end of
World War I that things came completely unhinged.
We realized that the world had
changed and we were in a world of constant change.
If you look back a little further though,
you will see that change
started to be recognized with the origin of species.
We now take for granted that everything is in flux,
that nothing is constant,
that everything is contingent, that everything is going to change.
I'm not saying you like it, but that's the way the world is and we all think that.
We didn't think that way 200 years ago and Darwin is a huge part of it.
Second from the last here, this is probably the one that obviously aside from man's connection to nature, this is the one that hits everybody's buttons. Darwin didn't invent secularization. Darwin didn't invent atheism. Darwin didn't invent disbelief. Darwin didn't invention being critical about your faith. Darwin was part and parcel of what was already an increasing secularizing trend in Western Europe. He was part and parcel of it. Did he accelerate it? Absolutely. He didn't invent it but he showed how you did not need an intelligent designer, to use a loaded phrase, to explain biology. That's the flip side of what I said earlier about the science of biology. You don't need God to explain biology. You can use God to explain biology, but you don't need God. After Darwin, you don't need God to do biology. That was a big deal.
Did that hasten some secularization?
Absolutely. Was it totally responsible for,
as a preacher put it in 1925 in Tennessee,
all the evils of modern society, prostitution,
drunkenness, hedonism, wild living and Darwinism?
[LAUGHTER] Probably not, but it
definitely was part of
the secularizing trend in Western society.
The last one is also really important.
I just like that word,
that's why I put it up there.
But use any words you want.
Victorian England and to a lesser extent,
culture on the continent on
Europe in the 19th century believed in progress.
They believed in it very deeply.
Everything was going to be better.
Everything was on the opposite way.
The British Empire was always going to be here.
Everything was going to improve.
Everything was headed in the right direction.
America is practically invented
on the notion of progress.
It's big news when a poll comes out it says,
a large proportion of Americans do not
think that their children
will be better off than they are.
That's a huge thing in America because the whole system is based on you doing better than your parents. You don't have to be very smart to read the newspaper every day and realize that we don't live in a necessarily guaranteed, progressive, wonderful world. We live in a world filled with bad things. We actually always lived in a world filled with bad things we just tried not to think about it. Now CNN tells us about them whether we want to hear about it or not. Darwin was part not all, but Darwin was an integral part of telling us how the world really is instead of how we want it to be. Organisms are not designed to be harmonious. Life does not exist to play nice. Organisms don't sit around like care bears and love each other. Organisms do two things. They survive and they reproduce, that's it. Sometimes that leads to astonishing beauty and astonishing comfort and astonishing pleasure and sometimes it leads to wasps eating living prey from the inside out and wild beasts being disemboweled on National Geographic.
We take all that for granted because of what we see on television and because of the wars of the 20th century.

We shouldn't say Darwin is bad because some Nazis quoted him.

Darwin's not bad because of the Nazis.

The Nazis arose out of all kinds of complicated influences that have led society to be a lot less simple and benign than it was 200 years ago. That's not Darwin's fault but Darwin was part of that trend.

If you google evolution, you will prove to yourself the point about popular culture and just there are stores called evolution. There's a store on the mall in The Commons in Ithaca called Evolution sells shoes that I don't understand. [LAUGHTER] There's a car called evolution. We now talk about galactic evolution and star evolution. We talk about evolution of economies, we talk about evolution of continents, we talk about evolution of all kinds of things. Nobody bats an eye talking about the evolution of application management services.

Okay. Why is this worth me ranting at you for an hour? Is this a problem?
Is Darwin's Paradox a problem?

When I've talked to people about this, or when other people have written and discussed this issue, which I by no means invented, some people say, "Don't expect perfection here."

People are not perfect. Don't expect them to be totally consistent. People just are screwy sometimes. Just because they go to the doctor and get their car repaired at a different place than they worship on Sunday doesn't mean that they're crazy. Life is full of choices. Sometimes we do this, and sometimes we do that. Sometimes we decide this, and sometimes we decide that. Inconsistency is part of life. Maybe what I've just said to you, we should just suck it up and live with, that Darwin was important scientifically, but most Americans don't accept it. Deal with it. I have a collection of quotes that would suggest that. John Updike points out what you all know, during the day you believe a lot of
mutually exclusive things, during the day.
Sometimes maybe at the same time.
The test of a first-rate intelligence
is the ability to hold
two opposed ideas in the mind at
the same time and still retain the ability to function.
[LAUGHTER] It could be
a healthy thing to be able
to maintain two points of view.
We shouldn't do the same thing all the
time. We should be flexible.
Maybe I'm setting up a straw man,
maybe we shouldn't be worried about it.
Think about this, Massimo Pigliucci
who teaches at Stony Brook;
very good evolutionary biologist,
talked in Ithaca last week in
our Darwin days and he used the top example there.
He said, "I know I should be a vegetarian,
but I really love cheeseburgers."
[NOISE] Well,
if you're so smart and
you know you should be a vegetarian,
why did you eat cheeseburgers? Because I like them.
I know that many people [NOISE] that play
the lottery do not read books on statistics,
but they know what the odds are [NOISE].
Why do they play the lottery?
Because, what's the tagline of a lottery? You never know.
Yes, you do [NOISE].
Why do people start smoking?
They know it's bad for you.
Why do people keep smoking while they're on chemotherapy?
Yeah, I know they're addicted, but it's because they
hold mutually opposite ideas.
My grandfather smoked until he was 104 and
he did just fine.
I like this one. I found this one on the Internet.
[LAUGHTER] We do stuff like this every day,
so what's the big deal?
Here's what I think the big deal
is and why I really do think that
this is a serious epistemological,
intellectual, cultural, scientific crisis.
If we can get out of this hole that we're in,
the 21st century is supposed to
be the century of biology.
Twentieth century is sometimes
called the century of physics.
The 21st century is supposed
to be the century of biology.
All of us, at least I'm told,
that pretty soon we are all going to be
carrying our genetic code,
our genome on a little computer stick.

We're going to go to our doctor
and they're not going to ask us questions.
They're going to just read our
genome and treat us that way.
It's going to be called personal medicine.

[LAUGHTER] I didn't make that up.
Folks, that is going to be based on evolutionary biology.
If we don't think biology runs by the rules of science,
then I'm really not all that excited about
handing my genome to anybody [LAUGHTER].
I may not be excited about it anyway
but think about it for a second.
So medicine is why, medicine and genomics.
Agriculture. We can't feed everybody.
We thought we could, we thought we were up
to here in food.
We're not anymore, at least not cheap food.
What are we going to do about that?
We're destroying the planet and it's now gotten to
a point where it isn't about
cute furry animals, it's about us.
Finally, we figured that out.
In other words, some very serious decisions
have to be made about biology this century.
If half of Americans think that,
[NOISE] [LAUGHTER] then those people
are probably not going to be able to make good decisions.

Evolution is happening right now inside us, around us,

in the immediate future,

in your gut, in your children,

in the rain forest.

It's happening right now and

we're causing a lot of it and we're going to

live with the consequences of it.

If science is wrong about all of this,

[FOREIGN] But for 150 years,

it seemed like we know what we're doing.

If 50 percent of

the most advanced country in

the world don't believe that,

then what are we going to do about all of these issues?

This talk used to have a different ending.

[LAUGHTER] All our partisan politics aside,

many of you know that science was

not taken seriously in the previous administration.

That was not just about politics,

it was about people

not understanding science and not accepting science.

It mattered a lot. This guy said in his statement,

in his inaugural speech.

Some scientists just passed

out on the floor when they heard it.

[LAUGHTER] But seriously, everybody was glad to hear it.
But he's going to need some help.

If we are to survive

the 21st century in any semblance of our current state,

we're going to need to take seriously his statement.

Thank you very much for having me.

[APPLAUSE]