

CONTENDING MODERNITIES

Out of the Lab Transcript

A Contending Modernities Podcast Science and the Human Person Working Group

EHSAN MASOOD: “Hello. Anyone who has ever used a computer, a phone, or a tablet is familiar with the idea of editing out your mistakes. Type something wrong, and with a few keystrokes, you can replace your misspelled word with the correct version. This is, of course, much harder, if not impossible, to do with life. From the relatively trivial, such as buying a book that bores us, to taking the wrong job, we have to accept that there is no delete key, there is no editing function to smooth away our errors. But in recent years it has become clear that in one fundamental area of biological research it might be possible to do just that. Using a technology called CRISPR/Cas9, it’s possible to edit out what some may call mistakes and to repair faulty genes. The implications of what has been called gene editing are widespread and profound, raising important questions about how, even if, this technology should ever be used. The problem, of course, isn’t new: science regularly throws up new ideas. Some merely challenge our worldview, but others carry stronger, and more dangerous risks. The most common way of dealing with these risks is through regulation: all technologies from nuclear power to nanotechnology are regulated. Regulation is what keeps us safe, for examples, from the potential dangers of human cloning. The details will vary from country to country but the broad reasoning is the same.

“Now, the best regulations consider a range of points of view, and gene editing should be no exception. But that isn’t always what happens. In this podcast, we’re going to explore gene editing from the perspective of ethics and religion. And that’s because these are two perspectives we don’t often hear in public debates.

“The podcast is the component of a research project and it’s called Contending Modernities. It’s being led by researchers at the University of Notre Dame and it explores how the forces of religion and secularism are interacting in the modern world. My name is Ehsan Masood and I am a science journalist. Together with researchers, academics, and commentators, we’re going to be discussing the question: How should we regulate gene editing technologies? Around the table with me here in the studio are five panelists drawn from academia and from journalism. And they in turn will quiz a number of experts in ethics and religion. These are our witnesses, and they will offer their own



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perspectives. But before we hear from our panelists, I just want to draw your attention to a report published in February 2017. The report is from the US National Academy of Sciences and, to paraphrase, it says the US should consider gene editing for humans, but in a tightly controlled and limited number of circumstances. And that is still a pretty bold statement, because until now, the consensus among scientists is that gene editing should not be considered for human use.

“So, let’s start by hearing from our panelists today. We’re seeing the first glimmers of this technology being used on people; can you introduce yourselves.”

MICHAEL FITZGERALD: “I’m Michael FitzGerald, and I’m a journalist and articles editor at the Boston Globe Magazine. Many of these people are doing things that are beyond regulation, faster than regulation can keep up with, and regulation gets in their way, so I think it is probably wise for us to look at this new technology and say, well, why don’t we try to get ahead of this. I also come at this as a mainline Protestant, so from a perspective of religion and religious belief you are not going to get one point of view.

EHSAN MASOOD: “Thank you Michael. Deborah, Deborah Blum.”

DEBORAH BLUM: “My name is Deborah Blum, I am the director of the Knight Science Journalism Program at MIT. My attitude is always caution because I have followed certain technologies, particularly recently looking at radioactive elements, and the research that followed out of that discovery, in which we know from our past that there tends to be a ‘This is an amazing best thing’ without looking forward in an intelligent way always. And without getting ahead of the technology until we are confronted with the consequences. So my tendency again, agreeing with Michael, is that it would be very smart to try to look ahead in this case.”

EHSAN MASOOD: “Thank you. Adil.”

Adil Najam: “Thank you. My name is Adil Najam, I am the Dean of the Pardee School of Global Studies of Boston University. I come to this from two areas that I work on; one is policymaking and the ethics of policymaking, not the ethics of particular policies, but the process of how policy gets made. The other one is even more important to me. I study the global environment, in particular climate change, and issues like this bring to the fore not only what they do to the human species but also what they do to the relationship between humans and the rest of the planet.”

EHSAN MASOOD: “Thank you. Aline.”

ALINE KALBIAN: “My name is Aline Kalbian. I am a scholar of religious ethics. I teach at Florida State University in the Department of Religion there. My research has really focused on a number of questions. Namely, how is it that religious communities think about moral problems, how do they articulate their thoughts about moral problems, and how do they change their views about moral issues. There is a tendency to immediately presume that religious communities are going to hold views that aren’t flexible or open to broader thinking and how do we bring religious voices into public deliberation in a way that values them without imposing their views on others who might not share them.”

EHSAN MASOOD: “Thank you. Ebrahim.”

EBRAHIM MOOSA: “My name is Ebrahim Moosa, I am Professor of Islamic Studies at the Keough School of Global Affairs at the University of Notre Dame. I work on Islamic law and ethics broadly and I have a particular interest in bioethics. I am always intrigued at Muslim religious authorities around the globe, who, when you have the advent of a new technology, always say no, and after a few years they say yes. And it is interesting to see how theological resistance turns into acquiescence and I am trying to figure out why and how that happens.”

EHSAN MASOOD: “Thank you Ebrahim. Our first witness is Robert Tappan. Robert is an assistant professor in the Department of Philosophy and Religious Studies at Towson University. He has a book in process, which is called *Beyond Clerics and Clinics*, and it is on reproductive technology in Iran. Robert, welcome.”

ROBERT TAPPAN: “Thank you very much.”

EHSAN MASOOD: “What is your perspective on this question?”

ROBERT TAPPAN: “I feel that there is a basic dilemma when you are thinking about gene editing technology and Islam. There is Islam’s extraordinary historical drive to treat disease based on a saying of the Prophet Mohammad, and there are various versions but I will give you the standard version: “There is no disease that God created except that God also created its cure.”

EHSAN MASOOD: “Should we hold that thought for a moment? And let’s get straight on to Aline. Your witness.”

ALINE KALBIAN: “Thank you Robert. Following up on that, one of the things that seems so striking about this technology and a lot of these gene therapy types of technologies is that not only are they about eliminating disease but also they seem to be about eliminating difference and vulnerability, especially if that line between therapy and enhancement gets blurry.”

ROBERT TAPPAN: “Sure.”

ALINE KALBIAN: “I wonder what Islam has to say, or Muslim countries where you have done your research, handle issues of handicap and difference and people who are differently abled and how they are perceived in that context.”

ROBERT TAPPAN: “Right. Yeah that’s a great question. For sure, addressing issues of disability could be very important with this technology, and in some historically Muslim majority countries there are genetic diseases that lead to disability and other problems, so it does seem like, it could be something that would be extremely valuable in addressing those concerns. Because there are social and cultural, perhaps, discrimination against people with different disabilities. It’s also harder. In the United States, we have the ADA and things like that that can help.”

EHSAN MASOOD: “What’s the ADA?”

ROBERT TAPPAN: “The Americans with Disabilities Act. Whereas in a lot of other countries, not just in the Muslim world, it is hard to have a disability and get around and be a productive member of society. So I think this kind of technology could be helpful, depending on how it is used, to address some of those concerns. However, that is not to say, especially perhaps from the more religious perspective, that you are somehow in need of having this disability corrected.”

EHSAN MASOOD: “Adil.”

ADIL NAJAM: “Robert, what scares you—“

ROBERT TAPPAN: “What scares me?”

ADIL NAJAM: “—about gene editing.”

ROBERT TAPPAN: “That’s a great question.”

ADIL NAJAM: “Or about anything else” <<Group laughs>> “Go for it.”

ROBERT TAPPAN: “Wow. We could go into all sorts of things but that is a different topic. I think, and I am also thinking of this in terms of, perhaps, from an Islamic perspective, but simply as being an ethicist who is concerned with these issues globally. Things like not only how humans are used but the use of animals in certain ways. I am thinking especially, I mean I find it fascinating but also horrifying, or potentially horrifying, chimeras and these kinds of human-animal hybrids. I just taught my first class of the semester in Faith Perspectives and Bioethics and started off with a screenshot of the pig embryo with human DNA in it that was just created recently. So, the idea that these kinds of technologies are in some way following the market, there are things we could talk about there, the use of genetically engineered mice and the things that you all have mentioned, it’s a big business. Those kinds of things are frightening, to think about what we can do, maybe, rather than what we should do, or how those two might go together.”

EHSAN MASOOD: “Our next witness is Maura Ryan. Maura is Professor of Christian Ethics at the University of Notre Dame, which is where she joins us. Her primary interests are in bioethics and health policy and her books include *Ethics and Economics of Assisted Reproduction*. Maura, welcome.”

MAURA RYAN: “Yes, thank you, it’s very good to be here.”

EHSAN MASOOD: “It’s great to have you. Let’s go straight to Michael FitzGerald. Michael, your witness.”

MICHAEL FITZGERALD: “I wanted to start with, I happened to have an advanced copy of a book called *The Gene Machine* by Bonnie Rochman which looks at the impact genetic technologies are having already on parenting and having kids. And she uses an example of the way that we have been able to isolate diseases like Tay-Sachs, or conditions like Tay-Sachs, and help parents fertilize eggs that are not going to have those chromosomes in them. And, in fact, in one case I think she describes someone editing the chromosome out, so it’s not there at all, and using that embryo. Can you talk a bit about whether this is a potential step forward for thinking about the ways in which

we are going to see gene editing technology used, in a way that perhaps society could be in favor of, by and large.”

MAURA RYAN: “Sure. If we think about, and here I want to speak from the point of view of religious bioethics. So for, say, many of the Christian traditions, the end of science, the end of medicine is to serve health and well-being within the common good. So, we want to think about how is it that we create a common good. How do we create the conditions through which individuals flourish together as a community? We celebrate the power of science and medicine to alleviate human suffering but what goes along with that would be caution about assuming that we could somehow eliminate all suffering, and caution about how our uses of science and medicine or our advances create a certain kind of society. So, we would want to think about... And we would also want to think about, from the standpoint of theological ethics, about how these interventions reflect or alter our notions of kinship, family, reproduction.”

EHSAN MASOOD: “Deborah, your witness”

DEBORAH BLUM: “Hi Maura, I have a fairly simple question, which is, we had been talking in an earlier session about trust in science. And it occurred to me to wonder, do ethicists have trust in science? Do ethicists believe that scientists are actually thinking and considering seriously some of the issues you are raising about how new technologies should be used and whether they affect the common good? Or do you have concerns in fact that technology such as the one we are discussing today, CRISPR/Cas9, say, are going to move forward without internal ethical consideration by the science community?”

MAURA RYAN: “Right. I think it depends. I would say that my concern lies more on the side of commercialization. I am more concerned about there being no brakes on that side of the shop than there being no serious ethical reflection on the part of scientists. That said I agree that what is missing is a concern for what we might call impact on the least well off. And concern for the way in which these technologies might well exacerbate existing inequalities.”

EHSAN MASOOD: “Thank you. Aline, your witness.”

ALINE KALBIAN: “Hi Maura. I am going to go in a slightly different direction. When I first started hearing about gene editing I was really struck by the metaphor of editing. I think it’s a really interesting one. In a report that the Nuffield Council on Bioethics issued on this topic they address

this question of the implications of using this language of editing, suggesting that the genome is a book, and scientists are going in as editors, which somehow implies that there is an authorial presence. 'Who wrote this book.' What are the implications of that. It leads me then to wonder what you think about how the public's perception of that technology is shaped, either positively or negatively by this metaphorical language."

MAURA RYAN: "I think that's a wonderful question. When I think of editing, I think not only of a text but I think of improving a text, right, so if I turn my manuscript over to an editor I expect it to come back better than it was, somehow."

EHSAN MASOOD: "That doesn't always happen." <<Group laughs>>

MICHAEL FITZGERALD: "The journalists are shaking their heads."

MAURA RYAN: "Even if we disagree, the goal of good editing would be to make your text clearer and better than it would have been otherwise. And I think that is very much a part of the way in which the public perceives these technologies, both optimistically and pessimistically. I think where religious traditions can contribute to this conversation is in recognizing that, you know, there is no perfect book. There is no... We are not going to edit out all forms of suffering. That's not just that we have to accept it because we have had to accept it so far, because we didn't have any way to get out of it, but that it is built into our human nature."

MICHAEL FITZGERALD: "Where do you see this playing out on the ground: in effect are the ethics of this going to be shaped by ministers and other church leaders for most people, because they are going to look and say, 'oh, ethicists, that's someone who thinks big thoughts in a place that I can't afford to go to, I'm not really sure that what they have to say really matters to me. But this guy or woman in front of me in my congregation, what they have to say means a lot.' So how important will that be for shaping this sense of ethics across a broader population, at least in the US?"

MAURA RYAN: "That's a great question. I would say that most religious communities have professional ethicists who are not only ministers, say, who would train in the ethical and philosophical traditions of the particular community but they have also scholars of ethics who participate in the larger academic debates among ethicists. So, there is a lot of back and forth and a lot of translation that goes back and forth between religious communities (pastors, preachers,

bishops, etc.), and the scholars of ethics who are, one would hope anyways, informing the preaching and teaching and policymaking within those communities. It takes us back again to this question of trust and transparency that keeps coming up. I don't think that every ethicist has to be a scientist, or that every ethicist has to be a physician, but you certainly need to know who you can trust in order to learn what you need to know in order to make an informed judgment."

EHSAN MASOOD: "Maura Ryan, Professor of Christian Ethics at University of Notre Dame. Thank you, so very much."

MAURA RYAN: "Thank You."

EHSAN MASOOD: "Our next witness is Andrea Vicini, Associate Professor of Moral Theology at Boston College. The previous academic year he was part of a Princeton University project examining societal implications of astrobiology. His books include *Human Genetics and the Common Good*. Adil, he is your first witness."

ADIL NAJAM: "Thank you. Andrea, there seems to be a consensus that some sort of regulation, at some level, is appropriate. Historically, religion has often been a font of regulation, on moral grounds, on edicts, in various ways because it had the authority. It remains for many people a major basis of how they act on various issues. In other contexts, governments take on that debate, meaning this is what Europe is doing, this is what the US is doing, this is what this country in Europe is doing. And there is also the question of whether on something like this any regulation should be global. I wanted to get from you where do you think the regulatory impulse should come from on a question like gene editing."

ANDREA VICINI: "I think the process of reflecting how we address it should involve first scientists. But then there is a second level. I would like to expand the conversation to society, to the public, and religious bodies, religious thinkers, are part of society on the whole. Finally, there is the third level of international organizations, national organizations, or national governments and states."

ADIL NAJAM: "Do I hear you right that you are saying science-led first and foremost, society then, and politics last?"

ANDREA VICINI: "I wouldn't understand what I proposed in terms of first and last, but in terms of those who are engaged and involved. So I would say there are different levels, it's not a first and

after, or a first and a last. I want to respect scientists who are able to address issues, and I want to engage with them in a conversation about what are their perceived issues, scientifically and ethically. But then I would like, at the same time, a transparent and engaged conversation within society about the type of society that we want, and how we want to address issues that concern health and disability.”

ADIL NAJAM: “Again just to stay on this point, can you think of another debate that we have had in recent years that you would want this to be like? For example, would you want a conversation like what is happening with climate change. Or with some other field. Or does this require something that we haven’t seen in science policy in recent years?”

ANDREA VICINI: “I would say that we have some examples that I consider positive examples where there are all these different levels. The first one concerns the human genome project. The human genome project was in the early nineties, proposed a major scientific endeavor to sequence the entire human genome. We didn’t have the technology that we needed to achieve it, and we were not aware of what were possible ethical issues that we had to address. So since the beginning, a part of the funding of this major international project was allocated to reflecting on ethical issues, and issues concerning the human genome project also became public domain, so there was a public conversation on this.”

EHSAN MASOOD: “Our final witness is Abdulaziz Sachedina, who is Chair in Islamic Studies at George Mason University. He is one of the pre-eminent scholars in Islamic bioethics and his seminal book is called *The Islamic Roots of Democratic Pluralism* and also *Islamic Biomedical Ethics*. Professor Sachedina, thank you for joining us. Deborah, your witness.”

DEBORAH BLUM: “I think my question follows out of an earlier discussion. We seem to be dividing bioethics by Islam, or by Christianity, or by, atheism, even, but aren’t there universal ethical concerns regarding something like gene editing that would apply to everyone? In other words, should we be isolating this?”

ABDULAZIZ SACHEDINA: “I think religion has a role to play in certain cultures, and certain cultures do provide credibility to religious opinions as compared to, let’s say, secular opinions, or scientific opinions. I think Muslim culture predominantly would listen to its religious impulse more loudly than other cultures would do. Not that the people in that culture are all religious, but certainly they pay attention to what their scholars say, what do scriptures say, would you have any

justification for such and such opinion. Gene editing would be looked upon as providing benefit or not providing benefit; being harmful the society or the individual, or not being harmful to the society or to the individual. So the criteria that would be used would be to see how it serves the public, therefore, for example, in Iran or in Iraq you find the clinics that are operating without any regulation from the government and without any ethical qualms about what they are doing, and are free to do and more liberal than you can ever imagine. Downs syndrome, for example, prenatal genetic testing creates the possibility of saying ok let's get rid of the harm that might come to the mother or that might come to the family. Or the family is too big: 'we are seven now, I have seven children, I don't want any more...' So all of these things really lead to what we call referring to the religious scholars. 'What do you say, Ayatollah? What do you say about it? You, Mufti, what do you say about it?' I think it comes at a point, people might not really obey the ayatollah or the mufti but they want to know, that they have heard it. They might ignore completely what the scholars might say."

DEBORAH BLUM: "But they are going to ask."

ABDULAZIZ SACHEDINA: "Yes."

EHSAN MASOOD: "Thank you, Deborah. Michael, your witness."

MICHAEL FITZGERALD: "So, when you look at the question of how we regulate this kind of technology across societies you raise the point that there are places where the rules and perspectives on what we have already seen emerge, reproductive technologies for instance, are much more restrictive, and much less. Do you see perhaps the existence of a place where there are no restrictions, that being the place where all [the regulations] get shaped and places perhaps, the US being one of them, where we have the sense that maybe we should be regulating this and keeping it under wraps. Are we going to see this stuff emerge from someplace that doesn't care? Does regulation even actually matter if that disconnect exists?"

ABDULAZIZ SACHEDINA: "I think most of these issues depend upon democratic culture, where people are ruled by the rule of law, where scientists do not act as an elite group in society that doesn't care for what society does and believes and sensitizes itself. I think there is a general trend: paternalistic medicine and paternalistic science both are dangerous in terms of not informing the public of what is happening in the scientific world. I think hospitals are very much agnostic in culture. So, you might wonder, I have lectured for example in Mercy Hospital in Portland, Oregon,

and it is a very different environment, this is a Catholic hospital. I have not come across a Shia hospital that is directly guided by the Shia values in Iran, and the values are very much what the physicians bring in. The physicians are the ones... 'If I am religious then I do care for it, but if I am not religious I don't care.' The majority of the scientific community that I come across in the Muslim world are not religious, or they might be outwardly religious because cosmetically you must pretend you are religious."

MICHAEL FITZGERALD: "We have the potential for wild cards."

ABDULAZIZ SACHEDINA: "Exactly. It's that kind of trend which doesn't allow religion really to take its proper place as ethical evaluation of the situation. Also, let us remember one thing, that Muslim culture is predominantly Sharia-oriented."

EHSAN MASOOD: "Which means..."

ABDULAZIZ SACHEDINA: "The legality of the questions is far more important than the moral issues and dilemmas that we would raise."

EHSAN MASOOD: "So they are quite literalist."

ABDULAZIZ SACHEDINA: "The difference is that in ethical reasoning you want to see the right and the wrong but not in the other areas. I think that that's a problem that we are faced with, that law and ethics are not integrated in a sense whereby the ethics inform the legal decision-making."

30:08

EHSAN MASOOD: "Adil, your witness."

ADIL NAJAM: "There are multiple arguments you are making, two of which I am trying to reconcile, and I say this as a Muslim myself. I don't find convincing your suggestion that in countries that have lots of Muslims the will of what the scholars say says much more. I don't see any evidence of that at all, except for hand-waving. For example, scholars say 'don't lie.' People lie. They keep saying 'don't be corrupt.' People are corrupt. You yourself went on and say about the clinics and so on and so forth."

“So I get a little worried about that definitive view and where that will take us on gene editing. Then on the other side, this notion that people are not educated, which may be true, but I am not sure that right now in Boston everyone around us in sports bars is sitting and talking like we have been for the last hour either. Right? What I am trying to get at is that once we label societies as Islamic, or Muslim, or whatever, do we not fall into the trap or the danger of trying to put frameworks around that label that we have just put on them and miss really how policy is done? My sense on this is that on something like gene editing, while a conversation may be wrapped in religion, you yourself what I am hearing partly saying is that while it will be wrapped in religion it will actually be made on exactly the same principles as elsewhere in the world.”

ABDULAZIZ SACHEDINA: “That’s a very, very important point, very important observation. How I have dealt with it, I think, there seems to be a contradiction here in my opinion and I think I should go back, trace back some of my steps. I don’t want to give the impression that the culture is monolithic. I don’t want to say that everyone is agnostically acting, or religiously acting, but I do want to say that there are forms of public information that you and I take for granted in Boston and Washington that are not taken for granted in the Middle East where I work. People are not newspaper reading all of the time. There reading is very little done, radio shows are heard but they do not cover these issues, television shows are there, they don’t cover these issues... In other words, there is very little content on such matters between the public and those who are communicating these ideas to the public. So, therefore, there is a lacuna, there is a vacuum of information, not thoroughly, but let’s say you went and asked the average person about IVF clinics operating in Iran. They wouldn’t be able to tell you what exactly they are doing. Not that there is any difference in the population.”

ADIL NAJAM: “And in Boston and Washington they will?”

ABDULAZIZ SACHEDINA: “In other words, what I am suggesting, I don’t want to give an impression of monolithic population in the Muslim world, but at the same time I am aware of the diversity.”

EHSAN MASOOD: “Aline, your witness.”

ALINE KALBIAN: “One of the things that seems so apparent about this gene editing and the CRISPR technology is the entrepreneurial aspect of it, the fact that people are making money from this and that a lot of the commerce surrounding it is not being regulated. So it leads me to wonder

whether Islam's ideas about entrepreneurship, free enterprise, competition... To what extent would they shape that aspect? Is there was any wisdom within Islam that might help people think about how to regulate the commercial aspects of this?"

ABDULAZIZ SACHEDINA: "The commercial aspect again depends upon how the technology is marketed. If the technology is not marketed for general consumption, people do not know the value, and the value is known only by the scientists who are doing the research and who are going to make big bucks out of that. So, I think there is that dimension to it, and as I say that, in my study of this literature I see very little reference of the commercialization issue. There is not much reference to that. Yes, there is now the reference that is coming on organ donation, for example, I am able to sell my kidney for \$15,000 to save somebody's life, and because of the poverty I am willing to do that. I am willing to endanger my own life because I have other responsibilities. In other words, what we are really seeing is that in the state system there is hardly any regulatory legislations controlling these matters. And the state itself is unfortunately corrupted. So there is hardly accountability for what they do. And that lack of accountability leads to very damaging impact on how the technology is marketed, how the technology is introduced, and sometimes they are introduced without even the notice of the government, is how it is done. It's like genetic testing is done now, now pre-marriage genetic testing is required by law in Iran. So you already have clinics that are doing that work, but they go beyond that. And there are no regulatory ways of controlling exactly what is going on in those labs. So you have a lot of need for government regulation and policymakers are not as fully aware as they ought to be, because of a lot of corruption."

EHSAN MASOOD: "Michael, final quick word."

36:20

MICHAEL FITZGERALD: "We don't even know, really, the impact that genes versus culture have, as things play out, so how do you inform people in these clinics about what it means if you have a gene edited or a gene removed?"

ABDULAZIZ SACHEDINA: "They do know this much: that the genes with which we are born are mutable. In the Shia world they are known to be mutable. There is no determinism that controls it. In other words, there is an open mind to what we call what changes in human nature, and mutation could occur in the next generation or the third generation. So there is, you know, that

kind of attitude about it. It is not universal though, and that information depends on how the culture is informed.”

EHSAN MASOOD: “Professor Abdulaziz Sachedina, Chair in Islamic Studies at George Mason University. Thank you very much. We have heard from our witnesses. Starting, Ebrahim, with you, has anything that you have heard caused you to change your opinion or to modify it? Or has been perhaps something that you were not expecting?”

EBRAHIM MOOSA: “Yes, there’s one area that I have not thought about a great deal which is the whole question of regulation. And it came through very strongly in this panel. I study theologians who spout opinions and they don’t think of regulation. That’s the very critical thing. So in many parts of the Muslim world, theologians are autonomous, except for in places like Iran and others where they are part of the state, but not all of them, so they don’t think in terms of governmental process. They don’t think in terms of the big picture of the political economy of societies. They think through their textual traditions, their traditions of theology, and that is for them much more important, and to have coherence in that domain is pre-eminent, more important than the coherence of the larger state and structure. So regulation, one thing I will take away from this conversation is how will I encourage people working in Islamic bioethics to think about the question of the big picture.”

EHSAN MASOOD: “Aline, thank you.”

ALINE KALBIAN: “Let me say that generally because of what I do I have a fair amount of confidence in what ethicists can contribute to these conversations. But then I have other moments, and there were moments today where I find myself thinking now, what is it exactly, that ethicists bring to the table.”

EHSAN MASOOD: “They did struggle a little bit, didn’t they.”

ALINE KALBIAN: “I don’t know that they struggled but I think it is partly the question that Deborah raised of Professor Sachedina: ‘Are there universal ideas or principles.’ Because that language of universality then suggests that citizens who are relatively well-educated are capable of tapping into these universal principles. So even the principles that were released in the document that the National Academy of Science and Medicine released earlier this week, these are principles that you don’t have a PhD in ethics to understand: avoiding harm, promoting good, being fair,

respecting persons, and so on. And one other thing that I was struck by in the conversation today that wasn't really touched on and I wish that we had had more time to talk about it was the relationship between individual good and the common good. So many of these decisions when we are thinking as a society about 'how slowly do we want to move forward,' because we are moving forward, I don't think there is any stopping it, but how slowly and deliberately do we want to move forward. Do we shape those questions around the needs of individuals, you know, 'my child who has cancer,' 'my father who has Alzheimer's,' or do we think about what is in the best interest of the larger good?"

EHSAN MASOOD: "Adil."

ADIL NAJAM: "You asked whether something had changed in one's view of the question. I think it did, very similar to my colleagues. Unfortunately, I come to the unfortunate conclusion that the gap between the conversation on the ethical dimensions of gene editing and the policy and entrepreneurial realities of how change is and will happen, is much larger than what I feared it was."

EHSAN MASOOD: "Because in the past, the different communities of opposition have organized. I am thinking for example, the Catholic Church in the UN Population Conference of 1994, you know, and including in this the run-up to so many climate change conferences, where different, whether it is groups of religious believers, or environmentalists, or business lobbies, there has been a kind of groundswell of opposition. And I don't see that happening here."

ADIL NAJAM: "Not yet. And maybe it will. But there are multiple things that weren't mentioned. For example, the two parts of the world, and two ethical frameworks, that I think will eventually influence where this goes as much as anything else, weren't even mentioned in the whole conversation. Not even by us. China and India. The technological impulse to be technological leaders of these countries themselves, these are going to be, these are big countries, these are big science ambitions, that is going to drive what is going to happen in Europe, what is going to happen in the US. It is going to be a discussion of these entrepreneurial impulses. There are very very rich people and I can for example envisage one of these mega-rich people saying 'I want a son with green eyes, and I am going to have personal research done'—I know it sounds a bit fantastic, but some of these things are going to move in different ways."

EBRAHIM MOOSA: “For instance, stem cell research has moved to South Korea and Japan during the Bush era, and regulation there is less restrictive there than elsewhere.”

DEBORAH BLUM: “Of course, South Korea had terrible problems with stem cell fraud, as well. I think you make an excellent point. And when I was listening, and it did make me think, you know, you hear these sorts of ethical universalities in which we are working toward technologies that do no harm and technologies that serve a common good, and one of the challenges is for us, with gene editing, is that we don’t have those answers now. We actually don’t know what the harm is that could be done yet. We actually don’t know the common good yet. So this is an important conversation to have before all of this plays out.”

EHSAN MASOOD: “Michael, anything change for you?”

MICHAEL FITZGERALD: “I came in thinking, as I said, that regulation will emerge largely in response to consequences. I still think regulation is going to emerge largely in response to consequences. Consequences may be happening in other countries than the US, and we will respond to that. That hasn’t changed. I also came in thinking about this weirdly prescient scene in the novel *White Teeth*, where there is a character called Future Mouse,

EHSAN MASOOD: “Which is Zadie Smith’s...”

MICHAEL FITZGERALD: “Zadie Smith’s 2000 novel. Future Mouse is a sort of important character in the plot, even though it is a mouse, a genetically modified mouse. There is chaos around this mouse. There is the way that fundamentalist Christians react to it, there is the way that the secular atheists react to it, there is the way that the radical Muslims react to it, there is the way that the kind of average English bloke reacts to it, you know, the guys at the pub and their families. And none of these perspectives agree or can be brought together in a coherent way. So I came in with that in my head and I still sort of feel like from a religious perspective, and from a scientific perspective, there is a lot of reverence on both sides that is going to come into play. And we didn’t talk at all about scientific reverence, but there is a real reverence, almost worship of science, amongst especially people who are secular. And I think there is going to be some tension and conflict there that has got to get sorted out; it’s not clear to me, it wasn’t clear to me coming in how that’s going to happen; it’s still not clear to me.”

ALINE KALBIAN: “One interesting thing that strikes me about the Catholic view, for example, is that one might have expected the two witnesses that we talked about who were coming at this from a Catholic perspective to have been really focused on the embryo, because let’s be frank, that has been an issue that has really concerned the Catholic church other the last many decades on issues related to abortion and reproductive technology and so forth. Yet, Professor Ryan drew the attention to this question of justice. And I think that Pope Francis, if you look at his teachings and his writings, has really in some ways changed the subject a bit for Catholics, so that his *Laudato Sii*, the encyclical on the environment, really focuses on consumerism, commodification, on equality. So it is interesting to me, when I try to think about, which argument is going to resonate most with everyday Catholics, and I suspect it’s not going to be as much concerns about the three-day old embryo and can we manipulate it as much as it’s going to be these concerns about justice, which then brings us back to your point about universal principles. Because I think that’s not just a religious issue, it’s a more universal one.”

EHSAN MASOOD: “Adil, brief point.”

ADIL NAJAM: “Very very very short parting thought. The morality of ethics is central, absolutely important, but do not forget the economics of ethics, and the politics of ethics. What took the US to the moon was not just the Apollo program, it was the Sputnik program. Once Dolly came out, the conversation changed.”

EHSAN MASOOD: “Dolly the cloned sheep.”

ADIL NAJAM: “Dolly the cloned sheep. If you get things that go out on Twitter, create waves of conversations, our entire framework of how this happens is going to be very very different, because that is the world we operate in.”

EHSAN MASOOD: “Adil Najam, Aline Kalbian, Ebrahim Moosa, Deborah Blum, and Michael FitzGerald. Thank you so very much.”