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EDITOR'S BLOG

Paving an equitable path for others

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Alondra Nelson stepped down last month from her role as leader of the White House Office of Science and Technology Policy (OSTP). Today's editorial in *Science* highlights her accomplishments while she served in the Biden administration. I interviewed Nelson to talk about the challenges she faced as the first Black woman in many instances throughout her career. A transcript of my conversation with her can be found below (lightly edited for clarity).

Holden Thorp: Let's start with open access and the August 2022 memo that will forever be known as the "Nelson memo." What were your goals in taking this step? Why did you decide it was the right time?

Alondra Nelson: Just to go back, the Biden-Harris administration came into office with a lot happening [in American society]. We were at the high watermark of the pandemic. But in addition, there was just a general mistrust of science and a mistrust of government.

Recall that on the administration's first day, there was an executive order about advancing equity. And then in the first week, there was the presidential memorandum on scientific integrity and restoring trust in government. Those were for me, the cornerstones of the work that my team was doing at OSTP. Also, we had a real imperative to be more transparent and to do all that we could to restore trust in the work that we were doing. I've said this before publicly—we had an obligation, and it was incumbent upon us as policy-makers, to "show our work" as we would have to do in math class.

I think this week actually might be the 10-year anniversary of the "Holdren memo."

Holden Thorp: Yes.

Alondra Nelson: That [Holdren] memo initiated important work (in expanding public access to federally funded research findings). But, it was also the case that we came into office at a different moment. We really had to be a lot more transparent about the work that we were doing.

We spent more than a year of just talking to people. Part of the theory here was that White House policy-making isn't mandated in the same way that regulatory offices are to do lots of deliberation. But we were trying to restore trust in science and government, so it was incumbent upon us to do a lot of deliberation.

I hoped that people sensed this, and saw this, and even had some engagement with it. We brought, from the academy, "office hours" for a lot of our policy streams, and every week there was time set aside to talk to any stakeholders who might want to have conversations.

We started, early in the administration, a process of talking to publishers, to graduate students, to academics from community colleges, to R1s (research universities), to nonprofit publishers, book publishers, science publishers, about the publishing landscape. Those were the currents that led to the August 2022 memo.

Also, I think there was a sense that norms of good governance should prevail [throughout government]. While it was important that the science agencies were at the table and had at this point been working in the space of public access for almost a decade, it was also the case that evidence, science, publishing, and R&D funding happen all over government. There was no reason why those norms shouldn't apply all over government.

And moreover, I would say that colleagues in government, like the National Endowment for the Humanities, had really been very forward-leaning and a front-runner in the humanities space in open access. There was leadership around public access and a kind of social contract with the taxpayer and the American public that was worth galvanizing in a whole-of-government way.

Holden Thorp: Perfect. You tweeted what you thought of the way *Science* has responded to the memo.

Alondra Nelson: I think it's really admirable, which is what I said in my tweet, in part because what we're after here is public access. I think that people, publishers, libraries, scholars, and researchers should come to that in the way that makes most sense for them, is most equitable for them, and aligns with the mission of their work and what they do.

So I appreciate what *Science* has done because it's a kind of multifaceted strategy—allowing the author's manuscript to be deposited in a repository. But there's also attention to low- and middle-income countries. There's attention to HBCUs (Historically Black Colleges and Universities) and minority-serving institutions. So I very much appreciate that the *Science* strategy is trying to make knowledge—the knowledge ecosystem—more equitable in different ways. Obviously, public access is just one of those ways and I think that's what we really want. We want a response from the whole publishing [and] science knowledge ecosystem that is committed to using the levers and the missions that people have in their work. That makes knowledge available to more people and allows more people to benefit from it.

Holden Thorp: But are you worried that the commercial publishers might get more power as a result of all this?

Alondra Nelson: There are lots of different ways to reply to the public access memo and only one of those ways could lead to more power, more funding for commercial publishers. But I want to be very clear that there are ways to be in alignment with the public access guidance that don't have a cost—at least an upfront cost for the researcher. I think the *Science* family of journals has done a good job of walking that line.

Holden Thorp: Okay. Let's switch to a couple of other things.

Alondra Nelson: I want to add one thing which is just to say that as part of…the commitment to opening up the process of science and technology policy-making, we talked to quite a lot of commercial publishers—many of them more than once. We also talked to lots of other people. I think that we brought a lot more people, and voices, and perspectives to the table, incoming to what resulted in that August 2022 guidance.

I think for Washington, and for science and technology policy, that might not be the norm, but we're really proud of the process. Obviously, all of these meetings [were on the record]. And so people can look for themselves at the record of who we talked to, and when.

Holden Thorp: Well, you gave us an avenue to do what we wanted to do and as far as we're concerned, that was the most important thing. I'm sure you saw *JAMA*. Kirsten Bibbins-Domingo (editor-in-chief) basically did the same thing.

Alondra Nelson: Absolutely. I'm really encouraged by the leadership of *JAMA* and *Science* for sure.

Holden Thorp: Yeah. Kirsten is doing an amazing job. So let's talk a little bit more about life in Washington and the administration. You probably saw the Pew study that says trust in science is still high. A significant majority of Democrats think that scientists should have a role in crafting policy. But a significant majority of Republicans think that we should just

put stuff in the journals and then not be involved in how policy is implemented. I'm guessing you believe that scientists should be involved in crafting policy. How do we build more broad support for the role of scientists in policy?

Alondra Nelson: I think I would broaden that a little bit and say that there's been now a 15 year…longer…legislative text movement to bring more evidence into policy-making. I'll just leave it at that. So you have something like the COMPETES Act of 2010, which says that there needs to be evidence-based policy-making.

I think that policy-making and what's happening in Washington right now is really the long tail implementation of a decade-plus move to just make evidence more pronounced in policy-making, so it's not kind of whim and whimsy. To use a phrase I used before: People need to be able to show their work.

In the space of science and technology policy, in particular, that means that you need science and scientists at the table. Policy-making is always going to be evidence informed and science informed. Science itself is not policy. A paper even in a fine publication like *Science* is not itself policy. And there are trade-offs, and the deliberative process, and democracy at the table as well.

I'm not familiar actually, with this Pew study. I would want to refuse a little bit of what feels like the necessary ideological polarization of this and just say that there has been real bipartisan agreement over many, many years. A strong evidence base that can be demonstrated has to be a part of the work of policy-making.

Holden Thorp: Okay, I'll send you that the Pew study. Can you look at it? I'm sure you'll find it interesting.

All right, you've done so much—maybe more than anyone—to contextualize science within sociology, and history, and anthropology, and everything else. I'm always struggling and trying to come up with new ways to help scientists think about that, and a lot of the writing that I do is around that. Obviously in your book about race and genetics, you bridge that gap.

How do we get more scientists who are or were at the bench to think in this way? They have undergraduate degrees that were filled with didactic courses that didn't give them a broad view of the world. And I put myself in the same category. I learned all this stuff after the fact and still am learning. How do we get more scientists to focus on the larger sociological context of what we do?

Alondra Nelson: I think what we've learned over the last few years, particularly in the context of the pandemic, is that science is critically important. Science and its applications in technology, innovation, is all really important. Consider the case study of the pandemic—decoding the genome of SARS-CoV-2 in less than a month, having a vaccine in less than a year. These are extraordinary feats of science and technology and innovation. Having the vaccine distributed and ready for people to use soon after its development are all extraordinary.

Across that whole trajectory, there were examples and instances in which people didn't trust the vaccine. People wouldn't take the vaccine. People were unsure about the vaccine, for example. There are debates even in the news this week and over the last month about masking and not masking.

All of these questions are about the intersection of science and society. That was really why I was so proud and honored to start in OSTP, for the first time, a cluster of work that took those two things as inextricably linked, and deeply important for the work of science and technology policy.

I hope that one of the lessons learned by all of us is that you can't have effective science, or technology, applied science, or innovation, without actually thinking about the use cases; the context in which these things will be disseminated and circulated; the folks that you need to talk to upstream if you're going to have the downstream outcomes that you want in a particular process, or with a particular product, or scientific output. That is part of the trust making.

I would say to scientists—even scientists, researchers, and engineers who don't have a particular social orientation around their work—that even if they simply care about having efficacious science, it's going to increasingly require them to engage with the social context and the social implications of their work.

And then I would say all the more to scientists, engineers, researchers, and engineers, who do really want to take this up in a full-throated way, that there are partners in government and at their universities, at their colleges, and at their workplaces, if they are willing to partner and think together across that sort of intersection of science and society.

Holden Thorp: And how do we convince the curriculum committees at the universities to give us some room to put this material in?

Alondra Nelson: I'm going to use an N-of-1, which is my life and my career. I've seen extraordinary things happen. I am often, before my time in Washington, asked to come and speak with curriculum committees, with deans of medical schools, and to their students precisely about these issues.

I was on the faculty at Yale, which was my first job out of graduate school; I was an assistant professor. One of the biggest majors at Yale might be called health in society, or health studies, or something like that. [That major] didn't exist [when I arrived at Yale]. …the motivation and the inspiration…came from the students.

I think there is a kind of powerful force, particularly among the new generation of scientists and of researchers, technologists, who really understand that the curriculum needs to change, needs to broaden. And not just include social issues writ large, but really take seriously equity and inequities. The histories of some of these fields have not been equitable and have in some cases caused harm. The curriculum needs to change if we're to have the kind of a future for these fields, and for science, and technology research and policy, that I think we all want, and that certainly the American public deserves.

Holden Thorp: Most good positive things that have happened in higher education have been because students asked for them. This'll probably be the same thing.

All right. So when you see things like the governor of Florida attacking Black studies, and politicians trying to take out DEI (diversity, equity, and inclusion) programs, how do we get the scientists to see that even though their initial take on this might be, "Well, this isn't part of science," that this is attacking the nature of knowledge, and the things that they should be concerned about?

I mean, I wrote a column saying that if the same changes that were made in the AP (Advanced Placement) African American Studies course were made in AP Environmental Studies, you'd be taking out climate change. Now that's a very instrumentalist take, because distorting these things is bad in its own right. Is there a deeper argument that we can make to try to get scientists to focus on academic freedom and knowledge and the things that are going on in American higher education, in a proactive way?

Alondra Nelson: I haven't been following this as closely as I should, but I would say it's really encapsulated in part of your question, which is that [with] issues of academic freedom and issues of freedom of speech—there goes one, then there goes all. We need to be willing to be allies with each other if we want to preserve the space of inquiry, and of research, and of science.

Holden Thorp: Okay. Good. So we're still struggling to achieve equity in the scientific workforce and in grant making. You've seen this closer than most of us who are on the outside, opining in one direction or another about this. Why has it been so hard for the NIH (National Institutes of Health) and the NSF (National Science Foundation) to close the gender gap and make grant awards more equitable?

Alondra Nelson: I'm still reflecting on my 2 years in Washington but one of my takeaways is a pretty pronounced appreciation for the work that NIH and NSF are doing in the space of advancing equity and broadening participation in STEM (science, technology, engineering, and mathematics).

It is a hard problem. I think one of the things that I'm most proud of from my time at OSTP is the work that the White House did in trying to coordinate these efforts.

I think that part of the challenge that we've faced [with broadening participation in STEM] is that you can talk about different funding bodies in government, or you can talk about different nonprofits, different college and university programs, or different after-school programs. None of these things had really been coordinated in a way that allowed us to leverage more

than the sum of its parts. And certainly, what we've tried to do at OSTP was to again say to NIH and NSF—yes, let's work on this. This is, in part, because they have such a big footprint, these colleagues need to be working, digging in deep in this space.

But it's also the case that we need to be partnering with the Department of Labor and the Department of Education. There are ways that even government itself can have a more coordinated effort around broadening participation in the STEM ecosystem —everyone from veterans, to rural communities, to folks of color.

That partly means, I think, government serving as an example of how you link up K-12 education efforts at a place like the Department of Education, with workforce and training efforts at the Department of Labor. And then have NSF and NIH doing their work. We've had folks working in silos and not working with an appreciation for the whole ecosystem.

In my time at OSTP, we had a vision paper—a white paper—a vision for STEM equity and excellence. We also participated in announcing the launch of a new effort called the STEMM (science, technology, engineering, mathematics, and medicine) Opportunity Alliance as a, full disclosure, partner with [AAAS]. The aim is to break down these silos and link up this work that people have been doing for good reason, for particular business sectors, and for particular educational sectors in particular regions—really try to sew that up, add some connective tissue. Part of the mission is to have accountability data about people's outcomes, to really begin to move the needle for this in earnest.

And honestly, part of what's been so inspiring about working in the space of science and technology policy in the Biden-Harris administration—in addition to the day one commitments to equity, and the early commitments to building trust, and just expanding who sits at the table of science and technology policy-making—has been the way that the president understands science and technology, to really sit at the center of [all policy]. Not only did we talk about the grand challenges and the problems, but what I found so inspiring is that science and technology also sit at the center of the aspirations and the opportunities.

So you don't just view science and technology as supposed to fix the hard things. It also is opening up economic opportunity and driving innovation, inspiration, and discovery for people. A key part of that is building a STEM ecosystem that is not siloed, but is coordinated, and that can be the driver for these future aspirations for the country.

Holden Thorp: Great.

So you've been the first Black woman to do many different things, and will continue to be in the future. I see a lot of folks on social media struggling with the exhaustion that comes from being a pioneer, and having to be on every committee, and having every Black student want them to be their mentor, and having to explain race to their white colleagues. But you're still incredibly optimistic. What words of inspiration do you have for those who are struggling against all of these barriers?

Alondra Nelson: First I would say, the barriers are real. It is important to just bear witness to the fact that these are challenging spaces, and I would say that science and technology can be more challenging still.

We know the response when you ask young people, "Who is a scientist?". We know who they point to or who they think about. We know the demographic data for many fields in the sciences do not reflect national representation. The participation of women, of women of color, of people of color more generally is less [than this national representation]. So the challenges are true.

But I also feel optimistic because I certainly never anticipated that we would get to a place where the perspectives and work that I have done and bring to thinking about science and technology policy would be brought to the center of national policy, and brought to the White House.

In policy spaces, people talk about the "Overton window." So I don't know if we've moved the Overton window, but we certainly, I think over the last few years, have made it possible to imagine ways of thinking about science and technology that have a much bigger tent, that consider issues of inequality, and issues of equity, and that make it okay to bring a vision for more beneficial science and technology that benefits more people and includes more people.

So being the first obviously has its challenges. But I am the first because I go about my work knowing that I'm never going to be the last. Anybody that works with me knows that I go in as the first to just clear space for others. And that was the case for the people that I hired in my time at OSTP, both as a deputy director and as acting director. And so you're the first, but you're not the last. And it's making a change, sometimes too incrementally and too slowly, but it's certainly making a change.

Holden Thorp: Well, we're deeply appreciative of you being willing to do that, and doing it with such optimism, and in a way of lifting everybody up. Now, do you have any last things you want to say to our readers about your experience and what you're going to do now that you're back in the life of the mind?

Alondra Nelson: I've never left the life of the mind, although the mind gets filled with other things in Washington! I would say I'm still reflecting on the lessons learned. But one of them is that when you have the right leadership—and I'm thinking of the president and the vice president—when you have multisector partners, you can get a lot done in a relatively short amount of time.

The time in Washington is like an accordion. It's both shorter than you would expect and longer than you would expect, the lived experience of it. But in that time, we really moved the needle on public access. We moved the needle on STEM equity. We did work to advance and institutionalize more deeply scientific integrity. We released this blueprint for the AI (artificial intelligence) Bill of Rights. And so there's just been work that we're incredibly proud of. I'm really proud to have tried to model and advance science and technology policy that really places the needs of people at the center of it. We see things like that also in work like the CHIPS and Science Act.

I hope that going forward, we won't be able to think about science and technology policy without thinking about social implications, social issues, and equity. I hope that imprint has been left on the work and, more importantly, will improve the work and improve people's lives.

Those of us who are researchers, even those who are teachers, there's a way in which the work is always with you, so we work very hard. We work long hours. The work never goes away. You don't leave the office and close the door. It's always with you. So that was my experience before coming to Washington. And I would say even with that experience, this is the hardest work I've ever done. It is hard and exhausting, in the most kind of profound way.

But it is also just exhilarating, and it's been the most fulfilling work of my life. I hope that I can help to encourage other academics and researchers to get involved and bring their talents to government, either for short or long durations. It's incredibly important and government really needs the various types of expertise, including young policy-makers, social scientists, scientists who are working in interdisciplinary spaces, and those who are working in spaces that NSF calls convergence across various sectors. I think they are all super important.

I'm coming away also with a healthy sense of impatience about what it means to bring research and analysis to policy-making places so that it can improve people's lives. So in addition to my full-time faculty position at the Institute for Advanced Study, I'm joining the Center for American Progress.

Holden Thorp: Oh, wonderful. That's awesome.

Alondra Nelson: I'll be a distinguished senior fellow there, from March 1st. My portfolio…there is about how to do policy-making that really acknowledges and appreciates that science and technology touch every part of American life. And so as much as you need a science policy team or a tech policy team, the work that I want to do will be about science and technology policy [cutting across] domestic and international policy, health care, education, democracy, and the like. I'm looking forward to staying engaged in the policy-making space.

Holden Thorp: Wonderful. Well, thank you for your time.

Alondra Nelson: Great to talk to you.