



## The virtual SciCon conference series | Transcript

### Chris Anderson | Future-Proofing journalism – ideas for the digital age (9th November 2020)

Mod.: Prof. Holger Wormer

[Holger Wormer]: So welcome, everybody, to the next session of our European conference on Science Journalism in the Digital Age, called SciCon. My name is Holger Wormer and I'm a professor of science journalism at TU Dortmund University. And I will also be a moderator for the next 60 minutes, either live on the video of the session, which will, as always, be recorded. So be careful today.

Today, our guest is Chris Anderson, who is professor of Media and Communication at the University of Leeds, and a member of the Board of Advisors at the Tow Center, Columbia University Graduate School of Journalism. Chris Anderson received his Ph.D. from Columbia University. And afterwards he was an associate professor of media culture at the City University of New York.

His primary research interest includes journalism studies, particularly the sociology of digital news, but also science and technology studies, as well as the sociology of knowledge and (normative theories?) on the public sphere.

So, Chris, thank you so much for being here. And today you will share with us some ideas, well, some ideas for the digital age, which hopefully could promise a way of future proofing journalism and later on in the discussion - I think we will have the discussion after your talk, which will be about 30 minutes - after the discussion, we may also talk about your description of journalism, of fear, which I've read about. So, this is a kind of cliff hanger for later on, about this issue, but now the floor is yours, Mr Anderson. Thank you very much.

[Chris Anderson]: Great. Thank you all so much for having me. It would have been lovely to attend this in person and I'm sure we'll all keep saying that for the next many months. But it's it's still great to be here virtually with all of you on Zoom from Leeds.

I'll get to this a little bit in the talk, but I don't think a conference on science journalism has ever been more relevant, possibly, than in this year. I mean, what a year to have this conference.

Probably science journalism has been part of the news ecosystem in many people's lives in a way that it never has been for most of life. Certainly in my life and probably the lives of many people. So, I'm going to get to this in the talk. But I just want to say

it's a real honour to be with all of you for a topic that's just so important. I'm going to share my slides now. I'm always wary of Zoom talks that drag on for too long. I think - I feel, at least - that our attention span is shorter on this technology. I have no scientific evidence for this, but I do often feel like our attention span is shorter on this technology than it is in real life. So, I will try to keep it just to 30 minutes. And if I do run longer than that these days, just let me know.

OK, and then let's start a slideshow. Okay, there we go. Hopefully everyone can see that. So, for this, I did just take the title of the session, which is "Future-Proofing Journalism: Ideas for the Digital Age".

As you can see, there are many challenges faced by journalism in the digital age, and in the twenty-first century, journalism is experiencing a huge lack of audience trust, particularly in Europe, Western Europe, the United States and the U.K. Obviously, this varies from country to country. And I don't know the numbers off the top of my head. Germany may be one of those countries that's blessed with slightly higher trust in the press than places like the United States or the United Kingdom, where trust in journalism has really plummeted. But probably one of the major challenges faced by journalism today is this lack of audience trust.

A second challenge, something that many people have talked about over the last decade or decade and a half, is declining revenue and declining business models for the news. I'm sure you've probably all heard this many times, but the transition of journalism from a largely analogue print and television-based medium to a digitally-based medium - one, particularly, where Facebook, Google and platforms have kind of monopoly control over news distribution - has led to a dramatic decrease in the ability of many news organizations to make a profit. This is shifting a little bit, particularly at the major sort of elite news publications like The New York Times and Washington Post, which are increasingly making money. But by and large, the collapse of journalism's business model has been a huge challenge that has been pursuing journalism for the past decade or at least 15 years.

A third challenge is an increasingly polarized society. This relates to lack of audience trust, right? How can journalism function in a world where everyone seems to want to believe in their own reality and we have trouble agreeing on a consensus set of beliefs that journalism can help foster?

And finally, a challenge is, is technological change. And this could go in many directions, but simply news organizations understanding how technology is affecting their operations. New technology - keeping pace with new technologies, knowing how new technologies can or cannot be integrated into the newsroom. Again, I could go on and on.

All of these challenges could take up hours of our time. Certainly they could all take up half an hour, which is why I want to zero in and focus on this last challenge here, which I think is particularly relevant for a group of folks, science journalists and folks concerned with topics related to science journalism. And that challenge is what I want to call a gap between certainty and uncertainty, and increasingly scientific journalism.

And there's a paradox here that I'll repeat many times, and this is the first time you're

going to hear me say it. But the challenge is between a journalism that has in many ways better understanding of science and better access to science than ever before, but navigating the fact that much of the best science is uncertain, provisional, and can always change. This is the nature of science, and it is being reported on by journalism that is increasingly sophisticated and exact. And what I'm going to discuss is: in a world where you have all of these other factors going on, this gap can cause major challenges and major problems for journalism. And I'm going to talk about that and hopefully help you understand what I mean over the course of the rest of the talk.

So, we're going to focus on the last one gap between certainty and uncertainty, and increasingly scientific journalism. All right, so I want to start with this opening puzzle and hopefully the slide, well, the slide is sort of already ancient history. The man on your left here is hopefully going to soon be a figment of America's past. But it's not history yet. And what do I mean with this opening puzzle? What I mean with this opening puzzle is this: you can see this slide right here. This is a piece of data journalism from The Guardian. A year in expenses. Parliament's releasing the full details of its MPs' expense claims. And this is from 2008/2009.

As you can see, this is filled with tons of quantitative information, percentage declines, charts, bar graphs, beautiful layout, what you might call data-driven scientific exact journalism. And increasingly, there is more and more journalism of this kind. Journalism that is in many ways scientific and has an increasing ability to report on scientific topics. In other words, journalism, parts of journalism, some journalism is better than ever.

By a normative standard that we would want to apply to it, it's more sophisticated, more exact, more data-driven. And yet, the world we are in seems to be increasingly irrational, motivated by all sorts of irrational political passions and producing irrational leaders. So how do we navigate this paradox between, on the one hand, an increasingly sophisticated scientific journalism and the larger state of our political culture, which often... for those of you who don't know this, is American professional wrestling. So, an American political culture or a world political culture which often seems increasingly unhinged.

So, what does that mean? What does that mean for society and what does that mean for journalism? How do we account for this gap between the carnivalesque nature of our politics and the scientific nature of our journalism?

Well, I just want to add that I think that this is increasingly important in the world of coronavirus, in the world that we have been dealing with for the past almost a year. And I mentioned this at the beginning, and I'll just say it again: I don't think there has been a moment in which science journalism has been more important, has been more read by more people. There may be other moments that I'm not thinking of. But I think if you were to say what has been the dominant, most important form of news reporting in 2020, it has been journalism that is trying to deal with science, specifically and so far as it is, helping society try to understand the coronavirus.

Right. So just like the previous slide, we have a type of journalism that is scientific in a sense that it's really sophisticated and trying to understand what this disease is,

how it works, how it functions, what it means for society, what it means for our political leaders - and at the same time dealing with all sorts of irrational, irrational political currents.

So again, how do these intersect? This is a specific case version of the slide that I presented earlier. So, in this talk, I really want to focus on this attempt to navigate between certainty and uncertainty, the degree to which we know what the ... let's just take the coronavirus as a stand-in. I may use it as a stand in in this talk.

The certainty of knowing what something like the coronavirus is, how it works, what it does, how it travels, what it means, what it means for politics, what it means for policy, how do we navigate between the degree to which we know what's going on in the world and the degree to which we don't know what's going on in the world, and the degree to which journalism, scientific journalism, science journalism is trapped between this world of certainty, where science and journalists have some clue about what's happening, and uncertainty, where there's a lot we don't know.

And I'm going to cover this in three basic pillars. I'm first going to touch very briefly on a very brief history of American scientific journalism. This is my last big research project that I like to talk about with all of you, because it informs all of my conclusions and all of the ways that I'm thinking about how journalism operates today. So, it's a trip back to the American past. Very brief that I hope will be useful.

Two, I want to talk about following the science. I want to present two case studies of this idea of following the science in the world of coronavirus.

And third, I want to talk about what we should do. What we as citizens, we as science journalists and we as people interested in studying science journalism, how we ought to... What it means for what we ought to be doing as a society and as a profession.

So those are the pillars of the talk today. So, we're going to start off with bullet point one, a history of American scientific journalism. And this comes out of a book that I published with Oxford University Press in 2018. The title of the book is *Apostles of Certainty - Data Journalism and the Politics of Doubt*. And the book is primarily a history of how American journalists have used scientific evidence and data in news reporting.

Right. So how have journalists tried to use numbers, charts, scientific facts, all of these forms of evidence that go beyond simply what politicians told them? One way journalists report on reality, one way journalists report on society, is that they ask politicians what's going on. They talk to the political party leaders. They talk about what political party leaders said and then they report on that. That's one major way that journalists talk about, or report on, what's going on

And I'm interested in all the other ways historically that journalists have operated. How they have used data, how they've used charts, how they've used talking to scientists, how they've used all of these forms of scientific evidence in their reporting, and primarily how they've used it over the course of history or at least the last hundred years. The book starts off in 1900 and it ends in 2016. And sort of looks at the historical arc of how American journalists have used this type of information and

this type of knowledge and reporting on public affairs. And I want to also talk about... in the book, I also talk about how these shifts relate to larger changes in US culture and US politics.

So, to the degree that I'm interested in this talk in this gap between scientific certainty and scientific uncertainty and how journalists navigate it, this book is about the same thing. Less present-oriented and less about today, but really a history of how American journalists have tried to do this. So, the book really touches on three key eras in the history of American scientific journalism.

The first - I'm not going to spend a ton of time on this because it's a bit uniquely American, I would say. But this goes back all the way to the 1910s and 1920s in the United States. And in that era, known by American historians as the "American Progressive Era," journalists drew on all of this very primitive social science that was being carried out across cities all over the United States, where armies of volunteers were fanning out all over cities and conducting these things called social surveys, where they were trying to count and calculate all sorts of aspects of what was happening in the American population.

And these people who are conducting these social surveys produced, as you can see, they produced maps, they produced charts. This is a colour-coded map of an area in London, where volunteers are mapping instances of poverty in London, in the streets, as you can kind of see here, colour-coded by blocks. This right here is actually a little form that volunteers, the social surveyors, would carry around with them. These are actually stickers here. And if you can see it, if I was in person, I would be pointing at this right now. These are stickers right here. And they would take these stickers and they would actually go to these maps that they had, and they would place them on the street, would actually place them on houses in the street. And out of that, they would build these maps. And out of that, these early proto-scientific-journalists would try to build charts and graphs about what was happening in American cities.

So these journalists, who were more concerned with facts and more concerned with data and more concerned with science than what politicians were telling them, produced what I call in this book a form of "social survey journalism" where they really thought that if they presented people with the reality of what was happening in American cities, the United States would enact better urban policy, basically. So, this is, like I said, in the 1910s and 1920s, a world that precedes even the establishment of traditional sociology and traditional social political science in the United States. In the book, I talk about this as the earliest form of scientific journalism, the earliest form of journalism insofar as it really was trying to conduct itself like science and trying to conduct itself in a way that drew more on the scientific method.

OK, the second thing I talk about in the book is this gentleman, Philip Meyer, who probably some of you have heard of. I can see a few of you nodding. Yes. Philip Meyer is well-known among people who study the applications of social science techniques to journalism. And Philip Meyer.... if these guys before were taking this sort of proto-sociology and trying to apply it to news, Philip Meyer argued that what journalists needed to do is take actual social science and apply it to news, take all the techniques that sociologists, political scientists had been using and use them in news stories and use them to write news stories.

So this is the second moment I talk about in the book. We're now past sort of primitive sociology and we're on to the real thing. And Philip Meyer was an evangelist, remains today an evangelist for this type of journalistic work. And he is the one that really pushed this idea that journalism could and should be more like social science and more like science than it already was.

The third section of the book is this thing that I studied in the field. I actually studied people who are practising it. It's called structured journalism, and structured journalism.... We don't have time to go into it in great detail here. But structured journalism, if Philip Meyer, as you can see here, was trying to apply sociology to journalism, structured journalism is trying to apply data science to journalism. So, in some ways, the next form of scientific work.

So, Philip Meyer wanted to apply sociology and social science techniques to journalism. And these folks out there who are evangelists for this form of work, are arguing that journalists, they don't even just need to use social science. They need to use data science. And so this is the third part of the book.

And what I argue in the book and I try to sum it up in this little chart, is that what this story is, is actually a progressive history of increasing journalist exactitude. In other words, over time, believe it or not, journalists are getting better and better at applying a variety of scientific techniques to the reporting of news. And in the book, I outline each of these squares in detail. You sort of have the progressive era, which was the social surveyors, and then you have precision journalism and then you have this computational journalism and they all use different materials. They all apply different methods. They're all operating within different political contexts.

And they all understand and embrace a different form of epistemology. But the argument I'm making in the book is contrary to many people who like to argue that journalism has always declined, journalism has got worse, journalism is not as good as it used to be, journalism has fallen. When you tell this story, what you see is: Hey, actually, journalism, parts of journalism, some parts of journalism have actually gotten increasingly exact, increasingly scientific and increasingly sophisticated. Hooray.

Well, but. If I ended the story here, it would be quite boring and we could all go home and be very happy with ourselves and with the state of the world. But obviously, it's not that way. There's obviously a but here.

So, we see a history of increasing exactitude and sophistication. But. And what is the but? I want to talk about the but in terms of now, to take us to the present day, to covid case studies. I will talk very briefly about two covid case studies: Case study one, "Masks", and case study two, "The airborne spread of coronavirus," by talking about the two countries that I have lived in and live in now, the United States and the United Kingdom.

Again, I hope this is interesting and relevant for a German audience and for an EU audience. It's not a happy story for either of them. So at the very least, you can comfort yourselves in thinking, "Well, maybe we're not this bad," but I'm going to talk

about the case of masks in the US and the case of airborne spread in the U.K. and I'm going to do it really quickly since I know we don't have a ton of time left. So - case study one, Masks.

And there you can see the man who I'm happy to say is the soon to be former president of the United States, Donald Trump, in a made-for-television moment where he posted his own diagnosis of coronavirus, stood on his balcony in this very kind of disturbing fashion, and tore off his mask, in this very melodramatic moment where he took his mask off. And all of this with Donald Trump and Donald Trump's behaviour during the coronavirus has led to a situation where the United States is seen as a polity, has been seen as a polity, where its leadership deliberately ignored science.

It has deliberately ignored the scientific recommendations of the scientific community.

And one of the reasons why it has been able to do that is that it has focused on old science to the detriment of the latest scientific findings. So those of you who may not remember this, or you may... I'm not sure how it is in parts of Europe, but in the United States, there was a long-time consensus that masks were not useful in preventing the spread of illnesses. There was a deep anti-mask culture in the United States and in other parts of Europe as well. And there remains this culture in many places. And this is in contrast to Asia, for instance, where there's a huge culture of mask-wearing, particularly when it comes to disease.

And over time, in the United States, when coronavirus emerged, the science behind masks changed and scientists starting to hedge their bets or change their minds and say, "Well, actually, maybe masks are not useful in some ways, but they're actually incredibly useful in all these other ways. And guys, it might not be a bad idea if you would all start wearing them. It's a small thing that you can do that can actually stop the spread of the coronavirus."

But because this represented a change in the science, it led to a political opening in which some degree of scientific uncertainty could be mobilized for political purposes. People like Donald Trump and his family and people who did not want to wear masks could step out and say, "We don't need to wear masks. The scientists have said we don't need to wear masks. There's no evidence that we need to wear masks. Oh, just a year ago, you were saying we don't need to wear masks. Why are you saying it now? It's a big conspiracy."

The fact that there was this change created an uncertainty which could then be mobilized by political actors for political purposes. And to some degree, the United States was less anti-science, although it certainly was, than it was a mobilized political community that attempted to take advantage of the fact that science is never stable, science is always provisional. Science is always changing. Hopefully in a good way and a forward thinking way. But they took advantage of that fact about science and they tried to mobilize it for political ends. OK, now we turn to the U.K. and the question of airborne transmission.

Now, if you're like me and you've lived in the U.K. for the past year, you have

continually heard these words from the British government, which is that they are following the science and the British government is following the science. Boris Johnson cannot open his mouth for more than five minutes without claiming that the British government is following the science. And this is in deep contrast to the United States, where there is this rhetorical invocation among the leadership that they hate science and they don't care about science and they think that science is unimportant.

Well, in the U.K., it's very different. The U.K. government follows the science and you can even see this difference in the slides here. Right there is Donald Trump removing his mask. And there's this very sort of calm, scientific looking knight, Sir Patrick Vallance. He's reassuring us all that the U.K. government is following the science wherever the science leads us. And I will say this just as an aside. I will say that I was really sensitive to this, coming from the United States, which does have such a deep anti-scientific culture: It really struck me as an outsider when I moved to the U.K. how much - at least verbal - faith there was in science from the political leadership.

So, we seem to be talking about two very different contexts and two very different cases here. But in the U.K., there was an equally difficult political decision in trying to deal with the science behind the airborne transmission of the coronavirus. Much like the science behind masks in the United States changed to some degree, the science behind airborne transmission and coronavirus has changed.

In the early days of the virus, there was a great debate. In fact, that if you remember, there was all this talk about washing hands, right? Wash hands, wash hands, wash hands. Well, as it turns out, washing hands probably was not a bad thing, but it was one of the least helpful things you could do, because scientific evidence increasingly shows that touching surfaces is not primarily where you get Covid.

In fact, coronavirus is an airborne disease that is not even transmitted via droplets, but it hangs in the air in enclosed, poorly ventilated spaces. This was a change in the science. And in fact, there is still huge debate about the degree to which Covid is airborne, and if it is airborne, how it is transmitted. Science hasn't figured this out, but there is an increasing consensus on the fact that airborne transmission is important, and airborne transmission plays a major role in how the virus spreads. But the science changed. And because the science changed, there was a huge - I would say, deliberate deliberate - delay in the United Kingdom policy apparatus in acknowledging and embracing this new scientific evidence about how the airborne virus is transmitted. And that is in a country that claims very highly to be following the science.

Once again, we have a change in the science which led to a political opening in which uncertainty could be mobilized to create a delay in enacting protective measures in order to save the British economy. Because the science changed, because there was uncertainty in the scientific community on exactly what was going on, UK policy leaders were able to delay their acknowledgment of this change. And they did it because - and I joked about this with a friend - they did it because the UK is a dark, cold, rainy country. And if you start telling people they need to do things outside, you're in serious trouble. I mean, that's a joke. But I ... honestly don't think it's much more subtle than that. I think the UK is a country where reviving the economy to any degree requires being inside. And when you start to acknowledge this new, uncertain,



provisional, debate, but robust scientific evidence about airborne transmission, you are going to have serious economic consequences as opposed to a place that's warmer, or opposed to places like Scandinavia, where there is an entire national tradition of learning to socialize and live outside.

So, these are our two case studies. And here is the conclusion.

In both of these cases, despite different political rhetoric, change in science and continued scientific uncertainty were used by political actors for non-scientific ends. Change in science and continued scientific debate and uncertainty were used by political actors for political ends. In the United States with masks, and in the UK with airborne transmission. And yet, as I argued in the historical part of the talk, journalism is increasingly exact, sophisticated and scientific. So, it then leads to this big final question.

What should science journalists do? What do we do in this situation? And here are my final recommendations. What should science journalists do?

Number one, acknowledge the changing science up front. Acknowledge at the very beginning of your reporting that the science is changing. Right, that the science is different now than it was maybe even three months ago. We thought this about masks and now we maybe think this. Don't disguise it in simply just the reporting of facts. Acknowledge that there has been a change.

But the second thing that science journalists need to do is remind or educate readers that changing science is good. Changing science means science is working as it ought to. The fact that science changes and evolves is not bad. It does not mean that science doesn't work. And it does not mean that science is a fraud. It means that science is working because it means that we are improving our understanding of what is actually happening in a slow and provisional way. But we are improving it.

Three: Always be clear about what we don't know. Acknowledge in articles, acknowledge in reporting that there are things that we just don't know and that we are not sure about. This will keep bad actors from pointing out that there are things we don't know. Journalists should take the initiative in pointing out that there are still things we don't know.

Four, and this is not particularly helpful, but it is really the main thing I can say: Science journalists always need to be prepared for politicians to use your nuance as a political weapon. So when you are nuanced, nuanced in your story, when you are nuanced in your reporting, politicians, if they want to, are going to use that nuance as a political weapon for their own ends and for their own purposes, but - perhaps in a bit of an existentialist way - that doesn't mean you should give up on nuance!

Just because people are going to take what you say and use it for their own ends doesn't mean to give up on nuance. That, in the end, is not improving public discourse. It is not improving public life. And in the end, it will cause more problems than trying as best you can to give your readers the nuance of a particular situation.

OK, and that is it. So, I hope that this was useful. I hope the chronology was

interesting for you. I hope you can see how that history, that American history of increasing exactitude relates to the dilemma in which we find ourselves today, where we are facing this gap between certainty and uncertainty, between increasingly sophisticated forms of journalism and this real, very real dilemma that science is a provisional, and always temporary, and always uncertain, enterprise.

And I think that, as you can see, this has huge political ramifications and huge journalistic ramifications for all of us. And my "What to do"-bit is provisional. And perhaps is not strongly worded enough for many of you, but I hope it's a starting point for a conversation.

OK, so that's it from me. I'm happy to respond to questions. Also to talk about journalism of fear, which I would love to chat about possibly how it relates to the talk, anything at all that you would like to talk about with me. So, thank you so much.

[Holger Wormer]: Thank you very much, Chris Anderson. Before I would start with a, well, rather pessimistic question, maybe there are some other questions which are a little bit more optimistic. So, we have another 20 minutes. So, I think it's not a good idea to start with the pessimistic one. So is anybody there, somebody having a question to Chris.

[Franco Zotta]: I also only have pessimistic questions, so...

[Chris Anderson]: Pessimism is fine. I mean, you know, it's been a bad year. I'm happy to start with that.

[Holger Wormer]: Go ahead.

[Franco Zotta]: It's Karl, maybe he has an optimistic question.

[Karl]: I don't know. I would try to pose it optimistically. And one thing that was really interesting for me, and especially here in Germany, was there was one medium, which was (a very high?) and many people listened to it, even more people than, for example, the daily main TV news, "Tagesschau", at some time. And this was a podcast of the major or most important German virologist, Christian Drosten. He had millions of downloads. And it was like just 30 minutes of conversation with a science journalist. But I was wondering how much ... you showed that slide with all these graphs and so on. So how much should, in these special times, journalists or the work of journalists be in the focus, or how should scientists - when they are able to address the public - be in the focus, and their work.

[Chris Anderson]: Yeah. Thank you, Carl. That's a great question. And this is actually a huge debate both in the scientific community and in the journalistic community, because you have to two options. Option one is that the scientists themselves can speak up, using all of the new media and the new tools, like podcasts, for instance, that you pointed out. And there are many people in science - and not just biological science, but social science - there is even this move in the scientific world, especially in the world of public understanding of science circles that says: "You know what, scientists? You're always going to be misrepresented by journalists. You're always going to be... it's always going to be fudged or done poorly in a particular way. You

need to get out there and you need to cut out the middleman and you need to t speak on behalf of science for yourselves."

And I think that that's a hugely valid and valuable and perfectly reasonable step to take. My research has always looked at the middleman. I've always thought that even if scientists themselves do step to the fore, even if they do kind of step to the front, there is, for better or worse, always going to be that middleman. And what that middleman does and says is still of, you know, is still of public import. But that said, I certainly think that and this is true in the US. You have historians giving podcasts who get huge numbers. You have many, many people who used to be in a closed-off scholarly community who are now talking to publics in new ways. You know, I do think it raises one interesting question and then I'll stop.

I think it raises one interesting question on the degree to which - if there's a tension between science participating in the public sphere, in the political sphere, and science's desire to operate in a professional world where only its own rules of evidence apply.

So science also gets value, in some ways, of being closed off from politics.

I'm not saying that it's a sustainable way to do it or that that's necessarily the right way to do it. But many scientists do get professional rewards from being in a closed-off ecosystem. And when you participate in the public sphere, there are new rules and there are new reward systems and a new rewards structure. And I think that, to the degree science is going to take this route, it needs to be honest with itself about what that means and how those different rewards, systems and imperatives can change what science is. I don't think it's necessarily bad, but I do think that science can't pretend that they can do this and that everything is going to remain exactly the same. I think it needs to be honest about what the implications might be.

[Holger Wormer]: Thank you very much.

So is there another rather optimistic question. Angelica Jacobs, please.

[Angelika]: Hi. Thanks a lot for the great presentation. I especially love your recommendation about including that changing science means that science is working. But I think that knowing how science works isn't to be expected from everyone. And how do you include this information in your daily reporting without repeating yourself over and over again or putting a huge disclaimer above everything? You're right.

[Chris Anderson]: Yeah, that's a huge problem. And there are practical difficulties in doing this, as you say. So, I'll take it in two parts. First of all, just the practical difficulties, which is sort of what you're interested in.

In your daily reporting, how can you do this in a way that grapples with the fact that not everyone is necessarily cognizant of how science works? So, the question - you didn't ask it this way, but a very bold way of asking the question could be: "Do journalists need to have a graphic about the scientific method to every story they do? Is that what we're talking about here?"

I don't think they necessarily need to do that. And I think that that would probably create bad journalism. But I do think that this is one of those areas in which new digital tools and new digital ways of conveying and displaying information can really be valuable to journalists in ways that we haven't quite figured out yet. So, you know, if you're just thinking about it in terms of a television broadcast or a traditional print or a word-based news story, then, yes, you are going to face practical difficulties in conveying that information. But perhaps there are ways you can do it through links. Perhaps there are ways you can do it through pop-up boxes. Perhaps there are ways you can have a button somewhere that says "If you want to learn more about the science, click here."

It can take you to another page, where it does get a little more nitty-gritty about how the science actually works. So, I totally agree. I mean, there are real practical difficulties in doing this in a way that still is a positive and aesthetic reading experience for readers, but I do wonder whether new technologies and new ways of conveying information can be mobilized. So that's answer one on the practical side.

But I think there's a more fundamental philosophical question that you're asking. And I want to dwell on that for a second. And that is what you said: most people - many people, maybe most people in the United States, unfortunately, don't have any idea how science works, and they just don't know that there is a deep lack of public understanding. There's a deep lack of understanding by citizens of the fact that when the science changes, it can be a good thing. Many, many people do not know this.

And I am an unusual journalism scholar insofar as that I often say that there are a lot of problems with democracy, and with the direction of our public, that journalism cannot solve, that journalism simply has to be humble and chastened and admit that it cannot solve these. It cannot solve the fact that many Americans are ignorant of science on its own, it's too much to expect that this is a problem that journalism is going to be able to fix.

This does not mean that it cannot be fixed, but it needs to be fixed also in places that lie outside of journalism, for instance, American public education. You know, the American relationship between church and state and the degree to which evangelical leaders have so much power in the US.

I mean, this is a bit outside the topic, but I do think that journalists can only do so much. And journalists shouldn't feel that they have to be the only ones engaging in this process of "remedial education". There needs to be a system-wide mobilization to fix it. And journalists can play a role in that. But all the burden cannot be placed on them to solve a problem.

That seems to be the answer to the next question, that I get in the chat by (ManfredRonzheimer), who is asking, "So what must science do that Donald Trump and other corona-deniers accept the findings of science?" Well, actually, maybe there is already even a difference between Donald Trump and the other corona deniers. But I think that's exactly what you have said before, that it's not a burden that can be just borne by journalists, isn't it?

[Chris Anderson]: Yeah. Unfortunately, that's the answer that I just gave. It gave us an easy answer to a lot of questions. And I could give it to almost everything that you ask and I'm going to try not to. But yes, number one, that is a great answer to Manfred. Why is it up to journalism to cure Donald Trump of his insanity? I mean, that's a lot to ask. But because I don't want to give that answer to...

So, that's the easy answer, that's the first answer. The other answer, I do think that there have been some stories that news outlets have run, which tell the story of deniers who get coronavirus, and they're told in this very "feature", human-interest way where they're not hard news stories. They're very long, and they talk to these people who were Donald Trump voters, who were these people who denied what was happening with Corona and then got it. And about the degree to which their beliefs changed and their advice for the world changed. And that really outlines it. That really shows, in a very human way, some of the ways that people have changed their minds and some of these implications. I don't think it is ever possible to cure Donald Trump of his aversion to science, but I do think it is possible to some degree to contribute to curing the beliefs of ordinary people, the people who might vote for Trump or who might like Trump.

Again, not on its own, and not by itself, and maybe not the most important thing, and not the only thing. But I do think that there are small ways, largely by emphasizing the human element of these things, that journalism can play a role in....

[Holger Wormer]: But just let's have a look at the changing media system. So, keeping in mind your [technical issue] picture, which you started with at the beginning, and also keeping in mind this very old idea of "The medium is the message." So is there still a chance in the media system, which has more and more small bits and is getting faster and faster, to really win the race for complex science in competition with these short messages and often very simple but very attractive lines?

[Chris Anderson]: Yeah. When I published my book, when I sent the book out for review, my very good friend, Rasmus Nielsen, who's the head of the Reuters Institute for Journalism at Oxford, more or less asked me the same question. He said, "Well, Chris. Your solution about nuance and subtlety and all of this makes sense for you, because you are a thoughtful person who likes to read, but the vast majority of news consumers are not consuming news this way, both in terms of the technology that you mention - and you emphasize that - but also in terms of just the daily habits of people. Most people consume the news in a very superficial, shallow sort of drive-by sense. Good luck with that."

So that was basically his way of asking it. Yours was nicer than that. But I do think it's a legitimate question. I guess that my response would be that to some degree, the problem with science, at least in US politics, is an elite problem, it is a problem.

So most people don't consume news in this more thoughtful and more nuanced and more subtle way. They largely take their cues from their political leaders and they largely take their cues from elite leadership.

And I just said in response to Angelica's question, some political leaders are

irredeemable. They will never be convinced by any of the arguments I make, and they will never be convinced because they have a political incentive in believing differently. It is in their political interest to believe otherwise. But my hope, I guess, is that not all political leaders are irredeemable.

You know, I think that when you get outside the United States into slightly saner countries, of which I still believe Germany is maybe an example of one, despite knowing there are political polarization problems in Germany as well, but there are political leaders in Western democracies that are more reasonable and more open to being convinced to accept the subtle nuances of science.

And if we can change the tenor and change the belief structures of political leaders and the elites, the political elites, then all of those people who don't really watch the news or don't really read the news or don't care about that nuance will still follow the people leading them. And that may be a way of encouraging change from the top down. You can see that's a narrow path. And there's a lot of "Well, if you do this and this and this and this and maybe this." So, I take your point that there's a lot that needs to go well for that to happen. And I'm basing my hope on a small read.

But, you know. I guess I'll just wrap it up by saying that this is the one way that interacting more with other countries and doing comparative work can perhaps give us hope, because if our only knowledge of political systems was Brazil, Turkey, the US and the UK, I would be a bit despairing.

But there are other systems and there are other parties and there are other leaders out there. And I think that we in the US and the UK can perhaps get over our own insulation and isolation a little bit and try to learn from other places, where things seem to be going at least a little bit better in terms of the behaviour of political leaders.

[Holger Wormer]: Thank you very much. So maybe, Franco, we would just move forward to your pessimistic question.

Then we have another two maybe in the chat, they're about (inc., participants talking over each other).

[Franco Zotta]: I wanted to ask about all the recommendations you listed on your last slide. At the end, they need an ecosystem for quality journalism. And your first slide shows us that we don't have much of a future for this sort of journalism. So how do you combine this ideal of journalism with the reality of journalism, which is problematic in so many ways?

[Chris Anderson]: Yeah.

Believe it or not, if I'd given this talk to you five years ago, I would have had a slightly different answer to that question. I am marginally more optimistic that there is more of a future for quality journalism than we thought five or ten years ago. The economics are bad, but they're not quite as bad as we thought they were, and that there are financial solutions, both in terms of public support and in terms of government funding solutions, and in terms of market-oriented solutions.

There are some tiny green shoots in this world, and all is not lost and maybe all is not lost quite as much as we thought it might have been in this regard ten years ago. The problem, though, is that elite journalism that is successful, especially in market terms, often maps onto a single political ideology.

So, for me, the question is less "How do we ensure a marketplace for high-level quality journalism?" But in addition to that, how do we not only ensure a market for that, but how do we ensure that the market is not solely grounded in one political party or one political belief? Because if the only people you are reaching in your high-quality journalism are people who already agree with you, then what?

The trouble is that all of the solutions that I'm very optimistic about in terms of sustaining high-quality journalism, almost all of them are ones that require, for financial reasons, preaching to the choir. You see what I mean?

So, the green shoots that do exist don't solve the problem that quality journalism often maps onto political ideology. That's just to say that, yes, it's a huge problem. And I think it's only partly a problem in terms of the market not being there, but it's a problem of how the market works and how you can diversify the market in a way that has elite quality journalism not simply being financially successful by appealing to people in Manhattan who like to read The New York Times.

[Holger Wormer]: I think we have time for one last question, so Katharina Jakob was asking the question how journalists should control whether they follow the most reliable scientists or not.

There is the example of climate change, where people very often construct a kind of debate or controversy around whether it exists. What's your view on this question?

[Chris Anderson]: I think there's an even sharper way of putting the question, which is: If you focus on the uncertainty of science and if you focus on the degree to which science is provisional and unknown, then what journalists often do is they quote a climate change denier who represents 0.1% of all of the scientists out there, and a climate change believer scientist, who falls in with 99.9% of all scientists out there.

So, I would just say that this is not the way to emphasize uncertainty in science, this sort of false balance, or quoting one person who may be an outlier in terms of believing in climate change. I don't think that's the way that you encourage readers to think about scientific uncertainty.

I do think that probably within the world of climate change science, there is still debate among the people who believe in it and who acknowledge it and acknowledge that it's caused by human beings. And perhaps in the ways that it ought to be mitigated, perhaps in the ways that the fossil fuel industry ought to be regulated. So, I do think that there's a degree of productive nuance and productive scientific debate that you can engage in over the question of climate change that doesn't give any credit or any credence at all to the people who just simply don't believe that it exists.

I think another thing you can do with climate change is that you can show how the

science has changed and show how the science has increasingly been in a direction towards greater belief in the reality of man-made climate change. So that's a way of bringing uncertainty into the article that does not require empowering the people that you mention who should not be empowered and who should not be included in legitimate scientific debate. So, yes, what you're talking about is the lazy way. It's the bad way. And we should not do it.

[Holger Wormer]: OK, it's three o'clock now, Chris, and I would just like to take home one good optimistic message that there are at least some parts of journalism that are getting more and more precise and more and more scientific. Maybe we have to continue another day about business models in journalism. And unfortunately, we will also have to skip questions on your paper on the journalism of fear for today. But it is an interesting paper, so I can only recommend to everybody to read it and cite it. Scientists know it's important to be cited so everybody knows this, but thank you very much for today.

And I hope that we'll have you here another time, and all the other listeners and spectators. The sessions of the SciCon conference will be going on until May, and we now hope that we may be able to meet in Freiburg, Germany, in spring.

So thank you very much, Chris. Thank you, everybody, for listening today.

[Chris Anderson]: Thank you so much. Thanks, everybody. Thank you.

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