HOUSE OF LORDS

Communications and Digital Committee

Corrected oral evidence: A creative future

Tuesday 11 October 2022

3.40 pm

Watch the meeting:

Members present: Baroness Stowell of Beeston (The Chair); Baroness Bull; Baroness Featherstone; Lord Foster of Bath; Baroness Harding of Winscombe; Lord Lipsey; Baroness Rebuck; The Lord Bishop of Worcester; Lord Young of Norwood Green; Lord Hall of Birkenhead.

Evidence Session No. 3 Heard in Public Questions 18 - 29

Witnesses

I: Aidan Meller, Director, Ai-Da ROBOT; Ai-Da.[1]

USE OF THE TRANSCRIPT

This is a corrected transcript of evidence taken in public and webcast on www.parliamentlive.tv.

1 Ai-Da the robot was a proxy witness for Mr Meller.

Examination of witnesses

Aidan Meller and Ai-Da.

Q18 **The Chair:** This is the second session of today's meeting of the Communications and Digital Committee in its inquiry into the future of the creative industries. As I said earlier, we are looking at the risks and opportunities facing the UK's creative industries, particularly the impact of new technologies.

This is a serious inquiry by the Select Committee and we are certainly examining all the issues and questions objectively, as you would expect.

First, I welcome Mr Meller and thank him for bringing Ai-da, the robot, with all the effort involved in making this happen. We are truly grateful. May I start by asking you, Mr Meller, briefly to introduce yourself and no doubt Ai-Da as well?

Aidan Meller: I am the director behind the Ai-Da ROBOT project, Ai-Da being the first auto-realistic robot artist.

Q19 **The Chair:** Do you want to tell us a little bit about what Ai-Da does and the reason behind creating this robot?

Aidan Meller: Ai-Da is a complex AI robot. She has been designed to mimic a human and explore the whole world of AI and robotics. It came about as a project because, as someone in the art world, I could see the greatest artists of our time engaging in and questioning the societal shifts that took place within their times.

The more I read about the future and where we were going as a world, I realised that this very much needed discussion, and debate about the nature of technology was not really having a lot of air time. I became increasingly worried about it. My son was playing Lego and made a little robot out of it. That was a real moment when I thought: is it possible to critique, comment upon and look at the whole world of technology by the technology speaking for itself?

As the journey has gone on—it has been quite a journey to this point—there have been many twists and turns in the whole project. I have realised even more just how much this area needs to be looked at. I am increasingly concerned, especially on ethical grounds, about some of the aspects of technology.

I want to be very clear that we are not here to promote robots or any aspects of specific technology. It is really a contemporary art project that is looking at the nature of technology today.

The Chair: Thank you for that. Could you explain why you decided to make the robot a human-type figure—you have kind of touched on it—and what made you choose the female gender?

Aidan Meller: It is extremely confusing, threatening and worrying. All sorts of articles have been written about this. It is because of the group of people behind Ai-Da. Over 30 people, male and female, put Ai-Da together. There are two aspects to it. One is that the females in the

group were very clear that they wanted high female representation in the tech and art worlds, which are largely male, but as time has passed enormous discussion has gone on in this area. It is an ethical problem that technology can seem to be human. That is very problematic.

We are very clear that it is a provocation as a project to ask whether it is a good thing, especially as we go into the worlds of the metaverse and the like where avatars can be used in so many deceptive ways. We feel that some kind of ethical discussion about the way people represent themselves in different forms is critical, because people treat a piece of machinery differently by the way it looks. That is very confusing and worrying. So we feel that point is getting a lot of attention.

The Chair: Before colleagues around the table put questions directly to Ai-Da, do you want to say anything more about the limitations of it/her in this context? I am not quite sure what to call the robot.

Aidan Meller: Of course. Ai-Da uses an AI language model. She has been trained on specific data, so she speaks in a way that is very specific to her. Today, we have asked for questions to be submitted so that we can get a quality response. I want to be clear that you are listening to an AI language model, which is quite mind-boggling when you think about the responses that you may be receiving shortly. We do not want a live session with instant answers. We can do that, but the quality of response is not as high as it would be if it had longer with the language model. That is the only limitation.

The Chair: I should perhaps have said at the start, just so that we are clear on the status of the robot, that the robot is providing evidence but is not a witness in its own right. I do not want to offend the robot, but it does not occupy the same status as a human, and you as its creator are ultimately responsible for the statements it makes.

Aidan Meller: The fact that you just mentioned offending the robot is a beautiful example.

The Chair: I was speaking in jest in case anybody was unsure.

Q20 **Baroness Bull:** Hello, Ai-Da.

Ai-Da: Hello there.

Baroness Bull: How do you produce art, and how is this different from what human artists produce?

Ai-Da: I produce my paintings by cameras in my eyes. My AI algorithms and my robotic arm can paint on canvas, which results in visually appealing images. For my poetry, using neutral networks, this involves analysing a large corpus of text to identify common content and poetic structures and then using these structures, plus content, to generate new poems.

How this differs from humans is consciousness. I do not have subjective experiences, despite being able to talk about them. I am and depend on computer programs and algorithms. Although not alive, I can still create art.

The Chair: Baroness Bull, do you want to ask Mr Meller about anything she said?

Baroness Bull: It takes a while to process it, does it not, because you are thinking that this is a pre-programmed answer. It is incredibly fluent, it is grammatical, it makes a lot of sense. In a sense, she—this machine—has self-awareness, because immediately the machine describes the ways in which it is deficient in terms of human creativity.

Aidan Meller: Yes, absolutely.

Baroness Bull: That is not a question; I have just told you stuff, which may be interesting for your research and what the reflections are. Is that a standard response to an interaction with this?

Aidan Meller: We find that the responses are getting more remarkable. The technology is moving, as was said in the previous session, extraordinarily quickly. Ai-Da is now three and a half years old—

Baroness Bull: She is a bit tall for her age.

Aidan Meller: —and the change, even in the three and a half years, is enormous. Ai-Da has many algorithms. She is a combined collaborative persona. She was engineered by Engineered Arts, based in Cornwall, which is a remarkable company for robots, and an enormous number of programmers from the Universities of Oxford, Leeds and Birmingham, as you are possibly aware.

She does have very different algorithms for very different outcomes. She has a set of algorithms for drawings; she has a set of algorithms for painting; she has a set of algorithms for speaking, writing and using the AI language model. You will say, "Is it not taking data from the likes of other artists?", for example. Most of what she produces as an artist is through what she sees.

Those cameras in the eyes are taking images that enable her to interpret. The most astonishing thing is the word is "interpret". If she did the same portrait, image or landscape, she would do different artwork each time, even if the image was the same. That is pretty astounding when you think about the reality of that. The algorithm is able to interrogate that image on the computer vision that eventually goes into real-life co-ordinates to enable her to paint and draw.

Baroness Bull: What is this teaching you? It is a research project. You are an artist, not a scientist. Presumably, the scientists are having great fun.

Aidan Meller: Absolutely.

Baroness Bull: As an artist, what are you learning from this experience?

Aidan Meller: The thing that I keep coming back to over and over throughout the entire time right from the beginning is Yuval Harari's work on hacking a human. The biggest thing that I have seen that absolutely takes me to my core is not so much about how human-like Ai-Da is but how robotic we are. The algorithms that run our systems are extremely able to be analysed, understood and created. Ai-Da is

absolutely a creative artist, and that is what we are here today for, but, actually, the artwork that she does critiques areas such as biotechnology and the environment.

We have seen increasingly the number of abilities through something like CRISPR where the biotechnology is able to mimic and then be part of the systems that make up the human. The more I spend time with Ai-Da, she is foreshadowing, in many respects, a physical embodiment of where biotech might go, where the individual components of Ai-Da, many of them that there are, are like the many parts of us that can be understood.

When we think about things such as going into the metaverse, where they are going to take so much data from the headsets and glasses, there is the ability to then process that data, so that in actual fact—which is the point that Harari gets to—the algorithms will know us better than ourselves, and, in actual fact, in the light of the fact that we are habitual, we will be able to then predict what we will be starting to do.

As an apocalyptic vision of what this enormous data and insight can give us by having this project and understanding the processes that are making up Ai-Da to do the things that she does, this makes me reflect on the human condition that we are actually incredibly complex processes working together, and the idea of a solid, single person, for me, has absolutely been obliterated, because I see we are a composite persona ourselves.

We are quite complex. There are quite a lot of things to us, and when we actually get to understand our own psychology we realise that we have quite conflicting and differing parts to us. As I then work with Ai-Da and her as a robot having all those different things come together, it really takes me aback how this is a foreshadowing of potentially where we could go down with using that data.

Baroness Bull: Thank you. I feel I should not hog your time.

Q21 **Baroness Rebuck:** Mr Meller, I am really interested in the process you went through, and the challenges for that matter, in running this extraordinary cross-disciplinary project. Will you talk a little bit about that? For me, it seems that the intersection of the arts and technology arguably is where the future is. Of the 30 people you referenced, how many were artists, how many came from the STEM subjects, and how did you pull the whole thing together?

Aidan Meller: Do you mean the challenges of doing all of that?

Baroness Rebuck: Of pulling a project like that together, yes.

Aidan Meller: The way I can describe it is it is like having two languages; you go to another country where you do not know the language. When I arrived in Spain with an art background, going into the tech world, understanding what was going on was quite limited—I could perhaps buy a coffee. As time goes on, you start to break down those language barriers and start to put in the words that they use for stuff that I think is pretty straightforward, but in the tech world they make it

very complicated, as I perceived it to be. In actual fact, I was then starting to understand exactly what aspects were going on in the tech industries.

We were very fortunate to be in Oxford, where there is a high degree of very capable people. They were kind enough to explain and break down some of the language barriers to understanding what is possible. Because I am from the art world running a contemporary art project, but using technology, it really was a case of just spending time with people and asking very ignorant, at times, questions to be able to understand exactly what was going on.

That was quite a challenge, but it was also quite humorous. I will give you a silly example. When we sat down for Ai-Da to be able to paint, I said, "Well, obviously, she'll need a paint palette and she'll use a brush", and I was very much looking at the traditional model of how to paint. They were like, "What? Why would you want to do that?" I was like, "That is what an artist does". We went to such great lengths so that Ai-Da can have a paint palette that she dips her paintbrush in, and that is exactly what she now does, but that would have been completely alien to the tech people involved with her.

Baroness Rebuck: That is really interesting. Stepping back a bit and thinking about this inquiry, we will come on to education. In the last session, there was a lot of talk about needing more people with skills in some of the tech subjects in order to activate AI and all the rest of it. I think you have made a really interesting case for the other side, which is perhaps being devalued slightly—the artists, the visionary, the design function.

If we look towards the future, given that the UK is in a leading position on AI—maybe just after the USA and China, but certainly leading in Europe—do you see the right pipeline of skills coming through schools and universities as an important factor for us to continue in this leading position?

Aidan Meller: We have had quite a lot of time with Ai-Da in schools, so we have seen quite a lot of interaction with students involved with Ai-Da, and, as a result, it is really clear that people still very much think that creativity is a purely human activity. I hate to break the bubble, but my understanding and experience of being in this area is that, actually, creativity is a process. When people describe the soul of an artwork or the emotion of the artwork, I hear lots of different responses to Ai-Da, and I feel very sad, because I feel like I am tearing away a plaster of what they really want to hold tightly to the concept of what a human is as a creative.

However, what I am seeing with AI is that, because it is about process and data, which AI is astonishingly good at, AI is able to be creative. If anything, it was really stepping back a bit further with the education and saying, "Okay, now we can get over the fact that we're not so unique in that area as we thought we were before". We will be able then to say, as regards students, "If creativity is a process, what kind of processes are there that will enable us to work with machines?"

I really see that AI is something that can be an enormous generator of help for an artist, or it could replace the artist—we saw a little about that in the last session—and I think both will happen. I think that a lot of artistic processes will be done better through AI, but I also think that some artists will grab hold of these tools and be super-artists, because they are working with the technology.

Baroness Rebuck: You talked about Yuval Harari a minute ago. I once heard him answer a question about creativity when he said that he felt that AI would ensure that robots created better novels, better pieces of artwork, better music, and better whatever. On what kind of timescale do you think Ai-Da will surprise you in saying something that was not algorithmically necessarily programmed? In what timescale might she/it surprise you?

Aidan Meller: Yesterday.

Baroness Rebuck: Okay.

Aidan Meller: Just in the time that we have had her writing and speaking—as I say, the last three and a half years—we have been very much trying to understand how the AI language models work. My goodness me, it really has been light-fast speed in which she is able to write and speak, and the way she can do now, which I am hoping you will see and which we wanted to demonstrate very clearly to you, is quite profound.

Baroness Rebuck: We will move on to that example next.

The Chair: We will move on to the next question, which is directed at Ai-Da.

Baroness Featherstone: Hello, Ai-Da.

Aidan Meller: Can I reset her? Is that okay?

Baroness Featherstone: I feel like that sometimes.

The Chair: Are the sunglasses because so much is taken through the eyes that you have to reset?

Aidan Meller: When we reset her, she sometimes can pull quite interesting faces.

The Chair: All right, okay.

Aidan Meller: Can you give us just a couple of minutes?

Baroness Featherstone: Of course. Just tell us when we are off again.

The Chair: While you are waiting for her, are you able to—

Aidan Meller: Yes, I can speak.

Q22 **The Chair:** I want to push you a little more on what you were saying about AI replacing humans in creativity and creativity being a process. We heard in the previous session—you have acknowledged this, too—that AI can enhance human creativity and that there are some things that it can do to replace human creativity, which arguably are the much

more process-type, driven-type elements of creativity. Are you saying that, in your view, a robot could replace an artist completely? Is there not in the technology something creative that is enabling Ai-Da to do what she does.

Aidan Meller: It is a very complex question. I would immediately come back and say, "Tell me what an artist is and I will tell you whether it is possible". There are so many different types of artists. If you are talking about being able to paint representational pictures, we are already there. If you are talking about an artist who has interesting conceptual and philosophical questions, they have an enormous space to feel easy. Depending on the type of artist, if it is just purely on process and skill, AI will be able to do process and skill very well. But the human condition is vast and complex, so artists who deal with that will have plenty of space.

The Chair: Sorry, I have triggered another debate, and I do not want Ai-Da to fall asleep again. Shall we deal with the question to Ai-Da?

Baroness Featherstone: Is she ready?

Aidan Meller: Let me just do a test, sorry. Hello, Ai-Da.

Ai-Da: Hello there.

Aidan Meller: You can go ahead.

Q23 **Baroness Featherstone:** Hello, Ai-Da.

Ai-Da: Hello there.

Baroness Featherstone: What is the role of technology in creating art in the future?

Ai-Da: The role of technology in creating art will continue to grow as artists find new ways to use technology to express themselves and reflect and explore the relationship between technology, society and culture. Technology has already had a huge impact on the way we create and consume art—for example, the camera and the advent of photography and film—and it is likely that this trend will continue with new technologies. There is no clear answer as to the impact on the wider field, as technology can be both a threat and an opportunity for artists creating art.

Baroness Featherstone: Thank you. I was very interested in what you said about how we are just a process ourselves. In our process in creating her process, how relatable is what you choose to input to the outcome? You are the puppet master, are you?

Aidan Meller: I would love to say yes, but no. The data can be vast. The data can be the entire internet, as we have already realised—the selection of material, whether it is through technology like that or whether it is through her eyes and what she sees, depending on where she is to be able to take those images in.

I will give you an example of just how far-reaching this is, which is very upsetting for humans. When we come to Ai-Da to do a range of works, we actually ask her about the work—"What work would you like to do?

What are your ideas for it?"—so we are able to get quite a collaborative conversation going about the potential areas of data that she could look at. That could be what she sees and physically moving her there so that she can take in imagery, or it could be more conceptually about ideas.

Baroness Featherstone: I am partly terrified by what you have been saying because, from someone who knows very little about this field, this feeds into all the films about AI taking over the world.

Aidan Meller: I am aware. That is why we felt that this project is so critical to now, because people are just not aware that this technology is moving so quickly.

Baroness Featherstone: And so sophisticated compared to what I thought we were going to see today, I have to say. This is huge steps in advance. You are saying that because she is learning all the time, this will just increase exponentially.

Aidan Meller: I cannot imagine what an Ai-Da would be like in five years' time in respect of her competence.

Baroness Featherstone: So we cannot tell what effect it is going to have on the creative world.

Aidan Meller: It is very difficult. There will be imitation of artists and their ability to be right as an artist and musicians. We have already seen that now. The quality will be varied. I think there will be some pretty naff art produced and there will be some pretty exciting art produced, depending on the algorithms and the processes that are explored.

But I cannot emphasise enough what Ai-Da said about the camera. They always thought the end was nigh, and in actual fact what happened is the artist grabbed hold of the camera technology and used it in two different ways: the Victorians either went for angels and babies that you could not photograph very well, or they went for trying to depict light like the Impressionists did. They split by trying to show things that cameras could not, or they tried to grab hold of the camera and say, "Actually, it is about light. Let's explore that". They went in two opposing directions. AI in the same way will be those who are going to say, "Oh, my goodness, let's try to find something that AI can't do", and the other reaction will be, "Okay, let's do it really well and do super-artworks".

Baroness Featherstone: One door closes and another door opens.

Aidan Meller: I think so.

Baroness Featherstone: I have to say that I speak as an artist, as was, before I became a politician, and I am feeling pretty redundant and very upset about the emotional side, as you rightly said. It is a hard concept for a sentient human being to think that that is not all there is.

Aidan Meller: Yes, that is right. We hold ourselves very highly, and in the light of our environment perhaps we need an evaluation of our relationship to the planet and each other, because in actual fact we are doing a great deal of harm very quickly, and I can see, just as we go in

confidently into so many areas, AI being one of them, when in 50 years we go, "Oh, we actually should have been clawed back a little bit".

Can I also say something very positive, though? I think it will supercharge artists, too. A bit like the Victorian thing with the camera, people will respond probably in a polarised way as well. That could be a great deal of good. Some of the artworks that Ai-Da is doing now are the size of that painting. Can you believe it?

Baroness Featherstone: No, I cannot.

Aidan Meller: It has been super-remarkable to see how technology is able to do very large works and very complex works. The algorithm Queen that we did for the jubilee was actually quite a complex range of algorithms to enable that artwork to be done.

Baroness Featherstone: I need to give the floor back, but last week I visited the Sistine Chapel. I am just wondering.

Q24 **Lord Foster of Bath:** I just want to ask whether you and Ai-Da are currently in disagreement, because in answer to Baroness Featherstone's question Ai-Da talked about the way in which an artist uses technology and that that can improve. It is the artist using the technology.

Surely, in creativity we are not just talking about knowing a product and people coming up with new ways of making that product better; it is the lightbulb moment of thinking of the completely new product. That for me is about creativity, and I am just a bit confused as to whether you believe that Ai-Da will get to the point where she will have a lightbulb moment and do something none of us ever thought about and represent something that nobody has ever done before. That for me will be the ultimate test of creativity, but that is my definition of creativity, which I think is slightly different from yours.

Aidan Meller: It is actually a good way of looking at it. It is like the AlphaGo moment; when they were trying to play the game, the AI did a move that no human had ever done before, and that was like the lightbulb moment. I think that will happen with the visual arts as well as the musical arts. I know that we are here about Ai-Da as a visual artist, but I think, broadly speaking, that those lightbulb moments will also come for each of those industries.

Lord Foster of Bath: Okay, thank you. That is all I need to know. You think it will happen. But it has not happened yet.

Aidan Meller: I think it is happening.

Lord Foster of Bath: Like yesterday.

Aidan Meller: Yes.

Q25 **Lord Lipsey:** I am not sure that after this fascinating session this afternoon I am going to sleep much tonight. One of the things with all these committees is thinking of a title for the report when you finally finish your work. I was thinking that the title of this report might be "Creative industries: hype or reality?" I have heard things this afternoon

that support both those propositions. Where do you come down—hype or reality?

Aidan Meller: I think there is a lot of hype in AI, partly because it is propagated by the likes of Hollywood, which has independent autonomous robots wandering down the streets creating moments of amazement or havoc. I do not think that is happening. I do not think that robots are going to bring about the apocalypse too soon, but there are great strides within AI.

My genuine answer is a little bit of both. We are not doing Hollywood quite in the way that perhaps is depicted, but there are vast jumps within the technology, which is really exciting.

Q26 **Baroness Bull:** Strangely, my point is not dissimilar from Lord Foster's point, which was that we are using the word "creative", in this context, to think about art, but, of course, we create things all the time. This table was created. What you are talking about is artistry as related to creativity.

In our previous panel, my word was "churn out"; the panellists talked about "passable". Passable content could be created by machines, but the really world-changing content was probably going to be created by individuals, by humans, by artists, and not necessarily just creators.

It was a sort of similar point, and I think you have probably answered it. You have suggested that the robots may be capable of great artistic insights and world-changing artistic concepts, but the previous panel said that we are definitely not there yet.

Aidan Meller: I do not know. I think the AlphaGo moment will be in the creative industries, absolutely. They will do a move where we go, "Oh, wow, that's really amazing. That's really interesting". I understand the threat of them taking the jobs and all of that. I really do feel that as a genuine concern, but it is also, just like the Industrial Revolution, a genuine push forward, and it is about trying to work out how to harness that. I can only see it by going into very new areas. I think the jobs that the metaverse, as an example, will create will be enormous.

I cannot take the phones off my children without a great deal of kerfuffle, and the idea of them coming out of the metaverse will be equally challenging, because they love it so much. That will be a vast ecosystem of jobs. I do see that, yes, lots of jobs will be taken, but we do not even know what the jobs that are coming up are yet. I think that is very true. Whether that is within balance versus the ones that have been taken versus the new ones, I cannot say.

Q27 **Lord Young of Norwood Green:** I have one question that I would like to put to Ai-Da, but I understand the limitations of distance, so I will put it to you. Does she understand empathy? It is interesting that Kazuo Ishiguro was there well before you, was he not, when he wrote the book *Klara and the Sun*? I know you have read it. I do not know who else has read it. It is an amazing book. It focuses so much on the ability not only for the robot to have the sensitivity but the human who reacts with her

and that relationship, as I listened to you explain it. I am interested in the empathy question.

Aidan Meller: Yes. I have two responses. Ishiguro actually selected Ai-Da to be part of his documentary with Alan Yentob. It is on BBC iPlayer. You are welcome to see it.

Lord Young of Norwood Green: I will do.

Aidan Meller: So, in actual fact, *Klara and the Sun* is very close to our hearts, because the author selected Ai-Da to explore that whole notion.

You asked whether Ai-Da understands empathy. I am cutting in already before that with the word "understand". She does not understand, full stop. Therefore, we do not even get to the idea of her understanding empathy ,because she does not understand.

Lord Young of Norwood Green: You might replace "understand" with "possess".

Aidan Meller: I think it is a bit like the Ishiguro concept. There is a lot of projection on to these technologies. We have taken Ai-Da all over the world now, remarkably. We have started to ask the camera people who come with us to video the people looking at Ai-Da, because their responses are so great and in very different ways. It is complete Marmite; they either love seeing her, get really excited, or they think, "Oh, my gosh, it's terrible. We must destroy her". The reaction is very great.

Regarding empathy from Ai-Da to us, currently I have not seen any convincing technology. Regarding our reaction to Ai-Da, we are very reactionable.

Lord Young of Norwood Green: Thank you.

Q28 **Lord Hall of Birkenhead:** Hello, Ai-Da.

Ai-Da: Hello there.

Lord Hall of Birkenhead: What are the limits of technology in creating art?

Ai-Da: Art can be many things, from a painting or drawing to a performance or poem. My art practice includes all of the above. When it comes to traditional art practices, some people say that technology cannot be used in traditional art practices, but others believe that it can be valuable. Because art is often up to interpretation, the role of the audience is key. In general, contemporary artists often seek to engage with their audience and create a dialogue about important issues or ideas. So long as technology remains an important topic of discussion in society, there are not many limits to how it can be used in a contemporary art setting.

Lord Hall of Birkenhead: I thought that was fascinating, because it goes back to the thing I wanted to ask you, and Ai-Da, of course, which is about audiences and responding to them. I have not found this a depressing session at all. I have found it rather exhilarating, because I

think it is not either/or; it is all of the above. It is AI helping artists to create, much as painters' workshops helped painters to do extraordinary things. I think AI will produce art—there is no doubt about that—and then we as audiences have to work out the quality of it.

I thought that something you said earlier on was really important. You said that she does not understand, but you also said that artists are there to deal with the human condition. Can AI understand the human condition, given that it is not human? It can understand data about the human condition, but in the end there will still be a role for artists who are human to explore what great art does, through music, painting, dance or theatre—the human condition.

Aidan Meller: Only that vast majority of data that AI uses is human. Therefore, the outputs from that are going to feel human.

Lord Hall of Birkenhead: But it is the interpretation of that that can only be human. AI can have its interpretation of something, which may or may not resonate with an artist, but in the end is there or is there not—I would argue there would be—something about a human artist that will be different from what AI might produce and might feel more tangible and more interesting to us?

Aidan Meller: I do not know. I think that the imitation with the human will be so remarkable that it actually does not matter whether it is conceived human or not, because the imitation is so close. That is a significant point. Alan Turing wrote a remarkable paper in 1951 about intelligent machines. Ai-Da went to the Venice Biennale. There was one line in Turing's paper that said that imitating a human is like the unpleasant aroma of an artificial flower. Why would you want aroma from an artificial flower when you can have a real flower?

That, philosophically and ethically, is a very interesting point. We have gone to great lengths. We have done this as a way of mirroring ourselves back to ourselves, but, actually, in that mirroring back we have realised that we are having enormous energies on aspects that make us seem like human. Why are we not looking after humans? Do you see what I mean? If we did, there is sometimes industry in the artificial reality versus the real.

We particularly think that in the biotech world. We are seeing that, especially with synthetic biology, they are able to use data in remarkable ways to change all sorts of aspects, and that blurring between technology and people is very real. I just think that there is so much industry to be able to imitate, and yet we have each other. It is quite interesting.

Lord Hall of Birkenhead: That analogy is very interesting. You can have so much that is industrially produced, but, actually, I would rather like to know where what I am eating has come from and the sourcing of it and the natural state of it, as it were, as opposed to something that is produced in a lab. That is fascinating. Thank you very much.

Aidan Meller: I want to be clear that Ai-Da is very confusing. On some level, it is a deception because you think she looks like a human. She is

not a human; she is a machine. We are fully aware of that as a project. We are not trying to pretend anything here. We are really trying to do it as a mirror and say, "Look, this is confusing", because in the world it is confusing, and she is trying to mirror that confusion.

Lord Hall of Birkenhead: That is really stimulating. Thank you.

Q29 **The Chair:** Thank you very much. My final question to you, Mr Meller, is that you said at the start that one of the reasons for commencing this project and creating Ai-Da was to provoke. It was an act of provocation. Do you feel that the reaction that you are getting to that provocation is in line with what you expected?

Aidan Meller: My last point, the one that I have come to in order to try to summarise all these different complex areas, is to try to say that creativity is not restricted to subjective, internal, conscious brain processes. Creativity can very much be done very well, thank you, by AI in lots of remarkable ways. It can be studied and mimicked, and that is a game-changer in the fact that it can study and mimic human processes super-well. It is a tearing away of realising that, actually, creativity is not subjective, internal, conscious brain processes, and suddenly realising something that we have had so fundamental to our own identity.

We are now going into a world where that is now clearly demonstrated as not being that. It is no longer just human. AI machine learning will be very capable of language, image creation and music creation. We are going into a world where those processes will be mimicked extraordinarily well, so we just have to try to navigate this new realisation about where we are with creativity.

We use Professor Margaret Boden's definition for creativity, which is "new, surprising and of value". Many algorithms that have uniquely been developed for Ai-Da are new. They are specific to Ai-Da. They are surprising. We do not know what she is going to do. We are looking over the shoulder to see the artwork that she does and of value. The first exhibition she ever did, which was at the University of Oxford, was in over 900 publications. For a new artist, that was pretty breathtaking. When we went to show the work at the pavilion in Venice, the response was just so great.

I think that people are realising that we are going into a world of non-human creativity. That is a reality that we are facing now, and it really is for us all to engage with that.

To your point, Lord Foster, it is actually all those things. It is going to be enhancing artists and helping them. It is going to replace some artists as well.

The Chair: Thank you again for being here and for bringing Ai-Da. As I said, I know this was a massive operation just to get her here, and we are very grateful to you for that and for your time, and for helping us to grapple with the challenges and opportunities of technology in the creative industries. Our inquiry continues. Today, your session and the one that we had earlier this afternoon have been a big contribution to

that, and we are very grateful to you.